

Before the  
Federal Communications Commission  
Washington, D.C.

In the Matter of: )  
Public Comment on Whether Wi-Fi on School ) DA-23-1011  
Buses Should be on the Proposed Eligible Services ) Docket No. WC 13-184  
List for Fiscal Year 2024 )

**COMMENTS OF ADVOCATES FOR THE EMS DISABLED  
IN RESPONSE TO THE ABOVE-REFERENCED MATTER**

**OCTOBER 26, 2023**

**FILING PARTIES**

The parties listed below collectively constitute the “Advocates for the EMS Disabled,” and have joined together and have granted permission to submit these Comments:

Wired Broadband, Inc., Odette Wilkens, President & General Counsel, Forest Hills, NY; Children’s Health Defense (childrenshealthdefense.org); Children's Health Defense, Virginia Chapter, Caroline Kennedy and Kathy Blum, Fairfax, VA; Rocky Mountains for Safe Technology, Susan Foster & Shannon Shine, Co-Founders, Lyons, Colorado d/b/a in California as California Fires & Firefighters; Virginians for Safe Technology, Fredericksburg, VA; Ingrid Iverson, **EMS Disabled**, La Plata for Safe Technology, CO; Deborah Shisler, **EMS Disabled**, La Plata for Safe Technology, CO; Coloradans for Safe Technology, Andrea Mercier (mother of a **severely disabled child** who is adversely impacted by geopathic stress and **various forms of non-ionizing radiation**), Colorado Springs, CO; Coloradans for Safe Technology, Nancy Van Dover, DVM OMD Dipl Acup, CO; Brenda Schafer, **EMS/MCS Disabled**, Frazier Park, CA; Virginia Farver, Fort Collins, CO; Alliance for Microwave Radiation Accountability, Inc. (AMRA), Michael Muadin, President, **EMS Disabled**, East Chatham, NY; Pittsfield Injured & Concerned Citizens, Pittsfield, MA; Last Tree Laws Massachusetts, Kirstin Beatty, Director, and Massachusetts Ballot Committee Rad[iation] Limits at Last Tree Laws, Chair, **EMS Disabled**, Holyoke, MA; EM Radiation Research Trust, Eileen O’Connor, Charity Director, United Kingdom; SW Pennsylvania for Safe Technology, Susan Jennings, MPA BA, Founder, Mount Pleasant, PA; Idahoans for Safe Technology, Boise, ID; SafeTech NC, Mary Anne Tierney, RN, MPH, Electromagnetic Radiation Specialist, Fairview, NC; New Hampshire for Safe Technology, Deb Hodgdon, Stratham, NH; Sharon Behn, **EMS Disabled**, National Council for Independent Living Transportation Subcommittee, Member, Arden, NC; Floris Freshman, **EMS Disabled**, Scottsdale, AZ; Dr. Allen Dubner, D.C. and Sharon Dubner, Los Gatos, CA; Dr. Kathy Veon, DAOM, CCN, L.Ac, Dipl. Ac., **EMS Disabled**, Heathrow, FL; Richard Thom, Jordan, MN; Glenda Ploeger, Grandmother, Fletcher/Fairview, NC; Frederick P. Sinclair, Jr., Alfred, NY; Leonard Arcuri, All In Parent Coaching, Mooresville, NC; Sarah Aminoff, Safe Tech International, Union City, CA; Kate Kheel, Safe Tech International, Taneytown, Maryland; Patricia Burke, Safe Tech International, Millis, MA; Massachusetts for Safe Technology, Cecelia Doucette, Director, Sheffield, MA; Napa Neighborhoods for Safe Technology, Valerie Wolf, CA; Jacquelyn Sauriol, **EMS Disabled**, Portland, OR; Joanne Pizzino, MD, **EMS Disabled**, Hillsborough NC; Consumers for Safe Cell Phones, Cynthia Franklin, Director, Bellingham, WA; Larry Burk, MD, Non-Ionizing Advisory Committee, NC Radiation Protection Commission, Durham, NC;

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## INTRODUCTION

For the reasons set forth below, we oppose including Wi-Fi on school buses on the proposed Eligible Services List for FY 2024 (the "List"). (The recent Declaratory Ruling allowing the E-Rate Program to include Wi-Fi on school buses is hereinafter referred to as the "rule.")

The purported goal of making Wi-Fi accessible on school buses is to close a professed "homework gap" on school buses, without any evidence to support the notion that children will be doing, or even want to do, their homework on school buses. Rather, children are more likely to use Wi-Fi on their cell phones and iPads, having nothing to do with homework. A growing body of evidence shows childhood addiction to social media platforms on their cell phones and tablets powered by Wi-Fi, commonly referred to as "social media addiction." **Therefore, the FCC should be protecting children from this type of addiction, not increasing the opportunity for childhood addiction by placing school bus Wi-Fi accessibility on the List**, particularly when such access would be unsupervised by teachers and without parental consent.

In addition, placing school bus Wi-Fi accessibility on the List will increase exponentially the level of radio frequency (RF) radiation from Wi-Fi to which children will be exposed. In so doing, the FCC is failing to comply with an appellate court order of 2021 that requires the FCC to examine the risks of such exposure to children.

These comments will focus on (1) children's social media addiction being exacerbated if Wi-Fi for school buses is placed on the List; (2) the FCC's failure to comply with an appellate court's decision requiring that the FCC re-examine its RF exposure limits in relation to its effects on children;; and (3) the settled science on adverse bio-effects of RF radiation exposure on children, from which the FCC should protect children, rather than including on the List the subsidization and provisioning of Wi-Fi in school buses on that would inevitably increase children's exposure to RF radiation.

Our recommendation: if the FCC really thinks that children will be doing homework on school buses, then it would be far better to distribute free books on school buses than free Wi-Fi.

Also incorporated herein by reference are comments submitted by Virginians for Safe Technology on October 16, 2023, attached hereto as Appendix A. Although those comments opposed the inclusion of Wi-Fi on school buses as part of the E-Rate program, and a Declaratory Ruling since that filing now includes Wi-Fi on school buses as part of the E-Rate program, other aspects of those comments are still relevant for arguments in opposition to including school bus Wi-Fi on the List.

**(1) CHILDREN’S SOCIAL MEDIA ADDICTION WILL  
BE EXACERBATED IF SCHOOL BUS WI-FI IS  
PLACED ON THE LIST**

Regarding the illusory notion of bridging a professed “homework gap” on school buses, it may be that the drafters of the rule have never observed a school bus full of children. Anyone who has observed a school bus full of children would probably attest to the fact that the children are engaging in animated, if not boisterous, discourse with their fellow students, apparently creating and maintaining social bonds. That is, and should be, part of their socialization process. Providing children with Wi-Fi access to use their mobile devices would distract them from this important socialization process of interpersonal interactions and social bonding. But in either event, most assuredly, no homework would be getting done, hence, no “homework gap” on school buses.

We now come to the crucial issue of social media addiction. Children and adolescents, who would be the purported beneficiaries of bus Wi-Fi inclusion on the List, are vulnerable to the catastrophic effects of social media addiction caused by their use of social media platforms on their mobile devices. Social media addiction has been scientifically recognized since 2008 associated with overuse of social media.<sup>1</sup> Injuries that children suffer from these platforms are numerous, including eating disorders, depression, anxiety, trouble sleeping, trauma, stress, obsessive compulsion, disruptive and impulse-control disorders, self-harm, suicidal ideation and suicide.<sup>2</sup> It has been asserted that the technology companies have designed their platforms to be addictive, prioritizing profits over children’s safety.<sup>3</sup> The inclusion of school bus Wi-Fi on the List would have the effect of benefiting the technology companies rather than the children. **Therefore, by placing school bus Wi-Fi on the List, the FCC is increasing the opportunity for children’s further exposure to injurious social media platforms, and childhood addiction to those platforms.**

Children’s social media addiction is the gravamen of two major lawsuits: (1) a Master Complaint of hundreds of cases for personal injury against defendant technology giants, Meta (Facebook and Instagram), Snap, ByteDance (Tik-Tok) and Google (YouTube), filed on May 15, 2023 in Superior Court in Los Angeles on behalf of children who have been injured or who have died as a result of their use of

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<sup>1</sup> Tim Davies & Pete Cranston, *Youth Work and Social Networking: Interim Report*, The National Youth Agency (May 2008), Social Media Cases, para. #61.

<sup>2</sup> Nino Gugushvili et al., *Facebook use intensity and depressive symptoms: A moderated mediation model of problematic Facebook use, age, neuroticism, and extraversion* at 3, BMC Psych. 10, 279 (Nov. 28, 2022), Social Media Cases, para #96.

<sup>3</sup> *Christina Arlington Smith, et al, v. TikTok Inc., et al*, Case No. 22STCV21355, Judicial Council Coordination Proceeding No. 5255, May 15, 2023 [Social Media Cases].

social media platforms (collectively, the “Social Media Cases”)<sup>4</sup> and (2) a Complaint from a coalition of 41 state attorneys general and the District of Columbia against defendant Meta Platforms, Inc. (and related companies, “Meta”), filed on October 24, 2023 (the “AG Complaint”).<sup>5</sup> Both complaints assert that the technology companies have designed their platforms to be addictive, being likened in a news article to tobacco and the opioid crisis.<sup>6</sup> Social media platforms’ negative effects on children have also been the subject of a congressional hearings.<sup>7</sup>

Therefore, placing school bus Wi-Fi on the List would do nothing to bridge an illusory “homework gap,” but instead would enable social media addiction among children on school buses. Taxpayer dollars should not be spent enabling social media addiction nor while children are on school buses or to aid technology companies to gain children’s personal information when children access their platforms from their mobile devices while on school buses. This would further facilitate technology companies to target young users, gather their personal information and viewing habits without parental oversight on the school bus, and to generate more ad revenue.

The Master Complaint explains that social media platforms are designed to build in “stimuli and social reward mechanisms (e.g., ‘Likes’) that causes the [children] to compulsively seek social rewards.”<sup>8</sup> Given the stimuli and rewards embedded in social media platforms, children and adolescents tend to engage in addictive and compulsive behavior.<sup>9</sup> Teenagers are vulnerable to social approval, and “[g]iven their limited capacity to self-regulate and their vulnerability to peer pressure, children (including teens) are at greater risk of developing a mental disorder from use of Defendants’ products.”<sup>10</sup> “Products” refers to the technology companies’ platforms.

The AG Complaint further amplifies this issue by citing “overwhelming” internal research that the technology company has intentionally maximized the time and attention that children and teens spend on its platform often at the expense of their mental and physical health<sup>11</sup> -- “to entice, engage and ultimately ensnare youth and teens.”<sup>12</sup> The platform features are designed to be psychologically manipulative “to induce young users’ compulsive and extended Platform use.”<sup>13</sup> The AG Complaint further specifies how children’s vulnerabilities have been exploited, by means of:

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<sup>4</sup> Christina Arlington Smith, et al, v. TikTok Inc., et al, Case No. 22STCV21355, Judicial Council Coordination Proceeding No. 5255, May 15, 2023 [Social Media Cases].

<sup>5</sup> Complaint for Injunctive and Other Relief, filed in federal district court in northern CA, October 24, 2023 [AG Complaint], <https://www.documentcloud.org/documents/24080215-meta-lawsuit>; see also,

[https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare\\_permalink](https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare_permalink) and

<https://apnews.com/article/metachildrenteensharmlawsuit-17858802d76143d358e38ee15150dc94>.

<sup>6</sup> [https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare\\_permalink](https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare_permalink).

<sup>7</sup> See, e.g., <https://www.cruz.senate.gov/newsroom/press-releases/sen-cruz-to-tiktok-official-you-have-dodged-the-questions-more-than-any-witness-i-have-seen-in-my-nine-years-serving-in-the-senate>.

<sup>8</sup> Social Media Cases, para. # 128.

<sup>9</sup> Fulton Crews et al., Adolescent cortical development: A critical period of vulnerability for addiction, 86 *Pharmacology, Biochemistry and Behavior* 189-199 (Feb. 2007), Social Media Cases, para. #79.

<sup>10</sup> Betul Keles et al., *A systematic review: the influence of social media on depression, anxiety and psychological distress in adolescents*, 25(1) *Int’l J. Adolescence and Youth* 79-93 (2019), Social Media Cases, para. #77.

<sup>11</sup> AG Complaint, para. #2; see also, [https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare\\_permalink](https://www.wsj.com/tech/states-sue-meta-alleging-harm-to-young-people-on-instagram-facebook-f9ff4641?st=pqhz5px946q233z&reflink=mobilewebshare_permalink).

<sup>12</sup> AG Complaint, para. #1, <https://www.documentcloud.org/documents/24080215-meta-lawsuit>.

<sup>13</sup> AG Complaint, para. #2.

“(a) dopamine-manipulating recommendation algorithms; (b) ‘Likes’ and social comparison features ... ; (c) audiovisual and haptic alerts that incessantly recall young users to Meta’s Social Media Platforms ... ; (d) visual filter features known to promote young users’ body of dysmorphia; (e) content presentation formats, such as infinite scroll, designed to discourage young users’ attempts to self-regulate and disengage with Meta’s Platforms.”<sup>14</sup>

The AG Complaint cites unfair and deceptive practices under state consumer protection laws, and violations under the Children’s Online Privacy Protection Act of 1998 (COPPA) by unlawfully collecting personal data of children under the age of 13 without parental consent. The Master Complaint cites Consumer Reports which reported that 7.5 million children under 13 were on Facebook and that age-algorithms have been used to target them.<sup>15</sup> A further breakdown in the U.S. shows that “[i]n 2021, 32% of 7- to 9-year-olds,<sup>16</sup> 49% of 10- to 12-year-olds,<sup>17</sup> and 90% of 13- to 17-year-olds . . . used social media.”<sup>18</sup> **Therefore, the FCC should not be the vehicle by which social media platforms can reach children on school buses.**

In an article, *“Why Tech Leaders Don’t Let Their Kids Use Tech,”*<sup>19</sup> it’s reported that technology executives restrict or forbid their children’s use of the very technology that they are providing to the public, including “the makers of smartphones and tablets, of social media channels and game boxes.” Reported examples have included technology “titans” such as former Apple’s Steve Jobs and Bill and Melinda Gates have admitted to placing restrictions on their children’s use of technology. Chris Anderson, former Wired magazine editor and CEO of 3D Robotics, said that his kids “accuse me and my wife of being fascists and overly concerned about tech, and they say that none of their friends have the same rules. That’s because we have seen the dangers of technology firsthand. I’ve seen it in myself, I don’t want to see that happen to my kids.”<sup>20</sup> **Therefore, placing Wi-Fi on school buses on the List would override any parental direction to their children not to use Wi-Fi enabled mobile devices.**

**The Mining of Children’s Data, a Profitable Commodity for Tech Companies.** The technology companies design, engineer, market and operate their social media platforms “to maximize the number of children who download and use them compulsively.”<sup>21</sup> They count on children seeing their ads to generate ad revenue and to mine “a trove of data about their preferences, habits and behaviors.”<sup>22</sup> The safety risks for children were identified early on. Chairman Robert Pitofsky of the FTC identified the risks for children in COPPA testimony to the U.S. Senate Subcommittee on Communications in 1998, that the internet facilitates and teaches children to disclose personal information without parental awareness or consent and poses safety risks.<sup>23</sup>

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<sup>14</sup> AG Complaint, para. #4.

<sup>15</sup> Social Media Cases, para. #58.

<sup>16</sup> Share Too Soon? Children and Social Media Apps, C.S. Mott Child’s Hosp. Univ. Mich. Health (Oct. 18, 2021), Social Media Cases, para, 97.

<sup>17</sup> Social Media and Teens, Am. Acad. Child & Adolescent Psychiatry (Mar. 2018); Social Media Cases, para. #97.

<sup>18</sup> Ibid, Social Media Cases, para. #97.

<sup>19</sup> “Why Tech Leaders Don’t Let Their Kids Use Tech,” <https://kidzu.co/health-wellbeing/why-tech-leaders-dont-let-their-kids-use-tech/>.

<sup>20</sup> Ibid.

<sup>21</sup> Social Media Cases, para. #52.

<sup>22</sup> Social Media Cases, para. #52.

<sup>23</sup> Social Media Cases, para. #56.

Exploiting children's data has become a profitable commodity.<sup>24</sup> The data enables technology companies to sell to advertisers the ability to target narrow tranches of people including children.<sup>25</sup> As the Master Complaint describes,

“a child user today becomes an adult user tomorrow . . . Defendants’ insatiable appetite for growth has created a need for younger and younger users . . . Like Joe Camel of old [tobacco industry ad targeted to children], Defendants’ recent attempts to capture pre-adolescent audiences include ‘kid versions’ of apps that are ‘designed to fuel [kids’] interest in the grown-up version.’<sup>26</sup>

The Master Complaint further explains:

“Defendants’ apps addict young users by preying on their already-heightened need for social comparison and interpersonal feedback-seeking.<sup>27</sup> Because of their relatively undeveloped prefrontal cortex, young people are already predisposed to status anxieties, beauty comparisons, and a desire for social validation.<sup>28</sup> Defendants’ app encourage repetitive usage by dramatically amplifying those insecurities.<sup>29</sup>”

Former Google CEO, Eric Schmidt states that: “the greatest damage from social media seems to occur during the rapid brain rewiring of early puberty, around ages 11 to 13 for girls and slightly later for boys.”<sup>30</sup> The important role of the prefrontal cortex in children's development and its exploitation is further explained:

“Children and adolescents are especially vulnerable to developing harmful behaviors because their prefrontal cortex is not fully developed.”<sup>31</sup> The use of social media platforms impairs the normal development of the prefrontal cortex, which: “help[s] inhibit impulsive actions and ‘regulate[s] emotional responses to social rewards.’”<sup>32</sup>

The prefrontal cortex develops later than other parts of the brain; therefore,

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<sup>24</sup> Social Media Cases, para. #s 52 and 53.

<sup>25</sup> Social Media Cases, para. #52.

<sup>26</sup> Leonard Sax, *Is TikTok Dangerous for Teens?*, Inst. Family Stud. (Mar. 29, 2022), Social Media Cases, para. #53.

<sup>27</sup> Jacqueline Nesi & Mitchell J Prinstein, *Using Social Media for Social Comparison and Feedback-Seeking: Gender and Popularity Moderate Associations with Depressive Symptoms*, 43 J. Abnormal Child Psych. 1427-38 (Nov. 2015), Social Media Cases, para. #91.

<sup>28</sup> Susan Harter, *The Construction of the Self: Developmental and Sociocultural Foundations* (Guilford Press, 2d ed., 2012), Social Media Cases, para. #91.

<sup>29</sup> Social Media Cases, para. #91.

<sup>30</sup> Social Media Cases, para. #85.

<sup>31</sup> Nino Gugushvili et al., *Facebook use intensity and depressive symptoms: A moderated mediation model of problematic Facebook use, age, neuroticism, and extraversion* at 3, BMC Psych. 10, 279 (Nov. 28, 2022), Social Media Cases, para #64.

<sup>32</sup> Zara Abrams, *Why young brains are especially vulnerable to social media*, Am. Psych. Ass'n (Aug. 25, 2022), Social Media Cases, para. #63.

“children and adolescents have less impulse control and less ability to evaluate risks, regulate emotions, regulate their responses to social rewards, than adults.”<sup>33</sup>

The Master Complaint asserts that Defendants’ product features “create and maintain a user’s ‘flow-like state,’ a hyper-focused, hypnotic state, where bodily movements are reflexive and the user is totally immersed in smoothly rotating through aspects of the social media product.”<sup>34</sup> This experience of ‘flow,’ as psychologists describe it, ‘fully immerse[s]’ users, distorts their perception of time, and is associated with excessive use of social media sites.”<sup>35</sup>

Dr. Mark D. Griffiths, Distinguished Professor of Behavioral Addiction at Nottingham Trent University, U.K., explains that the “rewards” on social media platforms that are intermittent and unpredictable, explains “one of the main reasons why social media users repeatedly check their screens.”<sup>36</sup> These unpredictable rewards trigger a dopamine release in anticipation of a potential reward; however, since dopamine quickly wears off, it can lead the user to “become disheartened and disengaged.”<sup>37</sup> These periodic and unpredictable intervals of rewards keeps the user in a feedback loop, constantly checking for notifications.<sup>38</sup>

The Master Complaint explains how this addiction occurs in children:

“Social rewards deliver a rush of dopamine and oxytocin, known as the ‘happy hormones’ ... Dopamine is a neurotransmitter that is central to the brain’s reward system.”<sup>39</sup> “Between the ages of 10 and 12, dopamine receptors multiply . . . which makes social rewards – like compliments or laughter from a friend more pleasant – and adolescents become more sensitive to attention from others.”<sup>40</sup>

Adolescents are at a stage where their personalities and identities are forming, much of which “is now reliant on social media.”<sup>41</sup> During a period of craving, imaging shows “decreases of frontal cortex activity and executive functioning, leading to impaired ‘decision-making, self-regulation, inhibitory control, and working memory.’”<sup>42</sup>

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<sup>33</sup> Social Media Cases, para. #65.

<sup>34</sup> See e.g., *What Makes TikTok so Addictive?: An Analysis of the Mechanisms Underlying the World’s Latest Social Media Craze*, Brown Undergraduate J. of Pub. Health (Dec. 13, 2021), Social Media Cases, para. #95.

<sup>35</sup> Nino Gugushvili et al., *Facebook use intensity and depressive symptoms: A moderated mediation model of problematic Facebook use, age, neuroticism, and extraversion* at 3, BMC Psych. 10, 279 (Nov. 28, 2022), Social Media Cases, para #95.

<sup>36</sup> AG Complaint, para. #157.

<sup>37</sup> AG Complaint, para. #158.

<sup>38</sup> AG Complaint, para. #159.

<sup>39</sup> Zara Abrams, *Why young brains are especially vulnerable to social media*, Am. Psych. Ass’n (Aug. 25, 2022), Social Media Cases, para. #66.

<sup>40</sup> Zara Abrams, *Why young brains are especially vulnerable to social media*, Am. Psych. Ass’n (Aug. 25, 2022), Social Media Cases, para. #68.

<sup>41</sup> Betül Keles et al., *A systematic review: the influence of social media on depression, anxiety and psychological distress in adolescents*, 25(1) Int’l J. Adolescence and Youth 79-93 (2019), Social Media Cases, para. #68.

<sup>42</sup> George Koob & Nora Volkow, *Neurobiology of addiction: A neurocircuitry analysis*, 3(8) Lancet Psychiatry 760-773 (August 2016), Social Media Cases, para. #70.

Social psychologist Adam Adler explains that “[t]he minute you take a drug, drink alcohol, smoke a cigarette . . . when you get a like on social media, all of those experiences produce dopamine, which is a chemical associated with pleasure. When someone likes an Instagram post, or any content that you share, it’s a little bit like taking a drug. As far as your brain is concerned, it’s a very similar experience.”<sup>43</sup> Once the brain makes this association, the anticipation of a reward can now trigger a dopamine rush.<sup>44</sup>

The Master Complaint goes on to explain that:

“Conversely, if the stimulus is withheld, feelings of fatigue and anxiety or depression may be experienced, along with decreased sensitivity to the stimulant, which is associated with the withdrawal component of addiction.”<sup>45</sup>  
“Youth are more susceptible than adults to feelings of withdrawal when a dopamine hit wears off. Depending on the intensity, delivery and timing of the stimulus, and the severity of its withdrawal, these feelings can include anxiety, dysphoria and irritability.<sup>46</sup> Children and adolescents also are more likely to engage in compulsive behaviors to avoid these symptoms . . .”<sup>47</sup>

**Therefore, the FCC would be enabling childhood social media addiction by placing school bus Wi-Fi on the List which will benefit the technology companies, but not the children, as amply demonstrated in the Master Complaint of the Social Media Cases and the AG complaint, nor will such inclusion require teacher supervision or parental consent.**

## **(2) THE FCC’S FAILURE TO COMPLY WITH AN APPELLATE COURT’S DECISION REQUIRING THAT THE FCC RE-EXAMINE ITS RF EXPOSURE LIMITS IN RELATION TO ITS EFFECTS ON CHILDREN**

The Court of Appeals for the D.C. Circuit ruled against the FCC in August, 2021, when the FCC declined to update its RF radiation emission limits dating back to 1996. The limits were challenged as out-of-date, not based on science, and placing the general population at risk. The Court remanded the RF emission limits back to the FCC, calling out the FCC for acting in an “*arbitrary and capricious*” manner in “*its complete failure to respond to comments concerning environmental harm caused by*” RF radiation *below the current FCC emission limits*.<sup>48</sup> Those comments in the FCC docket consisted of 11,000 pages of peer-reviewed, scientific studies of proven harms, and hundreds of people reciting their injuries, from

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<sup>43</sup> Eames Yates, *What happens to your brain when you get a like on Instagram*, Business Insider (Mar. 25, 2017); Soren Krach et al, *The rewarding nature of social interactions*, 4(22) *Frontiers in Behav. Neuro* (May 28, 2010); Julian Morgans, *The Secret Ways Social Media is Built for Addiction*, *Vice* (May 17, 2017).

<sup>44</sup> Social Media Cases, para. #72.

<sup>45</sup> Substance Abuse and Mental Health Services Administration (US) Office of the Surgeon General (US). *Facing Addiction in America: The Surgeon General’s Report on Alcohol, Drugs, and Health*. Washington (DC); US Dept of Health and Human Services; 2016 Nov., Chapter 1, Introduction and Overview of the Report, Social Media Cases, para. #73.

<sup>46</sup> George Koob & Nora Volkow, *Neurobiology of addiction: A neurocircuitry analysis*, 3(8) *Lancet Psychiatry* 760-773 (August 2016), Social Media Cases, para. #73.

<sup>47</sup> Social Media Cases, para. #73.

<sup>48</sup> Environmental Health Trust, et al v. FCC (D.C. Ct of Appeals, 2021), [https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFD7/\\$file/20-1025-1910111.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/FB976465BF00F8BD85258730004EFD7/$file/20-1025-1910111.pdf).



RF radiation. The Court also cited the FCC's failure to review those studies, **or examine its effects on children or long-term exposure.**<sup>49</sup> The Court continued to admonish the FCC:

"...That failure undermines the Commission's conclusions regarding the adequacy of its testing procedures, **particularly as they relate to children**, and its conclusions regarding the implications of long-term exposure to RF radiation, exposure to RF pulsation or modulation, and the implications of technological developments that have occurred since 1996, **all of which depend on the premise that exposure to RF radiation at levels below its current limits causes no negative health effects.** Accordingly, we find those conclusions **arbitrary and capricious** as well." [Emphasis added.]

***"The factual premise—the non-existence of non-thermal biological effects—underlying the current RF guidelines may no longer be accurate."***

As scientists have warned, the "safety" limits protect industry, not people, since harmful bio-effects can occur well below those limits.<sup>50</sup> To date, the FCC has failed to update its 1996 limits, and **can no longer be viewed as safety limits to protect the public.** Instead, they serve as a **safe harbor for industry to provide immunity** from liability for personal injury, **no matter how badly children and others are injured.**<sup>51</sup>

The FCC **has failed to examine its effects on children.** Yet, the FCC's rule to expose children to more RF radiation by making Wi-Fi accessible on school buses ignores entirely the court's remand order to the FCC.

***Would you board a plane whose safety guidelines have not been updated since 1996? Or buy a car under those conditions? Then why would the FCC want to expose children to RF radiation under those conditions, especially in light of the Court's remand order with specific reference to effects on children?***

### **(3) THE SETTLED SCIENCE OF ADVERSE BIO-EFFECTS OF WI-FI RADIATION EXPOSURE ON CHILDREN**

Children are particularly vulnerable and are adversely affected by RF radiation in their environment, homes and schools.<sup>52</sup> A special risk factor has been identified for children "due to their smaller body mass and rapid physical development, both of which magnify their vulnerability to known carcinogens, including radiation."<sup>53</sup> The American Academy of Pediatrics has pointed out that children are

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<sup>49</sup> Environmental Health Trust, et al v FCC, D.C. Court of Appeals, 2021.

<sup>50</sup> The 5G Appeal, <http://www.5gappeal.eu/the-5g-appeal/>.

<sup>51</sup> See also a comprehensive briefing, <https://ehtrust.org/wp-content/uploads/Setbacks-Ordinances-Health-Liability-for-Wireless-Facilitites-.pdf> and <https://ehtrust.org/wp-content/uploads/5G-Health-and-Policy-New-York-City-March-15-2023-.pdf>.

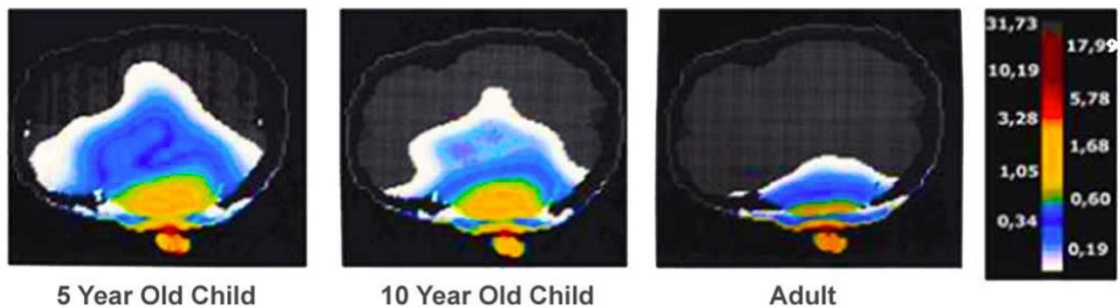
<sup>52</sup> *Children and Wireless Radiation*, <https://ehtrust.org/educate-yourself/children-and-wireless-faqs/>.

<sup>53</sup> *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 21, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, [https://bioinitiative.org/wp-content/uploads/pdfs/sec24\\_2012\\_Key\\_Scientific\\_Studies.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf).<https://bioinitiative.org/>.

disproportionately affected by RF radiation due to their lower bone density and amount of fluid in the brain allowing for absorption of greater quantities of RF radiation than in adults.<sup>54</sup>

Children's "brain tissues are more absorbent, their skulls are thinner and their relative size is smaller."<sup>55</sup> RF radiation penetrates more deeply into the skulls of children compared to adults,<sup>56</sup> as shown below in cell phone usage.<sup>57</sup>

## Children are more vulnerable to RF microwave radiation.



Depth of absorption of cell phone radiation in a 5-year old child, a 10-year old child, and in an adult from GSM cell phone radiation at 900 MHz. Color scale on right shows the SAR in Watts per kilogram. Source: [Exposure limits: the underestimation of absorbed cell phone radiation, especially in children](#)

Source: Exposure limits: the underestimation of absorbed cell phone radiation, especially in children, Gandhi, Morgan, Augusto de Salles, Han, Heberman, Davis, October 14, 2011.<sup>58</sup>

Exposure to RF radiation "can result in degeneration of the protective myelin sheath that surrounds brain neurons" and "[d]igital dementia has been reported in school age children."<sup>59</sup> It also increases the risk of childhood leukemia.<sup>60</sup>

<sup>54</sup> *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 21, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, [https://bioinitiative.org/wp-content/uploads/pdfs/sec24\\_2012\\_Key\\_Scientific\\_Studies.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf).<https://bioinitiative.org/>.

<sup>55</sup> Ibid.

<sup>56</sup> See, Dr. Melnick, London 5G Conference at 39:00, [https://www.youtube.com/watch?v=zSx\\_yDzxvM8&t=2295s](https://www.youtube.com/watch?v=zSx_yDzxvM8&t=2295s); <https://ehtrust.org/research-on-childrens-vulnerability-to-cell-phone-radio-frequency-radiation/> and <https://ehtrust.org/science/scientific-imaging-cell-phone-wi-fi-radiation-exposures-human-body/>.

<sup>57</sup> *Exposure limits: the underestimation of absorbed cell phone radiation, especially in children*, Gandhi, Morgan, Augusto de Salles, Han, Heberman, Davis, October 14, 2011, <https://pubmed.ncbi.nlm.nih.gov/21999884/>.

<sup>58</sup> Ibid.

<sup>59</sup> *Why children absorb more microwave radiation than adults: The consequences*, Morgan, Kesar and Davis, Journal of Microscopy and Ultrastructure, Vol. 2, Issue 4, December 2014, 197-204, <https://www.sciencedirect.com/science/article/pii/S2213879X14000583>.

<sup>60</sup> *Key Scientific Evidence and Public Health Policy Recommendations*, 2007, at 19, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, [https://bioinitiative.org/wp-content/uploads/pdfs/sec24\\_2007\\_Key\\_Scientific\\_Studies.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2007_Key_Scientific_Studies.pdf).

There are also neurological implications to RF radiation exposure for children.<sup>61</sup> Cell towers near schools and Wi-Fi in schools are potentially hazardous to children.<sup>62</sup>

- Elementary school children who were exposed to high levels of RF radiation generated from mobile phone base stations 200 meters from their schools “had a significantly higher risk of type 2 diabetes mellitus” than those exposed to lower RF radiation.<sup>63</sup>
- Adolescent school children who were exposed to high levels of RF radiation generated from mobile phone base stations within 200 meters from their schools had “delayed fine and gross motor skills, spatial working memory and attention” than those exposed to lower RF radiation.<sup>64</sup>
- A ten-year old child testified of his cardiac condition being caused by exposure to RF radiation in a library where he was being tutored.<sup>65</sup>

While children absorb more RF radiation than adults, fetuses are at even greater risk.<sup>66</sup> RF radiation “... has toxic effects in pregnancy, to the fetus and subsequent offspring ... and is tied to developmental problems in later life, including attention deficit and hyperactivity.”<sup>67</sup>

Children born of mothers who used cell phones during pregnancy developed more behavioral problems by school age than those whose mothers did not use cell phones during pregnancy, with the following results: “25% more emotional problems, 35% more hyperactivity 49% more conduct problems and 34% more peer problems.”<sup>68</sup> A study involving 24,499 children found a 23% increase of emotional and behavioral difficulties.<sup>69</sup>

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<sup>61</sup> See generally, <https://ehtrust.org/research-on-childrens-vulnerability-to-cell-phone-radio-frequency-radiation/>; see also, <https://ehtrust.org/cell-towers-and-cell-antennae/compilation-of-research-studies-on-cell-tower-radiation-and-health/>.

<sup>62</sup> Dr. Magda Havas: WiFi in Schools is Safe. True or False?, <https://www.youtube.com/watch?v=6v75sKAUFdc>.

<sup>63</sup> *Association of Exposure to Radio-Frequency Electromagnetic Field Radiation (RF-EMFR) Generated by Mobile Phone Base Stations (MPBS) with Glycated Hemoglobin (HbA1c) and Risk of Type 2 Diabetes Mellitus*, Sultan Ayoub Meo et al, International Journal of Environmental Research and Public Health, 2015; [https://www.researchgate.net/publication/283726472\\_Association\\_of\\_Exposure\\_to\\_Radio-Frequency\\_Electromagnetic\\_Field\\_Radiation\\_RF-EMFR\\_Generated\\_by\\_Mobile\\_Phone\\_Base\\_Stations\\_with\\_Glycated\\_Hemoglobin\\_HbA1c\\_and\\_Risk\\_of\\_Type\\_2\\_Diabetes\\_Mellitus](https://www.researchgate.net/publication/283726472_Association_of_Exposure_to_Radio-Frequency_Electromagnetic_Field_Radiation_RF-EMFR_Generated_by_Mobile_Phone_Base_Stations_with_Glycated_Hemoglobin_HbA1c_and_Risk_of_Type_2_Diabetes_Mellitus).

<sup>64</sup> Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2018). *Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health*, American Journal of Men's Health; <https://pubmed.ncbi.nlm.nih.gov/30526242/>.

<sup>65</sup> Child With Heart Problems From Wireless: 5G Health Risks California SB 649 Hearing,

[https://www.youtube.com/watch?v=OgNLR9fQOX4&list=PLT6DbkXhTGoDakSqp1i\\_7milpwGx4xMFq](https://www.youtube.com/watch?v=OgNLR9fQOX4&list=PLT6DbkXhTGoDakSqp1i_7milpwGx4xMFq).

<sup>66</sup> *Why children absorb more microwave radiation than adults: The consequences*, Morgan, Kesar and Davis, Journal of Microscopy and Ultrastructure, Vol. 2, Issue 4, December 2014, 197-204,

<https://www.sciencedirect.com/science/article/pii/S2213879X14000583>.

<sup>67</sup> Letter by Dr. Beatrice Golomb, Professor of Medicine, UC San Diego School of Medicine, Aug. 22, 2017,

<https://mdsafetech.org/wp-content/uploads/2017/09/golomb-sb649-5g-letter-8-22-20171.pdf>.

<sup>68</sup> *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 8, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, [https://bioinitiative.org/wp-content/uploads/pdfs/sec24\\_2012\\_Key\\_Scientific\\_Studies.pdf](https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf).

<sup>69</sup> Miller AB, Sears ME, Morgan LL, Davis DL, Hardell L, Oremus M, Soskolne CL. Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices. *Front Public Health*. 2019

Therefore, RF radiation can produce adverse health outcomes in children, a vulnerable population, whose parents have not been informed of potential health hazards of RF radiation. **Placing school bus Wi-Fi on the List would force children in a confined space to be surrounded by many Wi-Fi enabled devices, turned on all at once, which will exponentially increase children’s cumulative exposure to RF radiation and associated bio-effects. Who would be mandated to measure the level of exposure?**

This poses an especially large health risk for children who have become disabled from exposure to RF radiation, who may have no other alternative of getting to or from school. There is no “off” switch on a school bus for a child to opt out of exposure to RF radiation.

In a ground-breaking decision in the United Kingdom, a child was recognized with electro-magnetic disability and was awarded accommodation, meaning that the school was mandated to make accommodation for the child’s condition.<sup>70</sup> This was decided in 2022 by the Upper Tribunal of the Administrative Appeals Chamber, which is to say that the decision is precedent setting in the U.K. In the child’s own words:

I am a 13-year-old girl with EHS [electro-magnetic hypersensitivity]. I have headaches, insomnia and other symptoms sometimes when exposed to WiFi or other kinds of EMF [electro-magnetic frequency]. . . These can become very severe . . . I can feel things and sense things most people can’t. This has protected my health . . . I have previously been unable to go to school, as the school I went to put in WiFi . . . If you have EHS and are struggling to stay in good health, or can’t go to school, or work, don’t give up . . . People are becoming more aware of this condition, and even if right now it seems like nothing will ever change, it already is.<sup>71</sup>

However, in 2015, seven years prior to this decision, a 15-year old girl in the U.K. who had developed headaches and bladder problems attributed to her exposure to Wi-Fi routers in her school did not experience a positive outcome.<sup>72</sup> The school not only failed to acknowledge her severe condition but punished the girl for leaving class rooms containing routers that were causing her condition. In an apparent cry for help, the girl then either accidentally or intentionally, hanged herself, as her mother describes she was driven to despair.

Therefore, placing school bus Wi-Fi on the List is not a panacea but a health hazard for children from which they cannot opt out, exposing children to hazardous and unmonitored levels of RF radiation in school buses, every day of every school year.

Those suffering injuries from exposure to RF radiation are known as having electromagnetic sensitivity (EMS), also referred to as radiation poisoning or microwave sickness.<sup>73</sup> Hence, those with ensuing

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Aug 13;7:223. doi: 10.3389/fpubh.2019.00223. PMID: 31457001; PMCID: PMC6701402, also available at <https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full#B42>.

<sup>70</sup> <https://ehtrust.org/education-health-care-plan-ehcp-awarded-aug-2022-for-uk-child-on-the-basis-of-electromagnetic-hypersensitivity-ehs/>.

<sup>71</sup> Ibid.

<sup>72</sup> <https://www.pressreader.com/uk/daily-mail/20151201/281904477099139>

<sup>73</sup> Electromagnetic Sensitivity, also known as “microwave sickness,” <https://ehtrust.org/science/electromagnetic-sensitivity/>.

disabilities are referred to as “EMS Disabled.” They cannot use or be near a technology such as Wi-Fi that is injuring them.

It is the persistent pulsations of RF radiation that cause adverse bio-effects and ensuing disabilities.<sup>74</sup> It is the pulsed high peak power emissions that, for example, increase the potential for traumatic brain injury and consequent cognitive impairments.<sup>75</sup>

EMS disabilities encompass a constellation of symptoms which can include: sleep disturbances, chronic fatigue, chronic pain, poor short-term memory, difficulty concentrating (e.g., “brain fog”), skin problems, dizziness, loss of appetite, heart palpitations, tremors, vision problems, tinnitus, nose bleeds, asthma, reproductive problems and headaches, to name a few.<sup>76</sup> There are other sources showing the proliferation of such disabilities.<sup>77</sup> The symptoms are from the physiological injuries that individuals, including children, have sustained from exposure to wireless devices and facilities.<sup>78</sup>

To place RF radiation hazard in perspective, the very industry that offers wireless services views RF radiation as a pollutant and bio-hazard in published consumer brochures for cell phones, for which they disclaim liability for personal injury.<sup>79</sup> For example, an industry brochure for consumers for cell phone insurance protection states:

***“Pollutants means ... any artificially produced electric fields, magnetic field, electromagnetic field, sound waves, microwaves and all artificially produced ionizing or non-ionizing radiation ...”***<sup>80</sup>

Similar definitions for pollution are in the product protection plans for other telecommunications companies.<sup>81</sup> Industry’s published annual reports and SEC reports<sup>82</sup> also warn of the risk of litigation arising from personal injuries from their wireless services. Two of the largest insurance companies in the world (i.e., Lloyd’s of London and Swiss Re) have declined to insure telecom companies for any liability

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<sup>74</sup> Dr. Magda Havas: WiFi in Schools is Safe. True or False? at 7:15,

<https://www.youtube.com/watch?v=6v75sKAUFdc>; see also, Brief of Children’s Health Defense, and Building Biology Institute, et al as Amici Curiae in Support of Appellees/Cross-Appellants “Customers,” Sept 14, 2021, <https://childrenshealthdefense.org/wp-content/uploads/Brief-and-Addendum-Submitted-9-14.pdf>.

<sup>75</sup> Computational modeling investigation of pulsed high peak power microwaves and the potential for traumatic brain injury. Sci Adv. 2021 Oct; 7(44). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8555891/>.

<sup>76</sup> “Electrohypersensitivity as a Newly Identified and Characterized Neurologic Pathological Disorder” Int’l Journal of Molecular Sciences, <https://www.mdpi.com/1422-0067/21/6/1915>.

<sup>77</sup> Electrohypersensitivity (EHS) Is An Environmentally-Induced Disorder That Requires Immediate Attention, Dr. Magda Havas, J. Sci Discov (2019), <http://www.e-discoverypublication.com/wp-content/uploads/2019/03/JSD18020-final.pdf>; Presentation by Karl Maret, M.D., M.Eng., Presentation, 1-17-20, <https://www.youtube.com/watch?v=Xilsy3mcjY>; “The Bioinitiative Report,” <https://bioinitiative.org/>.

<sup>78</sup> Letter by Dr. Beatrice Golomb, Professor of Medicine, UC San Diego School of Medicine, Aug. 22, 2017, <https://mdsafetech.org/wp-content/uploads/2017/09/golomb-sb649-5g-letter-8-22-20171.pdf>.

<sup>79</sup> <https://ehtrust.org/wp-content/uploads/device-protection-brochure-nationwide.pdf>.

<sup>80</sup> <https://ehtrust.org/wp-content/uploads/device-protection-brochure-nationwide.pdf>.

<sup>81</sup> <https://ehtrust.org/key-issues/electromagnetic-field-insurance-policy-exclusions/>, <https://ehtrust.org/wp-content/uploads/ATT-Multi-Device-Protection-Pack-Insurance.pdf>, <https://ehtrust.org/wp-content/uploads/Sprint-Insurance-Terms-and-Conditions-Downloaded-2019.pdf>.

<sup>82</sup> See, e.g., Verizon’s 2021 U.S. SEC Form 10–K at 17 which states:

<https://www.verizon.com/about/sites/default/files/2020-Annual-Report-on-Form-10-K.PDF>.

for personal injury that results from these exposures.<sup>83,84,85</sup> Insurance companies, reviewing potential claims from a risk analysis perspective, have assessed RF radiation as “high” risk and is, therefore, generally excluded from coverage.

As early as April 2000, a study commissioned by a major telecom company showed findings of (1) adverse health impacts associated with exposure to RF radiation and (2) strong warnings to significantly lower the power of RF radiation exposure to the public.<sup>86</sup> The findings included risks of cancer (of the central nervous system and testicular cancer), leukemia, damage to the immune system and cognitive impairments. The study also recognized electro-sensitivity and the importance of developing a strategy to address the problem, particularly in vulnerable populations in “residential areas, **schools, nurseries, playgrounds, hospitals...**”<sup>87</sup>

On a larger scale, there have been serious risks to public health and safety:

1. There has been no pre-market testing of 5G for public health or safety, as confirmed by US Sen. Blumenthal (CT) during a Feb. 2019 hearing of wireless telecom executives. The telecom executives conceded that they were not aware of any independent scientific studies on the safety of 5G. Sen. Blumenthal also criticized the FCC and the FDA for inadequate answers on questions of public health. Sen. Blumenthal concluded, “We’re kind of flying blind here as far as health and safety is concerned.”<sup>88</sup>
2. Three studies since Jan 2023 show adverse health impacts from exposure to 5G towers. Previously healthy individuals developed typical “microwave syndrome” symptoms shortly after the towers were installed: headaches, abnormal fatigue, heart arrhythmia, burning skin, trouble concentrating.<sup>89</sup> The significance of these reports is that non-ionizing radiation<sup>90</sup> from 5G — well below levels allowed by authorities — can cause health problems in individuals who had no

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<sup>83</sup> <https://5gtechnologynews.com/insurance-companies-can-refuse-claims-related-to-electromagnetic-radiation-illnesses/>

<sup>84</sup> <https://ehtrust.org/wp-content/uploads/Swiss-Re-SONAR-Publication-2019-excerpt-1.pdf>, pg. 29.

<sup>85</sup> <https://ehtrust.org/key-issues/reports-white-papers-insurance-industry>.

<sup>86</sup> Mobile Telecommunications and Health/Review of the current scientific research, ECOLOG Institut, Hannover, April 2000, available at <https://docs.google.com/document/d/1Rd2c900GURf9YYQY-L2MHAFDYGIeT2R1tyMZYQhZTEA/edit>; ECOLOG is a research organization founded in 1991 by scientists from the [University of Hannover](https://www.uni-hannover.de/).

<sup>87</sup> Ibid.

<sup>88</sup> <https://ehtrust.org/health-effects-of-5g-wireless-technology-confirmed-at-us-senate-hearing-after-senator-blumenthal-questions-industry/>; see also, <https://mdsafetech.org/2019/02/13/no-research-on-5g-safety-senator-blumenthal-question-answered/>.

<sup>89</sup> Jan 2023 study of 63 year old man and 62 year old woman where 5G antennas were installed on the rooftop of their home, [https://www.gavinpublishers.com/assets/articles\\_pdf/Case-Report-The-Microwave-Syndrome-after-Installation-of-5G-Emphasizes-the-Need-for-Protection-from-Radiofrequency-Radiation.pdf](https://www.gavinpublishers.com/assets/articles_pdf/Case-Report-The-Microwave-Syndrome-after-Installation-of-5G-Emphasizes-the-Need-for-Protection-from-Radiofrequency-Radiation.pdf) and <https://childrenshealthdefense.org/defender/5g-radiation-microwave-syndrome-symptoms/>; Feb 2023 study of two previously healthy men where 5G antennas were installed on the rooftop of their business, <https://www.anncaserep.com/open-access/development-of-the-microwave-syndrome-in-two-men-shortly-after-9589.pdf>; April 2023 study of 52 year old woman whose apartment was 60 meters from a 5G base station, <https://acmcasereport.com/pdf/ACMCR-v10-1926.pdf?fbclid=IwAR2J-mE3XeBxqaXPQdFxsIf9Q23bMCer9vgUBHnCvJXBrgBv-w7YdRUDwF0>; see also, The microwave syndrome or electro-hypersensitivity: historical background <https://pubmed.ncbi.nlm.nih.gov/26556835/>.

<sup>90</sup> <https://childrenshealthdefense.org/emr/emf-key-terms-descriptions/>.



prior history of electromagnetic sensitivity.<sup>91</sup> Dr. Lennart Hardell, lead author of the reports and a world-renowned scientist on cancer risks from radiation, affirms these reports as “groundbreaking” because they serve as the “first warning of a health hazard.”<sup>92</sup>

3. The WHO’S International Agency for Research on Cancer (IARC) classified RF radiation (2G and 3G) as a possible human carcinogen back in 2011,<sup>93</sup> similar to lead, diesel fuel and gasoline engine exhaust.
  - a. The WHO carefully states on its website that “only a few studies have been carried out at the frequencies to be used by 5G”<sup>94</sup> thereby skirting the issue of 5G safety. Indeed, a number of studies since Jan 2023 have already shown harm, as referenced above.<sup>95</sup>
  - b. When the WHO states on its website lack of causality of harm from wireless radiation,<sup>96</sup> it is referring to the 2011 IARC “2B” classification based on possible carcinogenicity. However, over a decade later, Dr. Miller, a former Senior Epidemiologist and Senior Scientist at the IARC has stated, “[t]here is sufficient evidence to now classify radiofrequency radiation as a human carcinogen.”<sup>97</sup>
4. The National Toxicology Program (NTP), commissioned by the Food and Drug Administration (FDA) to conduct a \$30 million study, in 2018 found clear evidence of cancer.<sup>98</sup> NTP is one of the most prestigious institutions in the world in toxicology. Indeed, in 1999 the FDA nominated to the NTP the study of RF radiation “with a high priority,” to conduct animal studies, stating that it was “**not scientifically possible to guarantee that non-thermal levels of microwave radiation . . . will not cause long-term adverse health effects.**”<sup>99</sup>

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<sup>91</sup> <https://childrenshealthdefense.org/emr/emf-wireless-health-impacts/>.

<sup>92</sup> <https://www.stralskyddsstiftelsen.se/two-studies-show-that-5g-caused-the-microwave-syndrome-in-healthy-persons/>.

<sup>93</sup> [https://www.iarc.who.int/wp-content/uploads/2018/07/pr208\\_E.pdf](https://www.iarc.who.int/wp-content/uploads/2018/07/pr208_E.pdf).

<sup>94</sup> <https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health>.

<sup>95</sup> Jan 2023 study of 63 year old man and 62 year old woman where 5G antennas were installed on the rooftop of their home, [https://www.gavinpublishers.com/assets/articles\\_pdf/Case-Report-The-Microwave-Syndrome-after-Installation-of-5G-Emphasizes-the-Need-for--Protection-from-Radiofrequency-Radiation.pdf](https://www.gavinpublishers.com/assets/articles_pdf/Case-Report-The-Microwave-Syndrome-after-Installation-of-5G-Emphasizes-the-Need-for--Protection-from-Radiofrequency-Radiation.pdf) and

<https://childrenshealthdefense.org/defender/5g-radiation-microwave-syndrome-symptoms/>; Feb 2023 study of two previously healthy men where 5G antennas were installed on the rooftop of their business,

<https://www.anncaserep.com/open-access/development-of-the-microwave-syndrome-in-two-men-shortly-after-9589.pdf>; April 2023 study of 52 year old woman whose apartment was 60 meters from a 5G base station,

[https://acmcasereport.com/pdf/ACMCR-v10-1926.pdf?fbclid=IwAR2J-](https://acmcasereport.com/pdf/ACMCR-v10-1926.pdf?fbclid=IwAR2J-mE3XeBxqaXPQdFxsIf9Q23bMCer9vgUBHnCvJXBrgBv-w7YdRUDwFO)

[mE3XeBxqaXPQdFxsIf9Q23bMCer9vgUBHnCvJXBrgBv-w7YdRUDwFO](https://pubmed.ncbi.nlm.nih.gov/26556835/); see also, The microwave syndrome or electro-hypersensitivity: historical background <https://pubmed.ncbi.nlm.nih.gov/26556835/>.

<sup>96</sup> <https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health>.

<sup>97</sup> Professor Miller, MD, FRCP, FRCP (C), FFPH, FACE, is an eminent physician and expert in preventative medicine, a scientific advisor to various scientific and health authorities, and a former Senior Epidemiologist and Senior Scientist at the World Health Organization’s (WHO) International Agency for Research on Cancer (IARC), <https://phiremedical.org/2020-nir-consensus-statement-press-release/>.

<sup>98</sup> *Environmental Health Trust, et al v. FCC*, Motion for Leave to File Brief of Amicus Curiae Joseph Sandri in Support of Petitioners Urging Reversal, Aug. 5, 2020, <https://ehtrust.org/wp-content/uploads/20-1025-Amicus-Brief-Joe-Sandri.pdf>.

<sup>99</sup> Letter from the Dept of Health and Human Services to the National Toxicology Program at the National Institute for Environmental Health Studies, May 19, 1999, [https://ntp.niehs.nih.gov/sites/default/files/ntp/htdocs/chem\\_background/exsumpdf/wireless051999\\_508.pdf](https://ntp.niehs.nih.gov/sites/default/files/ntp/htdocs/chem_background/exsumpdf/wireless051999_508.pdf).

5. As early as 2015, over 230 scientists from over 40 countries have signed “The 5G Appeal” to halt the proliferation of 5G -- The International Scientists’ Appeal to the United Nations to Protect Humans and Wildlife from the unconstrained proliferation of wireless radiation.<sup>100</sup> Other scientists have joined in consensus statements about their 5G concerns.<sup>101</sup>
6. Thousands of scientific and medical studies show neurological disorders; increased risk of cancer and brain tumors; DNA damage; oxidative stress; immune dysfunction; cognitive processing effects; altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and damage to the blood-brain barrier.<sup>102</sup>
7. The New Hampshire Commission that studied the health impacts of wireless radiation found that levels below the FCC emission limits can be harmful.<sup>103</sup>
8. The Board of Health of Pittsfield, MA issued an emergency order to turn off a 4G cell tower that injured 17 residents most of whom evacuated their homes.<sup>104</sup> **Children were vomiting in their beds, pets were vomiting and residents were becoming ill.**<sup>105</sup>

## CONCLUSION

For the foregoing reasons, Wi-Fi on school buses should not be on the Eligible Services List for FY 2024.

**On behalf of the Advocates for the EMS Disabled**

**Respectfully submitted,**

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<sup>100</sup> <http://www.5gappeal.eu/the-5g-appeal/>; see also, Dr. Martin Blank, PhD, Dept of Physiology and Cellular Biophysics, Columbia University, announcing the appeal early on and warning on wireless radiation, <https://www.youtube.com/watch?v=HgECRrabuZQ>; see also, <https://childrenshealthdefense.org/defender/5g-rollout-harm-regulation-profit/>.

<sup>101</sup> <https://phiremedical.org/wp-content/uploads/2020/11/2020-Non-Ionising-Radiation-Consensus-Statement.pdf>.

<sup>102</sup> See, e.g., A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation, 2022, <https://bioinitiative.org/conclusions/>; see also, Adverse health effects of 5G mobile networking technology under real-life conditions, May 1, 2020, <https://pubmed.ncbi.nlm.nih.gov/31991167/>; Wireless Radiation (RFR) – Is U.S. Government Ignoring Its Own Evidence for Risk? March, 28, 2019, <https://electromagnetichealth.org/electromagnetic-health-blog/u-s-gov-ignoring-own-evidence/>; Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency Radiation, *Electromagnetic Biology and Medicine*, 35(2), 186-202, Yakymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016), <https://pubmed.ncbi.nlm.nih.gov/26151230/>.

<sup>103</sup> <http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>.

<sup>104</sup> <https://ehtrust.org/cease-and-desist-order-against-verizon-cell-tower-by-board-of-health-pittsfield-ma/>.

<sup>105</sup> <https://ehtrust.org/family-injured-by-cell-tower-radiation-in-pittsfield-massachusetts/>.





## APPENDIX A

### Comments on FCC Proposal to Use E-Rate to Fund School Bus Wi-Fi Docket 13-184

Submitted: October 18, 2023

Wi-Fi installation on school buses is not an appropriate e-rate use case because it requires extending the classroom campus from a fixed building location to a vehicular mobile hotspot that is rife with student safety, health and potential personal injury hazards. Also, allowing unsupervised Internet access to social media like Tik-Tok was enough to cause strong opposition from lawmakers citing that this type of program doesn't even fall under the scope of an [e-rate program](#),<sup>106</sup> because a bus is not a supervised classroom. If approved, Wi-Fi on school buses would lower the bar substantially for what should be considered a nurturing 'space for learning' equivalent to a classroom and any place you can connect to the Internet should not be the new academic standard. Learning environments need to be optimized to create a safe space with adult supervision for every child, provide an ergonomic [laptop set-up](#)<sup>107</sup> on a desk or table, and provide Americans with Disabilities Act (ADA) access accommodations for those who need it, especially in this case, for those that are [Electromagnetically Sensitive](#) (EMS).<sup>108</sup>

EMS students cannot tolerate Wi-Fi nodes and routers in a classroom or bus which are typically set at the [highest power levels](#)<sup>109</sup> to assure maximum reception whether needed or not, and some severely EMS students may not be able to tolerate them at all. School buses that transit in rural areas, where this program will likely be used the most, would necessarily have to set the wireless routers at very high levels to get the bandwidth and good reception needed for a reliable mobile Wi-Fi connection. EMS children will have nowhere to go on a Wi-Fi school bus to be safe. Instead, they will be trapped in a confined space being radiated with radio frequency radiation (RFR), [a Group 2B](#)<sup>110</sup> possible carcinogen and telecom industry known air pollutant. RFR can be toxic in a confined area and is listed in the same category as these other possible carcinogens: lead, Mirex, gas engine exhaust and chloroform. Who will protect an EMS child on a Wi-Fi school bus?

The level of RFR in a school bus with Wi-Fi can multiply due to the potential for RF reflections on the metallic surfaces of the bus, significantly increasing the level of RFR exposures to each student. Those who are EMS or even students that may become vulnerable to RFR due to other health factors may need medical attention, but no school nurse will be available to help them. Also, some rural students may ride a school bus a maximum of 2 hours/day and over the course of the school year may develop repetitive, cumulative and long term personal health injuries and mental health problems because there is no healthy work space and adult supervision. Wi-Fi on school buses results in improper

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<sup>106</sup> <https://thehill.com/homenews/education/4242184-republicans-fcc-wifi-school-buses/> The Hill, "Republicans take on FCC to add Wi-Fi to school buses", October 9, 2023.

<sup>107</sup> <https://www.doe.virginia.gov/home/showpublisheddocument/2502/637952001829400000>

<sup>108</sup> <https://emfsafetynetwork.org/safety-precautions/electrical-sensitivity/>

<sup>109</sup> <https://www.techsafeschools.org/reducing-power>

<sup>110</sup> <https://monographs.iarc.who.int/list-of-classifications> International Agency for Research on Cancer, World Health Organization, *IARC Monographs on the Identification of Carcinogenic Hazards to Humans*, rev 10-11-2023

digital device use and concentrated potentially [toxic exposure to RFR](#)<sup>111</sup> air pollution from multiple wireless devices each student may use on the bus. It targets rural students who may become subject to a higher likelihood of [cancer](#)<sup>112</sup> and permanent physical injuries as a result.

Abandoning a protective classroom environment to expand to a mobile bus Wi-Fi platform in order to fix a social injustice problem, referred to as bridging the ‘homework gap’, is not a [“commonsense change”](#)<sup>113</sup> as Chair Rosenworcel suggests, but grossly negligent. In doing so, FCC is asking the Department of Education (DOE) to become derelict in their *loco parentis* duties to protect the safety and welfare of all the children under the supervision of their teaching and administrative staff during each school day or activity.

### **The School Bus Wi-Fi program does not provision for proper ergonomic student laptop use**

This proposed FCC rule does nothing short of forcing school children to use a laptop on their lap instead of a desk or table prohibiting them from being able to set-up a safe and ergonomic work area to avoid physical injury. FCC is promoting improper usage of a laptop while doing homework as an accepted norm by subsidizing the School Bus Wi-Fi program. It is well known that using laptops on the lap is medically unsafe and infringes on other statues and state laws that warn to avoid it. States, like [VA](#) and [MD](#), have developed laws to enforce digital device health and safety best practice guidelines in the classroom so these very type of repetitive injuries can be avoided.<sup>114, 115</sup> This proposed FCC rule, is legally inconsistent with those state health and safety guidelines, and creates personal injury liabilities that can do more harm than good. “Laptops on the lap have resulted in burns to the body...Doctors warn that [‘Toasted Skin Syndrome’](#)<sup>116</sup> can be caused by warm laptops and there are reports of [skin cancer](#) developing in the burned area.”<sup>117</sup> Even laptop manufacturers, like Lenovo, cite regulatory notice to avoid laptop on laps usage of their computers, like the Flex 14D/15D laptop warning shown below:

**“CAUTION: To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm (8 inches) must be maintained between the antennas connected to the wireless module and all persons. If the distance may not be maintained while the computer display is closed, you must set sleep as the power mode when closing the display.”<sup>118</sup>**

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<sup>111</sup> <https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones#:~:text=NTP%20conducted%20two-year%20toxicology%20studies%20in%20rats%20and,were%20published%20as%20Technical%20Reports%20in%20November%202018>. National Toxicology Study (NTP)

<sup>112</sup> <https://rumble.com/v2930dw-dr.-barrie-trower-the-truth-about-5g-and-wi-fi-part-1.html> Dr. Barrie Trower - “The Truth About 5G & Wi-Fi” - Part 1

<sup>113</sup> <https://www.fcc.gov/document/chair-rosenworcel-proposes-using-e-rate-fund-school-bus-wi-fi>

<sup>114</sup> VA DOE *Digital Devices in the Classroom: Health and Safety Guidelines*, June 2021.

<https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.doe.virginia.gov%2Fhome%2Fshowpublisheddocument%2F2500%2F637952001439270000&wdOrigin=BROWSELINK>

<sup>115</sup> MD DOE *Health and Safety Best Practice Guidelines: Digital Devices*

[https://www.marylandpublicschools.org/programs/Documents/ITSLM/Health\\_and\\_Safety\\_Best\\_Practice\\_Guidelines\\_Digital\\_Devices.pdf](https://www.marylandpublicschools.org/programs/Documents/ITSLM/Health_and_Safety_Best_Practice_Guidelines_Digital_Devices.pdf)

<sup>116</sup> <https://www.healthline.com/health/toasted-skin-syndrome> How laptops cause toasted skin syndrome, 9/30/20

<sup>117</sup> <https://ehtrust.org/laptops/>

<sup>118</sup> <https://www.manualowl.com/m/Lenovo/Flex-15-Laptop/Manual/433074?page=1#manual>, pg. 1.

The reason for this caution, is that Lenovo and other laptop manufacturers, must be FCC compliant with [47 CFR 2.1091\(b\)](#), an FCC rule that requires at least a [20 cm separation distance](#)<sup>119</sup> between the body and the laptop device antenna and it is up to the end user to comply with the cautions cited. However, in the case of school bus Wi-Fi and laptop use, the Department of Education would be forced to ignore this 20 cm separation distance rule, because there is no way to do it or enforce it. So why is FCC encouraging this type of improper digital device use to solve a homework problem? Do the ends justify the means, no matter what the cost to the students' health, as long as students have broadband connectivity on a school bus?

### **Health impacts from cumulative RFR from School Bus Wi-Fi**

Wi-Fi nodes on school buses cannot be strategically placed to avoid asymmetric distribution of the concentrated RFR and in some cases, will result in extreme individual student RFR exposures depending on the student seating configuration in proximity to the location of the router and nodes. The main part of their bodies most exposed to this concentrated RFR will be the top of the student's head. This type of microwave exposure should be avoided, not encouraged, as it has the capability of compromising the blood brain barrier with substantial evidence of impaired memory and damage to neurons. In research conducted by Nittby H. et al, it states that "EMF radiation leads to increased permeability of the Blood Brain Barrier (BBB) at non-thermal exposure levels. Damaging effects from radiofrequency EMF [upon neurons](#) has been shown after 28 days and 50 days."<sup>120</sup> Also, "When the BBB is more permeable, more toxins circulating in the blood can reach the brain."<sup>121</sup> [Behavior](#) can also be adversely impacted resulting in conditions such as depression, insomnia, impaired critical thinking and reasoning and suicide.<sup>122, 123</sup>

### **Medical Testimony about Wi-Fi in schools for a California School District**

#### **Letters from Doctors and Scientists Warning the Los Angeles Unified School District (LAUSD) Against Wi-Fi in Their Schools<sup>124</sup>**

[Letter from The American Academy of Environmental Medicine](#)

[Letter from Martha Herbert, M.D.](#), Harvard Medical School, Massachusetts General Hospital

[Letter from Martin Blank, Ph.D.](#), Department of Physiology and Cellular Biophysics, Columbia University, New York, NY

[Letter from Joel M. Moskowitz, Ph.D.](#), School of Public Health, University of California, Berkeley

[Letter from Dr. Olle Johansson, Ph.D.](#), Associate Professor, Department of Neuroscience, Karolinska Institute, Stockholm, Sweden

<sup>119</sup> <https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-2/subpart-J/subject-group-ECFR52efa600149ef42/section-2.1091>, 47 CFR 2.1091(b).

<sup>120</sup> <https://ehtrust.org/wi-fi-wireless-radio-frequency-radiation-can-damage-the-blood-brain-barrier/>

<sup>121</sup> <https://ehtrust.org/wi-fi-wireless-radio-frequency-radiation-can-damage-the-blood-brain-barrier/>

<sup>122</sup> <https://rumble.com/v2930dw-dr.-barrie-trower-the-truth-about-5g-and-wi-fi-part-1.html>, Dr. Barrie Trower - "The Truth About 5G & Wi-Fi" - Part 1

<sup>123</sup> <https://www.sciencedirect.com/science/article/pii/S0013935118300355?via%3Dihub>, *Wi-Fi is an important threat to human health*, Dr. Martin Pall, March 2018.

<sup>124</sup> <https://manhattanneighbors.org/parents-schools/>

[Letter from Dr. Magda Havas, B.Sc., Ph.D.](#), Trent University, ON, Canada

[Letter from Toni Stein, Ph.D.](#), West Coast Program Director of Environmental Health Trust

[Letter from Cindy Sage, M.A.](#), Sage Associates; Co-Editor, BioInitiative 2012 Report

[Letter from Devra Davis, Ph.D. MPH](#), Environmental Health Trust

### **Subrogated risk analysis: potential student harms outweigh perceived benefits of Wi-Fi convenience**

These are the risks subrogated to school children that would ride school buses with Wi-Fi:

- (1) The risk of higher power levels that would be needed to provide mobile broadband connectivity and high data throughput access in rural areas and thus higher student toxic RFR exposures;
- (2) The risk of microwaves penetrating deep into the top of the child's head where learning is processed adversely impacting cognition, memory and behavior;
- (3) The risk of significant RF reflections that would be created in a confined space of an electrically conductive metal bus that may be subject to surface currents;
- (4) The risk of the possibility of increasing the RFR inside the bus seating area above the FCC radiation exposure safety limit without the ability to monitor or measure at any time;
- (5) The risk of repetitive and cumulative personal injuries created by neglecting medical recommendations and some state legal guidelines for safe use of a laptop;
- (6) The risk of no ADA access accommodations for any EMS student for health reasons and no school nurse available should a student succumb to microwave illness or other related non-ionizing radiation exposure symptomology;
- (7) The risk of the increased likelihood of getting childhood cancers, and;
- (8) The risk of exposure to numerous electronic device projectiles in the event of any type of vehicular accident that would result in increased involuntary accidental injury.

This proposed rule, if adopted, subrogates all these risks of harm to students without their consent, and is not the solution to the homework gap. Wired connectivity is the answer, and it should be provided in fixed brick and motor buildings outside of school, but not in school buses. Consider installing fixed broadband Ethernet ports in public recreational and sports facilities and you could affect the same goal with parental supervision to bridge the homework gap. It is safer, more reliable and would be in an environment that is more conducive to learning and memory retention due to the lower whole body and head RFR exposures while using wired broadband.

### **Conclusions**

This is not a well thought out plan to request e-rate subsidization for Wi-Fi on school buses, no matter how convenient or justified it may appear for FCC to implement. It is ill conceived proposal to render a school bus as an extended part of a school's campus or classroom, as it could never be made a 'safe enough' environment for student learning cognition and memory retention. In fact, it will accomplish just the opposite over the long term as brain neuron cells continue to be damaged and die under the daily assault of concentrated microwave radiation to the head area in the confined space of a metal school bus, creating a microwave oven like effect.

If a program cannot be made reasonably safe, it shouldn't be granted approval as the risk should be considered too high. For \$50/month, or the estimated monthly cost of this subsidized School Bus Wi-Fi, those high risks should not be subrogated to the beneficiaries of the program, the school children, for any perceived academic "convenience". Under loco parentis, the school administration has the duty to keep children safe while under their supervision during school hours. In addition, per [47 USC 151](#), it is FCC's mission and duty to provide communications to "promote safety of life and property". This proposed FCC rule does neither. FCC is forcing school districts and students that participate in the School Bus Wi-Fi program to be non-compliant with one of FCC's own wireless device safety rules per [47 CFR 2.1091\(b\)](#). This non-compliance may result in many students developing repetitive personal injuries, receiving daily concentrated toxic RFR exposures that may cause illness, and getting burns or thermal injuries from skin contact with the laptop device/antennas that cannot be avoided. Therefore, the proposed FCC rule has no merit and should not be approved for e-rate funding.

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