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Dear Sir or Madam,

We are thankful to the University of Hawai'i Broadband Office for the opportunity to submit comments in response to the Initial Proposal to Implement the Broadband Equity, Access, and Deployment (“BEAD”) Program. The Environmental Health Trust is a not-for-profit think tank that promotes a healthier environment through research, education and policy. We work directly with policymakers, communities, and health and education professionals to bring awareness of environmental hazards and how to mitigate them.¹

The money that will be made available to Hawai'i through BEAD funding represents a once in a lifetime opportunity to advance Hawai'i's technological future through the 21st century and beyond. It is critical that the decisions made with this money will create an infrastructure that is truly future-proof and not just good-enough-for-now. Investments made into Hawai'i's Broadband future need to consider performance, scalability for future needs, energy efficiency, and effects on the environment and human health. The National Telecommunications and Information Association (NTIA), charged with distributing the bulk of the \$65 billion federal broadband infrastructure grant program, has stated clearly that “Eligible Entity should prioritize

¹ www.EHTrust.org

projects designed to provide fiber connectivity directly to the end user.”² And we agree.

It is imperative that BEAD funding decisions for Hawai'i's broadband future only be used for fiber technology all the way to the end user and not be wasted on wireless infrastructure which will not meet future connectivity needs, harm the environment and the health of Hawai'i residents and create another digital divide in just a few years. We encourage the state to supplement BEAD funding for areas that meet the Extremely High Cost Per Location Threshold so that every community has fiber to the premise. We encourage municipally owned broadband for these investments to ensure that the most informed decisions are made for each community.

Fiber is superior to wireless because it:

1. achieves the highest performance metrics like speed, low latency, reliability, cybersecurity and privacy;
2. can be easily and affordably scaled for future needs;
3. will make us competitive with other countries that have surpassed the U.S. thus far with their fiber deployments;
4. is energy efficient with the least carbon footprint to keep us on track with Maryland's environmental objectives;
5. has the least impact on the environment;
6. does not emit wireless radiation^{3 4 5 6} and will preserve the health and safety of residents.

Currently, all these goals can only be achieved with fiber optics to and through the premises. We urge UH to accept nothing less than the best for every resident of Hawai'i. Whether they live in urban, suburban, rural or tribal lands, whether rich or poor, every Hawai'i resident deserves fiber, the technology investment that will catapult them into the future.

Performance and Scalability

While wireless infrastructure promises faster and cheaper deployment, it is no match for the performance of fiber infrastructure and ends up being costlier in the long run to maintain and upgrade.⁷ The poor performance metrics of wireless infrastructure costs our states billions of dollars when residents and businesses are held up by unreliable service, low speeds, and issues with cybersecurity⁸ and privacy.

Baseline speed requirements of 100/20Mbps (download/upload) can be achieved with current cable infrastructure, the kind that is already available for most homes and businesses. 5G

² https://broadbandusa.ntia.doc.gov/sites/default/files/2022-09/BEAD-Frequently-Asked-Questions-%28FAQs%29_Version-2.0.pdf

³ Miller, A. B., Sears, M. E., Morgan, L. L., Davis, D. L., Hardell, L., Oremus, M., & Soskolne, C. L. (2019). [Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices](#). *Frontiers in Public Health*, 7.

⁴ Davis, D., Birnbaum, L., Ben-Ishai, P., Taylor, H., Sears, M., Butler, T., & Scarato, T. (2023). [Wireless technologies, non-ionizing electromagnetic fields and children: Identifying and reducing health risks](#). *Current Problems in Pediatric and Adolescent Health Care*, 53(2), 101374.

⁵ McCredden, J. E., Cook, N., Weller, S., & Leach, V. (2022). [Wireless technology is an environmental stressor requiring new understanding and approaches in health care](#). *Frontiers in Public Health*, 10.

⁶ Clegg, F. M., Sears, M., Friesen, M., Scarato, T., Metzinger, R., Russell, C., Stadtner, A., & Miller, A. B. (2020). [Building science and radiofrequency radiation: What makes smart and healthy buildings](#). *Building and Environment*, 176, 106324.

⁷ <https://www.benton.org/sites/default/files/FixedWireless.pdf>

⁸ <https://www.sdxcentral.com/articles/news/att-sounds-alarm-on-5g-security/2019/11/>

wireless infrastructure offers speeds similar to what cable currently provides⁹ and is limited in its capacity to reliably offer faster upload speeds peaking at just 50 Mbps. Using BEAD funding for wireless infrastructure will put communities in another digital divide in just a few years when bandwidth demands increase with future technology demands.

Baseline speeds for fiber infrastructure is 1000/1000 Mbps (download/upload) far surpassing wireless speeds at its minimum performance capabilities. Currently cities that have adopted all fiber networks are seeing speeds of 10,000/10,000 Mbps with the capabilities of upgrading to Terabyte symmetrical speeds. Chattanooga, Tennessee adopted fiber 12 years ago with symmetrical speeds of 1000 Mbps and has now upgraded to 10Gbps (or 10,000 Mbps) symmetrical speeds by simply replacing the electronics and keeping all the fiber intact.¹⁰

The pandemic shutdowns forced large families to work and school from home and it was a quick lesson on the imperative need for fast, reliable internet that not only allowed us to quickly download information but to also have fast upload speeds so that multiple family members can have online video calls at the same time. Wireless infrastructure fails in allowing multiple users on the same network to reliably have online video meetings at the same time.

Wireless infrastructure fails during inclement weather or when the path of the signal is obstructed.³ Fiber and current cable infrastructure can reliably offer superior service without these challenges.

Competition With Other Countries

The quality of broadband will make or break our ability to compete with the rest of the world.¹¹ Other countries have recognized the importance of fiber optics all the way to the premises and have invested heavily to reach 100% penetration, ensuring that even rural communities with unfavorable terrain have fiber. As of 2019 - 92% of China's internet users had fiber all the way to the home.¹² 62% of homes in the European Union 39 bloc nations have fiber to the premises.¹³ United Arab Emirates, Qatar, Singapore and Hong Kong all have higher than 90% penetration of fiber all the way to the premises while Iceland, Spain and Portugal are catching up at 76.8%, 73.5% and 71.1% respectively.¹⁴ The US, on the other hand, stands at 16.39% penetration of Fiber to the Premises and ranked 30th among Organization for Economic Co-operation and Development countries, as of 2020.¹⁵

Energy Efficiency

According to IEEE Magazine, 5G base stations are expected to consume roughly 3 times the

⁹ <https://www.highspeedinternet.com/resources/how-fast-is-5g-home-internet>

¹⁰ <https://fiberbroadband.org/2022/02/24/cheap-sneakers-or-good-shoes-investing-in-fiber-for-the-long-term/>
<https://fiberbroadband.org/2021/02/18/reflecting-on-chattanoogas-journey-to-becoming-a-10g-city/>

¹¹ <https://worldbroadbandassociation.com/greaterbroadbandinvestment/>

¹² <https://www.prnewswire.com/news-releases/2020-chinese-ftth-deployments-state-of-the-chinese-fiber-broadband-network-regional-comparative-competitive-landscape-analysis-of-the-fiber-optical-network-value-chain-301059551.html>

¹³ <https://www.lightwaveonline.com/ftx/ftth-b/article/14292814/ftth-passes-more-than-62-of-eu39-households-ftth-council-europe>

¹⁴ <https://www.ftthcouncil.eu/knowledge-centre/all-publications-and-assets/1710/ftth-b-global-ranking-2023>

¹⁵ <https://www.statista.com/statistics/604623/share-of-fibre-connections-in-broadband-oecd/#statisticContainer>

power of 4G base stations and more 5G base stations are required to cover the same area.¹⁶ Energy consumption is expected to increase by 61 times from 2020 to 2030 with 5G.¹⁷ Adding more strain on Hawai'i's electric grid, especially when we have not fully moved to renewable energy, will further exacerbate carbon emissions. One study found that the digital carbon footprint of an American is 5 times larger than the world average.¹⁸

According to countries that have already installed fiber to the homes (FTTH), like China and Spain, fiber is 85% more energy efficient than copper yielding a saving of 208GWh which represents a reduction of 56,500 tons of CO₂ emissions.⁶ One study done by the Federal Environment Ministry and the German Environment Agency found that video transmission through fiber optics is nearly 50 times more energy efficient than wireless.¹⁹ Research on whole network level assessments of the operational energy use implications of 5G warns “Energy-intensive user practices contribute to ever-growing levels of data traffic, and counteract the energy-saving potential of 5G efficiency improvements.”²⁰

Wireless Radiation Impacts on the Environment

No U.S. agency or international authority has ever acted to review research on wireless radiation effects on the environment nor set exposure limits to ensure protections for birds, bees, trees and wildlife.^{21 22} It is a critical regulatory gap.

In 2014, the U.S. Department of Interior wrote a letter to the NTIA detailing several published studies showing impacts of wireless radiofrequency radiation (RFR) to birds stating that, “There is a growing level of anecdotal evidence linking effects of non-thermal, non-ionizing electromagnetic radiation from communication towers on nesting and roosting wild birds and other wildlife.” It further stated, “However, the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”²³

Significant research has accumulated indicating serious environmental effects, yet with no review by federal agencies. On August 13, 2021, the United States Court of Appeals for the District of Columbia Circuit ruled in our case against the FCC (EHT et al. v FCC)²⁴ stating “we find the

¹⁶ <https://spectrum.ieee.org/5gs-waveform-is-a-battery-vampire>

¹⁷ https://www.datacenter-forum.com/datacenter-forum/5g-will-prompt-energy-consumption-to-grow-by-staggering-160-in-10-years?fbclid=IwAR0zQ_dGvwT_phdacXuhOkllYOm_p0u95nJAac1toWs4zGUNJnotrvRki7l

¹⁸ https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf

¹⁹ <https://www.umweltbundesamt.de/en/press/pressinformation/video-streaming-data-transmission-technology>

²⁰ Williams, Laurence and Sovacool, Benjamin K. and Foxon, Timothy J., The energy use implications of 5G: Reviewing whole network operational energy, embodied energy, and indirect effects (January 13, 2022). *Renewable and Sustainable Energy Reviews* 157 (2022) 112033, Available at SSRN: <https://ssrn.com/abstract=4008530>

²¹ Levitt, B. B., Lai, H. C., & Manville, A. M. (2021). [Effects of non-ionizing electromagnetic fields on flora and fauna, Part 3. Exposure standards, public policy, laws, and future directions.](#) *Reviews on Environmental Health*.

²² Levitt BB, Lai HC and Manville AM II (2022) [Low-level EMF effects on wildlife and plants: What research tells us about an ecosystem approach.](#) *Front. Public Health* 10:1000840. doi: 10.3389/fpubh.2022.1000840

²³ https://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf

²⁴ [Final Court Decision EHT et. al v. the FCC](#) 8/13/2021

[https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFDF7/\\$file/20-1025-1910_111.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFDF7/$file/20-1025-1910_111.pdf)

Commission’s order arbitrary and capricious in its complete failure to respond to comments concerning environmental harm caused by RF radiation.” The Commission also “completely failed even to acknowledge, let alone respond to, comments concerning the impact of RF radiation on the environment. That utter lack of a response does not meet the Commission’s obligation to provide a reasoned explanation for terminating the notice of inquiry.”²⁵ To this date the FCC still has not revisited its wireless radiation guidelines despite its court orders to do so over two years ago.

In 2021 and 2022 a three-part landmark research review by U.S experts of over 1,200 studies on the effects of non-ionizing radiation to wildlife entitled “Effects of non-ionizing electromagnetic fields on flora and fauna” found adverse effects in all species studies and at even very low intensities. Findings included impacts to orientation, migration, reproduction, mating, nest, den building and survivorship.^{26 27 28}

In a review published in *Environment International* on the ecological effects of RF-EMF, 70% of the studies reviewed found RF had a significant effect on birds, insects, other vertebrates, organisms, and plants, with development and reproduction in birds and insects being the most strongly affected.²⁹ Biologists caution that non ionizing electromagnetic radiation is a critical factor in the decline of pollinator and insect populations.³⁰

A new 2023 systematic review and metaanalysis of studies on the biological effects of non-ionizing electromagnetic fields (EMF) to insects published in *Reviews on Environmental Health* states the “vast majority of studies found effects, generally harmful ones” with toxic effects occurring at radiation levels that are below those considered safe for humans.³¹

Trees are at risk from wireless as well. A field monitoring study spanning nine years involving over 100 trees found damage on the side of the trees facing transmitting cell antennas.³² Researchers have released subsequent reports documenting continued impacts to tree canopy from cell tower antennas.^{33, 34} Other RF effects include impacts to leaf, shoot, seedlings of Aspen trees³⁵ and biochemical impacts to plants.³⁶

²⁵ [https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFDF7/\\$file/20-1025-1910111.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFDF7/$file/20-1025-1910111.pdf)

²⁶ Levitt, B. B., Lai, H. C., & Manville, A. M. (2021). [Effects of non-ionizing electromagnetic fields on flora and fauna, Part 3. Exposure standards, public policy, laws, and future directions.](#) *Reviews on Environmental Health*.

²⁷ Levitt, B. B., Lai, H. C., & Manville, A. M. (2022a). [Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment.](#) *Reviews on Environmental Health*, 37(1), 81–122.

²⁸ Levitt, B. B., Lai, H. C., & Manville, A. M. (2022b). [Effects of non-ionizing electromagnetic fields on flora and fauna, Part 2. Impacts: How species interact with natural and man-made EMF.](#) *Reviews on Environmental Health*, 37(3), 327–406.

²⁹ Cucurachi, S., Tamis, W. L. M., Vijver, M. G., Peijnenburg, W. J. G. M., Bolte, J. F. B., & de Snoo, G. R. (2013). [A review of the ecological effects of radiofrequency electromagnetic fields \(RF-EMF\).](#) *Environment International*, 51, 116–140.

³⁰ Balmori A. (2021) [Electromagnetic radiation as an emerging driver factor for the decline of insects.](#) *Science of the Total Environment*. 767: 144913

³¹ Thill A, Cammaerts MC, Balmori A. [Biological effects of electromagnetic fields on insects: a systematic review and meta-analysis.](#) *Rev Environ Health*. 2023 Nov 23

³² Waldmann-Selsam, C., Balmori-de la Puente, A., Breunig, H., & Balmori, A. (2016). [Radiofrequency radiation injures trees around mobile phone base stations.](#) *Science of The Total Environment*, 572, 554–569.

³³ Breunig, Helmut. [“Tree Damage Caused By Mobile Phone Base Stations An Observation Guide.”](#) (2017).

³⁴ 2021 Report [“Tree damage caused by mobile phone base stations”](#)

³⁵ Haggerty, K. (2010). [Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations.](#) *International Journal of Forestry Research*, 2010, 836278.

³⁶ Halgamuge, M. N. (2017). [Review: Weak radiofrequency radiation exposure from mobile phone radiation on plants.](#)

Environmental Health Trust has developed a website focused on the science of wildlife and wireless that you can access at wildlifeandwireless.org.

Fiber optics not only offers superior performance metrics and energy savings, but also has no radio frequency radiation emissions and therefore surpasses all these environmental issues.

Health and Safety

Extensive published scientific evidence indicates that wireless radiofrequency (RF) radiation at levels far below FCC limits can cause cancer,³⁷ increased oxidative stress,³⁸ genetic damage,³⁹ structural and functional changes of the reproductive system,⁴⁰ memory deficit,⁴¹ behavioral problems⁴², and neurological impacts.⁴³

*EHT et al. v. FCC the U.S. Court of Appeals for the D.C. Circuit*¹⁷ also ruled the FCC ignored scientific evidence on negative health effects from long term wireless radiation exposure at current allowable levels, especially in regards to children, who the American Academy of Pediatrics states⁴⁴ are more vulnerable to wireless radiation. The court ordered the FCC to examine the record evidence regarding long term exposure to children, health effects unrelated to cancer and environmental impacts. So far, the FCC has not responded. This landmark ruling highlights how no federal health agency has reviewed the full body of current research to ensure current safety standards are protective.

The state of New Hampshire had similar findings when it commissioned a study on the Environmental and Health Effects of Evolving 5G Technology and issued a final report⁴⁵ in 2020 with 15 recommendations including: requiring setbacks of all wireless transmitters from

Electromagnetic Biology and Medicine, 36(2), 213–235

³⁷ Miller, A. B., Morgan, L. L., Udasin, I., & Davis, D. L. (2018). Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102). *Environmental Research*, 167, 673–683. <https://doi.org/10.1016/j.envres.2018.06.043>

³⁸ Yakymenko, I., Sidorik, E., Kyrylenko, S., & Chekhun, V. (2011). Long-term exposure to microwave radiation provokes cancer growth: Evidence from radars and mobile communication systems. *Experimental Oncology*, 33(2), 62–70. <https://pubmed.ncbi.nlm.nih.gov/21716201/>.

³⁹ Falcioni, L., Bua, L., Tibaldi, E., Lauriola, M., De Angelis, L., Gnudi, F., Mandrioli, D., Manservigi, M., Manservigi, F., Manzoli, I., Menghetti, I., Montella, R., Panzacchi, S., Sgargi, D., Strollo, V., Vornoli, A., & Belpoggi, F. (2018). Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission. *Environmental Research*, 165, 496–503. <https://doi.org/10.1016/j.envres.2018.01.037>

⁴⁰ Kim S, Han D, Ryu J, Kim K, Kim YH. Effects of mobile phone usage on sperm quality - No time-dependent relationship on usage: A systematic review and updated meta-analysis. *Environ Res*. 2021 Nov;202:111784. doi: 10.1016/j.envres.2021.111784. Epub 2021 Jul 30. PMID: 34333014

⁴¹ Swiss Tropical and Public Health Institute. "Mobile phone radiation may affect memory performance in adolescents, study finds." *ScienceDaily*. ScienceDaily, 19 July 2018. <www.sciencedaily.com/releases/2018/07/180719121803.htm>.

⁴² Divan HA, Kheifets L, Obel C, Olsen J. Cell phone use and behavioural problems in young children. *J Epidemiol Community Health*. 2012 Jun;66(6):524-9. doi: 10.1136/jech.2010.115402. Epub 2010 Dec 7. PMID: 21138897.

⁴³ Hiie Hinrikus, Jaanus Lass & Maie Bachmann (2021) Threshold of radiofrequency electromagnetic field effect on human brain, *International Journal of Radiation Biology*, 97:11, 1505-1515, DOI: [10.1080/09553002.2021.1969055](https://doi.org/10.1080/09553002.2021.1969055)

⁴⁴ AAP Letter to the FCC Chairman calling for the FCC to open up a review of RF guidelines (7/12/2012), AAP Letter to US Representative Dennis Kucinich in Support of the Cell Phone Right to Know Act 12/12/2012, AAP to FCC Commissioner Mignon Clyburn and FDA Commissioner Margaret Hamburg calling for a review of RF guidelines 8/29/2013

⁴⁵ <https://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>

residences, businesses and schools, adopting a statewide position to encourage fiber optics to the premise, acknowledging the need for further studies to outline clinical symptoms related to RF exposure, developing RF safety limits to protect the environment, among other recommendations.

In 2022, the Pittsfield, Massachusetts Board of Health voted to send a cease-and-desist order to shut down a Verizon cell tower. The order ⁴⁶ issued to Verizon states “Whereas, soon after the facility was activated and began transmitting, the City started to receive reports of illness and negative health symptoms from residents living nearby the facility,...The negative health symptoms the affected residents have reported include complaints of headaches, sleep problems, heart palpitations, tinnitus (ringing in the ears), dizziness, nausea, skin rashes, and memory and cognitive problems, among other medical complaints. ... Whereas, as further documented below, the neurological and dermatological symptoms experienced by the residents are consistent with those described in the peer-reviewed scientific and medical literature as being associated with exposure to pulsed and modulated Radio Frequency (“RF”) radiation, including RF from cell towers.”

A major 2022 review of the existing scientific literature on cell tower radiation and health found associations with radiofrequency sickness, cancer and changes in biochemical parameters.⁴⁷ For example, a study published in *Electromagnetic Biology and Medicine* on people living near cell antennas found significant biochemical changes in the blood. This study evaluated effects in the human blood of individuals living near mobile phone base stations compared with healthy controls living more than 300 meters from a base station. The group living closer to the antennas had statistically significant higher frequency of micronuclei and a rise in lipid peroxidation in their blood; these changes are considered biomarkers predictive of cancer.⁴⁸

A review paper on corporate risk entitled “Limiting Liability with Positioning to Minimize Negative Health Effects of Cellular Phone Towers” reviewed the “large and growing body of evidence that human exposure to RFR from cellular phone base stations causes negative health effects.” The authors recommend restricting antennas near homes and within 500 meters of schools and hospitals to protect companies from future liability.⁴⁹

An Uninsured Risk

Currently, insurance authorities classify 5G and wireless radiation as “high” risk ^{50, 51} carriers define radio frequency as a pollutant and their insurers exclude it from health effects

⁴⁶ <https://ehtrust.org/wp-content/uploads/Pittsfield-Health-Board-Cell-Tower-Order-to-Verizon-April-11-2022-FINAL-REDACTED.pdf>

⁴⁷ A. Balmori (2022). Evidence for a health risk by RF on humans living around mobile phone base stations: From radiofrequency sickness to cancer. *Environ. Res.*, 214 (2022), Article 113851 <https://doi.org/10.1016/j.envres.2022.113851>

⁴⁸ Zothansiam, Zosangzuali, M., Lalramdinpui, M., & Jagetia, G. C. (2017). Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations. *Electromagnetic Biology and Medicine*, 36(3), 295–305. <https://doi.org/10.1080/15368378.2017.1350584>.

⁴⁹ Pearce, J. M. (2020). Limiting liability with positioning to minimize negative health effects of cellular phone towers. *Environmental Research*, 181, 108845. <https://doi.org/10.1016/j.envres.2019.108845>.

⁵⁰ Swiss Re 5G Report <https://ehtrust.org/wp-content/uploads/Swiss-Re-SONAR-Publication-2019-excerpt-1.pdf>

⁵¹ <https://ehtrust.org/key-issues/reports-white-papers-insurance-industry/>

liability coverage.^{52, 53}

A 2019 Report by Swiss Re Institute,⁵⁴ a world leading provider of insurance, classifies 5G mobile networks as a “high”, “off-the-leash” risk stating, “Existing concerns regarding potential negative health effects from electromagnetic fields (EMF) are only likely to increase. An uptick in liability claims could be a potential long-term consequence” and “[a]s the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency.”

Wireless companies inform shareholders of the risk⁵⁵ but not the communities impacted by the infrastructure.⁵⁶ For example, Crown Castle states in their [2020 10-K tax filing](#) that:

“If radio frequency emissions from wireless handsets or equipment on our communications infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues.

“The potential connection between radio frequency emissions and certain negative health effects, including some forms of cancer, has been the subject of substantial study by the scientific community in recent years. We cannot guarantee that claims relating to radio frequency emissions will not arise in the future or that the results of such studies will not be adverse to us.”

“If a connection between radio frequency emissions and possible negative health effects were established, our operations, costs, or revenues may be materially and adversely affected. We currently do not maintain any significant insurance with respect to these matters.”⁵⁷

Conclusion

Hawai'i has the potential to be at the forefront of technological advancements, environmental protections and health protections. The University of Hawai'i Office of Broadband has been given a once in a lifetime spending opportunity and can achieve all of these goals by investing into fiber optics all the way to every home and business, no matter the initial cost. We urge UH to stay steadfast in these goals so that Hawai'i can have the opportunity to compete on the world stage while keeping residents and the environment safe.

We are happy to provide UH with more information and resources if needed.

⁵² <https://www.genesisinsurance.com/toolbox/assets/pdfs/Segment:%20%20Public%20Entity/TPP%20B%20C-M%2000%2001%2005%20-05%20Coverage%20Part%20B.%20Public%20Officials%20Liability-Claims%20Made%20Coverage.pdf> (p.4)

⁵³ [Electromagnetic Field Insurance Policy Exclusions Cell Phone Radiation and EMFs - Environmental Health Trust](#)

⁵⁴ [Swiss Re SONAR New emerging risk insights](#)

⁵⁵ [Corporate Company Investor Warnings in Annual Reports 10k Filings Cell Phone Radiation Risks - Environmental Health Trust](#)

⁵⁶ <https://ehtrust.org/key-issues/corporate-company-investor-warnings-annual-reports-10k-filings-cell-phone-radiation-risks/>

⁵⁷ <https://www.sec.gov/Archives/edgar/data/1051470/000105147018000082/cci10-k123117.htm> See also Factsheets on Legal Liability of Cell Towers at <https://ehtrust.org/wp-content/uploads/Legal-Liability-Cell-Tower-Radiation-Health-Effects-3.pdf>



Sincerely,

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