Testimony of
Bethanne Cooley
Assistant Vice President, State Legislative Affairs
Opposition HB 1644
January 18, 2022

Before the New Hampshire House Science, Technology and Energy Committee

Chairman Vose, Vice Chairman Thomas and members of the Committee, on behalf of CTIA, the trade association for the wireless communications industry, I respectfully testify in opposition to HB 1644, related to the placement of wireless antennae and establishing a "Radiation Exposure Registry." The proposed legislation is flawed for two fundamental reasons: it is both unwarranted and unlawful. For the reasons described herein, we respectfully request this bill not advance.

As background, as you likely know, this legislation comes from recommendations from the majority report of the "Commission to Study The Environmental and Health Effects of Evolving 5G Technology," ("5G Commission). CTIA also had a seat on the 5G Commission. CTIA felt the majority of the "experts" who spoke before the 5G Commission sought to sow confusion on the science of wireless technology and the Commission failed to consider in a balanced fashion the well-developed reviews of the science from the U.S. and international health and safety organizations. We indicated as much as a signatory to the minority report from the 5G Commission.

As noted, the legislation before you, HB 1644, includes two recommendation from the 5G Commission: mandating separation distances for telecommunications antennae and establishing a so-called "Radiation Exposure Registry." To begin, the proposed bill is based on the unsupported premise that Federal Communications Commission ("FCC") regulated telecommunications equipment presents "a significant public health risk." As detailed below, **the consensus of the U.S. and international scientific community is that there are no known adverse health risks from the levels of RF energy emitted at the frequencies used by wireless devices (including cellphones) and facilities (including small cells).** Indeed, when setting limits for the RF emissions of wireless devices, the FCC intentionally provided a significant safety margin—50 times below the threshold at which adverse effects have been observed in laboratory animals.[1] Numerous, independent analyses of peer-reviewed studies conducted over several decades by national and international organizations have confirmed the adequacy of the FCC's limits, concluding that there are no known health risks to humans from RF energy emitted by wireless devices and infrastructure. And the FCC's sister agency, the Food and Drug Administration ("FDA") stands in full support

[1] The threshold for adverse effects was set at the level at which heating caused a "disruption of observable behavior" in animals. *See Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, First Report and Order, Further Notice of Proposed Rulemaking, and Notice of Inquiry, 28 FCC Rcd. 3498, 3582 ¶ 236 (2013) ("FCC NOI") ("[E]xposure limits are set at a level on the order of 50 times below the level at which adverse biological effects have been observed in laboratory animals as a result of tissue heating resulting from RF exposure."); IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz, IEEE Std. C95.1-2019, Annex B Sec. B.5.3.3 and Annex C Sec. C.2.1 (2019) ("Typically, the effect observed has been a decreased rate of responding or decreased reaction time.").

of the adequacy of the FCC's standards. The Director of the FDA's Center for Devices and Radiological Health wrote in 2018: "[B]ased on our ongoing evaluation of this issue and taking into account all available scientific evidence we have received, ***we have not found sufficient evidence that there are adverse health effects in humans caused by exposures at or under the current radiofrequency energy exposure limits***."[2] Thus, the scientific consensus as evaluated by experts, international standard-setting bodies, and federal health and safety agencies is that wireless devices and base stations at the FCC's RF exposure levels are safe.

Second, federal law would both expressly and impliedly preempt HB 1644. The Federal Communications Act, 47 U.S.C. 332(c)(7)(B)(iv), expressly preempts any zoning regulations based on "environmental effects of radio frequency emissions" from FCC-compliant equipment. In addition, courts have uniformly struck down state and local regulations based on claims that FCC RF emissions limits are inadequate or RF emissions from FCC-certified equipment are unsafe. *See Farina v. Nokia, Inc.*, 625 F.3d 97, 122 (3d Cir. 2010) (preempting claims based on assertion that FCC "standards are inadequate—that they are insufficiently protective of public health and safety"); *Murray v. Motorola, Inc.*, 982 A.2d 764, 777 (D.C. 2009) ("[I]nsofar as plaintiffs' claims rest on allegations about the inadequacy of the FCC's RF radiation standard or about the safety of their FCC-certified cell phones, the claims are preempted under the doctrine of conflict preemption.").

For either one or both of these reasons, HB 1644 should be rejected.

THE FCC'S RF EMISSIONS STANDARDS ADEQUATELY PROTECT CONSUMERS

FCC limits govern RF energy from antennas used in all wireless devices including cellular transmissions from cellphones, cell towers, and 5G small cells. The FCC based these limits on recommendations from the scientific community and expert non-government organizations. The FCC limits currently cover frequencies from 100 kHz to 300 GHz, including the "millimeter wave" or "mmW" frequencies.[3] These guidelines—based on internationally recognized scientific organizations—set limits for the maximum amount of RF exposure from wireless devices and include a significant margin of safety. Specifically, the FCC has set its limit for a consumer device's Specific Absorption Rate—the measurement for RF emissions for consumer devices such as cellphones—"at a level on the order of *50 times below* the level at which adverse biological effects have been observed in laboratory animals."[4] The agency explained that this 50-fold factor can well "accommodate a variety of variables such as different physical characteristics and individual sensitivities—

[2] News Release, FDA, *Statement from Jeffrey Shuren, M.D., J.D., Director of the FDA's Center for Devices and Radiological Health on the recent National Toxicology Program draft report on radiofrequency energy exposure* (Feb. 2, 2018) (emphasis added), https://www.fda.gov/news-events/press-announcements/statement-jeffrey-shuren-md-jd-director-fdas-center-devices-and-radiological-health-recent-national.
[3] Notice of Proposed Rulemaking, 34 FCC Rcd. 11742, 11742 ¶ 120.
[4] FCC NOI ¶ 236 (emphasis added).

and even the potential for exposures to occur in excess of [FCC] limits without posing a health hazard to humans."[5] In reality, wireless devices and antennas typically operate well under FCC thresholds.[6]

International health organizations have also studied the effects of RF exposure and determined that there is no risk from RF emissions from modern wireless device usage. The "Legislative Findings and Purpose" section of HB 1644 erroneously suggest that the World Health Organization ("WHO") views RF emission from telecommunications equipment as a "carcinogen." To the contrary, the WHO position has been, and continues to be, that "there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects."[7] The WHO has also concluded that "research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or 'electromagnetic hypersensitivity.'"[8] Likewise, both the United Kingdom Health Protection Agency Independent Advisory Group on Non-Ionizing Radiation and Swedish Council for Working Life and Social Research agree that RF exposure below guideline levels consistent with FCC limits do not cause health effects.[9] The National Cancer Institute agrees that "studies [on the possible association between cell phone use and cancer] are mixed, but overall, they do not show an association between cell phone use and cancer."[10] Likewise, the American Cancer Society explained that the "RF waves given off by cell phone towers don't have enough energy to damage DNA directly or to heat body tissues. Because of this, it's not clear how cell phone towers might be able to cause cancer."[11] And in 2020, the FDA released a large-scale review of published literature to "assess any possible causal relationship between [RF energy] exposure and the formation of tumors."[12] After examining approximately 125 animal studies and 70 epidemiological studies, the FDA stated that "there are no quantifiable adverse health effects in humans caused by exposures at or under the current cell phone exposure limits."[13] And just last month, in the largest

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[5] *Id.*; *see also Targeted Changes to the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, Resolution of Notice of Inquiry, Second Report and Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 34 FCC Rcd. 11687, 11696 ¶ 14 (2019) ("FCC 2019 Order") ("[O]ur existing exposure limits are set with a large safety margin, well below the threshold for unacceptable rises in human tissue temperature.").

[6] *See* FCC 2019 Order ¶ 14, n. 47.

[7] WHO, *Electromagnetic fields and public health: Base stations and wireless technologies*, Backgrounder (May 2006), https://www.who.int/teams/environment-climate-change-and-health/radiation-and-health/bstations-wirelesstech.

[8] WHO, *Electromagnetic fields and public health: mobile phones*, Backgrounder (Oct. 8, 2014), https://www.who.int/news-room/fact-sheets/detail/electromagnetic-fields-and-public-health-mobile-phones.

[9] *See* Health Protection Agency Independent Advisory Group on Non-Ionizing Radiation, *Health Effects from Radiofrequency Electromagnetic Fields* (RCE-20), at 3 (Apr. 2012), https://webarchive.nationalarchives.gov.uk/20140722075005/http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317133827077 ("The evidence suggests that RF field exposure below guideline levels does not cause acute symptoms in humans, and that people, including those who report being sensitive to RF fields, cannot detect the presence of RF fields."); Anders Ahlbom et al., Radiofrequency Electromagnetic Fields and Risk of Disease and Ill Health: Research During the Last Ten Years, Swedish Council for Working Life and Social Research, at 6 (2012), https://forte.se/app/uploads/sites/2/2015/11/10-y-rf-report.pdf ("Extensive research for more than a decade . . . has found no evidence for health risks below current exposure guidelines.").

[10] National Cancer Institute, *Cell Phones and Cancer Risk* (Jan. 9, 2019), https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/cell-phones-fact-sheet.

[11] American Cancer Society, Cell Phone Towers (emphasis omitted) ("*ACS Cell Phone Towers*"), https://www.cancer.org/cancer/cancer-causes/radiation-exposure/cellular-phone-towers.html (last visited Jan. 16, 2022).

[12] FDA, *Review of Published Literature between 2008 and 2018 of Relevance to Radiofrequency Radiation and Cancer*, at 4 (Feb. 2020), https://www.fda.gov/media/135043/download.

[13] *Id.* at 5.

case-control study to date of the relation between wireless phone use and the risk of brain tumors in children, adolescents, and young adults, researchers found "no evidence of a causal association between wireless phone use and [brain tumors] in young people."[14]

The scientific consensus regarding the safety of RF emissions applies equally to exposures from 5G technology using millimeter wave ("mmW") bands and the proliferation of small cell network architecture. Although 5G represents a new frontier for wireless communications, mmW frequencies do not. The international scientific community fully understands mmW frequencies. The Institute of Electrical and Electronics Engineers ("IEEE") has assembled a list of dozens and dozens of studies on mmW frequencies. The IEEE's RF exposure standards over the last 30 years have cited 85 different mmW studies, the earliest of which was published in 1976 and the most recent in 2018.[15] Common equipment such as "airport scanners, automotive collision avoidance systems and perimeter surveillance radar security systems" all use mmW technology.[16]

Acting responsibly, scientists and engineers continue to research RF exposure, including RF exposure with 5G technology. For example, studies have shown that 5G communication, which will take advantage of small cell network architecture, results in more base stations operating at *lower* power levels. A recent overview of exposure from small cells determined that such "[f]ixed small cell wireless communication installations . . . that operate in compliance with the regulations of the FCC will produce RF exposures well within the recommended exposure limits of the FCC, ICNIRP [International Commission on Non-Ionizing Radiation Protection], and IEEE."[17] Further, a recent study demonstrated that 5G antenna "densification does not increase the level of exposure, in contrast to a very popular belief. On the contrary, antenna densification does not change the exposure levels for the majority of the population, while, at base station proximity, a huge radiation decrease is experienced when more base stations are deployed in the same territory."[18]

Studies have also shown that 5G exposure does not cause adverse health effects. The IEEE's Committee on Man and Radiation recently completed a comprehensive review of 5G systems finding, based on the evidence to date, "the likelihood of yet unknown health hazards at exposure levels within current limits to be very low, if they exist at all."[19] The American Cancer Society explained that "[w]hile [5G] RF waves are

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[14] Castano-Vinyals, G. et al., *Wireless phone use in childhood and adolescence and neuroepithelial brain tumours: Results from the international MOBI-Kids study*, 160 Environment International 107069, at 15 (2022).
[15] CTIA, Resources, *Millimeter Wave Studies Cited by IEEE*, https://www.wirelesshealthfacts.com/wp-content/uploads/2021/04/Millimeter-Wave-Studies.pdf (last visited Jan. 16, 2022).
[16] Joan Conrow, *Three reasons why 5G is unlikely to cause harm*, Cornell Alliance for Science, (June 26, 2020), https://allianceforscience.cornell.edu/blog/2020/06/three-reasons-why-5g-is-unlikely-to-cause-harm/.
[17] William H. Bailey, *Wireless 5G Radiofrequency Technology: An Overview of Small Cell Exposures, Standards and Science*, at 5, Exponent (Apr. 2020) ("Bailey"), https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9144516.
[18] Chiaraviglio, L, *Do Dense 5G Networks Increase Exposure to Electromagnetic Fields?*, https://www.researchgate.net/publication/355844010, at 8 (Nov. 2021).
[19] Joan Conrow, *Three reasons why 5G is unlikely to cause harm*, Cornell Alliance for Science, (June 26, 2020), https://allianceforscience.cornell.edu/blog/2020/06/three-reasons-why-5g-is-unlikely-to-cause-harm/.

higher frequency (higher energy) than those used by older generations, they are still forms of non-ionizing radiation, so they still lack the ability to directly damage DNA."[20] Further, "these higher frequency RF waves are less able to penetrate the body than lower frequency waves, so in theory they might be less likely to have any potential health effects."[21] And a comprehensive review concluded that "[r]esearch to date does not provide a reliable scientific basis to conclude that the operation of these facilities will cause or contribute to adverse health effects in the population."[22]

FEDERAL PREEMPTION

House Bill 1644 should be rejected on the science discussed above, but also because it is not viable for two additional reasons. *First*, express preemption bars state and local antenna regulations based on concerns about RF safety. *Second*, implied conflict preemption independently bars any laws that conflict with the FCC's determination that its regulations are adequate to protect the public and its policy against over warning.

Congress determined that the FCC should be the "central[] authority" for regulating communications in the United States[23] This charge includes the regulation of "the kind of apparatus to be used" for wireless radio communications and "the emissions" that such equipment may produce.[24] The FCC promulgated its RF exposure rules to ensure that they protect human health nationwide as technology evolves, relying on sound scientific research of government and other expert organizations.

The FCC acted in its role as, in the words of the Supreme Court, the "exclusive" arbiter in the "technical matters" of radio,[25] which includes control for any environmental effects, including, among other things, RF emissions.[26] For example, the FCC recognized that "very high levels of RF radiation can be harmful due to the ability of RF energy to heat biological tissue rapidly."[27] Accordingly, the FCC's rules *limit* RF exposure to humans "from *all* transmitting facilities, operations, and devices it regulates."[28] Every court since 2005 that has addressed state and local efforts to regulate RF emissions from FCC-regulated telecommunications equipment has held that federal law either expressly and/or impliedly preempts state regulation based on challenges to the safety of wireless equipment.

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[20] *ACS Cell Phone Towers.*
[21] *Id.*
[22] Bailey at 7.
[23] 47 U.S.C. § 151.
[24] *Id.* § 303(e).
[25] *Head v. N.M. Bd. of Exam'rs in Optometry*, 374 U.S. 424, 430 n.6 (1963) (observing that the "Commission's jurisdiction over technical matters . . . is clearly exclusive").
[26] *Robbins v. New Cingular Wireless LLC*, 854 F.3d 315, 319-20 (6th Cir. 2017) (noting that Congress "delegate[ed] the task of setting RF emission levels to the FCC"). Of course, government entities can and have participated in the notice-and-comment aspect of the FCC's rulemaking. *See, e.g.*, City of Boston, Massachusetts, ET Docket No. 19-226 (filed June 17, 2020).
[27] FCC, RF Safety FAQ, *What Biological Effects Can Be Caused by RF Energy?*, https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety#Q5 (last visited Jan. 16, 2022).
[28] Letter from Thomas M. Johnson, Jr., General Counsel, FCC, to Joseph H. Hunt, Assistant Attorney General, DOJ, N.D. Cal. No. C 19-05322 WHA, at 3 (Apr. 13, 2020) (citing 47 C.F.R. §§ 1.1307, 1.1310, 2.1091, 2.1093) (emphasis added), https://docs.fcc.gov/public/attachments/DOC-363717A1.pdf.

The Federal Communications Act has an express preemption provision that prohibits state or local regulation of cellular equipment based on alleged health effects.[29] Specifically, 47 U.S.C. § 332(c)(7)(b)(iv) provides that: "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions." That provision preempts HB 1644 because its proposed restriction on antennae placement is based on alleged "adverse biological effects from wireless emissions," with the goal that the "mandated distance will significantly reduce the risk of biological effects and the probability of health effects within this distance of 1,640 feet."[30]

In addition, implied conflict preemption bars any state law regulation of RF emissions from FCC-compliant equipment based on health concerns.[31] Both the antennae placement requirement and the state-created "online registry that allows residents who are experiencing biological symptoms from wireless radiation exposure to list their relevant information" are based on concerns that (1) there are "significant health risk[s] associated with the cumulative effects of [RF] radiation with the proliferation of cell tower transmitters"; (2) there is "clear evidence of biological effects from [RF] radiation exposure, such as that from wireless devices and infrastructure emissions"; and (3) there are "adverse biological effects from wireless emissions." Regulation based on these concerns conflicts with the FCC's determination that "all [equipment] in compliance with its standards [is] safe."[32]

Furthermore, conflict preemption independently preempts HB 1644 because it conflicts with the FCC's careful balancing of its policy objectives to protect the public from harmful RF emissions and the development of an efficient wireless network.[33] The FCC's RF emissions standard reflects its "considered judgment about how to protect the health and safety of the public while still leaving industry capable of maintaining an efficient and uniform wireless network."[34] The basis for HB 1644 is that the FCC's RF standards are not "adequate to protect public health" and "wireless technology radio frequency radiation emissions . . . are currently being poorly managed" such that New Hampshire "should manage them more

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[29] 47 U.S.C. § 332(c)(7)(b)(iv); *see, e.g.*, *Cellular Phone Taskforce v. F.C.C.*, 205 F.3d 82, 96 (2d Cir. 2000) (interpreting the TCA to preempt a state and local government's power to regulate the placement, construction, and modification of personal wireless services facilities on the basis of health effects of RF emissions); *Santa Fe Alliance for Public Health and Safety v. City of Santa Fe, N.M.*, 2020 WL 2198120, at *7 (D.N.M. May 6, 2020) (noting the TCA explicitly preempts states and local governments from considering environmental effects of RF emissions in siting decisions).

[30] *See Kaspers v. Verizon Wireless Servs., LLC*, No. 1:20-CV-02142-LMM, 2021 WL 2193992, at *2 (N.D. Ga. Jan. 19, 2021) (plaintiffs' lawsuit objecting to installation of 5G equipment based on RF emissions health concerns was preempted because: "Section 332(c)(7)(B)(iv) . . . constrains state and local governments' authority by prohibiting them from [regulating] 'the placement . . . of personal wireless service facilities on the basis of'" RF emissions health concerns).

[31] *Farina*, 625 F. 3d at 129 ("[T]here is no indication . . . that either Congress or the FCC traditionally viewed state regulation of RF emissions as a necessary complement to federal regulation."); *Murray*, 982 A.2d at 777-78 ("[I]nsofar as Plaintiffs' claims rest on allegations about the inadequacy of the FCC's RF radiation standard or about the safety of their FCC-certified cell phones, the claims are preempted under the doctrine of conflict preemption.").

[32] *Farina*, 625 F. 3d at 126.

[33] *Id.* at 129.

[34] *Id.* at 125; *see also Cohen v. Apple*, 497 F.Supp.3d 769, 784 (N.D. Ca. 2020) (holding that the FCC's RF exposure standards reflect "uniform standards that balanced competing objectives of safety and efficiency").

carefully to a level as reasonably achievable."[35] New Hampshire is not allowed to "second guess the FCC's balance of its competing objectives" because "[a]llowing state law to impose a different standard permits a re-balancing to these considerations. A state-law standard that is more protective of one objective may result in a standard that is less protective of others."[36]

These implied conflict preemption principles apply with equal force to state requirements that "would 'risk contributing to an erroneous public perception' regarding the safety of FCC-certified [equipment]," because such requirements would "conflict with the FCC's considered policy judgment regarding how best and in what form to disseminate relevant information about RF exposure to the public."[37] A New Hampshire-created online registry for residents to list "biological symptoms from wireless radiation exposure" and the "address and location of the wireless transmitter in question" as well as the "type of cell transmitter or other wireless source in question" would send the unmistakable message from New Hampshire that FCC-certified and compliant wireless equipment is harmful. That directly "conflict[s] with the FCC's considered policy judgment regarding how best and in what form to disseminate relevant information about RF exposure to the public," and is therefore preempted.[38]

HB 1644 is also preempted by federal law in that the requirement to limit the placement of telecommunications antennae "1,640 feet from residentially zoned areas, parks, playgrounds, hospitals, nursing homes, day care centers, and schools" would inevitably result in a moratorium on wireless deployment.[39] In 2018, the FCC declared that state or local moratoria on the deployment of wireless telecommunications facilities violate Section 253(a) of the federal Communications Act and are therefore unlawful. In so doing, the FCC concluded that "express" moratoria (which, like HB 1644, include state actions that prevent or suspend the acceptance, processing, or approval of wireless infrastructure permit applications) are prohibited.[40] The FCC's ban on state and local moratoria was upheld by the United States Court of Appeals for the Ninth Circuit last year.[41]

In addition, the proposed moratorium is counter to federal policy designed to help deliver 5G to consumers across nearly every sector of the economy. Specifically, Congress enacted two statutory provisions – Section 6409 of the 2012 Spectrum Act and Section 224 of the Communications Act – to facilitate the deployment of ultra-fast, highly reliable, scalable, and very low latency networks. The resulting moratorium undermines

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[35] *Farina*, 625 F.3d at 129 n. 29 ("[T]he Commission's balance of these interests would be skewed by additional state restrictions.").
[36] *Id.* at 123, 134.
[37] *Cohen*, 497 F.Supp.3d at 785; *see also CTIA – The Wireless Ass'n v. City of Berkeley*, No. 15-cv-02529-EMC, 2020 WL 5576135 (N.D. Cal. Sept. 17, 2020) (holding the Berkeley Ordinance "overwarns and stands as an obstacle to the accomplishment of balancing federal objectives by the FCC").
[38] *Cohen*, 497 F. Supp. 3d at 785.
[39] *See* FCC, *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Third Report and Order and Declaratory Ruling, FCC 18-111 (Aug. 3, 2018). *See also* 47 U.S.C. § 253(a) ("No state or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.").
[40] *Id.* at ¶ 145.
[41] *See City of Portland v. United States*, 969 F.3d 1020, 1047-49 (9th Cir. 2020), *cert. denied* 141 S. Ct. 2855 (2021).

the balanced, common-sense wireless infrastructure deployment strategy that Congress and the FCC enacted and implemented to realize the full potential of 5G networks in the United States.

In closing, Americans' reliance on wireless service cannot be overstated, particularly over the last two years during the COVID-19 public health emergency as everyone was forced online nearly overnight. In that vein, in addition to its unlawfulness and flawed scientific conclusions, HB 1644 deprives New Hampshire residents of what they report actually wanting. According to a poll conducted by Harris Poll in mid-November 2020 in New Hampshire, nearly all voters (89%) said it was very important to have reliable, high-speed internet connectivity during the pandemic; nearly 80% support mobile wireless upgrades in their community mentioning factors like increased accessibility, connectivity, and speed.[42] These results indicate that legislation like HB 1644 is clearly ill advised policy contrary to what your constituents want.

For all of these reasons, we strongly urge the Committee to reject HB 1644.

[42] *See:* https://www.5gfor603.org/.