Capacity Building Project Plan

Department of Commerce and Consumer Affairs

State of Hawaii

2013-2015

The purpose of the Capacity Building Project is to resolve identified gaps in broadband service throughout the State to reduce barriers to broadband adoption. The project augments data findings and analysis on broadband accessibility included in the Department of Commerce and Consumer Affair's (DCCA) Hawaii Broadband Strategic Plan (December 2012), and implements recommendations made to advance broadband deployment in the State.

This Capacity Building Project Plan provides summaries and excerpts from various state and federal sources on broadband infrastructure deployment best practices (Section I) and affordable broadband pricing best practices (Section II). The report then makes specific recommendations (Section III) to reduce barriers to deployment and bridge infrastructure gaps to provide affordable broadband services. These recommendations build upon the capacity building goals and objectives outlined in the State Broadband Strategic Plan, incorporating many of the best practices around the nation. DCCA has sought input of the State Capacity Building Committee, comprised of public and private stakeholders, on these recommendations and will seek guidance from the Committee in their implementation.

I. Infrastructure Deployment Best Practices

A. National Broadband Plan

The National Broadband Plan recommended steps for the deployment of broadband infrastructure, recognizing government's significant role in network construction through permitting and zoning rules and regulation of infrastructure such as utility poles and conduits:

> Federal, state and local governments should do two things to reduce the costs incurred by private industry when using public infrastructure. First, government should take steps to improve utilization of existing infrastructure to ensure that network providers have easier access to poles, conduits, ducts and rights-of-way. Second, the federal government should foster further infrastructure deployment by facilitating the placement of communications infrastructure on federally managed property and enacting "dig once" legislation. These two actions can improve the business case for deploying and upgrading broadband network infrastructure and facilitate competitive entry.[1]

The Plan more specifically outlined these recommendations as follows:

Improving utilization of infrastructure
➢ The FCC should establish rental rates for pole attachments that are as low and close to uniform as possible, consistent with Section 224 of the Communications Act of 1934, as amended, to promote broadband deployment.
➢ The FCC should implement rules that will lower the cost of the pole attachment "make-ready" process.
➢ The FCC should establish a comprehensive timeline for each step of the Section 224 access process and reform the process for resolving disputes regarding infrastructure access.
➢ The FCC should improve the collection and availability of information regarding the location and availability of poles, ducts, conduits and rights-of-way.

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[1] See National Broadband Plan at Chapter 6, *available at* http://www.broadband.gov/download-plan/.

➢ Congress should consider amending Section 224 of the Act to establish a harmonized access policy for all poles, ducts, conduits and rights-of-way.

➢ The FCC should establish a joint task force with state, Tribal and local policymakers to craft guidelines for rates, terms and conditions for access to public rights-of-way.

Maximizing impact of federal resources

➢ The U.S. Department of Transportation (DOT) should make federal financing of highway, road and bridge projects contingent on states and localities allowing joint deployment of conduits by qualified parties.

➢ Congress should consider enacting "dig once" legislation applying to all future federally funded projects along rights-of-way (including sewers, power transmission facilities, rail, pipelines, bridges, tunnels and roads).

➢ Congress should consider expressly authorizing federal agencies to set the fees for access to federal rights-of-way on a management and cost recovery basis.

➢ The Executive Branch should develop one or more master contracts to expedite the placement of wireless towers on federal government property and buildings.

B.   FCC Technological Advisory Council

The purpose of the FCC's Technological Advisory Council (TAC) is to identify and evaluate high impact opportunities to accelerate transitions from legacy information and communication systems. In its report to the FCC Chair in 2011,[2] the TAC included the following recommendations:

Recommendations – Technological Advisory Council Chairman's Report (April 22, 2011)

1. **Municipal Race-to-the-Top program.** The FCC should sponsor a Race-to-the-Top-style awards/recognition program to identify a list of cities with the best practices in terms of broadband infrastructure deployment. The "Broadband City USA" contest could provide top rankings for cities and towns based on being the most broadband-friendly in terms of infrastructure planning, accommodation, and permitting/approvals processes. Cities and towns would have an incentive to compete for this designation, making it a tool to further new investment and economic development. The FCC could also use this program as an opportunity to highlight a host of best identified practices for broadband infrastructure deployment, including model city "rights of way" codes.

2. **Broadband Infrastructure Executive Order.** The FCC should formally request that the President issue an Executive Order on broadband infrastructure deployment on federal land and in federal buildings. The Executive Order would mandate the following for Federal rights of way and antenna siting approvals:
   *Single document format for permitting
   *Single federal agency to coordinate the permit approval process
   *Sixty day time frame for approvals

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[2] http://www.fcc.gov/encyclopedia/technological-advisory-council.

Such an Executive Order would place the Federal government in a position to advance network deployment and resiliency in communities with Federal buildings, especially urban areas where network congestion is most acute. In addition, this Executive Order could advance the development of micro cells, distributed antenna systems (DAS), and other innovative broadband infrastructure, demonstrating a path for growth in this market.

3. **Advocacy for Rapid Tower Siting.** The FCC should propose that states and municipalities employ a shortened "shot clock" for co-locations on existing structures or permit co-location "by right" - absent special circumstances. The TAC has identified several impediments to tower siting processes which could be overcome through updates to state and local procedures, including:
    *Inconsistent and non-concurrent time frames for environmental assessments
    *Redundant requirements for co-location applications
    *Repetitive rejection of incomplete applications without identification of deficiencies
Expediting the process for tower siting could have an important impact on the development of local broadband access in communities, boosting their marketability to new employers and network access for local entrepreneurs. If states and municipalities do not agree to expedite co-location approvals, the Commission should express its willingness to proceed with a new, shorter "shot clock" rule for co-locations.

4. **Best Practices/Technology Outreach to State and Local Governments.** The FCC should begin a dialogue with states and municipalities about proven new technologies for efficiently deploying broadband (e.g., micro-trenching, DAS equipment on city light poles, directional boring). The Commission should host a "road show" or series of workshops highlighting best identified practices with new technologies. This road show, in combination with leadership on the federal level through the Executive Order (See recommendation #1), can help accelerate the development of this new market for network infrastructure.

5. **Model an Online Deployment Coordination System.** The TAC believes that timely access to underground facilities has a direct bearing on infrastructure costs and deployment. The FCC should develop a "white label," web-based communication tool that can be adopted and labeled as their own by localities to provide advance notification of planned infrastructure projects. Such a web-based capacity would allow all those who must excavate rights-of-way to coordinate openings (i.e., "dig once") and thus speed deployment and reduce costs and civic disruption. Any state or municipality could voluntarily use the FCC model to implement its own "reverse one-call" system to provide notification of new infrastructure projects.

6. **New Metrics to Measure Broadband Network Quality.** The TAC believes that, for some usage models, developing metrics beyond throughput speed to measure the quality of Internet Protocol (IP) broadband networks is important for helping the IP ecosystem flourish by enabling "extended" quality standards that can support the subset of applications that require not only fast, but precise, timely and reliable broadband networks. Simply measuring broadband networks

by throughput speed does not provide a full picture nor set sufficient performance parameters to support uses with "extended" quality requirements such as healthcare monitoring, emergency services, alarms, etc. Although network services that meet such extended criteria may not be offered by all service providers, or included in all service plans, it would be beneficial to have common metrics for them.

Additionally, in transitioning to IP based networks the TAC will be identifying how reliability can be characterized in a multi-modal environment -where reliability is provided by having many alternate paths, means and/or modes of communications. The FCC should initiate the steps necessary for determining how this aspect of the transition will impact the basic architecture of emergency services.

7. **Highlight Stranded PSTN Investments.** Network providers have huge investments in existing PSTN infrastructure including copper wire, switches, pole space, and software. Although new information services are designed for IP networks, many homes and businesses still use devices that depend on specific characteristics of the PSTN (e.g., auto-dialers, alarm systems, ATMs, PoS terminals). These services and devices will have to be replaced and the accompanying construction and inspection "codes" revised. The TAC will be creating an inventory of such services. We would recommend that the FCC highlight this concern and initiate a public dialogue so that the technology and know-how for replacing such services is widely disseminated.

   The TAC in the coming months will conduct a further technical analysis of the potential short term, and low cost transitions of this legacy infrastructure, including new, IP-enabled devices and the use of traditional copper lines for high speed, high quality broadband.

8. **Promote Small Cell Deployment.** Small cell deployments have the ability to greatly increase spectral efficiency to meet demands of increasing teledensity. The FCC, with the participation of other relevant agencies (e.g., General Services Administration) should convene an industry-led group (e.g., providers, vendors, standards groups, and building owners) to discuss ways to accelerate the deployment of small cell wireless devices (i.e., femtocells, DAS, Wi-Fi) in commercial and government buildings and other high teledensity venues. Accelerating this deployment would meet growing market demand for mobile broadband in dense, urban areas and potentially create new employment for design, installation, and operation of wireless systems.

   Two ideas in particular that should be explored: (1) development of "universal architectures" for picocells, femtocells, etc., perhaps leveraging convergence around LTE, so that multiple providers using multiple spectrum bands could be served from a single device; and (2) creation of a new "small cell band" spectrum allocation, conceptually a hybrid between licensed and unlicensed spectrum, in which property owners and/or mobile broadband providers would have the ability

to freely deploy networks to offload broadband services from other networks with assurances of interference protection from neighboring users.

C.   Executive Order -- Accelerating Broadband Infrastructure Deployment (June 14, 2012)

President Barack Obama issued an Executive Order to facilitate the timely and efficient broadband deployment on Federal lands, buildings, and rights of way, federally assisted highways, and tribal lands, particularly in underserved communities. The Order established a Broadband Deployment on Federal Property Working Group (Working Group), composed of representatives of multiple federal agencies, to develop and implement a strategy that ensures a consistent approach to facilitate deployment by, among other things, avoiding duplicative reviews and coordinating review processes. A report was due within one year from the date of the Order. See Section I.5 below.

The Working Group member agencies with responsibility for managing Federal lands, buildings, or rights of way were directed to "develop and use one or more templates for uniform contract, application, and permit terms to facilitate nongovernment entities' use of Federal property for the deployment of broadband facilities. The templates shall, where appropriate, allow for access by multiple broadband service providers and public safety entities. To ensure a consistent approach across the Federal Government and different broadband technologies, the templates shall, to the extent practicable and efficient, provide equal access to Federal property for the deployment of wireline and wireless facilities."

Lastly, the Order required the United States Department of Transportation (USDOT), in consultation with the Working Group, to (1) review "dig once requirements" in its existing programs and implement a flexible set of best practices that can accommodate changes in broadband technology and minimize excavations consistent with competitive broadband deployment; (2) "work with State and local governments to help them develop and implement best practices on such matters as establishing dig once requirements, effectively using private investment in State ITS infrastructure, determining fair market value for rights of way on federally assisted highways, and reestablishing any highway assets disturbed by installation;" and (3) "review and, if necessary, revise its guidance to State departments of transportation on allowing for-profit or other entities to accommodate or construct, safely and securely maintain, and utilize broadband facilities on State and locally owned rights of way in order to reflect changes in broadband technologies and markets and to promote competitive broadband infrastructure deployment[.]" "Dig once requirements" are designed to reduce the number and scale of repeated excavations for the installation and maintenance of broadband facilities in rights of way.

The USDOT, in consultation with the Working Group and the American Association of State Highway and Transportation Officials, was directed to "create an online platform that States and counties may use to aggregate and make publicly available their rights of way laws and joint occupancy guidelines and agreements."

D. Executive Order: Accelerating Broadband Infrastructure Deployment – United States Department of Transportation, Federal Highway Administration, Office of Policy and Governmental Affairs Successful Practices of Broadband and Deployment in Highway Rights of Way: Summary Paper (May 2013)

The Working Group (identified in Section I.3 above) requested that the USDOT-Federal Highway Administration (USDOT-FHWA) "help identify successful practices that may assist State DOTs and local agencies implement policies that facilitate broadband deployment."[3] The USDOT-FHWA held a workshop in February 2013, and subsequently issued this USDOT-FHWA summary paper as part of its commitment to "present successful practices of broadband deployment in highway ROW, with a focus on the installation of underground fiber optic facilities and related efforts to minimize excavation of the roadway."

While there are many different successful approaches taken across the country, the USDOT-FHWA summary paper notes some agreement from stakeholders on the following topics:

Serving Underserved Areas – Due to the lack of market, state incentives, such as installation of empty conduit, ability to freely access highway ROW, and low or no-cost use of highway ROW for non-profit entities, encourage deployment.

Broadband Deployment Approaches Identified in Wireline Installations – Three different approaches have worked successfully: (1) publicly-owned and operated network; (2) privately-owned and operated network; and (3) public-private partnership network.

Resource Sharing – State DOT bartering or trading with service providers for the use of ROW or existing infrastructure, such as conduit, allows for expanded ITS networks into rural areas.

Reducing Deployment Time – Coordinated and consistent sharing of information on policies and practices, online mapping tools with detailed information on state routes and conduit locations, and electronic processes facilitate deployment.

Dig Once – Dig once and joint use of trenches practices can expedite deployment when implemented as part of a cooperative planning process. SDOT-FHWA has policies and procedures that support installation practices that minimize excavation; strongly encourages states to work collaboratively with service

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[3] Executive Order: Accelerating Broadband Infrastructure Deployment – United States Department of Transportation, Federal Highway Administration, Office of Policy and Governmental Affairs Successful Practices of Broadband and Deployment in Highway Rights of Way: Summary Paper (May 2013) at 3; *available at* http://www.fhwa.dot.gov/policy/otps/successprac.cfm..

providers on joint highways and utility planning and development; and promotes practices and technologies that align with the dig once concept.

The USDOT-FHWA summary paper includes summaries of five selected workshop presentations that offered unique approaches to deploying broadband in both rural and urban areas:

Case #1: Santa Monica City Net – The City built a publicly-owned and operated network, and in 2010 launched a 10 Gigabit network and partnered with ISPs to provide 10 Gigabit broadband to the community.

Case #2: Utah Department of Transportation (UDOT) – The State facilitated cooperative fiber and conduit trades with broadband service providers to expand its communications network across the state without major capital investment. UDOT meets regularly with telecoms and other state agencies involved in broadband deployment to foster the sharing of information, and makes telecoms aware of availability of facilities in the ROW. Telecoms may annually submit a "wish list" to the State's Telecommunications Advisory Council, which may coordinate deployments with road projects to align excavation and other implementation activities. ESRI maps highlight UDOT owned routes and road, and online information includes fiber and conduit locations, plans for economic development, contact information and weblinks.

Case #3: City of Boston – City adopted a "joint build" policy that mandated all telecoms to install their underground conduits "in the same trench, at the same time on a shared-cost basis." The policy requires the first telcom company seeking to build to be the "lead company" who must coordinate planning and construction work with other participating telecoms.

Case #4: Maryland State Highway Administration of the Maryland Department of Transportation – Maryland has a well-developed resource sharing program, which is separated funded through an account within the state's Transportation Trust Fund to advance IT-related projects. The state has 23 agreements with providers that are based on sharing highway ROWs for monetary or in-kind compensation. Maryland also established a rural broadband assistance fund and a rural broadband coordination board to facilitate deployment in rural areas, and passed laws making the use of highway ROW for telecommunication services available to non-profit entities without charge until 2020.

Case #5: E-Corridors Initiative of Virginia Tech - This is an outreach initiative of Virginia Tech to provide information to communities and to work with private stakeholders to coordinate efforts on installing broadband infrastructure, with a focus on serving disadvantages populations.

The USDOT-FHWA summary paper concludes with "the following next steps for agency action to help facilitate the deployment of broadband:

1. Prepare a letter from the FHWA Administrator to the Chief Executive Officers of the State Departments of Transportation to encourage State DOTs and local agencies to work with stakeholders in developing broadband policies, if appropriate.

2. Coordinate with AASHTO to host a webinar that includes presentations from the Utah and Maryland DOTs on their approaches for deploying broadband in the ROW.

3. Provide links and materials related to broadband on the Interagency Working Group OMB Sharepoint site and appropriate FHWA websites."

E.   Implementing Executive Order 13616: Progress on Accelerating Broadband Infrastructure Deployment. A Progress Report to the Steering Committee on Federal Infrastructure Permitting and Review Process Improvement by the Broadband Deployment on Federal Property Working Group (August 2013)

The Working Group (identified in Section I.3 above) issued this one year report in August 2013.[4] The report "details improvements made in the following areas: 1) coordinating consistent and efficient Federal broadband procedures, requirements, and policies; 2) improving efficiency by coordinating use of one or more uniform contract, application, and permit terms (related to broadband infrastructure deployment); and 3) fostering deployment of conduit for broadband facilities in conjunction with Federal or federally assisted highway construction (i.e., "Dig Once"3)."[5] Specifically, the report discusses the following seven key accomplishments, including the challenges addressed, the solution and actions taken, and next steps:

1. Aggregating Data Sets on Federal Asset Locations

Federal asset information is being collected from various agencies and aggregated onto (1) a Government Services Administration (GSA) ARC geographic information system (GIS) map to display Government owned inventory;[6] and (2) a DOT sponsored Federal

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[4] http://www.whitehouse.gov/sites/default/files/microsites/ostp/broadband_eo_implementation.pdf.
[5] Implementing Executive Order 13616: Progress on Accelerating Broadband Infrastructure Deployment at 2, *available at*: http://www.whitehouse.gov/sites/default/files/microsites/ostp/broadband_eo_implementation.pdf.
[6] Implementing Executive Order 13616: Progress on Accelerating Broadband Infrastructure Deployment. A Progress Report to the Steering Committee on Federal Infrastructure Permitting and Review Process Improvement by the Broadband Deployment on Federal Property Working Group (August 2013) at 3. Use of this information is described as follows:

> Although the tool's primary purpose is to help the wireless industry identify Federal rooftops where a commercial antenna installation could be sited or areas that are ineligible for siting, it also contains several layers of data useful to broadband deployment. The tool allows a user to quickly identify relevant Federal points of contact to obtain further information regarding a particular location or asset. For example, the tool offers visibility into the location of National park units, protected wilderness areas, and Tribal lands where antennae arrays could be challenging to locate.

Infrastructure Projects Permitting Dashboard (Dashboard), which is publicly viewable.[7] Plans are "to overlay the National Broadband Map on the GSA map to display where broadband projects are planned and have been deployed, particularly in underserved areas." The Dashboard will allow a "vendor a starting point to coordinate and undergo a long-term planning process with all of the required [agencies] through a single interface, with the goal of speeding up the overall project schedule."

2. Developing General Services Administration (GSA) Common Forms and Templates

The GSA, working with other federal entities, "developed a common master application, an antenna lessee checklist, master contracts, lease forms, and license forms" for the deployment of wireline and wireless facilities on Federal property. Executive agencies will be required to use the master contracts and forms. The Working Group agencies "will be responsible for establishing rental fees for the use and occupancy of Federal buildings and lands they manage, in accordance with their laws, regulations, and policies."

3. Developing an Online Platform for Common Applications and Forms

The United States Department of Agriculture (USDA) Rural Utilities Services (RUS) "is designing and piloting a common application system that would be the first of its kind to integrate RUS funding opportunities for broadband, water and waste, and electric projects (and associated environmental reviews) across the three programs for entities seeking grants from RUS." Work is also being done to potentially integrate this tool with other grant and permitting review processes in an effort to move towards a common application platform.

4. Ensuring Increased Accessibility and Usability of Federal Broadband Documentation

The Working Group collected from Work Group member agencies broadband deployment applications, forms, lease agreements, review procedures and process documents. To increase usefulness and accessibility of agency broadband information, this document inventory collected was used to create a searchable database of permitting and review information.[8]

5. Establishing Dig Once Best Practices

DOT-FHWA "has been active in coordination, communicating, identifying and promoting successful state and local policies and practices that facilitate the deployment of broadband at the state and local levels." In addition to DOT-FHWA's summary paper discussed in section I.4 above, FHWA "developed an additional summary paper--*USDOT-FHWA Background Paper and Work Plan Strategy*—which provides an

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[7] See http://www.permits.performance.gov/.
[8] This search tool contains information on permits and approvals as well and NEPA and other reviews, available at: http://www.permits.performance.gov/permit-inventory; see also http://www.permits.performance.gov/broadband_inventory.

overview of Federal and state policies and examples of utility accommodation, coordination of telecommunications installations with state Intelligent Transportation Systems infrastructure, and determinations of fair market value of ROW access."[9] DOT has also made information available on state utility accommodation laws and state joint-occupancy agreements.[10] It is also continuing to explore other platforms to minimize excavation at the state and local level.

6. Improving Section 106 and National Environmental Policy Act (NEPA) Efficiency Measures

"[T]he Working Group is developing mechanisms to streamline environmental and historic preservation review processes, drive additional consistency, and lessen the time and costs associated with the reviews, where appropriate. . . The Working Group is also working to increase the appropriate consistency and standard use of categorical exclusions (CATEX) from NEPA review for broadband projects that would not normally result in significant environmental effects."

7. Increasing Coordination with Tribal Nations for Permitting and Environmental Reviews

The Working Group is working with the Federal Communications Commission (FCC) to improve coordination with Tribal Nations for broadband permitting and environmental reviews. This includes expanded usage of electronic systems for notifications and exchanges of information for proposed projects.

F.   TECHNET'S 2012 State Broadband Index

Technet, a bipartisan policy and political network of technology CEOs, created this widely viewed report in December 2012, which measured where states rank as they look to high speed connectivity to grow strong economies and vibrant communities. The report noted "that states with inherent advantages can build on them, while some without those advantages are able to do better than expected."[11] The report provides illustrative case studies of actions taken by six states to encourage broadband.[12] The following provides highlights from those case studies:

<u>CALIFORNIA</u>

California developed a coordinated plan to promote deployment, expand support for new infrastructure, and take steps to expedite rights of way access. In 2006, Governor Arnold Schwarzenegger "issued an executive order to reduce regulatory roadblocks, install conduit in new road construction and establish the California Broadband Task Force, a public-private partnership to identify additional administrative actions to promote broadband access and usage within the state." Among other things, the Task Force recommended the following:

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[9] Available at http://www.fhwa.dot.gov/policy/otps/workplan.cfm. FHWA subsequently issued a "dig once" policy brief in October 2013, *Minimizing Excavation through Coordination*, available at *http://www.fhwa.dot.gov/policy/otps/policy_brief_dig_once.pdf.*

[10] http://www.fhwa.dot.gov/policy/otps/exeorder.cfm..

[11] Technet's 2012 State Broadband Index at 11, *available at* http://www.technet.org/wp-content/uploads/2012/12/TechNet_StateBroadband3a.pdf.

[12] *Id*. at 12-22.

- Build out high-speed broadband infrastructure to all Californians;
- Develop model permitting standards and encouraging collaboration among providers;
- Increase the use and adoption of broadband and computer technology;
- Engage and reward broadband innovation and research;
- Create a statewide tele-health network; and
- Leverage educational opportunities to increase broadband use.

"One of the most significant and impactful recommendations from the 2008 report, creation of the California Advanced Services Fund (CASF) to fund broadband network construction in unserved and underserved areas, quickly became reality." Legislation in 2008 authorized the CASF, funded through a small assessment on telephone and VoIP services, at a level of $100 million. In 2011, this fund was increased to $225 million through 2018.[13] Other 2008 task force recommendations enacted include legislation establishing the California Virtual Campus and allowing community colleges to qualify for the Teleconnect Fund; and authorizing community service districts to offer broadband services if they are not available from private sector providers.

California has also been a leader in promoting broadband use by, for example, "adopting a policy of regulatory restraint with respect to IP-enabled communications services—an important demand driver for broadband; investing in development of an extensive tele-health network and removing regulatory barriers to online learning by enabling schools to receive funding regardless of whether a student is physically in the classroom." Further, the California Public Utilities Commission created the California Emerging Technology Fund (CETF) to boost broadband adoption through conditions attached to the merger of AT&T/SBC with Verizon/MCI, requiring the contribution of $60 million over five years.

MAINE

By executive order, a Broadband Access Infrastructure Board (BAIB) was created in 2005. The BAIB issued its report in 2005, with recommendations that included "providing incentives and funding for broadband infrastructure, making regulatory changes to rights of way policies, granting funds for technology demonstration projects, and creating a Citizens' Advisory Board to lead technology demonstration efforts. In addition, the report recommended creating an entity with rulemaking authority and a professional staff to monitor broadband deployment and maintain information on availability, demand and potential funding." Maine thus created the ConnectME Authority in 2006, with "statutory authority to collect an annual fee (not to exceed 0.25% of revenue) from every communications provider for all services provided in the state. The Authority has provided 18 grants to providers to bring broadband to unserved areas across the state in the more than two years since it was formed, with the potential to reach 27,000 households." Through a $25 Million BTOP grant for a public-private partnership, Maine is expanding its middle mile infrastructure though its Three Ring Binder project.

Maine has taken other steps to integrate broadband into key sectors:

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[13] http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/CASF/ ("The CASF is funded by a surcharge rate on revenues collected by telecommunications carriers from end-users for intrastate telecommunications services. On January 1, 2008, the Commission adopted a surcharge rate of 0.25% to fund the program. On December 17, 2009, the Commission approved Resolution T-17248 which reduced the CASF surcharge from 0.25% to 0.00% effective January 1, 2010. To collect the additional funds authorized by SB 1040, the Commission issued Resolution T-17343 on September 22, 2011, which revises the surcharge from 0.0% to 0.14% effective November 1, 2011. The Commission approved Resolution T-17386 on February 13th, 2013, increasing the surcharge rate from 0.14% to 0.164% effective April 1, 2013."

- Member, FCC New England Telehealth Consortium, funded by Rural Health Care Pilot to links regional health care providers with urban public practices, research institutions, academic institutions and medical specialists. (However, to date, affordable broadband at speeds necessary for most healthcare entities is not available, and there is a low uptake of applications from healthcare providers to boost broadband demand for Electronic Health Records and Health Information Technologies
- Every Maine school and library has broadband service and 44 percent have fiber optic connections.
- Maine Learning Technology Initiative provides all seventh and eighth grade students and teachers in Maine with a laptop
- To bring next generation connectivity and speeds to the state, the University of Maine is a founding member of the NorthEast Cyberinfrastructure Consortium, a charter member of the Gig.U Project and a participant in the NorthEast Research and Education Network

UTAH

Utah "has become a regional technology hub capable of attracting high technology businesses and supporting broadband adoption and use in various sectors like healthcare and education." The state leads the country in publicly-supported broadband deployment projects, and hosts one of the first and largest open access fiber deployments in the nation, consisting of "16 cities that joined together to deploy an all fiber network to homes and businesses funded through municipal bonds."

Public private partnerships between the Utah Education Network (UEN) and providers have connected schools, covered by the UEN through state support and federal universal service funds and other federal grants. This "network serves as the 'anchor tenant' for many independent telecom providers throughout the state and is set to expand using BTOP funds to connect 149 more community anchor institutions."

The state's Department of Transportation has enabled broadband deployment through its policy "of facilitating cooperative fiber and conduit trades with broadband service providers as well as laying fiber conduit during road construction projects where it makes sense. The agency uses this backbone to provide "smart roads" to help eliminate traffic congestion."

"[T]he Utah Telehealth Network (UTN) connects urban and rural providers throughout the state with facilities and patients, enabling telemedicine, home monitoring for elderly and chronic patients, as well as public health and health administration projects."

MASSACHUSETTS

Massachusetts created the Massachusetts Broadband Institute (MBI) under the Massachusetts Technology Collaborative (MTC), the State's economic development agency. MBI was given "the ability to invest up to $40 million of state bond funds in necessary infrastructure assets like conduits, fiber-optics and wireless towers." These funds were used as leverage to attract BTOP grants and private investment. Regional coalitions have also "banded together to promote demand aggregation amongst anchor tenants, businesses and residents in rural western Massachusetts."

"The history of broadband policy in Massachusetts is full of partnerships—with the federal government, with private entities, amongst state agencies and interested nonprofits. For example, an MBI project along I-91 came from a collaboration between the state transportation agency, who was installing conduit for a traffic-management system and MBI who took the

opportunity to install some of its own fiber at the same time. The MBI has since developed a dig once policy and has a similar agreement with the Department of Conservation to use the state's fire towers as attachment points for wireless equipment. The state, as already noted, has received federal stimulus grants to expand existing projects as well as work with private providers to build new infrastructure like the MassBroadband, which will connect over 120 communities in western and north central Massachusetts. Such partnerships can fuel community action. In the western Massachusetts town of Leverett, the town has invested $3.6 million for a fiber-to-the-home project, which will use the MassBroadband infrastructure as its on-ramp to the Internet backbone.

While deploying broadband and working to support its adoption in residences and businesses, stakeholders have also invested in the capacity of the overall digital ecosystem in the state. The John Adams Innovation Institute, another division of the MTC, has worked to develop and support research universities, hospitals and laboratories, the concentration of venture capitalists and angel investors as a framework for the innovation economy in Massachusetts. The Institute conducts investment support studies for private entities and the public sector and leads efforts like the development of the State Regional Economic Development Strategy."

MISSOURI

"[E]lected officials, local stakeholders and representatives from private industry have demonstrated a commitment to planning for broadband and integrating the infrastructure into a broader, long-term strategy for development." The State's MoBroadbandNow is "a public-private initiative to expand broadband accessibility and facilitate the integration of broadband and information technology into state and local economies, including directing the state's stimulus funding and projects." Among other things, "the initiative has established regional teams to develop grassroots-level strategic broadband plans and holds an annual broadband summit."

The State is aggressively pursuing "building economic diversity and a growing broadband-based economy. . . . [T]he state has sought to encourage the use of information technology in agriculture and heavy manufacturing, while encouraging entrepreneurship and the growth of new and emerging high-tech companies. The state supports emerging businesses through public-private partnerships like the Missouri Technology Corporation and non-profit and public-supported efforts like the IT Entrepreneur Network and university-housed Innovation Centers. Finally, using tax credit incentives, the state has attracted several high-technology companies to the region including IBM, Capgemini and Unysis."

OHIO

"Ohio has a history of leading the country in its policies to support broadband deployment and usage, modeling programs for other states. In the past, the state has sought "alternative" regulatory arrangements to encourage providers to offer more broadband in exchange for its approval of mergers of telecommunications companies. The state also led federal policy with several other states, when, in December 2007, then Governor Ted Strickland launched Connect Ohio, a public-private partnership to address broadband availability in the state. Ohio made an investment to establish this program to map broadband availability, research broadband use and adoption, work to stimulate and aggregate demand, and engage communities in the development of local and regional technology plans and expanded this program with funding from NTIA when it became available in 2009. Also in 2007, the Governor created the Ohio Broadband Council to coordinate efforts to extend access to the states Broadband Ohio Network to every county in Ohio. In addition to developing a plan for statewide broadband

deployment, the Ohio Broadband Council was charged with coordinating all state-funded broadband initiatives, pursuing additional federal investments in broadband, promoting public and private broadband initiatives and addressing the digital divide in Ohio's rural and urban areas. The council expired in 2010 with the end of Governor Strickland's term." Ohio's next Governor announced "plans to have the state spend $8.1 million to upgrade Ohio's existing fiber optic network, connecting schools, governments, and other anchor institutions. The plan calls for a ten-fold increase in download speeds, expanding the network's capacity to 100 Gbps. "

Ohio also "has a long history of non-profit groups promoting and expanding the use of broadband by its citizens. The internationally-recognized, Cleveland-based OneCommunity has been working in the state's northeast region since 2003 to support technological innovation and broadband-based economic development through technology adoption programs and on its non-profit high-speed network. OneCommunity—with private companies Horizon Telcom and Com Net, Inc—joined with the state's OARnet to form the public-private Ohio Middle Mile Consortium which was awarded $141.3 million to combine with private funds to build 3,600 new miles of broadband fiber throughout Ohio."

"Finally, Ohio's leaders—both elected and not—are promoting the use of technology to support entrepreneurship and innovation. In Cleveland, an initiative called JumpStart pairs experience entrepreneurs with up and coming business leaders, especially women and minorities. In addition, numerous angel funds have newly emerged and are now well underway to making investments, led by a matching program that's a small part of the State's Third Frontier Program, a $700 million investment in research, innovation and economic development."

The state's educational institutions have also "made substantial investments in the region's digital economy as well. The Case Connection Zone is a research project with the goal of bringing 1 Gbps Internet connectivity to the neighborhoods surrounding Case Western Reserve University. The current beta block comprises 100 separate residences, and the University has sought to expand this coverage as part of the national Gig.U initiative. The initiative has already spawned two startups in the neighborhood while serving as a model for university communities around the country. And, the Ohio State University Office of the CIO and OARnet are helping underserved communities achieve broadband Internet connectivity through wireless technologies, with major funding from the American Distance Education Consortium (ADEC), the Governor's Office of Appalachia and the Ohio Community Computing Network (OCCN)."

G.   Broadband in Washington 2012 Report

This report, prepared by the Washington State Broadband Office, included the following State Broadband Advisory Council Recommendations related to infrastructure deployment:[14]

> From first responders, to libraries, to business development, Washington should encourage collaboration in the planning, deployment and utilization of new networks and new services to promote sustainable success among Washington's communities and businesses. This means:
>
> Encourage and reward public-private partnerships. Projects that effectively demonstrate a significant degree of consultation between and among public entities, private entities, or a

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[14] 2012 Annual Report on Broadband in Washington, *available at* http://www.commerce.wa.gov/Documents/Broadband-2012-Report-FINAL.pdf.

mix thereof should receive a higher priority for funding opportunities than isolated proposals with a more limited or singular purpose.

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Promote efficiency in the delivery of public safety. By leveraging existing private and public broadband network investments we can improve the efficiency, extent and effectiveness of interoperable public safety communication throughout the state.

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The state should pursue all appropriate opportunities to eliminate regulatory and other barriers to private investment to support Washington's future as a leader in the digital economy and a broadband champion. This means:

Pursue opportunities to streamline the permitting process. Private provider investment can be encouraged by streamlining permits and right of way applications, establishing time frames to guide permit processes, supporting new approaches like de minimis change waivers and model ordinances to promote consistency among government permitting processes.

Establish policies that reduce the need for duplicate trenching. Costs are reduced and efficiency is improved by promoting multi-purpose public projects that consult with providers, share open trenches, and jointly use conduit.

H.   Minnesota Task Force Report 2012 Recommendations

Recommendations made by the State's broadband task force were, in some instances, based upon other states' broadband activities, and therefore provide a useful survey of those activities.[15]

Proposal: Provide a tax credit or grant to incent broadband providers to build in unserved areas. Coordinate with Connect Minnesota to provide target areas that are underserved or unserved and provide priority for projects that will serve these target areas

Example: Several states have proposed similar programs: the Mississippi broadband technology tax credit, the Idaho matching grant program and the Wisconsin sales tax exemption and income tax credit. The Task Force suggests the Wisconsin model as a preferred option.

Outcomes: The goal in establishing such an incentive would be to allow private providers to offset a portion of build-out costs to make build-out and service provision in unserved areas more cost effective. By utilizing data and mapping resources, the state could ensure that the incentive was focused in regions currently underserved or unserved by high speed broadband.

Proposal: Extend current sales tax exemption on equipment purchased for use in a central office to include the purchase of fiber optics and broadband equipment.

Example: Currently, machinery and equipment used directly by a telecommunications, cable television or direct satellite service providers is exempt from sales and use tax in

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[15] The full report is available at http://www.connectmn.org/sites/default/files/connected-nation/Minnesota/files/tfdecember_2012_report.pdf.

Minnesota. This proposal would expand the exemption to include fiber equipment necessary to deploy higher bandwidth speeds that meet the state broadband goals.

Outcomes: Based on Task Force members' testimony, the savings captured by eligible providers through this tax incentive would allow for increased investment in equipment to deploy high speed broadband to underserved or unserved areas of Minnesota. The Task Force estimates that every dollar of public investment would correspond to $12 of private investment by eligible companies.

Proposal: Create a program or mechanism to coordinate rural broadband installation with state and federal programs assisting hospitals, schools, libraries, and public safety facilities with obtaining broadband

Example: The Task Force heard from stakeholders that a number of federal programs are designed to ensure that specific community resources (including hospitals, schools, libraries and public safety facilities) have access to high speed broadband service. The Task Force concludes that there should be a resource within state government, such as the Office of Broadband Development, to serve as a clearinghouse for this information.

Outcomes: The Task Force believes that implementation of this proposal would ensure that Minnesota is well positioned to take advantage of federally-funded opportunities to incent broadband investment (particularly in rural areas) and leverage these opportunities with future state investment to maximize impacts. This proposal could also serve as an outreach tool for the state in order to proactively encourage project development and to speed completion of ongoing projects.

Proposal: Implement a formal "Dig Once" process to coordinate highway construction and broadband deployment projects

Example: This year, Arizona enacted the "Digital Arizona Highways Act of 2012" which allows the state to install broadband conduits in conjunction with rural highway construction projects. The Task Force recommends that Minnesota establish a similar formal process to both allow the state to install conduit and provide an opportunity for broadband providers to install conduit, fiber, etc. when road construction projects are already scheduled to maximize opportunities for broadband providers and state, county and local transportation departments to collaborate.

Outcomes: The Task Force believes this proposal will reduce costs related to a lack of coordination and communication regarding rights-of-way, roadway and broadband infrastructure between transportation agencies and broadband providers. This would reduce costly multiple openings of infrastructure corridors, minimize inconvenience for travelers and citizens while reducing infrastructure project length. In addition, the Task Force believes it will spur engagement between state government and private providers. Ultimately, the Task Force believes enacting this proposal will help advance Minnesota towards achieving its statutory broadband goals.

Proposal: Develop a Minnesota Fiber Collaboration Database

Example: This proposal is modeled after the California Fiber Collaboration Database, which allows broadband providers to view upcoming construction projects, notify the state transportation department of their interest in including broadband infrastructure in a project and provides opportunities for collaboration among companies interested in joint trenching opportunities.

Outcomes: The Task Force believes that Minnesota could achieve outcomes similar to California's, where the database is used by broadband providers to collaborate on projects and share construction costs when they wish to build in the same area.

Proposal: Establishment of an ongoing, post-Task Force resource within state government for high speed broadband-focused efforts in the future.

Example: The Task Force feels it is important to establish an ongoing entity to carry on the work of monitoring whether the state is making progress in achieving its broadband goals and making recommendations to policy makers in order for the state to meet those goals. The entity should include elected, citizen and multiple state agency participants and be accountable to the Governor and Legislature. The Task Force recommends looking to the Legislative-Citizen Commission on Minnesota Resources and the Legislative Energy Commission as two possible structures.

Outcomes: The Task Force views this ongoing entity as a consistent resource within state government to provide the necessary expertise to policy makers to make progress toward achieving the broadband goals.

II.   Affordable Broadband Pricing Best Practices

Affordable broadband best practices across the nation offer strategies to make service accessible to low income subscribers and to rural area subscribers faced with higher broadband service costs, as well as to lower the cost of higher speed levels to encourage adoption to further drive demand. Targeting of policies for this purpose requires both pricing data as well as information on subscriber spending motivations within household budgets at various income levels.[16]

A.   Municipal and Public/Private Wireline Broadband Networks

The deployment of high speed wide area networks is cost prohibitive for providers in rural areas with small populations of potential customers. Many municipalities across the country, as well as public/private partnerships, have established community broadband networks to fill in gaps in service.

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[16] Broadband Commission for Digital Development, "The State Of Broadband 2012: Achieving Digital Inclusion For All," Sept. 2012, *available at* http://www.broadbandcommission.org/Documents/bb-annualreport2012.pdf.

Example: In Maryland, a public/private non-profit company, the Maryland Broadband Cooperative (MDBC), was formed to build and manage a fiber optic network backbone throughout Maryland.[17] Once completed, the network will cover 800 miles and server more than 16 counties in the state. The MDBC will provide access to member companies, but will not itself provide Internet access services.

B.   Wireless Mesh Networks

Mesh networks can reduce the requirement for trenching and wired connections (assuming electrical power is available either from the grid or photovoltaics). These networks do not require a wired broadband backbone cable because they consist of many wireless access nodes that connect to each other to achieve wide area coverage.

C.   Community WiFi Networks

Community driven open WiFi networks provide free or low cost open networks. Example: Kokua Wireless[18] is a community network with a large presence on the island of Oahu, and limited presence on the island of Maui and Hawaii Island. Businesses share their Internet access on the publicly accessible Kokua Wireless network though a $250 customized WiFi antenna. People accessing the free service see an advertisement of one of the participating businesses once every 30 minutes.[19]

A similar, though much larger, community network is Fon's global WiFi network.[20] Fon sells a $49 access point that creates a dual WiFi environment: A private WiFi network for the access point's owner and a public network to be shared with the public. Those owners who share their Internet access using the Fon access point are given free access to the more than 7 million Fon hotspots around the world. In March 2013, Fon partnered with Deutsche Telekom (one of the largest telecommunications company in the world) to provide free WiFi hotspot access for Deutsche Telekom's 12 million broadband subscribers in Germany. Deutsche Telekom plans to provide access to Fon hotspots to its broadband customers in Bulgaria, Greece, Romania, Slovakia and Hungary in the near future.[21]

Open Garden provides a shared community network that creates an ad hoc mesh network using smartphones and 3G/4G connected laptops.[22] Software on non-3G/4G tablets and laptops connect to 3G/4G mobile devices running the Open Garden software to share network connectivity. When one network sharing device moves out of range, the Open Garden software on the non-network connected devices can automatically find and share another nearby Open Garden network sharing device. A March 2013 update to the software provides Channel Bonding which can pool multiple sources of network access.

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[17] http://www.mdbc.us/.
[18] http://kokuawireless.com/.
[19] Pacific Business News, "Thousands of laptop users take advantage of free WiFi service," Sept. 2008, *available at* http://www.bizjournals.com/pacific/stories/2008/09/08/story6.html?page=all.
[20] http://corp.fon.com/.
[21] The Fon Blog, "Welcoming Our Newest Partner, Deutsche Telekom," *available at* http://corp.fon.com/blog/welcoming-our-newest-partner-deutsche-telekom.
[22] http://opengarden.com/.

If no Internet connected Open Garden device is found, Open Garden on the resource using device can chain through other devices until it find one with Internet access.

D.   Satellite and Wireless Internet Service Providers

Broadband via satellite and terrestrial wireless broadband have provider delivery alternatives in rural areas where DSL and broadband cable services are not available.

Satellite broadband service has been slower and associated with higher latency than wired broadband solutions. However, the FCC reported that the newer generation of satellites, whose deployment started in 2011, have demonstrated improved performance. In February 2013, the FCC stated that:

> *As relevant here, the high capacity of ViaSat's ViaSat-1 satellite, which at the time of launch surpassed the total capacity of all current Ku-, Ka-, and C-band satellites over North America, together with other technological improvements discussed below, have decreased latency and improved the quality of satellite broadband service available to subscribers.*[23]

Wireless Internet Service Providers (WISPs) use various wireless communications technologies to provide broadband service. This includes mesh networking as well as licensed and unlicensed frequencies. Like satellite broadband, WISP service provides wireless broadband service to areas where wire based services are not available. And, because, of the shorter transmission distances involved (compared to satellites), WISP provided service generally does not have latency issues. These terrestrial wireless services are, however, subject to environmental factors which may degrade service over time.

E.   Free and Subsidized broadband services

To reach low income families, programs have been created to provide subsidized broadband services. An example of subsidized broadband service is a program from Connect2Compete. Connect2Compete is a nonprofit organization that arose from a public-private partnership and launched on August 7, 2011. Its goal is to help Americans access technology through: free digital literacy training, discounted high-speed Internet, and low-cost computers. These offerings are available to eligible free school lunch children and their families. Participating providers offer eligible families two years of cable Internet and modem rental for $9.95 per month, a laptop or desktop computer for $150, and free digital literacy training.

Oceanic Time Warner Cable offered a similar program, the Oceanic Time Warner Cable Starter Internet program, which identified eight (8) similarly qualified schools in the State of Hawaii.[24] The Hawaii State Public Library System (HSPLS) launched its Mobile Program late in 2012, which is making approximately 200 laptops available for loan to library patrons. These laptops include free 3G wireless data service. The HSPLS also provides free WiFi hotspots in 50 libraries.

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[23] FCC. Measuring Broadband America 2013. http://www.fcc.gov/measuring-broadband-america/2013/February%23Findings.

[24] Time Warner Cable Starter Internet Participating Schools. http://www.timewarnercable.com/MediaLibrary/1/1/Content%20Management/campaigns/2012/starter_internet/StarterInternet_ParticipatingSchools.pdf.

III. Recommendations to Build Broadband Capacity

A. Reduce Deployment Time

1. Increase Available Information

a) Aggregate Data on State and County Assets
   ➢ To improve the collection and availability of information regarding the location and availability of poles, ducts, conduits and rights-of-way, coordinate consistent online sharing of detailed information on state and local routes and conduit locations. Include contact information and weblinks.
   ➢ Create an ArcGIS online map to display government owned inventory modeled after federal Government Services Administration (GSA) ArcGIS map

b) Create Online Library of Agency Information
   ➢ Coordinate consistent online sharing of information on agency policies and practices, and permitting and other review information, through creation of a searchable database. Include contact information and weblinks.

c) Develop Online Deployment Coordination System
   ➢ Develop web-based system that will provide advance notice of state and local infrastructure projects to allow coordination of broadband infrastructure deployment requiring access to underground rights of way with all required agencies.
      o Create a publicly viewable State Infrastructure Projects Permitting Dashboard, modeled after the DOT sponsored Federal Infrastructure Projects Permitting Dashboard or adapt calendar notification system developed by DCCA for Act 151 permit exemption notice.
      o Consider development of a Fiber Collaboration database modeled after ones developed in Minnesota and California. These databases allow broadband providers to view upcoming construction projects, notify the state transportation department of their interest in including broadband infrastructure, and provides opportunities for joint trenching collaboration among providers.

2. Streamline and Create Uniform Processes

a) Establish Common Access Policies
   ➢ Work with providers and stakeholders to address pole attachments issues, and establish a harmonized access policy for all poles, ducts, conduits and rights-of-way.

> Create and promote model permitting ordinances for consistency among county permitting processes.

b) Develop Common Forms and Templates
> Develop uniform applications, checklists, contracts, and license forms for the deployment of wireline and wireless facilities on state and county property.
> Develop one or more master contracts to expedite the placement of wireless towers on state government property and buildings. Improve access to government assets through methods to expedite access, such as model contracts to place wireless infrastructure on government property and building.

c) Establish Common Rate Guidelines
> Establish guidelines for rates, terms and conditions for access to public rights-of-way through working group representing relevant state and county agencies.
  o Expressly authorize state agencies to set the fees for access to rights-of-way on a management and cost recovery basis. Make access to fiber corridors along state highways and roads and other assets available at consistent and reasonable cost and in a competitively neutral manner.

d) Develop Online Platform for Common Applications and Forms
> Design and pilot a common application system similar to one being developed by the United States Department of Agriculture (USDA) Rural Utilities Service (RUS).

e) Streamline Targeted Processes that Create Costly Delays
> Identify specific permit and approval processes that create costly delays for providers. Encourage interagency discussions and efforts to identify method to expedite process and mitigate delays. This may include working with the applicant cooperatively to correct application deficiencies within a short time frame (e.g., 5 days).
> Continue to work with providers on modernizing regulatory framework and environment to facilitate broadband infrastructure deployment while continuing to protect and provide for other interests of its residents. This may include streamlining legislation such as de minimis change waivers and co-location by right.

f) Broadband Community Program
> Sponsor a Race-to-the-Top style awards/recognition program for broadband infrastructure deployment best practices. Separate categories could be created for government entities and private organizations. The identified best practices could then be used as a model for other communities statewide.

g) Broadband Liaison
  ➢ Charge Chief Strategy Officer for Broadband and Telecommunications or similar officer to serve as a liaison between providers and the various State agencies to help expedite deployment.

h) Pre-approved Wireless Sites
  ➢ Pre-approve state and county properties for wireless sites.

B.   Maximize State and County Resources

1.   Shared Resources and Shared Access

a) Establish Dig Once and Joint Build Policies
  ➢ Create "dig once" and joint use of trenches practices or legislation for coordination and collaboration in the use of rights-of-way (including sewers, power transmission facilities, rail, pipelines, bridges, tunnels and roads). For example, State financing of roadway and other relevant infrastructure projects could be made contingent on allowing joint deployment of conduits by qualified parties.
  ➢ Utilize SDOT-FHWA policies and procedures, and information made available, that support installation practices that minimize excavation; and promote practices and technologies that align with the dig once concept.
  ➢ Encourage coordination between the State and local agencies to identify opportunities for development of new fiber facilities and other critical broadband infrastructure in conjunction with planned State and local capital improvement projects.
  ➢ Consider City of Boston type "joint build" policy, which mandates that all telecoms install their underground conduits in the same trench at the same time on a shared-cost basis.
  ➢ Work with county agencies to develop plans to close physical infrastructure gaps to provide broadband access for remote and difficult to reach areas in the State.
  ➢ Align and leverage State and county broadband infrastructure related projects and activities.
  ➢ Work collaboratively with service providers on joint highways and utility planning and development.
  ➢ Establish a utilities coordinator/review position in conjunction with the State Department of Transportation office to facilitate and coordinate broadband infrastructure projects utilizing government roadways and rights of way.

b) Utilize Public–Private Approach in Wireline Installations
  ➢ Coordinate provider-government infrastructure projects, where possible and public benefit provided.

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> ➤ Exchange use of ROW or existing infrastructure, such as conduit, and expedite use of that infrastructure with providers to facilitate network upgrades and competitive entry, and to get expanded networks into rural areas.

c) Shared Conduits
> ➤ Construct conduits in state and county rights-of-way and make access equally available to providers with a single agreement and fee for access. Work with State DOT on open, competitively neutral access to rights-of-way for providers. Develop model ordinance and lease agreements that may be used by the counties.

d) Co-location Sites.
> ➤ Identify opportunities where state and local governments could provide access to property for co-location facilities for wireless and wired providers in un-served and underserved areas (such as H-3).

2. Plan for Infrastructure

a) Better Identify Gaps in Service
> ➤ Utilize alternative methods of data collection, such as creating local working groups consisting of county government and community groups to assist in data gathering to map un-served and underserved areas of each island. DCCA should continue to map CAIs with broadband connectivity, and begin to map CAIs with no connectivity for potential planning projects.

b) Develop a Process to Obtain Real-Time Data from Providers to Monitor Progress
> ➤ Develop a system to obtain and maintain reliable and current data to allow more accurate mapping of unserved and underserved areas of the State for use in creating effective plans to address infrastructure needs. Promote www.hawaiispeedtest.net to capture internet speed metrics.

c) Utilize Regulatory and Subsidized Access to Advance Broadband Infrastructure Deployment
> ➤ Create legislation to implement broadband infrastructure, including:
> > o A bill/ ordinance requiring developers to file a broadband plan for newly planned communities and other planned developments, including high-rises and hotels
> > o A bill/ordinance requiring high-rises and hotels to install bi-directional amplifiers (allowing greater penetration of digital signal)

d) Utilize franchise authority to extend INET infrastructure and to improve service levels.
   ➢ Strengthen and expand the State's I-NET and distribute benefits to best serve the State as well as the individual counties.

e) Develop Plans
   ➢ Develop strategies to address the need for "last mile" infrastructure for rural areas of the State where distances from a central distribution point are great and population densities do not provide a sufficient market to support the deployment by providers alone. Identify funding sources to be able to incentivize broadband infrastructure deployment in order to provide affordable broadband service for residents in these areas. Leverage funding from federal programs.
   ➢ Develop plans for fully redundant and survivable fiber optic infrastructure on each island through partnerships and leveraging of existing systems.
   ➢ Create high speed projects or include plans for high speed infrastructure within development plans, such as the HCDA Kaakako High Speed Demonstration project; the Governor Abercrombie's Kakaako complete streets initiative; and the City & County of Honolulu's rail transit project and transit-oriented development.
   ➢ Increase Transpacific Fiber Connectivity
      o Create privately managed, shared access fiber-ready international cable landing stations on each of the major islands to induce additional submarine fiber cable projects to the State. Review applicable Hawaii regulatory framework for opportunities to streamline landing site permitting and approvals.
      o Work with relevant state and county agencies, including the Department of Defense, and other parties to take advantage of opportunities to participate in proposed transpacific undersea cable projects.
      o Create incentives for existing transpacific cable owners who are repairing or upgrading their systems that will allow the State to upgrade its existing broadband network.

3. Institute Affordable Broadband Policies

a) Form Public/private Partnerships to Create Un-served/Underserved Area Networks
   ➢ Create partnerships to establish community broadband wireline networks to fill in gaps in service in rural areas with low population. The State should identify and actively seek potential funding programs to advance broadband infrastructure, such as FCC universal service support.

- ➢ Create partnerships to establish wireless mesh networks to achieve wide area coverage to fill in gaps in service in rural areas with low population.

b) Support and Assist Networks for Un-served/Underserved Areas
- ➢ Support and assist in the establishment of open WiFi networks that provide free or low cost open networks, such as the County of Hawaii Kokua Wireless network.
- ➢ Support and assist Wireless Internet Service Providers (WISPs) that provide services in areas where wire based services are not available.
- ➢ Consider incentives that may be used to encourage rural broadband investment, such as matching funds for such investment.