To: The Members of the RI House Innovation, Internet, and Technology Committee

There is much in H7083 THE RHODE ISLAND BROADBAND DEVELOPMENT PROGRAM that I can wholeheartedly support. Those points are as follows:

(5) **Fixed wireless can be deployed quickly as a temporary, lower performance Internet service that is limited in broadband speeds by the availability of spectrum and weather conditions since it travels in the atmosphere from fixed attachments such as utility poles and serves several hundred subscribers. Fixed wireless has a four (4) to six (6) year lifecycle and cannot keep pace with increased requirements for bandwidth. (emphasis added)**

(6) **Fiber-to-the-premises is a future proof "DO IT ONCE, DO IT RIGHT" option for long-term future market demand**, typically offered at a symmetrical one gigabit per second (1 Gbps) up to ten gigabits per second (10 Gbps), with the technology scalable as the endpoint electronics improve. Fiber-optic cable does have a high initial capital cost to deploy; however, **fiber-optic cable has much lower operating costs, is more resilient, and is a superior investment to serve the increasing market demands for high speeds needed by consumers and businesses over the next several decades. (emphasis added)**

7) Fiber-optic technology plays an integral role in remote learning, small business, telehealth, public safety and emergency communication, and economic development. COVID-19 has proven the need for dedicated high-speed, fiber-optic technology.

(8) While complementary, wireless broadband solutions alone cannot meet the enormous demand placed upon the communication networks to keep Rhode Island competitive in the 21st century. Wireline broadband via fiber-optic technology is laser transmitted and can be designed to operate in the event of electrical power interruptions and is more resilient to extreme weather events. Should there be inclement weather or a major power outage, Internet service can seamlessly continue to operate.

(10) Because of the size of Rhode Island, the state has more fiber-optic cable per square mile than any other state in the country. Over forty-eight (48) strands of fiber-optic cable run throughout the state, yet less than ten (10) strands are being used and only by hospitals, colleges, universities, libraries, municipal facilities, and schools.

(14) Rhode Island needs a statewide broadband strategy to create the on/off ramps to connect Rhode Island residents and businesses to the forty-eight (48) strands of fiber-optic technology that run throughout this state. This strategy shall include creating a modern network in order that residential and business customers can experience gigabit service, create competition by making pricing affordable with Internet service provider (ISP) choices, and bridge the digital divide in rural areas or where telecommunication providers choose not to service.

However, the glowing recommendations for the use of fiber-optics for the "last mile" are negated by the following definition, found on page 4 of H7083:

(1) "Broadband" means a laser high speed and high capacity transmission technique using a wide range of frequencies to include, **but not be limited to**, transmission over strands of fiber-optic cable. **(emphasis added)**

This language is essentially the same as in last year's flawed Broadband bill. This is what I find objectionable, and why I cannot support this bill.

With this definition, by not limiting transmission to fiber-optic, there is again the possibility/probability of "small cell" antennas/wireless/sWTFs (small wireless telecommunications facilities) being utilized for the "last mile" to the residence or business. The "middle mile" is already available in RI. Fiber strands were installed throughout RI towns in 2010. This provides an advantage to RI, but Rhode Islanders still need the "on/off ramps" to their homes and businesses for access to the internet. This "last mile" needs to be wired Fiber to the Premises (FTTP), not wireless "small cells" for 5G.

Here is a summary of the reasons that FTTP is superior to wireless. Fiber-optics to the premises:

- Runs directly to the home or business and allows data rates up to 100 times faster than wireless.
- Allows for more secure and private transmission (as wireless communications can be hacked or surveilled).
- **Emits NO** harmful pulsed radiofrequency/microwave radiation, as wireless does.
- Is more resilient as it continues to work in case of a power emergency (wireless will not run without power for the "small cell" transmitters and towers).
- Is capable of transmitting tremendous amounts of data.
- **Is infinitely upgradable for up to 40-50 years.** As the end-point electronics improve, it will be possible to swap out the electronics to increase the data rate transmitted over the fiber-optic cable. This is not possible with wireless, which requires upgrades every few years.
- It is **not** an energy guzzler, as is wireless.

I urge you to take heed of Dr. Timothy Schoechle's expertise and advice when comparing the long-term benefits of fiber optics to the many faults of wireless service. His essential book on this topic is *Re-Inventing Wires: The Future of Landlines and Networks.*
https://gettingsmarteraboutthesmartgrid.org/pdf/Wires.pdf

Here are some highlights:

- **The Telecommunications Act of 1996 has resulted in the reconsolidation of communications monopoly providers dominated now by a "triopoly"** [AT&T, Verizon, and Comcast] that has come to be even more limiting and detrimental than the original AT&T Bell System monopoly.

- **The privatized wireless market has failed to deliver adequate and sustainable connectivity,** resulting in the U.S. falling in rank to #17 of 20 among developed countries in fixed broadband penetration as a percentage of the population.

- **Only a fiber-based broadband system can overcome the access inequality and second-rate connectivity currently impeding our nation in a myriad of ways**. Optical fiber technology, comprised of wires that carry data encoded on light beams, is easily capable of delivering data rates that are orders of magnitude greater than cable, DSL and wireless. Wireline stays roughly two orders of magnitude ahead, i.e. about 100 times as fast, as wireless.

- **Wireless technologies are unreliable, vulnerable to security and privacy problems and prone to both latency and delay issues.** Wireless provides poorer voice quality, artificial scarcity of service, unnecessarily high costs to the public, and, importantly, negative economies for speed. Due to collusion among dominant incumbent providers, the nation is now left with expensive, second-rate wired services for the rich, expensive, second-rate wireless services (or no service at all) for those who cannot afford wires, and no national effort to pursue advanced fiber networks that are being readily adopted by the rest of the world.

- **Local communities must build and finance broadband fiber networks**, in the same way that state and local governments provide schools, streets, bridges, water systems, sewers and libraries. Fast, reliable internet access has taken on the

same importance as other basic needs. States and cities must lead the way to a reliable, safe, resilient, energy efficient and affordable "information highway". High-speed fiber networks should be funded by public funds, taxes, municipal bonds and grants from governments and foundations, not by private business with commercial conflicts of interest. …

- **Investing for the future in fiber based internet access for communities pays off**, such as in Chattanooga's cutting-edge fiber network, where the municipal broadband system cost $220 million to develop, and thus far has translated into $865 million in economic growth for the city. Longmont, Colorado's NextLight™ municipal broadband system is barely a year old but the availability of cheap ($49/month), symmetrical, neutral and fast broadband is already proving to be a magnet for business relative to neighboring communities.

- **Deployment of wired systems is being suppressed by regulatory politics and corporate business strategies that enrich the "triopoly" players Verizon, AT&T and Comcast.** The triopoly has deliberately obstructed community and municipal broadband networks by sponsoring the adoption of state laws that preempt wireline competition from public municipalities. **[This is what happened in RI in 2017, with the swift passage of the Small Cell Siting Act (an ALEC model bill), an Act foisted on unsuspecting legislators by lobbyists for the telecom industry. This Act is one of the most repressive, anti-local laws ever written. It prohibits local authorities from using the power granted to them by the United States Congress in the Telecommunications Act of 1996 to prevent the uncontrolled deployment of wireless antennas in their communities.]**

- **The cost of internet access can be significantly reduced with fiber networks.** Presently, by blocking municipal fiber, but at the same time declining to build it out themselves [even though they collected billions of dollars from unsuspecting consumers on their phone bills for years, dollars that were promised for fiber to the premises. See the interview with Bruce Kushnick, in which he "explains how local telephone customers paid billions for a national fiber optic network, but

telecoms used it to offset the cost of wireless which is more profitable for them." https://soundcloud.com/greenstreetradio/the-big-telecom-swindle-green-street-with-bruce-kushnick], the dominant carriers are able to "cherry-pick" the most profitable customers and maintain artificial scarcity and high prices—while rural communities and the urban poor languish on the wrong side of the "digital divide." Community-based fiber networks can provide lower cost, affordable services to all. …

- **Wireless networks are energy guzzling and not sustainable.** A wired connection (copper, DSL, cable, fiber) is the most energy efficient method to access the internet. An "explosion" in energy consumption, approaching 5–10% of world electricity supply, is now needed for the operation and manufacture of wireless infrastructure. The average iPhone, for example, uses more energy than a mid-size ENERGY STAR® compliant refrigerator, or about 361 kW-h counting wireless connections, data usage and battery charging. In the 3 years between 2012-2015 the wireless cloud increased its carbon footprint by the equivalent of adding 4.9 million cars to the road. Ironically, the global internet system is almost entirely dependent on an inefficient, polluting, and archaic energy source—coal. This irresponsible trajectory is entirely avoidable using fiber communications networks to the home [and business].

- **Universal dependence on wireless systems leaves people vulnerable in the event of power grid failure.**
  In the event of a prolonged power outage, mobile devices leave people with no service, compared to landlines with independent power sources. These can offer reliable communication even when the grid is down. …

- **5G and the Internet of Things (IoT) are engines of forced obsolescence, intended to create lucrative public demand for more millions of new chips, apps, wireless devices and appliances. The Internet of Things (IoT) will also enable commercial interests to collect huge troves of data about the most intimate details of our lives, details that can be sold and/or captured by botnets.** When critical systems are linked to remote actuators and/or cloud-based software, those links can become vulnerable, inadequate or inappropriate. IoT also raises many health and safety issues, such as what if a stove or

> oven is activated by a cell phone when something flammable is nearby? Or a hacker in China finds a way to control door locks, furnaces or the national grid system? The very concept of a wireless Internet of Things must be considered for what it is—in large part an unnecessary technology looking for a market and wireless industry cash cow. **(emphasis added)**

https://gettingsmarteraboutthesmartgrid.org/wires.html

Here is a chart that summarizes the harms to human health and security, as well as to environmental health, from 5G wireless and the Internet of Things (IoT) that 5G enables:

"Concern for man himself and his fate must always form the chief interest of all technical endeavors…in order that the creations of our minds shall be a blessing and not a curse to mankind." – Albert Einstein, California Institute of Technology, February 16, 1931

https://whatis5g.info/?fbclid=IwAR1k4RjBrdc7mGkTeegvUSXliDBpfVc6eHMfTsdTI3OP4udkT6tN3eetITE

I urge the Committee to reconsider the language in this bill that perpetuates a loophole for the telecom industry to continue the roll-out of energy inefficient, unsafe, unreliable, and insecure wireless connections, using the influx of tax-payer federal dollars to do so.

Thank you

Sincerely,

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