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To: BB&K Clients and Other Interested Parties

From: Gerard L. Lederer
James R. Hobson
Matthew K. Schettenhelm

Date: October 24, 2014

Re: FCC Adopts New Wireless-Service-Facility Rules

This memorandum summarizes a Report and Order, FCC 14-153 ("Wireless Infrastructure Order" or "Order") of the Federal Communications Commission ("FCC") that both modifies the rules that govern the agency's own review of wireless facilities, and adopts new rules to limit how State and local governments may review these facilities. To comply with the FCC's new rules, many local governments will need to modify their ordinances and adjust their practices. Local governments that disagree with the FCC's rules may also file for reconsideration or file an appeal in federal court. We will be working with a number of communities on these issues, and, if possible, will develop collaborative efforts on reconsideration, appeal, and ordinance-revision efforts. Please contact us with any questions about these issues. We will also be hosting a webinar to discuss the Order and next steps in detail on November 4th.

We first address the FCC's new rules concerning the practices of States and local governments under headings V and VI (which match the headings in the Commission's order). In these sections, the Commission:

- interpreted and implemented the "collocation" provisions of Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012; and

- clarified and extended a declaratory ruling of 2009 applying to Section 332(c)(7)(B)(ii) and (v) of the Communications Act.

We then summarize the FCC's rules concerning its own review of wireless facilities under headings III and IV below. The Commission:

- adopted new or modified rules for environmental and historic preservation review of small wireless facilities, including Distributed Antenna Systems ("DAS"); and

- codified an exception to advance notice of the placement of temporary towers under the Antenna Structure Regulation ("ASR") requirements.

V. Implementation of Section 6409(a).

The FCC adopts new rules that govern how a State or local government may regulate requests to modify existing wireless towers and base stations. The rules pose a number of serious problems. We analyze each section below.

The FCC implements Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, 47 U.S.C. § 1455(a), which reads:

> a) Facility modifications.
>
> (1) In general. Notwithstanding section 704 of the Telecommunications Act of 1996 (Public Law 104-104) or any other provision of law, a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.
>
> (2) Eligible facilities request. For purposes of this subsection, the term "eligible facilities request" means any request for modification of an existing wireless tower or base station that involves--
>
> (A) collocation of new transmission equipment;
>
> (B) removal of transmission equipment; or
>
> (C) replacement of transmission equipment.
>
> (3) Applicability of environmental laws. Nothing in paragraph (1) shall be construed to relieve the Commission from the requirements of the National Historic Preservation Act or the National Environmental Policy Act of 1969.

1. Definition of Terms in Section 6409(a)[1]

a. Scope of Covered Services[2]

The Commission determined that Section 6409(a) applies to facilities used in connection with "any Commission-authorized wireless communications service." This includes broadcast facilities. The Commission rejected local governments' view that the statute is best read to apply only to personal wireless service and public-safety communications.

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[1] Order ¶145.
[2] Order ¶146.

Analysis: The FCC's determination will ensure that Section 6409(a) and the Commission's rules apply broadly. Providers will be able to use Section 6409(a) to modify a facility regardless of the service it provides. This differs from 47 U.S.C. § 332(c)(7), which applies only to "personal wireless service" facilities.

b. Transmission Equipment[3]

The FCC defines "transmission equipment" broadly as equipment that facilitates transmission of any Commission-authorized wireless service. It includes, but is not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, and regular and backup power supply.

Analysis: The rule will allow providers to use Section 6409(a)'s approval process to collocate, remove, and replace a broad array of equipment. Local governments should note that the definition applies not just to antennas, but also to fiber, and to regular and backup-power supplies. Local governments had argued that backup-power supplies are not "transmission equipment" because they do not transmit communications. The FCC rejected that view.

c. Existing Wireless Tower or Base Station[4]

The FCC defines "tower" narrowly as "[a]ny structure built for the sole or primary purpose" of supporting any Commission-licensed or authorized antennas and their associated facilities. It defines "base station" broadly to include not only the equipment that communicates with user equipment (regardless of the technological configuration, and encompassing DAS and small cells), but also the "structure" that supports or houses that equipment. The Commission clarified, however, that a structure would qualify as an existing "base station" only if at the time of the application, the structure already supports or houses communications equipment. Other structures that do not host communications equipment are not "base stations." The Commission also clarified that to qualify as a "base station," the facility must have been "approved under the applicable zoning or siting process" or have "received another form of affirmative State or local regulatory approval," such as an authorization from state PUC.

Analysis: The definition of "tower" is a small victory for local governments. Its "primary" purpose must be to host antennas. This would exclude utility poles, light poles, and water towers. Note, however, that the term is not limited to traditional cell towers. For example, if a DAS provider placed a pole solely to host its facilities, the pole would constitute a tower.

The Commission's "base station" definition, however, is a disappointment. On the positive side, the definition is not so broad as to include any structure that *might* host a wireless-service facility. It also does not extend to structures that host facilities without proper state or local approval. It follows that unless a local government chooses not to subject wireless facilities in

[3] Order ¶155.
[4] Order ¶161.

certain areas to zoning review, it may review every facility that hosts wireless equipment through a full zoning process at least once (unless the facility has a state approval).

But the good news ends there. Local governments have already approved many wireless facilities. Under the FCC's approach, *all* those facilities are "base stations," subject to Section 6409(a)'s approval process, which requires approval unless the modification is a "substantial change." Likewise, going forward, any wireless equipment that the local government approves is also a "base station" and therefore subject to the Section 6409(a) process. Local governments had argued that Congress intended Section 6409(a)'s process to apply to a much smaller class of facilities. We argued that a "base station" means either: (i) only communications equipment *at* a "wireless tower"; or (ii) if communications equipment can be distinct from a tower, only communications equipment, not the underlying structure that supports it. The Commission's approach rejects both. Couple with the FCC's approach to "substantially change the physical dimensions" discussed later, the broad definition of "base station" makes it more difficult for local governments to approve any wireless facility, because it can be modified later through the streamlined Section 6409(a) process.

d. Collocation, Replacement, Removal, Modification[5]

The FCC then addressed what modifications Section 6409(a) permits a provider to make to a "wireless tower" or "base station." The Commission ruled that "collocation" includes the *first* placement of transmission equipment on a "wireless tower" or "base station." This differs from local governments' view that "collocation" occurs only if the tower or base station already hosts other equipment with which the new equipment would be *co*-located. (This is effectively the result for modifications to "base stations," but that is not because of the "collocation" definition but because the FCC defined "base station" to include only those structures that already host wireless equipment.) The FCC also found that if the collocation, replacement, or removal of transmission equipment makes structural enhancements to (i.e., "hardening" of) the wireless tower or base station "necessary," Section 6409(a) applies to that hardening activity. The Commission ruled that Section 6409(a) does not permit a provider to replace the structure on which the equipment is located.

Analysis: The FCC's "collocation" definition will extend Section 6409(a)'s approval process only slightly, to requests to modify "towers" that do not currently host any wireless equipment. Its approach to "hardening" of the underlying "tower" or "base station" is likely acceptable, because it is only permitted in cases where it is "necessary"—although local governments and industry may find that they dispute what changes qualify. And the Commission's finding that total replacement of the underlying structure falls outside of Section 6409(a) is a positive. Local governments may continue to apply their standard procedures to such requests.

[5] Order ¶176.

e. Substantial Change and Other Conditions and Limitations[6]

The FCC then turned to defining "substantially change the physical dimensions" of a tower or base station. The Commission adopted an "objective standard." Under its rule, a modification substantially changes the physical dimensions of a wireless tower or base station if it meets any of the following criteria:

(i) Increases in Height

(i) for towers other than towers in the public rights-of-way:

a. it increases the height of the tower by:

i. more than 10% or

ii. the height of one additional antenna array with separation from the nearest existing antenna not to exceed 20 feet, whichever is greater;

(ii) for other eligible support structures:

a. it increases the height of the structure by:

i. more than 10% or

ii. more than **10 feet**, whichever is greater.

The baselines to measure changes in height are:

- *for deployments that are or will be separated horizontally*: measured from the original support structure;
- *for all others*: measured from the dimensions of the tower or base station, inclusive of originally approved appurtenances and any modifications that were approved prior to February 22, 2012, the date that Congress passed Section 6409(a).

(ii) Increases in Width

(i) for towers other than towers in the public rights-of-way:

a. it involves adding an appurtenance to the body of the tower that would protrude from the edge of the tower

i. more than **20 feet**, or

[6] Order ¶182.

ii. more than the width of the tower structure at the level of the appurtenance, whichever is greater;

(ii) for other eligible support structures:

a. it involves adding an appurtenance to the body of the structure that would protrude from the edge of the structure by more than **6 feet**;

(iii) Additional Equipment Cabinets

(i) for any eligible support structure:

a. it involves installation of more than the standard number of new equipment cabinets for the technology involved, but **not to exceed four cabinets**; or,

(ii) for towers in the public rights-of-way and base stations,

a. it involves installation of **any new equipment cabinets** on the ground if there are no pre-existing ground cabinets associated with the structure, or else involves installation of ground cabinets that are more than 10% larger in height or overall volume than any other ground cabinets associated with the structure;

(iv) Excavation/Deployment Beyond Site

(i) it entails "any excavation or deployment outside the current site."

a. The Commission defines "site" as:

i. For towers other than towers in the public rights-of-way,

1. the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site, and,

ii. for other eligible support structures,

1. further restricted to that area in proximity to the structure and to other transmission equipment already deployed on the ground.

(v) Concealment Elements

A modification is a substantial change if it would "defeat the concealment elements of" the wireless tower or base station.

(vi) Other Conditions on the Wireless Tower or Base Station

A modification is also a substantial change if it does not comply with conditions—other than those conditions related to height, width, equipment cabinets, excavation/deployment, or concealment elements—associated with the siting approval of the construction or modification of the eligible support structure or base station equipment.

* * *

The FCC also ruled that facility modification remains subject to "building codes and other non-discretionary structural and safety codes." Specifically, local governments may require a covered request "to comply with generally applicable building, structural, electrical, and safety codes or with other laws codifying objective standards reasonably related to health and safety."

Analysis: The FCC's definition of "substantially change the physical dimensions" is a missed opportunity and a major disappointment. Local governments had argued that the Commission's standard must consider modification requests in context. They argued, for example, that if a 1-foot extension would reach into a street or sidewalk, it would constitute a "substantial change in physical dimensions" even though it may be a physically small change. They also argued that the FCC could not adopt fixed definitions because the statute looks to whether the particular facility in question (which may be very small) changes "substantially." They further argued that local governments should be able to establish what later modifications to a particular site would be "substantial." Local governments claimed that only this approach would not discourage them from granting initial approvals that might change in unexpected and problematic ways later.

The FCC elected to stick with what it called a test based on "specific, objective" factors. Under its standard, a provider may automatically extend any "base station" (any utility pole, light pole, building, or other structure that currently hosts wireless equipment) 10 feet in height and 6 feet in width, provided that it also matches any concealment elements. Local governments must now expect that any 10-foot-tall wireless facility that they have already approved or will approve may automatically become a 20-foot facility.

The FCC also effectively declined to allow local governments to use conditions to establish, site-by-site, what later height, width, and cabinet-addition modifications to a particular tower or base station would be "substantial." Under the FCC's approach, inconsistency with a local condition would constitute a "substantial change" only if the condition does not conflict with the Commission's approach to height, width, cabinets, etc. The FCC noted examples of local conditions that might be relevant to the substantial-change analysis as including conditions related to "fencing, access to the site, [and] drainage."

There are some positives. The FCC's recognition that any modification that would "defeat the concealment elements of" a wireless tower or base station qualifies as a "substantial change" is an important step. The FCC does not clarify, however, how formally a local government must

establish "concealments elements" or what modifications would cause those elements to be "defeated." This could lead to disputes. Another positive change is the Commission's approach to equipment cabinets associated with right-of-way towers and base stations. The Commission properly recognized that if there is no current equipment cabinet associated with the structure, a provider's request to add a cabinet would constitute a "substantial change." And the FCC properly recognized that local governments may apply health and safety codes.

2. Application Review Process, Including Timeframe for Review[7]

The FCC ruled that a local government may require a party seeking approval under Section 6409(a) to submit an application so that the local government can determine whether its request is covered by the statute. The FCC clarified, however, that a local government may require only that documentation that is reasonably related to determining whether the request falls under the statute. A local government may not require documentation "proving the need for the proposed modification or presenting the business case for it."

The FCC established that a local government must act on a Section 6409(a) request within 60 days. That period may be tolled by the parties' agreement or if the local government notifies the applicant within 30 days that specific information in the application is incomplete. After the applicant makes a supplemental filing, the local government then has an additional 10-days to notify the applicant that the application remains incomplete because the specific information that the local government had identified remains incomplete (the local government may not toll the 60-day clock by notifying the applicant of other missing information). The FCC also clarified that its 60-day clock runs regardless of local moratoria.

Analysis: The FCC's 60-day period is shorter than the FCC's previously established 90-day shot clock for collocations of personal-wireless-service facilities. It could put local-government staff under considerable pressure. In addition, the FCC's statement that local governments may not adopt moratoria underscores that local governments should act promptly to revise their ordinances.

3. Remedies[8]

The FCC finds that because Section 6409(a) states that a local government "may not deny, and shall approve" a qualifying request, a local government must act either to approve or deny an application within the 60-day period. If the local government fails to take any action during that period, the request is deemed granted at the time the applicant notifies the local government of the deemed grant in writing. The FCC explains that a local government may challenge a deemed grant in court "when it believes the underlying application did not meet the criteria in Section 6409(a) for mandatory approval, would not comply with apply with applicable building codes or

[7] Order ¶205.
[8] Order ¶222.

other non-discretionary structural and safety codes, or for other reasons is not appropriately 'deemed granted.'" The FCC indicates that it will not be involved in adjudicating disputes.

Analysis: The FCC does not seriously address the constitutional concerns with a federal agency deeming, by rule, that a local government has granted a regulatory approval that it has not. Local governments continue to have a serious argument that the rules violates the Tenth Amendment. And even if the Constitution permits such a rule, it's not clear that Section 6409(a) does. Section 6409(a) requires that a local government "may not deny, and shall approve" a covered request. The FCC's rule would, in some cases, declare that a local government has approved a request that falls outside the statute. The remedy is difficult to square with the FCC's earlier statement that "only requests that do in fact meet the provision's requirements are entitled to mandatory approval."

4. Non-application to States or Municipalities in Their Proprietary Capacities[9]

The FCC explained that Section 6409(a) and its rules do not apply when local governments act in a proprietary capacity, *i.e.,* when they enter into lease and license agreements to allow parties to place antennas and other wireless service facilities on local-government property.

Analysis: The FCC's approach is consistent with its proposal in the Notice of Proposed Rulemaking. Given that the record reflected near unanimity on this point, any other conclusion would have been a surprise.

5. Effective Date[10]

The FCC decided that because local governments "may need time to make modifications to their laws and procedures" to conform with the order, the rules would not take effect until 90 days after Federal Register publication.

Analysis: Local governments should consider acting promptly to update ordinances.

VI. SECTION 332(C)(7) AND THE 2009 DECLARATORY RULING[11]

1. Completeness of Applications[12]

The FCC clarified that its Section 332(c)(7) shot clock begins to run "when an application is first submitted, not when it is deemed complete." It also clarified that after an applicant responds to an incompleteness notice, a local government may then only toll the shot clock if it notifies the applicant within 10 days that the request information remains incomplete. The local government

[9] Order ¶237.
[10] Order ¶241.
[11] Order ¶243.
[12] Order ¶254.

must "specify the code provision, ordinance, application instruction, or otherwise publically-stated procedures that require the information to be submitted."

Analysis: This procedure tracks that which the Commission established for Section 6409(a).

2. Moratoria[13]

The FCC ruled that its Section 332(c)(7) shot clocks run "regardless of any moratorium." The FCC said that it finds "no reason to conclude that the need for [changes in codes] should freeze all applications." The agency noted that a local government would have an opportunity to justify any delays in court. It declined to rule that moratoria of particular length are *per se* unreasonable, indicating that courts can resolve such disputes.

Analysis: Local moratoria have always been risky; the FCC's guidance here heightens that risk.

3. Application to DAS and Small Cells[14]

The FCC clarified that "to the extent DAS or small-cell facilities, including third-party facilities such as neutral host DAS deployments, are or will be for the provision of personal wireless services," their applications are subject to the Section 332(c)(7) shot clocks. The FCC declined to create a longer shot clock for these facilities.

Analysis: Local governments should process DAS and small-cell deployments that will be used for the provision of personal wireless service facilities no differently than other wireless facility requests under Section 332(c)(7).

4. Definition of Collocation[15]

The FCC declined to apply its new definition of "collocation" under Section 6409(a) to define "collocation" under Section 332(c)(7). For purposes of Section 332(c)(7), a "collocation" will continue to be a request to place an antenna on an existing structure that does not lead to a "substantial increase in . . . size." For purposes of Section 6409(a), a "collocation" remains a collocation even if it would substantially increase the size of the underlying facility.

Analysis: This preserves the status quo under Section 332(c)(7). It highlights that local governments must take care to distinguish Section 6409(a) and other applications.

[13] Order ¶263.
[14] Order ¶268.
[15] Order ¶273.

5. Preferences for Deployments on Municipal Property[16]

The FCC declined PCIA's invitation that it rule that a local government's preferences for siting on local-government property violate Section 332(c)(7). The FCC found insufficient evidence in the record to support a rule.

Analysis: The FCC elected to leave the issue to the courts.

6. Remedies[17]

The FCC declined to adopt a "deemed granted" remedy under Section 332(c)(7). However, it indicated that when a local government fails to act within its shot clocks and there is no compelling need for additional time, courts should treat such circumstances "as significant factors weighing in favor" of injunctive relief.

Analysis: This preserves the status quo.

III. NEPA and NHPA Review of Small Wireless Facilities

As with other federal agencies, the FCC is obliged to carry out the provisions of the National Environmental Policy Act ("NEPA"), 42 U.S.C.§§ 4321 et seq., and the National Historic Preservation Act ("NHPA"), 16 U.S.C.§ 470f. Examples of FCC rules carrying out these obligations may be found at 47 C.F.R.§ 1.1307 and the related Section 1.1306 dealing with "categorical exclusions" from Section 1.1307. In the Order, the FCC is chiefly concerned with extending these exclusions to encourage installation of wireless cells and systems considered "small" and thus unlikely to have significant environmental or historical preservation impact.

<u>However, none of these exclusions, new or old, is immune from FCC review for environmental assessment ("EA") under Section 1.1307(c) and (d), on complaint or on the FCC's own motion.</u>

NEPA Categorical Exclusions

ANTENNAS . At Note 1 of Section 1.1306, the current exclusion refers to antennas mounted on existing buildings or antenna towers. The FCC asked what was to be included besides the antennas themselves.

- Answer: All on-site equipment associated with the antennas, "including transceivers, cables, wiring, converters, power supplies, equipment cabinets and other comparable equipment."

What about building interiors?

[16] Order ¶278.
[17] Order ¶281.

- Answer: Mounting an antenna "on" a building is the same as installing it "in" the building, unless the building is entitled to historic preservation as elsewhere defined.

  How about other structures, such as utility poles and water towers?

- Answer: The exemption should extend to "other man-made structures" unless barred under historic preservation considerations at Section 1.1307(a)(4).

  RIGHTS OF WAY New categorical exclusion (Section 1.1306, Note 4) for placements above-ground in utility and communications rights of way, but only if:

  1. ROW is so designated by government or tribe; and

  2. in active use for the designated purpose; and

  3. no substantial increase in size compared to structures already in ROW in the same vicinity, "substantial increase" meaning:

     - Exceeds height of existing support structures in vicinity by more than 10% or 20 feet, whichever is greater; or

     - Adds more than four new equipment cabinets or more than one new equipment shelter; or

     - Involves a new appurtenance protruding from the edge of the structure by more than 20 feet or more than the width of the structure at the level of the appurtenance, whichever is greater (except for weather protection or cable connection); or

     - Involves construction "outside the site," as defined (e.g. Order, ¶ 63).

  4. This new exclusion is separate from and additional to a current categorical exclusion at Section 1.1306, Note 1, for installation of wire or cable along "existing aerial and underground corridors." The new exclusion does not apply underground.

NHPA Categorical Exclusions

These may be based on, but are independent of, two "programmatic agreements" found at 47 C.F.R. Part 1, Appendix B, "Nationwide Programmatic Agreement for the Collocation of Wireless Antennas," and Appendix C, "Nationwide Programmatic Agreement Regarding the Section 106 National Historic Preservation Act Review Process." The Order (¶ 86) defers potential additional streamlining of wireless placements affecting historic preservation to the completion of an open programmatic agreement proceeding. It helps to understand the new exclusions if readers familiarize themselves with Appendices B and C cited above.

UTILITY STRUCTURES Defined as utility poles or electric transmission towers in active use by a utility as defined at 47 U.S.C.§ 224, but does not include light poles, lamp posts or other structures whose primary purpose is to provide public lighting. The exclusion is subject no new ground disturbance and to size limits:

- Open or closed antenna volumes not exceeding three cubic feet for any one antenna and not exceeding six cubic feet cumulatively, with a cumulative limit of 17 cubic feet for associated equipment, these limits to include any existing equipment already mounted on the structure with three specific non-inclusions:

  - Vertical cable runs connecting power and other services; and

  - Ancillary equipment installed by other entities (e.g. power meters) outside the new applicant's ownership or control; and

  - Comparable non-included equipment from pre-existing wireless deployments on the structure.

  BUILDINGS AND OTHER NON-TOWER STRUCTURES To apply only to collocations where there is at least one pre-existing antenna in the "same vicinity" as the new antenna, as defined at ¶¶ 98-101 of the Order. The concept of vicinity is related to the extent to which the new installation would create additional intrusions on the viewscape. The prior measure of 45 years as an age eligible for historic preservation is deleted. 47 C.F.R. Part 1, Appendix B, section V.

- The size limit on the new installation is more restrictive than found in the NEPA exclusions: Three feet in height or width, no new equipment cabinets visible from the street or adjacent public spaces.

- New installation to comply with all zoning and historic preservation conditions applied to existing antenna(s) in the same vicinity, such as concealment requirements.

- No new ground disturbance, meaning that any excavation related to new installation must be at least two feet less wide or deep than for the prior installation.

- New installations must not lie within inside, or within 250 feet of the boundary of, a historic district; nor be located on structure that is designated as a National Historic Landmark or listed or eligible for listing in the National Register; not be the subject of a pending complaint alleging harmful effect on historic properties.

- Interior installations generally are granted the same exclusions as above.

IV. Environmental Notification Exemption for Registration of Temporary Towers

This codifies a previous waiver from notice requirements only for temporary towers not subject to environmental assessment under Section 1.1307 and (1) to be placed for no more than 60 days; (2) do not require construction notice to the Federal Aviation Administration ("FAA"), or marking or lighting under FAA regulations; (3) extend no higher than 200 feet above ground level; and (4) involve no or minimal ground excavation. See Order, ¶¶ 106-134.

EXISTING

PROPOSED: Install (9) new panel antennas + RRUs inside proposed stealth on rooftop

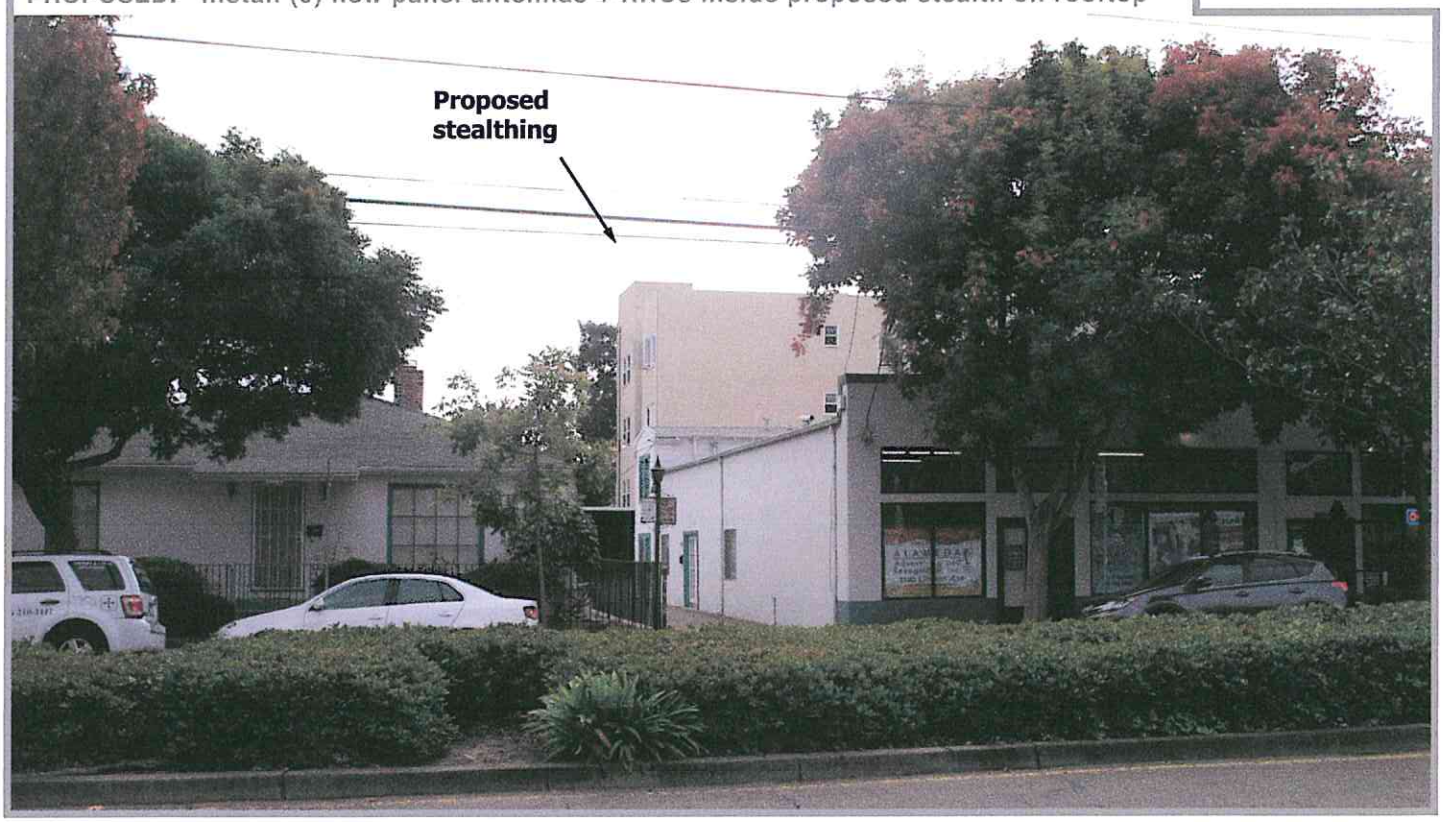
Cortel Photosims

at&t

CCU3085
1538 St Charles St
Alameda CA 94501

EXISTING

PROPOSED: Install (9) new panel antennas + RRUs inside proposed stealth on rooftop



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View 2 of 3

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EXISTING

PROPOSED: Install (9) new panel antennas + RRUs inside proposed stealth on rooftop

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View 3 of 3

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View Chart

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Radio Frequency – Electromagnetic Energy (RF-EME) Compliance Report

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EBI Project No. 62146280
November 25, 2014

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EBI Consulting
environmental | engineering | due diligence

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APPENDICES

EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by AT&T Mobility, LLC to conduct radio frequency electromagnetic (RF-EME) modeling for AT&T Site CCU3085 located at 1538 St. Charles Street in Alameda, California to determine RF-EME exposure levels from proposed AT&T wireless communications equipment at this site. As described in greater detail in Section 2.0 of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public exposures and occupational exposures. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

This report contains a detailed summary of the RF EME analysis for the site, including the following:

- Antenna Inventory
- Site Plan with antenna locations
- Antenna inventory with relevant parameters for theoretical modeling
- Graphical representation of theoretical MPE fields based on modeling
- Graphical representation of recommended signage and/or barriers

This document addresses the compliance of AT&T's transmitting facilities independently and in relation to all collocated facilities at the site.

Statement of Compliance

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

Per AT&T's corporate policy, the FCC's general population limits are applicable to all rooftop sites, regardless of the level of access control. As presented in the sections below, based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 16 feet of ATT's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 4 feet of ATT's proposed antennas at the main roof level. Additionally, there are areas where elevated workers may be exposed to power densities greater than the occupational limits. The worst-case emitted power density may exceed the FCC's occupational limit within approximately 5 feet of AT&T's proposed antennas at the antenna face level. Workers and the general public should be informed about the presence and locations of antennas and their associated fields.

AT&T Recommended Signage/Compliance Plan

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, requires that:

1. All sites must be analyzed for RF exposure compliance;
2. All sites must have that analysis documented; and
3. All sites must have any necessary signage and barriers installed.

Site compliance recommendations have been developed based upon protocols presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, additional guidance provided by AT&T, EBI's understanding of FCC and OSHA requirements, and common industry practice. Barrier locations have been identified (when required) based on guidance presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012. The following signage is recommended at this site:

- Green INFO 1 sign posted on or next to the access door to the rooftop and on the barrier near the antennas.
- Yellow CAUTION sign posted on the barrier near the antennas.

The signage proposed for installation at this site complies with AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document and therefore complies with FCC and OSHA requirements. Barriers are recommended on this site. More detailed information concerning site compliance recommendations is presented in Section 5.0 and Appendix E of this report.

1.0 SITE DESCRIPTION

This project involves the proposed installation of up to nine (9) wireless telecommunication antennas on a rooftop in Alameda, California. There are three Sectors (A, B, and C) proposed at the site, with three (3) proposed antennas per sector. For modeling purposes, it is assumed that there will be one (1) LTE antenna in each sector transmitting in the 700 and 1900 MHz frequency ranges, one (1) UMTS/LTE antenna in each sector transmitting in the 850, 1900, and 2100 MHz frequency ranges, and one (1) LTE antenna in each sector transmitting in the 700 and 2300 MHz frequency ranges. The Sector A antennas will be oriented 20° from true north. The Sector B antennas will be oriented 240° from true north. The Sector C antennas will be oriented 120° from true north. The bottoms of the antennas will be approximately 1.56 feet above the main rooftop. Appendix B presents an antenna inventory for the site.

Access to this site is accomplished via a stairwell penthouses located on the main roof. It is unknown if the roof access door is locked and, as such, the general public is assumed to be able to access the rooftop.

Modeling results were generated based on information from the following materials:

- RFDS – SAN-FRANCISCO-SACRAMENTO_SAN-FRANCISCO_CCU3085_2015-New-Site_New dated 10/22/2014
- CDs – CCU3085 90ZD Rev A dated 11/4/2014

2.0 FEDERAL COMMUNICATIONS COMMISSION (FCC) REQUIREMENTS

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/ controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general public/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

General public/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Table 1 and Figure 1 (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by

frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm^2). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm^2) and an uncontrolled MPE of 1 mW/cm2 for equipment operating in the 1900 MHz frequency range. For the AT&T equipment operating at 850 MHz, the FCC's occupational MPE is 2.83 mW/cm^2 and an uncontrolled MPE of 0.57 mW/cm^2. For the AT&T equipment operating at 700 MHz, the FCC's occupational MPE is 2.33 mW/cm^2 and an uncontrolled MPE of 0.47 mW/cm^2. These limits are considered protective of these populations.

Table 1: Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure

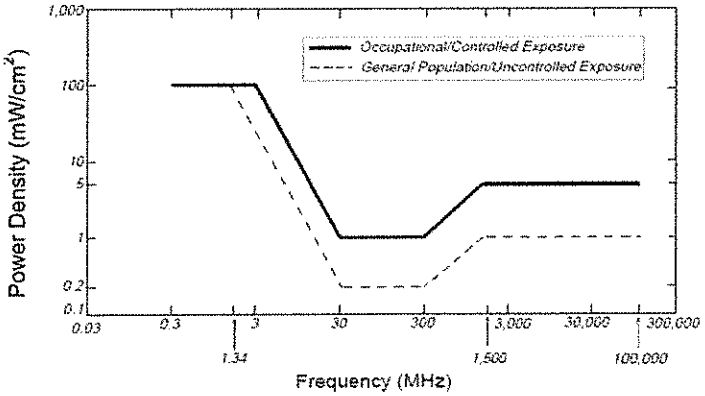
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$, $[H]^2$, or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6

(B) Limits for General Public/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$, $[H]^2$, or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)
* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm^2	1.00 mW/cm^2
Cellular Telephone	870 MHz	2.90 mW/cm^2	0.58 mW/cm^2
Specialized Mobile Radio	855 MHz	2.85 mW/cm^2	0.57 mW/cm^2
Long Term Evolution (LTE)	700 MHz	2.33 mW/cm^2	0.47 mW/cm^2
Most Restrictive Freq. Range	30-300 MHz	1.00 mW/cm^2	0.20 mW/cm^2

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication (PCS) facilities used by AT&T in this area operate within a frequency range of 700-1900 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

3.0 AT&T RF Exposure Policy Requirements

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, requires that:

1. All sites must be analyzed for RF exposure compliance;
2. All sites must have that analysis documented; and
3. All sites must have any necessary signage and barriers installed.

Pursuant to this guidance, worst-case predictive modeling was performed for the site. This modeling is described below in Section 4.0. Lastly, based on the modeling and survey data, EBI has produced a Compliance Plan for this site that outlines the recommended signage and barriers. The recommended Compliance Plan for this site is described in Section 5.0.

4.0 Worst-Case Predictive Modeling

In accordance with AT&T's RF Exposure policy, EBI performed theoretical modeling using RoofView® software to estimate the worst-case power density at the site rooftop-level resulting from operation of the antennas. RoofView® is a widely-used predictive modeling program that has been developed by Richard Tell Associates to predict both near field and far field RF power density values for roof-top and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. The models utilize several operational

specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

For this report, EBI utilized antenna and power data provided by AT&T and compared the resultant worst-case MPE levels to the FCC's occupational/controlled exposure limits outlined in OET Bulletin 65. The assumptions used in the modeling are based upon information provided by AT&T and information gathered from other sources. T-Mobile also has antennas on the rooftop. Information about these antennas was included in the modeling analysis.

Per AT&T's corporate policy, the FCC's general population limits are applicable to all rooftop sites, regardless of the level of access control. Based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 16 feet of AT&T's antennas on the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 4 feet of AT&T's antennas on the main roof level. Additionally, there are areas where elevated workers may be exposed to power densities greater than the occupational limits. The worst-case emitted power density may exceed the FCC's occupational limit within approximately 5 feet of AT&T's proposed antennas at the antenna face level. Workers and the general public should be informed about the presence and locations of antennas and their associated fields.

At the nearest walking/working surfaces to the AT&T antennas, the maximum power density generated by the AT&T antennas is approximately 1,174.00 percent of the FCC's general public limit (234.80 percent of the FCC's occupational limit). The composite exposure level from all carriers on this site is approximately 1,188.80 percent of the FCC's general public limit (237.76 percent of the FCC's occupational limit) at the nearest walking/working surface to each antenna. Based on worst-case predictive modeling, there are no areas at ground level related to the proposed AT&T antennas that exceed the FCC's occupational or general public exposure limits at this site. At ground level, the maximum power density generated by the antennas is approximately 4.10 percent of the FCC's general public limit (0.82 percent of the FCC's occupational limit).

There were also worst-case predicted exposures above the general public and occupational MPE in front of the T-Mobile antennas. Modeling indicates that the AT&T contribution to these areas is 5% or less of the general public MPE and, as such, under FCC regulations, AT&T is not responsible for these predicted exceedances.

The inputs used in the modeling are summarized in the RoofView® export file presented in Appendix C. A graphical representation of the RoofView® modeling results is presented in Appendix D. It should be noted that RoofView® is not suitable for modeling microwave dish antennas; however, these units are designed for point-to-point operations at the elevations of the installed equipment rather than ground-level coverage. Based on AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, microwave antennas are considered compliant if they are higher than 20 feet above any accessible walking/working surface. There are no microwaves installed at this site.

5.0 RECOMMENDED SIGNAGE/COMPLIANCE PLAN

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. As presented in the AT&T guidance document, the signs must:

- Be posted at a conspicuous point;
- Be posted at the appropriate locations;
- Be readily visible; and
- Make the reader aware of the potential risks prior to entering the affected area.

The table below presents the signs that may be used for AT&T installations.

Informational Signs		Alerting Signs	
	INFO 1		NOTICE
	INFO 2		CAUTION - ROOFTOP
	INFO 3		CAUTION - TOWER
	INFO 4		WARNING

Based upon protocols presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, and additional guidance provided by AT&T, the following signage is recommended on the site:

Recommended Signage:

- Green INFO 1 sign posted on or next to the access door to the rooftop and on the barrier near the antennas.
- Yellow CAUTION sign posted on the barrier near the antennas.

Barriers should be installed 13 feet by 9 feet in front of the AT&T Sector C antennas at the main roof level. Barriers are not recommended within 6 feet of the edge of the rooftop due to OSHA standards and the low parapet height,. However, EBI recommends that AT&T and the landlord take additional measures to ensure that persons accessing the rooftop (for example, roofers or other maintenance workers) are informed of areas where RF levels exceed the FCC general public and occupational limit and made aware that these areas must be avoided to maintain compliance with FCC requirements. It is recommended that the landlord distribute this report to anyone accessing the roof and ask for confirmation that it has been read and understood. In cases where the roof access is assumed to be unrestricted, we also recommend the illumination of the signs. Barriers should be constructed of weather-resistant plastic or wood fencing. Barriers may consist of railing, rope, chain, or weather-resistant plastic if no other types are permitted or are feasible. Painted stripes should only be used as a last resort and only in regions where there is little chance of snowfall. If painted stripes are selected as barriers, it is recommended that the stripes and signage be illuminated. The signage and any barriers are graphically represented in the Signage Plan presented in Appendix E. It is important to note that this Signage Plan is specific for AT&T antennas only, and does not address RF emissions of other carrier antennas.

6.0 SUMMARY AND CONCLUSIONS

EBI has prepared this Radiofrequency Emissions Compliance Report for the proposed AT&T telecommunications equipment at the site located at 1538 St. Charles Street in Alameda, California.

EBI has conducted theoretical modeling to estimate the worst-case power density from AT&T antennas and other carrier antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements, as well as AT&T's corporate RF safety policies. As presented in the preceding sections, based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 16 feet of ATT's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density may exceed the FCC's occupational limit within approximately 4 feet of ATT's proposed antennas at the main roof level. Additionally, there are areas where elevated workers may be exposed to power densities greater than the occupational limits. The worst-case emitted power density may exceed the FCC's occupational limit within approximately 5 feet of AT&T's proposed antennas at the antenna face level. Workers and the general public should be informed about the presence and locations of antennas and their associated fields.

Signage is recommended at the site as presented in Section 5.0 and Appendix E. Posting of the signage and installation of the recommended barriers brings the site into compliance with FCC rules and regulations and AT&T's corporate RF safety policies. Workers or members of the general public accessing areas directly in front of the other carrier antennas should contact the carrier and/or landlord to determine appropriate setbacks or measures to safely occupy those areas.

7.0 LIMITATIONS

This report was prepared for the use of AT&T Mobility, LLC to meet requirements outlined in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

Appendix A

Certifications

Reviewed and Approved by:

sealed 25nov2014

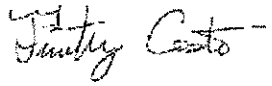
Michael McGuire
Electrical Engineer

Note that EBI's scope of work is limited to an evaluation of the Radio Frequency – Electromagnetic Energy (RF-EME) field generated by the antennas and broadcast equipment noted in this report. The engineering and design of the building and related structures, as well as the impact of the antennas and broadcast equipment on the structural integrity of the building, are specifically excluded from EBI's scope of work.

Preparer Certification

I, Timothy Costa, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified "occupational" under the FCC regulations.
- I am familiar with the FCC rules and regulations as well as OSHA regulations both in general and as they apply to RF-EME exposure.
- I have been trained in on the procedures outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document (dated September 21, 2012) and on RF-EME modeling using RoofView® modeling software.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.



Appendix B

Antenna Inventory

Antenna Number	Operator	Antenna Type	TX Freq (MHz)	ERP (Watts)	Gain (dBd)	Antenna Model	Azimuth (deg.)	Length (feet)	Horizontal Beamwidth (Degrees)	X	Y	Z
ATT A1	AT&T	Panel	LTE 700	420	12.4	Andrew SBNHH-1D65B	20	6.1	68	140	58	1.6
ATT A1	AT&T	Panel	LTE 1900	1331	15.8	Andrew SBNHH-1D65B	20	6.1	66	140	58	1.6
ATT A2	AT&T	Panel	UMTS 850	194	12.2	Andrew SBNHH-1D65B	20	6.1	66	135	60	1.6
ATT A2	AT&T	Panel	UMTS 850	585	12.2	Andrew SBNHH-1D65B	20	6.1	66	135	60	1.6
ATT A2	AT&T	Panel	LTE 2100	1426	16.1	Andrew SBNHH-1D65B	20	6.1	63	135	60	1.6
ATT A2	AT&T	Panel	UMTS 1900	666	15.8	Andrew SBNHH-1D65B	20	6.1	66	135	60	1.6
ATT A3	AT&T	Panel	LTE 700	560	12.4	Andrew SBNHH-1D65B	20	6.1	68	130	63	1.6
ATT A3	AT&T	Panel	LTE 2300	1216	16.2	Andrew SBNHH-1D65B	20	6.1	58	130	63	1.6
ATT B1	AT&T	Panel	LTE 700	420	12.4	Andrew SBNHH-1D65B	240	6.1	68	129	59	1.6
ATT B1	AT&T	Panel	LTE 1900	1331	15.8	Andrew SBNHH-1D65B	240	6.1	66	129	59	1.6
ATT B2	AT&T	Panel	UMTS 850	194	12.2	Andrew SBNHH-1D65B	240	6.1	66	130	54	1.6
ATT B2	AT&T	Panel	UMTS 850	585	12.2	Andrew SBNHH-1D65B	240	6.1	66	130	54	1.6
ATT B2	AT&T	Panel	LTE 2100	1426	16.1	Andrew SBNHH-1D65B	240	6.1	63	130	54	1.6
ATT B2	AT&T	Panel	UMTS 1900	666	15.8	Andrew SBNHH-1D65B	240	6.1	66	130	54	1.6
ATT B3	AT&T	Panel	LTE 700	560	12.4	Andrew SBNHH-1D65B	240	6.1	68	131	49	1.6
ATT B3	AT&T	Panel	LTE 2300	1216	16.2	Andrew SBNHH-1D65B	240	6.1	58	131	49	1.6
ATT C1	AT&T	Panel	LTE 700	420	12.4	Andrew SBNHH-1D65B	120	6.1	68	135	46	1.6
ATT C1	AT&T	Panel	LTE 1900	1331	15.8	Andrew SBNHH-1D65B	120	6.1	66	135	46	1.6
ATT C2	AT&T	Panel	UMTS 850	194	12.2	Andrew SBNHH-1D65B	120	6.1	66	137	51	1.6

Antenna Number	Operator	Antenna Type	TX Freq (MHz)	ERP (Watts)	Gain (dBd)	Antenna Model	Azimuth (deg.)	Length (feet)	Horizontal Beamwidth (Degrees)	X	Y	Z
ATT C2	AT&T	Panel	UMTS 850	585	12.2	Andrew SBNHH-1D65B	120	6.1	66	137	51	1.6
ATT C2	AT&T	Panel	LTE 2100	1426	16.1	Andrew SBNHH-1D65B	120	6.1	63	137	51	1.6
ATT C2	AT&T	Panel	UMTS 1900	666	15.8	Andrew SBNHH-1D65B	120	6.1	66	137	51	1.6
ATT C3	AT&T	Panel	LTE 700	560	12.4	Andrew SBNHH-1D65B	120	6.1	68	140	56	1.6
ATT C3	AT&T	Panel	LTE 2300	1216	16.2	Andrew SBNHH-1D65B	120	6.1	58	140	56	1.6
TMO A1	T-Mobile	Panel	1900	2394	16	Unknown	340	5.0	65	61	74	2.6
TMO A2	T-Mobile	Panel	2100	4258	16	Unknown	340	5.0	65	54	75	2.6
TMO B1	T-Mobile	Panel	1900	2394	16	Unknown	220	5.0	65	44	61	2.6
TMO B2	T-Mobile	Panel	2100	4258	16	Unknown	220	5.0	65	53	61	2.6
TMO C1	T-Mobile	Panel	1900	2394	16	Unknown	160	5.0	65	56	61	2.6
TMO C2	T-Mobile	Panel	2100	4258	16	Unknown	160	5.0	65	60	60	2.6

1. Note there are only 3 AT&T antennas per sector at this site. For clarity, the different frequencies for each antenna are entered on separate lines.
2. Note that EBI uses an assumed set of antenna specifications and powers for unknown and other carrier antennas for modeling purposes.

Appendix C

Roofview® Export File

StartMapDefinition

Roof Max Y	Roof Max X	Map Max Y	Map Max X	Y Offset	X Offset	Number of Areas	Envelope	List Of Areas
180	180	190	190	20	20	1	$AE$21:HB	$AE$21:$HB$200

StartSettingsData

Standard	Method	Uptime	Scale Factor	Low Thr	Low Color	Mid Thr	Mid Color	Hi Thr	Hi Color	Over Color	Ap Ht Mult	Ap Ht Method
4	2	1	1	100	1	500	4	5000	2	3	1.5	1

StartAntennaData — It is advisable to provide an ID (ant 1) for all antennas

ID	Name	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type	Other Loss	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain	BWdth Pt Dir	Uptime Profile	ON flag
ATT A1	LTE	700	30	2	200	1/2 LDF	0.5		24.44282	Andrew	SBNHH-1D65B	140	58	1.555		6.05	12.35	68;20		ON
ATT A1	LTE	1900	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	140	58	1.555		6.05	15.75	66;20		ON
ATT A2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	135	60	1.555		6.05	12.15	66;20		ON
ATT A2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	135	60	1.555		6.05	12.15	66;20		ON
ATT A2	LTE	2100	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	135	60	1.555		6.05	16.05	63;20		ON
ATT A2	UMTS	1900	60	1	200	1/2 LDF	0.5		17.70726	Andrew	SBNHH-1D65B	135	60	1.555		6.05	15.75	66;20		ON
ATT A3	LTE	700	40	2	200	1/2 LDF	0.5		32.59042	Andrew	SBNHH-1D65B	130	63	1.555		6.05	12.35	68;20		ON
ATT A3	LTE	2300	25	4	200	1/2 LDF	0.5		29.51209	Andrew	SBNHH-1D65B	130	63	1.555		6.05	16.15	58;20		ON
ATT B1	LTE	700	30	2	200	1/2 LDF	0.5		24.44282	Andrew	SBNHH-1D65B	129	59	1.555		6.05	12.35	68;240		ON
ATT B1	LTE	1900	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	129	59	1.555		6.05	15.75	66;240		ON
ATT B2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	130	54	1.555		6.05	12.15	66;240		ON
ATT B2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	130	54	1.555		6.05	12.15	66;240		ON
ATT B2	LTE	2100	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	130	54	1.555		6.05	16.05	63;240		ON
ATT B2	UMTS	1900	60	1	200	1/2 LDF	0.5		17.70726	Andrew	SBNHH-1D65B	130	54	1.555		6.05	15.75	66;240		ON
ATT B3	LTE	700	40	2	200	1/2 LDF	0.5		32.59042	Andrew	SBNHH-1D65B	131	49	1.555		6.05	12.35	68;240		ON
ATT B3	LTE	2300	25	4	200	1/2 LDF	0.5		29.51209	Andrew	SBNHH-1D65B	131	49	1.555		6.05	16.15	58;240		ON
ATT C1	LTE	700	30	2	200	1/2 LDF	0.5		24.44282	Andrew	SBNHH-1D65B	135	46	1.555		6.05	12.35	68;120		ON
ATT C1	LTE	1900	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	135	46	1.555		6.05	15.75	66;120		ON
ATT C2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	137	51	1.555		6.05	12.15	66;120		ON
ATT C2	UMTS	850	40	1	200	1/2 LDF	0.5		11.80484	Andrew	SBNHH-1D65B	137	51	1.555		6.05	12.15	66;120		ON
ATT C2	LTE	2100	60	2	200	1/2 LDF	0.5		35.41451	Andrew	SBNHH-1D65B	137	51	1.555		6.05	16.05	63;120		ON
ATT C2	UMTS	1900	60	1	200	1/2 LDF	0.5		17.70726	Andrew	SBNHH-1D65B	137	51	1.555		6.05	15.75	66;120		ON
ATT C3	LTE	700	40	2	200	1/2 LDF	0.5		32.59042	Andrew	SBNHH-1D65B	140	56	1.555		6.05	12.35	68;120		ON
ATT C3	LTE	2300	25	4	200	1/2 LDF	0.5		29.51209	Andrew	SBNHH-1D65B	140	56	1.555		6.05	16.15	58;120		ON
TMO A1	T-Mobile	1900	30	4				3	60.14247	Unknown	Unknown	61	74	2.58		5	16	65;340		ON
TMO A2	T-Mobile	2100	30	4				0.5	106.9501	Unknown	Unknown	54	75	2.58		5	16	65;340		ON
TMO B1	T-Mobile	1900	30	4				3	60.14247	Unknown	Unknown	44	61	2.58		5	16	65;220		ON
TMO B2	T-Mobile	2100	30	4				0.5	106.9501	Unknown	Unknown	53	61	2.58		5	16	65;220		ON
TMO C1	T-Mobile	1900	30	4				3	60.14247	Unknown	Unknown	56	61	2.58		5	16	65;160		ON
TMO C2	T-Mobile	2100	30	4				0.5	106.9501	Unknown	Unknown	60	60	2.58		5	16	65;160		ON

StartSymbolData

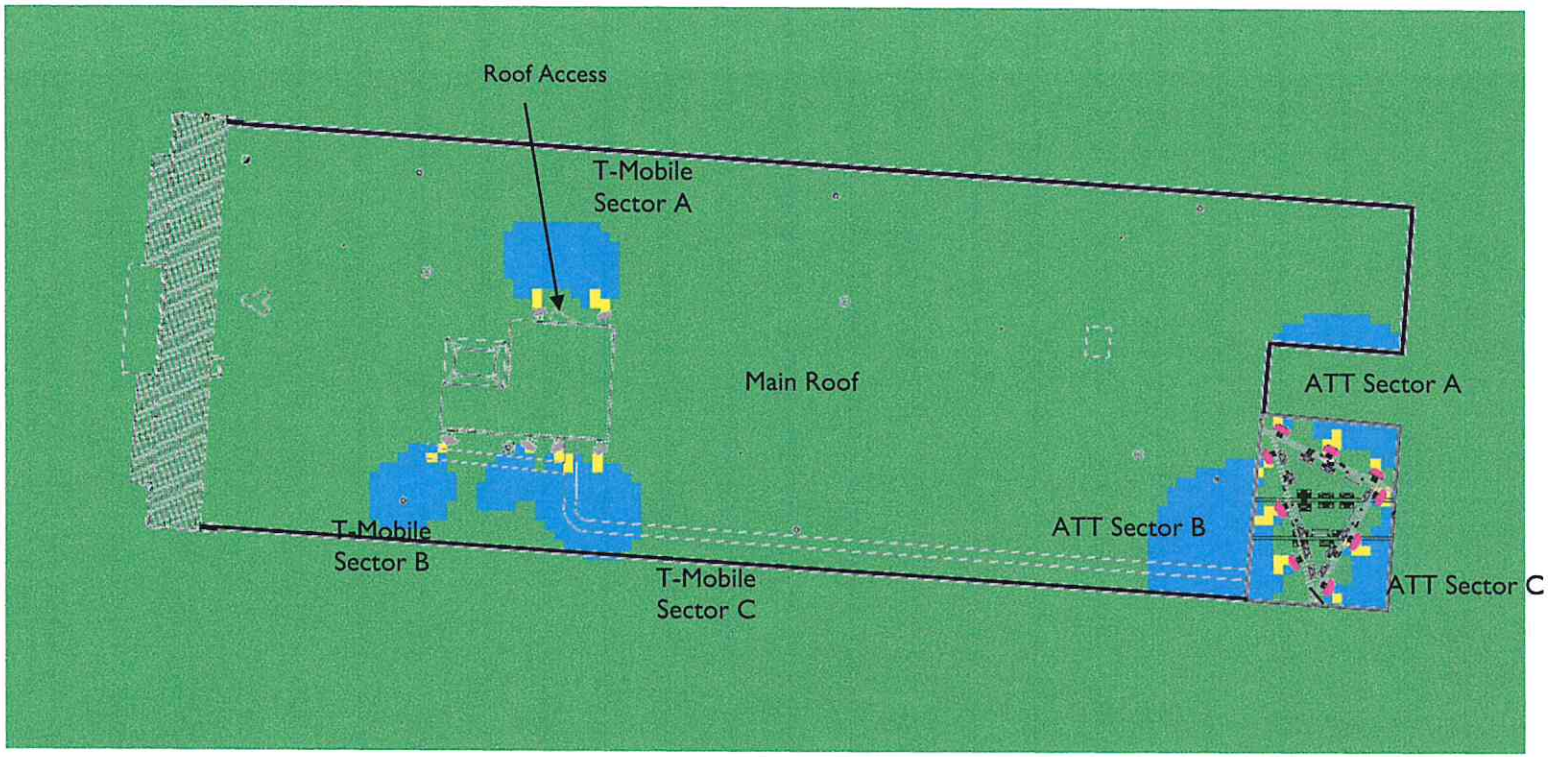
Sym	Map Marker	Roof X	Roof Y	Map Label	Description (notes for this table only)
Sym		5	35	AC Unit	Sample symbols
Sym		14	5	Roof Access	
Sym		45	5	AC Unit	
Sym		45	20	Ladder	

Appendix D

Roofview® Graphics

AT&T Antennas

Other Carrier Antennas



% FCC Public Exposure Limit

- Exposure Level ≥ 5,000
- 500 < Exposure Level ≤ 5,000
- 100 < Exposure Level ≤ 500
- Exposure Level ≤ 100

Roofview: Composite Exposure Levels

Facility Operator: AT&T Mobility

Site Name: Central & St. Charles Relo

AT&T Site Number: CCU3085

USID Number: 167230

Report Date: November 25, 2014

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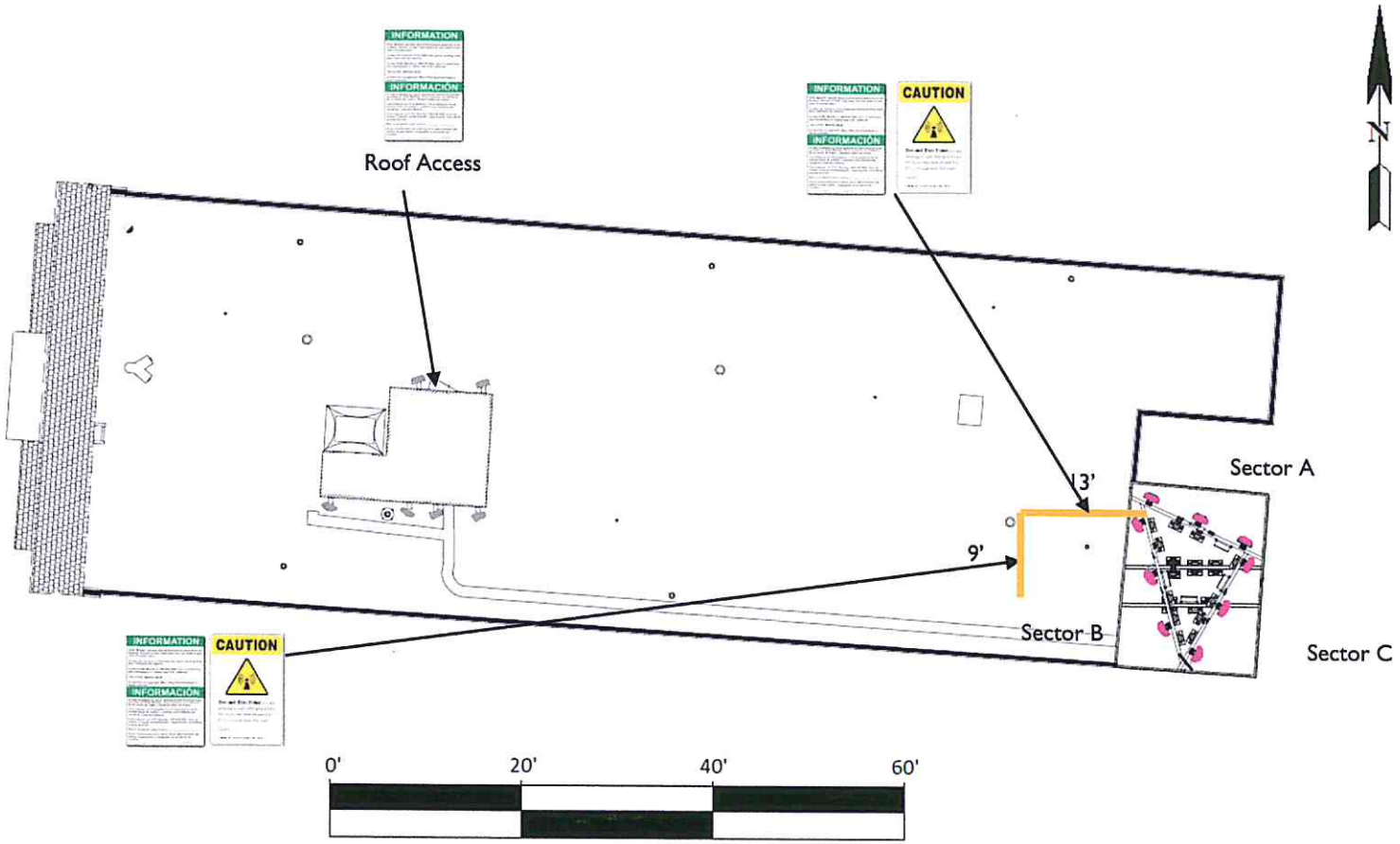
Appendix E

Compliance/Signage Plan



AT&T Antennas **Other Carrier Antennas**

Sign Identification Legend			
	Denotes AT&T Information Sign 1		Denotes AT&T NOTICE Sign
	Denotes AT&T Information Sign 2		Denotes AT&T CAUTION Sign
	Denotes AT&T Information Sign 3		Denotes AT&T CAUTION Tower Sign
	Denotes AT&T Information Sign 4		Denotes AT&T WARNING Sign

Recommended Hard Barrier

Compliance/Signage Plan
Facility Operator: AT&T Mobility
Site Name: Central & St. Charles Relo
AT&T Site Number: CCU3085
USID Number: 167230
Report Date: November 25, 2014

EBI Consulting
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EXISTING

PROPOSED: Install (12) new panel antennas + RRUs inside proposed stealth on rooftop

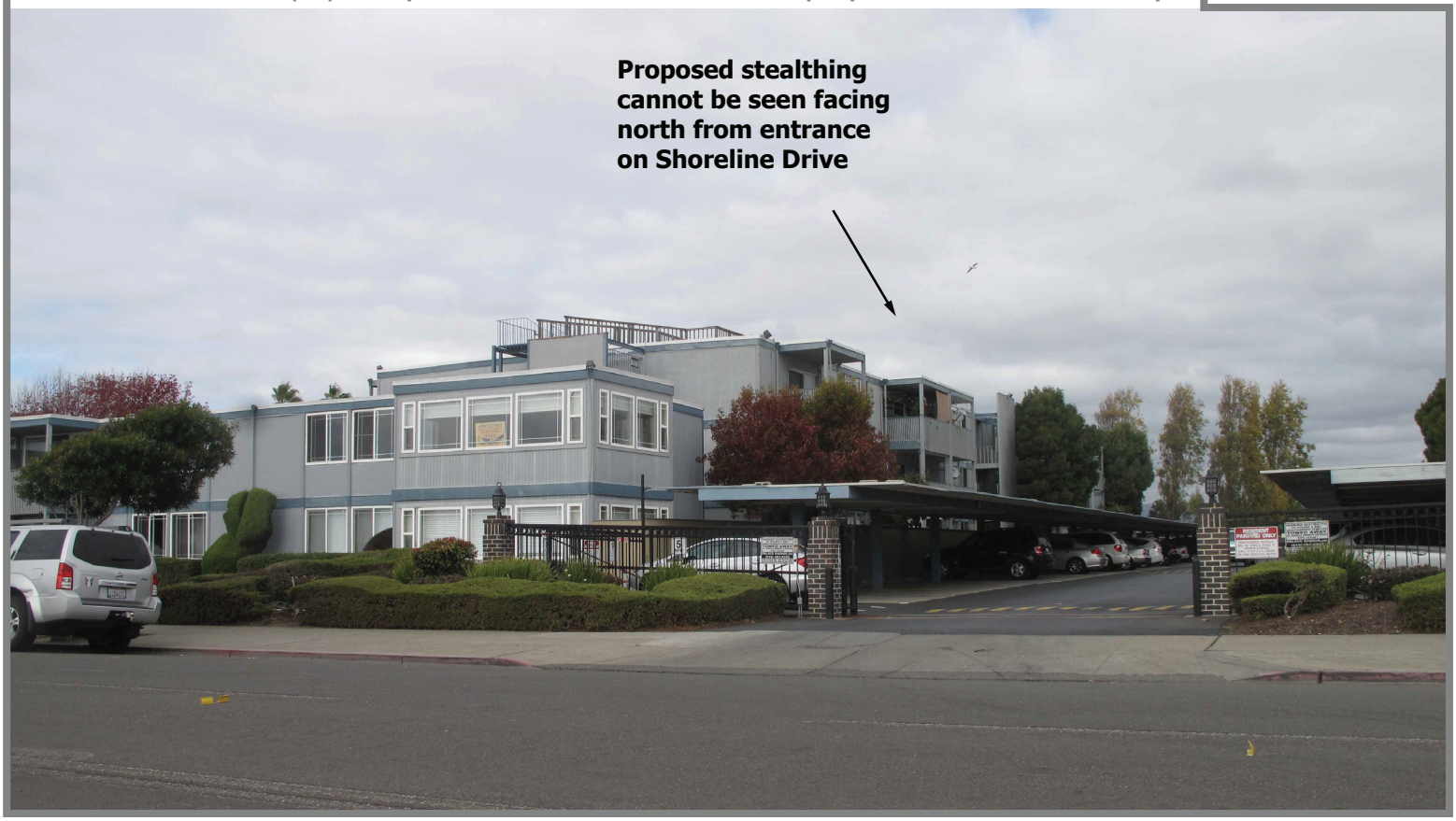
Cortel Photosims

at&t

CCU3969
1777 Shoreline Dr
Alameda CA 94501

EXISTING

PROPOSED: Install (12) new panel antennas + RRUs inside proposed stealth on rooftop



Cortel Photosims

at&t

CCU3969
1777 Shoreline Dr
Alameda CA 94501

EXISTING

PROPOSED: Install (12) new panel antennas + RRUs inside proposed stealth on rooftop

Cortel Photosims

at&t

CCU3969
1777 Shoreline Dr
Alameda CA 94501

VIEWS

Cortel Photosims

View Chart

at&t

CCU3969
1777 Shoreline Dr
Alameda CA 94501

Radio Frequency – Electromagnetic Energy (RF-EME) Compliance Report

USID# 167231
Site No. CCU3969
Otis Relo
1801 Shoreline Drive
Alameda, California 94501
Alameda County
37.759922; -122.262347 NAD83
Rooftop

EBI Project No. 62146129
November 13, 2014

Prepared for:

AT&T Mobility, LLC
c/o Cortel, LLC
3265 Baker Street
Sacramento, CA 94123

Prepared by:

EBI Consulting
environmental | engineering | due diligence

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

Purpose of Report

EnviroBusiness Inc. (dba EBI Consulting) has been contracted by AT&T Mobility, LLC to conduct radio frequency electromagnetic (RF-EME) modeling for AT&T Site CCU3969 located at 1801 Shoreline Drive in Alameda, California to determine RF-EME exposure levels from proposed AT&T wireless communications equipment at this site. As described in greater detail in Section 2.0 of this report, the Federal Communications Commission (FCC) has developed Maximum Permissible Exposure (MPE) Limits for general public exposures and occupational exposures. This report summarizes the results of RF-EME modeling in relation to relevant FCC RF-EME compliance standards for limiting human exposure to RF-EME fields.

This report contains a detailed summary of the RF EME analysis for the site, including the following:

- Antenna Inventory
- Site Plan with antenna locations
- Antenna inventory with relevant parameters for theoretical modeling
- Graphical representation of theoretical MPE fields based on modeling
- Graphical representation of recommended signage and/or barriers

This document addresses the compliance of AT&T's transmitting facilities independently and in relation to all collocated facilities at the site.

Statement of Compliance

A site is considered out of compliance with FCC regulations if there are areas that exceed the FCC exposure limits and there are no RF hazard mitigation measures in place. Any carrier which has an installation that contributes more than 5% of the applicable MPE must participate in mitigating these RF hazards.

Per AT&T's corporate policy, the FCC's general population limits are applicable to all rooftop sites, regardless of the level of access control. As presented in the sections below, based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 6 feet of ATT's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density will not exceed the FCC's occupational limit at the main roof level.

AT&T Recommended Signage/Compliance Plan

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, requires that:

1. All sites must be analyzed for RF exposure compliance;
2. All sites must have that analysis documented; and
3. All sites must have any necessary signage and barriers installed.

Site compliance recommendations have been developed based upon protocols presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, additional guidance provided by AT&T, EBI's understanding of FCC and OSHA requirements, and common

industry practice. Barrier locations have been identified (when required) based on guidance presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012. The following signage is recommended at this site:

- Green INFO 1 sign posted on or next to every access to the rooftop and on the barrier near each of the three sectors of antennas.
- Blue NOTICE sign posted on the barrier near each of the three sectors of antennas.

The signage proposed for installation at this site complies with AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document and therefore complies with FCC and OSHA requirements. Barriers are recommended on this site. More detailed information concerning site compliance recommendations is presented in Section 5.0 and Appendix E of this report.

1.0 SITE DESCRIPTION

This project involves the proposed installation of twelve (12) wireless telecommunication antennas on a rooftop in Alameda, California. There are three Sectors (A, B, and C) proposed at the site, with four (4) proposed antennas per sector. For modeling purposes, it is assumed that there will be one (1) UMTS antenna in each sector transmitting in the 850 MHz frequency range, one (1) LTE antenna in each sector transmitting in the 700 and 1900 MHz frequency ranges, one (1) LTE antenna in each sector transmitting in the 700 and 2300 MHz frequency ranges, and one (1) LTE antenna in each sector transmitting in the 2100 MHz frequency range. The Sector A antennas will be oriented 25° from true north. The Sector B antennas will be oriented 310° from true north. The Sector C antennas will be oriented 95° from true north. The bottoms of the antennas will be 5.3 feet above the main roof level. Appendix B presents an antenna inventory for the site.

Access to this site is unknown. To be conservative and to comply with AT&T's corporate policy, the modeling results are reported as though the general public is able to access the rooftop.

Modeling results were generated based on information from the following materials:

- RFDS – CCU3969_2015-New-Site_New_mq3253_3701A004AY_13323785_167231_10-23-2014_Planned-Submit-for-Approval_v1.00[1] dated 10/23/2014
- CDs – CCU3969 90 ZD Rev A dated 11/9/2014

2.0 FEDERAL COMMUNICATIONS COMMISSION (FCC) REQUIREMENTS

The FCC has established Maximum Permissible Exposure (MPE) limits for human exposure to Radiofrequency Electromagnetic (RF-EME) energy fields, based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP) and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC guidelines incorporate two separate tiers of exposure limits that are based upon occupational/controlled exposure limits (for workers) and general public/uncontrolled exposure limits for members of the general public.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/ controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general public/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

General public/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Table 1 and Figure 1 (below), which are included within the FCC's OET Bulletin 65, summarize the MPE limits for RF emissions. These limits are designed to provide a substantial margin of safety. They vary by frequency to take into account the different types of equipment that may be in operation at a particular facility and are "time-averaged" limits to reflect different durations resulting from controlled and uncontrolled exposures.

The FCC's MPEs are measured in terms of power (mW) over a unit surface area (cm^2). Known as the power density, the FCC has established an occupational MPE of 5 milliwatts per square centimeter (mW/cm^2) and an uncontrolled MPE of 1 mW/cm2 for equipment operating in the 1900 MHz frequency range. For the AT&T equipment operating at 850 MHz, the FCC's occupational MPE is 2.83 mW/cm^2 and an uncontrolled MPE of 0.57 mW/cm^2. For the AT&T equipment operating at 700 MHz, the FCC's occupational MPE is 2.33 mW/cm^2 and an uncontrolled MPE of 0.47 mW/cm^2. These limits are considered protective of these populations.

Table 1: Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure

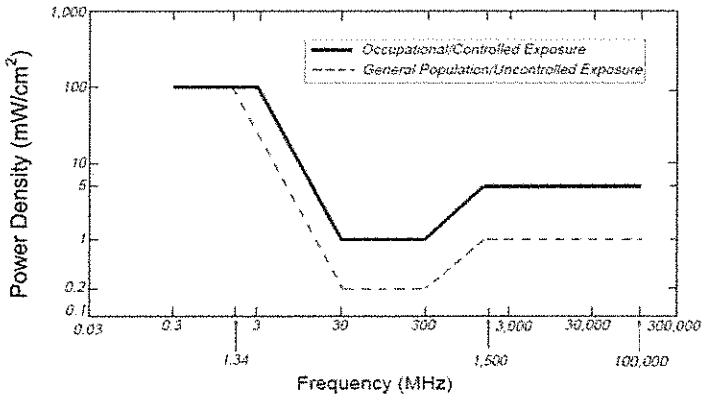
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$, $[H]^2$, or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6

(B) Limits for General Public/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $[E]^2$, $[H]^2$, or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)
* Plane-wave equivalent power density

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)



Based on the above, the most restrictive thresholds for exposures of unlimited duration to RF energy for several personal wireless services are summarized below:

Personal Wireless Service	Approximate Frequency	Occupational MPE	Public MPE
Personal Communication (PCS)	1,950 MHz	5.00 mW/cm^2	1.00 mW/cm^2
Cellular Telephone	870 MHz	2.90 mW/cm^2	0.58 mW/cm^2
Specialized Mobile Radio	855 MHz	2.85 mW/cm^2	0.57 mW/cm^2
Long Term Evolution (LTE)	700 MHz	2.33 mW/cm^2	0.47 mW/cm^2
Most Restrictive Freq, Range	30-300 MHz	1.00 mW/cm^2	0.20 mW/cm^2

MPE limits are designed to provide a substantial margin of safety. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

Personal Communication (PCS) facilities used by AT&T in this area operate within a frequency range of 700-1900 MHz. Facilities typically consist of: 1) electronic transceivers (the radios or cabinets) connected to wired telephone lines; and 2) antennas that send the wireless signals created by the transceivers to be received by individual subscriber units (PCS telephones). Transceivers are typically connected to antennas by coaxial cables.

Because of the short wavelength of PCS services, the antennas require line-of-site paths for good propagation, and are typically installed above ground level. Antennas are constructed to concentrate energy towards the horizon, with as little energy as possible scattered towards the ground or the sky. This design, combined with the low power of PCS facilities, generally results in no possibility for exposure to approach Maximum Permissible Exposure (MPE) levels, with the exception of areas directly in front of the antennas.

3.0 AT&T RF Exposure Policy Requirements

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, requires that:

1. All sites must be analyzed for RF exposure compliance;
2. All sites must have that analysis documented; and
3. All sites must have any necessary signage and barriers installed.

Pursuant to this guidance, worst-case predictive modeling was performed for the site. This modeling is described below in Section 4.0. Lastly, based on the modeling and survey data, EBI has produced a Compliance Plan for this site that outlines the recommended signage and barriers. The recommended Compliance Plan for this site is described in Section 5.0.

4.0 Worst-Case Predictive Modeling

In accordance with AT&T's RF Exposure policy, EBI performed theoretical modeling using RoofView® software to estimate the worst-case power density at the site rooftop-level resulting from operation of the antennas. RoofView® is a widely-used predictive modeling program that has been developed by Richard Tell Associates to predict both near field and far field RF power density values for roof-top and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

For this report, EBI utilized antenna and power data provided by AT&T and compared the resultant worst-case MPE levels to the FCC's occupational/controlled exposure limits outlined in OET Bulletin 65. The assumptions used in the modeling are based upon information provided by AT&T and information gathered from other sources. There are no other wireless carriers with equipment installed at this site.

Per AT&T's corporate policy, the FCC's general population limits are applicable to all rooftop sites, regardless of the level of access control. Based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 6 feet of AT&T's Sector A antennas and 5 feet of AT&T's Sector B and C antennas on the main roof level.

At the nearest walking/working surfaces to the AT&T antennas, the maximum power density generated by the AT&T antennas is approximately 406.40 percent of the FCC's general public limit (81.28 percent of the FCC's occupational limit). Based on worst-case predictive modeling, there are no areas at ground level related to the proposed AT&T antennas that exceed the FCC's occupational or general public exposure limits at this site. At ground level, the maximum power density generated by the antennas is approximately 11.90 percent of the FCC's general public limit (2.38 percent of the FCC's occupational limit).

The inputs used in the modeling are summarized in the RoofView® export file presented in Appendix C. A graphical representation of the RoofView® modeling results is presented in Appendix D. It should be noted that RoofView® is not suitable for modeling microwave dish antennas; however, these units are designed for point-to-point operations at the elevations of the installed equipment rather than ground-level coverage. Based on AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, microwave antennas are considered compliant if they are higher than 20 feet above any accessible walking/working surface. There are no microwaves installed at this site.

5.0 RECOMMENDED SIGNAGE/COMPLIANCE PLAN

Signs are the primary means for control of access to areas where RF exposure levels may potentially exceed the MPE. As presented in the AT&T guidance document, the signs must:

- Be posted at a conspicuous point;
- Be posted at the appropriate locations;
- Be readily visible; and
- Make the reader aware of the potential risks prior to entering the affected area.

The table below presents the signs that may be used for AT&T installations.

Informational Signs		Alerting Signs	
	INFO 1		NOTICE
	INFO 2		CAUTION - ROOFTOP
	INFO 3		CAUTION - TOWER
	INFO 4		WARNING

Based upon protocols presented in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document, dated September 21, 2012, and additional guidance provided by AT&T, the following signage is recommended on the site:

Recommended Signage:

- Green INFO 1 sign posted on or next to every access to the rooftop and on the barrier near each of the three sectors of antennas.
- Blue NOTICE sign posted on the barrier near each of the three sectors of antennas.

Barriers should be installed 20 feet by 24 feet approximately 5 feet in front of Sector B and C antennas and 6 feet in front of the Sector A antennas surrounding the FRP screen. Barriers should be constructed of weather-resistant plastic or wood fencing. Barriers may consist of railing, rope, chain, or weather-resistant plastic if no other types are permitted or are feasible. Painted stripes should only be used as a last resort and only in regions where there is little chance of snowfall. If painted stripes are selected as barriers, it is recommended that the stripes and signage be illuminated. The signage and any barriers are graphically represented in the Signage Plan presented in Appendix E.

6.0 SUMMARY AND CONCLUSIONS

EBI has prepared this Radiofrequency Emissions Compliance Report for the proposed AT&T telecommunications equipment at the site located at 1801 Shoreline Drive in Alameda, California.

EBI has conducted theoretical modeling to estimate the worst-case power density from AT&T antennas to document potential MPE levels at this location and ensure that site control measures are adequate to meet FCC and OSHA requirements, as well as AT&T's corporate RF safety policies. As presented in the preceding sections, based on worst-case predictive modeling, the worst-case emitted power density may exceed the FCC's general public limit within approximately 6 feet of ATT's proposed antennas at the main roof level. Modeling also indicates that the worst-case emitted power density will not exceed the FCC's occupational limit at the main roof level.

Signage is recommended at the site as presented in Section 5.0 and Appendix E. Posting of the signage and installation of the recommended barriers brings the site into compliance with FCC rules and regulations and AT&T's corporate RF safety policies.

7.0 LIMITATIONS

This report was prepared for the use of AT&T Mobility, LLC to meet requirements outlined in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by EBI are based solely on the information provided by the client. The observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to EBI so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

Appendix A

Certifications

Reviewed and Approved by:

sealed 13nov2014

Michael McGuire
Electrical Engineer

Note that EBI's scope of work is limited to an evaluation of the Radio Frequency – Electromagnetic Energy (RF-EME) field generated by the antennas and broadcast equipment noted in this report. The engineering and design of the building and related structures, as well as the impact of the antennas and broadcast equipment on the structural integrity of the building, are specifically excluded from EBI's scope of work.

Preparer Certification

I, Jonathan Ilgenfritz, state that:

- I am an employee of EnviroBusiness Inc. (d/b/a EBI Consulting), which provides RF-EME safety and compliance services to the wireless communications industry.
- I have successfully completed RF-EME safety training, and I am aware of the potential hazards from RF-EME and would be classified "occupational" under the FCC regulations.
- I am familiar with the FCC rules and regulations as well as OSHA regulations both in general and as they apply to RF-EME exposure.
- I have been trained in on the procedures outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document (dated September 21, 2012) and on RF-EME modeling using RoofView® modeling software.
- I have reviewed the data provided by the client and incorporated it into this Site Compliance Report such that the information contained in this report is true and accurate to the best of my knowledge.

Appendix B

Antenna Inventory

Antenna Number	Operator	Antenna Type	TX Freq (MHz)	ERP (Watts)	Gain (dBd)	Antenna Model	Azimuth (deg.)	Length (feet)	Horizontal Beamwidth (Degrees)	X	Y	Z
ATT A1	AT&T	Panel	LTE 700	806	12.0	CCI HPA-45R-BUU-H6-K	25	6.0	66	30	34	5.3
ATT A1	AT&T	Panel	LTE 1900	3021	14.8	CCI HPA-45R-BUU-H6-K	25	6.0	61	30	34	5.3
ATT A2	AT&T	Panel	LTE 2100	3237	15.1	CCI HPA-45R-BUU-H6-K	25	6.0	62	27	34	5.3
ATT A3	AT&T	Panel	UMTS 850	1242	12.7	CCI HPA-45R-BUU-H6-K	25	6.0	65	23	34	5.3
ATT A4	AT&T	Panel	LTE 700	815	12.0	CCI HPA-45R-BUU-H6-K	25	6.0	66	19	34	5.3
ATT A4	AT&T	Panel	LTE 2300	2825	15.3	CCI HPA-45R-BUU-H6-K	25	6.0	57	19	34	5.3
ATT B1	AT&T	Panel	LTE 700	806	12.0	CCI HPA-45R-BUU-H6-K	310	6.0	66	16	34	5.3
ATT B1	AT&T	Panel	LTE 1900	3021	14.8	CCI HPA-45R-BUU-H6-K	310	6.0	61	16	34	5.3
ATT B2	AT&T	Panel	LTE 2100	3237	15.1	CCI HPA-45R-BUU-H6-K	310	6.0	62	16	29	5.3
ATT B3	AT&T	Panel	UMTS 850	1242	12.7	CCI HPA-45R-BUU-H6-K	310	6.0	65	16	24	5.3
ATT B4	AT&T	Panel	LTE 700	815	12.0	CCI HPA-45R-BUU-H6-K	310	6.0	66	16	20	5.3
ATT B4	AT&T	Panel	LTE 2300	2825	15.3	CCI HPA-45R-BUU-H6-K	310	6.0	57	16	20	5.3
ATT C1	AT&T	Panel	LTE 700	806	12.0	CCI HPA-45R-BUU-H6-K	95	6.0	66	31	20	5.3
ATT C1	AT&T	Panel	LTE 1900	3021	14.8	CCI HPA-45R-BUU-H6-K	95	6.0	61	31	20	5.3
ATT C2	AT&T	Panel	LTE 2100	3237	15.1	CCI HPA-45R-BUU-H6-K	95	6.0	62	31	24	5.3
ATT C3	AT&T	Panel	UMTS 850	1242	12.7	CCI HPA-45R-BUU-H6-K	95	6.0	65	31	27	5.3
ATT C4	AT&T	Panel	LTE 700	815	12.0	CCI HPA-45R-BUU-H6-K	95	6.0	66	31	31	5.3
ATT C4	AT&T	Panel	LTE 2300	2825	15.3	CCI HPA-45R-BUU-H6-K	95	6.0	57	31	31	5.3

1. Note there are only 4 AT&T antennas per sector at this site. For clarity, the different frequencies for each antenna are entered on separate lines.

Appendix C

Roofview® Export File

StartMapDefinition

Roof Max Y	Roof Max X	Map Max Y	Map Max X	Y Offset	X Offset	Number of envelope		List Of Areas
120	100	150	120	20	20	1	$AE$81:$D $AE$81:$DZ$200	$AE$81:$DZ$200

StartSettingsData

Standard	Method	Uptime	Scale Facto	Low Thr	Low Color	Mid Thr	Mid Color	Hi Thr	Hi Color	Over Color	Ap Ht Mult	Ap Ht Method
4	2	1	1	100	1	500	4	5000	2	3	1.5	1

StartAntennaData It is advisable to provide an ID (ant 1) for all antennas

ID	Name	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type	Other Loss	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain	BWdth Pt Dir	Uptime Profile	ON flag
ATT A1	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	30	34	5.3		6	11.95	66;359		ON
ATT A1	LTE	1900	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	30	34	5.3		6	14.75	61;359		ON
ATT A2	LTE	2100	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	27	34	5.3		6	15.05	62;359		ON
ATT A3	UMTS	850	40	2	10	1/2 LDF	0.5		67.46678062	CCI	HPA-45R-BUU-H6-K	23	34	5.3		6	12.65	65;359		ON
ATT A4	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	19	34	5.3		6	12	66;359		ON
ATT A4	LTE	2300	25	4	10	1/2 LDF	0.5		84.33347578	CCI	HPA-45R-BUU-H6-K	19	34	5.3		6	15.25	57;359		ON
ATT B1	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	16	34	5.3		6	11.95	66;284		ON
ATT B1	LTE	1900	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	16	34	5.3		6	14.75	61;284		ON
ATT B2	LTE	2100	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	16	29	5.3		6	15.05	62;284		ON
ATT B3	UMTS	850	40	2	10	1/2 LDF	0.5		67.46678062	CCI	HPA-45R-BUU-H6-K	16	24	5.3		6	12.65	65;284		ON
ATT B4	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	16	20	5.3		6	12	66;284		ON
ATT B4	LTE	2300	25	4	10	1/2 LDF	0.5		84.33347578	CCI	HPA-45R-BUU-H6-K	16	20	5.3		6	15.25	57;284		ON
ATT C1	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	31	20	5.3		6	11.95	66;69		ON
ATT C1	LTE	1900	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	31	20	5.3		6	14.75	61;69		ON
ATT C2	LTE	2100	60	2	10	1/2 LDF	0.5		101.2001709	CCI	HPA-45R-BUU-H6-K	31	24	5.3		6	15.05	62;69		ON
ATT C3	UMTS	850	40	2	10	1/2 LDF	0.5		67.46678062	CCI	HPA-45R-BUU-H6-K	31	27	5.3		6	12.65	65;69		ON
ATT C4	LTE	700	30	2	10	1/2 LDF	0.5		51.42227071	CCI	HPA-45R-BUU-H6-K	31	31	5.3		6	12	66;69		ON
ATT C4	LTE	2300	25	4	10	1/2 LDF	0.5		84.33347578	CCI	HPA-45R-BUU-H6-K	31	31	5.3		6	15.25	57;69		ON

StartSymbolData

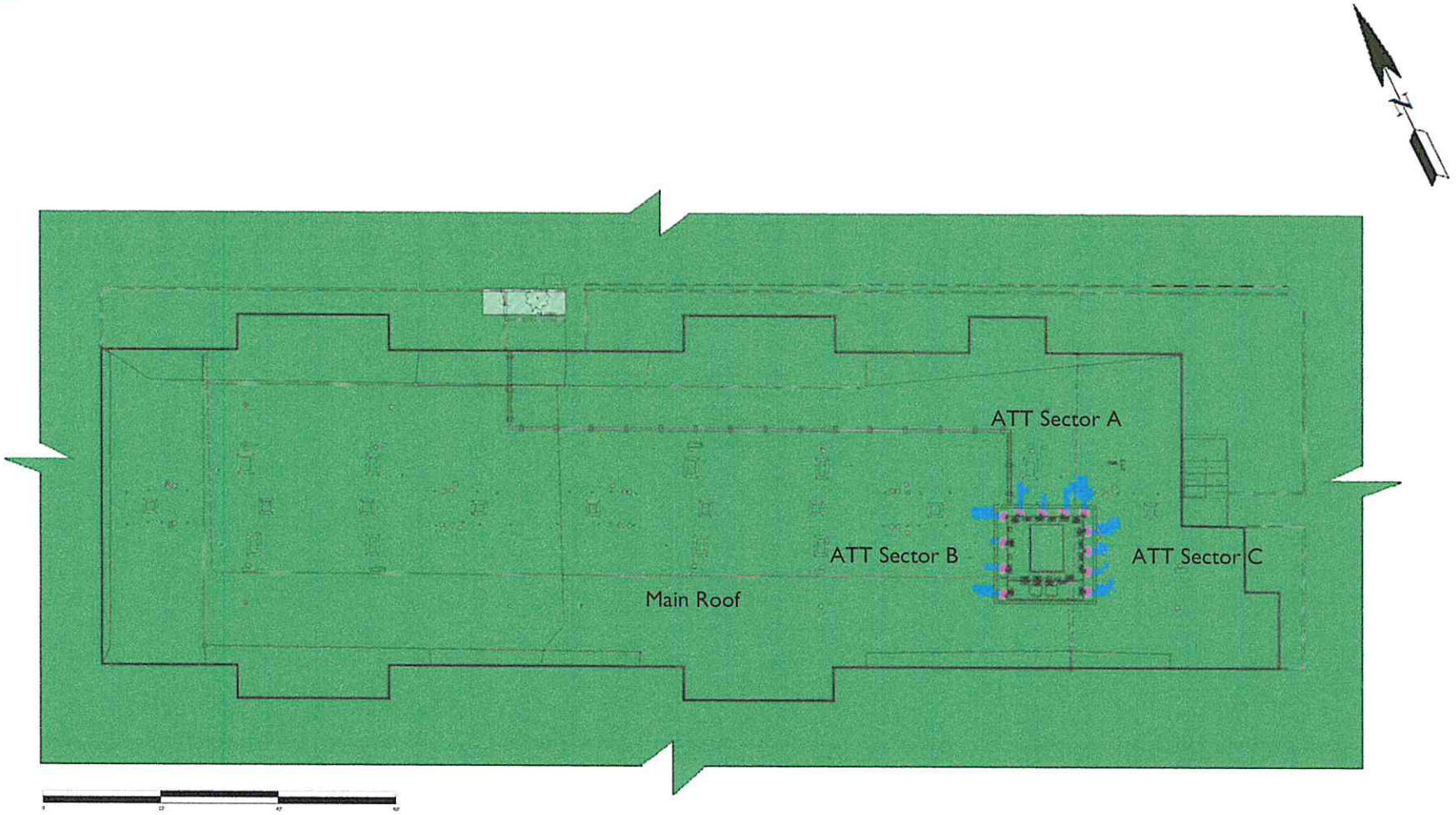
Sym	Map Mark	Roof X	Roof Y	Map Label	Description (notes for this table only)
Sym		5	35	AC Unit	Sample symbols
Sym		14	5	Roof Access	
Sym		45	5	AC Unit	
Sym		45	20	Ladder	

Note: Antenna azimuths have been adjusted for modeling purposes. Actual antenna azimtuhs for Sector A-B-C are 25-310-95.

Appendix D

Roofview® Graphics

AT&T Antennas



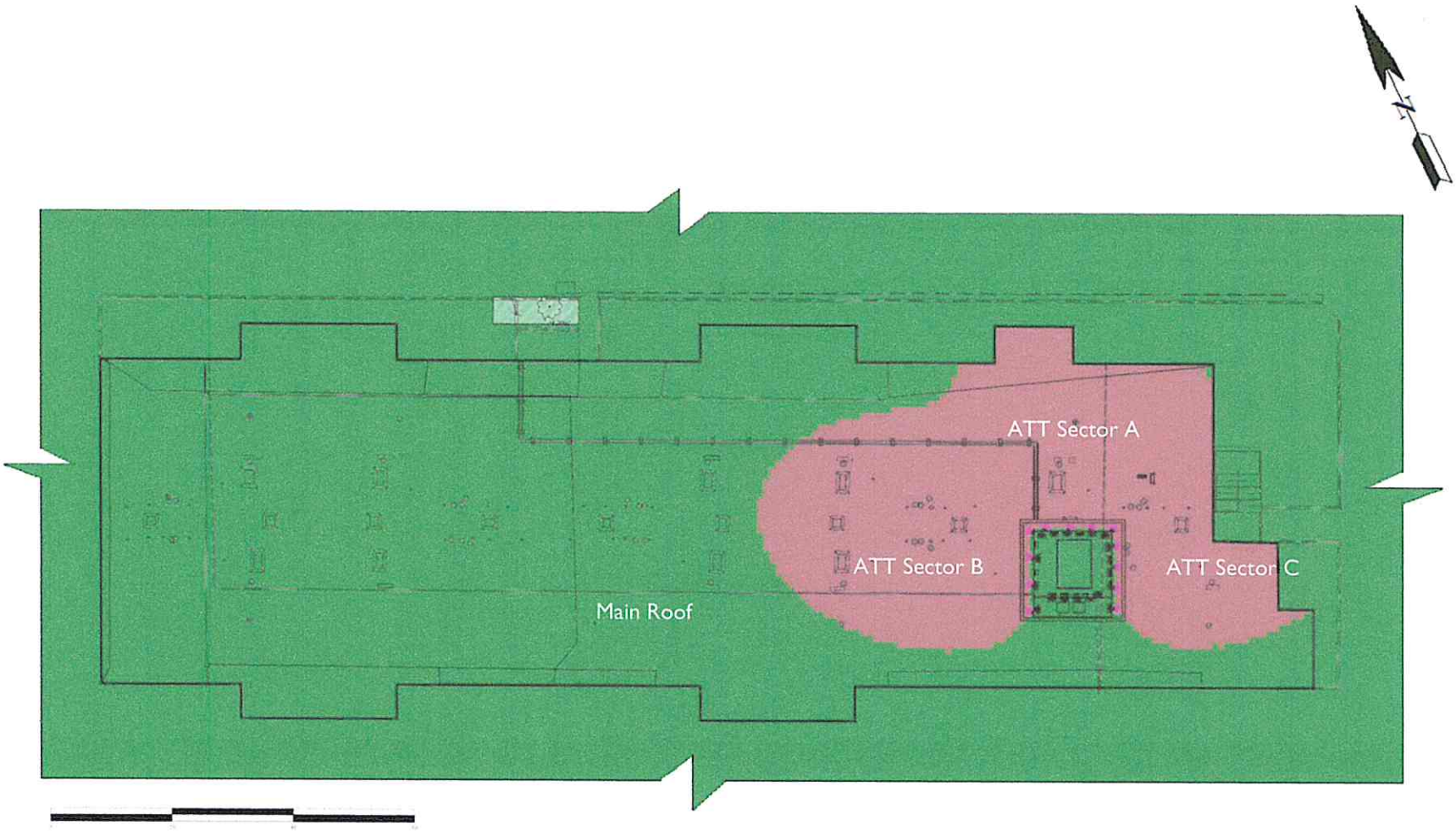
% FCC Public Exposure Limit	
	Exposure Level ≥ 5,000
	500 < Exposure Level ≤ 5,000
	100 < Exposure Level ≤ 500
	Exposure Level ≤ 100

Roofview: Composite Exposure Levels

Facility Operator: AT&T Mobility
Site Name: Otis Relo
AT&T Site Number: CCU3969
USID Number: 167231
Report Date: November 13, 2014

EBI Consulting

AT&T Antennas



% FCC Public Exposure Limit	
	Exposure Level > 5
	Exposure Level ≤ 5

Note that the areas shown in brown are where AT&T antennas contribute more than 5% of the FCC's general exposure RF limit. These do not overlap any areas in front of other carrier antennas exceeding the FCC's general exposure RF limit because there are no other carriers as shown in Figure 1. Under FCC regulations, AT&T is therefore not responsible for any predicted exceedances of another carrier's antennas.

Roofview: AT&T Exposure Levels

Facility Operator: AT&T Mobility
Site Name: Otis Relo
AT&T Site Number: CCU3969
USID Number: 167231
Report Date: November 13, 2014

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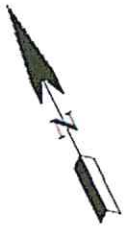
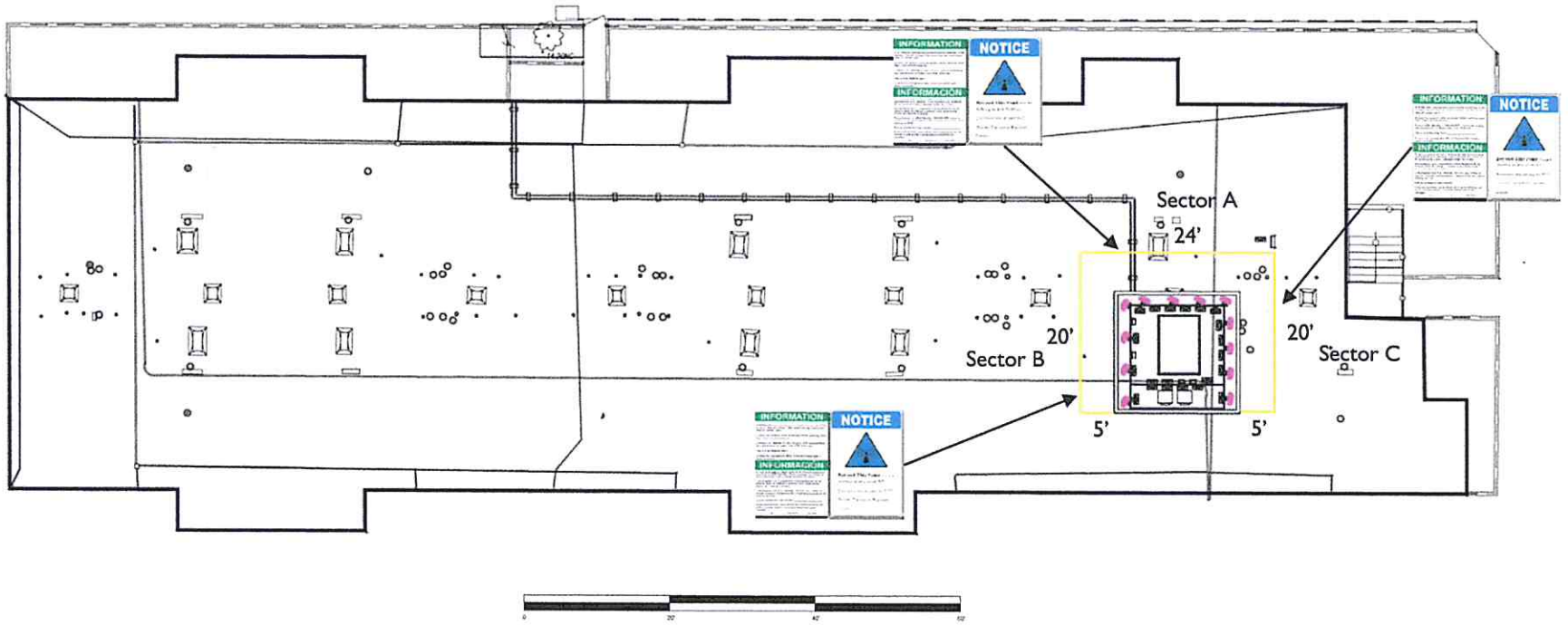
Appendix E

Compliance/Signage Plan

To be posted at every access to the site.





AT&T Antennas

Sign Identification Legend			
	Denotes AT&T Information Sign 1		Denotes AT&T NOTICE Sign
	Denotes AT&T Information Sign 2		Denotes AT&T CAUTION Sign
at&t	Denotes AT&T Information Sign 3		Denotes AT&T CAUTION Tower Sign
	Denotes AT&T Information Sign 4		Denotes AT&T WARNING Sign

Recommended Hard Barrier

Compliance/Signage Plan
Facility Operator: AT&T Mobility
Site Name: Otis Relo
AT&T Site Number: CCU3969
USID Number: 167231
Report Date: November 13, 2014

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Cortel

March 12, 2015

Deborah Diamond
Community Development Department
2263 Santa Clara Ave
Alameda, CA 94501

RE: **AT&T Telecom Facility**
AT&T Site ID: CCU3085 (FA 13323784)
Property Address: 1538 St. Charles Street, Alameda, CA 94501
Project Number: PLN14-0729

Dear Ms. Diamond:

Please find the enclosed documents as supplemental material for the AT&T application for the proposed new telecommunications facility at 1538 St. Charles Street (PLN14-0729).

- Revised RF Exposure Study
- Alternative Site Analysis
- RF Statement, with Propagation Maps

This application seeks permission to collocate AT&T's proposed wireless telecommunications facility on the same rooftop as an existing wireless telecommunications facility, so the FCC's 90-day shot clock applies. AT&T filed the application on December 8, 2014. The shot clock was tolled from the city's December 16, 2014 incomplete letter until AT&T's complete response on February 2, 2015. Thus, the city must take final action on AT&T's application no later than April 25, 2015 (Day 90). Please let us know as soon as possible if you calculate a different shot clock deadline.

Should you have any questions before, please feel free to contact me at 415-601-3194 or by e-mail at alex.orner@cortel-llc.com.

Sincerely,

Alex Orner, Site Acquisition Specialist
Cortel, Inc.
Authorized Representative for AT&T
415-601-3194 (cell)
alex.orner@cortel-llc.com

AT&T Mobility • Proposed Base Station (Site No. CCU3085)
1538 St. Charles Street • Alameda, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Mobility, a personal wireless telecommunications carrier, to evaluate the base station (Site No. CCU3085) proposed to be located at 1538 St. Charles Street in Alameda, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

AT&T proposes to install directional panel antennas above the roof of the residential building located at 1538 St. Charles Street in Alameda. The proposed operation will, together with the existing base stations at the site and nearby, comply with the FCC guidelines limiting public exposure to RF energy.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive FCC limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5,000–80,000 MHz	5.00 mW/cm^2	1.00 mW/cm^2
BRS (Broadband Radio)	2,600	5.00	1.00
WCS (Wireless Communication)	2,300	5.00	1.00
AWS (Advanced Wireless)	2,100	5.00	1.00
PCS (Personal Communication)	1,950	5.00	1.00
Cellular	870	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

General Facility Requirements

Base stations typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables. A small antenna for reception of GPS signals is also required, mounted with a clear view of the sky. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the

antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that at greater distances the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

Site and Facility Description

The site at 1538 St. Charles Street in Alameda was visited by Mr. Brian Palmer, a qualified engineer employed by Hammett & Edison, Inc., during normal business hours on March 9, 2015. Six directional panel antennas, reportedly for use by T-Mobile, were observed on the stairwell penthouse above the roof of the four-story residential building located at that address. Observed on top of a light pole in a parking lot about 400 feet to the south were antennas for use by Sprint. The maximum power density level observed for a person at ground near the site was 2.7% of the most restrictive public limit, for the combined operation of existing RF services at the site as installed and operating at that time. The measurement equipment used was a Narda Type NBM-520 Broadband Field Meter with Type EF-0391 Isotropic Broadband Electric Field Probe (Serial No. D-0698); the meter and probe were under current calibration by the manufacturer.

Based upon information provided by AT&T, including zoning drawings by Cortel, Inc., dated January 22, 2015, it is proposed to install nine Andrew Model SBNHH-1D65B directional panel antennas within a view screen enclosure to be constructed near the center of the roof of the building. The antennas would be mounted with up to 8° downtilt at an effective height of about 47 feet above ground, 7 feet above the roof, and would be oriented in groups of three toward 60°T, 180°T, and 300°T, to provide service in all directions. The maximum effective radiated power in any direction would be 16,780 watts, representing simultaneous operation at 3,600 watts for WCS, 4,330 watts for AWS, 5,970 watts for PCS, 1,000 watts for cellular, and 1,880 watts for 700 MHz service.

For the limited purpose of this study, the transmitting facilities of the existing carriers are assumed to be as follows:

Operator	Service	Maximum ERP	Antenna Model	Downtilt	Height
T-Mobile	AWS	4,400 watts	Ericsson AIR21	2°	46 ft
	PCS	2,200	Ericsson AIR21	2	46
Sprint	BRS	1,500	DHHTT65B-3XR	6	43
	PCS	5,500	DHHTT65B-3XR	2	43
	SMR	430	DHHTT65B-3XR	2	43

Study Results

For a person anywhere at ground, the maximum RF exposure level due to the proposed AT&T operation by itself is calculated to be 0.049 mW/cm^2, which is 5.0% of the applicable public exposure limit. The maximum calculated cumulative level at ground, for the simultaneous operation of all those carriers, is 8.1% of the public exposure limit. The maximum calculated cumulative level at any nearby building* is 9.5% of the public limit. The maximum calculated cumulative level at the second-floor elevation of any nearby residence† is 7.8% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels. Levels are calculated to exceed the applicable exposure limits on the roof of the subject building, in front of the antennas.

Recommended Mitigation Measures

It is recommended that the roof access door be fitted with an alarmed "panic bar," so that the antennas on the roof are not accessible to unauthorized persons. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training be provided to all authorized personnel who have access to the roof, including employees and contractors of the wireless carriers and of the property owner. No access within 10 feet directly in front of the antennas themselves, such as might occur during maintenance work on the roof, should be allowed while the base stations are in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. Marking yellow demarcation lines with paint on the roof, to identify areas calculated to exceed the FCC occupational limit, and posting explanatory signs‡ at the roof access door, next to the demarcation lines, and at the antennas, as shown in Figure 3, would be sufficient to meet FCC-adopted guidelines. Similar measures may already be in place for T-Mobile.

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* Located at least 17 feet away, based on the drawings.

† Located at least 50 feet away, based on photographs from Google Maps.

‡ Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidance from the landlord, local zoning or health authority, or appropriate professionals may be required.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the base station proposed by AT&T Mobility at 1538 St. Charles Street in Alameda, California, can comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, need not for this reason cause a significant impact on the environment. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations. Locking the roof access door is recommended to establish compliance with public exposure limits; training authorized personnel, painting demarcation lines, and posting explanatory signs are recommended to establish compliance with occupational exposure limits.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2015. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

William F. Hammett, P.E.
707/996-5200

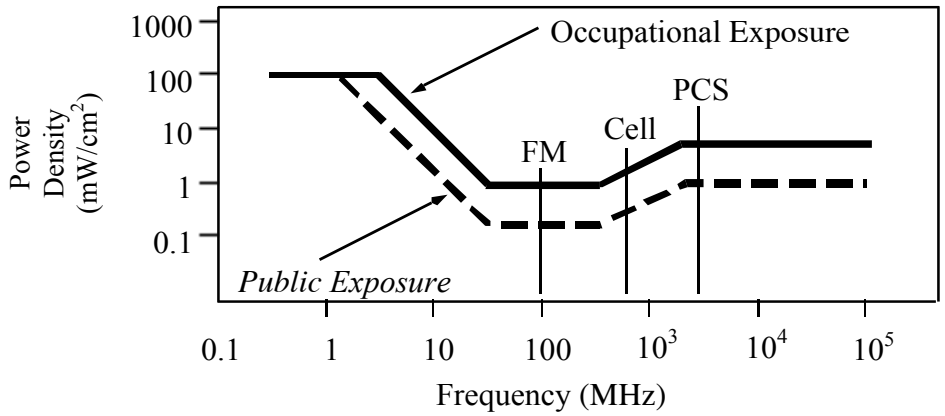
March 12, 2015

FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency	Electromagnetic Fields (f is frequency of emission in MHz)					
Applicable Range (MHz)	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
0.3 – 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 – 3.0	614	*823.8/ f*	1.63	*2.19/ f*	100	*180/ f^2*
3.0 – 30	1842/ f	*823.8/ f*	4.89/ f	*2.19/ f*	900/ f^2	*180/ f^2*
30 – 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 – 1,500	$3.54\sqrt{f}$	*$1.59\sqrt{f}$*	$\sqrt{f}/106$	*$\sqrt{f}/238$*	f/300	*f/1500*
1,500 – 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

Near Field.

Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications base stations, as well as dish (aperture) antennas, typically used for microwave links. The antenna patterns are not fully formed in the near field at these antennas, and the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives suitable formulas for calculating power density within such zones.

For a panel or whip antenna, power density $S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$, in mW/cm^2,

and for an aperture antenna, maximum power density $S_{max} = \frac{0.1 \times 16 \times \eta \times P_{net}}{\pi \times h^2}$, in mW/cm^2,

where θ_{BW} = half-power beamwidth of the antenna, in degrees, and
P_{net} = net power input to the antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of the antenna, in meters, and
η = aperture efficiency (unitless, typically 0.5-0.8).

The factor of 0.1 in the numerators converts to the desired units of power density.

Far Field.

OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density $S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$, in mW/cm^2,

where ERP = total ERP (all polarizations), in kilowatts,
RFF = relative field factor at the direction to the actual point of calculation, and
D = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.

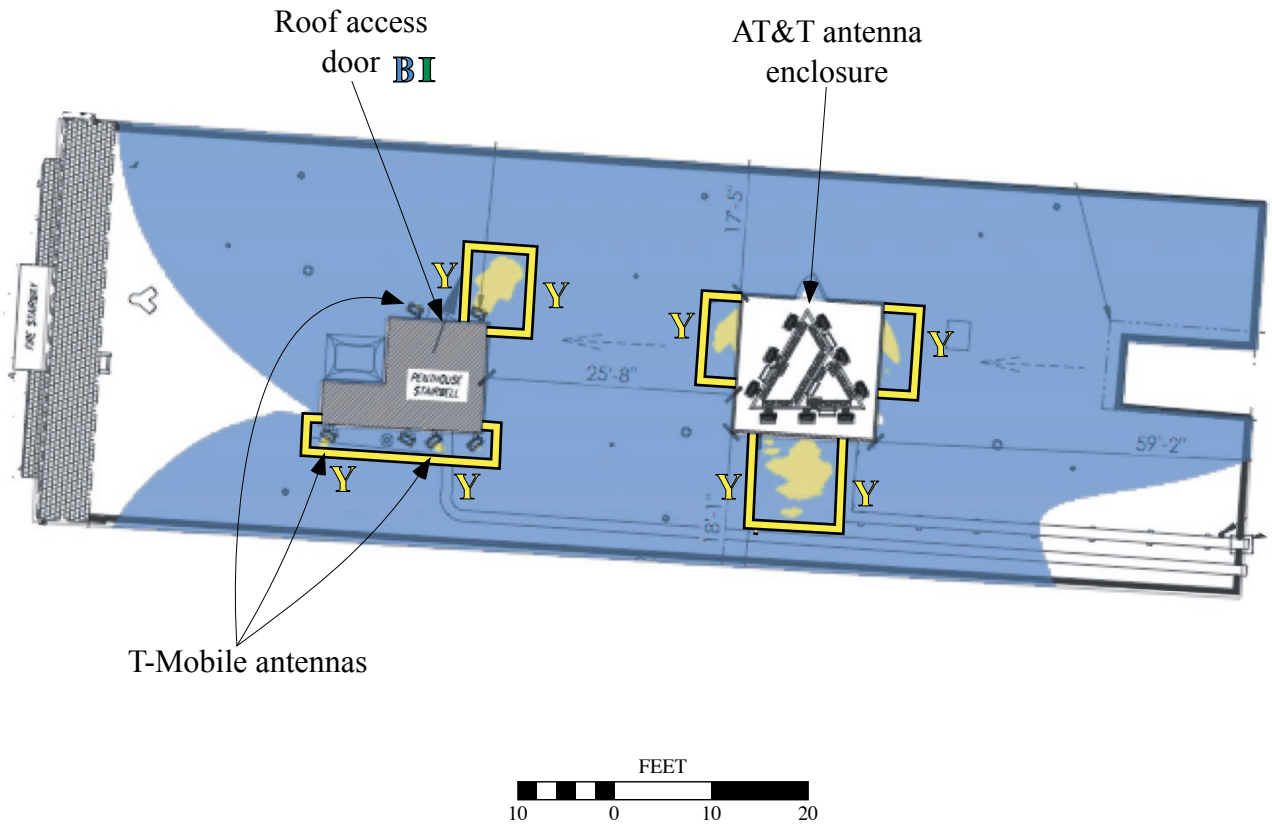
AT&T Mobility • Proposed Base Station (Site No. CCU3085)
1538 St. Charles Street • Alameda, California

Calculated RF Exposure Levels on Roof
for Proposed AT&T plus Existing T-Mobile

Recommended Mitigation Measures

- Lock all roof access locations
- Mark boundaries (if shown)
- Post explanatory signs
- Provide training

North



Notes:
Base drawing from Cortel, Inc., dated January 22, 2015.
Calculations performed according to OET Bulletin 65, August 1997.
Training should be provided to all persons with access to the roof.

Legend:	Less Than Public	Exceeds Public	Exceeds Occupational	Exceeds 10x Occupational
Shaded color	N/A			
Boundary marking	N/A			
Sign type	I - Green INFORMATION	B - Blue NOTICE	Y - Yellow CAUTION	O - Orange WARNING

Alternative Sites Analysis

AT&T Mobility

Wireless Communications Facility
at
1538 Saint Charles Street
Alameda, CA

Site ID: CCU3085

Introduction

New Cingular Wireless PCS, LLC d/b/a AT&T Mobility ("AT&T") has a significant gap in its service coverage in this portion of Alameda. AT&T proposes to collocate a stealth wireless communications facility ("WCF") on the roof of this apartment building property ("Proposed Facility") as a means to fill this gap in coverage. The Proposed Facility consists of nine panel antennas (three sectors of three antennas) mounted on the roof an fully concealed behind a 10' tall stealth enclosure designed as a faux penthouse to match the building's exiting penthouse, with the related equipment to be housed within a 102.7 square foot enclosure adjacent to T-Mobile's existing wireless telecommunication equipment in the garage. The Proposed Facility will be located about 25-26 feet from T-Mobile's existing WCF on this roof. The Proposed Facility is designed to minimize visual impacts, blend within the existing environment, and obscure the antennas. The Proposed Facility is the least intrusive means to fill the significant gap of the alternatives investigated by AT&T as explained below.

Objective

AT&T Mobility has identified a significant gap in its service coverage in Alameda, in an area roughly bordered by Buena Vista Avenue to the north, Benton Street to the east, Central Avenue to the south, and Wood Street to the west. The Proposed Facility will improve coverage to the surrounding residential neighborhoods with over 400 homes and a significant commercial area along Lincoln Avenue and vicinity, a parks, schools, places of worship and various other points of interest in the immediate vicinity. The service coverage in this portion of Alameda is described in the accompanying Radio Frequency Statement. The most recent traffic data available from Google Earth Pro for this area indicates that the average traffic along Central Avenue near Bay Street was 10,100 vehicles per day in 2012.

Methodology and Zoning Criteria

The location of a WCF to fill a significant gap in coverage is dependent upon topography, zoning, existing structures, collocation opportunities, available utilities, access, and a willing landlord. Wireless communication is line-of-sight technology that requires WCFs to be in relatively close proximity to the wireless handsets to be served.

AT&T seeks to fill a significant gap in service coverage using the least intrusive means under the values of the community as expressed in the Alameda Municipal Code ("Code"). Thus, AT&T is guided by Chapter 30-21 of the Code regarding use permits. AT&T also looks to the city's prior approvals of WCFs as guidance for acceptable installations. For example, there is an existing T-Mobile WCF on this same rooftop as the Proposed Facility. Finally, AT&T recently was required to vacate its existing site on the nearby school that serves this area. The gap in coverage results from the need to decommission that site. Thus, AT&T has sought non-school sites in the area to replace the necessary service coverage.

Analysis

AT&T investigated potential alternative designs of and alternative sites for facilities to fill the identified coverage gap in this portion of Alameda. The following is a map showing the locations of the Proposed Facility and the alternative sites that AT&T investigated. The alternatives are discussed in the analysis that follows.

Location of Candidate Sites

Proposed Facility – 1538 Saint Charles Street

Existing:

Proposed:

Conclusion: Based upon location, a willing landlord and the superior coverage as shown in the proposed coverage map included in AT&T's Radio Frequency Statement, the Proposed Facility is the least intrusive means for AT&T to meet its service coverage objective.

This four-story apartment building just south of Lincoln Avenue currently houses an approved T-Mobile WCF that consists of visible antennas on the side of a rooftop penthouse. AT&T proposes to collocate the Proposed Facility on this rooftop by installing a faux penthouse to completely screen its antennas, with equipment located in a garage adjacent to T-Mobile's equipment. The Proposed Facility will be completely screened and the faux penthouse will blend in with the building and surroundings. The Proposed Facility is the least intrusive means to fill the significant gap of the alternatives investigated by AT&T.

Alternative No. 1 – Mastick Senior Center, 1155 Santa Clara Avenue

Conclusion: More intrusive than Proposed Facility

This senior residential property houses a Sprint monopole. This is a feasible option, but the Proposed Facility offers a better opportunity for minimal stealth construction and design consistent with the city Code.

Alternative No. 2 – Pagano's Hardware, 1100 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This store is a relatively short building. A WCF here would not close AT&T's significant service coverage gap due to the low height and because the adjacent four-story apartment building (where the Proposed Facility is to be located) would block radio frequency signals. In addition, this building does not offer a collocation opportunity.

Alternative No. 3 – Vines Cafe & Gallery, 1113 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This commercial building is relatively short and the roof would not accommodate a WCF. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 4 – Lee Chiropractic, 1204 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

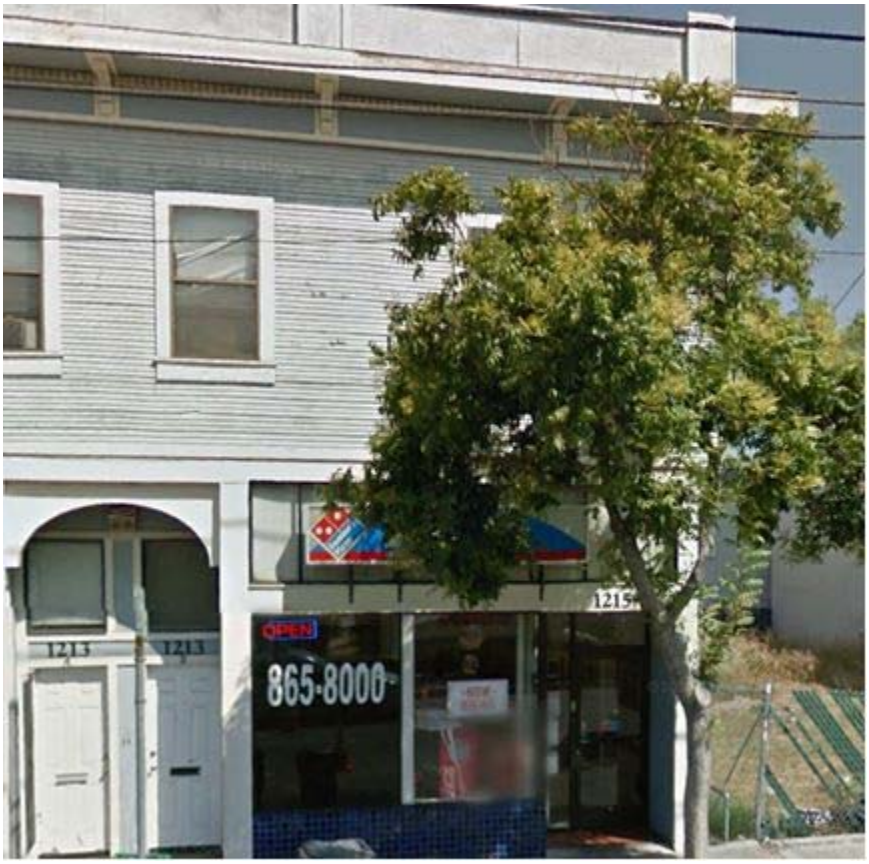
This two-story office building is relatively short, and it does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 5 – Intensity Martial Arts, 1209 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This two-story commercial use does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 6 – Domino's Pizza, 1215 Lincoln Avenue



Conclusion: Not feasible; more intrusive than Proposed Facility

This two-story commercial use does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 7 – The Market Spot, 1200 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This two-story market does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 8 –Faith Bible Church, 1206 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This short church does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 9 – Bay Stamp & Engraving, 1222 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This two-story building does not present a collocation opportunity. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a rooftop WCF on this property would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 10 – Alameda Chapel, 1001 Lincoln Avenue

Conclusion: Not feasible; more intrusive than Proposed Facility

This is a very short church building. A rooftop WCF here would not be high enough to close AT&T's significant service coverage gap. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Alternative No. 11 – Seventh Day Adventist Church, 1515 Verdi Street

Conclusion: Not available; more intrusive than Proposed Facility

This church is located near the edge of the service coverage objective to the southwest of the Proposed Facility. This property is not available because Seventh Day Adventists churches do not lease space for WCFs. In addition, a WCF here would be more intrusive than a fully concealed rooftop collocation such as the Proposed Facility.

Conclusion

The Proposed Facility is the least intrusive means by which AT&T can close its significant service coverage objective in this portion of Alameda.

AT&T Mobility Radio Frequency Statement
1538 St .Charles Street, Alameda, CA
Site ID: CCU3085

STATEMENT OF MICHAEL QUINTO

I am the AT&T radio frequency engineer assigned to the proposed wireless communications facility at 1538 St .Charles Street, Alameda, CA (the "Property"). Based on my personal knowledge of the Property and with AT&T's wireless network, as well as my review of AT&T's records with respect to the Property and its wireless communications facilities in the surrounding area, I have concluded that the work associated with this permit request is needed to close a significant service coverage gap in an area roughly bordered by Buena Vista Avenue to the north, Benton Street to the east, Central Avenue to the south, and Wood Street to the west. The service coverage gap will exist once AT&T decommissions its existing wireless communications facility at Wood Middle School. To remedy this service coverage gap, AT&T will need to construct a new wireless communications facility.

The service coverage gap will be caused by inadequate infrastructure in the area. As explained further in Exhibit 1, AT&T's existing facilities cannot adequately serve its customers in the desired area of coverage, let alone address rapidly increasing data usage. The site will not only close the gap in coverage and help address rapidly increasing data usage driven by smart phone and tablet usage, but it will also include 4G LTE service coverage. This site is part of an effort to fully deploy 4G LTE technology in the area.

AT&T uses industry standard propagation tools to identify the areas in its network where signal strength is too weak to provide reliable in-building service quality. This information is developed from many sources including terrain and clutter databases, which simulate the environment, and propagation models that simulate signal propagation in the presence of terrain and clutter variation. AT&T designs and builds its wireless network to ensure customers receive reliable in-building service quality. In-building service is critical as customers increasingly use their mobile phones as their primary communication device (approximately 44% of American households are now wireless only) and rely on their mobile phones to do more (E911, GPS, web access, text, etc.).

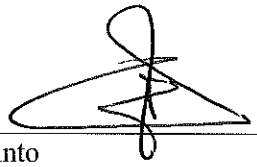
Exhibit 2 is a map of the existing UMTS 3G service coverage (without the proposed installation at the Property) in the area at issue. It includes service coverage provided by existing AT&T sites. The green shaded areas depict areas within a signal strength range that provide acceptable in-building service coverage. In-building coverage means customers are able to place or receive a call on the ground floor of a building. The yellow shaded areas depict areas within a signal strength range that provide acceptable in-vehicle service coverage. In these areas, an AT&T customer should be able to successfully place or

receive a call within a vehicle. The blue shading depicts areas within a signal strength range in which a customer might have difficulty receiving a consistently acceptable level of service. The quality of service experienced by any individual customer can differ greatly depending on whether that customer is indoors, outdoors, stationary, or in transit. Any area in the yellow or blue category is considered inadequate service coverage and constitutes a service coverage gap.

Exhibit 3 to this Statement is a map that predicts service coverage based on signal strength in the vicinity of the Property if antennas are placed as proposed in the application. As shown by this map, placement of the equipment at the Property closes the significant UMTS 3G service coverage gap.

In addition to these 3G wireless service gap issues, AT&T is in the process of deploying its 4G LTE service in Alameda with the goal of providing the most advanced personal wireless experience available to residents of the county. 4G LTE is capable of delivering speeds up to 10 times faster than industry-average 3G speeds. LTE technology also offers lower latency, or the processing time it takes to move data through a network, such as how long it takes to start downloading a webpage or file once you've sent the request. Lower latency helps to improve the quality of personal wireless services. What's more, LTE uses spectrum more efficiently than other technologies, creating more space to carry data traffic and services and to deliver a better overall network experience. Attached Exhibits 4 and 5 are LTE maps that illustrate how the proposed site closes the significant service coverage gap in LTE service coverage. Moreover, it is important to note that as existing customers migrate to 4G LTE, the LTE technology will provide the added benefit of reducing 3G data traffic, which can contribute to the significant service coverage gap on the UMTS (3G) network during peak usage periods.

I have a Bachelor of Science Degree in electronics and communications engineering and have worked as an engineering expert in the wireless communications industry for over 14 years.



Michael Quinto
AT&T Mobility Services LLC
Network, Planning & Engineering
RAN Design & RF Engineering

March 11, 2015

EXHIBIT 1
Prepared by AT&T Mobility

AT&T's digital wireless technology converts voice or data signals into a stream of digits to allow a single radio channel to carry multiple simultaneous signal transmissions. This technology allows AT&T to offer services such as secured transmissions and enhanced voice, high-speed data, texting, video conferencing, paging and imaging capabilities, as well as voicemail, visual voicemail, call forwarding and call waiting that are unavailable in analog-based systems. With consumers' strong adoption of smartphones, customers now have access to wireless broadband applications, which consumers utilize at a growing number.

Mobile data traffic in the United States grew by 75,000 percent over a six-year span, from 2001-2006. And in the seven years that followed, mobile data traffic on AT&T's national wireless network increased more than 50,000 percent *(from January 2007 through December 2013).* AT&T expects total mobile data volume to ***grow 8x-10x over the next five years***. To put this estimate in perspective, all of AT&T Mobility's mobile traffic during 2010 would be equal to only six or seven weeks of mobile traffic volume in 2015. The FCC noted that U.S. mobile data traffic grew almost 300% in 2011, and driven by 4G LTE smartphones and tablets, traffic is projected to grow an additional 16-fold by 2016.

Mobile devices using AT&T's technology transmit a radio signal to antennas mounted on a tower, pole, building, or other structure. The antenna feeds the signal to electronic devices housed in a small equipment cabinet, or base station. The base station is connected by microwave, fiber optic cable, or ordinary copper telephone wire to the Radio Network Controller, subsequently routing the calls and data throughout the world.

The operation of AT&T's wireless network depends upon a network of wireless communications facilities. The range between wireless facilities varies based on a number of factors. The range between AT&T mobile telephones and the antennas in and nearby Alameda, for example, is particularly limited as a result of challenges such as blockage from buildings, trees, and other obstructions as well as the limited capacity of existing facilities.

To provide effective, reliable, and uninterrupted service to AT&T customers in their cars, public transportation, home, and office, without interruption or lack of access, coverage must overlap in a grid pattern resembling a honeycomb.

In the event that AT&T is unable to construct or upgrade a wireless communications facility within a specific geographic area, so that each site's coverage reliably overlaps with at least one adjacent facility, AT&T will not be able to provide adequate personal wireless service to its customers within that area. Some consumers will experience an abrupt loss of service. Others will be unable to obtain reliable service, particularly if they are placing a call inside a building.

Service problems occur for customers even in locations where the coverage maps on AT&T's "Coverage Viewer" website appear to indicate that coverage is available. As the legend to the Coverage Viewer maps indicates, these maps depict a high-level *approximation* of coverage, which may not show gaps in coverage; *actual* coverage in an area may differ substantially from map graphics, and may be affected by such things as terrain, foliage, buildings and other construction, motion, customer equipment, and network traffic. The legend states that AT&T does not guarantee coverage and its coverage maps are not intended to show actual

customer performance on the network, nor are they intended to show future network needs or build requirements inside or outside of AT&T's existing coverage areas.

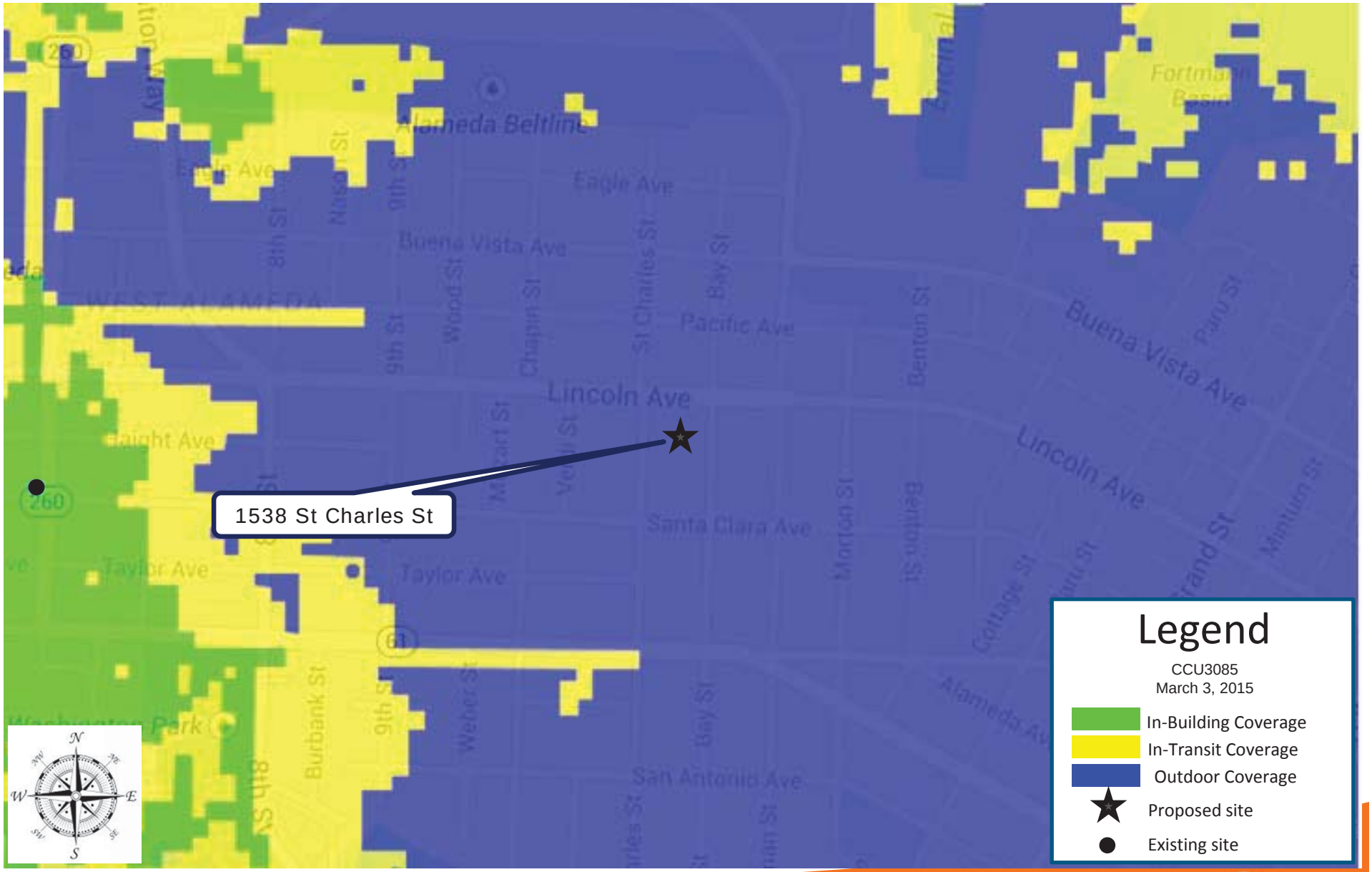
It is also important to note that the signal losses and service problems described above can and do occur for customers even at times when certain other customers in the same vicinity may be able to initiate and complete calls on AT&T's network (or other networks) on their wireless phones. These problems also can and do occur even when certain customers' wireless phones indicate "all bars" of signal strength on the handset.

The bars of signal strength that individual customers can see on their wireless phones are an imprecise and slow-to-update estimate of service quality. In other words, a customer's wireless phone can show "four bars" of signal strength, but that customer can still, at times, be unable to initiate voice calls, complete calls, or download data reliably and without service interruptions.

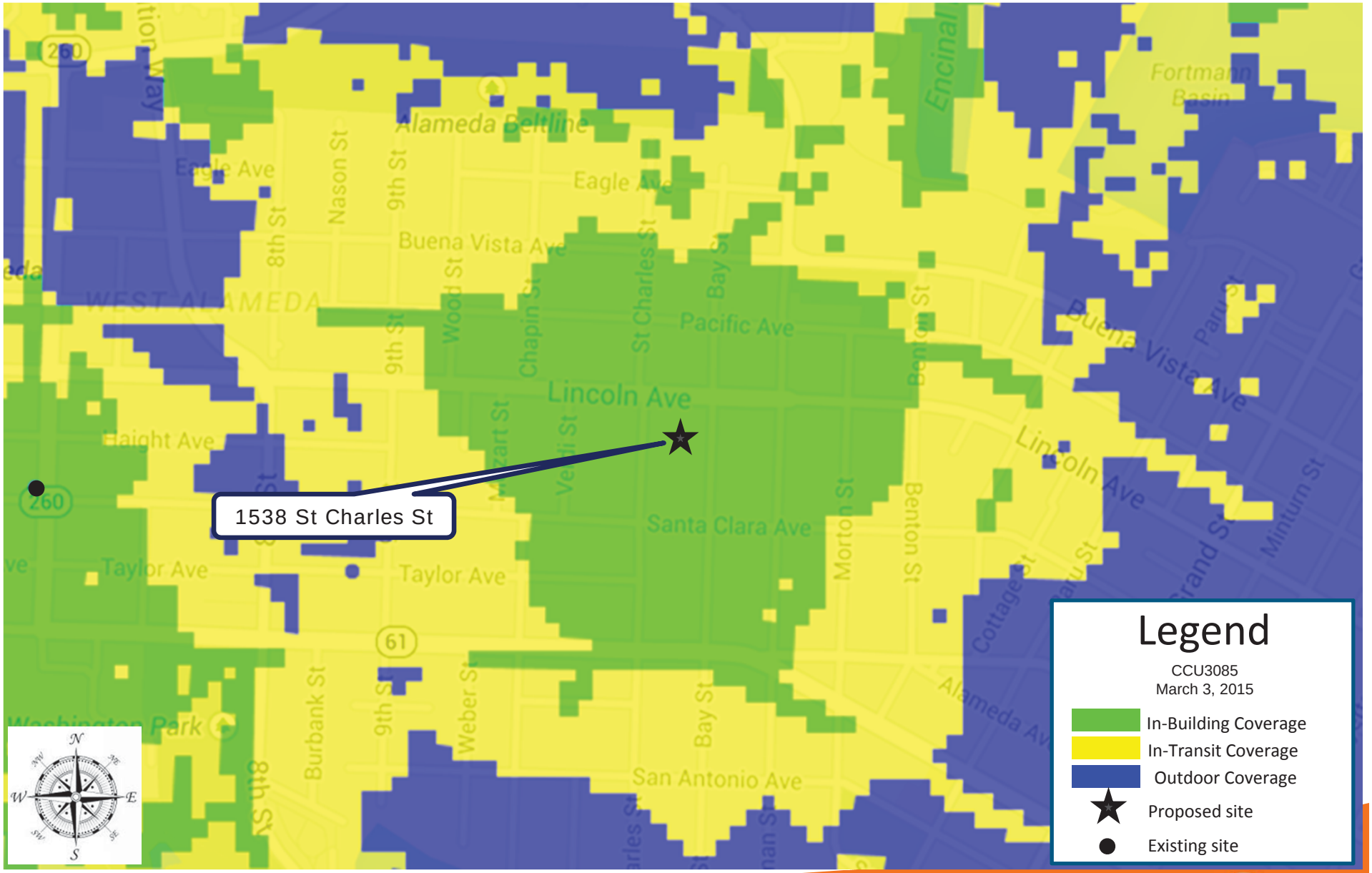
To determine where new or upgraded telecommunications facilities need to be located for the provision of reliable service in any area, AT&T's radio frequency engineers rely on far more complete tools and data sources than just signal strength from individual phones. AT&T creates maps incorporating signal strength that depict existing service coverage and service coverage gaps in a given area.

To rectify this significant gap in its service coverage, AT&T needs to locate a wireless facility in the immediate vicinity of the Property.

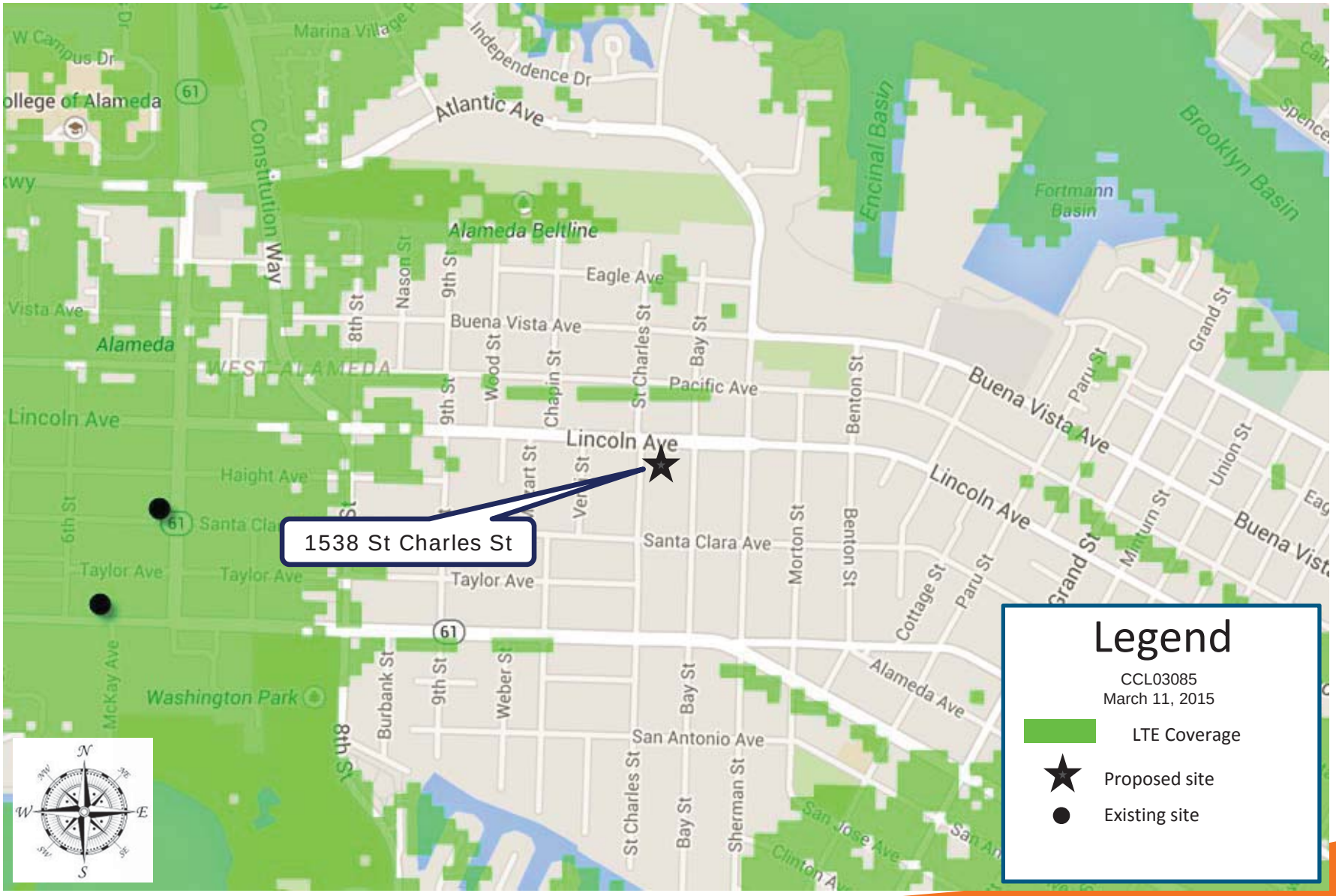
Without CCU3085 Coverage



With CCU3085 Coverage



Without CCL03085 Coverage



With CCL03085 Coverage

March 12, 2015

Deborah Diamond
Community Development Department
2263 Santa Clara Ave
Alameda, CA 94501

RE: **AT&T Telecom Facility**
AT&T Site ID: CCU3969 (FA 13323785)
Property Address: 1777 Shoreline Drive, Alameda, CA 94501
Project Number: PLN14-0731

Dear Ms. Diamond:

Please find the enclosed documents as supplemental material for the AT&T application for the proposed new telecommunications facility at 1777 Shoreline Drive (PLN14-0731).

- Revised RF Exposure Study
- Alternative Site Analysis
- RF Statement, with Propagation Maps

This application is subject to the FCC's 150-day shot clock. AT&T filed the application on December 9, 2014. The shot clock was tolled from the city's December 16, 2014 incomplete letter until AT&T's complete response on February 2, 2015. Thus, the city must take final action on AT&T's application no later than June 25, 2015 (Day 150). Please let us know as soon as possible if you calculate a different shot clock deadline.

Should you have any questions before, please feel free to contact me at 415-601-3194 or by e-mail at alex.orner@cortel-llc.com.

Sincerely,

Alex Orner, Site Acquisition Specialist
Cortel, Inc.
Authorized Representative for AT&T
415-601-3194 (cell)
alex.orner@cortel-llc.com

AT&T Mobility • Proposed Base Station (Site No. CCU3969)
1777 Shoreline Drive • Alameda, California

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of AT&T Mobility, a personal wireless telecommunications carrier, to evaluate the base station (Site No. CCU3969) proposed to be located at 1777 Shoreline Drive in Alameda, California, for compliance with appropriate guidelines limiting human exposure to radio frequency ("RF") electromagnetic fields.

Executive Summary

AT&T proposes to install directional panel antennas above the roof of the residential building located at 1777 Shoreline Drive in Alameda. The proposed operation will, together with the existing base station nearby, comply with the FCC guidelines limiting public exposure to RF energy.

Prevailing Exposure Standards

The U.S. Congress requires that the Federal Communications Commission ("FCC") evaluate its actions for possible significant impact on the environment. A summary of the FCC's exposure limits is shown in Figure 1. These limits apply for continuous exposures and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. The most restrictive FCC limit for exposures of unlimited duration to radio frequency energy for several personal wireless services are as follows:

Wireless Service	Frequency Band	Occupational Limit	Public Limit
Microwave (Point-to-Point)	5,000–80,000 MHz	5.00 mW/cm^2	1.00 mW/cm^2
BRS (Broadband Radio)	2,600	5.00	1.00
WCS (Wireless Communication)	2,300	5.00	1.00
AWS (Advanced Wireless)	2,100	5.00	1.00
PCS (Personal Communication)	1,950	5.00	1.00
Cellular	870	2.90	0.58
SMR (Specialized Mobile Radio)	855	2.85	0.57
700 MHz	700	2.40	0.48
[most restrictive frequency range]	30–300	1.00	0.20

General Facility Requirements

Base stations typically consist of two distinct parts: the electronic transceivers (also called "radios" or "channels") that are connected to the traditional wired telephone lines, and the passive antennas that send the wireless signals created by the radios out to be received by individual subscriber units. The transceivers are often located at ground level and are connected to the antennas by coaxial cables. A small antenna for reception of GPS signals is also required, mounted with a clear view of the sky. Because of the short wavelength of the frequencies assigned by the FCC for wireless services, the

antennas require line-of-sight paths for their signals to propagate well and so are installed at some height above ground. The antennas are designed to concentrate their energy toward the horizon, with very little energy wasted toward the sky or the ground. This means that it is generally not possible for exposure conditions to approach the maximum permissible exposure limits without being physically very near the antennas.

Computer Modeling Method

The FCC provides direction for determining compliance in its Office of Engineering and Technology Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated August 1997. Figure 2 attached describes the calculation methodologies, reflecting the facts that a directional antenna's radiation pattern is not fully formed at locations very close by (the "near-field" effect) and that at greater distances the power level from an energy source decreases with the square of the distance from it (the "inverse square law"). The conservative nature of this method for evaluating exposure conditions has been verified by numerous field tests.

Site and Facility Description

The apartment complexes on Shoreline Drive in Alameda were visited by Mr. Brian Palmer, a qualified engineer employed by Hammett & Edison, Inc., during normal business hours on March 9, 2015. Four directional panel antennas for use by T-Mobile were observed high on the face of the three-story apartment building at the rear of the complex located at 1801 Shoreline Drive. The maximum power density level observed for a person at ground near the site was 1.7% of the most restrictive public limit, for the combined operation of the existing RF services at the site as installed and operating at that time. The measurement equipment used was a Narda Type NBM-520 Broadband Field Meter with Type EF-0391 Isotropic Broadband Electric Field Probe (Serial No. D-0698); the meter and probe were under current calibration by the manufacturer.

Based upon information provided by AT&T, including zoning drawings by Cortel, Inc., dated January 9, 2015, that carrier proposes to install twelve CCI Model HPA-45R-BUU-H6 directional panel antennas behind view screens to be constructed on the elevator penthouse above the roof of the three-story apartment building at the rear of the complex located at 1777 Shoreline Drive. The antennas would be mounted with up to 4° downtilt at an effective height of about 35½ feet above ground, 9 feet above the roof, and would be oriented in groups of four toward 25°T, 95°T, and 310°T. The maximum effective radiated power in any direction would be 16,190 watts, representing simultaneous operation at 3,860 watts for WCS, 4,650 watts for AWS, 4,360 watts for PCS, 1,000 watts for cellular, and 2,320 watts for 700 MHz service.

For the limited purpose of this study, the transmitting facilities of T-Mobile are assumed to be as follows:

Service	Maximum ERP	Antenna Model	Downtilt	Height
AWS	4,400 watts	Ericsson AIR21	2°	30 ft
PCS	2,200	Ericsson AIR21	2	30

Study Results

For a person anywhere at ground, the maximum RF exposure level due to the proposed AT&T operation by itself is calculated to be 0.048 mW/cm^2, which is 5.5% of the applicable public exposure limit. The maximum calculated cumulative level at ground, for the simultaneous operation of both carriers, is 7.2% of the public exposure limit. The maximum calculated cumulative level at the top-floor elevation of any nearby residence* is 28% of the public exposure limit. The maximum calculated cumulative level at any nearby school building† is 6.3% of the public exposure limit. It should be noted that these results include several "worst-case" assumptions and therefore are expected to overstate actual power density levels. Levels are calculated to exceed the applicable public exposure limit on the roof of the subject building, in front of the antennas.

Recommended Mitigation Measures

It is recommended that the outdoor roof access stairs continue to be kept locked, so that the AT&T antennas are not accessible to unauthorized persons. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training be provided to all authorized personnel who have access to the roof, including employees and contractors of AT&T and of the property owner. No access within 28 feet directly in front of the antennas themselves, such as might occur during maintenance work above the roof, should be allowed while the base station is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. Marking a blue demarcation line at the stair landing below the top of the stairs, to indicate that certain areas above that point are calculated to exceed the FCC public limit, and posting explanatory signs‡ at the roof access stairs and on the screens in front of the antennas, as shown in Figure 3, such that the signs would be readily visible from any angle of approach to persons who might need to work within that distance, would be sufficient to meet FCC-adopted guidelines.

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* Located at least 100 feet away, based on photographs from Google Maps.
† Located at least 130 feet away, based on photographs from Google Maps.
‡ Signs should comply with OET-65 color, symbol, and content recommendations. Contact information should be provided (*e.g.*, a telephone number) to arrange for access to restricted areas. The selection of language(s) is not an engineering matter, and guidance from the landlord, local zoning or health authority, or appropriate professionals may be required.

Conclusion

Based on the information and analysis above, it is the undersigned's professional opinion that operation of the base station proposed by AT&T Mobility at 1777 Shoreline Drive in Alameda, California, can comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, need not for this reason cause a significant impact on the environment. The highest calculated level in publicly accessible areas is much less than the prevailing standards allow for exposures of unlimited duration. This finding is consistent with measurements of actual exposure conditions taken at other operating base stations. Locking the roof access stairs is recommended to establish compliance with public exposure limits; training authorized personnel, marking roof areas, and posting explanatory signs are recommended to establish compliance with occupational exposure limits.

Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2015. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.

William F. Hammett, P.E.
707/996-5200

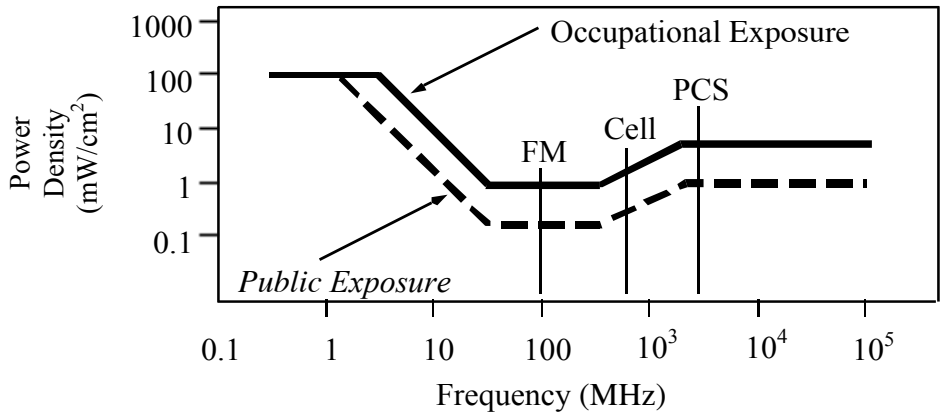
March 12, 2015

FCC Radio Frequency Protection Guide

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The FCC adopted the limits from Report No. 86, "Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," published in 1986 by the Congressionally chartered National Council on Radiation Protection and Measurements ("NCRP"). Separate limits apply for occupational and public exposure conditions, with the latter limits generally five times more restrictive. The more recent standard, developed by the Institute of Electrical and Electronics Engineers and approved as American National Standard ANSI/IEEE C95.1-2006, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," includes similar limits. These limits apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health.

As shown in the table and chart below, separate limits apply for occupational and public exposure conditions, with the latter limits (in *italics* and/or dashed) up to five times more restrictive:

Frequency	Electromagnetic Fields (f is frequency of emission in MHz)					
Applicable Range (MHz)	Electric Field Strength (V/m)		Magnetic Field Strength (A/m)		Equivalent Far-Field Power Density (mW/cm^2)	
0.3 – 1.34	614	*614*	1.63	*1.63*	100	*100*
1.34 – 3.0	614	*823.8/ f*	1.63	*2.19/ f*	100	*180/ f^2*
3.0 – 30	1842/ f	*823.8/ f*	4.89/ f	*2.19/ f*	900/ f^2	*180/ f^2*
30 – 300	61.4	*27.5*	0.163	*0.0729*	1.0	*0.2*
300 – 1,500	$3.54\sqrt{f}$	*$1.59\sqrt{f}$*	$\sqrt{f}/106$	*$\sqrt{f}/238$*	f/300	*f/1500*
1,500 – 100,000	137	*61.4*	0.364	*0.163*	5.0	*1.0*



Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits, and higher levels also are allowed for exposures to small areas, such that the spatially averaged levels do not exceed the limits. However, neither of these allowances is incorporated in the conservative calculation formulas in the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) for projecting field levels. Hammett & Edison has built those formulas into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radio sources. The program allows for the description of buildings and uneven terrain, if required to obtain more accurate projections.

RFR.CALC™ Calculation Methodology

Assessment by Calculation of Compliance with FCC Exposure Guidelines

The U.S. Congress required (1996 Telecom Act) the Federal Communications Commission ("FCC") to adopt a nationwide human exposure standard to ensure that its licensees do not, cumulatively, have a significant impact on the environment. The maximum permissible exposure limits adopted by the FCC (see Figure 1) apply for continuous exposures from all sources and are intended to provide a prudent margin of safety for all persons, regardless of age, gender, size, or health. Higher levels are allowed for short periods of time, such that total exposure levels averaged over six or thirty minutes, for occupational or public settings, respectively, do not exceed the limits.

Near Field.

Prediction methods have been developed for the near field zone of panel (directional) and whip (omnidirectional) antennas, typical at wireless telecommunications base stations, as well as dish (aperture) antennas, typically used for microwave links. The antenna patterns are not fully formed in the near field at these antennas, and the FCC Office of Engineering and Technology Bulletin No. 65 (August 1997) gives suitable formulas for calculating power density within such zones.

For a panel or whip antenna, power density $S = \frac{180}{\theta_{BW}} \times \frac{0.1 \times P_{net}}{\pi \times D \times h}$, in mW/cm^2,

and for an aperture antenna, maximum power density $S_{max} = \frac{0.1 \times 16 \times \eta \times P_{net}}{\pi \times h^2}$, in mW/cm^2,

where θ_{BW} = half-power beamwidth of the antenna, in degrees, and
P_{net} = net power input to the antenna, in watts,
D = distance from antenna, in meters,
h = aperture height of the antenna, in meters, and
η = aperture efficiency (unitless, typically 0.5-0.8).

The factor of 0.1 in the numerators converts to the desired units of power density.

Far Field.

OET-65 gives this formula for calculating power density in the far field of an individual RF source:

power density $S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times ERP}{4 \times \pi \times D^2}$, in mW/cm^2,

where ERP = total ERP (all polarizations), in kilowatts,
RFF = relative field factor at the direction to the actual point of calculation, and
D = distance from the center of radiation to the point of calculation, in meters.

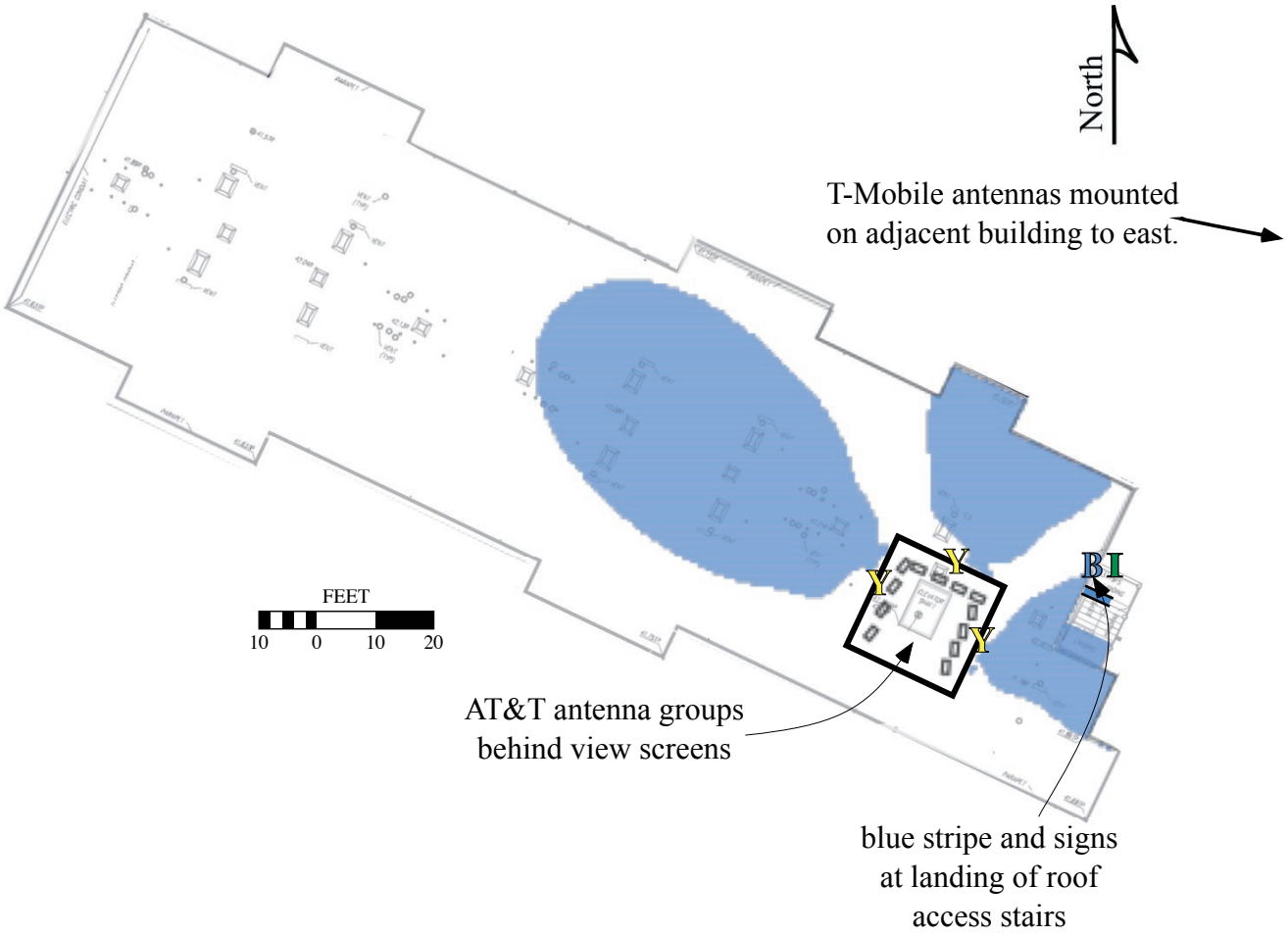
The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 100 in the numerator converts to the desired units of power density. This formula has been built into a proprietary program that calculates, at each location on an arbitrary rectangular grid, the total expected power density from any number of individual radiation sources. The program also allows for the description of uneven terrain in the vicinity, to obtain more accurate projections.

AT&T Mobility • Base Station No. CCU3969
1777 Shoreline Drive Street • Alameda, California

Calculated RF Exposure Levels on Roof

Recommended Mitigation Measures

- Lock all roof access locations
- Mark boundaries (if shown)
- Post explanatory signs
- Provide training



Notes:
Base drawing from Cortel, Inc., dated January 9, 2015.
Calculations performed according to OET Bulletin 65, August 1997.
Training should be provided to all persons with access to the roof.

Legend:	Less Than Public	Exceeds Public	Exceeds Occupational	Exceeds 10x Occupational
Shaded color	N/A			
Boundary marking	N/A			
Sign type	I - Green INFORMATION	B - Blue NOTICE	Y - Yellow CAUTION	O - Orange WARNING

Alternative Sites Analysis

AT&T Mobility

Wireless Communications Facility
at
1777 Shoreline Drive
Alameda, CA

Site ID: CCU3969

Introduction

New Cingular Wireless PCS, LLC d/b/a AT&T Mobility ("AT&T") has a significant gap in its service coverage in this portion of Alameda. AT&T proposes to install a stealth wireless communications facility ("WCF") on the roof of this apartment building ("Proposed Facility") as a means to fill this gap in coverage. The Proposed Facility consists of twelve panel antennas (three sectors of four antennas) mounted around an existing elevator shaft and surrounded by a stealth enclosure designed to match the character of the existing structure, with the related equipment to be housed in cabinets at ground level concealed behind a CMU wall designed to match the building. The Proposed Facility is designed to minimize visual impacts, blend within the existing environment, and obscure the antennas. The Proposed Facility is the least intrusive means to fill the significant gap of the alternatives investigated by AT&T as explained below.

Objective

AT&T Mobility has identified a significant gap in its service coverage in Alameda, in an area roughly bordered by Dayton Avenue to the north, Willow Street to the east, the Pacific Ocean to the south, and Shell Gate Road to the west. The Proposed Facility will improve coverage to the surrounding residential neighborhoods with over 380 homes, a park, schools and various other points of interest in the immediate vicinity. The service coverage in this portion of Alameda is described in the accompanying Radio Frequency Statement. The most recent traffic data available from Google Earth Pro for this area indicates that the average traffic along Otis Drive near Grand Street was 7,156 vehicles per day in 2012.

Methodology and Zoning Criteria

The location of a WCF to fill a significant gap in coverage is dependent upon topography, zoning, existing structures, collocation opportunities, available utilities, access, and a willing landlord. Wireless communication is line-of-sight technology that requires WCFs to be in relatively close proximity to the wireless handsets to be served.

AT&T seeks to fill a significant gap in service coverage using the least intrusive means under the values of the community as expressed in the Alameda Municipal Code ("Code"). Thus, AT&T is guided by Chapter 30-21 of the Code regarding use permits. AT&T also looks to the city's prior approvals of WCFs as guidance for acceptable installations. For example, there is an existing T-Mobile WCF on the rooftop of the adjacent building from the Proposed Facility. Finally, AT&T recently was required to vacate its existing site on the nearby school that serves this area. The gap in coverage results from the need to decommission that site. Thus, AT&T has sought non-school sites in the area to replace the necessary service coverage.

Analysis

AT&T investigated potential alternative designs of and alternative sites for facilities to fill the identified coverage gap in this portion of Alameda. There are very few available alternatives in this portion of the city due to the number of single-family homes and lack of commercial properties. The following map shows the locations of the Proposed Facility and the alternative sites that AT&T investigated. The alternatives are discussed in the analysis that follows.

Location of Candidate Sites

Proposed Facility – 1777 Shoreline Drive

Existing:

Proposed:

Conclusion: Based upon location, a willing landlord and the superior coverage as shown in the proposed coverage map included in AT&T's Radio Frequency Statement, the Proposed Facility is the least intrusive means for AT&T to meet its service coverage objective.

This apartment building is located along Shoreline Drive. The adjacent building in the same complex houses an approved T-Mobile WCF. AT&T proposes to locate its Proposed Facility on this rooftop by installing a wall around the existing elevator shaft to completely screen its antennas. The result will be an unnoticeable WCF with a very minor change to the appearance of the rooftop. The related equipment will be located at ground level and it will also be unnoticeable behind a CMU wall designed and painted to match the building. The Proposed Facility will be completely screened and the faux penthouse will blend in with the building and surroundings. The location and appearance of the Proposed Facility complies with the Code and meets city design criteria. The Proposed Facility is the least intrusive means to fill the significant gap of the alternatives investigated by AT&T.

Alternative No. 1 – 1701, 1705, 1711 Shoreline Drive

Conclusion: More intrusive than Proposed Facility

This set of apartment buildings is located adjacent to Wood Middle School. AT&T selected the Proposed Facility as less intrusive because it is adjacent to an existing approved WCF on the same property and it is further from the school than these buildings.

Alternative No. 2 – Wood Middle School

Conclusion: Unavailable

This school recently terminated the lease allowing AT&T to operate its WCF here. Last year, the Alameda Unified School District Board adopted a resolution to formally oppose WCFs on school property. This site is no longer available to AT&T, which is the reason AT&T is now seeking to relocate to the Proposed Facility.

Alternative No. 3 – Donald Lum Elementary School

Conclusion: Unavailable

This school is located adjacent to Wood Elementary School. Given the new policy of the Alameda Unified School District prohibiting WCFs on school property, and direction from the school district to remove WCFs from schools in Alameda, this site is not available.

Alternative No. 4 – Rittler Park

Conclusion: More intrusive than Proposed Facility

This city park is located adjacent to Wood Middle School. Given its location immediately adjacent to the school, and the intense opposition to locating WCFs on school property, this site is more intrusive than the Proposed Facility. In addition, a WCF here would need to be a freestanding structure that might stick out more than the proposed stealth rooftop installation.

Alternative No. 5 – Shoreline

Conclusion: More intrusive than Proposed Facility

The shoreline offers no opportunity to conceal a WCF. A WCF here would be much more visible and intrusive than the Proposed Facility.

Conclusion

The Proposed Facility is the least intrusive means by which AT&T can close its significant service coverage objective in this portion of Alameda.

AT&T Mobility Radio Frequency Statement
1777 Shoreline Drive, Alameda, CA
Site ID: CCU3969

STATEMENT OF MICHAEL QUINTO

I am the AT&T radio frequency engineer assigned to the proposed wireless communications facility at 1777 Shoreline Drive, Alameda, CA (the "Property"). Based on my personal knowledge of the Property and with AT&T's wireless network, as well as my review of AT&T's records with respect to the Property and its wireless communications facilities in the surrounding area, I have concluded that the work associated with this permit request is needed to close a significant service coverage gap in an area roughly bordered by Dayton Avenue to the north, Willow Street to the east, the Pacific Ocean to the south, and Shell Gate Road to the west. The service coverage gap will exist once AT&T decommissions its existing wireless communications facility at a school. To remedy this service coverage gap, AT&T will need to construct a new wireless communications facility.

The service coverage gap will be caused by inadequate infrastructure in the area. As explained further in Exhibit 1, AT&T's existing facilities cannot adequately serve its customers in the desired area of coverage, let alone address rapidly increasing data usage. The site will not only close the gap in coverage and help address rapidly increasing data usage driven by smart phone and tablet usage, but it will also include 4G LTE service coverage. This site is part of an effort to fully deploy 4G LTE technology in the area.

AT&T uses industry standard propagation tools to identify the areas in its network where signal strength is too weak to provide reliable in-building service quality. This information is developed from many sources including terrain and clutter databases, which simulate the environment, and propagation models that simulate signal propagation in the presence of terrain and clutter variation. AT&T designs and builds its wireless network to ensure customers receive reliable in-building service quality. In-building service is critical as customers increasingly use their mobile phones as their primary communication device (approximately 44% of American households are now wireless only) and rely on their mobile phones to do more (E911, GPS, web access, text, etc.).

Exhibit 2 is a map of the existing UMTS 3G service coverage (without the proposed installation at the Property) in the area at issue. It includes service coverage provided by existing AT&T sites. The green shaded areas depict areas within a signal strength range that provide acceptable in-building service coverage. In-building coverage means customers are able to place or receive a call on the ground floor of a building. The yellow shaded areas depict areas within a signal strength range that provide acceptable in-vehicle service coverage. In these areas, an AT&T customer should be able to successfully place or

receive a call within a vehicle. The blue shading depicts areas within a signal strength range in which a customer might have difficulty receiving a consistently acceptable level of service. The quality of service experienced by any individual customer can differ greatly depending on whether that customer is indoors, outdoors, stationary, or in transit. Any area in the yellow or blue category is considered inadequate service coverage and constitutes a service coverage gap.

Exhibit 3 to this Statement is a map that predicts service coverage based on signal strength in the vicinity of the Property if antennas are placed as proposed in the application. As shown by this map, placement of the equipment at the Property closes the significant UMTS 3G service coverage gap.

In addition to these 3G wireless service gap issues, AT&T is in the process of deploying its 4G LTE service in Alameda with the goal of providing the most advanced personal wireless experience available to residents of the county. 4G LTE is capable of delivering speeds up to 10 times faster than industry-average 3G speeds. LTE technology also offers lower latency, or the processing time it takes to move data through a network, such as how long it takes to start downloading a webpage or file once you've sent the request. Lower latency helps to improve the quality of personal wireless services. What's more, LTE uses spectrum more efficiently than other technologies, creating more space to carry data traffic and services and to deliver a better overall network experience. Attached Exhibits 4 and 5 are LTE maps that illustrate how the proposed site closes the significant service coverage gap in LTE service coverage. Moreover, it is important to note that as existing customers migrate to 4G LTE, the LTE technology will provide the added benefit of reducing 3G data traffic, which can contribute to the significant service coverage gap on the UMTS (3G) network during peak usage periods.

I have a Bachelor of Science Degree in electronics and communications engineering and have worked as an engineering expert in the wireless communications industry for over 14 years.

Michael Quinto
AT&T Mobility Services LLC
Network, Planning & Engineering
RAN Design & RF Engineering

March 11, 2015

EXHIBIT 1
Prepared by AT&T Mobility

AT&T's digital wireless technology converts voice or data signals into a stream of digits to allow a single radio channel to carry multiple simultaneous signal transmissions. This technology allows AT&T to offer services such as secured transmissions and enhanced voice, high-speed data, texting, video conferencing, paging and imaging capabilities, as well as voicemail, visual voicemail, call forwarding and call waiting that are unavailable in analog-based systems. With consumers' strong adoption of smartphones, customers now have access to wireless broadband applications, which consumers utilize at a growing number.

Mobile data traffic in the United States grew by 75,000 percent over a six-year span, from 2001-2006. And in the seven years that followed, mobile data traffic on AT&T's national wireless network increased more than 50,000 percent *(from January 2007 through December 2013).* AT&T expects total mobile data volume to ***grow 8x-10x over the next five years***. To put this estimate in perspective, all of AT&T Mobility's mobile traffic during 2010 would be equal to only six or seven weeks of mobile traffic volume in 2015. The FCC noted that U.S. mobile data traffic grew almost 300% in 2011, and driven by 4G LTE smartphones and tablets, traffic is projected to grow an additional 16-fold by 2016.

Mobile devices using AT&T's technology transmit a radio signal to antennas mounted on a tower, pole, building, or other structure. The antenna feeds the signal to electronic devices housed in a small equipment cabinet, or base station. The base station is connected by microwave, fiber optic cable, or ordinary copper telephone wire to the Radio Network Controller, subsequently routing the calls and data throughout the world.

The operation of AT&T's wireless network depends upon a network of wireless communications facilities. The range between wireless facilities varies based on a number of factors. The range between AT&T mobile telephones and the antennas in and nearby Alameda, for example, is particularly limited as a result of challenges such as blockage from buildings, trees, and other obstructions as well as the limited capacity of existing facilities.

To provide effective, reliable, and uninterrupted service to AT&T customers in their cars, public transportation, home, and office, without interruption or lack of access, coverage must overlap in a grid pattern resembling a honeycomb.

In the event that AT&T is unable to construct or upgrade a wireless communications facility within a specific geographic area, so that each site's coverage reliably overlaps with at least one adjacent facility, AT&T will not be able to provide adequate personal wireless service to its customers within that area. Some consumers will experience an abrupt loss of service. Others will be unable to obtain reliable service, particularly if they are placing a call inside a building.

Service problems occur for customers even in locations where the coverage maps on AT&T's "Coverage Viewer" website appear to indicate that coverage is available. As the legend to the Coverage Viewer maps indicates, these maps depict a high-level *approximation* of coverage, which may not show gaps in coverage; *actual* coverage in an area may differ substantially from map graphics, and may be affected by such things as terrain, foliage, buildings and other construction, motion, customer equipment, and network traffic. The legend states that AT&T does not guarantee coverage and its coverage maps are not intended to show actual

customer performance on the network, nor are they intended to show future network needs or build requirements inside or outside of AT&T's existing coverage areas.

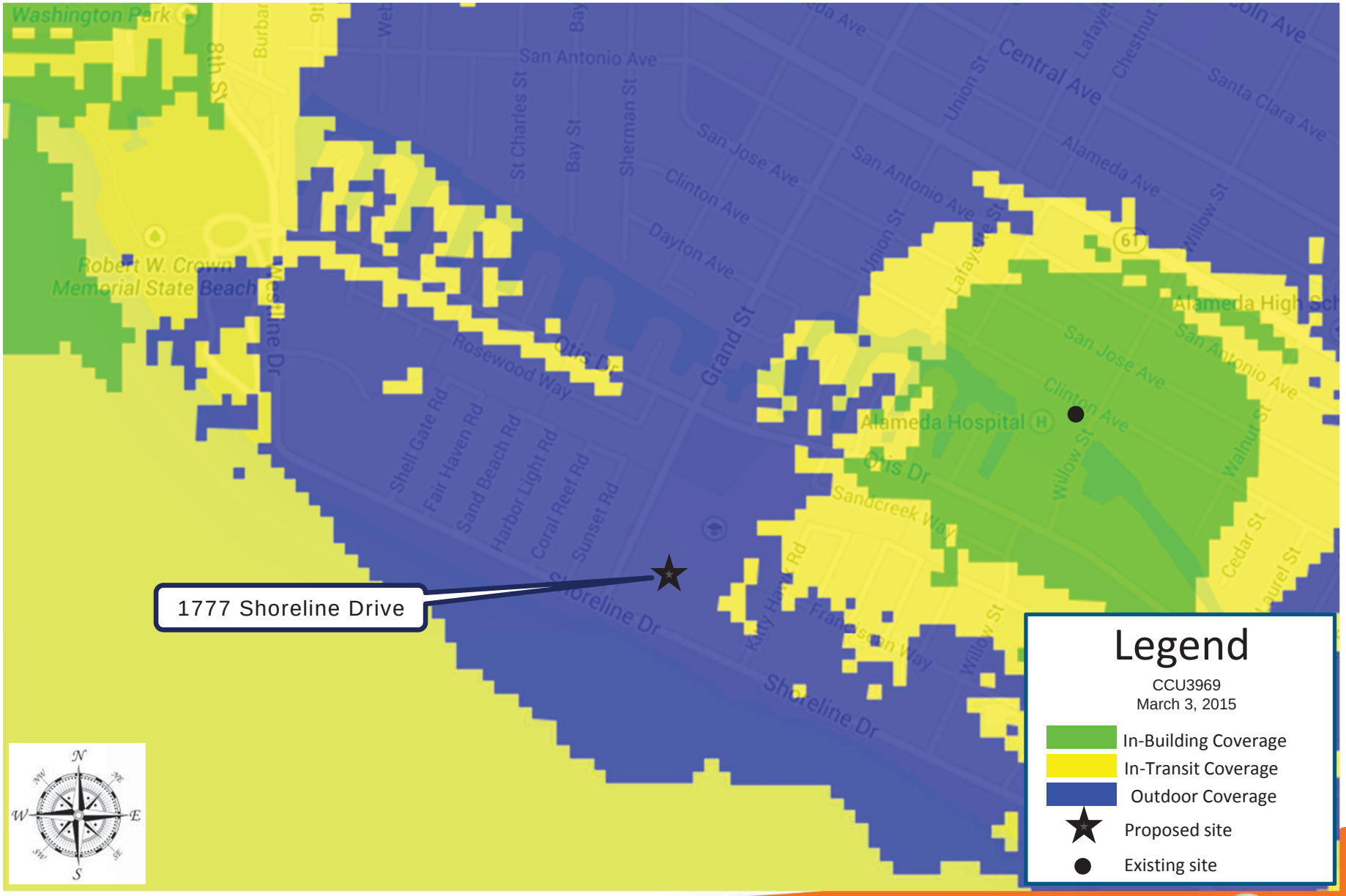
It is also important to note that the signal losses and service problems described above can and do occur for customers even at times when certain other customers in the same vicinity may be able to initiate and complete calls on AT&T's network (or other networks) on their wireless phones. These problems also can and do occur even when certain customers' wireless phones indicate "all bars" of signal strength on the handset.

The bars of signal strength that individual customers can see on their wireless phones are an imprecise and slow-to-update estimate of service quality. In other words, a customer's wireless phone can show "four bars" of signal strength, but that customer can still, at times, be unable to initiate voice calls, complete calls, or download data reliably and without service interruptions.

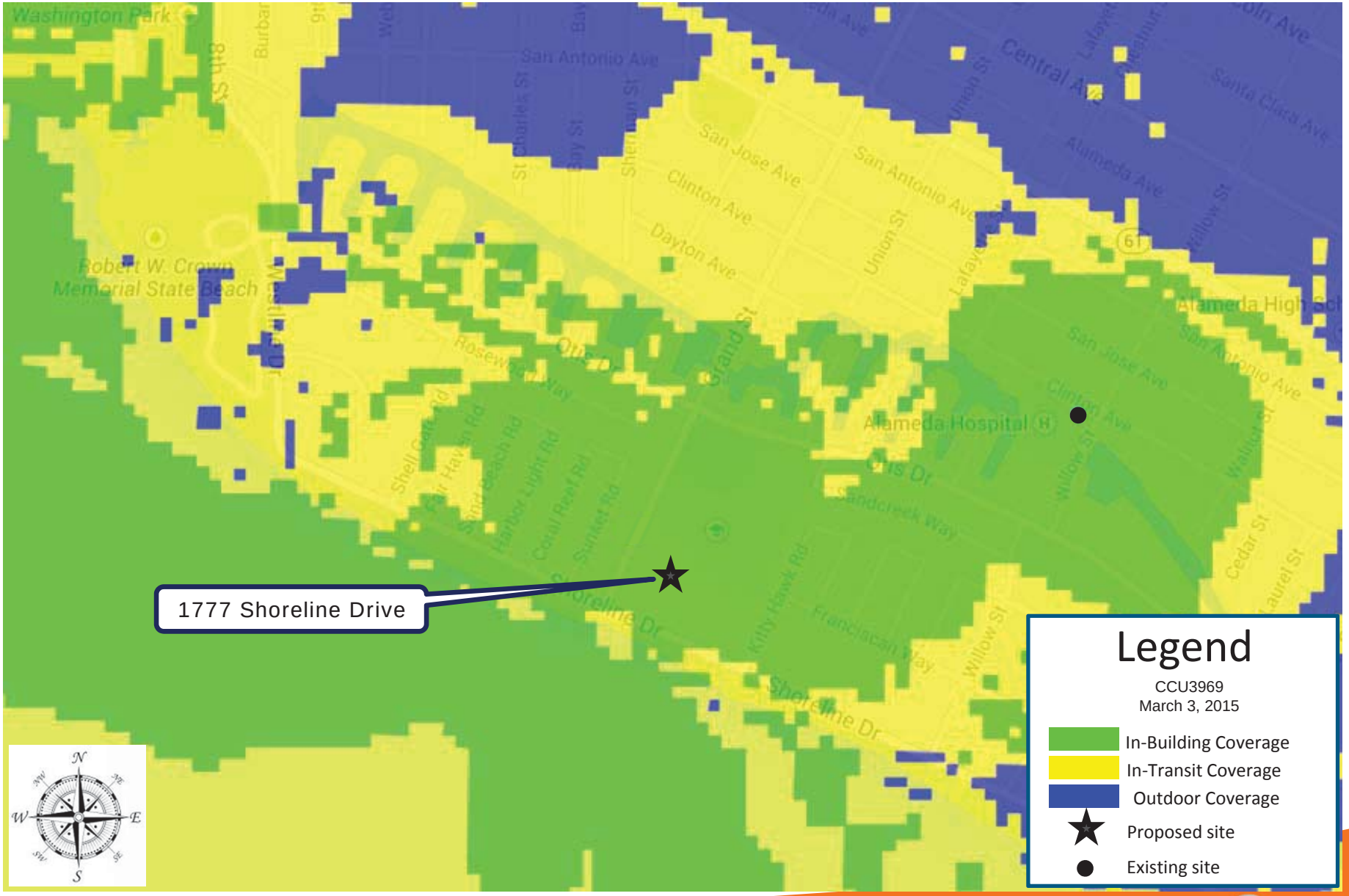
To determine where new or upgraded telecommunications facilities need to be located for the provision of reliable service in any area, AT&T's radio frequency engineers rely on far more complete tools and data sources than just signal strength from individual phones. AT&T creates maps incorporating signal strength that depict existing service coverage and service coverage gaps in a given area.

To rectify this significant gap in its service coverage, AT&T needs to locate a wireless facility in the immediate vicinity of the Property.

Without CCU3969 Coverage



With CCU3969 Coverage



Without CCL03969 Coverage

With CCL03969 Coverage