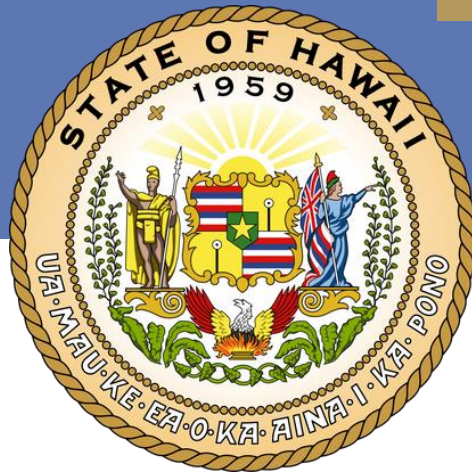


JULY 2023



STATE OF HAWAII BEAD FIVE-YEAR ACTION PLAN

**INTERNET
FOR ALL**



STATE OF HAWAI'I BEAD FIVE-YEAR ACTION PLAN

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1 Executive Summary

A high-speed Internet connection used to be a nice-to-have, but today, it is a necessity. In 2020, the coronavirus pandemic highlighted that the Internet is for more than just entertainment; it is *essential* to have continuous access to education, work, healthcare, and other professional services. Since March 2020, the federal government has dedicated over \$65 billion in federal funding to make sure that no one in the country is ever left behind because of lack of Internet access again. Hawai'i is on track to receive more than \$400 million from this historic investment.

The largest of all funding pools, the Broadband Equity, Access, and Deployment (BEAD) Program prioritizes building high-speed Internet access to unconnected (i.e., unserved) residential locations, and to communities with underperforming Internet connections (i.e., underserved). Hawai'i will see \$149.5 million under the BEAD Program alone to connect an estimated 12,700 who cannot connect to the Internet at home or are relying on outdated technology to get it.

The University of Hawai'i (UH) is the designated BEAD Program lead, in addition to leading the coordination of all other broadband efforts in the State. UH is partnering with Hawai'i's counties, various state agencies, community organizations, the telecom industry, and others to understand each community's greatest needs to develop a broadband action plan to answer those needs as we work toward a common goal of ensuring all residents are fully equipped to participate and thrive in a digitally connected world. This broadband deployment plan has two parts: infrastructure and education.

Hawai'i will take several actions to achieve its two main objectives of building infrastructure and providing digital literacy support services: (1) Internet buildout to unserved and underserved residences; (2) Community Internet Access Hubs, where residents can access high-speed Internet within their community; (3) Development of a "State of the Internet" map for Hawai'i showing unserved and underserved locations, locations served under other funding, Community Internet Access Hubs and locations for digital literacy programs; (4) A community "Digital Navigator" program, where residents with high digital literacy skills teach those with little or no digital literacy skills how to navigate devices and the web; (5) Community outreach and engagement activities to educate residents on the #Internetforall initiative and the need for Internet, and learn more about Internet and digital literacy needs across our State, and; (6) Broadband outreach, training, and education content creation for public distribution.

Hawai'i's target to achieve universal access to the Internet relies on the combination of BEAD funds through 2027 with other federally funded commitments, the ability to overlay effective and affordable Internet access alternatives for very high-cost areas, and related key middle mile (submarine and terrestrial fiber) investments expected to be completed by the end of 2026. Current funding supports continuous improvements to Internet connectivity in our State through 2030, with a look toward creating a sustainable Internet access market for years to come.

2 Overview of the Five-Year Action Plan

2.1 Vision

Hawai'i will provide universal access to high-speed Internet for all residents by 2030. Our public sector — State and Counties — together with our community service providers and private employers, will work to maximize the benefits of this historic investment of public funds to achieve this vision. All residents will be connected via modern fiber optic or similar service to guarantee high-speed (100Mbps or better) access.

The University of Hawai'i leads the State's broadband effort while closely collaborating with the community of stakeholders, including the Hawai'i Department of Business, Economic Development, and Tourism (DBEDT), the Department of Hawaiian Home Lands (DHHL), the Hawai'i Department of Transportation (DOT), the four Counties (Hawai'i, Kaua'i, Maui and Honolulu), community anchor institutions (CAI), incumbent and competitive telecommunications providers, and statewide grassroots community organizations, to ensure that our collective efforts deliver maximum benefit from the numerous federal funding programs. Work on the infrastructure elements will be closely accompanied by thoughtfully implemented digital equity programs to promote the necessary digital skills development for residents, enhance our local workforce, and stimulate and diversify our State's economy.

BEAD represents the largest of the federal broadband funding programs and prioritizes last-mile support for our unserved and underserved communities. Taken together, the long list of federal programs will ensure we have reliable, affordable, and sustainable efforts addressing our first-, middle- and last-mile infrastructure needs, as well as robust community-based services aimed at achieving digital equity and literacy in order to support a digitally literate workforce of the future.

By 2030, Hawai'i envisions communities where every resident has meaningful access to reliable and affordable high-speed Internet, bolstered by a strong digital equity program. This will enable all of our residents to fully participate in a digitally enabled world where online services are ubiquitous and technology is woven throughout our society. Our goal is to embed resources within communities by training digital navigators local to the area, and offering technology literacy training and other digital equity services tailored to a community's particular needs. The State hopes to engage existing CAIs (e.g., schools, libraries, and other public facilities) across the islands as partners as we discuss ways to support them as we hope to potentially expand their offerings to include neighborhood-based community digital hubs where we can bring together residents in need with digital navigators and other resources to help them overcome the barriers to adoption of high-speed Internet services.

'Apakau ka lā (translation: 'spreading of the sun's rays') — this metaphoric expression captures the State's vision to build fast, reliable, and affordable broadband

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infrastructure to every community and guarantee accessibility for every resident. The investment in broadband begins at the first mile, where reliable Internet infrastructure must first reach our State through trans-Pacific connections; it is extended to our islands and neighborhoods via the middle mile and fills any gaps in the last mile, where the Internet reaches every resident, community anchor institution, and business on our islands.

2.2 Goals and Objectives

Hawai'i's goals and objectives are structured to achieve maximum leverage and benefit from this historic investment of federal funds. These goals and objectives collectively support the vision of providing meaningful access to high-speed Internet for all residents by 2030. The BEAD program broadly supports this vision by prioritizing new connections to unserved and underserved locations, raising the floor for all connections to the Internet to at least 100Mbps, and ensuring the deployment of gigabit service to CAIs. BEAD also supports critical training for building skills to overcome the legacy hurdles to adoption of technologies.

Table 1: State Goals and Objectives

Goals	Objectives	Measure
Provide reliable and affordable access to high-speed Internet for all residents (universal service)	<ul style="list-style-type: none"> Identify locations without access to high-speed Internet service through community outreach. Redefine Community Anchor Institutions (CAIs) with less than 1 gigabit service to reach all communities. 	<ul style="list-style-type: none"> Increase the accuracy of the FCC map data by adding previously unmarked locations. Increase the number of identified CAIs and create a funding priority list by collaborating with Counties and community organizations. Build connections to locations without access and reach qualifying (i.e., less than 1 gigabit service) CAIs.
Enable all Hawai'i residents to fully participate in a digitally integrated society	<ul style="list-style-type: none"> Expand digital equity programs Integrate State Digital Equity (DE) plan with BEAD plan, leveraging State DE capacity grants with BEAD funds 	<ul style="list-style-type: none"> Increase the number of residents with digital literacy, workforce development, and online safety skills through training programs Build a statewide program to train and support community digital navigators Expand digital support network by fostering partnerships between community service providers and CAIs Establish and maintain a catalog of digital equity service providers and offerings connected with CAIs
Maximize benefits to Hawai'i through effective coordination of all State- and federally funded	<ul style="list-style-type: none"> Apply funding to strategic uses that best fit each funding program while connecting with the overall 	<ul style="list-style-type: none"> Define State broadband strategy Define clear roles and responsibilities for all stakeholders.

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broadband projects	<ul style="list-style-type: none"> State strategy. Use federal funds to leverage access to private funds to further invest in Hawai'i's infrastructure Integrate existing IT workforce development initiatives with BEAD/DE 	<ul style="list-style-type: none"> Refine State broadband strategy as additional funds and programs become available Monitor efforts to ensure consistent outcomes and results.
Protect public broadband infrastructure assets created from Federal and State broadband investment programs and ensure their financial sustainability.	<ul style="list-style-type: none"> Ensure public oversight through Act 231, SLH 2022, establishing a broadband infrastructure working group. 	<ul style="list-style-type: none"> Develop recommendations to Hawai'i Legislature to effectively manage broadband assets, including potentially establishing a public entity to represent the public good to manage the assets and ensure financial and operational sustainability.

To accomplish these goals, the federal government created several programs (additional program details in Table 6):

Table 2: Federal Funding for Hawai'i

Federal Funding for Hawai'i	Program Purpose
\$149.5 million	Broadband Equity, Access, and Deployment Program (BEAD) Priorities are (1) connect those with no connection; (2) connect those with old, slow connections (3) connect community anchor hubs.
\$115.5 million	Capital Projects Fund (CPF) Funding for critical infrastructure. Hawai'i projects are new undersea cables, landing stations, and connections and community centers in state-owned public housing.
\$17.3 million	Tribal Broadband Connectivity Program (TBC) Reserved for Dept. of Hawaiian Home Lands use. Priorities include connecting the unconnected, affordability, and digital literacy.
\$37.3 million	Enabling Middle Mile Program Competitive grant award to Hawaiian Telcom to build 'middle mile' infrastructure, expanding intra-island fiber networks.
\$570,000	Digital Equity Act (DEA) Establishes DBEDT's Digital Equity office, which is developing a statewide plan to promote digital equity and inclusion.
\$16.6 million	Affordable Connectivity Program (ACP) Helps eligible residents with their Internet bill, to date 45,500 households have enrolled and collectively received \$16.6 million in subsidies.

Hawai'i's investment strategy first utilizes key public investments to reset the small/mid-market capital investment paradigm to remediate the most critical failings of the "fully competitive" US telecommunications market. Magnified by our isolated island geography, the aging and brittle threads that interconnect our islands with one another and the rest of the global Internet need direct public investment to ensure their continued use and longevity. The public investment is intended to affect a positive change in the private capital return-on-investment. Despite continued growth of use of technologies outside of Hawai'i's metropolitan centers, the high capital cost of building infrastructure into remote and rural areas remains a difficult investment to justify for private sector capital. The State's investment in key inter-island and terrestrial middle

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mile infrastructure will lower the capital cost of Internet access to backhaul infrastructure for all providers — and as a result, for all residents — and increase the capacity and resilience of the critical middle mile infrastructure serving the state. Refreshed investment in Hawai'i's key middle mile routes also has the desirable benefit of eliminating the most significant hurdle to landing new trans-Pacific systems on our shores.

The broad injection of public capital and wrap-around support services will reinvigorate the competitive commercial telecommunications market by making it more attractive for commercial telecom providers to make other investments that grow their business while also benefiting Hawai'i. Increasing the market potential by incrementally improving take-up rates and the general digital literacy of the population will help fuel expansion opportunities for incumbents as well as new providers. Residents, businesses, and government operations throughout the state will benefit from lowering the cost of internal connections and access to an increasingly competitive telecommunications market. By taking the initiative and building new key broadband routes to previously unserved areas, the State will expand Hawai'i's direct-service market capacity and stimulate new economic prospects. A world-class high-speed Internet connection available to all Hawai'i residents empowers the potential export of local products, services, and talent. Opportunities include Hawai'i-originated research and commercial entities and peer-level collaboration with existing and new entities from regional and global sources.

Building on the foundational middle mile investments funded by the CPF and MMG programs, and the legacy last mile investments funded by RDOF and CAF, Hawai'i will utilize BEAD and TBC funds to fill the remaining gaps in our rural last mile infrastructure. Many of those areas that were previously uneconomical service locations for private carriers will be fully served by robust and affordable Internet access. While benefiting incumbent service providers, the comprehensive middle and last mile investments will also significantly lower the capital cost for new competitive service providers and other community-based networks to enter the market, which will also benefit consumers. Direct public investment in strategic middle mile routes is intended to lower the capital and operating costs incurred by telecommunications providers, encourage new competitive market entrants, and encourage new interest in commercial investments in Hawai'i-beneficial assets, including critical needs such as the construction of new trans-Pacific first mile submarine cable landings. In addition to addressing the capital gap, advance permitting for seaward and landing access for cable landings will remove the single greatest risk hurdle for new trans-Pacific landings.

All of this infrastructure investment will only be fully converted into tangible benefits for residents with the simultaneous statewide provisioning of digital equity and literacy services. These wrap-around support services are critical to overcoming the many hurdles to adoption most prevalent in our underrepresented communities. The

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wrap-around strategy centers around support for community digital hubs and community digital navigators that can provide in-person, on-site support for our communities with the greatest need.

3 Current State of Broadband and Digital Inclusion

3.1 Existing Programs

Table 3: Current Activities that the Broadband Program/Office Conducts

Activity Name	Description	Intended Outcome(s)
Community Convenings, Conversations and Outreach	The long-running Broadband Hui series of conversations bring together a diverse group of interested participants, engaging in a range of discussions ranging from infrastructure to competition to digital equity and literacy.	Increase the public's understanding of broadband and support for engagement and input regarding broadband and DE programs in their local communities.
Department of Commerce and Consumer Affairs (DCCA), Broadband Assistance Advisory Council	Statutorily created advisory council under DCCA for the discussion of broadband issues and looking to resolve potential regulatory issues for statewide industry and government representatives.	Recommendation of process improvements or changes in practices to streamline support for statewide broadband activities.
Department of Commerce and Consumer Affairs (DCCA), Cable TV Division, INET oversight and coordination	Regulatory oversight of statewide cable TV franchise agreements to oversee and manage the implementation of franchisee institutional network (INET) implementation. The INET is a franchisee obligation to provide private telecommunications transport for State entities (including DOE/K12 and UH). Of note, the capacity may not be used for commercial purposes.	DCCA works to maximize the benefits to the State/DOE/UH organizations from the INET provisions of the cable TV franchise agreements.
State Broadband Staff Coordination	Comprised of B&F staff, UH grant program staff, DBEDT, and the NTIA BEAD Federal Program Officer (FPO), who meet monthly to coordinate ongoing and planned broadband initiatives.	Enable a coordinated and streamlined effort to advance broadband and digital equity conversation and action.
Act 231 Broadband Working Group	Statutorily established working group to recommend structure and makeup of public entity to hold State broadband assets constructed or acquired as a result of federal program investments; in support of the working group, convene an industry advisory group of industry and enterprise representatives to provide recommendations to the working group.	Provide recommendations to the legislature before the start of the 2024 legislative session.
Statewide Coordination of Broadband Investments	Under the delegated authority of the Governor and together with	Maximize the benefits to the State resulting from public

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	the executive leadership of the Lt. Governor, work to orchestrate applications and implementation of public broadband investments by and on behalf of the State.	broadband investments. Support the overall objective of sustainable, high-value investment activities with the goal of reliable and affordable Internet access for all residents. Coordination of efforts to apply for available formula and competitive grant programs to support end-to-end sustainable broadband infrastructure in support of the State's vision of reliable and affordable Internet for all.
Oversight, monitoring, and management of the execution of grant-funded efforts	For grant awards/sub-awards under CPF and BEAD, directly execute any planning and execution of the projects under these awards/sub-awards, including periodic reporting and compliance activities.	<p>CPF: Execution of the two approved program plans; BEAD: Execution of the five-year activities funded under the BEAD Planning Funds award, including completion of the required planning phase efforts (Five- Year Action Plan, Initial Proposal, State Challenge, Final Proposal), and oversight, monitoring, and management of the implementation projects approved under the Final Proposal.</p> <p>DE: Collaboration with DBEDT to support statewide DE work and integrate efforts with BEAD planning and execution.</p> <p>TBC: Collaboration with DHHL to support work in support of the Native Hawaiian community on DHHL lands, including integration with statewide BEAD, CPF, and DE efforts.</p>

Table 4: Current and Planned Full-Time and Part-Time Employees

Current/ Planned	Full-Time (FT)/Part- time (PT)	Position	Description of Role	BEAD Funded
Current	FT	Broadband Infrastructure Architect	Technical infrastructure advisor serving as an architect to design and oversee infrastructure projects to ensure suitability for commercially viable high-speed Internet service. Provides a technical interface for carriers and ISPs when coordinating work for the State.	No (CPF)

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Current	FT	Broadband Research Analyst	Provides program management support for the UH broadband and critical infrastructure working group. Functions as a research analyst covering all State, Federal, and privately funded critical infrastructure projects supporting statewide broadband services in Hawai'i.	No (CPF)
Current	FT	Broadband Grant Program Coordinator	Responsible for managing all fiscal, human resource, travel, and recording keeping of the project transactions. Responsible for all facets of program management and administrative support for the Principal Investigator (PI), staff, faculty, and researchers associated with the project and other related grant initiatives. Contributes to the overall broadband project coordination and communication through work on project planning, creation of project reports and presentations, and maintaining social media and web presence.	No (CPF)
Planned	PT	Compliance and Contract Manager	Oversees compliance and contracting activities in support of federal broadband grants.	Yes
Planned	FT	Community Outreach and Engagement Specialist	Increases and broadens community engagement to help support planning, deployment, and adoption statewide.	Yes
Current	FT	Communications Specialist	Media and social platform communications specialist; will engage in community outreach activities and work to translate the highly technical broadband materials to plain language.	Yes
Current	FT	Data Specialist	Responsible for developing and maintaining technology solutions to support the broadband project including, but not limited to, data management, data visualization, analytics, GIS mapping, technical documentation, and process automation.	Yes
Planned	FT (2)	Technical Project Manager	Responsible for oversight, monitoring, and management of project execution, including directing, monitoring, and management of contractors	Yes

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			performing BEAD (or other related) funded projects	
Current	PT (multiple)	State Broadband Leadership	UH program management support (grant management and program design) and State broadband strategy. Includes participation by VP for Information Technology & CIO, Director of Cyberinfrastructure and Director of Network Services.	No (UH)
Current	PT (multiple)	UH/RCUH Support	UH/RCUH administrative and compliance support (administrative support, fiscal and procurement, personnel/HR, financial management, compliance reporting).	No (UH)

Current and Planned Contractor Support

In general, all of the deployment and related support efforts funded by BEAD will be executed by organizations contracted under the BEAD award funds (together with State matching funds). Additional matching funds will be provided by organizations as part of their contract commitment to execute the agreed-upon scope of work. This approach is generally true for all of the federally funded broadband grant programs.

Contracted support is included in the BEAD Planning Funds award, to provide a range of services at the grassroots level on a statewide basis. These contracted services include training, outreach, communications, and data collection and analysis roles. One set of contracts, to each of the four (4) county governments, will directly support outreach and engagement, leveraging the long-standing relationships of the respective counties with their constituents. In particular, knowledge of the communities throughout their jurisdictions and the known set of service providers already engaged with community members will substantially support the State's overall outreach and engagement efforts. Support for the counties includes engagement support, outreach, subscriptions related to community engagement, and incremental staffing support directly in support of the outreach and engagement activities. The Counties have each created a Community Engagement Plan (see Appendix 7.4 Community Engagement Plans) which describes planned activities and delivery for engaging with the communities, sharing information about BEAD and DE programs, identifying individuals who are unserved and underserved, and collecting potential CAI locations. The current plans and contract run through the end of the year, with the option to extend to ensure continued engagement. Plans will be regularly updated based on engagements and to provide new information and guidance from NTIA.

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Table 5: Current and Planned Contractor Support

Current/ Planned	Full-Time (FT)/Part- time (PT)	Position	Description of Role
Current	FT	Community Engagement and Outreach Coordinator, Temporary Term	Increases and broadens community engagement to help support planning, deployment, and adoption statewide.
Planned	FT	Public Relations Firm	Fulfill communications and outreach for State communications; create and establish broad-reaching public communications campaigns for use across all Federal, State, and County broadband activities (providing a common baseline for consistent communications and outreach).
Planned	FT	County Assistance	Additional staffing to assist County governments with outreach, community communications, engagement, and mapping activities; contracts with the County governments also support meeting costs, supplies, and related outreach and subscription costs to support their community efforts.

Table 6: Broadband Funding

Source	Purpose	Amounts
Broadband Equity, Access, and Deployment Program	Funds will be broadly used to provide last mile connectivity to unserved and underserved homes throughout the State, to be followed by connecting CAIs, and will supplement digital equity, workforce development and build other related connection gaps and needs. Funds will also cover DHHL locations (to the extent not already covered by Tribal Broadband Connectivity program funds or other federally funded programs).	\$149,484,493.57 (plus State match of \$33,000,000 appropriated for FY24 by Legislature; together with additional public and private sector match – The Department of Budget and Finance has committed to request an additional \$13,000,000 in the FY25 supplemental budget)
Coronavirus Capital Projects Fund (States)	The State CPF allocation will be used for two primary activities. The first major investment is	\$115,475,318

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	<p>projected to attract and leverage private investment in new subsea construction, with State allocations planned to support the design, permitting, and construction of a new inter-island submarine fiber optic cable system, together with associated terrestrial assets to provide interconnection with terrestrial telecommunications network backbones. The second major investment will be the creation of community hubs at HPHA public housing facilities, coupled with free and reduced access to broadband for public housing residents for a limited term through ACP enablement.</p>	
Coronavirus Capital Projects Fund (DHHL)	<p>DHHL proposes to utilize CPF funds for the pre-construction engineering and design to support the deployment of infrastructure delivering service under multiple 2.5GHz licenses allocated under the FCC 2.5GHz Rural Tribal Window program, together with the potential for unlicensed CBRS 3.5GHz use. The engineering and design outcomes will be utilized to support the construction of the wireless ISP deployment as an integral part of the DHHL effort to deploy comprehensive last mile services consisting of hybrid fiber and wireless infrastructure; the buildout will primarily be funded by the \$90m allocated to DHHL under the Tribal Broadband Connectivity (TBC) program (\$30m under CAA2021, and \$60m under IJJA statutory allocations to DHHL for the benefit of the Native Hawaiian communities). The robust combination of the hybrid fiber and wireless infrastructure deployments under TBC, together with braided support from the State of Hawai'i's BEAD, CPF, and ARPA funds, will ensure that all of our Native Hawaiian communities are fully connected to robust, resilient, and affordable broadband infrastructure.</p>	\$167,504
Coronavirus State and Local Fiscal Recovery Funds	<p>State inter-island submarine cable system desktop design and cable landing station site surveys and pre-permitting work.</p>	\$1,500,000 COMPLETED
Enabling Middle Mile Infrastructure Grant Program	<p>On September 29, 2022, UH submitted its competitive application in collaboration with Hawaiian Electric Co. (HECO), UH and HECO proposed to build terrestrial fiber along the public rights-of-way and offer open-access at a reasonable cost to the dark fiber infrastructure. The resulting terrestrial fiber assets would</p>	\$43,941,543 NOT AWARDED

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combine with the subsea build to create new, robust, and geographically diverse routes to stabilize and enhance Hawai'i's critical middle mile broadband infrastructure. All broadband uses, including access by incumbents and new competitive entrants, would benefit from the significant increases in capacity and reliability, and the significantly lower capital cost resulting from the public middle mile investments.

Enabling Middle Mile Infrastructure Grant Program	Project URGENT by Hawaiian Telcom awarded under the program on June 16, 2023. Builds a combination of subsea and terrestrial middle mile segments.	\$37,356,955 Total project: \$87,466,529
FCC, ACP Outreach Grant Program	Facilitate promotion, awareness, and participation in the Affordable Connectivity Program (ACP). Two awards were issued, one to DBEDT and the other to 'Elepaio Social Services.	\$740,000 (DBEDT) \$350,000 ('Elepaio Social Services)
Rural Digital Opportunity Fund (Hawaiian Telcom)	In February 2021, \$24 million in RDOF funding was awarded to Hawaiian Telcom to deploy fiber broadband service to over 8,000 unserved and underserved locations in rural areas of Hawai'i. By 2027, all identified locations will be serviced with speeds of 1Gbps/500Mbps.	\$24,000,000
State Digital Equity Planning Program (State)	DBEDT's Broadband and Digital Equity Office (HBDEO) will lead the charge in the Digital Equity Program. The Digital Equity Planning funds will be used to hire a contractor to assist in developing the plan, with other labor contracted out as necessary to deploy data collection initiatives to develop the plan accordingly.	\$570,883.08
State Digital Equity Planning Program (DHHL)	In July 2022, DHHL submitted a Letter of Intent to receive funding under the tribal allocation of the Digital Equity Planning Grant. These funds will be used to develop a unique digital equity plan for the Hawaiian Home Lands.	~\$50,000
Digital Equity Capacity Grant Program	Following the completed State Digital Equity Plan, states will be allocated formula funding to support Digital Equity capacity building.	TBD in Spring 2024
State Digital Equity Capacity Program (DHHL)	TBD - subject to State funding availability	TBD
Tribal Broadband Connectivity Program	Use and adoption plus mapping. Infrastructure assessment and last mile deployment awarded following the initial NOFO. Award amount \$17.2m (deployment will be in the follow-up award subject to the tranche 2 NOFO).	\$90,000,000

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3.2 Partnerships

Table 7: Partners

Partners	Description of Current or Planned Role in Broadband Deployment and Adoption
Department of Business, Economic Development, and Tourism (DBEDT)	Lead applicant in the State Digital Equity Programs. Collaborator on DE requisites specified under BEAD (direct coordination required)
Department of Hawaiian Home Lands (DHHL)	TBCP recipient. Native Hawaiian State office and collaborator for outreach and engagement to address infrastructure, access, and DE programs on Hawaiian homelands
Sandwich Isles Communications	ILEC, ISP, Last mile connectivity
Hawaiian Telcom	ILEC, ISP, First mile (SEA-US consortium), Middle mile, Last mile connectivity
Charter Communications	CLEC, ISP, Last mile connectivity
Lumen Technologies	CLEC, Last mile connectivity
ServPac	CLEC, Last mile connectivity
Ocean Networks	First mile connectivity - design and site surveys
Kaua'i Island Utility Cooperative	Middle mile connectivity (dark fiber only), community partner, workforce development
Hawaiian Electric Company	Middle mile connectivity (dark fiber only), community partner, workforce development
Chamber of Commerce Hawai'i	IT Sector Partnership (workforce development), community outreach and engagement
Island and regional chambers of commerce	Community outreach and engagement
County of Kaua'i	Community outreach and engagement, coordination of county participation in projects
City & County of Honolulu	Community outreach and engagement, coordination of county participation in projects
County of Maui	Community outreach and engagement, coordination of county participation in projects
County of Hawai'i	Community outreach and engagement, coordination of county participation in projects
County Economic Development Boards	Community outreach and engagement
Regional Chambers of Commerce	Community outreach and engagement
CIO Council of Hawai'i	Workforce development, industry partnerships
Non-Profit Service Providers	Community engagement, service delivery providers, community partners
Philanthropic Organizations	Funding partners, community engagement
Educational Institutions and Organizations	Workforce development, community outreach, service providers, CAIs

3.3 Asset Inventory

The current state of broadband infrastructure investments in Hawai'i places the vast majority of assets in the hands of commercial carriers. The largest portion of broadband infrastructure capital assets sits with Hawaiian Telcom (ILEC), Charter Communications (CLEC), and cellular carriers AT&T/Verizon/T-Mobile, with relatively small assets held

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by other CLECs (mostly Lumen, Servpac). Most statewide utility poles and distribution/transmission towers are owned by the two electric utilities, with a limited number of poles owned by a mix of other owners. Access to poles, together with construction, maintenance, and management of the pole assets, is the responsibility of the pole owners and generally operates consistent with legacy joint-pole operations.

A limited amount of private telecommunications network assets are owned by large enterprises, telecommunications carriers, electric utilities, and government, including government contractors. Radio tower assets are owned by commercial tower asset managers, mostly working with the major cellular service providers. A handful of satellite ground station operators also are present throughout the State, including those owned and operated by the federal government. The State owns and operates some key middle mile assets in statewide licensed microwave radio networks, including some of the supporting tower infrastructure.

The majority of inter-island submarine cable system assets are owned by Hawaiian Telcom (including the Paniolo submarine cable system recently purchased by Hawaiian Telcom in bankruptcy auction proceedings). Trans-Pacific cable landing station sites are currently all owned by the system's consortium ownership and, in most cases, managed and operated by one of the consortium members. Terrestrial backhaul from all trans-Pacific cable landing station sites is generally limited in supply and access and historically has been priced at a significant premium compared to comparable terrestrial backhaul capacity in California and Oregon. Colocation space in the cable landing stations has also been available only in limited situations, under the control of the fiber system consortium owner (or, in some cases, the landing party owner), and generally at a premium cost with restricted availability. In recent years, there have been improvements in access and costs, although still at a level significantly higher than our continental United States (CONUS) counterparts.

The statewide Institutional Network (INET) availability supports significant fiber-based connectivity between and among nearly all major public facilities and includes inter-island connectivity. The INET is a provision of service for the public good as an integral part of the statewide cable television franchise operation, with oversight by the Hawai'i Department of Commerce and Consumer Affairs. Since the INET is delivered as connectivity provisioned off the statewide Charter Communications infrastructure, it is **not** considered an asset owned by the State, and its use is restricted to public uses and not available for resale. The statewide INET does connect a large portion of public CAls in the state. Note that Hawaiian Telcom also operates a "cable television" operation under a franchise agreement; its service franchise area is currently limited to O'ahu, and delivers limited network resources commensurate with its market share, as a portion of its franchisee commitment.

The State received American Recovery and Reinvestment Act (ARRA) and Broadband Technology Opportunities Program (BTOP) funds to complete connections

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to a handful of rural schools and libraries. Those funds were invested as incremental cost extensions under the statewide INET program; the resulting assets were extensions of the Charter Communications infrastructure but held for the benefit of the State INET operation.

Current digital equity and literacy efforts are supported mainly through existing programs within the Hawai'i State Public Library System and DBEDT, with additional projects funded by other federal grants (mostly telehealth outreach programs run by a combination of non-profit organizations and units of the UH).

As a part of its current operational network infrastructure, UH owns IRUs on the Asia-America Gateway System (AAG) (2x10Gb O'ahu to CONUS) and the Southeast Asia-United States System (SEA-US) (100Gb O'ahu to CONUS, O'ahu to Guam). It also has long-term agreements for colocation space at the Guam GNC/Piti CLS, the Hawaiiki Kapolei CLS, and the right of entry to the Southern Cross Kahe CLS. In partnership with the Australia Academic Research Network (AARNet), UH has access to capacity on the Southern Cross Cable Network (SCCN) (2x100Gb, Australia to O'ahu to CONUS + Australia to Hawai'i Island to CONUS; note: used for research and education (R&E) traffic only). In partnership with the Research Education Advanced Network New Zealand (REANNZ), UH peers with REANNZ at the Hawaiiki Kapolei CLS. UH also maintains multiple racks at DRFortress for backup facilities, operation of the Hawai'i Internet Exchange (HIX), and network interconnection with carriers and the DRFortress commercial Internet exchange (IX). Commercial telecommunications operators also own similar assets and capacities to support their operations.

3.4 Needs and Gaps Assessment

Since March 2020, Hawai'i has had many individual efforts to collect data on the broadband and digital equity landscape due to a societal push to remote work, education, and telehealth during the global health crisis. A few reports have been published since then, focusing on digital literacy and workforce. As examples, Hawai'i recently released the following studies:

Digital Workforce Hui – 2022 State of Hawai'i 5-Year Strategic Plan for a Digitally Ready Workforce¹ – published October 2022

In November 2021, the National Governors Association awarded the State of Hawai'i and five other states \$100,000 to develop a strategic State plan for increasing access to digital skills necessary to perform education, training, and work. The Digital Workforce Hui, comprised of various State leaders from State offices and nonprofit sectors, published a final report in October 2022. This final

¹<https://static1.squarespace.com/static/622006dacc4d885cc34eb673/t/630f652f6bf2e05c1b98bc9e/1661953349951/Digital+State+Plan+2022>

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report featured input from communities statewide to create a 5-year strategic plan to close digital skills gaps in the State's workforce.

State of Hawai'i – Hawai'i Digital Literacy & Readiness Study² – published September 2021

Published in September 2021 by the State of Hawai'i's Department of Labor & Industrial Relations' Workforce Development Council, this study aimed to establish an initial benchmark on Hawai'i's digital literacy and digital readiness following federal and national level studies that some two-thirds of Americans had poor to no computer skills. This study measured the digital literacy and reading of Hawai'i's working-age population, considering various demographic markers, such as education, occupation, industry, and geography.

Vibrant Hawai'i – Digital Literacy Project³ – published September 2021

Vibrant Hawai'i, a nonprofit based in Hawai'i County, published this report focusing on increasing equitable opportunities. This project covers Hawai'i County only and occurred from January 2021 through March 2022, in which digital literacy workshops convened across the island with two core focus demographics: the unprepared and the Old Guard (mostly Native Hawaiians and those with business/trade school educations). As secondary outcomes, Vibrant Hawai'i identified programmatic feedback to gauge project scalability and sustainability, program effectiveness, incubating on island job creation alongside refurbishment of computers, increasing enrollment in EBB and ACP, and increasing equity for Hawai'i County residents in telehealth, online education, and online benefit and employment applications.

Collectively, these larger-scale studies have demonstrated lower literacy rates among distinct communities and the benefit of digital literacy programs to advance individual confidence in digital skills for leisure and professional tasks. All three reports can be found online. In addition, DBEDT's work on the State Digital Equity Plan also features an assessment of digital equity measures. This data will inform BEAD, and the completion of the assessment is expected in Summer 2023.

Further data collection for BEAD purposes addressing the needs and gaps will be a joint venture of UH, DBEDT, and the counties, with funding provided to counties for use towards data collection efforts, among other pre-approved activities detailed in this plan. In addition, contracted aid is also planned to assist counties and the State in the data collection process, with data visualization of all data components to be fulfilled by the UH team and presented collectively on behalf of the State. County efforts to collect data will be largely guided and supported by UH to ensure that the same data types are

²<https://labor.hawaii.gov/wdc/files/2021/11/Final-Statewide-Digital-Literacy-Survey-Report-from-Omnitrac-11.15.2021.pdf>

³https://6b9617c5-46b6-4011-b92a-1a749a57361f.usfiles.com/ugd/fb5ef8_59b5a5c1e9eb44fcab626a219098194c.pdf

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collected across all counties for the most concise scope of the State's broadband and digital equity landscape.

The State has already begun work on data collection, with DBEDT currently working on the State's Digital Equity Plan, conducting focus groups to gather information on Internet use habits, challenges and barriers to use and adoption, and digital equity solutions to ensure that the digital equity programs created focus on meeting the needs of the represented communities. In addition, DBEDT is creating a historical log of digital equity-related events that have been conducted and future events.

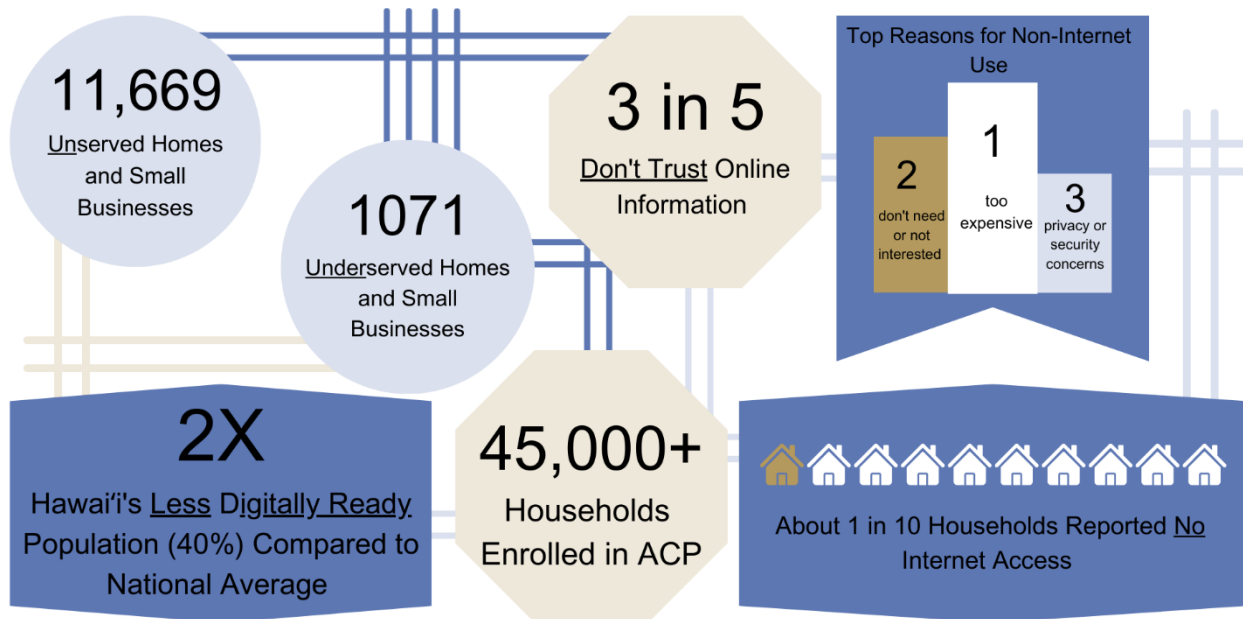
A number of efforts at the State and County levels have been completed or are currently underway to collect and update pertinent location data for the State's broadband investment efforts. These accumulated data layers can be found on the City and County Open Spatial ArcGIS Data Portal (C&C Honolulu) and the State Office of Planning and Sustainable Development GIS Portal. In addition, U.S. census data, the FCC broadband map, the NTIA Indicators of Broadband Need map, the USAC ACP tracker, and others will determine what other information the State has and is lacking (i.e., data AND community needs).

The State will continue to refine location data to support its upcoming Initial Proposal to be submitted at the end of December. As advised by NTIA, the State will document the processes to apply corrections and updates to the FCC FABRIC data map to refine the locations submitted with the Initial Proposal (directly loaded from NBAM). Information gathered during the location updates will also inform the range of services required for statewide wrap-around services, including plans and partners that may deliver the services to statewide communities. The State anticipates partnering with a range of non-profit organizations positioned to deliver services to their network of communities effectively. It is also expected that increasing demand for services will arise during the various projects to build access into unserved and underserved locations. Subject to available funds and in partnership with other philanthropic funding sources, the State expects to be able to provide device and potentially service subsidy support for communities and individuals with need.

Throughout the execution of projects funded by BEAD and other federal broadband sources, the State and Counties will consider thoughtful means to sustain the delivery of services and support to communities with need. Private support will also be encouraged to help ensure that services do not expire once available public funds are exhausted.

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Figure 1: Hawai'i Broadband Quick Stats



3.4.1 Broadband Deployment

BEAD program guidelines clearly identify eligible locations for building infrastructure to achieve the State's goals and objectives. As advised by NTIA, the State will submit its defined process to refine the FCC map data submitted with its Initial Proposal due in December 2023. We expect to specify a methodology to provide fact-based corrections to remove non-residential locations, amend likely service locations that are served but marked as unserved, and are hopeful of inserting any locations missing from the FCC map data at the point of submission through support for individual and bulk challenges to the FCC Fabric locations. The State also desires to set aside a small contingency fund to be able to handle additional locations identified post-Initial Proposal submission (throughout the construction and implementation phase). The State also expects to expand on the definition of CAIs with the assistance of the Counties and their community partners. This expanded list will be submitted with the State's Initial Proposal. Subject to availability of funds, the State will also address critical middle mile gaps, in particular to support connections to rural and remote communities.

In order to help manage and monitor location data throughout the process, the State will layer its additional data together with FCC data (from CQA and NBAM), in particular, to help visualize progress during the implementation projects post-Final Proposal. The consolidated map will also reflect progress on other funded efforts, including RDOF, CAF, and CPF projects. Based on the current intentions of several public sector organizations, we also expect the availability of public Wi-Fi to increase in particular as DE and related outreach activities are underway.

3.4.2 Broadband Adoption

Digital adoption continues to be a challenge, especially among NTIA-identified covered populations in Hawai'i, each experiencing significant barriers to access, oftentimes facing a tapestry of overlapping challenges to navigate even for basic connectivity. A 2021 study found 40% of Hawai'i residents to be less digitally ready compared to the 2015 national average of 19%. A network of planning efforts in Hawai'i seeks to embrace opportunities for cross-sector collaboration and could benefit from increased funding support to bring the programs to scale, including, but not limited to: workforce development planning in 2021 that would partner with the public and private sector employers to integrate training and adoption, ongoing efforts by the Hawai'i State Public Library System to provide telehealth support to communities across the State, and existing community programs ready to scale and integrate digital adoption into existing curricula.

Hawai'i's unserved and underserved location counts are lower than many other states considering our relative population and household counts. While the highest priority for BEAD funds will connect the unconnected locations, we must account for the range of additional barriers to adoption that contribute to the higher percentage of lack of use (versus lack of access). These barriers include affordability, particularly when considering Hawai'i's very high cost of living, including food, healthcare, and other basic essentials. Other factors include a lack of access to useful devices and the need for training or support to properly utilize devices and access online services.

The NTIA Internet Use Survey reported in November 2021 that as many as 100,000 survey respondents reported no home Internet use by anyone in their household, meaning that there are likely tens of thousands of households that may have access to Internet service but have not yet adopted it. In addition, the survey reported the top three reasons for non-use of the Internet at home in Hawai'i as: (1) don't need or not interested; (2) too expensive; (3) and privacy or security concerns. While we recognize that there are residents who will choose not to adopt broadband, we will work within our communities to continue to educate on the need for broadband adoption by building a positive rapport on the uses of the Internet for everyday means (e.g., work, education, healthcare, banking, social networking, etc.) and the basic cybersecurity precautions that can be taken to protect one's identity and data online.

3.4.3 Broadband Affordability

Affordability continues to be a principal barrier for many populations; although individuals may obtain devices at little or no cost, it is an ongoing challenge to afford the monthly payments for Internet connectivity. Free broadband is recognized by various communities as a way to boost adoption in low-adoption areas, to provide support for industries that could be catalysts for adoption with great broadband access and even a lifeline for those communities where job and health resources are low and rely heavily

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on digital connectivity for everyday life. The challenge for the State and Counties is that Internet access is not free, and substantial availability of free access directly impacts the business viability of carriers and ISPs - some entity will have to bear the recurring costs of the “free” service.

If we are to achieve meaningful success, the State’s work to achieve universal access to the Internet must include affordability as a critical success factor. For the purpose of establishing a measurable baseline, the State will set its affordability floor at \$30/month for a minimal service level of 100Mbps/20Mbps service (100Mbps downstream, 20Mbps upstream), based on the federal ACP basic subsidy rate and the generally agreed upon “threshold” to high-speed Internet service. The State expects to be able to raise this threshold for service over time as technology and use cases drive higher performance requirements.

Even at the \$30/month level, the State expects a material number of residents to struggle to pay for basic Internet service. For now, ACP will provide “net free” access to the Internet for qualifying residents. Hawai'i is tracking enrollment in ACP, currently just over 40,000 households, though an estimated 163,000 households may be eligible for this financial assistance.⁴ DBEDT has received an award of over \$700,000 from the FCC to continue ACP promotion and sign-up activity, together with a second award to 'Elepaio Social Services of \$350,000. Given the expansion of promotional activity, we expect to see a continued rise in ACP enrollment.

Programs such as the ACP will be a requirement to ensure that those with the greatest financial needs remain connected to online information and services. While the current ACP program funding is expected to be exhausted in 2024, the State is hopeful that additional funding will be available to continue the program, at least through the point at which the FCC is successful in rethinking the federal universal service fund structure and supports. Legacy programs such as (telephone/voice) Lifeline support should be expanded to ensure that all Americans have *affordable* access to the Internet. The State may also consider a supplemental program of its own, subject to the availability of a sustainable source of funds.

In addition to subsidies and similar buy-down programs to support residents with need, the State’s investment in broadband infrastructure is also intended to lower the cost of competitive entry to the Hawai'i market, and to spur increased competition in the ISP space. If successful, such an increase in competition should help consumers through reduced service costs and/or increased capabilities without increases in subscription costs.

⁴<https://static1.squarespace.com/static/610831a16c95260dbd68934a/t/62785ccb671629771cd1a60d/1652055243247/Broadband-Connectivity-Fact-Sheet-CPSP-2022.pdf>

3.4.4 Broadband Access

For our rural census areas (eight that are classified as urban), many of whom see lower numbers in Internet access and adoption, it is imperative that these communities have alternative means to access broadband. Currently, these communities rely largely on being able to access the Internet at home or at public libraries. These communities require at least a few other alternative locations (e.g., CAIs) where they can access the Internet at any time of the day with access extending beyond the confines of a structure (i.e., to the parking lot). Rural communities may also benefit from increased cellular connectivity to reduce the dead spots that may exist within their communities.

The opportunity for greater public access points through community hubs and public spaces where residents already gather is tremendous. Existing communication channels and trust networks can be built up to connect unserved and underserved populations through libraries, community health centers, community centers, vocational programs, churches, and even personal relationships. Rural communities especially highlight the need for increased public access points, where experiences paint the picture, such as residents driving to a highways pullout for connectivity for a virtual job interview, seniors asking neighbors for help with virtual telehealth appointments or video calls with their grandchildren living across the country; or those needing language support asking friends with computers to translate simple websites that do not support their language or allow them to perform simple functions on their mobile phone.

The State will need to engage medical clinics, federally qualified health centers (FQHCs), hospitals, and health insurance companies to identify households that do not have access to telehealth services because they have: (1) unreliable Internet service; (2) no devices with Internet connectivity capacity; (3) or do not know how to use a computer, tablet, or other mobile device with Internet connectivity. Likewise, the State will need to engage the library system to determine the total number of patrons who visit the library because they cannot or do not have access to reliable Internet service at home. Additional work with the Hawai'i Department of Education and within the UH System and alongside private colleges and universities will hope to provide a clearer understanding of the limitations of technology and Internet access to participate in online schooling.

Special consideration is needed in the State's overall strategy to support residents that may live in locations with suitable access to high-speed Internet but may not have suitable space or arrangements in their residence to support meaningful use of that access. There are also residents that are homeless or houseless, without access to a traditional residence, who would potentially utilize CAIs or other public Wi-Fi locations as their preferred (or only) means to access high-speed Internet service.

Both public and private organizations already offer free access to Wi-Fi based service at a growing number of locations throughout the State. The growth of capacity at CAIs, together with an increasing desire to utilize free Wi-Fi access as a means to

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attract customers, will help to accelerate that growth. The State may consider the addition of such free Wi-Fi access locations as a useful layer to its comprehensive public outreach efforts. While typical Wi-Fi offerings have limited range and performance and would otherwise be considered unserved by the strictest NTIA definition, the mesh of public Wi-Fi services would add to the convenience of home Internet access for the general public.

3.4.5 Digital Equity

Hawai'i's Digital Equity Plan (DEP) is being developed under the State of Hawai'i Broadband and Digital Equity Office (HBDEO) leadership and is anticipated for public comment in September 2023. This section provides a Digital Equity Plan framework, including initial findings around needs and gaps, as well as, recommendations to inform the administration of capacity grants. The DEP will be included in the BEAD Five-Year Action Plan by reference, and integrated materials throughout the plan.

Hawai'i's Vision for a Digitally Equitable Future

In 1824, King Kamehameha III declared “He aupuni palapala ko’u - mine is a Kingdom of literacy,” ushering in an era where Hawai'i birthed over 100 newspapers in various languages and experienced one of the highest literacy rates in the world. Once again in 2023, Hawai'i has the opportunity to lead as we embark upon an era of Digital Literacy.

Hawai'i's vision for Digital Equity is informed by its rich history, while looking forward to the next seven generations of a thriving people. It recognizes that digital equity goes beyond acute needs experienced each day and has the power to impact fundamental quality of life. A digitally equitable future will be one in which all residents of Hawai'i have the confidence, freedom from constraints, and meaningful access to the Internet, tools, and skills to be digital learners.

Understanding Digital Equity in Hawai'i

Digital inequity in Hawai'i is a significant issue that affects various individuals and communities across the State. With the reliance on digital technologies becoming increasingly pervasive, those who lack access to reliable and affordable Internet service, devices, and digital literacy skills are severely disadvantaged in today's interconnected world. The COVID-19 pandemic highlighted and exacerbated these existing inequities.

As remote work, online learning, telehealth services, and virtual interactions became essential, individuals and communities faced immense obstacles in getting digitally connected. These challenges will continue without high quality Internet access, adequate tools, and the necessary digital literacy skills. The impact of digital inequity extends across various sectors and geographic regions in Hawai'i—economy, workforce, education, healthcare, essential services, and civic and social engagement. Access to affordable, high-speed Internet, connected devices, digital literacy training,

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and support programs for communities will empower Hawai'i's residents and create a more equitable and prosperous future.

The State's role in achieving digital equity has been a DBEDT priority dating back to the 2012 Hawai'i Broadband Strategic Plan, and leading to the establishment of the HBDEO in 2021. The Hawai'i Broadband Hui, coordinated by DBEDT, led the State's 2020 adoption of the Digital Equity Declaration, which reaffirmed that all residents in Hawai'i will have access to the digital skills and connectivity needed to participate fully in our society and economy. In 2021, the State led a study to understand the digital readiness of its residents, and in 2022, the State adopted a 5-year plan for workforce digital readiness that centered digital equity in igniting its vision to make Hawai'i, "a State where people learn."

2023 Digital Equity Plan Preliminary Key Findings

The 2023 DEP planning process has focused on the input and experiences of populations particularly impacted by digital inequities and identified as "covered populations" by NTIA:

- Aging individuals
- Formerly incarcerated individuals
- Veterans
- Individuals with disabilities
- Individuals with language barriers
- Ethnic minorities
- Native Hawaiians
- Rural residents
- Individuals living in low-income household

Through ongoing community engagement, the DEP planning team has thus far conducted 38 focus groups with covered populations and 21 interviews with key stakeholders including CAIs, workforce development entities, and organizations that serve covered populations. Across all populations, the barriers faced are plentiful. Many face a tapestry of overlapping challenges that exacerbate the digital divide. Despite the obstacles, these residents persist in pursuing solutions.

Fear, Shame, and Confidence are initial barriers that impact all groups, although most pronounced among seniors and those with limited English proficiency, even holding individuals back from accessing existing programs. Concerns about privacy and security exacerbate these feelings, especially for many victimized by scams. As one provider shared, "they have this technology in their hands now but are being scammed because they don't know how to use it." Incarcerated individuals, those experiencing homelessness, immigrants, and minorities additionally face trust-related issues, historical trauma, and discrimination that create barriers.

Affordability of both high-speed Internet and devices is a principal obstacle for all covered populations. For example, members of large households must split time on a

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single computer: students for school, parents for work, grandparents for telehealth, and everyone for social connections. Some weigh monthly payments for Wi-Fi service against other basic needs like food, rent, and electricity. Internet access is sparse in rural communities, but connections are also unreliable in some urban areas. Parents in covered households described driving their kids to a McDonald's parking lot to attend school virtually during COVID. Previously incarcerated persons shared the catch-22 of needing a phone to apply for a job, but a job to afford a phone.

Access - Other barriers to be explored in-depth by the DEP include: transportation, time, basic literacy, family responsibilities, disconnection from value, functionality of websites and applications, adaptations for persons with disabilities, mobile interface for those with only a phone, and HIPAA compliance. The DEP will share unique challenges faced by specific populations and the gaps in services that currently seek to address them.

2023 Digital Equity Plan Key Strategies

The DEP will offer a robust set of strategies developed through the 2023 planning process and informed by important work being done throughout Hawai'i by key stakeholders and community partners. The following strategies and principles are recommended to guide future investments:

- **Develop Digital Pilina:** Pilina is a Hawaiian word that refers to relationships. Embedded within it is the concept of building trust and familiarity. To break through barriers faced by covered populations, programs must center on the lived experiences of the people they serve, compassionately meet people where they are physically and emotionally, and develop deliberate relationships between people and programs, systems, and the digital world.
- **Invest in a Digital Navigator Network:** Motivated individuals and community organizations can be empowered and equipped to be digital navigators who meet people where they are, access ACP and other resources, and foster digital pilina and upskilling through the digital economy.
- **Provide Meaningful Access:** Access to the Internet, devices, and skills must go beyond simple availability to also ensure affordability and be designed to minimize a range of barriers faced by covered populations. Public facilities including parks, libraries, and housing should seek opportunities to provide safe, free, and continuous access.
- **Leverage Existing Resources:** CAIs are locations where residents already gather and should be empowered to leverage additional access to a wide range of services and programs that integrate digital literacy. Programs and hubs that have achieved success in providing access, education, and training should be a priority for

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investment and scaling. Community organizations serving covered populations should be engaged as key partners in implementation.

4 Obstacles or Barriers

4.1 Understanding Broadband and the “Why”

Broadband is a complex concept with many invisible pieces required that most people are unaware of. Similar to electricity, most people know in general what it is but do not understand the inner workings of electricity or the behind-the-scenes activities it takes to be able to just flip a switch for light. However, unlike electricity, broadband is something consumers need a certain level of technical understanding (digital literacy) to utilize effectively. For example, having a router and modem to get Wi-Fi, ethernet cables, fiber versus cable, available Internet service providers for their area, Internet speeds, etc. This knowledge is not easily obtained and readily available to many residents. Similar to how someone who has never experienced 4K resolutions may not understand how much better picture quality is possible with a 4K resolution television, many do not understand “why high-speed Internet,” how much their Internet experience can improve, and the opportunities that can arise with having high-speed Internet. It will be a challenge to educate the people of Hawai‘i about broadband, why the State is investing in high-speed Internet infrastructure, and how the public can benefit while also asking for their participation in our BEAD and Digital Equity efforts.

4.2 High-Cost Geographic and Topographic Barriers

Serving geographically remote rural areas, including extended residential setbacks, will be amongst the greatest and highest cost barriers to achieving ubiquitous Internet-for-All. Of note, in August 2022, the FCC disqualified Starlink’s RDOF bid set to cover all locations on the island of Niihau—a privately owned island that supports a small population. BEAD is expected to provide service to those sites instead under the high-cost and extreme high-cost area designations. The generally high cost of last mile infrastructure for Hawai‘i’s unconnected locations, anticipated to be well above the national average for high-cost areas, will likely impact our ability to fully serve all residents without requiring significant non-federal matching funds. Recognized remote regions such as east Maui and the northern and southern ends of Hawai‘i island will present similar cost challenges, including factors such as lava-impacted regions. Niihau island offers a unique case cost challenge to support approximately 20 households separated by any current broadband middle-mile infrastructure by dozens of miles of ocean.

Finally, to reiterate the impact of ample residential setbacks, those unserved or underserved locations with extended setbacks will likely end up in the extremely high-cost group given the additional distance requirements (potentially over a mile in some cases) that also have substandard or no existing pathway supports.

4.3 Service to Locations Lacking Reliable Power

Some of the most remote locations may also lack a source of reliable power. Regardless of how Internet service is delivered to the location (fiber, coax, wireless, satellite), connection to the Internet and any device(s) to be used will require reliable access to power. While some locations may be able to operate independently, a reliable and stable power source is necessary to ensure access to reliable Internet service. Off-grid sites will also likely be without any accessible pole line or conduit pathway, making it extremely difficult and very expensive to build service into such locations.

Highly remote or off-grid locations may be a better use case for low Earth orbit (LEO) satellite service. While generally not at the “affordable” cost level, LEOsat could provide a useful service offering that runs on an as-needed basis given the need and power source(s).

4.4 Service to Location-less Residents

Historic fractures between public agencies and certain populations add to the challenges of connecting with these communities. Those experiencing homelessness, for example, have unique challenges in connecting to broadband without stable residences or addresses. Pacific Islanders, who have been historically cut off from healthcare access, who struggle with language and cultural barriers, and who experience discrimination in housing opportunities, face trust-related barriers that go beyond physical or financial implications. The State’s 2021 Workforce Readiness Plan featured the challenges of trust, shame, lack of comfort, and confidence that other NTIA-covered populations might face to even access the digital equity programs that are available to them. The current Digital Equity Plan outreach has shown that each covered population highlights the importance of connecting to their communities directly and working through trusted organizations with longstanding trust-based working relationships.

4.5 Resistance to Adoption and Change

The State anticipates that one of the most difficult barriers to overcome will be negative perceptions of Internet technologies and fears related to Internet use. The primary approaches to overcoming these barriers are based on educating and informing individuals about the value of Internet access and the benefits associated with meaningful Internet use. The ideal delivery mechanism requires effective, person-to-person interaction, favoring individuals with pre-existing relationships with the individual being trained, or at least with that individual’s community.

Our approach to overcoming resistance to adoption begins with close collaboration with each county to help forge broad community partnerships to identify the needs of communities across the State and help identify organizations that can and are willing to support community-based digital literacy and related training programs. Ideally, the organizations would work to recruit, train, and support efforts by community

members to support their relatives and neighbors. This approach leverages the existing trust fabric of each community to help overcome historically unsuccessful educational efforts by “imported” trainers. Additional incentives that may be available include access to devices for those in need and discounted or subsidized service offerings (e.g., ACP).

4.6 Cooperative Collaboration Among a Range of Diverse Stakeholders

The State is mainly served by two ISPs who provide residential service (Charter and Hawaiian Telcom). The State’s competitive landscape is significantly smaller than other states and territories, and there will be a heavy reliance on these providers to collaborate with the State to ensure service to residents with no last mile connectivity or underserved status across all islands, regardless of cost for deployment and topographical barriers. A handful of small and potentially new startup ISPs may be able to help fill gaps subject to sufficient capacity and capability to deliver services.

4.7 Access to Sufficient Human, Technical, and Contract Resources for Deployment of Community Wrap-Around Services

The anticipated spike in construction activity to build telecommunications infrastructure will stress local capacity within the ISP enterprises and in the supply chain of subcontractors commonly used by the industry. Large utility operations, including telecommunications and electric utilities, will feel the impacts of the spike in activity funded by the large federal infrastructure investments. While many of the construction workforce needs may be transient in nature, we do expect to see an overall increase in the steady State demand for engineers and technicians that will be responsible for operating and managing expanded broadband networks, as well as the staff of repair and maintenance, customer service, and other related staff to support the increased demand for services.

Some of these classes of employment should see gains in demand over the immediate term as ISPs ramp up in preparation for the increased work. Short-term training and workforce development efforts are already in place in Hawai'i, pre-dating the federal broadband investment, courtesy of other funding sources, and in comprehensive recognition of the already chronic IT sector workforce shortage. Employers can (and are) already take advantage of these training and certification opportunities to pre-position skilled labor in anticipation of the spike in projects.

Besides the expected increased demand for utility construction and technical skills required to build, maintain and operate the expanded telecommunications infrastructure, the State anticipates the need to support broad additional classes of skilled workers to support the State’s goal of meaningful universal access to the Internet. Widely available digital literacy, training, and support services are critical to that success. These wrap-around services must be readily available statewide to ensure that residents will be fully capable of utilizing access to high-speed Internet service.

4.8 Supply Chain Delays and Inflation Impacts

Supply chain issues are anticipated with the overwhelming influx of interest in broadband deployment, with multiple federally funded programs underway at once for all states. Backlog is largely expected across all fronts, including fiber and device purchases, with evidence already from approved Capital Projects Funds and other programs of significant delays in the global supply chain, particularly for products including fiber optic cables, fiber transceivers, and network equipment. The delays impacting the IT supply chain have remained the same since the beginning of the pandemic; with the climbing demand, such delays are expected to further degrade over the next few years. Build America, Buy America (BABA) requirements may exacerbate supply chain issues, in particular when all states and territories work to build infrastructure in the same timeframe. Any material delays in project execution, whatever the reason, will increase the impacts of inflation on project costs.

4.9 Inconsistent or Competing Funding Priorities

Every county is working towards identifying the most prevalent gaps in broadband and digital equity for their respective communities. Each county's population experiences the lack of broadband differently, with communities varying demographics, cost of service, and geographic challenges differing across the islands and their respective county. The State recognizes that this will vary from county to county and that funding priorities may not necessarily be consistent across the four counties, nor will the funding awarded be proportionate to the size of the county (i.e., there will not be a state-level formula for proportionate allotment across counties eligible for award) but available competitively to the State as a whole. Counties will be provided support from UH and additional contractor support to ensure their funding priorities are identified, and any concerns are accounted for in the implementation work.

4.10 Federal Grant Compliance, Monitoring, and Need for Patience in Arrival of Implementation Funding

It is important to note that funding will not be as readily available as may be publicly perceived. Parties interested in funds or considering applying for funding at a later date are encouraged to remain patient as the largest portions of BEAD funds to be used to construct new connections to residences and CAls will not be under contract until at least the second half of 2024, and potentially 2025. Once contracted, further delays may occur due to supply chain and permitting process requirements before new connections materialize. Digital equity and potentially other wrap-around services may be available sooner (i.e., mid-2024), provided the State can properly navigate and receive required approvals for its Initial Proposal and State Challenge process.

4.11 Permitting Delays and Impacts on Construction

Any delays or bottlenecks in the required permitting processes could impact the anticipated amount of construction activity resulting from the collective investments. The simple impact of a large number of construction efforts happening during a short period of time will stress the capacity of permitting agencies statewide. Policy leaders at every level of government should make fiber connectivity a priority and communicate that objective widely and consistently to agencies, stakeholders and the general public. The acknowledgment by leaders is powerful and will help provide the necessary authority to all parties who play a role so that they may obtain the resources they need to help carry out this national directive.

Government agencies should consider establishing best practices for submitting and reviewing applications to access public rights-of-way and infrastructure, which balance their needs with enabling expeditious deployment. The State and Counties may jointly consider some manner of relief for broadband construction efforts to mitigate the timing impacts, provided safety and prudent business practices are not ignored (some of this is available under existing Act 151, ref. cca.Hawai'i.edu/broadband/act-151/).

5 Implementation Plan

5.1 Stakeholder Engagement Process

Hawai'i has initiated outreach via known public and organizational networks, requesting assistance in identifying bonafide community grassroots organizations that can directly assist with outreach and engagement at the affected community level. Together with existing grassroots outreach under the Hawai'i Broadband Hui (over three years running), we expect to bring broad inputs and feedback to the planning and implementation efforts. We will overlay a public service announcement outreach effort and provide briefing information to legislators to connect with their constituents and connect with statewide stakeholders and special interest groups. All outreach efforts will be fully coordinated with the State Digital Equity Plan effort (already underway), and the DHHL outreach efforts under the TBC program.

Initial efforts will be structured around public sector engagement and outreach, together with strategic networks based on organized non-profit and service providers that have reach into grassroots, neighborhood organizations. Public sector engagement will be driven through the State executive department and County designees to help identify known connectivity, equity, and literacy gaps; and connect us with their community organizations already engaged for outreach and general community engagement activities. Since many of these organized entities already hold regular member or public meetings, we will utilize those existing events to help us push information broadly throughout the State. We expect also to leverage elected officials, including legislators and county councilmembers, to help us broadly reach out to neighborhoods around the State.

The non-profit sector outreach begins with organized statewide and countywide entities, such as the Chambers of Commerce, Economic Development Boards, State and County businesses, and community organizations. The group will be extended to start with large philanthropic service providers, such as Aloha United Way, Catholic Charities, and the Institute for Human Services. Specific regional or neighborhood non-profits that have previously participated in our broadband outreach activities will also be connected, including Vibrant Hawai'i, Hawaii Literacy, and Lanakila Pacific. In parallel with these efforts, we will continue to leverage the work of the Broadband Hui to keep connected with statewide grassroots participants.

While some of the informational and discussion sessions will be held online (via Zoom), we expect many discussions will be held in smaller, neighborhood-centric in-person convenings. Likely locations will include public (e.g., public libraries, schools, or university locations) or community centers. We will utilize a "local host" organization whenever possible to keep the focus at the grassroots level. Some larger informational-type meetings will also occur; the smaller meetings will help to encourage a greater degree of participation by attendees.

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Once the team completes a suitable public communications campaign, we will hold a statewide in-person public listening tour to reinforce the statewide education and outreach process. The goals of the statewide listening tour will be to share information regarding work funded by the multiple federal programs, including what work and support will be covered by public funds. The public listening tour will include stops on all islands (one or more sessions per island), to be held in the Fall after the start of Fall semester classes and before the start of the winter holiday season. The public listening tour will be in conjunction with a traditional media outreach campaign, including legacy print and media channels. The public media campaign will be developed over the Summer months by UH broadband office staff with the assistance of contractors and public sector external communications offices.

5.1.1 Partnership with Counties

All four counties are actively partnering with the UH broadband team to provide local outreach, engagement, and support for the Five-Year Action Plan along with the subsequent detailed planning and implementation efforts. The efforts include engagement with the State's digital equity efforts, informational and outreach briefing activities, and active engagement of local stakeholders and community groups to provide broad and comprehensive reach for the State's broadband efforts.

In order to help maximize the effectiveness of the collaborative efforts with the Counties, the state broadband office will provide financial support in the form of four sub-awards to the counties, to enable funding of supplemental staffing and direct support for local non-profit and community groups - that funding support was in the approved BEAD Planning Funds proposal, and will be distributed as sub-awards to the Counties for each to use to help maximize local engagement activities. In addition to the sub-award funding, the state broadband office will provide financial support for technical assistance and training in support of both statewide and county efforts (also as provided for in the BEAD Planning Funds award).

In addition to the direct funding to the Counties, the state broadband office will provide financial support for technical assistance and training in support of both statewide and county efforts (as provided for in the BEAD Planning Funds award). The State recognizes that the initial funding commitment of \$100,000 per County will likely need to be supplemented within 12 to 18 months subject to spend-down by County. This initial sum is intended to allow counties to fund the initial activities and or aid they identify they require to fulfill project demands. In addition, the Hawai'i state broadband office will provide ongoing support to counties in data collection and visualization when needed, additional support for outreach and engagement activities, and identifying the measures required to meet Hawai'i BEAD's programmatic goals and individual county priorities. The BEAD Planning Funds include consideration to fund contractor support to aid with activities such as data collection, coordination, outreach, and local project management to assist the limited County staff.

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Over the course of the Five-Year Action Plan, the Initial Proposal and State Challenge process, and the Final Proposal, the State will work closely with the counties to gain context of community infrastructure and digital equity needs to ensure those county-level priorities are met. Throughout the next few months, our partnership with county leadership will provide the groundwork for informational briefings across the State, where the public will have an opportunity to learn more about the funding going into the broadband space to ensure that all residents have the opportunity to be connected and have the necessary skills to make the most of the Internet. Each county has unique issues challenging their communities, and as such will inform the planning and implementation efforts necessary to see broadband flourish in those communities they serve. Counties will assist in identifying the gaps in broadband coverage and reconcile unserved and underserved communities, as well as identify and support community digital hubs, service providers, and partners for wrap-around support services. Collaboration is integral to ensuring ongoing support for access and wrap-around support services in local communities.

Finally, partnership with the counties is expected to streamline the required construction and implementation activities in their respective localities for new and improved telecommunications infrastructure.

5.1.2 Coordination with DHHL TBC Efforts

Historically, residents on Hawaiian Home Lands have experienced poor access to robust, reliable broadband that was unfortunately exacerbated by their contracted LEC, who effectively failed to install and provision sufficient last mile service assets on Hawaiian Home Lands. UH is working closely with DHHL to ensure that the programmatic objectives of TBC are met, and that work in that space is fully coordinated and braided with BEAD and other sources of public investment to ensure that all of the unmet needs of Hawaiian Home Land residents are fulfilled within the program's period of performance window. UH and DHHL entered into an MOA in the Fall of 2022 to formalize an existing effort by the UH broadband team to lend technical and programmatic support to DHHL. The overall coordination effort will also ensure that duplication of effort is avoided in accordance with the requirements of the set of federal programs - this includes an overlay of RDOF, CAF, and other legacy broadband infrastructure programs.

As an integral part of the statewide coordination effort, DHHL outreach and community engagement will be conducted in collaboration with other State broadband outreach and community engagement efforts included as part of the State's CPF, BEAD, and DE programs (note: some duplication of effort has occurred over the startup period during the first half of 2023 as each of the programs was initiated at different times, as overlaid with the legacy Broadband Hui coordinated efforts for outreach and information gathering). While some differences exist across the various program requirements, the core outreach and community engagement efforts will benefit from

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greater efficiencies and the orchestration of solutions for residents. The overall coordination efforts by Hawai'i state broadband office will also serve to ensure that statewide BEAD and DE funds are available to fully complement TBC-funded work. State CPF and BEAD investments are also intended to support closing DHHL middle mile gaps in coverage.

In addition to coordination with DHHL (as the recipient of TBC funds), NTIA is working to help define a suitable consultation path to engage the broader Native Hawaiian community in order to comply with its BEAD consultation requirements. We understand that the specifics will be provided by NTIA in August after joint consultation with the NTIA TBC and the NTIA BEAD programs.

5.1.3 Engagement with Business and Community Groups, Including Active Non-Profit Organizations (also tied to 5.1.1. and 5.1.2.)

Extensive community engagement and outreach are critical to ensure that the State's BEAD effort can achieve the objective of meaningful, robust, reliable, and affordable Internet-for-All Hawai'i's residents. In addition to simply provisioning the required telecommunications infrastructure to establish access to the Internet, it is critical that Hawai'i build and maintain a rich and robust social infrastructure of digital equity and digital literacy wraparound services, with statewide reach supporting all of our communities. Building on the concept of CAIs, Hawai'i looks to establish and work to sustain widespread Community Digital Hubs to provide community-based access and support in every statewide community.

Community Digital Hubs may be sourced from a range of public and private non-profit organizations. These may include public and private educational institutions, community centers, non-profit service centers, business organizations, economic and community development entities - any gathering place that has some kind of sustainable organizational support. Community Digital Hubs may also be mobile or even "pop-up" provided the operation has some foundational support.

Community engagement at the highest level (i.e., counties) is underway to identify and organize around key community players who can reach into their local communities and further pinpoint the needs of a community, determine which residences may be unserved or underserved but do not have a proper street address to be accounted for in the FCC maps, and as the programs progress, impart digital literacy and workforce development skills with residents. Together with the CAIs and Community Digital Hubs, these communities will be the roots of creating Community Digital Navigator programs that will be critical to building sustainable community-based wraparound service delivery systems.

The State and Counties have identified a number of nonprofits already working in this space, including, Vibrant Hawai'i, Hawaii Literacy, Lanakila Pacific, Catholic Charities, Institute for Human Services, Aloha United Way, Hawai'i Foodbank, and Hawai'i Community Foundation, with additional organizations continually being added to the group. Given their existing community relationships, we expect that the counties will

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be able to add a significant number of grassroots-type organizations to the group. As our outreach and engagement efforts ramp up over the coming months, we expect to build a substantial web of community partners who will help us gather information and ideas to formulate project ideas and broadly encourage participation across our diverse statewide communities.

UH has also connected with the already existing IT sector workforce development efforts underway by the CIO Council of Hawai'i and the Chamber of Commerce Hawai'i. The CIO Council of Hawai'i has an ongoing effort to improve the alignment between education and industry to increase the number of students in IT-related education pathways and programs and improve the workforce pool's overall employment-ready quality. The current effort originated several years ago and has the full support and participation of the CIO Council of Hawai'i membership (100+ industry CIOs representing Hawai'i public and private sector organizations). The current effort includes engagement with educators and student groups in IT sector programs, focused on alignment of curriculum, and participation by industry in education delivery, internships, and apprenticeship-like programs. The direct result of the effort has been a substantial increase in internship and employment training activities, funded by a variety of sources. A stellar example is the Good Jobs Hawai'i program that brings together funding from multiple sources to directly support the training of students and incumbent workers, in high-demand IT topics. One of the four explicit target areas for Good Jobs Hawai'i is the IT sector space, to include support for workforce critical to broadband infrastructure design, deployment, operations, and maintenance - this effectively provides a headstart on the BEAD workforce development activities that will be integrated with the ongoing community activities as BEAD funding reaches the implementation stage.

Together with the CIO Council of Hawai'i, the Chamber of Commerce Hawai'i has also been executing a workforce development initiative of its own, also in coordination with the UH system. The IT Sector Partnership has been underway for two years and continues to run with three working groups led by community leaders (<https://www.cochawaii.org/itsector/>). As the primary convener of the IT Sector Partnership, the Chamber of Commerce brings its large statewide membership of over 2,000 organizations to the table to ensure broad participation by statewide employers. The Hawai'i state broadband office will also leverage the opportunity to bring the BEAD workforce development activities in alignment with the ongoing IT Sector Partnership program.

5.1.4 Orchestration of Statewide Efforts

All active broadband programs in the State are coordinated by UH, including BEAD, CPF, DE (DBEDT), ACP (DBEDT), and TBC (DHHL assisted by UH). Additional federally funded efforts are also in-flight by DOT (FHWA funds) and Hawaiian Telcom (RDOF+CAF funds). All funded efforts are expected to complement each other and result in effectively braided efforts to minimize gaps in coverage, eliminate duplication of

efforts, and maximize the overall benefit to the State. The overall effort is focused on achieving robust, reliable, and affordable Internet-for-All.

All active efforts are in regular communication to coordinate efforts and maximize efficiencies. In addition, the state broadband office is in the process of collecting an inventory of current broadband related efforts across all State executive branch departments (under EM 23-03, directing cabinet members to provide broadband project information to UH).

5.1.5 Hawai'i Act 231 Broadband Working Group

The State convened the initial Act 231 Broadband Working Group meeting on March 30, 2023. The meeting was convened via Zoom, with a handful of participants present in person at the University of Hawai'i, Information Technology Center. The meeting included representatives of UH, DBEDT, B&F, DCCA, DAGS, DOH, DOE, DHHL, Kaua'i County, City and County of Honolulu, Maui County, Hawai'i County, and the Lt. Governor. A meeting recording is posted at the UH broadband site, along with meeting materials. The Act 231 Broadband Working Group will continue to meet as needed to determine the appropriate governance structure to implement, operate, and maintain state-owned broadband infrastructure assets.

In order to provide broad industry input to the process, the Act 231 Broadband Working Group is organizing an industry advisory group that will include representatives from key telecommunications providers and large industry representatives. The industry advisory group will be convened by State broadband staff to collect and assemble inputs for consideration by the Act 231 Broadband Working Group. The initial participants of the industry advisory group have been identified and an initial meeting is scheduled for July 21 to brief members on the current status of the broadband investment effort and to seek industry inputs and recommendations for the Act 231 Broadband Working Group. The industry advisory group includes representatives from all major wireline and wireless carriers, local colocation and Internet exchange operators, and selected large enterprise operators.

The charter of the Act 231 Broadband Working Group is to examine the oversight and management of the public assets created by and under the ownership of the State and submit its recommendations as to the structure of a public entity to hold and manage those public assets, in a report to the legislature of its findings and recommendation, including proposed legislation, to the legislature no later than twenty days prior to the convening of the regular session 2024.

5.1.6 Ongoing Engagement and Monitoring

UH and DBEDT began meeting with counties in March 2023 to establish county roles to contribute to the overall success of BEAD implementation, identify staff members fulfilling broadband and digital equity leadership in their respective counties, determine technical assistance and programmatic knowledge requiring clarification, assigning tasks contributing to the overall success of BEAD and the Digital Equity plan (e.g. story maps, identification of smaller non-profit and local philanthropic organizations, etc.), and

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coordinating outreach activities to identify community needs and inform communities on the importance of fast, reliable Internet access and digital literacy skills. Counties will receive a sum of planning funds to enable them the flexibility to meet local staffing or contractor help for project fulfillment, fund county-wide outreach, fund mapping efforts, and other activities pertinent to BEAD's success. A lump sum of \$100,000 will be granted to each individual county with an eighteen (18) month period of performance extended to them. Scheduled weekly meetings with counties include county report-outs and are used to regroup, provide County and State updates, and continue team coordination.

UH is releasing funds under a Memorandum of Agreement, requiring that counties provide quarterly reports on spending, activities, data, and metrics on community engagement activities. In addition, UH is required to fulfill reporting requirements to the State Department of Budget & Finance, and NTIA.

5.1.7 Identifying Unserved and Underserved Last Mile Locations

UH has utilized the FCC's National Broadband Map data to identify unserved and underserved locations in Hawai'i. There are approximately 13,000 locations across the State that qualify for BEAD. UH plans to adopt the NTIA's BEAD challenge process model to engage Internet service providers, counties, and non-profits to further refine the set of unserved and underserved locations in Hawai'i.⁵

5.1.8 Engagement with Industry to Build Infrastructure

Following the State Challenge process as outlined in the forthcoming Initial Proposal and Final Proposal, the State will engage with carriers, Internet service providers, and utility construction organizations to secure bids for build out of high-speed Internet infrastructure to those identified unserved and underserved locations. The process will need to identify the State's chosen extreme high-cost threshold in order to help ensure it does not exhaust available funds solely on last-mile construction. Some of the challenges will be in difficult geography and terrain that is often associated with Hawai'i's highly rural locations. In addition, high setback properties will create a significant cost challenge for the State to manage its effective use of available funds. Depending on the nature of the locations to be served, there may be a mix of technologies that are eligible to manage cost while achieving the desired universal service connections.

⁵ <https://internetforall.gov/bead-challenge-process-policy>

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5.2 Priorities

Table 8: Priorities for Broadband Deployment and Digital Inclusion

Priority	Description
Unserved and Underserved Last Mile	BEAD NOFO highest priority. An estimated 13,000 residences in the Fabric are considered unserved or underserved and do not fall under CAF, RDOF, or Hawaiian Home Lands. As underscored by the BEAD program, our ultimate priority is to build out last mile connectivity to these unserved locations first, and underserved residents next. Service solutions will look primarily towards fiber, hybrid, and satellite in cases of isolated high-cost locations, as well as the necessary infrastructure upgrades for underserved residents.
Digital Equity and Digital Literacy (Wrap-Around Services)	Ref. BEAD and DE NOFOs. Internet access alone is insufficient to ensure residents benefit from the BEAD program. It is imperative that the necessary skills to use technology offering Internet connectivity are developed, and healthy relationships between residents and technology are established. This includes a thorough education on navigating devices and digital skills development that allows the use of online services (e.g., telehealth, e-learning, telework) and supports a digital workforce.
Expansion of Community Hubs	While access to the home is of primary importance under BEAD, offering an alternative location to access the Internet at community digital hubs offers an added layer to support individuals that need location alternatives (due to lack of suitable space within the home, or as to individual preference). Residents should have the opportunity to visit local community digital hubs offering robust Internet access, digital literacy classes, technical support, and telehealth support services.
Community Digital Navigator Program	Community Digital Navigators will play a critical role in closing the digital chasm, assisting their respective community members with all matters of digital literacy, online security, and awareness as to the use of services and protection of personal and financial information. They will be the frontline in guiding late adopters to devices, getting them connected, teaching technical skills, and providing technical assistance. Support for Community Digital Navigators will be instrumental in advancing the State's digital equity goals under both the BEAD and the DE programs. Community Digital Navigators ideally support a wide range of topics and supports, many requiring appropriate training and (in some cases) certifications to support the trust fabric of the program. Current efforts around micro-credentials, stackable credentials, and skill badges should be an ideal part of the Community Digital Navigator program. These individuals should also be supported by stipends - volunteers are great, but the stipends will help to ensure the program can be useful for sustaining community support, and an integral part of community workforce development efforts.
High-Cost LEO Satellite Support	A number of Hawai'i's unserved and underserved locations fall under the high-cost and extremely high-cost designations and are severely challenged by topography and rurality (including large property setbacks). Potential LEO satellite support may be a critical element to reaching those extremely high-cost areas, ensuring they have equitable access to robust, high-speed Internet while maximizing funding for the State's other unserved and underserved locations. Note the higher subscription costs may have to be mitigated via some measure of affordability support.

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IT/Cyber Workforce Development	Hawai'i's IT and Cyber workforce remains considerably small and will need to be built out, with development a priority to ensure a reliable local workforce capable of sustaining our evolving infrastructure and demand for connectivity, and diversifying our tech landscape through quality education and training programs. Efforts under any broadband funding programs will be integrated with existing IT and Cyber workforce development efforts already underway and pre-dating the federal broadband investment programs.
Filling Connectivity Gaps for Service and Resilience	Middle-Mile and related infrastructure supports to ensure reliable and resilient connections for remote areas of the State, in particular, to provide upstream connectivity and reliability to maximize outcomes for last-mile investments.

5.3 Planned Activities

During the Initial Proposal development, and the subsequent State Challenge Process, the State's primary planned activity is identifying and vetting FCC map data to locate NTIA prioritized locations for last mile deployment. This proposed process to update the FCC map data will be fully described in the State's Initial Proposal, for approval by NTIA. Subject to that approval, the State will apply additional fact-based filters to the list of locations downloaded from NBAM and submitted with the Initial Proposal to establish a cleaned-up list of eligible unserved and underserved locations to submit to the State Challenge process.

The State intends to fully adopt the NTIA Model State Challenge process (released in June 2023).⁶ Based on the NTIA Model State Challenge process, and the current state of the FCC map data, Hawai'i intends to pursue additional outreach processes to help ensure that the full set of eligible locations is identified on the FCC map. The goals of running these outreach processes are to:

- (a) Establish the processes, procedures, and apps to support the State Challenge Process, and validate the readiness of the State's support infrastructure to effectively execute the State Challenge Process.
- (b) Work to refine the identified unserved and underserved locations to help prepare the Hawai'i Initial Proposal and ensure it is based on location and service data of sufficient accuracy to better guide last mile investment planning and determine the necessary matching funds financial model required.
- (c) Accept broad public input as a part of the information gathering process.

The outreach processes would be run in the Fall of 2023 to assist with the preparation of a well-crafted Initial Proposal. Hawai'i would run its official State Challenge process

⁶ <https://broadbandusa.ntia.gov/funding-programs/broadband-equity-access-and-deployment-bead-program/technical-assistance> (Model Challenge Process can be downloaded here. Note that the State will describe its pre-challenge update process for approval by NTIA as part of its Initial Proposal.)

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upon release and approval of the Initial Proposal to further refine the last mile and overall BEAD investment strategy.

One of the critical elements to inform the State's Initial Proposal will be the degree to which additional (over the required 25% match) matching funds may be required to fund the State's overall BEAD investment strategy. There are significant elements of the overall strategy, in addition to the basic (and highest) priority to address universal access at the 100/20Mb floor (unserved + underserved). In particular, the need to sufficiently provision widely distributed Community Digital Hubs, statewide wrap-around support services, and integration of statewide IT/Cyber workforce programs, and close potential gaps in terrestrial middle mile facilities, will be absolutely necessary to achieve meaningful Internet-for-All.

Once the State Challenge process is complete, Hawaii would proceed with its competitive procurement activities to identify the contractors that would complete the required last mile implementation efforts. The competitive procurements will be structured to help ensure all locations receive proposals. The competitive procurement process may include additional rounds of responses by potential contractors in order to establish the State's extreme high cost threshold, and to help manage the overall cost of last mile deployments (including the impact of high setback distances on the cost of construction). Also, if required, additional design and engineering efforts would be conducted during this period to refine the requirements for the competitive procurement activities. Areas that are particularly isolated (from geographic and existing infrastructure perspectives) may require special consideration as to technical and business strategy. Once all contractors and the necessary financial requirements have been identified, the Final Proposal will be completed and submitted for NTIA review and approval.

On receiving approval of the Final Proposal, the State would proceed with the required last mile implementations, as well as any of the other funded activities under the Final Proposal. Depending on the funding available, these efforts would include the provision of wrap-around support services in our statewide communities of need, adding support for CAIs and Community Digital Hubs, enhancement of in-flight IT/Cybersecurity workforce development activities, and potentially closing any critical gaps in middle mile terrestrial facilities. Further information on planned activities is detailed below.

5.3.1 Unserved and Underserved Deployment

BEAD prioritizes service to unserved locations before funding under BEAD may be used toward underserved locations and digital equity programs. Beginning in 2024, Hawaii plans to release multiple RFPs grouping various unserved locations together state- and county-wide, ensuring that even the most costly of locations in the hardest to reach places are accounted for. This will be followed by RFP releases for eligible underserved locations. A rigorous subgrantee selection process will be established and applied to

both unserved and underserved deployment to ensure that selected subgrantees' commitment to the program is fulfilled with care to all locations at a reasonable cost as we work together to attain universal service for the State of Hawai'i.

Work is ongoing to identify unserved locations that will need to be serviced before any other funding may be used towards underserved and digital programs funded out of BEAD. The initial proposal will introduce unserved locations and respective RFP terms, including a feasible match requirement and other requirements for prospective applicants.

- Partners: Counties, ISPs
- Funding: BEAD

5.3.2 Community Access Hubs

CAIs are well-known common access points for digital literacy project deployment and promoting outreach efforts for broadband equity, literacy, and access. Hawai'i's state public library system has already established itself as a community leader in the space of digital literacy and equity, as it works to redefine the role of the public library system.

The CAI term generally encompasses schools, libraries, community health centers, and public housing, among others, many of which have seen pilot projects for broadband that can be replicated at other community access locations for greater reach to populations that may still see limited access to existing services. Hawai'i has compiled a list and created a map of potential CAIs (pending definition in Initial Proposal) across the State. As another priority of the BEAD program, Hawai'i must identify which of these CAIs do not offer over 1GB of service and ensure that these sites also have the necessary speeds to serve their community. This list can be found in the appendix.

In addition to these traditionally defined CAIs, identification and adoption of additional community access hub locations, over and above the defined CAIs, would consist of non-profit locations with missions consistent with the delivery of wrap-around support services to their communities; e.g., community centers, community support facilities, service centers, private schools, and other similar community centered facilities. The State of Hawai'i looks to other community serving organizations such as the Institute for Human Services (IHS), Goodwill Industries, Salvation Army, Aloha United Way, Economic Development Alliance of Hawaii, and the various Hawai'i Chambers of Commerce as alternative last mile connectivity and digital equity access points. Other sites of interest include the above organizations operating mobile or "on-wheels" programs, and CAIs under the Department of Education and HSPLS that do not currently participate in any community access programs.

Using funds on a one-time basis to deliver equipment (e.g., computers, laptops, routers, etc.) to these sites for public use would potentially enable new locations to

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serve previously unserved communities or otherwise provide an alternative site to connect to the Internet for communities. Additionally, by executing a multi-year contract, broadband access can be provided to sites that do not currently have the bandwidth to sustain a public network. Each site participating as a community access location will also be a candidate site for digital literacy training, and other educational and public (government) support services, including remote education and workforce development. Community members will have access to technical support on-site and remotely should it be required.

As potential CAI sites are identified, the State will work with CAI candidates to determine the suitability of the location, and availability of resources both with the CAI and with potential partners from its community, to deliver some mix of services and support required by neighboring communities.

- Partners: Listed above and others
- Funding: BEAD, DE

5.3.3 Data Collection and Visualization

Beginning in the second half of 2023, the State will make a big push towards data visualization and collection during the Initial Proposal and BEAD challenge process, with the primary goal of preparing the State for RFP releases in 2024 first tackling our unserved and underserved locations, with attention to CAIs with less than 1Gb service as well. The State recognizes the need to establish a transparent broadband landscape that encourages the improvement of broadband service, promotes education on access and availability, and drives down broadband service costs. One of the planned efforts to do this is to create a “living” State broadband map. Mapping efforts will include layers with data on community outreach efforts and response, human barriers to adoption, federally funded project areas, state funded project areas, CAIs, and reported unserved/underserved locations. Efforts will be largely collaborative between UH, the Counties, and DBEDT for completion of the State portion, with data and mapping specialists from both organizations fronting the effort and additional voluntary effort from UH to support the initiative. Finally, mapping on Hawaiian Home Lands is planned for completion under the Tribal Broadband Connectivity Program’s first tranche of awarded funding, again with support from UH as needed.

- Partners: Counties, DBEDT, DHHL, others
- Funding: BEAD (State), TBC (DHHL)

5.3.4 Inter-Island Submarine Cable Ring

The State of Hawai'i currently has three operational carrier-owned and operated inter-island fiber systems, all of which are halfway through or past the end of their planned service lifetime. This puts the State in an immediate and dire need to construct a new

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inter-island fiber system with the capacity to sustain the State for transformational decades to come with reliable and affordable broadband access for all. At the forefront again is the necessary long-view needed to ensure the State has reliable, affordable, and future-proof broadband infrastructure in place.

Incorporated in the inter-island subsea fiber buildout is the identification of several potential landing sites that could be enhanced to support new trans-Pacific fiber system landings. As work on the inter-island system progresses, we anticipate renewed interest in landing a Hawai'i facing branch off planned trans-Pacific subsea cable systems (note: the news of the White House press release approving CPF funding for Hawai'i together with our completed desktop design effort appears to have triggered interest by at least three potential partners with existing trans-Pacific routes).

In May 2022, UH awarded a contract to Ocean Networks Inc. to survey at least twelve (12) potential CLS locations across the islands and complete a desktop design study for the inter-island submarine fiber cable route(s). The study has since been completed and was the first step towards progress on building a new inter-island subsea system, and as noted above, renewed interest in landing a Hawai'i facing branch off planned trans-Pacific fiber routes. These additional builds will significantly increase capacity, diversity, and design resilience from today's existing routes and CLSs. Hawai'i's CPF submission in September 2022 included program plans to execute the permitting and construction of the northern path of the inter-island submarine cable ring. An RFP to secure a private partner to build, construct and operate the new subsea system was released in June 2023, with proposals due from Offerors in August. Subject to selection and favorable execution with a selected private partner, this northern path is expected to be ready for service in 2026.

- Partners: TBD
- Funding: CPF

5.3.5 Terrestrial Middle Mile Buildout - Cable Landing Stations and Other Front Haul Pathways

The State of Hawai'i currently has eighteen privately owned and or operated cable landing stations across Kaua'i, O'ahu, Maui, Moloka'i, Lāna'i, and Hawai'i Island. Currently, no cable landing station is fully carrier-neutral, limiting the appeal of landing new transpacific submarine fiber systems to the islands and effectively limiting competition. While the Hawaiki CLS at Kapolei is mostly carrier-neutral in ownership and operation, the lack of additional seaward bores and limited terrestrial backhaul facilities make its carrier-neutral status mostly symbolic. In introducing carrier-neutral truly carrier-neutral CLS infrastructure to Hawai'i, the State will be able to foster competition by lowering capital costs and increasing access through open-access principles, and promoting a future-proofed broadband infrastructure landscape.

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Work on terrestrial middle mile design is already underway, with ARPA funds supporting an RFP awarded to Ocean Networks to complete a desktop study identifying potential cable landing sites across all islands that offer diversity and functionality to the current broadband landscape by means of accessibility in the seaward approach as well as terrestrial backhaul. Twelve (12) sites were identified to include in the engineering study, the first step in this process for site identification, procurement, and eventual construction. This includes potential Hawaiian Home Lands locations, which would benefit from building up interconnectivity for their services.

Several new CLS sites are intended to be designed in preparation for the proposed new inter-island fiber build and ahead of planned trans-Pacific routes with the potential to land in Hawai'i. The State may consider expansion of existing CLSes, including those with wet segments nearing their end-of-life (e.g., JUSCN, SCCN), plus, the Hawaiki Kapolei CLS (as noted above), beach manholes at HECO Kahe, the Natural Energy Laboratory of Hawaii Authority (NELHA), and Kaka'ako Look Lab / JABSOM, pending results of the engineering study, cost estimates, and viability of existing sites for future use.

- Partners: Ocean Networks, TBD
- Funding: ARPA, CPF

5.3.6 Terrestrial Middle Mile Buildout - New Fiber

In September 2022, UH, in partnership with Hawaiian Electric, submitted a \$44 million proposal to the NTIA Middle Mile grant program. This application proposed support for new, high-capacity terrestrial fiber routes to support dark fiber IRUs for carriers and large enterprise customers. An additional \$87 million competitive proposal was submitted by Hawaiian Telcom to support non-duplicative festoon and terrestrial routes to key areas via a combination of subsea and terrestrial segments to enhance the reach of its current statewide network.

Additionally, ARPA/CSFRF/BEAD funds are planned for use in providing tail connections to integrate with key network interfaces and or handoffs, or to connect with other middle mile connections. In a limited number of cases, ARPA/CSFRF/BEAD funds will build middle mile gaps as required to ensure that last mile construction has the necessary backhaul infrastructure in place.

In June 2023, Hawaiian Telcom was notified of the award for its \$87 million proposal. Initial planning and preparations are currently underway to build the critical middle mile infrastructure. Hawaiian Telcom will receive \$37 million in federal funds and committed matching funds of \$50 million in cash and in-kind contributions.

- Partners: UH/Hawaiian Electric *MMG Proposal not funded; Hawaiian Telcom
- Funding: Middle Mile Grant Program, ARPA/CSFRF/BEAD

5.3.7 Trans-Pacific Fiber

Since 2018, the State of Hawai'i has been bypassed by all new trans-Pacific fiber systems (five in total). While today's fiber capacity is sufficient to support Hawai'i's need for broadband over the next decade, the increase in demand for broadband and the approaching end of service dates for the two older trans-Pacific fiber systems (JUSCN, SCCN) factor heavily into the necessity of future-proofing Hawai'i's connectivity to the global landscape. Work is underway to begin choosing the next sites for carrier-neutral cable landing stations across our islands to bolster traffic to Hawai'i for new trans-Pacific fiber. Of note, preliminary efforts to date on the inter-island subsea fiber system have attracted multiple parties interested in potentially landing branch segments off new trans-Pacific systems. Multiple conversations are underway to determine the feasibility of bringing branch segments ashore in Hawai'i.

Primary hurdles faced by trans-Pacific system owners considering landing in Hawai'i include not only the incremental capital cost and limited direct market size (offset by the prospects of exchanging traffic with other trans-Pacific systems already present), but also the high degree of uncertainty historically faced by new landings, specifically permitting, access rights, and easement negotiations. Operating costs attributed to our high cost of living, and high cost of power (potentially offset by green options) also contribute to general reluctance by trans-Pacific system owners. Finally, availability of a stable berthing and supply location for cable system spares affects time-to-repair commitments for existing and new systems.

Total projected costs for just one new trans-Pacific fiber system are expected to exceed \$500 million, and when partnered with a new inter-island fiber system, will ensure a robust, reliable fiber first-mile and middle-mile infrastructure to and within our State for years to come.

- Partners: Multiple private sector potential partners
- Funding: TBD, private

5.3.8 Community Digital Navigator Program

As detailed above in Table 8, digital navigators are critical to closing the digital divide. Individuals and community organizations can be empowered and equipped to be digital navigators who meet people where they are, and foster digital pilina and upskilling through the digital economy. Ideal candidates are fluent in other languages and are attuned to unique needs of populations such as individuals experiencing homelessness, kūpuna, immigrants, individuals with disabilities, and previously incarcerated individuals.

Digital navigators will be deployed to strategic locations such as libraries and established CAIs, along with a broad range of community digital hubs. At these sites, they will aid residents in gaining access to devices, helping them get connected, teach technical skills necessary for independent technology use for personal and professional

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tasks, and provide continued technical assistance to late adopters. The state will leverage statewide IT/Cyber workforce development efforts to enhance and expand the available staffing pool to support community access locations and community digital hubs.

At these sites, navigators will assist residents gain access to devices and the internet, register for ACP and other affordability programs, learn technical skills necessary for both independent technology use for both personal and professional tasks, and obtain continued technical assistance. Further coaching and assistance can be provided via telephone, email, video chat, or other channels that meet the needs of learners. The state will leverage statewide IT/Cyber workforce development efforts to build a staffing pool to support CAIs and community digital hubs.

The Community Digital Navigator Program will serve as the umbrella program to provide consistency of purpose and process to serve a wide range of services needed to overcome broadband use hurdles to adoption. Within the program, various levels of training and certifications will tie each individual's skills to the matrix of needs. The Digital Navigator program pilot currently supporting ACP outreach and enrollment provides the basis for building layers of skills to broadly support statewide wrap-around service requirements. These layers may include, in addition to ACP, skills supporting digital literacy, use and connections, cybersecurity, and other similar services that may be useful in our communities across the state. Over the course of 2023 this community based and implemented program will develop specific training, both on-line and in-person, that will be recommended as standard practices. The current digital equity plan research has supported the HBDEO priority to provide resources for rural community locations using local, trusted navigators to support a wide range of service provision support.

The Community Digital Navigator Program was originally modeled based on the Community Telehealth Navigator pilot program supported by HUD and its non-profit partner, Hawaii Literacy. The Community Telehealth Navigator program recruits, trains and supports (via stipend) individuals from the identified community of need, in order to leverage the beneficial network effects of individuals known to their community that may best provide insights and most effective delivery of wrap-around support services - in the case of the HUD pilot, for telehealth supports to public housing residents.

- Partners: Various non-profit organizations and others
- Funding: BEAD, DE

5.3.9 Pre-Construction Engineering and Design on Hawaiian Home Lands

DHHL proposes to utilize "tribal" CPF funds for the pre-construction engineering and design to support the deployment of infrastructure delivering service under multiple 2.5GHz licenses allocated under the FCC 2.5GHz Rural Tribal Window program,

together with the potential for unlicensed CBRS 3.5GHz use. The engineering and design outcomes will be utilized to support the construction of the wireless ISP deployment as an integral part of the DHHL effort to deploy comprehensive last mile services consisting of hybrid fiber and wireless infrastructure. The buildout will primarily be funded by the \$90 million allocated to DHHL under the TBC Program (\$30 million under CAA2021, and \$60 million under IJA statutory allocations to DHHL for the benefit of the Native Hawaiian communities). The robust combination of the hybrid fiber and wireless infrastructure deployments under TBC, together with braided support from the State of Hawai'i's BEAD, CPF, and ARPA funds, will ensure that all Native Hawaiian communities are fully connected to robust, resilient, and affordable broadband infrastructure.

Under its initial TBC award, DHHL expects to conduct site and feasibility assessments in order to deploy significant last-mile (preferably) fiber infrastructure with its remaining TBC allocation. The initial award includes a number of use and adoption projects, in addition to the infrastructure planning and design effort. With an initial contract (pending execution), DHHL expects to be informed as to the state of existing support infrastructure on DHHL lands and to integrate those findings with other information already available from incumbent carriers. Based on these inputs, DHHL, with assistance from UH, will seek to design and engineer a suitable infrastructure solution that can be used to deliver modern, high-speed Internet service to residents of DHHL lands. Based on the new infrastructure, DHHL anticipates seeking one or more concession-type agreements with carriers to operate reliable and affordable high-speed Internet service for residents of its lands.

As noted in other sections, the DHHL TBC funded efforts will be coordinated with the anticipated delivery of new infrastructure and service funded under RDOF and CAF legacy programs, as well as support from BEAD and DE programs for infrastructure and wrap-around support services.

- Partners: UH, Private partners to be determined
- Funding: CPF (DHHL), TBC (DHHL)

5.3.10 Hawai'i Public Housing Authority (HPHA) Connections Program

The objective of the Hawai'i Public Housing Authority (HPHA) Connections Program is to incrementally upgrade residential connection facilities in all HPHA owned units, to be immediately eligible for full ACP subsidy coverage, initially at a minimum performance floor of at least 100/20 Mbps for all residents. The lower performance floor is the initial delivery threshold to accommodate time to upgrade existing end-to-end network or infrastructure upgrades that may occur in phases over the project execution. Over the period of performance, the minimum performance floor will be increased to 100Mb symmetrical (or better) as increased upstream capacity is fully allocated to the HPHA facility nodes, and as the carrier facilities are fully upgraded to support the necessary

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capacity via direct fiber uplink or updates to system standard protocols over existing hybrid fiber-coax infrastructure. The approach will hopefully avoid the high cost and/or significant disruption to residential units, including any potential hazmat material mitigation and abatement activities required (due to the age of most of the HPHA facilities). Any new HPHA housing units or those that will be subject to other substantial renovation efforts will be eligible for replacement fiber optic infrastructure or high-performance hybrid fiber-coax infrastructure as best suited to the individual properties.

The program will also enable any designated common use room(s) to be connected at symmetric gigabit-class performance for the shared use of residents - initially including 45 HPHA facilities that have identified available common use spaces. Upgrades to facility entry infrastructure required to support gigabit access to the common use rooms will also increase the performance floor for all residents of those facilities.

The HPHA Connections Program will be coordinated with the recently announced capital construction program by HPHA in order to build for the maximum benefit of HPHA residents. Any new HPHA construction will incorporate modern utility infrastructure by design. Depending on the timing of new construction, the HPHA Connections Program may provide support for new infrastructure construction.

Depending on the availability of funds, the State may request an amendment to the HPHA Connections Program to include county-owned public housing facilities under the same design principles.

In addition to being eligible for traditional ACP funding (i.e., residential subsidy), HPHA may be able to access possible bulk funding authority via HUD that may fully fund high-speed Internet access for all of the HPHA residents in eligible facilities.

- Partners: HPHA
- Funding: ACP/HUD, CPF

5.3.11 Outreach and Communications

In partnership, UH and HBDEO must engage the community in a meaningful way that allows for a two-way flow of communication, one where the public can be educated on topics of broadband and equity, and a chance for the public to provide community feedback and to collaborate in imagining the next community hubs. These convenings from UH are expected to run concurrently with the Broadband Hui's Ho'ike subcommittee, another public-facing convening expected to supplement equity and literacy. Convenings may potentially be supplemented on the day of the respective event with a poster session featuring organizations that want to promote their AEL programs to residents. Furthermore, island-wide poster sessions unaffiliated with the convenings should be held at large public centers (e.g., shopping malls and centers, libraries) as a low-cost, low-planning method to promote programs in the community.

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This will support greater community exposure in heavily trafficked common areas, even without access to the Internet. Residents may then choose to engage and learn more about the programs in their locale that may appeal and apply to them or pass on the information to someone they may know.

Moreover, in addition to previously noted efforts, UH intends to maintain the www.hawaii.edu/broadband/ website with the most up-to-date information on broadband projects in the State, with a focus on the infrastructure projects planned in both middle mile and last mile networks. UH maintains that digital equity and literacy efforts are primarily supported by HBDEO, which must maintain its website with all relevant materials in that domain. Both websites will function as the “first stop” for informing the community and maintaining transparency. An online presence casts a broad reach to the public, and with a planned social media presence (Instagram, Facebook) in addition to physical outreach, outreach, and communications will be leveraged to their fullest potential.

HBDEO has engaged in robust outreach to each of the NTIA-covered populations to lift up their voices and experiences, collect data to better understand the challenges experienced by those communities, and inform potential strategies that can build upon effective programs and services. Outreach efforts thus far include 38 focus groups and 21 interviews with service providers, agency leaders, and members of the covered populations themselves. These events were held within the respective communities, in-person and virtually, where appropriate, and in partnership with key community organizations serving these populations.

While the discussion topics were similar across populations, the formats for the groups were modeled to meet communities where and when they were most comfortable and with the least impact on them. This includes gathering in the backyard of community leader homes, meeting farmers on their properties, joining regularly scheduled virtual programs, and even attending traditional cultural basket weaving events while listening to community feedback. Future engagement will consider similar strategies to maximize community participation, input, and relationship building. The State developed simple communications tools to support the outreach, including FAQs, flyers, mapping diagrams, and a consolidated website.

- Partners: Counties, planned contractor
- Funding: BEAD, DE

5.3.12 Free or Reduced Access for Qualifying Residences

On December 31, 2021, the ACP officially replaced the Emergency Broadband Benefit (EBB) to become the permanent program for cost reduction of broadband services for low income and tribal households. This program is available to any household that meets 200% or less of the 2022 Federal Poverty Guidelines, dependent

on the household size. At the end of 2021, household enrollment in EBB concluded at 18,430, a participation count that has since increased under the ACP and is at 45,000 as of June 5, 2023, with plenty more residents who still qualify for the program unenrolled to date ([USAC tracker](#)). Of note, a significant number of participants reached through the digital equity planning process were unaware of the ACP opportunity, indicating opportunity for increased outreach as well as resolving eligibility and connectivity concerns.

ACP enrollment in Hawai'i relies on "Digital Navigators", who work hands-on with the community to get households enrolled. This process can be improved to maximize engagement and program information awareness through the solicitation of translated outreach materials to ensure all households have equal access to this program. Outreach materials should be shared at community access locations in addition to CAIs to ensure visibility within the community. Primary and secondary schools can participate in informing their students' families by distributing a general news release of the program in print form to their students and families. All community sites participating in distributing or displaying outreach materials should be considered for in-person ACP enrollment help sessions, where Digital Navigators are present to assist in the enrollment process. Consideration should also be given to addressing the difficulty some in covered populations have experienced in attempting to enroll in ACP. Cultural centers and heritage community centers may also be beneficial to reach populations that may otherwise face language barriers. Additionally, online promotion of the ACP should resemble that of previous EBB efforts in the State, with the additional promotion of this permanent program on public access Wi-Fi networks.

Plans to support and boost ACP enrollment will see assistance from BEAD and DE funding, and, if awarded, the ACP enablement grant program.

- Partners: HPHA, Counties, HUD and others
- Funding: ACP, ACP Enablement Grant Program, BEAD, CPF, DE Programs

5.3.13 Digital Equity and Literacy Content Creation; Leverage Existing Programs

Digital literacy skills are gained through instruction and hands-on educational methods with supporting tutorials or other educational content that shows users how to perform such tasks. This may include, at the most basic level, how to navigate digital devices, perform basic computer functions, utilize different applications including the web, job search functions such as creating a resume, searching for jobs, and applying for jobs, or more advanced technical workforce skills to meet industry demands. The Workforce Development Council, HSPLS, and Hawaii Literacy are all organizations with means to provide educational content for introductory and intermediate technical skills development. This includes creating publications and courses that may be hosted in person or independently online to develop literacy skills for all residents.

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Currently, the State Workforce Development Council, HSPLS, and Hawaii Literacy all offer or have offered digital literacy training to various extents, with the geographic restriction being the greatest inhibitor to reaching across the State. Provided proper funding from the Digital Equity Act, unserved, underserved, and remote communities will ideally be able to visit their nearest CAI (e.g., library, school, community health center, public housing facility) for access to these programs if they do not have access from their residence.

Further instruction in advanced, technical skills development may be pursued through UH Community Colleges offering courses at their home campus or education centers, and pending the implementation and success of the proposed Pāhoa Library project from UH's submission for Connecting Minority Communities Pilot Program, may see other CAIs provide access to community college courses for the purpose of IT skills development.

Challenges that programs have had in scaling to meet greater needs often focus on staff capacity, followed closely by funding, availability of instructors, participants' access to suitable devices, and post-instruction mentoring. In recognition of this, the 2021 State Workforce Readiness Plan included a priority goal to: "Meaningfully expand, support, and fund existing successful programs". In addressing human capital, communities focused on soft skills and community engagement as core competencies—rather than educational background or experience—both in public positions and in community navigator roles, who can help to develop trust-based relationships with covered populations to connect communities to key programs.

- Partners: HPHA and others
- Funding: ACP, ACP Enablement Grant Program, BEAD, DE Programs

5.3.14 Digital Literacy Outreach, Training, and Education, Connect with Community Access Locations

Under the coordination of the overall broadband investment leadership by UH, HBDEO will construct and vet the State's DEP. The office leadership has built and now co-facilitates the convening of the Broadband Hui along with the County of Hawai'i, whose weekly meetings function as an open forum for stakeholders in the broadband and digital equity community to share project updates of all ongoing, completed, or planned digital equity programs. Public awareness should continue through the Broadband Hui and its participating stakeholders and through televised, radio, print, and word-of-mouth channels. Outreach should penetrate communities statewide, and include exposure through public spaces, such as public transportation, public housing, public libraries, community centers, and schools.

With participation from the Department of Education, HSPLS, HPHA, Hawai'i Association of Nonprofit Organizations, and other organizations with community-wide

presence, outreach materials should be readily available for distribution from any of the aforementioned entities. Churches, particularly in smaller or remote communities, are also effective distribution points for information on services that would improve the well-being of their members. Furthermore, distributing entities should have representatives on-site who are readily available to speak about the programs available to residents or refer residents to the appropriate individual for more information if they are uncertain of what a program may entail.

Outreach efforts in the State should promote maximizing the application of federal programs like the Affordable Connectivity Program (ACP) along with local digital literacy training and education opportunities hosted by local nonprofits and State entities. This includes digital literacy training sessions hosted at community colleges or other CAIs and other programs intended to provide training, education, and access to digital technology and broadband. Of the 130 languages spoken in Hawai'i, digital literacy outreach materials should be translated into, at a minimum: Hawaiian, Thai, Ilocano, Tagalog, Khmer, Kosraean, Marshallese, Samoan, Tongan, Chinese Mandarin and Cantonese, Korean, and Spanish. This is to maximize the reach of access, education, and training information to populations facing language barriers.

Language translation and other accessibility tools are critical to providing information to all populations; however, communities across the State indicated that connecting with minority and limited English-proficient populations needs to go further. Today, one in six adults in Hawai'i struggles to read,⁷ and nearly 50 percent of Hawai'i's foreign-born population does not speak English well.⁸ These populations need basic literacy support in addition to language translation. Moreover, many may be disconnected from formal institutions and face additional barriers of time, transportation, cost, and trust. A digital navigator or similar support network can provide ongoing, individualized help to connect populations and navigate them through necessary resources.

- Partners: UH, DBEDT, Counties, others
- Funding: ACP, ACP Enablement Grant Program, BEAD, CPF, DE Programs

5.3.15 Community Access Locations

CAIs are well-known common access points for digital literacy project deployment and promoting outreach efforts for broadband equity, literacy, and access. This term encompasses schools, libraries, community health centers, and public housing, among others, many of which have seen pilot projects for broadband that can be replicated at other community access locations for greater reach to populations that may still see

⁷ <https://nces.ed.gov/surveys/piaac/skillsmap/>

⁸ https://files.hawaii.gov/dbedt/economic/data_reports/Non_English_Speaking_Population_in_Hawaii_April_2016.pdf

limited access to existing services. Churches, especially in smaller or remote communities, serve as anchors to the lives and needs of residents and organize solutions to address obstacles. Distinct from CAIs are community access hub locations, which cover non-profit organizations with a statewide presence and reach. This includes the Institute for Human Services (IHS), Goodwill Industries, Salvation Army, Aloha United Way, Economic Development Alliance of Hawai'i, Hawai'i Alliance of Nonprofit Organizations, and the various Hawai'i Chambers of Commerce as alternative last mile connectivity and digital literacy access points. Other sites of interest include the above organizations operating mobile or "on-wheels" programs, and CAIs under the Department of Education and HSPLS that do not currently participate in any community access programs.

Using funds on a one-time basis to deliver equipment (e.g., computers, laptops, routers, etc.) to these sites for public use would potentially enable new locations to serve previously unserved communities or otherwise provide an alternative site to connect to the Internet for communities. Where possible and allowable, the State may exert leverage for discounting or provision of some "free" services to help sustain public access (e.g., public Wi-Fi). Each site participating as a community access location will also be a candidate site for digital literacy training, and other educational and public (government) support services, including remote education, security training, and workforce development. Community members will have access to technical support on-site and remotely should it be required.

A potential approach to minimize the ongoing operational cost liability for high-speed access to CAIs may include an interconnected dark fiber network infrastructure that could be fed via a shared ISP feed, or interconnected with a public ISP service. This would have the effect of establishing an INET-like infrastructure serving CAIs, to support high-speed connectivity for CAIs at a substantially reduced cost. Combination of CAIs with last-mile builds might provide a means to leverage the increase in residential reach to serve CAIs.

- Partners: Listed above and others
- Funding: BEAD, State Digital Equity Capacity Program

5.3.16 Integration with IT Workforce Development Initiatives

The IT/Cyber Leap-Start Experience Accelerator Program was launched in 2022 by UH. It is a program for students close to graduating to gain meaningful experience in the IT and Cybersecurity workforce sectors through mentorship opportunities with partnering employers in the IT and cybersecurity fields. Participants will be hired by UH as student employees, or post-graduation through RCUH (or potentially with a private sector employment partner) to perform duties under their mentoring entity on a rotational basis for a 12- to 24-month term. At any time during this term, they may be hired full-time by UH or the participating employers into the aforementioned sectors, effectively

“graduating” from the Leap-Start program. Other similar programs, including private sector internship programs, may also be integrated into the State’s digital equity and literacy efforts to develop a skilled, locally trained workforce.

5.3.17 Potential programs under the Digital Equity Capacity Grant Program

- Community Access Locations Program
- Data Collection Grant Program: The Data Collection Grant Program is proposed to provide funding to non-profit organizations interested in deploying data collection efforts to support the Hawai'i State Broadband and Digital Equity mapping effort.
- Digital Literacy Community Grant Program: Over the next few years, the State expects to release multiple requests for proposals (RFP) under the Research Corporation of the University of Hawai'i (RCUH) to fund access, equity, and literacy efforts, as well as last mile projects that are innovative and target communities that do not currently have local community broadband access points or access to digital literacy and skills training. This opportunity will allow for non-governmental entities with prior experience providing broadband service, broadband infrastructure, and other communication services and literacy programs to residential customers within the State of Hawai'i, to apply for funding to establish tech centers, digital literacy programs, and create outreach materials to inform the public about federal support programs and local last mile and access, equity, and literacy efforts.

5.4 Key Execution Strategies

Investments will be guided by the declared BEAD priorities, focusing first on extending last mile infrastructure to cover unserved and underserved locations, in coordination with statewide strategies for interconnecting with middle mile infrastructure and statewide wrap-around services to support meaningful adoption of high-speed Internet access. Also per the statutory requirements, BEAD investments will not over-build or duplicate efforts funded by other federal funding sources, including but not limited to, RDOF, CAF and TBC programs.

An additional priority for BEAD is to create and connect a broader spectrum of community hubs to extend the reach of grassroots community support and add locations to support the State's digital equity and digital literacy goals, and continuous support of IT/Cyber workforce development programs. The State already benefits from substantial, already funded, and in-progress IT and Cyber workforce development efforts, including broad participation by private and public sector employers. The Hawai'i state broadband office support funded under BEAD will continuously monitor the overall efforts funded across all federal broadband programs. BEAD Planning Funds included support for state broadband office capacity through the five-year term of the award to support oversight of projects funded under BEAD and compliance and monitoring of efforts through the term. The state broadband office efforts are responsible for efficiently allocating funds in the construction priorities over the entire period of performance. The State must ensure there are sufficient funds available to fill both anticipated and unanticipated gaps over the course of the next five years, aiming at the target goal of meaningful universal service, and bridge coverage for high-cost, extreme high-cost locations, a reasonable approach for high setback properties, and a last-mile contingency reserve.

5.5 Estimated Timeline for Universal Service

Hawai'i's overarching goal is to achieve meaningful universal access to reliable and affordable high-speed Internet service by 2030. In order to achieve that goal, the State expects to rely on the combination of BEAD investments (through 2026-2027), completion of the RDOF and CAF commitments by Hawaiian Telcom (~2027-2030), and the ability to overlay effective and affordable LEO satellite service for very high-cost areas (2026-2027).

Related investments in key middle mile assets are expected to be online by the end of 2026; these investments are expected to lower the capital cost of provisioning to both incumbent and new market entrants. This factor will be key to increasing competition, availability, and affordability of high-speed Internet services throughout the State.

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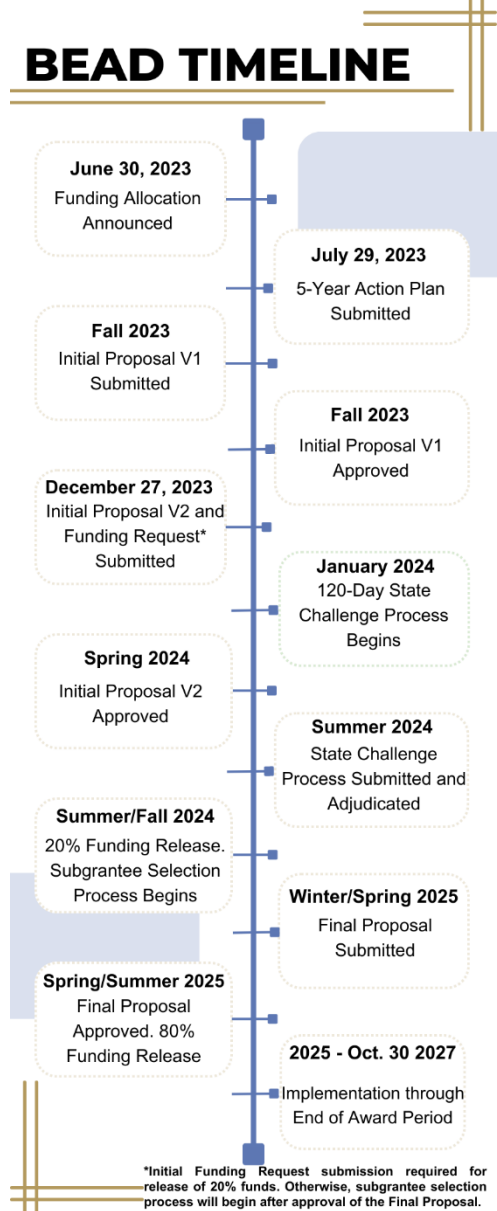
Long-term affordability will also be dependent on the continued availability of ACP or some similar program under the revisitation of the FCC's Universal Service program. Long-term concerns and potential barriers to achieving Internet for All in Hawai'i include the unknown disposition of ACP and related subsidy programs and uncertainties as to high-cost and ultra-high-cost last mile buildouts. We do also expect that the level of actual competition in our telecommunications market will continue to impact our overall reach and affordability goals. While there are significant public one-time funds available to incentivize achieving Internet for All in Hawai'i, there may be conditions or issues that will impair our ability to succeed at this goal.

5.6 Estimated Cost for Universal Service

The aggregate sum of all federal broadband investment programs, including legacy funding sources (e.g., FCC, USAC, USDA, EDA) and programs (e.g., RDOF, CAF, ReConnect), plus leveraging a similar amount from commercial providers and private sector partners is our expected cost to achieve the desired goal of Universal Service AND ensure meaningful access to the Internet for all. Total costs will also include the level of funding provided as a match, both directly to our projects, as well as separate private direct investments into the State's broadband infrastructure, from carriers and providers operating in Hawai'i.

We also expect to leverage some level of commercial investments into Hawai'i's infrastructure as we directly reduce the impactful hurdles to participating in our broadband infrastructure market. Historically, the public sector entities in the State, inclusive of federal, state, and county governments, have not made significant investments in telecommunications infrastructure assets; rather, the collective public sector "consumers" have been subscribers to commercially available broadband (Internet) service. This includes the use of public INET capacity made available via the State's cable television franchise agreements. There are limited investments of this type, mostly around public safety communications infrastructure that serves specific point-to-point needs for those uses.

Figure 2: Hawaii BEAD Timeline



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The long-term sustainable business model is the biggest uncertainty, as many of the needs for wrap-around services and related supports will need to secure reliable funding commitments. One possible source of funds for these supports includes ACP-like support under a completely re-envisioned FCC Universal Service Fund offering. Other support could come from non-federal public sources, including philanthropic sources to help sustain the non-profit service delivery community.

5.7 Alignment

Hawai'i's BEAD Five-Year Plan is crafted as an integral part of the State's overall broadband investment framework (see ongoing developments of the investment framework at www.hawaii.edu/broadband/). The investment framework details priorities to address the current aging and fragile middle mile infrastructure that has long constrained our ability to grow our effective utilization of global class network services. The limited size of Hawai'i's market is the primary factor that has limited commercial investment in the State, which now threatens the ability to grow and thrive together with CONUS neighbors. This critical middle mile infrastructure is the focus of our investments from the US Treasury Capital Projects Fund and the submitted NTIA Middle Mile Grant competitive proposals. The intent is to leverage these federal sources to incorporate a matching or larger investments by commercial partners (the federal investments will lead by overcoming the high capital cost hurdles that have so far caused commercial partners to avoid future Hawai'i investments in the middle mile and first mile space).

The BEAD Five-Year Plan effort is also directly integrated with the State's Digital Equity Plan effort, led by the Department of Business, Economic Development, and Tourism. The Digital Equity Plan effort is underway, with an expected completion by November 2023. While the BEAD Five-Year Plan will be submitted in July 2023, the State Digital Equity Plan will be included by reference, and will also be integrated in the State's BEAD Initial Proposal and Final Proposal efforts.

Funding support from the Tribal Broadband Connectivity program will focus initially on five use and adoption projects to provide short-term relief for the Native Hawaiian Community, and the effort to assess and plan deployment of last mile (primarily) dark fiber infrastructure for Hawaiian Home Lands (DHHL) locations are expected to bring the necessary layer 1 infrastructure to all locations within those areas. This effort fills the last mile promise, together with the statewide BEAD last mile infrastructure efforts. Note that it is expected that much of the middle mile infrastructure required to provide interconnection between and among the DHHL locations will be provisioned by a mix of incumbent carrier services and new middle mile builds supported by the State's overall investment strategy.

The final piece of the last mile matrix is fulfilled with the already contracted commitments by Hawaiian Telcom under its multiple RDOF and CAF awards. These

awards will provide the necessary last mile infrastructure for the designated award areas, and like the TBC-DHHL deployments, dovetail with the State's overall investment strategy.

Hawaii's overall broadband investment strategy is crafted to maximize the collective benefits of the multiple federal programs by carefully braiding the efforts together to support the State's goal of robust, reliable, and affordable access to the Internet for all.

5.7.1 Alignment - Workforce Development

Hawaii has significant statewide workforce development already underway in the IT sector, including cybersecurity. The Hawaii IT Sector Partnership is an ongoing effort convened by the Chamber of Commerce Hawaii, and supported by a number of partners, including UH. This IT Sector Partnership effort already includes several dozen public and private sector employers, includes material consideration for broad IT skills enhancement across the full spectrum of the State's workforce, and considers the active participation of our K-12 sector, and both credit and non-credit elements of our post-secondary education providers. This multi-year effort also includes the participation of industry training providers, including a number of common use, high value, instructional intellectual property (i.e., course materials).

Hawaii will leverage this ongoing IT sector workforce development effort to help support the broad IT literacy requirements associated with our Internet for All statewide goals and to help ensure a sufficiently broad and deep pool of technically skilled candidates for the future engineering, operation, and management of the State's broadband infrastructure.

While much breath has been given to the need for developing installers and construction crews, we are reminded that Hawaii's market and likely job count for these specialized construction skills will be limited over the long term, i.e., past the construction spike funded by the one-time federal investments. Based on the existing staffing and contract firms already in place, we anticipate that we should continue to feed the current steady state of construction skills, but not overly add to the size of that skills pool - lest we later run into a lack of construction jobs following our public investment spike. We do require that the range of technical skills are fully maintained in our community, but caution that we keep a watchful eye on future demands.

Existing funded efforts (outside of the federal broadband investment programs) focused on delivering high value training and certification for IT sector jobs and skills include the highly regarded Good Jobs Hawaii program⁹. In addition to broad coverage for individuals seeking employment and skills upgrades, the program has specialized

⁹ <https://uhcc.hawaii.edu/goodjobshawaii/>

support for employer-sponsored cohorts to upskill groups of incumbent employees to raise important skills and capabilities to raise their standing and value to employers.

5.8 Technical Assistance

Given sufficient clarity and reasonable work by our federal partners, the State anticipates that it will require limited technical assistance for the implementation of the planned projects. Depending on the mix of participating providers, we may require some technical assistance in support of compliance and regulatory efforts. We do expect that we will also require some technical assistance during the development of the Initial Proposal and through the State Challenge Process and procurement activities leading up to the Final Proposal.

6 Conclusion

Hawai'i will provide universal access to high-speed Internet for all residents by 2030. Our public sector — State and Counties — together with our community service providers and private employers, will work to maximize the benefits of this historic investment of public funds to achieve this vision. All residents will be connected via modern fiber optic or similar service to guarantee high-speed (100Mbps or better) access.

The leverage afforded by over \$400 million in federal broadband investment funds will fill the gaps and reinforce brittle infrastructure to deliver high-speed Internet access for all residents of Hawai'i. Combined with the investment by private sector partners and participation by the telecommunications industry, we expect to see material increases in adoption and use of high-speed Internet services, and the range of critical services that access empowers. Hawai'i's residents will have equity of access to education, healthcare, commerce, entertainment, and public services, consistent with any state in the country.

The combination of several federal broadband programs, together with BEAD, will support the State's build out and supporting efforts.

- First mile support: ARPA, CPF (support for new trans-Pacific connections)
- Middle Mile construction: ARPA, CPF, BEAD, MMG
- Last Mile construction: BEAD, TBC, RDOF, CAF
- Wrap-around services: DE, BEAD, TBC, EDA

Hawai'i is grateful for the unprecedented level of public investment in State infrastructure, and looks forward to making the most of that investment over the coming years to fully realize the vision of Internet for All.

7 Appendices

7.1 Glossary of Acronyms

- **ACP:** [Affordable Connectivity Program](#)
- **ARPA/CSFRF:** American Rescue Plan Act / Coronavirus State Fiscal Relief Funds
- **ARRA:** American Recovery and Reinvestment Act
- **BDA:** Broadband DATA Act
- **BEAD:** Broadband Equity Access and Deployment Program
- **BSL/BSLF:** Broadband Serviceable Location Fabric
- **BTOP:** Broadband Technology Opportunities Program
- **CAI:** Community Anchor Institution (e.g., school, library, hospital)
- **CAF:** Connect America Fund
- **CLEC:** Competitive Local Exchange Carrier
- **CONUS:** Continental United States
- **CPF:** Coronavirus Capital Project Funds
- **CQA:** CostQuest Associates (the entity that FCC contracted to create, manage and distribute the Fabric and data map)
- **DBEDT:** Hawai'i State Department of Business, Economic Development, and Tourism
- **DE:** Digital Equity
- **DEP:** Digital Equity Plan
- **DHHL:** Department of Hawaiian Home Lands
- **DOT:** Hawai'i State Department of Transportation
- **EBB:** Emergency Broadband Benefit
- **FCC:** Federal Communications Commission
- **FPO:** Federal Program Officer
- **HIDEC:** Hawai'i Island Digital Equity Coalition
- **HPHA:** Hawai'i Public Housing Authority
- **ILEC:** Incumbent Local Exchange Carrier
- **ISP:** Internet Service Providers
- **INET:** Institutional Network
- **IJJA:** Infrastructure Investment and Jobs Act
- **MDU:** Multi Dwelling Unit (condo, townhouse, apartment, etc.)
- **MMG:** Enabling Middle Mile Infrastructure Grant Program
- **MOU:** Memorandum of Understanding (sometimes referred to Agreement)
- **NELHA:** Natural Energy Laboratory of Hawaii Authority
- **NOFO:** Notice of Funding Opportunity
- **NTIA:** National Telecommunications and Information Administration
- **ODEC:** O'ahu Digital Equity Coalition
- **PIO:** Public Information Officer

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- **RDOF:** Rural Digital Opportunity Fund
- **RFP:** Request for Proposal
- **SBLN:** State Broadband Leaders Network
- **TBC:** Tribal Broadband Connectivity Program
- **UH:** University of Hawai'i

7.2 University of Hawai'i State Broadband Office Website

www.hawaii.edu/broadband/

7.3 County Story Maps

County of Hawai'i Story Map

<https://gis.Hawai'icounty.gov/arcgisportal/apps/storymaps/stories/8d085a980d034517849990a13bed1b48>

City & County of Honolulu Story Map

<https://gis.honolulu.gov/portal/apps/storymaps/stories/71378cfaff1b4504a5015bbe76c8cf88>

County of Kaua'i Story Map -

<https://storymaps.arcgis.com/stories/fa938a50431340148c14df0fd0d92254>

County of Maui Story Map - Under Development

7.4 County Engagement Plans

County of Hawai'i County Engagement Plan -

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/County-of-Hawaii_Comm-Engagement-Plan.pdf

City & County of Honolulu County Engagement Plan -

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/CCHonolulu_Comm-Engagement-Plan.pdf

County of Kaua'i County Engagement Plan -

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/County-of-Kauai_Comm-Engagement-Plan.pdf

County of Maui County Engagement Plan -

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/County-of-Maui_Comm-Engagement-Plan.pdf

7.5 Hawai'i State Digital Equity Plan DRAFT

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/HBDEO_DEP-DRAFT_05-22-2023.pdf

Please note that this is an early draft, formatted for inclusion in the BEAD Plan. The State’s DEP is due to be completed by November 2023.

7.6 Table of Unserved and Underserved Locations by Island

Table 9: Table of Unserved and Underserved Locations by Island

Island	Unserved	Underserved
Hawai‘i	9,054	335
Kaua‘i	383	12
Lāna‘i	41	0
Maui	1,039	561
Moloka‘i	400	28
O‘ahu	752	135
TOTAL	11,669	1,071

*Data from the National Broadband Availability Map (NBAM) - Released June 2023
(Fabric Data from 12/2022)*

7.7 List of Community Anchor Institutions

https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/Hawaii-CAI-List-v1_5YAP_FINAL.pdf

7.8 Map of Community Anchor Institutions

<https://lookerstudio.google.com/s/iYWg3KBHvzQ>

7.9 State of Hawai‘i BEAD Five-Year Action Plan Executive Summary

<https://www.hawaii.edu/broadband/wp-content/uploads/sites/40/2023/07/Hawaii-BEAD-5YAP-Executive-Summary.pdf>