

**MACKENZIE & ALBRITTON LLP**

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September 22, 2020

**VIA EMAIL**

President Norman Yee  
Supervisors Sandra Lee Fewer,  
Catherine Stefani, Aaron Peskin,  
Gordon Mar, Dean Preston, Matt Haney,  
Rafael Mandelman, Hillary Ronen,  
Shamann Walton, and Ahsha Safai  
San Francisco Board of Supervisors  
1 Dr. Carlton B. Goodlett Place  
San Francisco, California 94102

Re: Verizon Wireless Response to Appeal  
Collocated Telecommunications Facility, 2001 37<sup>th</sup> Avenue  
(St. Ignatius College Preparatory)  
Board of Supervisors Agenda, September 22, 2020

Dear President Yee and Supervisors:

We write on behalf of Verizon Wireless to ask that you uphold the approval of the Planning Commission and deny the appeal filed by the Saint Ignatius Neighborhood Association (“Appellant”) of a wireless facility collocated on proposed new stadium lighting at the St. Ignatius College Preparatory school (the “Approved Facility”). Verizon Wireless designed the Approved Facility to provide needed service with minimal impact. As confirmed by the Planning Commission, the Approved Facility meets all findings for approval under San Francisco’s Code (the “Code”). Appellant does not present any substantial evidence to warrant denial of the Approved Facility. Further, because the Approved Facility will fill a significant gap in Verizon Wireless service, and there is no less intrusive alternative, denial would violate the federal Telecommunications Act. We urge you to reject the appeal and approve the Approved Facility.

**I. The Project**

St. Ignatius College Preparatory school has proposed to add four 90-foot stadium lights to an existing field stadium at its private secondary school. The Approved Facility has been thoughtfully designed to minimize any impact by locating on the northwest light standard. Verizon Wireless proposes to place nine panel antennas, three integrated radio antenna units, six remote radio units, two surge suppressors, and ancillary equipment

within a 12-foot by 28-foot fenced area located on the ground, adjacent to the light standard.

Photosimulations of the Approved Facility are attached as Exhibit A. A report prepared by third-party consulting engineers, attached as Exhibit B, confirms that radio frequency (“RF”) exposure from the Approved Facility will fully comply with Federal Communications Commission (“FCC”) guidelines.

## **II. The Approved Facility Satisfies All Findings For A Special Use Permit.**

As confirmed by the Planning Commission’s approval, the Approved Facility meets all requirements for approval of a conditional use authorization, including the Planning Department’s Wireless Telecommunications Services Facilities Siting Guidelines (the “WTS Guidelines”), as detailed by the Planning Commission. Notably, the Approved Facility will not be detrimental to public health, safety or welfare, because radio frequency emissions will fall well under FCC exposure guidelines, and the facility will not be accessible to the public.

The Approved Facility satisfies all development standards, including the location preferences in the WTS Guidelines. WTS Guidelines, §8.1. The WTS Guidelines establish five categories of preferred location sites, and the Approved Facility qualifies for the two most preferred locations. The first location, “publicly-used structures,” includes “[w] here the installation complies with all FCC regulations and standards, schools, hospitals, health centers, places of worship, or other institutional structures. . . .” WTS Guidelines, §8.1.1. Here, the Approved Facility complies with all FCC regulations and standards, as established by the third-party engineer’s report and also because it is located at a school. San Francisco’s Department of Public Health have reviewed this report and independently approved it. Exhibit C.

The second location preference, “co-location site,” is for “[a]ny existing site on which a legal wireless telecommunications facility is currently located shall be a Preferred Location Site regardless of the underlying zoning designation of the site. . . .” WTS Guidelines, §8.1.2. Both AT&T Mobility and T-Mobile have wireless facilities on the three-story classroom building about 490 feet to the northeast of the Approved Facility at the school.

There will be no impact to views, as the Approved Facility will be located on the school’s proposed light standards. The Approved Facility will not increase the height of the lights and will use its existing infrastructure. The Approved Facility is necessary and desirable because it will improve wireless connectivity for residents, visitors, and emergency personnel, with minimal impact on the neighborhood.

In sum, the Approved Facility satisfies all requirements for approval.

### **III. Verizon Wireless Has Presented Substantial Evidence For Approval, And Appellant Presents No Substantial Evidence To Warrant Denial**

Under the federal Telecommunications Act, a local government’s denial of a wireless facility application must be based on “substantial evidence.” *See* 47 U.S.C. § 332(c)(7)(B)(iii). A denial of an application must be based on requirements set forth in the local code and supported by evidence in the record. *See Metro PCS, Inc. v. City and County of San Francisco*, 400 F.3d 715, 725 (9th Cir. 2005) (denial of application must be “authorized by applicable local regulations and supported by a reasonable amount of evidence”). While a local government may regulate the placement of wireless facilities based on aesthetics, mere generalized concerns or opinions about aesthetics or compatibility with a neighborhood do not constitute substantial evidence upon which a local government could deny a permit. *See City of Rancho Palos Verdes v. Abrams* (2002) 101 Cal. App. 4th 367, 381.

As set forth above, Verizon Wireless has provided substantial evidence to show that the Approved Facility complies with all requirements for approval under the Code. Among other evidence, photosimulations demonstrate the minimal impact of Verizon Wireless’s collocated antennas, painted to match. The submitted reports confirm that radio frequency exposure will comply with FCC guidelines, and noise emissions comply with City limits.

In contrast, Appellant has provided no evidence – let alone the substantial evidence required by federal law – to support denial of the Approved Facility. Appellant presents no evidence to contradict the Planning Commission’s findings for approval. We respond to Appellant’s various grounds for appeal below.

### **IV. The Planning Commission Properly Determined That The Approved Facility Is Exempt From CEQA**

Appellant challenges the Planning Commission’s exemption of the Approved Facility from the California Environmental Quality Act (Pub. Res. Code §§21000-21189.3) (“CEQA”) and the Guidelines for Implementation of the California Environmental Quality Act (14 Cal. Code Regs. §§15000-15387) (“CEQA Guidelines”). The Approved Facility qualifies for a Class 3 categorical exemption, which applies to new construction of small facilities or structures. 14 Cal. Code Regs. §15303. Courts have consistently upheld the application of the Class 3 exemption to a wide variety of wireless and telecommunications projects. *See Don’t Cell Our Parks v. City of San Diego* (2018) 21 Cal.App.5th 338 (faux tree telecommunications pole in public park); *Aptos Residents Ass’n v. County of Santa Cruz* (2018) 20 Cal.App.5th 1039 (10 microcell transmitter units on existing utility poles); *Robinson v. City and County of San Francisco* (2012) 208 Cal.App.4th 950 (40 wireless equipment cabinets on existing utility poles); *San Francisco Beautiful v. City and County of San Francisco* (2014) 226 Cal.App.4th 1012 (726 new utility cabinets on public sidewalks).

The CEQA Guidelines provide examples of the Class 3 exemption, including multi-family residential structures; a store, motel, office, restaurant or similar structure not exceeding 2,500 square feet in floor area; and in urbanized areas, up to four commercial buildings, not exceeding 10,000 square feet in floor area. 14 Cal. Code Regs. §15303. The Approved Facility has a much smaller footprint than these examples, with only a 336-square foot equipment enclosure and minimal equipment attached to a stadium light standard.

Finally, Appellant claims that exceptions to the Class 3 exemption preclude its use. 14 Cal. Code Regs. §15300.2. However, Appellant has not contended that any of these exceptions apply to the Approved Facility.

In sum, Appellant raises no grounds for appeal that constitute substantial evidence to deny the Approved Facility. In contrast, Verizon Wireless has provided ample evidence that the Approved Facility complies with all City requirements. The appeal must be rejected.

#### **IV. The Appeal Must Be Denied To Avoid An Unlawful Prohibition Of Service**

A local government's denial of a permit for a wireless facility violates the "effective prohibition" clause of the federal Telecommunications Act if the wireless provider can show two things: (1) that it has a "significant gap" in service; and (2) that the proposed facility is the "least intrusive means," in relation to the land use values embodied in local regulations, to address the gap. *See T-Mobile USA, Inc. v. City of Anacortes*, 572 F.3d 987 (9th Cir. 2009).

If a provider proves both elements, the local government *must* approve the facility, even if there is substantial evidence to deny the permit under local land use provisions (which there is not in this case). This is because the provider has met the requirements for federal preemption; i.e., denial of the permit would "have the effect of prohibiting the provision of personal wireless services." 47 U.S.C. § 332(c)(7)(B)(1)(ii); *T-Mobile v. Anacortes*, 572 F.3d at 999. To avoid such preemption, the local government must show that another alternative is available, technologically feasible, and less intrusive than the proposed facility. *T-Mobile v. Anacortes*, 572 F.3d at 998-999.

##### **A. Verizon Wireless Has Demonstrated a Significant Gap in Service.**

Verizon Wireless has identified a significant gap in its LTE service coverage in the area surrounding the St. Ignatius school in the Sunset District. Verizon Wireless's small cell facilities in the greater vicinity are too distant to serve the gap. The significant gap is described in the coverage maps, attached as Exhibit D. The existing coverage map shows a lack in-building LTE coverage on nearby school properties and the residential neighborhoods to the west and south. There is a lack of in-vehicle coverage along local roads to the west, north and east, and along a 0.6-mile stretch of major thoroughfare Sunset Boulevard to the east. The proposed coverage map shows that the Approved Facility will provide reliable new in-building coverage to the school properties and

residential neighborhoods, as well as new in-vehicle coverage to local roadways and Sunset Boulevard.

A third-party engineering firm, approved by the City, independently verified this gap by reviewing the maps and conducting their own drive test, attached as Exhibit E. They concluded that “Based on the measurement data, we conclude that the Verizon 4G LTE coverage map showing the service area without the proposed installation includes areas of relatively weak signal levels in the carrier’s present coverage.”

**B. The Approved Facility is the Least Intrusive Means To Fill the Significant Gap in Service.**

In an effort to address the significant gap, Verizon Wireless searched for a site that qualified for the WTS Guidelines’ Code’s top two preferences for wireless facility placement.

In short, Verizon Wireless has identified a significant gap in coverage and has shown that the Approved Facility is the least intrusive means to address it, based on the values expressed in City regulations. Under these circumstances, Verizon Wireless has established that denial of the Approved Facility would constitute an unlawful prohibition of service.

**V. Conclusion**

Verizon Wireless has worked diligently to identify the ideal location and design for a new facility to serve the south Monterey area. As confirmed by the Planning Commission, the Approved Facility meets all findings for approval under the Code. Appellant raises no substantial evidence to contradict this approval. Ensuring reliable Verizon Wireless service in Monterey is critical to residents and visitors as well as emergency service personnel. We strongly encourage you to affirm the Planning Commission’s approval, and to deny the appeal.

Very truly yours,



Paul B. Albritton

cc: Jeff Horn  
Bill Sanders  
Jocelyn Wong

**Schedule of Exhibits**

Exhibit A: Photosimulations

Exhibit B: Radio Frequency Exposure Report by Hammett & Edison, Inc.

Exhibit C: DPH Approval

Exhibit D: Engineering Necessity Case

Exhibit E: Hammett & Edison, Inc. Peer Review of Necessity

# Exhibit A





Existing



Proposed

proposed antennas

**Statement of Hammett & Edison, Inc., Consulting Engineers**

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a personal wireless telecommunications carrier, to evaluate the base station (Site No. 255926 “Sunset & Noriega”) proposed to be located at 2001 37th Avenue in San Francisco, California, for compliance with appropriate guidelines limiting human exposure to radio frequency (“RF”) electromagnetic fields.

**Background**

The San Francisco Department of Public Health has adopted an 11-point checklist for determining compliance of proposed WTS facilities or proposed modifications to such facilities with prevailing safety standards. The acceptable exposure limits set by the FCC are shown in Figure 1. The most restrictive limit for exposures of unlimited duration at several wireless service bands are as follows:

Wireless Service Band	Transmit Frequency	“Uncontrolled” Public Limit	Occupational Limit (5 times Public)
Microwave (point-to-point)	1–80 GHz	1.0 mW/cm <sup>2</sup>	5.0 mW/cm <sup>2</sup>
Millimeter-wave	24–47	1.0	5.0
Part 15 (WiFi & other unlicensed)	2–6	1.0	5.0
CBRS (Citizens Broadband Radio)	3,550 MHz	1.0	5.0
BRS (Broadband Radio)	2,490	1.0	5.0
WCS (Wireless Communication)	2,305	1.0	5.0
AWS (Advanced Wireless)	2,110	1.0	5.0
PCS (Personal Communication)	1,930	1.0	5.0
Cellular	869	0.58	2.9
SMR (Specialized Mobile Radio)	854	0.57	2.85
700 MHz	716	0.48	2.4
600 MHz	617	0.41	2.05
[most restrictive frequency range]	30–300	0.20	1.0

**Checklist**

Reference has been made to information provided by Verizon, including zoning drawings by Streamline Engineering and Design, Inc., dated April 16, 2019. It should be noted that the calculation results in this Statement include several “worst-case” assumptions and therefore are expected to overstate actual power density levels from the proposed operations. Figure 2 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”). This methodology is an industry standard for evaluating RF exposure conditions and has been demonstrated through numerous field tests to be a conservative prediction of exposure levels.

**Verizon Wireless • Proposed Base Station (Site No. 255926 “Sunset & Noriega”)  
2001 37th Avenue • San Francisco, California**

1. The location, identity, and total number of all operational radiating antennas installed at this site.

There are reported no wireless base stations installed at or near the site, a 90-foot stadium light pole sited next to the north end of the bleachers on the west side of the football field at St. Ignatius College Preparatory, located at 2001 37th Avenue.

2. List all radiating antennas located within 100 feet of the site that could contribute to the cumulative radio frequency energy at this location.

There were observed similar antennas for use by AT&T Mobility and T-Mobile located on the three-story classroom building about 490 feet to the northeast.

3. Provide a narrative description of the proposed work for this project.

Verizon proposes to install twelve antennas. This is consistent with the scope of work described in the drawings for transmitting elements.

4. Provide an inventory of the make and model of antennas or transmitting equipment being installed or removed.

Verizon proposes to install twelve directional panel antennas – three CommScope Model NNH4-65A-R6, three Ericsson Model 6701, and six Ericsson Model 2208 – on the 90-foot tall light pole. The antennas would employ up to 4° downtilt, would be mounted at effective heights of about 63, 45, and 50 feet above ground, respectively, and would be oriented in identical groups of four at about 120° spacing, to provide service in all directions.

For the limited purpose of this study, it is assumed that AT&T has installed Kathrein Model 800-10964 and CommScope Model JAHH-65A directional panel antennas, employing up to 6° downtilt and mounted at an effective height of about 42 feet above ground, and that T-Mobile has installed Ericsson Model AIR21 and RFS Model APXVARR24 directional panel antennas, employing 2° downtilt and mounted at an effective height of about 42 feet above ground.

5. Describe the existing radio frequency energy environment at the nearest walking/working surface to the antennas and at ground level. This description may be based on field measurements or calculations.

There is no installed access to the antenna location. The maximum measured\* RF level for a person at ground near the site was 0.0013 mW/cm<sup>2</sup>, which is 0.65% of the most restrictive public limit.

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\* February 13, 2019, using calibrated Narda Type NBM-520 Broadband Field Meter with Type EF-0391 Isotropic Broadband Electric Field Probe (Serial No. D-0454).



**Verizon Wireless • Proposed Base Station (Site No. 255926 “Sunset & Noriega”)  
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6. Provide the maximum effective radiated power per sector for the proposed installation. The power should be reported in watts and reported both as a total and broken down by frequency band.

The maximum effective radiated power proposed by Verizon in any direction is 18,545 watts, representing simultaneous operation at 193 watts for 28 GHz, 172 watts for CBRS, 5,250 watts for AWS, 5,130 watts for PCS, 4,170 watts for cellular, and 3,630 watts for 700 MHz service.

7. Describe the maximum cumulative predicted radio frequency energy level for any nearby publicly accessible building or area.

The maximum calculated cumulative level at any nearby building is 11% of the public limit; this occurs at the school buildings located about 240 feet to the northeast. The maximum calculated cumulative level at the nearby bleachers is 6.9% of the public exposure limit. The maximum calculated cumulative level at the second-floor elevation of any nearby residence<sup>†</sup> is 7.4% of the public exposure limit.

8. Report the estimated cumulative radio frequency fields for the proposed site at ground level.

For a person anywhere at ground, the maximum RF exposure level due to the proposed Verizon operation by itself is calculated to be 0.032 mW/cm<sup>2</sup>, which is 5.2% of the applicable public exposure limit. Cumulative RF levels at ground level near the site are therefore estimated to be less than 6% of the applicable public limit.

9. Provide the maximum distance (in feet) the three dimensional perimeter of the radio frequency energy level equal to the public and occupational exposure limit is calculated to extend from the face of the antennas.

The three-dimensional perimeters of RF levels equal to the public and occupational exposure limits are calculated to extend up to 94 and 36 feet out from the Verizon antenna faces, respectively, and to much lesser distances above, below, and to the sides; this does not reach any publicly accessible areas.

10. Provide a description of whether or not the public has access to the antennas. Describe any existing or proposed warning signs, barricades, barriers, rooftop striping or other safety precautions for people nearing the equipment as may be required by any applicable FCC-adopted standards.

Due to their mounting location and height, the Verizon antennas would not be accessible to unauthorized persons, and so no measures are necessary to comply with the FCC public exposure guidelines. To prevent occupational exposures in excess of the FCC guidelines, it is recommended that appropriate RF safety training, to include review of personal monitor use and lockout/tagout procedures, be provided to all authorized personnel who have access to the structure, including

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<sup>†</sup> Located at least 80 feet to the west, based on photographs from Google Maps.



**Verizon Wireless • Proposed Base Station (Site No. 255926 “Sunset & Noriega”)  
2001 37th Avenue • San Francisco, California**

employees and contractors of the wireless carriers and of the property owner. No access within 36 feet directly in front of the Verizon antennas themselves, such as might occur during certain maintenance activities high on the pole, should be allowed while the base station is in operation, unless other measures can be demonstrated to ensure that occupational protection requirements are met. It is recommended that explanatory signs<sup>‡</sup> be posted at the antennas and/or on the pole below the antennas, readily visible from any angle of approach to persons who might need to work within that distance.

*11. Statement of authorship and qualification.*

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, 2021. 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.

**Conclusion**

Based on the information and analysis above, it is the undersigned’s professional opinion that operation of the base station proposed by Verizon Wireless at 2001 37th Avenue in San Francisco, California, will comply with the prevailing standards for limiting public exposure to radio frequency energy and, therefore, will 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. Training authorized personnel and posting explanatory signs are recommended to establish compliance with occupational exposure limits.



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

April 10, 2020

<sup>‡</sup> 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; the San Francisco Department of Public Health recommends that all signs be written in English, Spanish, and Chinese.

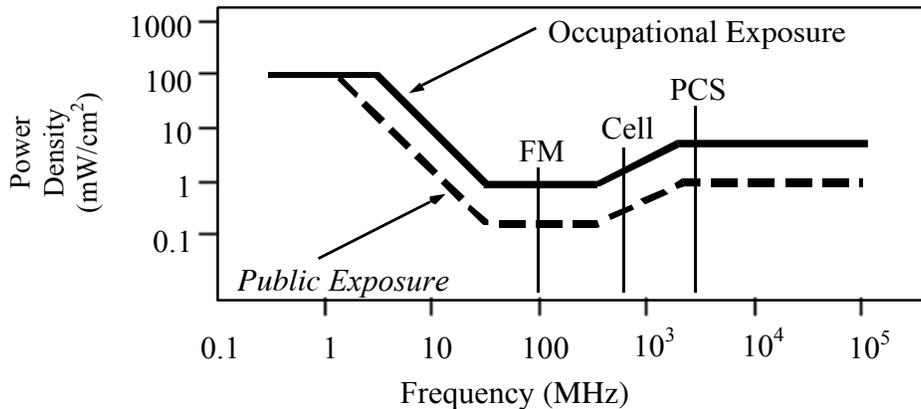


## FCC Radio Frequency Protection Guide

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



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 incorporated those formulas in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, 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<sup>2</sup>,

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<sup>2</sup>,

where  $\theta_{BW}$  = half-power beamwidth of antenna, in degrees,

$P_{net}$  = net power input to antenna, in watts,

$D$  = distance from antenna, in meters,

$h$  = aperture height of antenna, in meters, and

$\eta$  = 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<sup>2</sup>,

where  $ERP$  = total ERP (all polarizations), in kilowatts,

$RFF$  = three-dimensional relative field factor toward point of calculation, and

$D$  = distance from antenna effective height to 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 is used in a computer program capable of calculating, at thousands of locations on an arbitrary grid, the total expected power density from any number of individual radio frequency sources. The program also allows for the inclusion of uneven terrain in the vicinity, as well as any number of nearby buildings of varying heights, to obtain more accurate projections.



San Francisco City and County  
 Department of Public Health  
 Environmental Health Branch

London Breed, *Mayor*  
 Grant Colfax, MD, *Director of Health*  
 Stephanie K.J. Cushing, MSPH, CHMM, REHS  
*Director of Environmental Health*

Review of Cellular Antenna Site Proposals

**Project Sponsor :** Verizon **Planner:** Ashley Lindsay  
**RF Engineer Consultant:** Hammitt & Edison **Phone Number:** (707) 996-5200  
**Project Address/Location:** 2001 37th Av  
**Site ID:** 521 **SiteNo.:** SF05300A **Report Dated:** 4/10/2020

The following information is required to be provided before approval of this project can be made. These information requirements are established in the San Francisco Planning Department Wireless Telecommunications Services Facility Siting Guidelines dated August 1996.

In order to facilitate quicker approval of this project, it is recommended that the project sponsor review this document before submitting the proposal to ensure that all requirements are included.

- X 1. The location, identity and total number of all operational radiating antennas installed at this site was provided. (WTS-FSG, Section 10.4.1, Section 11, 2b)  
 Number of Existing Antennas: 0
- X 2. A list of all radiating antennas located within 100 feet of the site which could contribute to the cumulative radio frequency energy at this location was provided. (WTS-FSG, Section 10.5.2)  
 **Yes**       **No**
- X 3. A narrative description of the proposed work for this project was provided. The description should be consistent with scope of work for the final installation drawings. (WTS-FSG, Section 10)  
 **Yes**       **No**
- X 4. An inventory of the make and model of antennas or transmitting equipment being installed or removed was provided. The antenna inventory included the proposed installation height above the nearest walking/working surface, the height above ground level and the orientations of the antennas. (WTS-FSG, Section 10.5.2)  
 **Yes**       **No**
- X 5. A description of the existing radio frequency energy environment at the nearest walking/working surface to the antennas and at ground level was provided. A description of any assumptions made when doing the calculations was also provided. (WTS-FSG, Section 10.4.1a, Section 10.4.1c, Section 10.5)  
 **Yes**       **No**
- X 6. The maximum effective radiated power per sector for the proposed installation was provided along with the frequency bands used by the antennas. (WTS-FSG, Section 10.1.2, Section 10.5.1)  
 Maximum Effective Radiated Power: 18545 Watts
- X 7. Based on the antenna orientation, the maximum cumulative predicted radio frequency energy level for any nearby publicly accessible building or area was provided. (WTS-FSG, Section 10.4, Section 10.5.1)  
 Maximum percent of applicable FCC public standard at the nearest building or structure: 11 %  
 Distance to this nearby building or structure: 240 feet
- X 8. The estimated maximum cumulative radio frequency fields for the proposed site at ground level. (WTS-FSG, Section 10.5)  
 Maximum RF Exposure: 0.032 mW/cm<sup>2</sup>      Maximum RF Exposure Percent: 5.2 %

X 9. The maximum distance (in feet) the three dimensional perimeter of the radio frequency energy level equal to the public and occupational exposure limit is calculated to extend from the face of the antennas was provided. Any potential walking/working surfaces exceeding regulatory standards were identified. (WTS-FSG, Section 10.9.2)

Public Exclusion Area

Public Exclusion In Feet: 94

Occupational Exclusion Area

Occupational Exclusion In Feet: 36

X 10. A description of whether or not the public has access to the antennas was provided. A description was also provided of any existing or proposed warning signs, barricades, barriers, rooftop stripping or other safety precautions for people nearing the equipment as may be required by any applicable FCC-adopted standards. All signs will be provided in English, Spanish and Chinese. (WTS-FSG, Section 9.5, Section 10.9.2)

Yes       No

X 11. Statement regarding the engineer who produced the report and their qualifications was provided. The engineer is licensed in the State of California. (WTS-FSG, Section 11,8)

Yes       No

X **Approved.** Based on the information provided the following staff believes that the project proposal will comply with the current Federal Communication Commission safety standards for radiofrequency radiation exposure. FCC standard CFR47 1.1310 **Approval of the subsequent Project Implementation Report is based on project sponsor completing recommendations by project consultant and DPH.**

**Comments:**

There are no antennas existing operated by Verizon installed on the roof top of the building at 2001 37th Av. Existing RF levels at ground level were around 1% of the FCC public exposure limit. No other antennas were observed within 100 feet of this site. Verizon proposes to install 12 new antennas. The antennas are mounted at a height of 45- 63 feet above the ground. The estimated ambient RF field from the proposed Verizon transmitters at ground level is calculated to be 0.032 mW/sq cm., which is 5.2 % of the FCC public exposure limit. The three dimensional perimeter of RF levels equal to the public exposure limit extends 94 feet and does not reach any publicly accessible areas. Warning signs must be posted at the antennas and roof access points in English, Spanish and Chinese. Workers should not have access to within 36 feet of the front of the antennas while they are in operation.

     **Not Approved**, additional information required.

     **Not Approved**, does not comply with Federal Communication Commission safety standards for radiofrequency radiation exposure. FCC Standard

     1 Hours spent reviewing

Charges to Project Sponsor (in addition to previous charges, to be received at time of receipt by Sponsor)

Dated:     4/20/2020    

Signed: \_\_\_\_\_



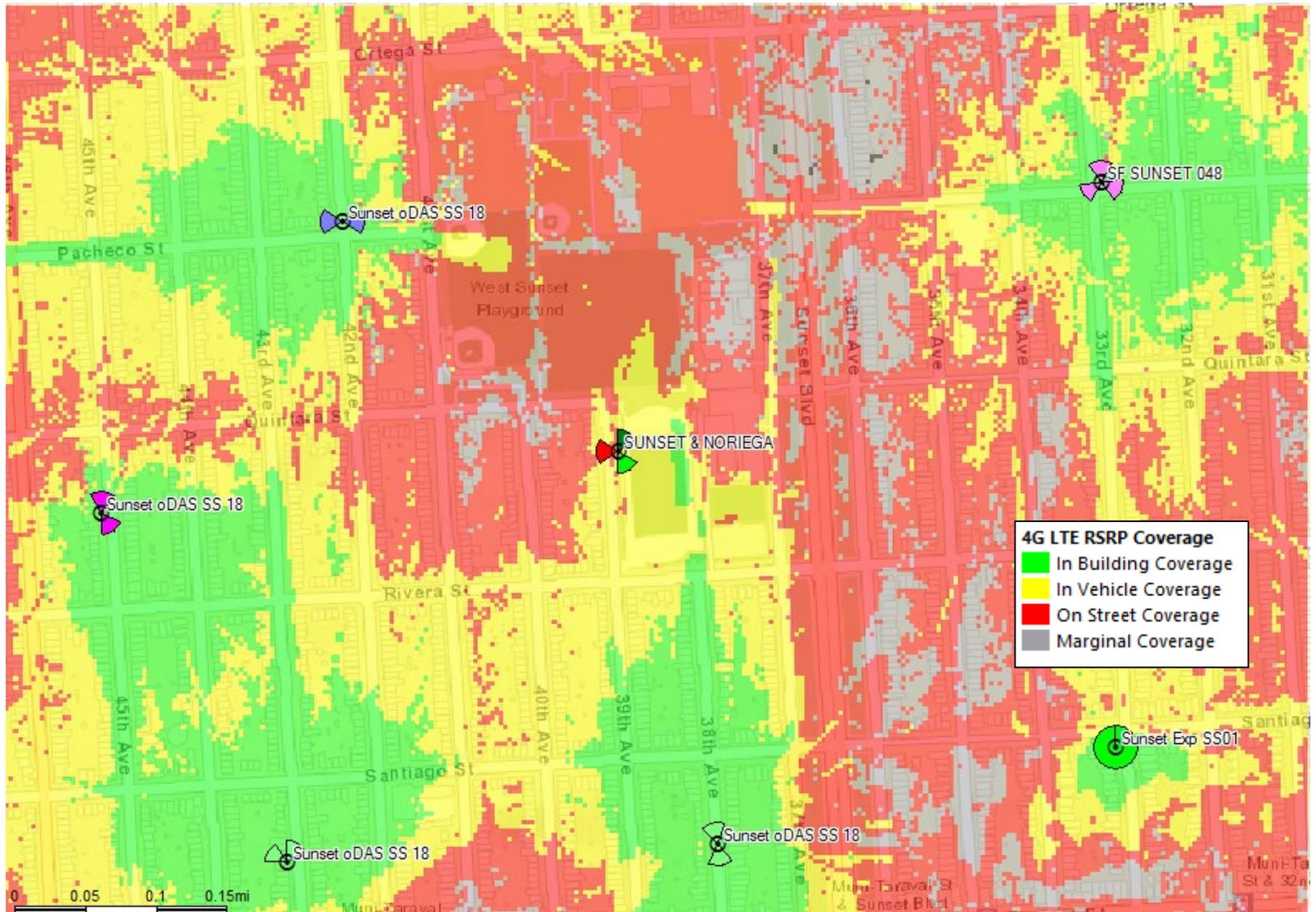
**Arthur Duque**

Environmental Health Management Section  
San Francisco Dept. of Public Health  
1390 Market St., Suite 210,  
San Francisco, CA. 94102  
(415) 252-3966

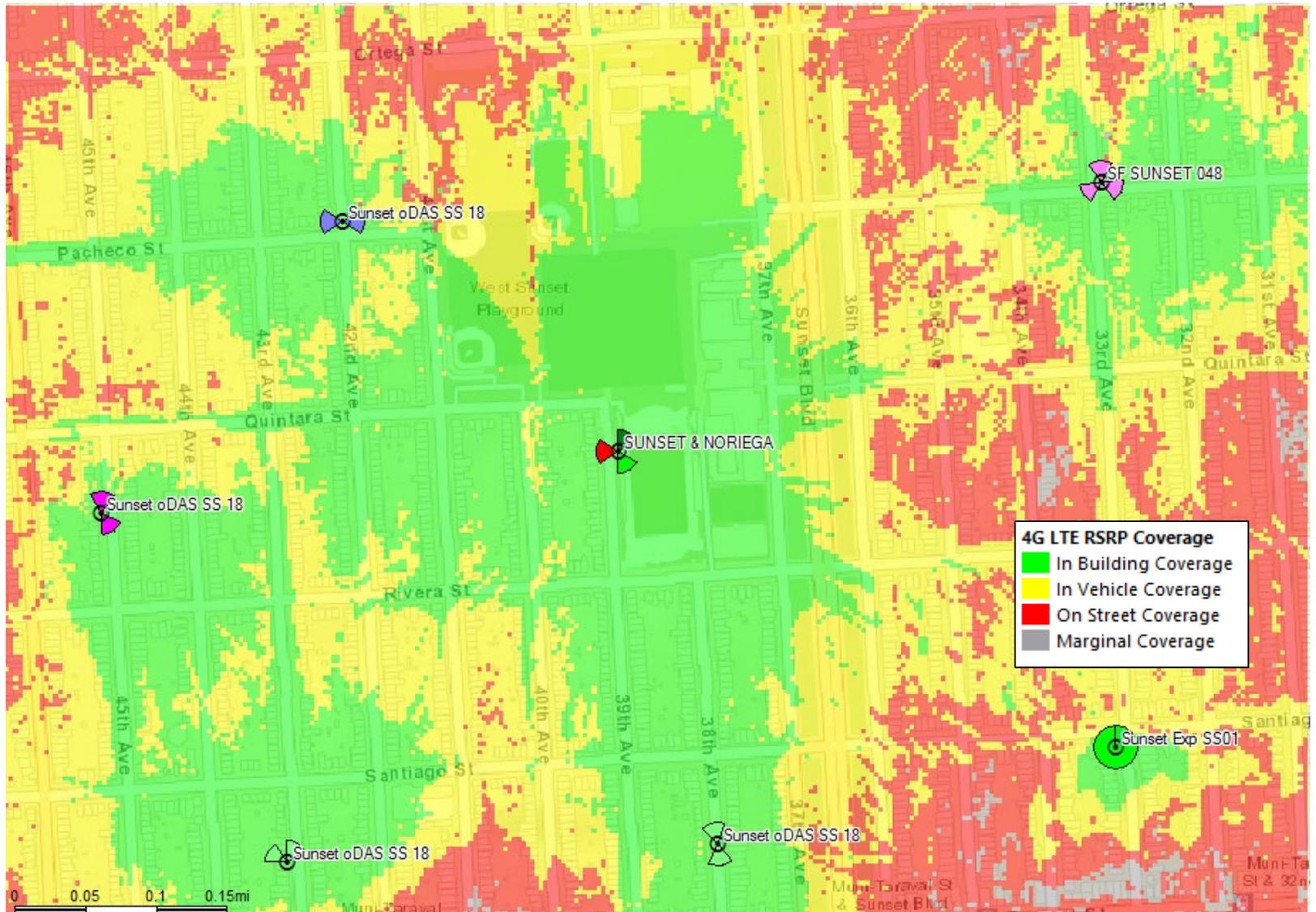
# **SUNSET & NORIEGA**

**March 30<sup>th</sup>, 2020**

# Existing LTE Coverage



# Proposed LTE Coverage





**HAMMETT & EDISON, INC.**  
 CONSULTING ENGINEERS  
 BROADCAST & WIRELESS

**Exhibit E**

WILLIAM F. HAMMETT, P.E.  
 RAJAT MATHUR, P.E.  
 ROBERT P. SMITH, JR.  
 ANDREA L. BRIGHT, P.E.  
 NEIL J. OLIJ, P.E.  
 MANAS REDDY, P.E.  
 BRIAN F. PALMER  
 M. DANIEL RO

ROBERT L. HAMMETT, P.E.  
 1920-2002  
 EDWARD EDISON, P.E.  
 1920-2009

DANE E. ERICKSEN, P.E.  
 CONSULTANT

BY EMAIL CHAD.CHRISTIE@RIDGECOMMUNICATE.COM

April 10, 2020

Mr. Chad Christie  
 Ridge Communications  
 949 Antiquity Drive  
 Fairfield, California 94534

Dear Chad:

As you requested, we have conducted the review required by the City of San Francisco of the coverage maps that Verizon Wireless will submit as part of its application package for its base station proposed to be located at 2001 37th Avenue (Site No. 255926 “Sunset & Noriega”). This is to fulfill the submittal requirements for Planning Department review.

**Executive Summary**

We concur with the maps provided by Verizon. The maps provided to show the before and after conditions are reasonable representations of the carrier’s present and post-installation coverage.

Verizon proposes to install twelve directional panel antennas – three CommScope Model NNH4-65A-R6, three Ericsson Model 6701, and six Ericsson Model 2208 – on the 90-foot stadium light pole sited next to the north end of the bleachers on the west side of the football field at St. Ignatius College Preparatory, located at 2001 37th Avenue. The antennas would employ up to 4° downtilt, would be mounted at effective heights of about 63, 45, and 50 feet above ground, respectively, and would be oriented in identical groups of four at about 120° spacing, to provide service in all directions. The maximum effective radiated power proposed by Verizon in any direction is 18,545 watts, representing simultaneous operation at 193 watts for 28 GHz, 172 watts for CBRS, 5,250 watts for AWS, 5,130 watts for PCS, 4,170 watts for cellular, and 3,630 watts for 700 MHz service.

Verizon provided for review two coverage maps, attached for reference. The maps show Verizon’s 4G LTE coverage in the area before and after the site is operational. Both maps show five signal levels of coverage, which Verizon colors and defines as follows:

- Green better than -75 dBm
- Yellow -75 dBm to -85 dBm
- Red -85 dBm to -95 dBm
- Grey -95 dBm to -105 dBm
- Black worse than -105 dBm

Mr. Chad Christie, page 2  
April 10, 2020

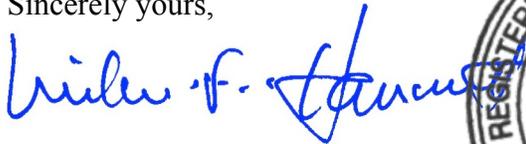
These service thresholds used by Verizon are in line with industry standards, similar to the thresholds used by other wireless service providers.

We conducted our own drive test, using an Ascom TEMS Pocket network diagnostic tool with built-in GPS, to measure the actual Verizon 4G LTE signal strength in the vicinity of the proposed site. Our fieldwork was conducted on April 6, 2020, between 9:50 AM and 11:40 AM, along a measurement route selected to cover all the streets within the map area that Verizon had indicated would receive improved service.

Based on the measurement data, we conclude that the Verizon 4G LTE coverage map showing the service area without the proposed installation includes areas of relatively weak signal levels in the carrier's present coverage. The map submitted to show the after coverage with the proposed base station in operation was reportedly prepared on the same basis as the map of the existing conditions and so is expected to accurately illustrate the improvements in coverage.

We appreciate the opportunity to be of service. Please let us know if any questions arise on this matter.

Sincerely yours,



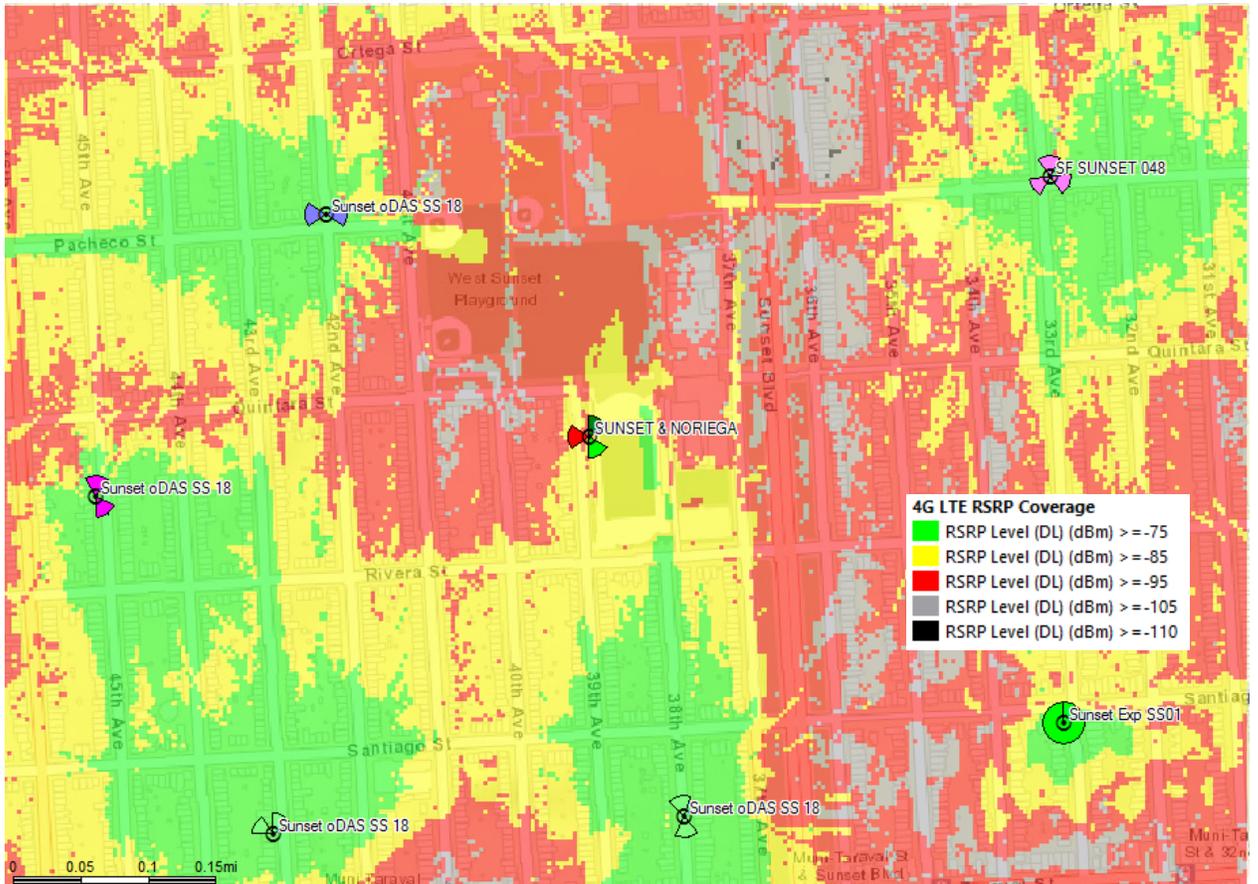
William F. Hammett, P.E.

Enclosures

scn

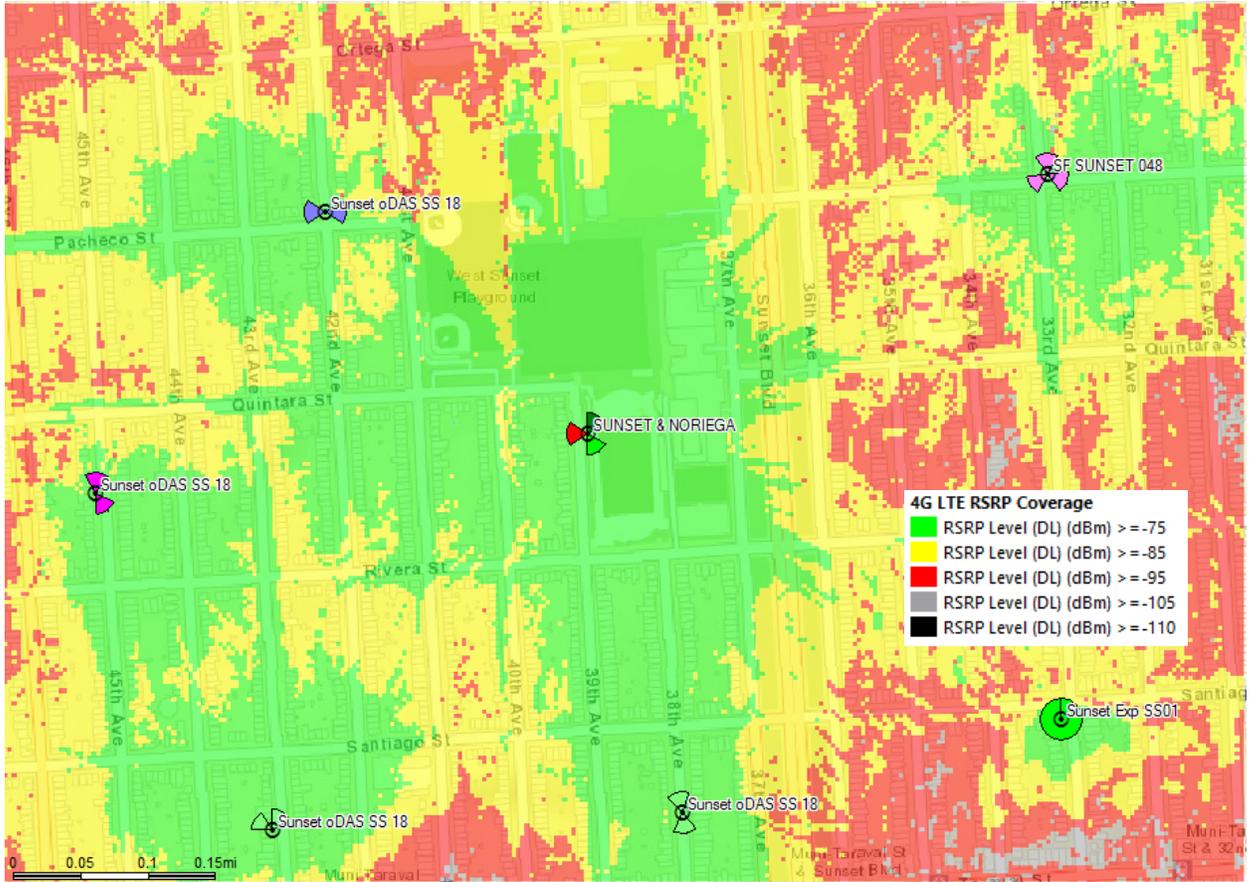


# Existing LTE Coverage



Confidential and proprietary materials for authorized Verizon personnel and outside agencies only. Use, disclosure or distribution of this material is not permitted to any unauthorized persons or third parties except by written agreement.

# Proposed LTE Coverage



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