

From: [Duggan, Scarlet](#)
To: [REDACTED]
Subject: RE: PA25-0072 - Expert Report of Kent Chamberlin, Ph.D in Opposition to Application of Verizon Wireless and AT&T Mobility for Permits for Two Cell Towers Across from 4607 Surrey Drive
Date: Friday, December 12, 2025 2:26:44 PM
Attachments: [Corona Del Mar - Kent Chamber, Ph.D - Expert Report and CV.pdf](#)

Hi Robert,

We have received your email below. Please note that your email will be provided to the Zoning Administrator as it relates to the 12/18/25 public hearing of PA25-0072. Your comment will be posted on the Zoning Administrator page at least 72 hours prior to the scheduled meeting date.

Thank you,

Scarlet Duggan, Land Use Manager

OC Public Works | Development Services
601 N. Ross Street, Santa Ana, CA 92701 | (714) 667-1606



From: Robert Berg [REDACTED] >
Sent: Friday, December 12, 2025 12:57 PM
To: Duggan, Scarlet <scarlet.duggan@ocpw.ocgov.com>; Robert Berg [REDACTED]
Subject: Fwd: PA25-0072 - Expert Report of Kent Chamberlin, Ph.D in Opposition to Application of Verizon Wireless and AT&T Mobility for Permits for Two Cell Towers Across from [REDACTED]

Attention: This email originated from outside the County of Orange. Use caution when opening attachments or links.

Dear Ms. Duggan:

Please ensure that the previously submitted document attached hereto is included in the documents available to the public when they click on the Public Notice link for the continuation of the public hearing in this matter on December 18, 2025. Please confirm. Thank you. Regards, Robert Berg.

Robert J. Berg, Esq.

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Begin forwarded message:

From: [REDACTED]
Date: December 2, 2025 at 3:38:42 PM CST
To: Scarlet Duggan <scarlet.duggan@ocpw.ocgov.com>, Justin Kirk <justin.kirk@ocpw.com>, Ray Diaz <ray.diaz@coco.oc.gov>, Robert Berg [REDACTED]
Cc: David Browne [REDACTED]
Subject: PA25-0072 - Expert Report of Kent Chamberlin, Ph.D in Opposition to Application of Verizon Wireless and AT&T Mobility for Permits for Two Cell Towers Across from 4607 Surrey Drive

Dear Ms. Duggan:

As you know, I am the attorney who represents a number of residents of Cameo Highlands in Corona Del Mar who oppose the application of Verizon Wireless and AT&T Mobility (PA25-0072) for permits to construct and operate two 40-foot tall monoeucalyptus cell towers on the periphery of the Pelican Hill golf course across from [REDACTED] in the Cameo Highlands neighborhood of the Cameo Community Association.

I am attaching hereto for immediate posting on the OCPW public hearing website the expert report of Dr. Kent Chamberlin in opposition to the above-referenced application. Dr. Chamberlin is a world-renowned expert in electromagnetics and radio frequency propagation and modeling. Dr. Chamberlin has reviewed Verizon Wireless's and AT&T Mobility's application and supporting documentation. In Dr. Chamberlin's expert opinion, the applicants have utterly failed to provide useable evidence of any significant gaps in

coverage in their wireless networks in the Cameo Community Association neighborhoods. The RF propagation maps upon which the applicants rely are fundamentally flawed and have not been validated with any real-world data, even though ample real-world data are readily available.

In Dr. Chamberlin's expert opinion, the "evidence" submitted by the applicants is so deficient that it cannot be considered to have any demonstrated reliability. Moreover, it is contradicted by the coverage data the applicants provide to the FCC twice each year, as required by federal law, under penalties of perjury and serious enforcement action should inaccurate information be submitted. That coverage data, included in the FCC National Broadband map for the Cameo Community Association neighborhoods, show that both Verizon Wireless and AT&T Mobility provide 100% outdoor stationary and in-vehicle wireless coverage. Moreover, my clients and other residents report having adequate wireless coverage in these neighborhoods.

Dr. Chamberlin also points out in his expert report the failure of the applicants to explore alternative co-location opportunities instead of constructing two brand-new adjacent cell towers across from [REDACTED]. The most obvious co-location site is the already-existing cell tower location at the Pelican Hill golf course maintenance building located at 6195 Pacific Highway. This location is close by the desired site, has excellent lines of sight to the target areas, is further removed from densely populated residential neighborhoods, is far less visible from surrounding public areas, and has available physical space. Neither applicant addresses the possibility of expanding this tower with either additional antennas on the existing facility, increasing the size of the existing facility -- as of federal right under the federal Spectrum Act, or adding another tower within this complex. And OCPW failed to do its job by ignoring entirely the applicants' failure to examine alternative co-location opportunities.

Finally, Dr. Chamberlin identifies other far less intrusive technologically feasible solutions to improve wireless coverage in the neighborhoods, including using boosters or amplifiers or installing some strategically deployed small cell wireless facilities in the public rights of way.

The applicants must show that they meet the County Code's wireless facility requirements with a preponderance of the evidence. Dr. Chamberlin demonstrates that they have failed to comply with the cardinal rules of scientific methodology and

their "evidence" is as meaningful as Rorschach ink blots. The Zoning Administrator must deny the applications.

In view of the critical importance of Dr. Chamberlin's expert report, I respectfully request that you confirm receipt of my email and attachments, post the report immediately, confirm to me once it is posted, and provide the Zoning Administrator with a copy immediately. Thank you for your attention to this.

Respectfully, Robert J. Berg

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December 2, 2025
Expert Report of Kent Chamberlin, Ph.D

BY EMAIL (scarlet.duggan@ocpw.ocgov.com)

Ms. Scarlet Duggan, Land Use Manager
Orange County Public Works, Development Services
601 N. Ross Street
Santa Ana, CA 92701
(714) 667-1606

Re: Verizon Wireless and AT&T Mobility (PA25-0072/OC25-60582)
VZW "Cameo Highlands"/AT&T "Pelican Hill"
Address: t/b/d across from [REDACTED]
APN: 473-041-20

Dear Ms. Duggan,

This expert report is being submitted as requested by and on behalf of residents of the Cameo Highlands neighborhood in Corona Del Mar, CA who oppose the two, 40-foot-tall mono-eucalyptus cell towers which Verizon Wireless and AT&T Mobility are proposing to install and operate on Pelican Hill property immediately above [REDACTED]. Please add this letter opposing said cell towers to the Orange County Public Works ("OCPW") file in connection with its review of these two wireless telecommunications facility projects.

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Executive Summary.

Verizon Wireless and AT&T Mobility are seeking to construct and operate two 40-foot-tall mono-eucalyptus cell towers on Pelican Hill property immediately above [REDACTED], Corona Del Mar, CA. Each tower is slated to accommodate 12 panel antennas for a combined total of 24 panel antennas.

The wireless carriers' stated justification for the two new towers is that existing cellular infrastructure does not provide Verizon Wireless and AT&T Mobility with sufficient coverage, resulting in "significant gaps" in their coverage at and around the proposed Surrey Drive installation site. The only "evidence" Verizon Wireless and AT&T Mobility have provided to support their claims of insufficient coverage is found in unvalidated radiofrequency ("RF") propagation maps submitted by unknown authors on behalf of Verizon Wireless and AT&T Mobility. As is discussed in greater depth below, the submitted RF propagation maps fail to meet acceptable professional and scientific standards. They are essentially scientifically non-probative Rorschach ink blots.

Most residents living near the proposed installation site report having adequate cell coverage. Residents who support the two proposed towers mostly claim that they have limited cell coverage in their homes, though some also say that they do not have adequate outdoor coverage, especially down by the beach. While there may be isolated gaps in coverage, such isolated gaps do not rise to the level of a "significant gap" and can be remedied by installing signal boosters, "small cell" antennas, or other far less intrusive, technologically feasible alternatives.

I understand from Attorney Robert Berg that the Ninth Circuit Court of Appeals has held that "significant gaps in coverage" within the meaning of the Telecommunications Act of 1996 ("TCA") "are extremely fact-specific inquiries that defy any bright-line legal rule." *Sprint PCS Assets, L.L.C. v. City of Palos Verdes Estates*, 583 F.3d 716, 727 (9th Cir. 2009), quoting *MetroPCS, Inc. v. City & County of San Francisco*, 400 F.3d 715, 733 (9th Cir. 2005), abrogated in part on unrelated grounds in *T-Mobile S., LLC v. City of Roswell*, 574 U.S. 293, 299 (2013). The Ninth Circuit specifically holds that a wireless carrier's presentation of its radio frequency propagation maps is not sufficient to establish a 'significant gap' in coverage. *Sprint PCS Assets, L.L.C.*, 583 F.3d at 727 ("The district court simply declared, as a matter of fact and fiat, that there was a 'significant gap' in Sprint's coverage in the City. Sprint defends this factual finding on appeal, arguing that its presentation of radio propagation maps was sufficient to establish a 'significant gap' in coverage. We disagree."). The Ninth Circuit further holds that "a gap" in coverage (e.g., individual "dead spots" within a greater service area) is not sufficient to constitute a significant gap in coverage; the gap in coverage must be truly "significant" because the TCA does not guarantee wireless providers coverage free of small "dead spots." *Metro PCS, Inc.*, 400 F.3d at 733-734 & fn. 10.

In the *Sprint PCS* decision, the Ninth Circuit explored the wide range of context-specific factors that must be assessed when determining whether any purported "gaps" in a wireless provider's coverage actually constitute legally "significant gaps" under the TCA. Among the examples of specific factors that the Ninth Circuit said should be considered are: (1) whether the gap affects a significant commuter highway or railway; (2) the nature and character of the area or the number of potential users in that area who may be affected by the alleged lack of service; (3) whether facilities are needed to improve weak signals or to fill a complete void in coverage; (4) whether the gap covers well-traveled roads on which customers lack roaming capabilities; (5) whether the gap shows up on

"drive tests;" (6) whether the gap affects a commercial district; and (7) whether the gap poses public safety risk. 583 F.3d at 727, citing cases. Neither Verizon Wireless nor AT&T Mobility addresses any of these context-specific factors; they simply claim, without any substantiation whatsoever, that coverage is inadequate in the Cameo Community Association neighborhoods. Under federal law, that "justification" does not pass muster.

Installing two 40-foot-tall cell towers — each equipped with 12 panel antennas — to address what may, at most, be still unproven minor, highly-localized gaps in coverage, would be totally excessive in my expert opinion. And even if built, the proposed towers may not cover the purported isolated gap areas due to unique topographical, building structure, or foliage challenges. That being said, even if a few isolated coverage issues are verified to exist in the real world with real-world evidence (remember, the wireless carriers' unproven RF propagation maps are just predictive, computer-generated models), such spotty coverage issues are best resolved using far less intrusive, technologically feasible alternatives such as low-power, small-cell antennas or relatively inexpensive signal boosters. These inobtrusive, lower-cost, and highly effective technologies are commonly used by industry to remedy localized signal deficiencies without imposing the substantial adverse impacts associated with imposing new industrial cell towers on a residential community.

In this report, I present an independent expert analysis and conclusions regarding available wireless coverage at and around the proposed installation site across from [REDACTED], on the periphery of the Pelican Hill golf course. I am well-qualified to present my expert opinion in this matter. I am Professor and Chair Emeritus of the Department of Electrical and Computer Engineering at the University of New Hampshire. My research focus has been in the fields of computational electromagnetics, RF engineering, and biomedical engineering. I draw on my nearly 40 years of research and academic expertise in reaching the expert conclusions discussed below.

I have no prior employment or affiliations as an RF engineer with any wireless carriers. As a result, my evaluation of the fundamental RF engineering concepts underlying this application is entirely free from industry influence and conflicts of interest.

I conclude that Verizon Wireless and AT&T Mobility each have failed to demonstrate a need for additional coverage at the proposed installation site across from [REDACTED] [REDACTED]. Based on the available evidence, in my expert opinion, neither Verizon Wireless nor AT&T Mobility has a significant gap in network coverage in the proposed service area.

Synopsis Of My Expert Qualifications.

I have appended my complete curriculum vitae to this report. But here, I highlight some of my past experiences that qualify me as an expert in this case. As previously stated, I am Professor and Chair Emeritus of the Department of Electrical and Computer Engineering at the University of New Hampshire. My primary area of research and teaching has been in electromagnetics. I have performed funded research for more than 25 sponsors on efforts that have involved the modeling and measurement of electromagnetic fields. These sponsors include, but are not limited to, the Federal Aviation Administration ("FAA"), the U.S. Department of Justice ("DOJ"), the U.S. Navy, the U.S. Army, the U.S. Air Force, and the National Science Foundation.

The aspects of my experience that are most relevant to Verizon Wireless's and AT&T Mobility's proposed cell towers are propagation modeling, interference modeling, and security

issues created by wireless telecommunications systems. I have taught RF concepts at the undergraduate and graduate levels throughout my career. In fact, one of my most popular courses has been Computational Electromagnetics where I teach graduate engineering students the theory behind computer models and how to build and evaluate them, with a focus on RF propagation modeling. The models I have worked with are based upon theories including Geometrical Optics, Physical Optics, the Geometrical Theory of Diffraction, Finite-Difference, Time-Domain (“FDTD”), and Moving-Window FDTD. These theories are incorporated into standard industry RF propagation map-modeling software that wireless carriers frequently use to prepare their RF propagation maps.

Besides my research and teaching duties, I have served as Associate Editor for IEEE Transactions on Antennas and Propagation. This is the preeminent peer-reviewed, scientific publication in my field. Finally, I served on a formal New Hampshire State Commission tasked by the legislature with exploring issues relating to 5G and wireless radiation. My primary role was to provide guidance on RF engineering issues. I continue to perform reviews for IEEE and for other publications in related disciplines. Below is greater detail regarding my relevant experience:

Computer modeling of radio wave propagation: My early career work in RF propagation modeling began with modeling the Instrument Landing System (both the Localizer and Glide Slope) in the presence of irregular terrain, vegetation, and other scattering/absorbing objects. I incorporated this work into my doctoral dissertation, which earned the international Radio Technical Commission for Aeronautics William E. Jackson Award. It was around this time that I wrote a seminal paper about the Longley-Rice model.¹ This work is significant in this case because contemporary propagation models, including the Forsk-Atoll propagation model used by AT&T Mobility to generate propagation maps at and around the proposed Survey Drive installation site, utilize many of the features of the Longley-Rice model.

Interference Modeling: The modeling and analysis of RF interference is related to propagation modeling, as it requires a knowledge of signal levels at the equipment being protected from interference. I have performed work for the FAA exploring co- and adjacent-channel interference at communication sites, with projects entitled “Capability Enhancement of the COSITE Computer Model for Use in Air-Ground Communications Facility Design and Telecommunications Analysis” and “Electromagnetic Interference Measurements on Emissions from Industrial, Scientific, and Medical (ISM) Equipment and Their Effects on ILS Localizer Receiver Performance.” I have also worked to resolve interference issues for the DOJ and the wireless telecommunications industry.

Public Safety and Security Issues: In a project funded by the DOJ, I was asked to investigate the vulnerability of cellphone communications in the event of an emergency. At the time I was involved in studying cellphone communications during emergencies, they were known to saturate and fail, as there would be a surge of people using their cellphones to contact family and friends. While the problem of using cellular communications for emergency calls and first responders has largely been resolved, as described below, the vulnerability of cellphone communications to jamming remains. One of my roles in the DOJ effort was to look at other forms of communication that would not be as susceptible to these vulnerabilities, such as VHF/UHF police and fire radios and technologies such as Datacasting.

¹ Chamberlin, Kent A. and Luebbers, Raymond J., “An Evaluation of Longley-Rice and GTD Propagation Models,” *IEEE Transactions on Antennas and Propagation*, AP-30, No. 6, Nov. 1982.

The Case.

Verizon Wireless and AT&T Mobility are proposing to install and operate two 40-foot-tall mono-eucalyptus cell towers on Pelican Hill property immediately above [REDACTED], Corona Del Mar, CA 92625.

According to a letter submitted by Peter J. Blied of PlanCom, Inc. to the County of Orange's Planning Division on May 8, 2025, each of the two 40-foot towers is slated to accommodate 12 panel antennas for a combined total of 24 panel antennas. Verizon Wireless's tower will have one 1-4' microwave dish antenna, six remote radio units, and three raycaps/surge suppressors. Verizon Wireless's equipment area will consist of three equipment cabinets, 1 GPS antenna, one 27 kW emergency back-up DC generator with a 125-gallon fuel tank, and connections and cabinets for utilities as needed. AT&T Mobility's tower will have 48 remote radio units and 8 DC surge protectors. AT&T Mobility's equipment area will consist of four equipment cabinets, one DC surge suppressor, one GPS antenna, one 30 kW emergency back-up generator with a 150-gallon fuel tank, and utility connections and cabinets as needed.

Verizon Wireless and AT&T Mobility assert a need for enhanced wireless coverage at and around the Surrey Drive installation site. To justify this need, Verizon Wireless and AT&T Mobility have submitted unvalidated RF propagation maps. The maps provided fail to meet even the most basic scientific standards in the field of RF propagation analysis for two primary reasons. First, Verizon Wireless and AT&T Mobility do not specify the parameters they used to generate their maps. And second, Verizon Wireless and AT&T Mobility have failed to produce any real-world data to validate the model(s) used to generate their maps.

The Federal Communication Commission's ("FCC") National Broadband Map is a highly accurate, granular tool for determining the presence of cell coverage anywhere in the United States, demonstrates 100% outdoor and in-vehicle coverage at and around the proposed Surrey Drive installation site. Most requirements for submitting data to the FCC for the National Broadband Map are prescribed in the Code of Federal Regulations ("CFR"), specifically under 47 CFR Part 1, Subpart V (sections 1.7001 through 1.7010). These rules detail everything from the scope and content of required filings, types of data and formats, mapping and location standards, deadlines, certification procedures, and methods for validating and challenging submitted data. Resident reports of adequate cell service at and around the proposed Surrey Drive installation site validate the accuracy of the FCC National Broadband Map. Any purported isolated coverage gaps can be easily "plugged" by installing "small cell" antennas, signal boosters, and/or amplifiers.

Documents Reviewed In Preparing This Report.

I have reviewed the following documents to prepare this report:

- AT&T Mobility project schematics (SITE NUMBER: CXL00041; SITE NAME: PELICAN HILL; IMW# WSLOS0066415; PACE # MRLOS112974; FA# 16381945; USID #330695).
- Verizon Wireless project schematics (CAMEO HIGHLANDS; Project ID: 17228239; ACROSS FROM 4607 SURREY DR. CORONA DEL MAR, CA 92625).
- May 8, 2025 "Project Justification Letter" submitted by Peter J. Blied of PlanCom, Inc. to the County of Orange Planning Division.
- October 2025 "CAMEO HIGHLANDS Prop Maps" submitted by Verizon Wireless.
- October 1, 2025 "Site Justification Coverage Maps" (Site ID: CXL00041; Site Address: [REDACTED] Corona Del Mar, CA 92625) submitted by AT&T Mobility

- October 9, 2025 “Project Resubmittal Letter” submitted by Peter J. Blied of PlanCom, Inc. to Scarlet Duggan.
- December 4, 2025 Orange County Public Works staff report from Orange County Development Services/Planning to the Orange County Zoning Administrator.

Verizon Wireless's And AT&T Mobility's "Evidence" Alleging That A Significant Gap in Coverage Exists At The Proposed Installation Site Is Based On A Wholly Unsubstantiated And Unexplained Predictive Computer Model.

Any modeling software, regardless of sophistication and soundness of the model, can be easily manipulated to show whatever results are desired. Verizon Wireless's and AT&T Mobility's coverage “needs case” suffers from fatal methodological and substantive flaws that fail to meet acceptable scientific standards in the field of RF propagation analysis.

Verizon Wireless has provided three theoretical RF propagation maps in support of the instant application. These three RF propagation maps were prepared by **an unknown individual** in October 2025 using **an unknown modeling tool**. AT&T Mobility provides virtually the same insufficient information as Verizon Wireless – three computer-generated RF propagation maps, produced by **an unknown individual** on October 1, 2025.

The coverage maps provided by Verizon Wireless and AT&T Mobility are presented as though they represent reality. **They do not.** RF propagation coverage maps are generated by computer modeling. They **merely represent predictive estimates** of what might be expected under certain conditions based upon various modeling assumptions and the data input into the model. Each specific area has its own unique attributes – topography, foliage, building types and density, and natural obstructions, for example. A model must be tweaked to account for these distinctions. Then, the model must be real-world tested to see if it provides meaningfully accurate results.

For real-world testing of the validity of RF propagation maps for wireless coverage, dropped call logs provide a "gold standard" measure for defining gaps in coverage. Dropped call logs are computerized records maintained by wireless carriers of cellphone calls made by a carrier's subscribers where an in-progress cellphone call is involuntarily terminated while in progress – e.g., the parties to the call are speaking, and then suddenly, without explanation, the call terminates. Possible reasons for the dropped call might be the loss of signal due to coverage limitations or overcapacity. Wireless carriers also maintain logs of calls placed which "failed to complete." The same reasons that calls terminate involuntarily may be the reasons that calls fail to be completed when placed. One would expect that if a carrier's dropped call log shows numerous dropped calls in a particular neighborhood, the RF propagation map for that neighborhood would show a lack of cell coverage for that carrier or the presence of a low-strength cell signal for that carrier. Such data would help verify the validity of the model. Likewise, a model's validity would be called into question if the model showed a lack of coverage in a particular neighborhood, yet the carrier's dropped call log showed few to no dropped calls in the neighborhood.

Another excellent way to "field-test" an RF propagation map's validity is through drive-tests performed by independent entities. In a "drive-test," an independent investigator simply drives through an area and takes RF signal strength measurements of the wireless carrier(s) of interest along the way. Such a test can be performed using a simple cellphone. There are other, more sophisticated devices that keep track of connectivity for multiple carriers automatically. In any event, the investigator conducting the drive-test places cellphone calls and keeps track of the location where each call is placed, the signal strength of the cellphone's radio signal, and a record

as to whether the call can be placed, completed, and/or maintained. If measured data corroborate the predictions of the modeled data, then one can have confidence in the accuracy of the model (because the model has been validated with real-world data).

This is all very basic scientific "best practices." I understand that the wireless carriers all maintain dropped call logs and failure-to-complete logs in the regular course of business. Drive-testing is an extremely simple protocol to conduct. However, neither Verizon Wireless nor AT&T Mobility provide any evidence one way or the other to suggest that either cross-checked their RF propagation maps against dropped call logs or failure-to-complete logs, or conducted any drive tests, or performed any other type of real-world testing to substantiate their claims that wireless coverage in and around the proposed Cameo Highlands cell tower installation site is inadequate. *This is a major failure of the most fundamental scientific methodology necessary to publish results credible to any reasonable, competent, independent, scientific reviewer.* Moreover, both Verizon Wireless and AT&T Mobility have failed to adequately explain what conditions their computer-modeled coverage maps incorporate. Without being told the parameters upon which the modeled output is based (e.g. the input data, assumptions built into the model, and other key settings), an independent RF modeling expert cannot meaningfully evaluate the RF propagation maps provided. Without this information, there is simply no way to determine whether the model is scientifically appropriate for the task, whether it is being applied correctly, or whether the underlying data is sufficiently "clean" and suitable for use.

As I explain to my students, whenever an RF propagation map is presented, the modeling exercise for creating that RF propagation map must be thoroughly documented and shared with the public. This transparency is essential to ensure that the analysis can be critically evaluated and independently replicated by other experts in the field. In this instance, I could not possibly replicate the RF propagation maps provided by the applicants because vital information about how they generated their RF propagation maps is missing from their reports.

The Orange County Staff and the Orange County Zoning Administrator should not accept unsubstantiated modelled RF propagation maps as the basis for approving permits under the County Code allowing for the construction and operation of the two 40-foot-high cell towers, each outfitted with 12 panel antennas. Rather, the County Staff and Zoning Administrator should insist that the applicants exercise a reasonable degree of scientific rigor and "best practices" methodology, particularly since the applicants have the burden of proving with a preponderance of competent and credible evidence that their project complies with the County Code.

In my professional opinion, the failure of Verizon Wireless and AT&T Mobility to provide any real-world data to validate their RF propagation maps and to provide the necessary data for any qualified expert to assess the legitimacy of the parameters used in employing the models to generate these RF propagation maps constitute fatal flaws in their analyses which deprive them of any probative value. **As such, it is my professional opinion that the Verizon Wireless and AT&T Mobility RF propagation maps are unreliable and unusable as evidence in this matter.**

The Forsk-Atoll Propagation Model.

According to the first page of AT&T Mobility's "Site Justification Maps" presentation, the Forsk-Atoll model was used by an unknown individual to generate AT&T Mobility's RF coverage maps. These maps purport to show a significant gap in coverage at the proposed Surrey Drive installation site. While the Forsk-Atoll model is an industry-recognized RF propagation model used for telecommunications network planning, it is far from being a "plug-n-play"

platform. Considerable expertise is required on the part of the user. Because it is a full-feature tool, it has a steep learning curve, requiring domain knowledge (radio propagation, RF engineering, and network technology) to use it effectively. Further, even for advanced propagation modeling tools such as the Forsk-Atoll model, there will always be real-world deviations (e.g., unusual terrain, building materials, dynamic changes, etc.), so results must be interpreted with sound and sophisticated engineering judgment.

Verizon Wireless does not specify the computer software package it utilized to prepare its RF propagation maps in this case. However, I know from other matters in which I have provided expert analysis involving Verizon Wireless cell tower permit applications that Verizon Wireless also frequently uses the Forsk-Atoll model. My above comments about the proper use of the Forsk-Atoll model - or indeed, any similar sophisticated RF propagation model – are equally applicable to Verizon Wireless.

For the reasons stated above, and for the additional reasons set forth herein, it is my expert opinion that the coverage maps submitted by Verizon Wireless and AT&T Mobility cannot be considered reliable. First, the qualifications of the individuals who created the maps are unknown, leaving me unable to determine whether they understand how to properly utilize, understand the limitations of, and interpret the output of RF propagation modeling using Forsk-Atoll (or similar) model software package. Second, the maps conflict with other evidence, including the FCC National Broadband Map and reports from community members, indicating that Verizon Wireless and AT&T Mobility already provide adequate coverage in and around the proposed Surrey Drive installation site.

The FCC National Broadband Map.

The FCC's National Broadband Map provides unbiased proof that neither Verizon Wireless nor AT&T Mobility have a significant gap in coverage at or around the proposed Surrey Drive installation site. The FCC National Broadband Map is a publicly available data source maintained by the FCC that accurately and incontrovertibly demonstrates that Verizon Wireless and AT&T Mobility both already provide full or nearly full coverage in the Cameo Community Association area, and in particular, at the proposed installation site.

The Broadband DATA Act, 47 U.S.C. §643, mandates that all Internet Service Providers (“ISPs”), including wireless carriers, produce data to the FCC demonstrating their respective coverage areas throughout the entire United States. The FCC takes this data to generate its National Broadband Map. According to the Act, it is “unlawful for any entity or individual to willfully and knowingly, or recklessly, submit information or data under this subchapter that is materially inaccurate with respect to the availability of broadband internet access service or the quality of service with respect to broadband internet access service.” Per 47 C.F.R. §1.7004(d), each data filing provided by ISPs must include:

[A] certification signed by a corporate officer of the provider that the officer has examined the information contained in the submission and that, to the best of the officer's actual knowledge, information, and belief, all statements of fact contained in the submission are true and correct. All providers also shall submit a certification of the accuracy of its submissions by a qualified engineer. The engineering certification shall state that the qualified engineer has direct knowledge of, or responsibility for, the generation of the provider's Broadband Data Collection filing. The qualified engineer shall also certify that he or she has examined the information contained in the submission and that, to the best of the engineer's actual knowledge, information, and belief, all

statements of fact contained in the submission are true and correct, and in accordance with the service provider's ordinary course of network design and engineering.

The FCC's National Broadband Map provides detailed data about wireless coverage availability throughout the United States down to the local street address level. The FCC National Broadband Map is found at <https://broadbandmap.fcc.gov/home>. On the home page, a "Search by address" box allows a user to enter a desired street address. Once entered, a map showing whatever broadband and mobile coverage is available at that street address will be displayed, listing each wireless carrier providing service and specifying what type of service is available (e.g., 3G, 4G, 5G). Greater detail can be obtained by zooming in on the map, and broader coverage is shown if the user zooms out. Given the harsh penalties prescribed for providing inaccurate information to the FCC about a wireless carrier's coverage, the likelihood is very high that the wireless coverage information that Verizon Wireless and AT&T Mobility self-reported to the FCC for the areas at and around the proposed Surrey Road installation site in the FCC National Broadband map is accurate.

Relevant screenshots of the FCC National Broadband Map are presented below where you will plainly see that the entire area has very good wireless coverage by multiple wireless carriers, including by Verizon Wireless and AT&T Mobility. Indeed, the FCC National Broadband Map shows that Verizon Wireless and AT&T Mobility each provide the entire area with 100% wireless coverage at both outdoor stationary and in-vehicle levels at the present time.

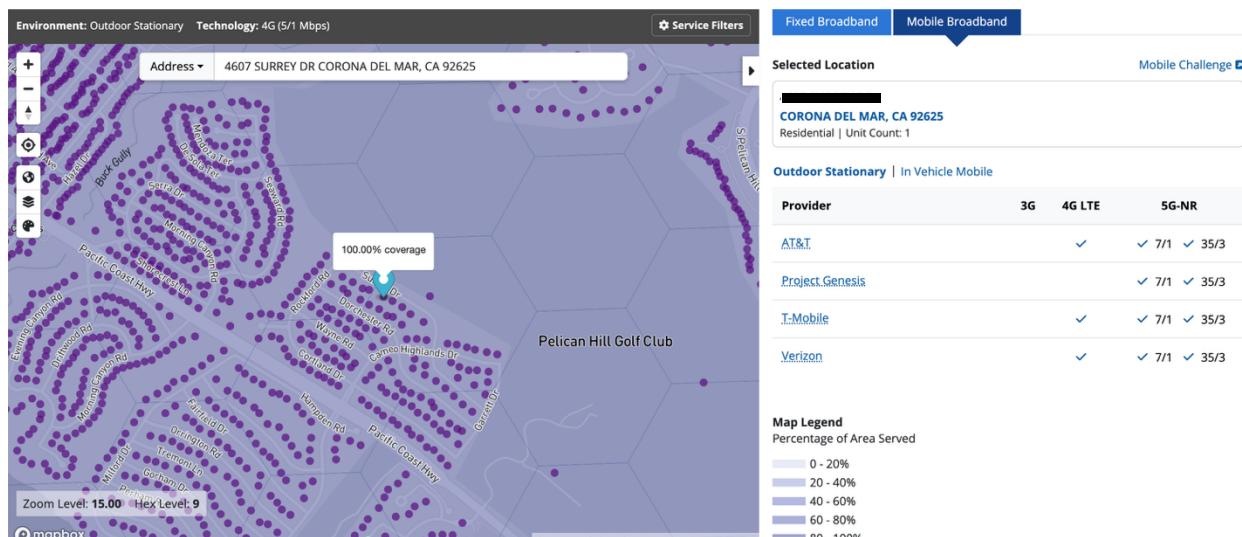


Figure 1: FCC National Broadband Map demonstrating 100% outdoor stationary mobile 4G LTE and 5G-NR coverage for AT&T Mobility and Verizon Wireless at and around the proposed installation site (4607 Surrey Drive, Corona Del Mar, CA).

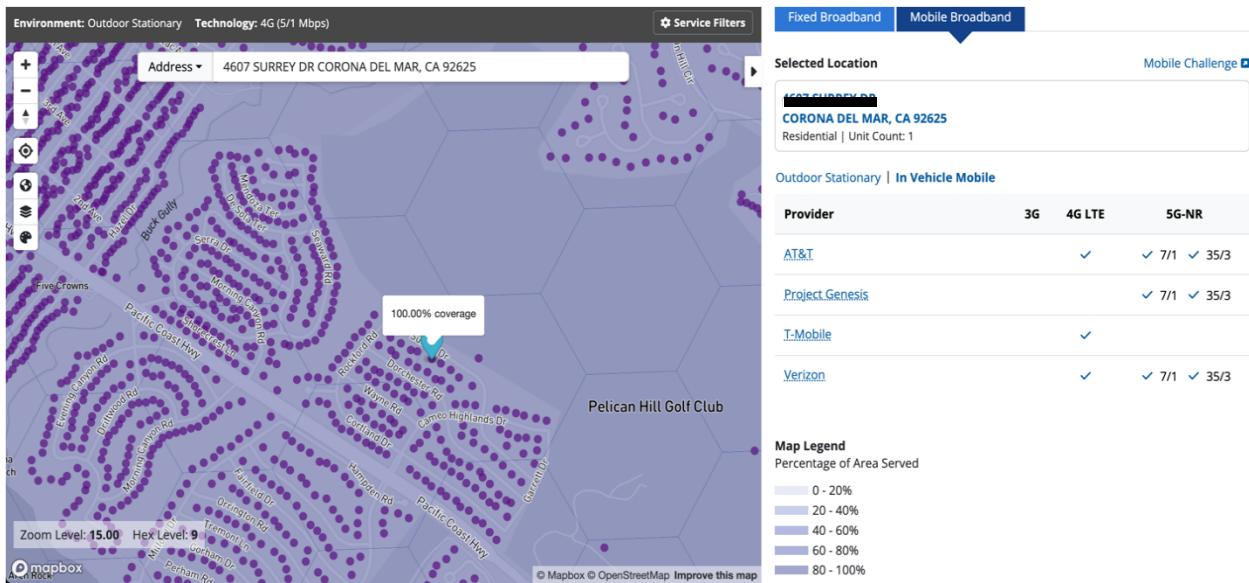


Figure 2: FCC National Broadband Map demonstrating 100% in-vehicle mobile 4G LTE and 5G-NR coverage for AT&T Mobility and Verizon Wireless at and around the proposed installation site [REDACTED], Corona Del Mar, CA).

Not only does the FCC National Broadband Map demonstrate 100% mobile outdoor stationary and in-vehicle coverage at the proposed installation site, but so do the providers' own publicly available, online wireless coverage maps.

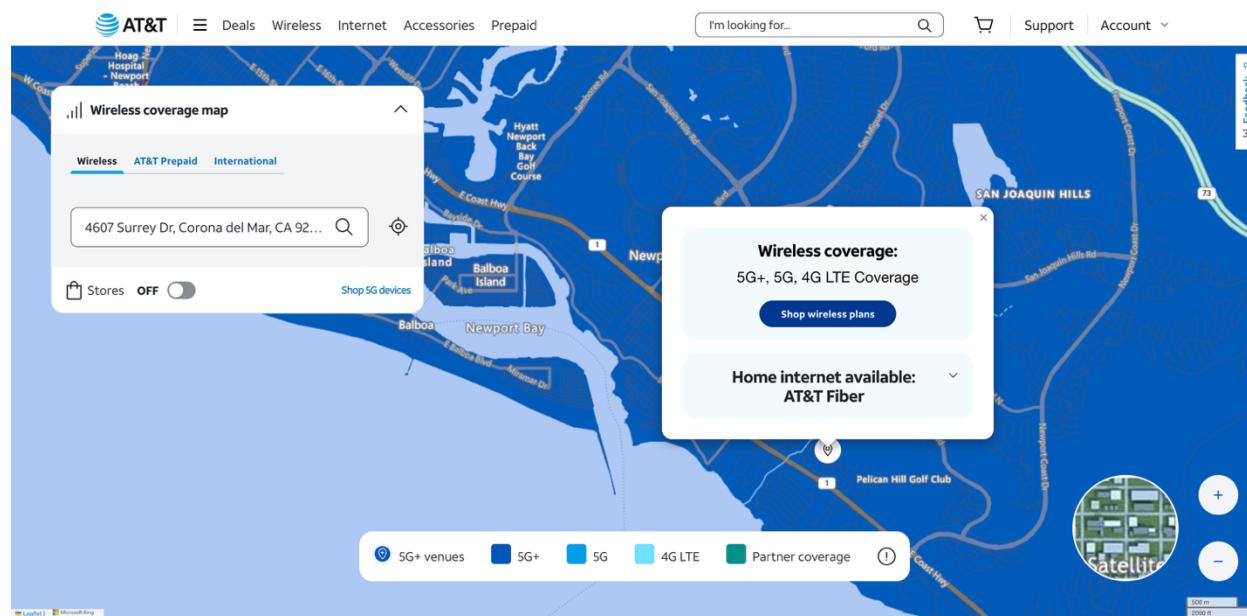


Figure 3: AT&T Wireless coverage map demonstrating 100% 5G+ coverage at and around the proposed installation site [REDACTED], Corona Del Mar, CA).

Find Home Internet and Cell Phone Coverage In Your Area

Explore all Verizon has to offer on internet (including Fios, 5G Home, and LTE Home) and cell phone coverage (5G Ultra Wideband, 5G, 4G LTE, Satellite SMS, and more)

Personal Business

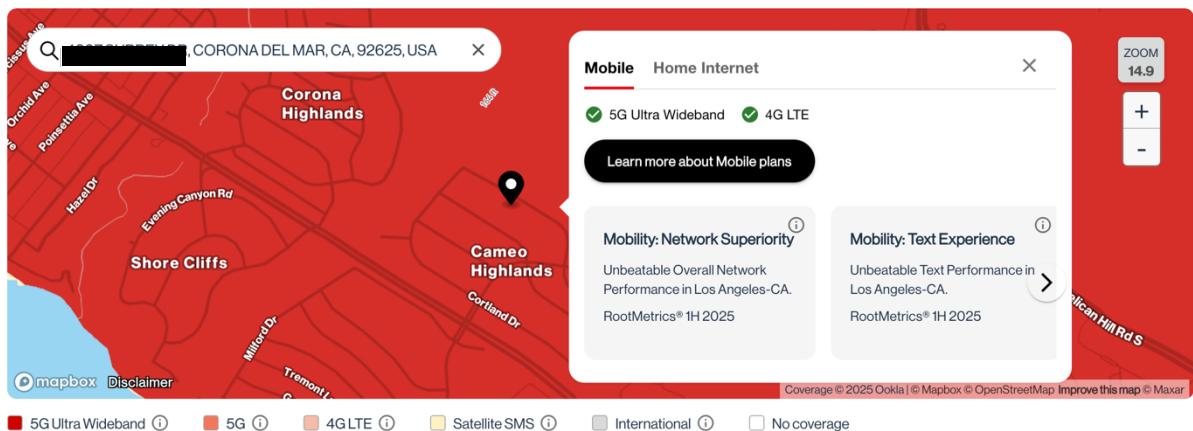


Figure 4: Verizon Wireless coverage map demonstrating 100% 5G Ultra Wideband and 4G LTE coverage at and around the proposed installation site [REDACTED], Corona Del Mar, CA).

I understand that numerous residents of the Cameo Community Association neighborhoods, including the clients who have retained my services herein, are Verizon Wireless and AT&T Mobility customers, and they find the wireless coverage to be adequate at and around the proposed installation site. This anecdotal evidence of adequate wireless coverage by Verizon Wireless and AT&T Mobility customers in the areas where Verizon Wireless and AT&T Mobility contend they have a significant gap in coverage is very important for two reasons: (1) because it contradicts the carriers' respective cases alleging coverage needs and (2) because it corroborates the data depicted in the FCC National Broadband Map.

Verizon Wireless And AT&T Mobility Have Failed To Assess The Feasibility Of Collocating On Existing, Nearby Wireless Telecommunications Infrastructure Or Utilizing Less Intrusive Means To Address Purported Coverage Concerns.

Although I conclude that two new 40-foot cell towers at the proposed Surrey Drive installation site are unnecessary, **purported isolated deficiencies in network performance can be readily remedied in at least three ways.**

One option is to install a cellphone booster (also known as a **signal booster or repeater**) which can be used to provide improved indoor and outdoor coverage. See <https://www.wilsonamplifiers.com/home>. Cellphone boosters can provide robust coverage in areas with no useable signal through the use of directional antennas, as opposed to the omnidirectional antennas used in cellphones. Directional antennas provide gain in a particular direction which can extract a usable signal out of the noise if the antenna is aimed at the strongest cell tower. The concept here is the same as for legacy television antennas, where clear

reception is achieved when the antenna is pointed towards the television transmitter antenna. For cellphone boosters, a fixed, bi-directional, high-gain antenna is employed to amplify a weak signal, and it does so without “just amplifying the noise” because a directional antenna only receives signals, and noise, from a narrow region in space.

A second option is for Verizon Wireless and AT&T Mobility to **collocate** on the existing 50-foot-tall cell tower at the Pelican Hill maintenance building at 6195 Pacific Coast Highway where Verizon Wireless already leases property from The Irvine Company and operates wireless antennas. I have carefully examined that site on Google Earth. The existing cell tower can be expanded (or another built 300 feet away), and AT&T Mobility can place antennas on either the existing tower or on a new one. No residents in the area have complained about the existing cell tower at the golf course maintenance building site. That location is a greater distance from residences, is far more "shielded" from public view by mature landscaping, and is already in a more appropriate "industrial" area.

That existing Verizon Wireless cell tower site is only about 2,000 feet from the site of the proposed Verizon Wireless and AT&T Mobility mono-eucalyptus cell towers across from 4607 Surrey Drive. Verizon's current cell tower site is just 1,500 feet from the Cameo Shores neighborhood and it is only about 725 feet from the Cameo Highlands neighborhood. The existing Verizon Wireless cell tower is about 2,950 feet from the corner of Brighton Road and Cameo Shores Road in Cameo Shores. This tower is a little more than 100 feet closer to that intersection than Verizon Wireless's proposed new cell tower across from Surrey Drive. These distance measurements were acquired using Google Earth's "Measure" tool.

If the current 50-foot-tall cell tower at the Pelican Hill maintenance building cannot accommodate more antennas, Verizon Wireless and AT&T Mobility can leverage Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012 (more commonly known as the Spectrum Act) (47 U.S.C. §1455), to increase the tower height by 20 feet. That additional height, along with additional antennas, would likely address any purported coverage issues at and around the proposed Surrey Drive installation site.

A third option is the installation of “**small cell**” **antennae** in strategic areas where purported gaps exist. Such “small cells” are attached to existing utility poles in the public right of way, and provide localized coverage that can be strategically directed to resolve topographically-caused isolated coverage gaps that signals from a new, but still more distant, macro cell tower will not reach.

Safety Concerns Pertaining To The Proposed Surrey Drive Installation Site.

According to a letter submitted by Mr. Peter J. Blied of PlanCom, Inc. to Ms. Duggan on October 9, 2025, Mr. Blied states, “We appreciate your thorough review of the application package as we work toward providing excellent wireless coverage for the community including E-911 connectivity.” Mr. Blied is insinuating here that E-911 connectivity does not exist at and around the proposed installation site. **This is untrue.**

First and foremost, the FCC National Broadband Map clearly shows that 100% outdoor stationary and in-vehicle mobile coverage already exist at and around the proposed Surrey Drive installation site for both Verizon Wireless and AT&T Mobility. Second, Verizon Wireless and AT&T Mobility have failed to provide sufficient RF propagation maps and other vital real-world evidence that a coverage issue actually exists at and around the proposed installation site. Third, because of FCC regulations, anyone calling 911 with a cellphone in the United States will have

the call picked up by the nearest available cell tower, even if the caller is not a subscriber of any of the carriers operating on the tower. **Thus, all cellphone users at and around the proposed Surrey Drive installation site, regardless of which carrier provides their service, can place a 911 call and it will be picked up by the nearest available cell tower.** And, if a first responder is trying to make a cellphone call, AT&T's FirstNet system gives priority to first responders over other users in emergency situations when cell network capacity might be stretched or overburdened. Fourth, while cellphones are in first responders' communications toolkits, they are generally *not* the tool of choice. Their first choice is a land-mobile radio that operates in the VHF/UHF band and at higher power than cellphones. The VHF/UHF band is considerably lower in frequency than cellphones, and the lower frequency affords propagation over much longer distances. In addition, first responder handheld VHF radios transmit around 5 Watts, whereas first responder in-vehicle radios can transmit at up to 110 Watts. This is much greater than the 2-3 Watts of instantaneous power that is typical of modern cellphone transmissions.

Why Wireless Companies Want New Wireless Telecommunications Infrastructure Even When No Coverage Gaps Or Network Capacity Issues Exist.

Why are wireless telecommunications companies spending money on unneeded, new infrastructure buildouts? This question arose in connection with the New Hampshire State Commission on which I served. We tried to understand why the wireless telecommunications industry continues to aggressively deploy new cell towers in areas with adequate existing coverage. The answer is increasingly clear that it is doing so to garner a share in the home internet market by offering a wireless option rather than the wired option that most of us currently use.

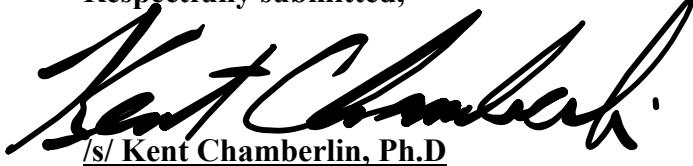
For customers enrolled in the wireless home internet option, they receive a small device that plugs into a standard electrical outlet. This small device provides internet access within the home via Wi-Fi. Unlike conventional routers that connect via fiber optics or cable, the devices connect to the internet through a wireless connection provided by nearby cell towers. The home internet market is huge, currently exceeding \$550 billion per year and expected to increase to over \$850 billion per year in the next few years. The only way that the wireless industry can overtake wired service providers (cable companies) is to build out wireless infrastructure beyond what is needed for cellphone use.

According to an October 23, 2024 news article published in *Fierce Wireless*, Verizon plans to build out its 5G fixed wireless access network to 90 million homes by 2028. During Verizon's 2024 third quarter earnings call, former Verizon CEO, Hans Vestberg, stated: "...fixed wireless access is generating more than \$550 million in revenue." Principal analyst, Roy Chua, of AvidThink noted: "They're obviously bullish on fixed wireless." (See <https://www.fierce-network.com/wireless/verizon-doubles-down-fwa-q3-call>). As reported by *Broadband Breakfast* on October 22, 2025, "...fixed wireless has become a part of AT&T's plan to push bundled home and mobile broadband." The company boasts the addition of 260,000 fixed wireless subscribers in the third quarter of 2025. (See <https://broadbandbreakfast.com/at-t-adds-270-000-fixed-wireless-288-000-fiber-subs/>.) These trends make clear that major national carriers, like Verizon Wireless and AT&T Mobility, are rapidly expanding and heavily investing in fixed wireless as a central component of their broadband business strategies.

Conclusion.

In sum, both Verizon Wireless and AT&T Mobility fail to provide sufficient evidence establishing a “significant gap” in their respective wireless coverage at and around the proposed Surrey Drive installation site. Verizon Wireless and AT&T Mobility have the burden to prove by a preponderance of the evidence the existence of a significant gap in coverage, and they each have failed spectacularly. In my expert opinion, Verizon Wireless and AT&T Mobility’s application to obtain approval to build and operate two new 40-foot mono-eucalyptus cell towers on the basis of purported coverage issues at and around the proposed Surrey Drive should be rejected by the County of Orange Zoning Administrator.

Respectfully submitted,



A handwritten signature in black ink, appearing to read "Kent Chamberlin".

/s/ Kent Chamberlin, Ph.D

Kent A. Chamberlin, Ph.D.

Home Address: [REDACTED]

e-mail: [REDACTED]

Education

1968-1973 University of Cincinnati

-Co-op experience with Air Force in Electronic Countermeasures

1974 BSEE Ohio University

1976 MSEE Ohio University

-Thesis: Design of a Digital Phase Lock Loop for Airborne Navigation

1982 Ph.D. Ohio University

-Dissertation: VHF Air-Ground Propagation Modeling

Areas of Expertise:

Computational Electromagnetics (Finite-Difference, Time-Domain (FDTD)); Propagation modeling (Geometrical Theory of Diffraction (GTD) and Physical Optics); Biological Signal Analysis (Frequency Domain and Wavelet)

Professional Experience Summary

Current	Professor and Chair Emeritus Special Expert for the Environmental Health Trust -had been serving as President Founder in high-tech startup company Special Expert, International Commission on the Biological Effects of Electromagnetic Radiation -had been serving as Vice-Chair Chair of the Virtual Learning Academy Charter School Board of Trustees
2014-2021	Professor and Chair, University of New Hampshire Dept. of Electrical & Computer Engineering
1985-2014	Professor, UNH Dept. of Electrical and Computer Engineering
2010 (Spring)	Visiting Professor: SRM University, Chennai, India
2000 – 2001	Fulbright Distinguished Chair in Antennas and Computational Electromagnetic at the University of Aveiro, Portugal

1993- 1994	Visiting Prof. at The Pennsylvania State University Department of Electrical Engineering. One-semester appointment to the Applied Research Labs
1982- 1985	Asst. Prof. at Ohio University Department of Electrical and Computer Engineering
1981 (Fall)	Visiting Professor at the FAA Technical Center
1977-1981	Senior Research Engineer with the Ohio University Avionics Engineering Center

Personal

United States Citizen, Married, Three Children

Research Experience

Below is a listing of research programs participated in along with the sponsoring agency and dates:

- “Error Correction Techniques for Chirped Fourier Transform in Dispersive Delay Lines”, Antenum, Inc, Jan, 2022-July 2022
- “Electromagnetic Pipe Fusion Analysis and Optimization,” Watts Water Corporation, Sept. 2017- Sept. 2020.
- “Low Cost, High Bandwidth, and Non-Intrusive Machining Force Measurement System,” The National Science Foundation, June 1, 2009- May 31, 2013
- “The Use of Datacast Signals for Public Safety Applications,” National Institute of Justice, January 2006- December 2007
- “Data Collection and Analysis of Low Altitude Propagation Effects for Mobile Radio,” U.S. Navy (SPAWAR), Feb. 04- Feb. 05.
- “Modeling the Wireless Ground-to-Ground Communication Channel”, Department of Justice (Project 54), June 2001- July 2004.
- “Distance Education Module Development,” part of an E2T2 (Enhancing Education Through Technology) grant obtained for the Seacoast Professional Development Center as part of the No Child Left Behind program, 8/04- 2/05.
- “Digital Air-Ground Link Modeling”, Federal Aviation Administration, 7/1/98-9/30/01.
- “Sidewall Dielectric Damage by RIE: Detection by Scanning Probe Microscopy and the Effect on Signal Propagation”, Semiconductor Research Corporation, 4/1/98-3/31/2001

- Development and Evaluation of a Distance Learning Classroom, Davis Educational Classroom, 1/99 - 12/99.
- “Development of the GELTI Propagation Model”, Federal Aviation Administration, 5/96- 9/97.
- “Electric Field Measurement by Scanning Probe Microscopy to Detect the Effect of Nanoscale Material Inhomogeneity on Signal Propagation in High Density Interconnects”, Semiconductor Research Corp., 10/96-12/97.
- “Propagation Model for Digital Radio in Airborne Platform”, MaddenTech (Subcontract from the U.S. Army), 9/95-9/96.
- “Development of Digital Signal Processing Techniques for Avionics Instrumentation Package”, Airfield Technologies, 1/95-8/95.
- “Modeling Propagation Path Loss for the Microwave Landing System (MLS) Operating on Humped Runways,” CTA (subcontract from the Federal Aviation Administration), 8/89-12/93.
- “Application of the Finite-Difference, Time-Domain Approach to aid in the design of low-cost, computer cabinetry that will meet FCC requirements for Radio Frequency Interference,” Digital Equipment Corporation, 6/92-12/93.
- “Investigation into reflection from terrain and building surfaces as applied to Microwave Landing System Modeling”, CTA (subcontract from the Federal Aviation Administration), 7/92-9/92.
- “Capability Enhancement of the COSITE Computer Model for Use in Air-Ground Communications Facility Design and Telecommunications Analysis,” Information Systems and Networks, Inc. (subcontract from the Federal Aviation Administration), 10/90-3/92.
- “Enhancement of FAA Modeling Capabilities,” Pabon, Sims, Smith & Associates (subcontract from the Federal Aviation Administration), 2/87-2/88.
- “Enhancement of FAA Modeling Capabilities,” Information Systems and Networks, Inc. (Subcontract from the Federal Aviation Administration, 11/86- 11/87.
- “Development of a Graphics-Oriented, Finite-Difference, Time-Domain Code in the C Programming Language, Microsoft Corporation, Summer, 1988.

- “Modeling and Validation of VOR and TACAN Errors Resulting from Near-Zone Parasitic Scatterers,” Graph-Tech, Inc. (subcontract from the Federal Aviation Administration), 11/84-8/85
- “VHF Omni-Range Maintainability and Course Accuracy, Federal Aviation Administration, 4/85-8/85
- “Modeling and Validation of VHF Air-Ground Communications Coverage in the Presence of Long-Range Radar Antennas,” Ohio University, Graph-Tech, Inc. (subcontract from the Federal Aviation Administration, 11/84-8/85
- “Microwave Landing System (MLS) Critical Areas Investigation,” Ohio University, Federal Aviation Administration, 9/83-11/84
- “Extension and Validation of the Geometrical Theory of Diffraction Propagation Model,” Ohio University, Electromagnetic Compatibility Analysis Center via Southeastern Center for Electrical Engineering Education, 6/82-1/83
- “Delivery of GTD Glide Slope Model and Operations Manual, “ Ohio University, Government of India, 10/83
- “Study of Glide Slope Signal Derogation Due to Presence of Aircraft Near Glide Slope Critical Area”, Federal Aviation Administration
- “Electromagnetic Interference Measurements on Emissions from Industrial, Scientific, and Medical (ISM) Equipment and Their Effects on ILS Localizer Receiver Performance,” Federal Aviation Administration
- “Development of Ground-to-Air Coverage-Area Prediction for VHF/UHF Communications,” Federal Aviation Administration

Other research efforts include: A centralized computer monitor system for O’Hare Airport (FAA); Development of a mathematical model and computer simulation for the Memory-Aided, Phase Lock Loop (MAPLL) for the Naval Avionics Facility in Indianapolis; Evaluation of Omega navigation receivers for the U.S. Coast Guard; Investigation of snow effects on the ILS Glide Slope.

Consulting (abbreviated)

AMI, Inc.: Modeling microwave devices to exploit frequency-dependent characteristics including the Chirped Fourier Transform.

Most & Associates: Expert witness for Main Coalition to Stop Smart Meters v. Maine Public Utilities Commission, Maine Supreme Court.

Byonyks, Inc: Exploring electromagnetic compatibility (EMC) issues on circuits for medical devices.

Remcom, Inc.: Provide engineering support and analysis relating to electromagnetics modeling efforts.

New Hampshire Public Television: Performed a signal coverage study as a pre-pilot program to implement datacasting for public safety applications.

KAI, Inc.: Performed FDTD analysis of heating effects of an antenna positioned in oil-bearing soil.

Information Systems & Networks Corporation: Aided in specifying a frequency management strategy for siting multi-channel, air-ground communication facilities.

Pacific Telecommunications Corporation, Alaskom Division: Investigated radiation patterns for meteor burst communication systems. This effort included computer simulation and airborne data collection for directional 40 MHz systems operating in the presence of irregular terrain.

Memberships

International Commission for the Biological Effects of Electromagnetic Fields (ICBE-EMF), IEEE (Senior Life Member): Antennas and Propagation Society and Electromagnetic Compatibility Society, Sigma Xi, Tau Beta Pi, Applied Computational Electromagnetics Society (ACES), International Union of Radio Scientists URSI)

Honors

Awarded Distinguished Professor of Renmin Hospital of Wuhan University

Awarded the UNH College of Engineering and Physical Sciences Outstanding Teacher for 2014

Awarded a Fulbright Distinguished Chair, served in Aveiro Portugal

Received a UNH Industrial Research Consulting Center Research Award

Awarded a Fulbright Fellowship in 1993 but was unable to accept because a family member could not take a requisite vaccine.

Received the Radio Technical Commission for Aeronautics William E. Jackson Award presented by the FAA Administrator

Professional Service

Active reviewer for several IEEE publications

Associate Editor for IEEE Transactions on Antennas and Propagation

Associate Editor of the International Journal for Computing

Proposal Reviewer for National Science Foundation, the National Institute for Health and the American Association for the Advancement of Science

Session Chair for numerous IEEE and URSI conferences

Editorial Review Board for SciTech Publishing

Served as member of the Evaluation Team, coordinated by the New Hampshire Department of Education, for the American University of Madaba in Jordan

Refereed, Invited, and Award-Winning Papers

Ben Ishai, P., Baldwin, H. Z., Birnbaum, L. S., Butler, T., **Chamberlin, K.**, Davis, D. L., ... Taylor, H. (2024). Applying the Precautionary Principle to Wireless Technology: Policy Dilemmas and Systemic Risks. *Environment: Science and Policy for Sustainable Development*, 66(2), 5–18. <https://doi.org/10.1080/00139157.2024.2293631>

Igor Belyaev, **Kent Chamberlin**, Suleyman Dasdag, Alvaro Augusto Almeida De Salles, Claudio Enrique Fernandez Rodriguez, Lennart Hardell, Elizabeth Kelley, Kavindra Kumar Kesari, Erica Mallory-Blythe, Ronald L. Melnick, Anthony B. Miller, Joel M. Moskowitz and Paul Héroux, “Cell Phone Radiation Exposure Limits and Engineering Solutions”, International *Int. J. Environ. Res. Public Health* 2023, 20(7), 5398; <https://doi.org/10.3390/ijerph20075398>

Igor Belyaev; Carl Blackman; Alvaro Augusto Almeida de Salles; **Kent Chamberlin** ; Suleyman Dasdag; William Dingeldein; Claudio Enrique Fernandez Rodriguez; Lennart Hardell; Kesari Kavindra; Paul Heroux; Elizabeth Kelley; Don Maisch; Erica Mallory-Blythe; Joel Moskowitz; Ron Melnick; Wenjun Sun; Igor Yakymenko, "Scientific Evidence Invalidates Assumptions Underlying the FCC and ICNIRP Exposure Limits for Radiofrequency Radiation: Implications for 5G ", Environmental Health, October 2022 <https://doi.org/10.1186/s12940-022-00900-9>

Patrick Abrami, Kenneth Wells, Gary Woods, James Gray, Tom Sherman, Denise Ricciardi, Brandon Garod, Esq., Carol Miller, David Juvet, **Kent Chamberlin**, Bethanne Cooley, Michele Roberge, and Paul Héroux, “Final Report on Commission to Study the Environmental and Health Effects of Evolving 5G Technology,” (RSA 12-K:12-14, HB 522, Ch. 260, Laws of 2019), DOI: 10.13140/RG.2.2.31724.59528

K Chamberlin, B McMahon, “Magnetic-field antenna for mobile reception of horizontally-polarized digital television-band signals,” International Journal of Wireless and Mobile Computing 19 (2), 133-137

Michael Klempa and Kent Chamberlin, “Broadband Termination Technique,” in review, IEEE Microwave Magazine.

Minu Valayil and Kent Chamberlin, “Enhancement of Parameters of Slotted Waveguide Antennas Using Metamaterials,” APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY JOURNAL. 34: 272-279. Feb 2019

Ronald Croce, Amber Craft, John Miller, Kent Chamberlin and David Filipovic, "Quadriceps mechano- and electromyographic time-frequency responses during muscular contractions to volitional exhaustion," *Muscle & Nerve Journal*, July 2015.

Amber Craft, Ronald Croce, John Miller, Kent Chamberlin and David Filipovic, "Shifts in Spectral Power Detected By Fourier and Wavelet Transforms During Muscular Contractions To Volitional Exhaustion," *Clinical Kinesiology* 69(2):5-10 · December 2014

Ronald Croce, John Miller, Kent Chamberlin, David Filipovic and Wayne Smith, "Wavelet analysis of Quadriceps power spectra and amplitude under varying levels of contraction intensity and velocity," *Muscle & Nerve* 11/2014; 50(5). DOI:10.1002/mus.24230

Kent Chamberlin, Ph.D., Wayne Smith, Ph.D., Seshank Appasani, Christopher W Chirgwin and Paul T Rioux, "Analysis of the Charge Exchange between the Human Body and Ground: Evaluation of "Earthing" from an Electrical Perspective," *Journal of Chiropractic Medicine*, DOI: 10.1016/j.jcm.2014.10.001 .

Keith Spaulding and Kent Chamberlin, "Measurements Relevant to Electrical Energy Transport both On and Off Acupuncture Meridians," February 2011, *Journal of Complementary and Alternative Medicine*.

Kent Chamberlin, "Intermodulation Product Interference: Theory and Practice," Keynote Address, International Conference on Communications & Computing (ICCC '10), Chennai, India, April 2010.

Benjamin McMahon, Kent Chamberlin & Scott Valcourt," Datacasting in the Mobile Environment," *Journal of Networks*, Issue 7, 2008.

Jason Chan, K. Sivaprasad, and Kent Chamberlin, "Modeling Frequency-Dependent Stripline Losses at High Frequencies," *IEEE Trans. Packaging Materials*, March 2007

Kent Chamberlin and Shahaji Bhosle," A Robust Solution for Preprocessing Terrain Profiles for Use with Ray-Tracing Propagation Models," *IEEE Trans. on Antennas & Propagation*, October 2004

Kent Chamberlin and Maxim Khankin, "Measuring the Impact of In-Vehicle-Generated EMI on VHF Radio Reception in an Unshielded Environment," Proceedings of the 2004 International Symposium on Electromagnetic Compatibility and winner of an "Excellence of the Presented Papers Award", Sendai, Japan

Kent Chamberlin and Dragan Vidacic, "Analysis of Finite-Differencing Errors to Determine Cell Size When Modeling Ferrites and other Lossy Electric and Magnetic Materials Using FDTD, " *IEEE Trans. on Electromagnetic Compatibility*, November 2004

Todd S. Gross, Kevin G. Soucy, Ebrahim Andideh, and Kent Chamberlin," Detection of Plasma-Induced, Nanoscale Dielectric Constant Variations in Carbon-Doped CVD Oxides by Electrostatic Force Microscopy," *Journal of Applied Physics*, 35 (2002) pg. 723-728.

Todd S. Gross, Christopher M. Prindle, Kent Chamberlin, Nazri bin Kamsah, and Yuanyan Wu, "Two-dimensional, electrostatic finite element study of tip-substrate interactions in electric force Microscopy of high-density interconnect structures," *Ultramicroscopy* Journal, 87 (2001) pg. 147-154

Kent Chamberlin, Mikhailo Seledtsov, and Petar Horvatic, "Modeling Large and Small-Scale Fading on the DPSK Datalink Channel Using a GTD Ray-Tracing Model", invited paper, Proceedings of the 2000 Applied Computational Electromagnetics Symposium, Monterey, California.

Jennifer Bernhard, Kent Chamberlin, and Chris Williamson, "A Student Perspective on an Internet-Based Synchronous Distance Learning Course Experience," *The Journal of the American Association of Engineering Education*, January 2000.

Bruce Archambeault, Kent Chamberlin, and Omar Ramahy, "EMC Modeling of Shielded Enclosures with Apertures and Attached Wires in a Real-World Environment", *Journal of the Applied Computational Electromagnetics Society*

Kent Chamberlin, "Terrain-Effect Modeling Using the Geometrical Theory of Diffraction," invited paper, *The Radio Science Bulletin*, International Union of Radio Science, March 1997.

Kent Chamberlin," An Automated Approach for Implementing GTD to Model 2-Dimensional Terrain Effects at Microwave Frequencies," *IEEE Transactions on Electromagnetic Compatibility*, February 1996

Kent Chamberlin and Lauchlan Gordon, "Modeling Good Conductors Using the Finite-Difference, Time-Domain Technique," *IEEE Transactions on Electromagnetic Compatibility*, Vol. 37, No. 2, May 1995.

Kent Chamberlin, Ken Komisarak, and Kondagunta Sivaprasad," A Method of Moments Solution to the Twisted-Pair Transmission Line", *IEEE Transactions on Electromagnetic Compatibility*, February 1995.

Kent Chamberlin," Overview of Terrain-Effect Modeling Using the Geometrical Theory of Diffraction," Invited Paper, Proceedings of the 1994 Beyond Line-of-Sight Conference, University of Texas, August 1994.

Kent Chamberlin, "Applications for Theory of Re-Radiation by Non-Linearly Terminated Antennas," Invited Paper, Proceedings of the 1993 URSI/IEEE Symposium, Kyoto, Japan.

R. Luebbers, K. Kunz, and K. Chamberlin," An FDTD Analysis of Transient Response from Non-Linearly Terminated Scatterers," *IEEE Transactions on Antennas and Propagation*, Vol. 41, no. 5, May 1993.

Chamberlin, Kent," Computer Modeling of MLS Signal Strength in The Presence of Runway Hump Shadowing," Invited Paper, Proceedings of ANTEM'92 Symposium on Antenna Technology and Applied Electromagnetics, Winnipeg, Manitoba, Canada, August, 1992.

Kent Chamberlin, Jarrett Morrow, and Raymond Luebbers," Frequency-Domain and FDTD Predictions of Harmonic Radiation by Nonlinearly-Terminated Dipole," *IEEE Transactions on Electromagnetic Compatibility*, November 1992.

Luebbers, R.J., Kunz, K.S., and Chamberlin, K.," Finite-Difference, Time-Domain Solution to the Wave Equation for Classroom Applications", *IEEE Transactions on Education*, November 1989 (Special Edition on Electromagnetics).

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Reviewed Conference Papers (abbreviated)

Minu Valayil and Kent Chamberlin, "Enhancement of Antenna Parameters of Slotted Waveguide Antennas Using Metamaterials," presented 2014 IEEE International Symposium on Antennas and Propagation

Kent Chamberlin and Daniel Carchidi, "Rapid Course Development Using OCW Resources: Applying the Inverted Classroom Model in an Electrical Engineering Course," Cambridge 2012: Innovation and Impact - Openly Collaborating to Enhance Education

Rama Rao and Kent Chamberlin, "Path Gain Measurements at 868/915 MHz for Wireless Sensor Communications in Indoor Corridors," 5th IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS), IEEE ANTS 2011, Bangalore, India

Todd Gross and Kent Chamberlin, "Low Cost, High Bandwidth, and Non-Intrusive Machining Force Measurement System," Proceedings of 2011 NSF Engineering Research and Innovation Conference, Atlanta, Georgia

Dan Brogan and Kent Chamberlin, "Comparison of Single-Frequency Monopulse Techniques that Mimic the Results of Multiple-Frequency, Single-Aperture Interferometry," 159th Meeting of the Acoustical Society of America, Baltimore, MD, April 2010

Dan Brogan and Kent Chamberlin, "Phase and Amplitude Monopulse Techniques to Increase the Accuracy of Within-Beam Bearing Estimates of Volume Scatterers," 158th Meeting of the Acoustical Society of America, October 2009, San Antonio, TX

Daniel S. Brogan and Kent A. Chamberlin, "Use of Within-Beam Mapping in Conjunction with Kalman Filtering to Improve Angle of Arrival Estimation Accuracy in Multi-beam Echo-Sounding," 158th Meeting of the Acoustical Society of America, October 2009, San Antonio, TX

Kent Chamberlin, Andrew Kun, Scott Valcourt and Benjamin McMahon," Evaluation of Data-casting in the Mobile Environment," Invited presentation, the 2008 International Wireless Communications Expo in Las Vegas, February 2008

Scott A. Valcourt, Pushpa Datla, Kent Chamberlin, Benjamin McMahon, "Information Integration for Public Safety Officers," in Proceedings of the SPIE Defense & Security Conference, Orlando, FL, March 2008.

Scott A. Valcourt, Pushpa Datla, Kent Chamberlin, Benjamin McMahon, "Using Two-Way Datacasting to Deliver Real-Time Public Safety Information," in Proceedings of the 2008 IEEE International Conference on Technologies for Homeland Security, Boston, MA, May 2008.

Kent Chamberlin, Christopher Glynn, Kondagunta Sivaprasad, "Transmission Line Axon Model for Acupuncture Therapy," Invited, presented at the 2007 North American Radio Science Meeting, Ottawa, ON, Canada.

Kent Chamberlin, Andrew Kun, Benjamin McMahon, Scott Valcourt, "Measuring Datacast Channel Characteristics for the Mobile Environment," Invited, presented at the 2007 North American Radio Science Meeting in Ottawa, ON, Canada.

Scott A. Valcourt, Kent Chamberlin, Benjamin McMahon, and Andrew Kun, "Systems Engineering of Datacasting for Public Safety Vehicles," 2007 IEEE Conference on Technologies for Homeland Security, Woburn, MA

Kent Chamberlin, Scott A. Valcourt, Benjamin McMahon and Andrew Kun, "Measurement of Propagation Effects for High-Speed, Digital UHF Channels," 2007 IEEE AP-S International Symposium on Antennas and Propagation in Honolulu, Hawaii, June 10-15, 2007

Henk Spaanenburg, Andrzej Rucinski, Kent Chamberlin, Thaddeus Kochanski and Lennart Long, "Globally-Collaborative Homeland" Security System Design," presented at and in the proceedings of the 2007 International Conference on Microelectronic Systems Education, San Diego, CA.

Kent Chamberlin, Andrew Kun, Benjamin McMahon and Scott Valcourt, "Evaluation of Data-casting in the Mobile Environment," presented at and in the proceedings of the 2007 IEEE 66th Vehicular Technology Conference, Baltimore, MD

Kent Chamberlin, Larry Brady and Raymond Luebbers, "Computer Simulation to Assess Effects of Aircraft Structures on Flight Inspection Antenna Performance," presented at and in the proceedings of the International Flight Inspection Symposium in Toulouse, France, June 2006.

Kent Chamberlin, Amalia Barrios and Josh Jenkins, "Data Collection, Analysis and Model Validation of Low-Altitude Propagation for VHF Mobile Radio," presented at the 2006 International Union of Radio Sciences (URSI) meeting in Boulder, Colorado, January 2006.

Kondagunta Sivaprasad, Kent Chamberlin and John LaCourse, "Transmission Line Axon Model for Acupuncture Therapy," International Union of Radio Science (URSI) meeting in New Delhi, India in October 2005.

Kent Chamberlin, Amalia Barrios, Kondagunta Sivaprasad and Josh Jenkins, "Data Collection, Analysis and Model Validation of Low-Altitude Propagation for VHF Mobile Radio," International Union of Radio Science (URSI) meeting in New Delhi, India in October 2005

Jason Chan, K. Sivaprasad & K. Chamberlin, "An Improved Estimation of Composite Strip-Line Losses" PIERS 2004, Pisa, Italy, March '04.

Kent Chamberlin, K. Sivaprasad and Maxim Khankin, "Measuring Small-Scale Fading at VHF Frequencies," presented at the 2004 International Union of Radio Sciences (URSI) meeting in Boulder, Colorado, January 2004.

Chan, Sathyendra, Sivaprasad, Chamberlin," Estimation of Strip-Line Losses in Printed Circuit Boards," Proceedings of the 2003 International Symposium on Antennas, Propagation, and EM Theory (ISAPE), Beijing, China

H. Sathyendra, J. Chan, K. Sivaprasad, K. Chamberlin and J. LaCourse, "Transmission Line Modeling for Acupuncture Modal Therapy," NE Bioengineering Conference, Newark, NJ, March 2003.

K. Chamberlin, M. Khankin, A. Barrios, "Progress on the Validation of Short-Distance, Ground-to-Ground Propagation Models at VHF Frequencies," USNC/CNC/URSI North American Radio Science Meeting in Columbus, Ohio, June 2003

Chamberlin, Kent, "Evolution of a Bottom-Up Distance Education Program," Proceedings of the 2002 American Society of Engineering Education Conference in Berlin, Germany

Chamberlin, Kent, "A Streamlined Approach for Collecting Signal Strength Data to Validate a Ground-To-Ground Propagation Model," presented at the International Union of Radio Scientists (URSI) meeting in Boulder, Colorado, January 2002

Barbara Dziurla-Rucinska and Kent Chamberlin, "Not so distant distance learning", Proceedings of the 6th Annual Advanced Technology Workshop ATW'98, May 19-20, 1998, Ajaccio, Corsica, France

Presentations Relating to Service on New Hampshire Commission on Wireless Radiation

Date	Presentation Details
2/24/2021	Keene City Council meeting (Zoom)
3/13/2021	Overview of New Hampshire Commission (YouTube)
4/7/2021	Interview Regarding NH Commission (YouTube)
6/16/2021	Presentation to York, Maine Board of Trustees and Citizens (Zoom)
6/24/2021	Movements of Safe Technology in North America Conference (Brazil via Zoom)
7/5/2021	Public Information Session for Pittsfield, MA (Zoom)
7/22/2022	Presentation to Environmental Working Group Administrators
7/30/2021	Radio Interview about Wireless Radiation (CKWR)
7/30/2021	Radio Interview about Wireless Radiation (WTBR)
8/17/2021	Public Information Session in York Maine (Zoom)
8/19/2021	Presentation to Lenox, MA Board of Health (Zoom)
9/3/2021	Presentation to National Call for Safe Technology (Zoom)
9/17/2021	Presentation to Mass. Public Utilities Commission on Wireless Radiation (Zoom)
9/23/2021	Public Presentation about wireless radiation at York, ME public library (in-person)
9/28/2021	Radio Interview about Wireless Radiation (Housatonic Live radio & podcast, Episode 71.7)
9/29/2021	Radio Interview about Wireless Radiation (David DeHaas radio & podcast)
10/7/2021	Podcast Interview about Wireless Radiation (John Krol)
11/3/2021	Presentation to Canadian Riding Representatives
11/9/2021	Environmental Health Trust Podcast
12/1/2021	Public Presentation about wireless radiation at Berwick, ME public library (in-person)
12/8/2021	New Hampshire Commission Setback Justification
1/13/2022	Testimony for HB1644 in NH House of Reps. Science, Technology & Energy Committee (in-person)
1/18/2022	Birmingham, MI presentation to School Board and Parents Part 1 (Zoom)
2/16/2022	Birmingham, MI presentation to School Board and Parents Part 2 (Zoom)
3/8/2022	Presentation to Stanley County, NC County Commissioners (Zoom)
3/15/2022	Testimony for HB1644 in NH House of Reps. Science, Technology & Energy Subcommittee (in-person)
3/29/2022	Radio Interview and Podcast with Green Street Radio
5/11/2022	Testimony for HB1644 in NH House of Reps. Science, Technology & Energy Subcommittee (in-person)
5/18/2022	Buckland, MA Public Hearing (Zoom)
6/1/2022	White Plains, NY City Council & Citizens
7/22/2022	Environmental Working Group (Uloma Uche, Olga Naidenko, Tasha Stoiber)

10/19/2022 Oley Township, PA Board of Supervisors and Citizens

10/25/2022 White Plains, NY 5G: An Undeniable Risk (my part at 16:30)

11/17/2022 Lenox, MA forum with Scott, Theodora, me and Andy Molner

1/25/2023 Queens, NY Community Board #1

3/30/2023 Let's Connect- Expert Forum hosted by Pittsfield & Wyandotte Communities

4/6/2023 Presentation to Hartford Health Director (Liany Arroyo) and Hispanic Community Leaders

4/12/2023 Presentation to Dr. Jeffery Robinson and Faculty of the Paul Robeson Malcolm X Academy

4/14/2023 Presentation to concerned parents of students at Starkey Ranch School

5/16/2023 Commissioner Mariano and Legal Team: they decide on permit for tower on Starkey Ranch School

6/12/2023 European Tour: Bexhill by Sea

6/13/2023 European Tour: Wimbledon

6/14/2023 European Tour: Royal Society of Medicine

6/15/2023 European Tour: Oxford, UK

6/17/2023 IEEE TC95 Meeting Presentation in Newbury, UK

6/17/2023 European Tour: Belgium-Rièze; Europeans for Safe Connections

6/18/2023 European Tour: York, UK

6/23/2023 European Tour: Interview with Stichting EHS group in Amsterdam

6/27/2023 Presentation to The Netherlands Knowledge Platform for Charging Infrastructure

8/18/2023 Interview at Conway Daily Sun

9/26/2023 Turning Down the Dial on Wireless Radiation in NC's Schools

10/18/2023 Stamford, CT Land-Use Commission of the Board of Representatives

11/15/2023 North Conway, NH Pope Memorial Library

1/18/2024 Green Street Radio Interview about OneName Project with Ruth Moss

1/29/2024 Presentation to Williamson County, TN Commission

2/15/2024 Testimony for Wanaque County, NJ Planning Board

3/5/2024 Hawaii Dept. of Education, Michael Otsuji

5/14/2024 National Spectrum Managers Association (NSMA)

5/21/2024 The Wave Forward Podcast with Michaela Z

5/30/2024 Environment + Energy Podcast/Vodcast Series with Jessica Hunt

6/4/2024 Presentations at Yale Symposium

6/12/2024 Presentation to Pittsfield, MA City Council in recognition of EMS Day Proclamation

6/12/2024 Interview on Channel 8 regarding proposed cell tower in Carlsbad, CA

7/5/2024 Presentation regarding smart meters with Paul Héroux

8/8/2024 Presentation to Administrators of the Village of Egg Harbor, WI

9/29/2024 Brief video to Ithaca, NY Planning Board

10/7/2024 Presentation to St. Catherine of Siena Elementary School Community, Manchester, NH

2/8/2025 Presentation arranged by Jensen Silvas, Streetsboro, Ohio

2/13/2025 In-person presentation to La Jolla, CA community

3/14/2025 Barcelona Medical Conference: II Congress of Medicine and Environmental Health

4/14/2025 Corona del Mar CA HoA

4/16/2025 The Real Truth About Health Webinar

4/18/2025 Greenfield MA ZBA with focus on engineering questions

4/21/2025 Renmin Hospital of Wuhan University
 4/22/2025 Tongji Medical College, HURST Symposium on Digital Health and Health Policy
 4/23/2025 Wuhan University

Administrative, Committee, and Outreach Experience

Organizing Committee for the OneName Project (Fall 2023- present): This group was formed in an effort to determine a single name to represent what is currently known as ElectromagneticHyperSensitivity (EHS). Presently, there are multiple names used to describe EHS, and this multiplicity poses a challenge when advocating for those with the affliction.

New Hampshire State Commission HB522 5G (August 2019-November 2020): This commission was convened to evaluate how the State should respond to potential health impacts associated with the rollout of 5G communications. I was appointed to this commission by the USNH Chancellor.

URC/ISE Planning Committee (Co-Chair, AY13-18): College committee charged with planning the logistics of the UNH Undergraduate Research Conference

URC/ISE Steering Committee (AY13): University committee addresses conference details from a university perspective

University Research and Engagement Academy Proposal Selection Committee (AY12-Present): University committee charged with selecting inductees into the Academy based upon their research proposals.

ECE Technician Search Committee (Chair, AY13): This departmental committee worked with HR to define the position and then successfully fill it.

UNH Disclosure Review Committee (AY99-02 and AY13-18): This university committee meets on a regular basis to determine whether relationships identified by proposal submitters constitute a conflict of interest according to university rules.

ECE Department Graduate Committee (Chair for over 15 years until AY14): Performed regular duties of graduate coordinator for ECE Masters and Doctoral programs, plus dealing with a program review and the addition of a non-thesis Master's option.

Search Committee for Electrical Engineering Technology Faculty Member at UNH Manchester (AY 13)

Advanced Manufacturing Cluster Hiring in Statistics Committee (AY2013): This committee was convened to ensure continuity and coordination in the Advanced Manufacturing cluster hire.

ad-hoc Committee on Promotion and Tenure Standards (AY13-17): This committee was formed by the Faculty Senate to look at issues that have arisen over the years relating to P&T. I was elected by the college to serve.

Faculty Activity Reporting Working Group (AY13): I was appointed by the Faculty Senate to monitor the process by which the FAR is being evaluated and revised.

CEPS e-Learning Committee (AY12 (Chair)): The mission of this committee is to determine next steps necessary to move forward with online programs, with findings documented in a final report.

eUNH Working Group (AY12): This group is advisory to the eUNH Steering Committee and was involved with tasks such as evaluating proposals submitted by outside vendors interested in partnering with UNH on online initiatives.

CEPS Curriculum and Academic Planning Committee (AY12):

College Promotion and Tenure Committee (AY01-03 and AY010-11(Chair)): The work of this time-consuming committee was complicated by unclear guidelines involving research faculty. Efforts outside of normal P&T Committee duties took place to help clarify those guidelines.

Faculty Senate Research and Public Service committee (AY11, Chair): This committee responded to all of the eight charges assigned to us.

President's Panel on Internationalization (AY11): I served on this panel as the representative of the Faculty Senate.

UNH Research Council (AY11): I served on this committee because of my role as Chair of the Faculty Senate Research & Public Service Committee

Sustainability Dual Major Leadership Team (summer-fall 2012): the goal of our team is to create a dual major in Sustainability that can be taken by all undergraduates at UNH.

Search Committee for Computer Science- Engineering Technology Faculty Member at UNH Manchester (AY10)

New Markets Working Group of the Strategic Planning Committee (Spring 09): as its name implies, this working group was charged with identifying new revenue streams for UNH.

CEPS Graduate Scholarship Committee (AY07- 09): this committee awards college scholarships to graduate students, including summer stipends and one-year fellowships that are used as a recruitment tool for outstanding applicants.

Faculty Moderator for the College of Engineering and Physical Sciences (AY08-09): this elected position entails the responsibility for conducting all college wide meetings and elections. The moderator works closely with the Dean's Office to help ensure that governance is carried out efficiently and according to policy.

Faculty Fellow for Distributed and Distance Education (AY03-04): the primary goal of this position, which received 50% support by the Provost's office, was to identify and articulate a University Vision on distance education. Duties included convening a working group to represent constituencies across campus in addition to meeting with individuals both on and off campus to obtain information and insights germane to distance education and e-learning in general.

Duties also included taking the lead on writing a proposal to consolidate distance learning at the University of New Hampshire. The proposal was submitted to the governing body overseeing state-funded higher education (USNH), and it laid out a plan for the partnering of all state organizations involved with distance education. This proposal was not endorsed by USNH.

University of New Hampshire Outreach Scholars Program (AY05): The Outreach Scholars Program is a faculty development initiative specifically designed to advance the University's academic strategic plan with a specific focus on outreach scholarship and engagement. The goals of this program include the development of mutually beneficial collaborative partnerships between faculty, extension educators, staff (New Hampshire Public Television, Office of Outreach Education), students and external partners with a specific focus on outreach scholarship and engagement.

Board of Trustees for the Great Bay Charter School (2003- 2013): This charter school, which began in Fall 2005) is affiliated with the Exeter School district and was initially targeted towards high-school students at risk. As such, emphasis is placed on project-based learning and electronically mediated learning. In addition to the normal functions performed by a Board of Trustees, the Great Bay Board provides oversight on the appropriate uses of technology in teaching. Experience with this type of education has shown that its positive effect is not limited only to students at risk.

Chair, Virtual Learning Academy Charter School (VLACS) Board of Trustees (January 2008-present): VLACS is a state-run, online charter school that provides an alternate means for New Hampshire junior high and high school students to obtain credits towards graduation. Major challenges for the Board have been to scale for rapidly increasing demand as well as to contend with a changing political/funding landscape.

Division of Continuing Education (DCE) Strategic Planning Group (AY04): This group of administrators, faculty and DCE staff met regularly throughout the year to develop a plan to reduce and redefine the scope of DCE so that it would be sustainable. That plan realigned the three main programmatic areas of DCE (Noncredit Programming and Marketing, Professional Development and Training, and Interhostel and Familyhostel) with other UNH entities in order to capitalize on synergies and best use limited resources.

New Hampshire Technology Council (AY04-05): The Council was an advisory group to the NH Department of Education regarding implementation of the State Educational Technology Plan. This assistance to the Department's Office of Educational Technology included developing policy guidelines to foster effective statewide technology integration, pursuing funding opportunities, designing infrastructure, identifying and disseminating information and resources, enlisting private sector support, and evaluating progress toward the vision of effective technology integration.

Seacoast Professional Development Center (SPDC) Advisory Board (Fall 02-10): the SPDC was created with funds from the *No Child Left Behind* grant, and the purpose of the center is to provide schoolteachers in the Seacoast region with training that will enable them to perform their jobs more effectively. The major duties of the Advisory Board are to evaluate assessment data on ongoing efforts and to make recommendations regarding future initiatives.

Faculty Instructional Technology Development Grant Committee (AY00-05): The primary responsibility of this committee was to evaluate proposals submitted to the grant program, which focuses on improving student learning experiences through the use of information technology.

Task Force on the Undergraduate Experience (AY02-03): This task force was charged with exploring ways to improve the undergraduate experience, particularly in the freshman year. The objective of the committee was to make recommendations about how the experience could be

improved, and measures that should be undertaken to bring about those improvements. A conclusion reached by the task force in its first year was that the freshman year experience could be enhanced by a series of inquiry courses. In an effort to bring these courses to fruition, the task force worked on defining those courses, including budgetary information, during its second year. After obtaining a go-ahead from the Provost office, requests for proposals for inquiry courses were distributed. Upon receiving the proposals, the task force evaluated them and made recommendations as to which one should be adopted.

Task Force on Network Security (Chair AY02): The purpose of the task force was to provide guidance to the President in shaping a policy that balances privacy with the need to increase network security. The result of Task Force efforts, performed in conjunction with the Faculty Senate, was a report that outlines acceptable boundaries between security and privacy.

Academic Computing Advisory Committee (Chair, AY00-02): This committee was advisory to the President and Provost and focused on the centrality of computing to UNH's teaching, research and public service missions. The committee represented all parts of the community and included faculty representatives from each college, including UNHM. The committee was charged with the development of short-term goals and long-range plans for academic and research computing at UNH, including all aspects of instructional and informational technology. The responsibility of the Chair of this committee was to facilitate liaison between university administration, faculty, and students on issues relating to the use of technology, and then to garner consensus on technology policy within the formal committee. The recommendations of this committee were and are used to determine how technology funds are spent on campus.

Faculty Fellow in CEPS to Direct a Distance Learning Pilot Program (Fall 97- Present (unofficial)): This position, which initially included release time support, entails all aspects of the execution of pilot courses over the Internet. The duties associated with this position include:

- The selection and purchase of course delivery hardware and software
- Working with CIS support staff to maintain software and equipment
- Developing courseware for remote course delivery
- Providing training and support for other participating faculty
- Marketing distance education courses
- Writing proposals to obtain outside funding for distance education initiatives. Funding obtained from one such proposal enabled the development of a classroom that is being used for simultaneous delivery to on-campus and off-campus students.
- Writing a strategic plan for CEPS use of distance education

New Hampshire Distance Learning Commission (appointed by Governor Shaheen in September 1999): This commission was charged with coordinating and promoting distance education initiatives throughout the state. The commission met regularly to identify means for working with industries, businesses and schools to make distance education an affordable reality in New Hampshire. There were fifteen other members of this commission, representing constituencies ranging from industry and business to government agencies and schools.

College Entrepreneurial Campus Committee (Fall 96- Spring 98): This committee acted as a steering committee in the planning of a UNH-affiliated enterprise facility on campus. This committee was comprised of two Deans, the Vice President for Research, the Directors of Research Computing and the Industrial Research Center, the Executive Director of Pease Development, and six faculty members. This committee established and coordinated the efforts of three subcommittees.

College Academic/Industry Alliance Subcommittee of the Entrepreneurial Campus Committee (Fall 96- Spring 98): The charge of this subcommittee was to look at the nature of University faculty, staff, and student involvement with the Entrepreneurial Campus. This committee was comprised of five faculty members and one Dean. Its primary mission was to develop criteria for academic and industrial alliances that would ensure success in a research-based economic development program.

College Facilities Subcommittee of the Entrepreneurial Campus Committee (Fall 1996- Spring 98): The charge of this subcommittee was to estimate the nature and size of the space that would be needed in the envisioned Entrepreneurial Campus. One facet of the subcommittee's work was to assess the space needs in each of the CEPS departments.

Coach and Advisor for the UNH Karate Club (AY88 through AY00 except for sabbatical year): Coaching responsibilities entailed teaching one or two classes per week, as well as participating in tournament judging and belt testing. Advising duties included maintaining class rosters, promotion records, travel arrangements, finances in addition to overseeing routine club activities and budgets.

University Distance Education Committee (AY97-98 through AY99-00): This committee was concerned with distance learning from a university-wide perspective. The committee explored ways in which the University might better serve the State by offering different education delivery methods. This committee became a subcommittee of the Academic Computing Advisory Committee.

Special Commission on the Budget Deficit (Fall 1995): Because of uncertainty regarding the magnitude of the projected budget deficit in fiscal year 97, the former Chairs of the Academic Senate Budget and Planning Committee were convened in the Fall semester to target the amount of that deficit. The primary duties of Commission members were to analyze the budget, contact individuals throughout the University to assess the expected shortfall in their particular areas, and then to aid in writing the final report that was presented to the University community.

College Freshman Calculus Committee (AY96): Reports of poor performance in follow-on courses, and concerns regarding retention, prompted a reevaluation of the manner in which freshman calculus was taught at UNH. The freshman calculus committee explored a variety of options and made recommendations that led to the creation of the Studio Physics/Calculus course as well as other changes.

University Budget and Planning Committee (Spring 89- Spring 93; Chair AY 92-93): The Budget and Planning Committee was formed by the Academic Senate to provide oversight of the University budget and to make recommendations regarding University planning issues. Gaining information regarding the budget in sufficient depth to make meaningful recommendations was achieved through frequent meetings with Trustees, the President and Vice-Presidents, Deans, and

other constituencies. Committee recommendations were disseminated to the University community through open forums and regular presentations in the Academic Senate. Committee members, particularly the Chair, participated in a wide range of university committees, as documented below.

Space Allocation/R&R Committee (non-voting member AY92-93): This committee, which was comprised of the University Vice-Presidents, was charged with making final decisions regarding all building initiatives, swing space, space allocation, renovations, leases, handicap access, and toxic waste.

UNH Planning Council (Fall 91- Spring 93): Formerly the Task Force on the Reallocation of Resources, this council included the full complement of Vice President and Academic Deans, and was tasked with providing both short and long-range visions for the University. Those visions translated into recommendations for the distribution of funds on campus, and it was formed by in-depth analyses of every department, both academic and non-academic, on campus.

President's Cabinet (AY 92): The eighteen-member President's Cabinet met weekly to discuss issues of general interest to the University Community. The issues discussed ranged from the volume of the bells in Thompson Hall, to diversity, to University policy. The objective of the cabinet was to serve as a focus group for then-President Dale Nitzschke.

Academic/Faculty Senate (AY92-93 and AY10-11): Served as representative of the Electrical & Computer Engineering Department and Chair of the Budget & Planning Committee.

Accreditation Steering Committee (AY92-93): This group provided guidance in the generation of the documents supporting UNH's ten-year accreditation effort. This steering committee established task forces to address each of the major topics relating to accreditation, and then combined the reports from those task forces into a single document. Accreditation was awarded as a result of the report.

Accreditation Task Force for Standard Two, Planning and Evaluation (Chair): It was the responsibility of this task force to write the part of the accreditation self-study that dealt with the university's progress in planning and evaluation since the last accreditation effort. This part of the report described planning and evaluation as it pertained to coping with budget rescission, academic programs, finance, and the physical plant.

Accreditation Task Force for Standard Nine, Financial Resources: This task force was responsible for writing the part of the accreditation self-study that dealt with financial resources, stability, reporting, and planning. The task force was chaired by the Vice President for Finance.

Faculty Observer: Trustees' Academic Affairs Committee (AY92-93): This trustee committee has the responsibility to approve or deny changes in any academic programs, to evaluate class access, to provide honorary degrees, and to look at promotion and tenure issues.

Task Force on the Reallocation of Resources (Spring 89- Spring 91): This task force was initiated by the Budget and Planning Committee and was put in place by the President to define a plan for addressing the budget deficits. This 13-member committee (which included five faculty, two Deans, one PAT, and five administrators) was charged with evaluating every department and office on campus, both academic and nonacademic, and then making recommendation as to the amount of cuts each could sustain while minimizing the negative impact to the University as a whole.

Department Industrial Associates Program (IAP): Committee (regular participant and presenter): The IAP offers a means by which local industry can advise and support the Department of Electrical & Computer Engineering. The IAP committee provides liaison with the participating companies and organizes the annual meeting.

University Advising Center Advisor (AY88- 89): The UAC is set up primarily to advise undeclared students across campus, and to give them insights into particular majors. The UAC serves many students who have been readmitted to UNH after having been removed due to poor academic performance.