

University of Hawaii
Ke Ala 'Ike Project

NEPA Environmental Assessment

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GLOSSARY OF ACRONYMS AND TERMS

ARRA	American Recovery and Reinvestment Act of 2009
Backbone infrastructure	Computer network providing a path for the exchange of information between different local area networks or subnetworks. A backbone can tie together diverse networks in the same building, in different buildings in a campus environment, or over wide areas.
BMP	Best Management Practices
broadband	High speed communications network with a frequency range divided into multiple independent channels for simultaneous transmission of signals, such as voice, data, or video
BTOP	Broadband Technology Opportunities Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CLEC	competitive local exchange carrier
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
co-locate	To install with existing cables
dark fiber	Fiber optic cable that is in place, but not transmitting a signal or being used
dBA	Decibel, which is a unit of relative measurement for sound
DOE	Department of Education
DOH	Department of Health
DLNR	Department of Land and Natural Resources
EA	Environmental Assessment
fiber ring	Ring of optical fiber designed to bring high-speed Internet service by stringing fiber optic cable on utility poles

GLOSSARY OF ACRONYMS AND TERMS (CONTINUED)

Gbps	Gigabits per second
Gigabit	One billion bits
HDOT	Hawaii Department of Transportation
HSPLS	Hawaii State Public Library System
INET	Institutional Network
Last Mile	Final "leg" of delivering Internet connectivity from a communications provider to the end user.
Middle Mile	Broadband network infrastructure that provides transport, Internet connectivity or access between anchor institutions.
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHO	Native Hawaiian Organizations
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Association
NPS	National Park Service
NRCS	National Resource Conservation Service
NTIA	National Telecommunications and Information Administration
over-lash	Method of installation that involves physically wrapping or tying new cables to existing cables that are already attached to a utility pole
RCRA	Resource Conservation and Recovery Act
ROW	Right-of-way
SHPD	State Historic Preservation Division of the Department of Land and Natural Resources (DLNR)
SHPO	State Historic Preservation Officer
UH	University of Hawaii
USACOE	United States Army Corps of Engineers

GLOSSARY OF ACRONYMS AND TERMS (CONTINUED)

USFWS	United States Fish and Wildlife Service
VLAN	Virtual Local Area Network
WDM	Wavelength Division Multiplex

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1. EXECUTIVE SUMMARY

The University of Hawaii (UH) System, through the "Ke Ala 'Ike" or "Pathway to Knowledge" project, proposes to expand and enhance a statewide fiber network to bring high-speed middle-mile service to the market and reliable connectivity to schools, libraries, and other community anchor institutions.

The Ke Ala 'Ike project will deploy and enhance direct fiber optic connectivity to approximately 380 community anchor sites on six islands including Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii Island. Community anchor sites benefiting from the project will include all public universities, all community colleges and their remote distance learning centers, all public K-12 schools including public charter schools, and all public libraries on the six islands. While focusing on community anchor institutions, the project will also enhance the availability of fiber middle mile capacity for some of our most underconnected towns, including Hana on the island of Maui and Lanai City on the island of Lanai, both of which are connected by microwave only. Upon completion, the project will provide 10 Gigabits per second (Gbps) connectivity to the public universities, community colleges and other institutions of higher learning, 1 Gbps connectivity to K-12 schools and libraries, and backbone infrastructure to the six islands with 10 Gbps-capacity inter-island circuits.

Only existing underground conduit and aerial systems within existing rights-of-way (ROW) as well as the existing intra-island fiber optic network will be used for the project. As such, the project will not require additional land acquisition, new construction of utility poles or conduits, or substantial modifications to existing buildings. Of the total 380 anchor sites, approximately 180 sites will use existing lines within the conduits and aerial systems, thereby precluding the need for new cable lines. No new construction or installation of new hardware or equipment is proposed for these sites. Another approximately 200 anchor sites will require installation of new lines, which will be pulled through existing conduits or co-located with existing aerial lines using an over-lashing method. All new fiber cables into the buildings will be run through existing aerial connections or existing underground ducts. No exterior modifications to any building will occur. Interior fiber optic patch panels will be installed in existing utility or communication rooms to terminate the new fiber cables.

A total of approximately 102 miles of new fiber will be installed within existing road rights-of-way or existing utility corridors. Of this total, approximately 82 miles of aerial fiber will be installed on Kauai, Oahu, Molokai, Maui, and Hawaii Island. The installation will be within the existing system of overhead utility poles and will be co-located on existing cables using an over-lashing method. Installation of the new fiber will involve the use of various construction equipment such as cherry picker-type vehicles to do overhead line work and auger-mounted rigs and cranes to replace utility poles, if necessary. In addition, approximately 20 miles of new underground ductile fiber will be installed on Oahu, Maui, and Hawaii Island and will be pulled through existing underground conduits and pull boxes. No new fiber is proposed for the island of Lanai.

No new utility pole installations or replacements are proposed as part of the project. However, in the event that an existing pole is determined to be deteriorated or otherwise substandard, the pole may need replacement. Pole replacements, if needed, will generally be conducted and paid for by Oceanic Time-Warner and Wavecom Solutions, in conjunction with their routine operation and maintenance activities. In the unlikely event that a pole

replacement is necessary but cannot be included in the routine maintenance schedules of Oceanic Time-Warner and Wavecom Solutions, the replacement cost will be borne by the UH.

An archaeological monitoring program will be implemented for any utility pole replacement located in archaeologically sensitive sediment layers including, U.S. Department of Agriculture soil series Jaucas Sand, Dune Land, and Fill Land. The archaeological monitoring program will include an archaeological monitoring plan approved by the State Historic Preservation Officer (SHPO). The monitoring program will be implemented in accordance with Hawaii Administrative Rules 13-279 regarding "Rules Governing Standards for Archaeological Monitoring Studies and Reports" as well as the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and will be performed by qualified archaeologists that meet the regulations of the Secretary of the Interior, per Section 112 of the NHPA. Further discussion regarding the monitoring program is included in Section 5.6.1.

The fiber will be deployed and maintained by UH's private for-profit partners, Oceanic Time-Warner and Wavecom Solutions, which in turn will allow both partners to improve their service capabilities. UH will continue to lead the planning, deployment, and support for the technical efforts of all partners. The deployment and maintenance work will be conducted through current joint pole agreements between the partners and owners of the utility poles.

While the Ke Ala 'Ike project is proposed independently, it will also complement the "Access for All: Hawaii Statewide Public Computer Centers" proposal to provide 693 new public access broadband-connected computers in 66 of the community anchor institutions. The 66 anchor institutions are also part of "Ke Ala 'Ike", and include community colleges, on Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii Island. The "Access for All" public computing center proposal would broaden the impact of this proposed community infrastructure by the dramatic increase in computers with high-speed broadband capabilities that would be available to the public. It is noted that this EA evaluates only the Ke Ala 'Ike project.

The Ke Ala 'Ike project will address all of the statutory purposes of BTOP either directly or indirectly, as follows:

- a. *To provide access to broadband service to consumers residing in unserved areas of the country; and*
- b. *To provide access to broadband service to consumers residing in underserved areas of the country*

The formal criteria do not place any public school, public library, community college or remote education center in a location defined as unserved or underserved. Many of Hawaii's consumers, however, are not well-served. The project will provide access for consumers without financial means through the public community anchor institutions.

- c. *To provide broadband education, awareness, training, access, equipment, and support to a variety of community anchor institutions*

This is the statutory purpose most directly addressed by the project. The project will provide complete coverage of all community colleges and their remote education centers, public

universities, public schools and public libraries in the State and enable them to provide outreach, access and support services for the most vulnerable in our communities, including the most remote regions. In addition, some of the university sites will include Hawaii's most strategic job-creating locations such as incubation centers and research facilities.

d. To improve access to, and use of, broadband service by public safety agencies

While not focused on the public safety agencies of the State or counties, some of the public anchor institutions are formally designated as evacuation sites or for other roles in the State's emergency operations plans. The availability of high-speed broadband will assist them in fulfilling their roles before and, possibly, during emergencies.

e. To stimulate the demand for broadband, economic growth, and job creation.

Since many libraries and schools are located in the most remote, rural and disadvantaged locations in the State of Hawaii where residents may not have the financial means to subscribe to whatever broadband access may be available. Students may have broadband access only at school, and the general public may primarily have access through public libraries and community colleges. These BTOP initiatives will help build support and demand for future higher bandwidth connections in homes and businesses.

Four alternatives were initially considered in this EA, including:

1. Preferred Alternative – Use of existing utility infrastructure to provide fiber optic network throughout rural areas of Hawaii by installing cable to existing underground ducts and overhead utility poles associated with existing anchor sites and major road ROWs.
2. Buried Cable Alternative – Install miles of fiber optic cable in buried roadside trenches.
3. Wireless Alternative – Implement a network of radio towers and microwave radios to provide wireless broadband delivery system. This alternative was excluded from consideration prior to analysis, as it fails to adequately support the broadband widths desired, and requires significant ground disturbance and visual impacts. In addition, microwave radio technology is not as reliable as fiber optics and would likely drive redundant wired projects on existing utility poles.
4. No Action Alternative – Status Quo.

This EA analyzes the Buried Cable Alternative and the No Action Alternative relative to the Preferred Alternative. The Preferred Alternative was found to have less environmental impact than the Buried Cable Alternative in most natural resource areas such as noise, air quality, geology and soils, water, biological, historical/cultural, and land use due to the greater effort required for installation and larger construction effort necessary for the Buried Cable Alternative. Potential impacts to aesthetic and visual resources are approximately equivalent. Potential impacts to infrastructure are also approximately equivalent. The Buried Cable Alternative is also prohibitively costly and would not meet the aggressive time

constraints of this project. The No Action Alternative fails to accomplish the project purpose. Table 1-1 summarizes potential effects of each alternative for the respective resource areas.

Results of the EA indicate the Preferred Alternative is not anticipated to result in significant adverse impacts to environmental resources. The proposed project extends through remote and rural areas of the state that are home to low income populations, and it is the intent of the project to bring meaningful communications service to these regions by providing the middle mile facilities required to drive end mile projects at reasonable, competitive prices. Therefore, this project is consistent with Environmental Justice principles in that low income areas would significantly benefit without being subject to any significant environmental impacts.