Item #2

City of Palo Alto (ID # 5109)

Architectural Review Board ARB Staff Report

Report Type: New Business **Meeting Date: 9/18/2014**

Summary Title: 3672 Middlefield Road Verizon Proposal

Title: Request by Verizon Wireless for Architectural Review and a Conditional Use Permit (CUP) application for the addition of 3 panel antennas on a 65 foot tall light pole at the Palo Alto Little League Field, and associated ground mounted equipment concealed within an enclosure. Zone District. R-1(8000). Environmental Assessment: Categorically exempt from the provisions of the California Environmental Quality Act (CEQA) per CEQA Guidelines Sections 15061(b)(3), 15301, 15302, and 15303.

From: Amy French

Lead Department: Architectural Review Board

RECOMMENDATION

Staff recommends the Architectural Review Board (ARB) recommend conditional approval of the Architectural Review application for the project based upon the findings contained in Attachment A and conditions of approval contained in Attachment B.

EXECUTIVE SUMMARY

Verizon Wireless is looking to improve its coverage in the vicinity of the Palo Alto Little League ball park site (shown on location map, Attachment C), and describes the project in the attached letter (Attachment D). Several years ago, Verizon submitted an application for a wireless communications facility; the project has evolved from the initial fake tree tower concept, to the two new "stealth" cell towers with cellular antennas on top concept, to the current proposal for one "stealth" cell tower topped by antennas replacing one ball field light tower in the same location.

There have been four community meetings to solicit public input. Staff discouraged previous proposals for the site, given the concerns of staff and the community; instead, staff advised the applicant to find a solution introducing less visual impact to the site and neighborhood.

Staff suggested locating the antennas on the existing light poles in the existing locations, in order to eliminate the visual impact of placing new towers at the site. Verizon's current proposal roughly follows staff's suggestion to place the new antennas on a light pole, in the

current location of the pole; however, the pole is new, and thicker (by 6-12 inches) and taller (by five feet) than the 12-inch diameter, 60-foot-tall light pole it would replace. The applicant proposes to encase the antennas within a radome, a "stealth" design intended to minimize the visibility of the antennas from offsite locations, in accordance with Palo Alto's Municipal Code (PAMC) Section 18.42.110.

While staff is more supportive of the applicant's current architectural solution for the site than the previous solutions, there are still some community members that oppose the wireless communications facility for various reasons. These reasons are briefly described in the Discussion section of this report, and staff has attached letters of concerns to this report (Attachment G).

One concern is that the wireless communication facility would impact the ball park's historic character. Since the property had been identified in 1998 as potentially eligible for listing on the California Register of Historic Resources, staff requested that the applicant conduct a historic evaluation; this evaluation (Attachment E) concluded that the property is not eligible for listing as a historic resource.

In the past several weeks, some community members (without concurrence of the property owner) have begun preparing paperwork to nominate the Little League Ball Park as a historic resource. Staff recently engaged a historic consultant, to evaluate the project proposal in the event that the property is deemed eligible for listing as a local, State or Federal historic resource in the future. The analysis (Attachment F) determined that, even if the Council were to approve a historic designation for the site at some point, following recommendation by the Historic Resources Board in accordance with PAMC Section 16.49.040, the proposed project would have no negative effect on the resource.

BACKGROUND

Wireless Communication Facilities

Wireless Communication Facilities (WCF) are subject to regulations of PAMC Section 18.42.110. The Purpose section of this code is "to accommodate continued improvements to wireless communications while minimizing visual impacts of such development" and to place and design the antennas and equipment in facilities that "blend with existing surroundings". The code states, "Building mounted WCF and co-location facilities are preferred and encouraged, subject to all other provisions of this section."

The City of Palo Alto has approved an increasing number of Wireless Community Facilities (WCF) in the past several years, given the rising use of cellular technologies. The City has approved several wide "stealth" WCF flagpoles (including one on Fire Station #4) and fake WCF trees (including one on a nearby property on Middlefield Road). In May 2011, during the time the City was considering AT&T's Distributed Antenna System (DAS) proposal, the City published a Frequently Asked Questions (FAQ) document on the City's website, to help the community

learn about Radio Frequency exposure and other concerns related to WCF technology. The FAQs are found here: http://www.cityofpaloalto.org/civicax/filebank/documents/27109.

On July 2, 2012, City Council directed staff to issue a request for proposal for a consultant/vendor to prepare a citywide wireless communications facilities plan. The RFP was released on October 2, 2012. Staff interviewed four firms for the study, and awarded a contract in April 2014 to Anthem Telecom, LLC. Meanwhile, the City is obligated to accept and process applications for WCF installations to meet the cellular industry needs, and the City is required to process such applications in a timely manner.

Under the Telecommunications Act of 1996, the FCC is charged with regulating the radiofrequency (RF) emissions from antennas and the City's ability to regulate in this area has been preempted.

Site

The project site is located on the south west side of Middlefield Road just south of the intersection of East Meadow Drive and Middlefield Road. The site is owned by the Palo Alto Little League and consists of a little league baseball field on approximately 2.74 acres. In addition to the ball field, the site contains parking areas, bleacher seating, *four* field light towers, a snack shack/office building, two dugouts, batting cages, storage structures, a picnic area, flag poles, and landscaping. To the rear of the site is a parking lot for Mitchell Park and the Covenant Presbyterian Church. Fire Station #4 is located north of the site, along with an electrical substation. Bordering the site's south side property line is the Mitchell Park library, and across the street (Middlefield Road) to the east are single family homes.

Application History

Verizon has investigated other sites in the area in an effort to improve their cellular communication network. In this area of town, there are very few tall buildings or other structures that provide the height needed for cellular antennas. Verizon has looked at other existing sites in an effort to 'co-locate' antennas, such that a new cell tower would not be needed. The other sites in the area did not provide the opportunity necessary to meet Verizon's needs.

Over the past several years NSA, working on behalf of Verizon Wireless, has presented the City various design proposals for cellular antennas at the Palo Alto Little League ball park. The first of these was a proposal for a stealth "tree" tower, where antennas and associated cables would have been concealed within a fake tree structure. Staff and the public had concerns over the visibility of the fake tree and the siting of the tree in close proximity to Middlefield Road. The applicant revised that proposal by moving the equipment shelter and the tree tower further back on the site. Staff did not support the extensive tree removal or the design of the fake tree. Staff advised the applicant to consider using the existing light poles as a possible location for the new antennas.

After moving away from the fake tree concept, the applicant submitted a revised proposal that included two new light towers with antennas on one of the two towers. While the new light towers would have blended into the ball field site, they also would have introduced new impacts from new lighting associated with the new light poles and needed approval of a variance for the height of the light fixtures; therefore, this concept was dropped and the applicant withdrew the original application. A new application, submitted early in 2014, proposed to replace two of the four existing, 60-foot-tall light towers with two new light towers, with three antennas placed at the top of each tower. That submittal has since been revised to propose the replacement of only *one* light pole with a new 65' pole, thicker than the existing light pole to conceal the necessary cables, and provide the structure to mount three new cellular antennas near the top of the new pole, and re-mount the field lights at the same height above grade as the existing lighting.

Project Description

The proposal includes the replacement of the existing field light standard with a new 65-foot tall wireless light/monopole with three antennas inside a new three foot diameter and five foot long radome. The existing ball field lighting would be reinstalled in its original orientation and height below the radome. The new 18" to 24" diameter pole would be the same metal color as the existing 12" diameter light poles, and the radome would be painted to match. The proposal also includes the construction of a 442 square foot equipment enclosure to house the ground mounded equipment and the backup hydrogen fuel cell emergency power generator. The equipment enclosure would be a concrete masonry unit (CMU) block wall with a metal roof. The new shed would be blended into the site, nestled between the existing storage sheds and the existing storage containers. It would be painted to match the dark green color of the adjacent storage structures. The cables between the pole and the equipment shed would be located underground. None of the existing trees would be impacted by the proposal.

DISCUSSION

Conditional Use Permit and Comprehensive Plan

The application includes a Conditional Use Permit (CUP) request to establish a new, "stand alone" wireless communication facility (WCF) at this site. In accordance with PAMC Chapter 18.42, Section 18.42.110, Wireless Communication Facilities, item (b)(3), a "stand alone" WCF also requires Architectural Review. Section 18.42.110 item (c) requires each WCF project to meet the standard zoning requirements for the zone district; however, this section (item 2) also allows a "stand-alone" WCF to be "no taller than 65 feet" by Exception, to be considered in conjunction with the required review process.

The Director of Planning and Community Environment is tasked with making a "tentative decision" on the CUP, and an appealable decision on the Architectural Review component of the application, in one action after receiving the ARB's recommendation. Within a 14 day period following the Director's action, any party aggrieved by the decision may:

(1) Request a hearing by the Planning and Transportation Commission (PTC) on the Conditional Use Permit (and there is no cost to request such hearing), and
(2) Appeal the Director's action on the Architectural Review application, subject to payment of an appeal fee.

The PTC's recommendation on the CUP would be forwarded to the Council and the Council is required to consider the CUP application. The CUP application would appear on the Consent Calendar and four Councilmember votes would be needed to pull the item off consent and schedule a "de novo" hearing. If the Architectural Review decision were appealed, the Consent would reflect this, and four Councilmember votes are needed to consider the Architectural Review appeal.

The findings for Conditional Use Permit contained in PAMC Section 18.76.110 (c) are applicable to this project; no additional findings are required for the height exception for stand-alone WCF. The CUP approval findings are that the granting of the CUP application will:

(1) not be detrimental or injurious to property or improvements in the vicinity, and will not be detrimental to the public health, safety, general welfare, or convenience, and

(2) be located and conducted in a manner in accord with the Palo Alto Comprehensive Plan and the purposes of this title (Zoning)."

A table of applicable Comprehensive Plan goals, policies and programs is provided with this report (Attachment H). It should be noted that Architectural Review approval finding #1 is similar to CUP finding #2, in that it also references the Comprehensive Plan. AR approval finding #1 states, "The design is consistent and compatible with applicable elements of the Palo Alto Comprehensive Plan".

<u>Neighbors' and Others' Concerns</u>

Neighbors and other citizens from elsewhere in Palo Alto submitted a number of letters and email messages (Attachment G). Some of these letters voice concerns about the proposed wireless antenna facility and many voice support for better coverage in the area.

Some of the concerns raised are related to noise, odors, lightning strikes, earthquakes, health impacts from Radio Frequency (RF) exposure, toxic emissions, loss of property values, possibility for future colocation under a 2012 Federal law, and concern that the proposal would be aesthetically destructive and negatively impact a historic resource.

- Noise

Some commenters noted concern that the wireless telecommunication equipment might be noisy. Many installations typically have air conditioning units to cool the equipment within the ground mounted enclosure. The units generate a minimal level of noise, not loud enough to be heard on an adjacent property. This installation will not generate noise, since the applicant

states that there will be no air conditioning unit at this facility (in Attachment C). The 2014 project application included an acoustics analysis prepared by Jared McDaniel of Illingworth and Rodkin, Inc. dated July 17, 2012. The study looked at the emergency power system, designed to power the equipment during power outages. The study notes the emergency fuel cell specification states that the unit would generate an average sound pressure level of 65 dBA at five feet from the unit. This works out to 29 dBA at 300 feet from the unit (the distance to single family residences), below the local ambient regulatory thresholds during daytime and nighttime hours. This works out to 36 dBA at 140 feet from the unit (the distance to the Mitchell Park Library and Community Center), which is 4 dBA below the local ambient during the quietest nighttime hours. The report suggest periodic testing occur during non-noise sensitive hours of the day to minimize any disturbance to the nearby residents (such as weekdays 10 am to 2 pm). The analysis also includes statements regarding noise from two air conditioning units; however, these units are no longer requested.

- Odors and Toxic Emissions

Some facilities have diesel fueled backup generators that are tested regularly to ensure they would operate in an emergency power failure. These produce fumes and emissions that can be unpleasant in close proximity to the generator. The proposed facility would have a hydrogen fuel cell backup power system that would not produce unpleasant odors or toxic emissions. The only emissions would be warm air and a small amount of water. There are no aspects of the proposal that would result in the production of negative odors or toxic emissions. It should be noted thatHydrogen fuel cells do not ignite the hydrogen. Hydrogen is diffused through a catalytic membrane where it gives up its electrons, the resulting hydrogen ions then combine chemically at a second catalyst on the other side of the membrane with oxygen to create electric current between the two catalysts and water as the only exhaust. There are no high temperatures and pressures like those associated with internal combustion engines, and there is no system of spark plugs, rotating coils or other sources of high voltage.

- Earthquake Safety and Radio Frequency Exposure

The concerns related to earthquake activity do not warrant a 'no-project' solution. The proposed tower, at a height five feet taller than the existing tower, is required to be built to current State of California building code standards to improve its stability in the event of an earthquake. Even in a catastrophic event that may take the tower down, it is not tall enough to endanger any nearby residence or the electrical substation. Radio Frequency (RF) exposure is regulated by the Federal Government, such that the City of Palo Alto does not have the authority to deny a project based on concern over RF exposure, provided the facility will comply with Federal Standards. The applicant had provided an RF analysis that confirmed the proposed wireless installation would not violate the Federal Standard.

- Tower Height

Cell towers are often very tall, sometimes reaching heights hundreds of feet in the air with multiple antenna arrays, highly visible from off-site locations. Other cell tower installations are of a "stealth" design, intended to be much less noticeable. The recent DAS installations on

existing utility poles in residential neighborhoods are much shorter than typically taller cell towers, but many more installations are required in order to provide the same level of coverage, and the installations are often much closer to residential homes. Stealth approaches also include use of color to camouflage antennas and equipment boxes to match their surroundings, or use of fake trees or wide flagpoles or other structures. The use of ball field light poles as a "stealth" cell tower is not a new concept as a new method to disguise a cell tower. There have been previous requests for "stealth" ball field lighting cell towers in Palo Alto.

The proposed 65 foot tall cell tower is in compliance with the City's height limit for a stand-alone Wireless Communication Facility as set forth in PAMC Section 18.42.110(c)(2). The tower is only five feet taller than the existing light pole, and does not have a very noticeable array of antennas on top, given the radome design. The visual impact and historic implications are discussed in the following paragraphs.

- Co-location and the Middle Class Tax Relief and Job Creation Act of 2012

The applicant has stated that no additional carriers, or 'co-location' of wireless communication antennas, are planned for use of this site, and that Verizon Wireless will be the only carrier on this site. The City's code (Section 18.42.110 (C)) only allows an exception for 65 feet height, maximum. Federal law (47 U.S.C. §1455) requires administrative approval of collocations that do not substantially change the physical dimensions of a wireless tower. Palo Alto would have permitting authority over any collocation and 47 U.S.C. §1455 would have no impact on a collocation application that would substantially change the physical dimensions of the proposed Verizon Wireless replacement light standard. However, the FCC has not yet issued guidelines defining "substantial change" and until it does, it is not clear how expansive the City's permitting authority over co-locations will be. To address the neighbors' concern that there could be additional co-locations, staff has requested the applicant to provide a voluntary covenant to run with the land confirming their intent that there will be no additional carriers.

- Visual Impact

PAMC Section 18.42.110(e) Antenna Design requires antennas to be designed to minimize visibility offsite and be of a "stealth" design. The current proposal is considered to meet this requirement, to reduce visibility from off site. Rather than introducing a new tower to the property, the application makes use of the fact that there are four, 60 foot tall ball field light standards on the site already, as a "stealth" technique. Replacing one of these with a cell tower monopole that is five feet taller would have less visual impact as viewed from off-site than any new cell tower proposal. The applicant proposes placement of the antennas within a radome to conceal them from view. The radome would be painted to match the color of the pole to blend in, relative to the other light poles. While the thicker pole and the radome structure will be new visual elements on the site, these would have a minimal visual impact. The visibility is further reduced by the fact that the ball field is surrounded by trees. There are tall eucalyptus trees that serve as a backdrop as viewed from Middlefield Road. The tree cover at the site is not so extensive that the tower would not be visible, but the tower would not be standing alone on the site given the extent of the mature vegetation. The design and siting of the

equipment enclosure has also been carefully considered, such that it will have the least visual impact. The structure would be placed in between existing storage structures and painted the same color as the others, so it would blend in.

- Historic Consideration

A concern was raised that the Little League Ball Field may be historic. The site is listed in the City's GIS system as being "potentially eligible for the California Register" but this designation does not mean the property is historic. It implies that the property may be eligible to be listed as a historic resource. The source of this listing was a 1998 Dames and Moore drive-by analysis of properties within Palo Alto that were more than 50 years old in 1998. From a brief visual inspection, the consultant concluded that the property may be eligible for listing on the California Register, with the understanding that any such designation would require a thorough historic analysis.

Applicant's Historic Report

The applicant for this project contracted a historic consultant to conduct a historic analysis of the property (Attachment E). The analysis found that the subject property was not the first Little League field in the Country, the State, or even within Palo Alto. It also noted that many of the field's original features have been replaced. These items include the bleachers, flag poles, the pitcher's mound, site fencing, and the scoreboard. It also found that, while there have been a few sports legends present at the field, these individuals have no significant association with the ball park. The formal analysis concluded that the property does not qualify for the National Register of Historic Places under Criterion A, B, C or D and does not appear eligible for the California Register of Historic Resources under Criterion 1, 2, 3, or 4. It goes on to conclude that the subject property is not considered to be a historic resource under the National Historic Preservation Act or the California Environmental Quality Act.

City's Historic Report

The City recently hired a separate outside consultant to do an analysis of the project in relation to the Secretary of the Interior Standards for Rehabilitation. Since experts can sometimes disagree, the City wanted to be sure that, if the property was found to be historic, that the proposed project would not have a negative impact on the resource. This consistency analysis (Attachment F) concluded that:

- Installation of the proposed Verizon Wireless equipment on the property would not constitute an adverse effect and would not negatively impact the integrity of the ball park;
- The elements of the Verizon project would not directly impact any of the existing physical features of the property; and
- The project would not impede the use of the property as a ball park.

ENVIRONMENTAL REVIEW

The application is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) per CEQA Guideline Sections 15301, 15302, 15303, and 15061(b)(3). Staff

was able to make this "exemption" determination based upon the reports submitted by the applicant referred to in this report and available in the City's file for the project. The applicant's submittal included the Noise Report, the RF Analysis, and the Historic Report.

COURTESY COPIES

Applicant: Charnel James
Jason Yotopoulos

Prepared by: Russ Reich, Senior Planner

Reviewed by: Amy French, AICP, Chief Planning Official
Cara Silver, Senior Assistant City Attorney

Attachments:

- Attachment A: ARB Findings (DOC)
- Attachment B: Conditions of Approval (DOC)
- Attachment C: Location Map (PDF)
- Attachment D: Applicant's Project Description Letter (PDF)
- Attachment E: State of California - The Resources Agency - Primary Record (PDF)
- Attachment F: Secretary of the Interior Standards for Rehabilitation Analysis (PDF)
- Attachment G: Public Correspondence as of 9/11/14 (PDF)
- Attachment H: Comp Plan Table (DOC)
- Attachment I: Photo Simulations (PDF)
- Attachment J: Project Plans (ARB Members Only) (TXT)

ATTACHMENT A
DRAFT FINDINGS FOR APPROVAL
ARCHITECTURAL REVIEW BOARD STANDARDS FOR REVIEW
3672 Middlefield Road / File No. 14PLN-00071

The design and architecture of the proposed project, as conditioned, complies with the Findings for Architectural Review as required in PAMC Chapter 18.76.

(1) *The design is consistent and compatible with applicable elements of the Palo Alto Comprehensive Plan.* This finding can be made in the affirmative in that the project complies with the policies of the Comprehensive plan as outlined in Attachment I and proposes a mixed use development in a location where mixed use projects are encouraged.

(2) *The design is compatible with the immediate environment of the site.* This finding can be made in the affirmative in that the project is designed to take advantage of existing site features, the four 60 foot tall ball field light towers. The new cell tower would replace one of the existing light towers such that there would not be an additional tower structure added to the site. The new tower would only be slightly taller at 65 feet and the antennas would be encapsulated within a radome to further reduce the visual impact to the site. The ground mounted structure would also be blended into the site by placing it between existing storage structures and painted the same color.

(3) *The design is appropriate to the function of the project.* This finding can be made in the affirmative in that the tower and the ground mounted equipment are designed to integrate into the site and serve the function of providing better cellular service to the community while not impacting the existing use of the property.

(4) *In areas considered by the board as having a unified design character or historical character, the design is compatible with such character.* This finding can be made in the affirmative. The property is not historic but the site does contain the unified characteristics of a baseball field. The design of the cell tower and the associated equipment has been purposefully considered to have the least visual impact to the site. While the pole would be thicker than the other light poles, and it will have the five foot radome on top, these features will not degrade the character of the baseball field. By using the light pole for the cell tower, it helps to integrate the cell tower proposal with the site in such a way that results in a minimal visual change. The design alternative would entail the introduction of a new pole structure on the property that would result in a greater visual intrusion.

(5) *The design promotes harmonious transitions in scale and character in areas between different designated land uses.* This finding can be made in the affirmative in that the light/cell tower would be only five feet taller than the existing light tower. The plan to replace an existing light tower with the new light/cell tower that is slightly taller, does promote the harmonious transition in scale and character between the existing ball field and the neighboring properties. The introduction of a new tower would have a greater visual impact than the current proposal.

(6) *The design is compatible with approved improvements both on and off the site.* This finding can be made in the affirmative in that the project would not introduce any features (structure or uses) that would interfere with existing uses both on and off the site. The existing use and physical improvements on the little league site would not be impacted by the project. The project would also not result in negative impacts to properties in the area.

(7) *The planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community*. This finding can be made in the affirmative in that the new tower and the ground mounted equipment cabinet have been designed and sited to blend into the existing site with the least visual impact. The new light/cell tower would be in the same location as the existing light tower and the ground mounted equipment would be located in between existing storage structures such that no existing on site functions such as the batting cages, the ball field, or the parking would be impacted.

(8) *The amount and arrangement of open space are appropriate to the design and the function of the structures.* This finding can be made in the affirmative in that the proposal allows the property to continue to provide an ample amount of open space.

(9) *Sufficient ancillary functions are provided to support the main functions of the project and the same are compatible with the project's design concept.* This finding can be made in the affirmative in that the new equipment shelter will sufficiently support the new light/cell tower and will maintain the design concept of the site.

(10) *Access to the property and circulation thereon are safe and convenient for pedestrians, cyclists and vehicles.* This finding can be made in the affirmative in that the proposal maintains the existing safe and convenient circulation for pedestrians, cyclists and vehicles.

(11) *Natural features are appropriately preserved and integrated with the project.* This finding can be made in the affirmative in that none of the existing trees would be impacted by the project

(12) *The materials, textures, colors and details of construction and plant material are appropriate expression to the design and function.* This finding can be made in the affirmative in that proposal includes colors and materials to match those currently existing on site. For example the pole will be the same color and material as the existing poles on site and the equipment shelter will be painted the same dark green color as the existing storage sheds.

(13) *The landscape design concept for the site, as shown by the relationship of plant masses, open space, scale, plant forms and foliage textures and colors create a desirable and functional environment.* This finding is not applicable as there are no landscape elements included in the proposal. All existing landscaping remains as is.

(14) *Plant material is suitable and adaptable to the site, capable of being properly maintained on the site, and is of a variety which would tend to be drought-resistant to*

reduce consumption of water in its installation and maintenance. This finding is not applicable due to the fact that no landscaping is proposed as part of this application.

(15) *The project exhibits green building and sustainable design that is energy efficient, water conserving, durable and nontoxic, with high-quality spaces and high recycled content materials. The following considerations should be included in site and building design:*

- *Optimize building orientation for heat gain, shading, daylighting, and natural ventilation;*
- *Design landscaping to create comfortable micro-climates and reduce heat island effects;*
- *Design for easy pedestrian, bicycle and transit access;*
- *Maximize on site stormwater management through landscaping and permeable paving;*
- *Use sustainable building materials;*
- *Design lighting, plumbing and equipment for efficient energy and water use;*
- *Create healthy indoor environments; and*
- *Use creativity and innovation to build more sustainable environments.*

This finding can be made in the affirmative in that the proposal uses a hydrogen fuel cell backup generator that burns cleanly resulting in no air emissions. The wireless equipment is also designed to minimize power consumption and space requirements, minimizing the overall scale and materials needed.

(16) *The design is consistent and compatible with the purpose of architectural review as set forth in subsection 18.76.020(a).* This finding can be made in the affirmative in that the project design promotes visual environments that are of high aesthetic quality and variety.

ATTACHMENT B
CONDITIONS OF APPROVAL
3672 Middlefield Road/ File No. 14PLN-00071

Planning Division

1. The ARB approval letter shall be printed on the plans submitted for building permit.

2. All noise producing equipment shall not exceed the allowances specified in Section 9.10 Noise of the Palo Alto Municipal Code.

3. Water all active construction areas at least twice daily and more often during windy periods to prevent visible dust from leaving the site; active areas adjacent to windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.

4. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;

5. Pave, apply water at least three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

6. Sweep daily (or more often if necessary) to prevent visible dust from leaving the site (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality.

7. Sweep streets daily, or more often if necessary (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

8. To the extent permitted by law, the Applicant shall indemnify and hold harmless the City, its City Council, its officers, employees and agents (the "indemnified parties") from and against any claim, action, or proceeding brought by a third party against the indemnified parties and the applicant to attack, set aside or void, any permit or approval authorized hereby for the Project, including (without limitation) reimbursing the City for its actual attorneys' fees and costs incurred in defense of the litigation. The City may, in its sole discretion, elect to defend any such action with attorneys of its own choice.

9. In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Coroner and the Director of Planning and Community Environment. Upon determination by the County Coroner that the remains are Native American, the Coroner shall contact the California Native American

Heritage Commission, pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code and the County Coordinator of Indian Affairs. No further disturbance of the site may be made except as authorized by the County Coordinator of Indian Affairs in accordance with the provisions of State law and the Health and Safety Code.

10. State of California Government Code Section 66020 provides that a project applicant who desires to protest the fees, dedications, reservations, or other exactions imposed on a development project must initiate the protest at the time the development project is approved or conditionally approved or within ninety (90) days after the date that fees, dedications, reservations or exactions are imposed on the Project. Additionally, procedural requirements for protesting these development fees, dedications, reservations and exactions are set forth in Government Code Section 66020. IF YOU FAIL TO INITIATE A PROTEST WITHIN THE 90-DAY PERIOD OR FOLLOW THE PROTEST PROCEDURES DESCRIBED IN GOVERNMENT CODE SECTION 66020, YOU WILL BE BARRED FROM CHALLENGING THE VALIDITY OR REASONABLENESS OF THE FEES, DEDICATIONS, RESERVATIONS, AND EXACTIONS. If these requirements constitute fees, **taxes, assessments,** dedications, reservations, or other exactions as specified in Government Code Sections 66020(a) **or 66021**, this is to provide notification that, as of the date of this notice, the 90-day period has begun in which you may protest these requirements.

11. This matter is subject to the California Code of Civil Procedures (CCP) Section 1094.5; the time by which judicial review must be sought is governed by CCP Section 1094.6.

12. To the extent permitted by law, the Applicant shall indemnify and hold harmless the City, its City Council, its officers, employees and agents (the "indemnified parties") from and against any claim, action, or proceeding brought by a third party against the indemnified parties and the applicant to attack, set aside or void, any permit or approval authorized hereby for the Project, including (without limitation) reimbursing the City for its actual attorneys' fees and costs incurred in defense of the litigation. The City may, in its sole discretion, elect to defend any such action with attorneys of its own choice.

13. The Applicant shall identify the Best Management Practices (BMP's) to be incorporated into a Storm Water Pollution Prevention Plan (SWPPP) for the project. The SWPPP shall include both temporary BMP's to be implemented during demolition and construction.

14. Construction hours shall be limited to 8:00am to 6:00pm Monday through Friday and 9:00am to 6:00pm on Saturdays. No construction is allowed on Sundays or Holidays as specified in Title 9 of the Municipal Code.

15. No individual piece of construction equipment shall produce a noise level exceeding one hundred ten dBA at a distance of twenty-five feet.

16. The construction noise level at any point outside of the property plane of the project shall not exceed 90 dBA.

17. Rules and regulation pertaining to all construction activities and limitations identified in this permit, along with the name and telephone number of a developer appointed disturbance coordinator, shall be posted in a prominent location at the entrance to the job site.

18. If required by Public Works the applicant shall work with the Public Works Department to create a logistics plan to manage construction activities prior to building permit issuance.

19. The pole structure shall be the same color and material as the existing light poles.

20. The radome shall be painted to match the pole structure.

21. No existing parking spaces shall be eliminated as a result of this project.

22. The ground mounted equipment enclosure shall be painted the same color as the existing storage buildings located on the project site.

23. The cell tower shall not exceed 65 feet in height.

24. Any cables and wires associated with this application shall be located inside the cell tower pole and/or underground such that they are not visible.

25. The Radio Frequency (RF) Emissions shall not exceed Federal Standards

Fire Department

26. The applicant shall submit a completed copy the document entitled "Optional Checklist for Local Government to Determine Whether a Facility is Categorically Excluded". If the applicant is required to submit an Environmental Assessment (EA) to the FCC, please indicate if it has been submitted and the date submitted.

27. A Fire Department key Knox Box is required if the building or site does not have 24-hour key availability.

28. The site shall have at least one sign per owner/service provider that indicates the company's name, site # and 24 emergency number as a minimum. This labeling shall be readable from a distance not less than 25 feet. Safety labeling (in addition to any required FCC labeling) may be required if there is the ability of anyone fitting the FCC definition of "general population" who may unknowingly come within the FCC prescribed Maximum Permissible Exposure (MPE) safety range of the RF emitting device.

29. A Hazardous Materials Registration Form is required to be submitted and approved prior to bringing any hazardous materials on site. Forms also available at http://www.unidocs.org

30. A Hazardous Materials Business Plan (HMBP) is required to be submitted and approved prior to bringing any hazardous materials on site. (PAMC17.16.010). Forms are available at http://www.unidocs.org. Note: The site chemical list may be below the state Hazardous Materials Business Plan reporting thresholds but the site is not exempted from PAMC 17 hazardous materials regulations (i.e. Hazardous Materials Registration, double containment, labeling, etc.)

31. Hydrogen fuel cell power plant shall be reviewed by the Building Division for compliance with the Mechanical Code and for proper seismic anchorage of equipment and fuel containers. Hydrogen Storage shall be reviewed by the Fire Department's Hazardous Materials Bureau for approved, compatible and properly labelled containers and piping.

32. Hazardous Materials Closure (Fire Dept. Closure Permit) is required prior to vacating any site which contained hazardous materials.

33. A fire extinguisher with a minimum of 2A10BC rating shall be installed.

34. A valid Use and Occupancy Permit is required.

Public Works Engineering Department

35. Associated with proposed equipment installation on the private property, if any work is required that impacts the public right-of-way (construction activities in sidewalk or street area), a Street Work Permit and/or an Encroachment Permit must first be obtained from Public Works Engineering in Development Services.

Urban Forestry Department

36. No trenching or excavation work will occur within the dripline (10x diameter R) of any tree.

37. If any revision or field changes occur in a tree dripline, then prior to site work preceding a tree preservation report (Tree Technical Manual, Section 2.10) shall be submitted for review/approval by Urban Forestry. Any such revision will be submitted at Development Center for routing and tracking.

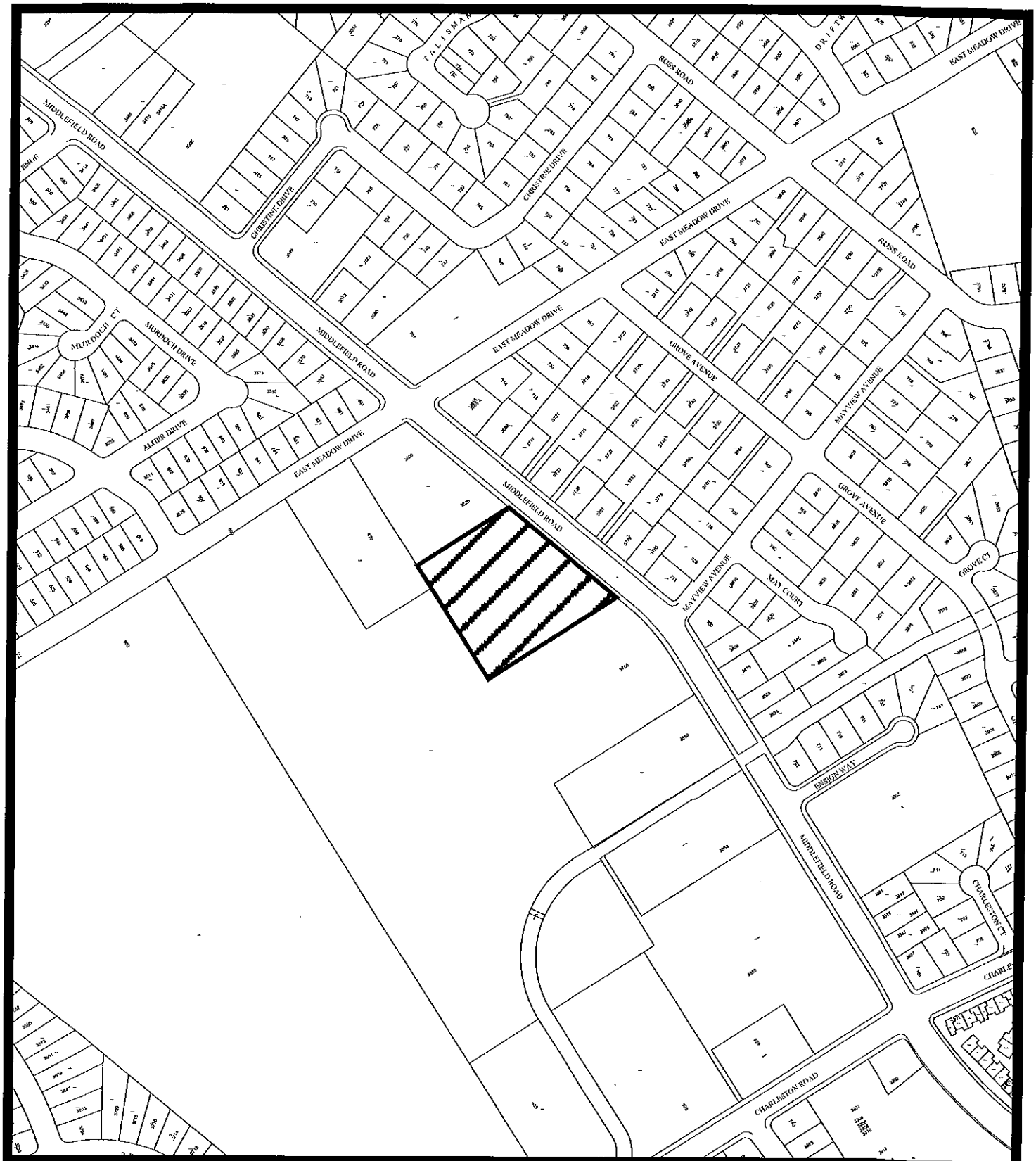
38. SITE PLAN REQUIREMENTS. The final Plans submitted for building permit shall include the following information and notes on the relevant plan sheets:

    a. SHEET T-1, BUILDING PERMIT. The building permit plan set will include the City's full-sized, Sheet T-1 (Tree Protection-it's Part of the Plan!), available on the Development Center website at http://www.cityofpaloalto.org/civicax/filebank/documents/31783. The Applicant shall complete and sign the Tree Disclosure Statement. No tree related inspections

are required unless revision or site changes require a tree preservation report, in which case Tree Activity Inspections will apply to this project.

b. Add a note that states: “Contractor parking, staging and activities shall not occur in the tree root area or dripline of any tree on the project parcel, subject to $500 penalty”.

Attachment C



The City of Palo Alto

3672 Middlefield Road

This map is a product of the City of Palo Alto GIS

0' 352'

mrich, 2014-09-10 16:53:20
(\\cc-maps\gis$\gis\admin\metaview.mdb)

This document is a graphic representation only of best available sources.
The City of Palo Alto assumes no responsibility for any errors. ©1989 to 2014 City of Palo Alto

Attachment D

MACKENZIE & ALBRITTON LLP
220 SANSOME STREET, 14TH FLOOR
SAN FRANCISCO, CALIFORNIA 94104

TELEPHONE 415/288-4000
FACSIMILE 415/288-4010

September 5, 2014

VIA FEDEX

Chair Lee Lippert
Vice Chair Randy Popp
Board Members Alexander Lew,
Clare Malone Prichard
and Robert Gooyer
Architectural Review Board
City of Palo Alto
250 Hamilton Avenue
Palo Alto, California 94301

Re: Architectural Review Board Design Review
Verizon Wireless Application # 14PLN-00071
Telecommunication Facility, 3672 Middlefield Road
Architectural Review Board Agenda, September 18, 2014

Dear Chair Lippert, Vice Chair Popp and Board Members:

We write to you on behalf of our client Verizon Wireless to encourage you to recommend architectural review approval of Verizon Wireless's proposed stealth wireless facility in the Palo Alto Little League ball park. After four years of community-driven design and re-design, Verizon Wireless has arrived at a truly stealth proposal for its wireless facility, with antennas mounted on a replacement field light standard and an equipment shed screened by existing structures. The proposed facility meets all necessary findings for architectural review approval.

I. Background

The original proposals for Verizon Wireless's facility at the Palo Alto Little League field have been dramatically redesigned based on community input. An original proposal to place two treepoles along Middlefield Road was abandoned due to community concerns regarding fake trees prominently placed along this major roadway. Similarly, plans for two new light standards at the back of the property allowing for nighttime use of the practice field were rejected based upon neighbor concerns as overly invasive. Taking into account community concerns, Verizon Wireless redesigned the

proposed facility in order to use the location of an existing 60 foot light standard and adding an extension of less than five feet, thereby minimizing any new visual impacts.

The community also raised aesthetic concerns regarding Verizon Wireless's original proposal for a 1,000 square foot equipment shed area to be located near Middlefield Road, including a diesel generator. Based upon those community concerns, Verizon Wireless has relocated and reduced the size of the equipment shed. The redesigned 510 square foot shed will be located between existing Palo Alto Little League equipment sheds and storage containers and will be fully screened on two sides. In turn, the diesel generator has been replaced with a silent hydrogen fuel cell located within the equipment shed to provide emergency backup power.

II. Project Description

As proposed, the Verizon Wireless facility at the Palo Alto Little League ball park will replace an existing 60-foot, 4-inch light pole in far right field with a 65-foot pole. The first 60 feet of the new pole will increase in diameter from 12 inches to 24 inches[1] with the same lighting array mounted at 56 feet. Lighting from the array will not change. From 60 feet to 65 feet, the diameter of the pole will increase to 36 inches to conceal the antennas. The color of the pole will match that of the other three existing light standards. Underground cable and conduit will extend between the light standard and the 510 square foot equipment shed. The 13-foot by 34-foot equipment shed will be placed between existing storage sheds and containers owned by the Palo Alto Little League such that the longer north and south faces are entirely screened from view. The equipment shed will consist of a concrete pad surrounded by a 9-foot, 6-inch CMU wall with a roof cover painted to match the existing sheds.

There will be no trees or shrubs removed for the installation of the wireless facility. The operation of the facility will be nearly inaudible, as there will be no external air conditioning or diesel generator. An emergency temporary generator parking area and remote plug are included in the plans in the event a long-term emergency exhausts the fuel cell hydrogen supply.

In short, the proposed facility has been carefully designed to minimize visual and all other impacts.

III. Scope of Review

The role of the Architectural Review Board (the "ARB") in conducting architectural review is set forth in Palo Alto Municipal Code § 18.76.020(a). In essence, this role is to promote the orderly development of property in Palo Alto with aesthetic

[1] As of the date of this letter, we have confirmed with the pole manufacturer that the diameter of the lower 60 feet of the pole can be further reduced to 18 inches if that is the preference of the Architectural Review Board.

designs that promote harmonious use of neighboring properties. With respect to wireless facilities, architectural review promotes stealth or camouflage facilities that are architecturally integrated into their surroundings. While wireless opponents will frequently raise issues of necessity, health, property values, community character and use compatibility, the ARB has generally remained true to the design review embodied in the 16 findings required under the Code. After years of design and careful redesign, the proposed facility easily meets the 16 required findings for a recommendation of approval by the ARB, as follows:

1. *The design is consistent and compatible with applicable elements of the Palo Alto Comprehensive Plan.* This finding can be made in that the Proposed Facility incorporates a streamlined, stealth design that replaces an existing structure with a like-kind structure that matches similar architectural features of the property. The project is also supported by the following Comprehensive Plan Policies: (B-13) Support the development of technologically-advanced communications infrastructure and other improvements that will facilitate the growth of emerging telecommunications industries; and (B-14) Work with electronic information network providers to maximize potential benefits for Palo Alto businesses, schools, residences, and other potential users.

2. *The design is compatible with the immediate environment of the site.* This finding can be made in that the proposed design blends with the existing field lights and the equipment sheds that are located within the Palo Alto Little League ballpark. The proposed equipment shed and replacement field light standard have been specifically designed and located to match existing little league facilities and to be compatible with the immediate environment of the ballpark.

3. *The design is appropriate to the function of the project.* This finding can be made in that the design of the equipment is minimal for the intended wireless telephone utility use and has been improved with a streamlined design that replaces an existing 60-foot field light standard and adds less than five feet in height. The reduced 500 square foot equipment shed architecturally mimics existing Palo Alto Little League equipment sheds and is placed between those existing structures such that it is screened from view.

4. *In areas considered by the board as having a unified design character or historical character, the design is compatible with such character.* This finding can be made based upon the EBI Consulting study and report dated July 9, 2014 and submitted with this application, which confirms that the Palo Alto Little League field is not an historic resource under applicable federal and state laws. In addition, replacing an existing light standard and placing a 500 square foot equipment shed between existing sheds will have no impact on any historic nature of the ball field, even if the field were a historic resource (which it is not).

5. *The design promotes harmonious transitions in scale and character in areas between different designated land uses.* This finding can be made because the repetitive design of a replacement field light among other field lights and an equipment shed within existing equipment sheds maintains the harmonious transition of the little league field to adjacent uses.

6. *The design is compatible with approved improvements both on and off the site.* This finding can be made in that the project elements have been designed to match with the existing field light standards and equipment sheds located on the property. As such, the project elements are compatible with all improvements on the site.

7. *The planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community.* This finding can be made because the replacement of an existing light standard maintains the existing order of improvements on the property. Similarly, the placement of the small equipment shed between existing equipment sheds of the same height maintains the existing internal sense of order by grouping equivalently-scaled improvements on the ball field.

8. *The amount and arrangement of open space are appropriate to the design and the function of the structures.* This finding can be made because use of the existing light standard location and placement of the equipment shed between existing equipment sheds minimizes the impact on existing open spaces that constitute the majority of the Palo Alto Little League field.

9. *Sufficient ancillary functions are provided to support the main functions of the project and the same are compatible with the project's design concept.* This finding can be made because the equipment shed, between existing equipment sheds, is located adjacent to parking areas for the little league field and will involve minimal intrusion for maintenance of the facility, which will occur less than once per month. Power and telephone interconnect to the facility will be provided underground and will have no impact on the aesthetics or use of the little league field.

10. *Access to the property and circulation thereon are safe and convenient for pedestrians, cyclists and vehicles.* This finding can be made because the proposed facility will have no impact on circulation under and around the field light. Access to the equipment shed from the adjacent parking lot and infrequent routine maintenance will not affect access and circulation in and around the little league field. No new access roads are required.

11. *Natural features are appropriately preserved and integrated with the project.* This finding can be made because no trees or plants will be disturbed.

12. *The materials, textures, colors and details of construction and plant material are appropriate expression to the design and function and whether the same are compatible with the adjacent and neighboring structures, landscape elements and functions.* This finding can be made because the replacement light standard mimics the design of existing light standards and the equipment shed is designed with wall texture, color and roof design that is compatible with existing sheds.

13. *The landscape design concept for the site, as shown by the relationship of plant masses, open space, scale, plant forms and foliage textures and colors create a desirable and functional environment.* This finding can be made because open space and circulation have been maintained within the ball field and equipment sheds through maintenance of a maximum amount of turf green space without the addition of inconsistent bushes and trees. Existing landscaped trees and bushes are concentrated along the perimeter of the ballpark in order to maximize turf playing areas within the ball field and adjacent to existing equipment sheds. Accordingly, no new bushes or trees are planned in order to maintain the pedestrian access and functionality of existing equipment sheds. This remains true to the existing landscape design.

14. *Plant material is suitable and adaptable to the site, capable of being properly maintained on the site, and is of a variety which would tend to be drought-resistant to reduce consumption of water in its installation and maintenance.* This finding can be made for the reasons stated regarding Finding 13. No additional irrigation requirements will be created by the proposed facility.

15. *The project exhibits green building and sustainable design that is energy efficient, water conserving, durable and nontoxic, with high-quality spaces and high recycled content materials.* This finding is not applicable to this project. The project consists of small, unoccupied utility structures and there is limited opportunity to incorporate green building design into the installations. Verizon Wireless radio equipment is designed to minimize power consumption and space requirements, minimizing the overall scale and materials required for the proposed facility.

16. *The design is consistent and compatible with the purpose of architectural review as set forth in subsection 18.76.020(a).* This finding can be made in that the project design is carefully integrated into the aesthetics of the immediate environment of the Palo Alto Little League ball park.

Conclusion

The Proposed Facility represents four years of siting and design review to arrive at a compatible design that blends into the aesthetic of the Palo Alto Little League ball field. Through creative engineering, Verizon Wireless, working together with Planning Division staff, has developed an integrated facility that blends harmoniously with existing structures and orderly development of the ball field. As set forth above, all necessary findings for Architectural Review Board recommendation can easily be made for this stealth facility that will provide immense public benefit to the neighboring community as well as little league players and fans.

Very truly yours,

Paul B. Albritton

Attachment E

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

*Resource Name or #: Middlefield Ball Park

P1. Other Identifier:
*P2. Location: ☐ Not for Publication ☒ Unrestricted *a. County: Santa Clara
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad: Mountain Vie, CA; Palo Alto, CA Date: 1981, 1978 T ; R ; ¼ of ¼ of Sec ; M.D. B.M.
c. Address: 3672 Middlefield Road City: Palo Alto Zip: 94303
d. UTM: Zone: 10s; 578402 mE/ 4142205 mN (G.P.S.)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate): APN 132-06-013

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Subject Property is a Little League baseball field constructed in 1952 with an irregular polygon plan encompassing approximately 2.74 acres. The Subject Property consists of the baseball field, the bleachers, the snack bar/office building, landscaped vegetation, and hardscape. The baseball field is configured as a regulation Little League baseball diamond and is sunken slightly below grade. Non-historic light poles are located just outside the field to the north east, north west, south east, and south west. The field features both dirt and grass in the standard Little League configuration. The field features removable bases and an artificial pitcher's mound. The field is enclosed to the north, east, and west by a concrete retaining wall. The wall to the north features lateral wood siding on the base of the wall. A chain link backstop fence is located on top of the north retaining wall and features speakers and an extension on the top. Chain link fence is located on top of the east and west retaining walls. In the infield along the east and west retaining walls are dugouts constructed of concrete block and feature non-historic safety fencing and non-historic aluminum benches. Access to the field is gained by stairs on the east and west retaining walls. The south of the field is bordered by chain link fence. Metal foul posts are located in the south west and south east corners of the outfield. South of the outfield fence at center field is a brick retaining wall and three flag poles. South of the outfield fence in right field is a non-historic scoreboard supported by two metal poles. North of the chain link backstop in the infield to the east and west are aluminum bleachers.
(Continued on Continuation Sheet, p. 4 of 9)
*P3b. Resource Attributes: (List attributes and codes) HP42. Stadium/ Sports Arena – Little League Baseball Field
*P4. Resources Present: ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
View north June 3, 2014, Photograph 1.

*P6. Date Constructed/Age and Sources: ☒Historic
☐Prehistoric ☐Both
Built 1952

*P7. Owner and Address:
Palo Alto Little League
P.O. Box 785
Palo Alto, CA 94302

*P8. Recorded by: (Name, affiliation, and address)
Justin Castells, Architectural Historian, EBI Consulting
11445 East Via Linda, Suite 2, #472
Scottsdale, AZ 85259

*P9. Date Recorded: 6/25/2014

*P10. Survey Type: (Describe)
Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.")
Proposed FCC Telecommunications Project for Site #117403, Verizon Wireless, LLC, 2014.

*Attachments: ☐NONE ☒Location Map ☐Sketch Map ☒Continuation Sheet ☒Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

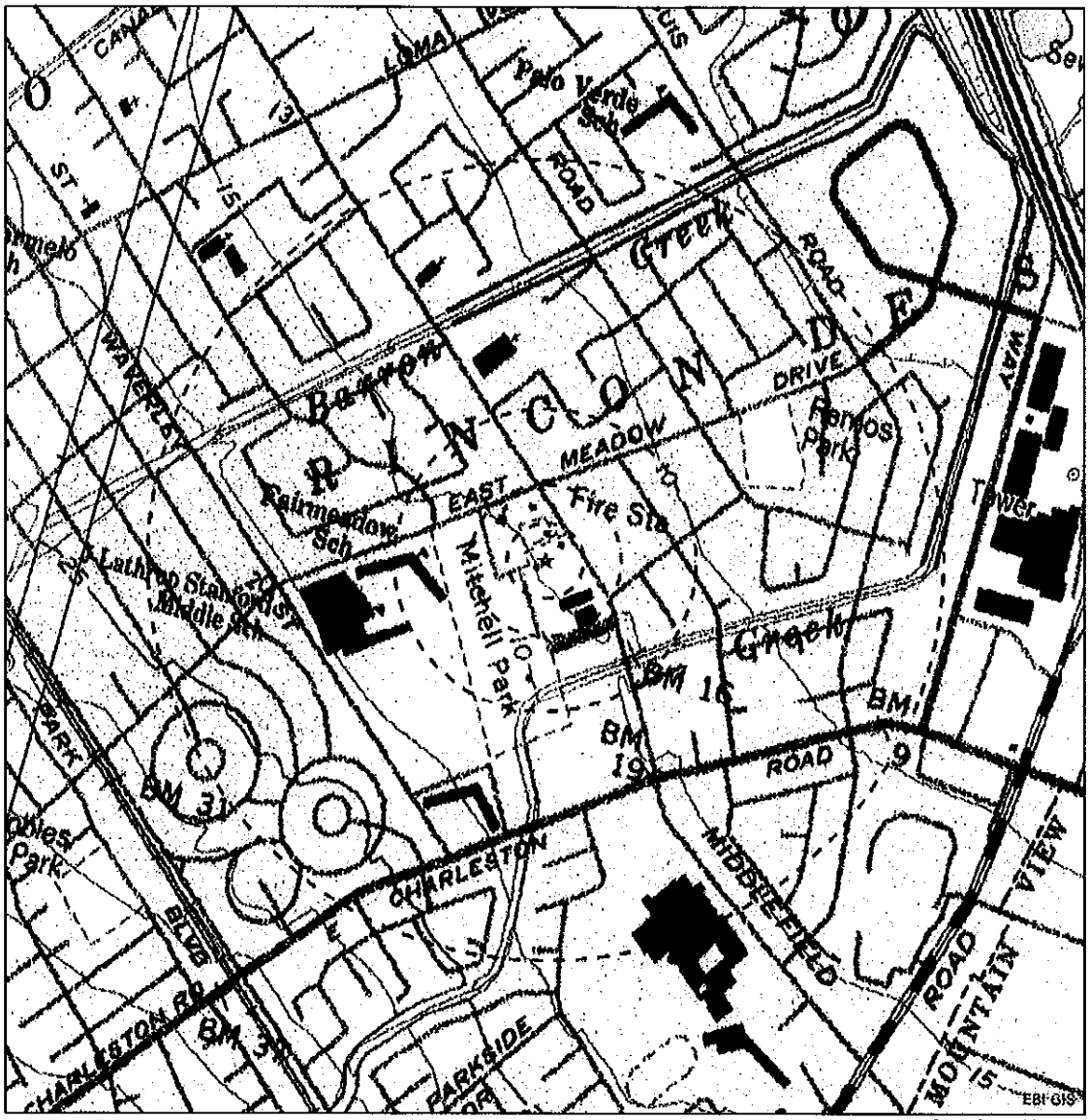
LOCATION MAP

Primary #
HRI#
Trinomial

*Resource Name or #: Middlefield Ball Park

*Map Name: Mountain View, CA; Palo Alto, CA

*Scale: 1:24,000 *Date of Map: 1981; 1978



Legend

☆ Project Site

Site Radius at 250', 500', 1000' and 1/2 mile

Source: Selected data from ESRI, EDI & USGS

N

USGS 24K Quad: Mountain View, CA 1981, Palo Alto, CA 1978

Date: 3/17/2014

Figure 2 - Topographic Map

0 250 500 1,000 1,500 2,000 Feet

117403 MEADOW MIDDLEFIELD
3672 MIDDLEFIELD ROAD
PALO ALTO, CA 94303

EBI Consulting
environmental | engineering | due diligence

*Required Information

BUILDING, STRUCTURE, AND OBJECT RECORD

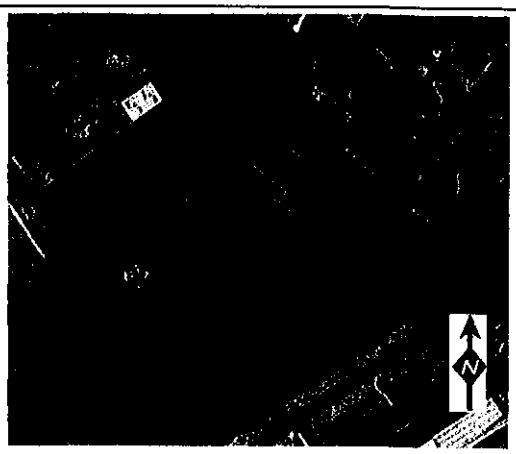
*NRHP Status Code 6Y

*Resource Name or # (Assigned by recorder) Middlefield Ball Park

B1. Historic Name: Middlefield Ball Park
B2. Common Name: Middlefield Ball Park
B3. Original Use: Little League Baseball Field B4. Present Use: Little League Baseball Field
*B5. Architectural Style: Utilitarian
*B6. Construction History: (Construction date, alterations, and date of alterations) Middlefield Ball Park was constructed in 1952; addition of four light poles, 2008 (City of Palo Alto); replacement of historic scoreboard, c. 2004 (Craig Laughton, Palo Alto Little League); replacement of historic flag pole with three flagpoles and a retaining wall, c.2004 (Craig Laughton , Palo Alto Little League); replacement of historic bleachers with aluminum bleachers, c. 2004 (Craig Laughton , Palo Alto Little League); replacement of pitcher's mound with artificial pitcher's mound, c. 2004 (Craig Laughton , Palo Alto Little league); in filled windows on the snack bar/office building, date unknown (based on field observation); replacement roof on snack bar/ office building, date unknown (based on field observations); addition of batting cages, date unknown (based on field observation).

*B7. Moved? ☒No ☐Yes ☐Unknown Date: Original Location:
*B8. Related Features: None
B9a. Architect: Morgan Stedman b. Builder: unknown
*B10. Significance: Theme: Little League Baseball Area: Palo Alto, CA
Period of Significance: 1952-1964 Property Type: Little League Baseball Field Applicable Criteria: N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)
Middlefield Ball Park was constructed in 1952 in Palo Alto, California. Palo Alto was incorporated in 1894 on lands purchased and subdivided by Timothy Hopkins. Hopkins was an associate of Leland Stanford and planned the town to serve Stanford University. Palo Alto grew with the university and soon lands to the south, including the town of Mayfield, were annexed to the city. The biggest growth came in the years after WWII, when residential and commercial development boomed in the city. During the late twentieth century, the presence of technology companies in Palo Alto led to a further boom as the city became a worldwide center for technological innovation (City of Palo Alto, 2007). The period of significance represents the construction of Middlefield Ball Park in 1952 through 1964 (50 year cut-off). (Continued on Continuation Sheet, p. 4 of 9)
B11. Additional Resource Attributes: (List attributes and codes) N/A
*B12. References:
City of Palo Alto Building Department. https://aca.accela.com/paloalto/. Accessed May 6, 2014
City of Palo Alto. 2007. City of Palo Alto Comprehensive Plan and Amendment. http://www.cityofpaloalto.org/gov/topics/projects/landuse/compplan.asp. Accessed May 6, 2014
Craig Laughton, Palo Alto Little League. 2014. Conversations with Palo Alto Little League Maintenance Supervisor Craig Laughton. 6.3.14.
Daily Palo Alto Times. 1952. "Sports". Daily Palo Alto Times. Monday, June 30, 1952.
Little League Baseball. 2014. http://www.littleleague.org/learn/about/historyandmission/chronology.htm. Accessed May 6, 2014.
Little League Baseball-West Region. "Email Correspondence-Cheryl Robinson, Little League Baseball West Region Administrative Assistant." 6.3.14.
Stamford American Little League. http://www.eteamz.com/stamfordamericanlittleleague/locations/. Accessed May 6, 2014.
Town of Los Altos Hills. http://losaltoshills.granicus.com/MetaViewer.php?view_id=2&clip_id=84&meta_id=10899. Accessed May 6, 2014.
Wik, Dave. 1952 "Hard work, cooperation make Little league Park a dream come true." Daily Palo Alto Times. Monday, June 23, 2014.
B13. Remarks: None
*B14. Evaluator: Justin Castells, EBI Consulting
*Date of Evaluation: 6/25/2014

(This space reserved for official comments.)



(Sketch Map with north arrow required.)
Subject Property outlined in red no scale
Source: 2014 Google Maps, www.google.com/maps, accessed June 6, 2014.

(Continued from p. 1 of 8, P3a. Description)
North of the chain link backstop behind home plate is a 2-story snack bar/office building. The building has a rectangular plan and features a medium-pitch front-gabled roof with asphalt shingles. The second floor of the building features horizontal wood siding. A row of six window openings is centered on the second floor of the south elevation and are infilled with roll up shutters. Metal entrance doors are located off center on the second story east and west elevations, access is gained by metal staircases on the east and west elevations. A double leaf casement window is located off center on the west elevation. "Palo Alto Little League Ballpark" signs located off center on the second floor north and west elevations. The first floor of the building is constructed of concrete block and features a passage located off center of the north and south elevations. The first floor features two openings covered with roll up shutters on the south elevation, a metal entrance door and an infilled window on the east elevation, one infilled window and one casement window on the west elevation, and five casement windows flanking the passage in a lateral course on the north elevation. The property also features hardscape such as a parking lot, non-historic batting cages and a non-historic storage container.

(Continued from p. 3 of 8, B10. Significance)
Little League Baseball traces its origins to Williamsport, PA in 1938 where Carl E. Stotz developed the first rules and field dimensions for a boys baseball program. Little League Baseball was officially formed by Stotz in 1939 and consisted of three teams from the Williamsport, PA area. By the following year, the sport began to grow with the introduction of a second Williamsport league as well as an additional playing field and by 1946 there were 12 leagues all within Pennsylvania. The first Little League officially formed outside of Pennsylvania was located in Hammonton, NJ in 1947 which was also the year of the first Little League World Series. The popularity of Little League grew exponentially in the late 1940s. By 1948 there were ninety-four organized leagues in the United States which grew to 307 just one year later. In 1949 the Saturday Evening Post ran a feature about Little League that reached more than 14 million people. Little League enjoyed further public exposure when newsreels highlighting the 1948 National Tournament were seen by millions of people across the United States. As a result, Carl Stotz was inundated with requests for information regarding starting Little Leagues from hundreds of communities. To protect the name, Stotz incorporated the name Little League in the state of New York in 1949. In 1951 the first permanent Little League was formed outside the United States in British Columbia, Canada and by 1954 there were more than 3,300 leagues worldwide. Little League baseball continues to be a popular sport in the United States (Little League Baseball, 2014).

Little League Baseball first came to California with the formation of the Jaycee Little League in San Bernardino, California in 1951. 1951 also saw the charter of the Palo Alto American Little League, which was followed in 1952 by the Palo Alto National Little League (Little League Baseball-West Region). The Subject Property, which was completed in 1952, was one the few Little League baseball facilities in Palo Alto to be privately owned by Little League Baseball. Little League Baseball owns and maintains many facilities throughout the United States including the fields at the Little League Baseball Western Region Headquarters in San Bernardino, California. The field was constructed at an estimated cost of over $100,000.00 which was almost entirely donated in the form of money, time, and materials by businesses and private donors in Palo Alto, California. The design of the field was by Palo Alto architect Morgan Stedman who based his design on Stanford University's Sunken Diamond baseball field (1931). The design is only nominally similar to Stanford's Sunken Diamond since the baseball diamond is no more than 3-4 feet below grade. The bleachers and the snack bar/office building were not completed by opening day, however they were constructed later that year (Wik, 1952). The proposed bleachers were estimated to have had the potential capacity for 12,000 spectators, however; based on historic aerials it appears such expansive bleachers were never constructed and smaller wooden bleachers were built. A grand opening ceremony and exhibition game was held at the park on June 29, 1952. In attendance were sports figures Ty Cobb and Glenn (Pop) Warner who praised the community for the construction of the park (Daily Palo Alto Times, 1952). The park has continued in operation since its opening in 1952.

Little League fields generally adhere to a set of field specifications set by Little League Baseball. The regulations stipulate that the distance between bases be no more or less than 60 feet and the distance from home plate to the pitcher's mound is set at 46 feet. distance from home plate to the outfield fence is generally set by the local league, which results in some variety throughout the country. The Little League Baseball recommended distance is 200 feet or more(Little League Baseball). Little League fields may also feature dugouts, bleachers, outfield and infield fencing, and a backstop. Some also feature restroom facilities and/or snack bars.

(Continued on p. 5 of 9, Continuation Sheet)

(Continued from p. 4 of 9, Continuation Sheet, B10. Significance)

Morgan Stedman was a prominent bay area architect during the 1950s and 1960s. Many of the residential buildings he designed can still be found in Palo Alto today, including three in the vicinity of Stanford University. His work was primarily in home design, and was featured at least five times during the 1950s by House Beautiful as part of the magazine's "Pace-Setter" series of articles. He worked in a variety of styles including modern, Spanish eclectic, and Japanese influenced design. He favored conforming his designs to the surrounding landscape, semi-enclosed outdoor patio spaces, interior courtyards, and atriums. One of his designs in Los Altos Hills, California was listed on the town's local register of historic resources in 2012 (Town of Los Altos Hills, 2012).

The Subject Property was evaluated based on the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. The Middlefield Ball Park has remained in its original location at 3672 Middlefield Road. The character defining features of a historic ballpark typically include such elements as the baseball diamond, fencing, dugouts, pitcher's mound, bleachers, flagpoles, score board, and the snack bar/office building. Middlefield Ball Park's character defining features appear to all have been altered during the 2004 renovation (after the period of significance). The design and materials have been impacted with the replacement of the bleachers with aluminum bleachers (c. 2004), the replacement of the pitcher's mound with a synthetic mound (c. 2004), the replacement of the flagpole with new flagpoles (c. 2004), and the replacement of the scoreboard with a new scoreboard (c. 2004). In addition general maintenance has resulted in the replacement of elements including chain link fencing over time. The feeling and association remain intact since the field is still recognizable as a Little League Baseball field and it continues to operate in that capacity. The setting has changed due to the modification of existing buildings and continued development in the surrounding area. Because of the modifications made to the Middlefield Ball Park post-date the ballpark's period of significance and have impacted the park's character-defining features, the ball park does not retain sufficient integrity.

National Register of Historic Places and California Register of Historical Resources Eligibility Evaluation

The Subject Property was evaluated under National Register of Historic Places **Criterion A** for its potential significance as part of any historic trends or events that may have made an important contribution to the broad patterns of our history and under California Register of Historical Resources **Criterion 1** for its potential association with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. Middlefield Ball Park was constructed during a period of growing popularity of Little League Baseball in the United States. It represents one of many fields constructed during this time period throughout the United States to accommodate the growing demand for Little League facilities. There are better examples that represent the growth of Little League in the United States, including Howard J. Lamade Stadium in South Williamsport, Pennsylvania. It does not appear to be the first nor the oldest Little League Baseball field in the United States or in California. In addition, this is not the location of the earliest Little League field in Palo Alto, California. The first Little League game in the city was played at El Camino Park in 1951. Research has not indicated that this specific Little league field is associated with any significant development or event associated with the history of the United States, Palo Alto, or California. **Therefore, the Subject Property does not appear to meet the criteria for significance under National Register of Historic Places Criterion A or California Register of Historical Resources Criterion 1.**

The Subject Property was evaluated under National Register of Historic Places **Criterion B** for its potential significance and association with a person of importance in national history and under California Register of Historical Resources **Criterion 2** for its association with the lives of persons important to local, California or national history. While many contractors, builders, and city officials were involved in the construction of Middlefield Ball Park and many players and coaches have made use of the facilities, research does not indicate that any specific individuals of importance in national, local, or California history are associated with this particular baseball field. According to baseball-almanac.com there have been ten professional baseball players born in Palo Alto, while research could not confirm that these players participated in any Little League games at the field, none of them appear to have made any significant contributions to the sport. Beyond their presence at the opening ceremony, sports legends Ty Cobb and Glenn (Pop) Warner have no significant association with the Middlefield Ball Park. **Therefore, the Subject Property does not appear to meet the criteria for significance under National Register of Historic Places Criterion B or California Register of Historical Resources Criterion 2.**

(See Continuation Sheet 6 of 9)

*Recorded by: Justin Castells, EBI Consulting *Date: 7/9/2014 ☒ Continuation ☐ Update

(Continued from p. 5 of 9, Continuation Sheet)

The Subject Property was evaluated under National Register of Historic Places **Criterion C** for its potential significance as a property which embodies the distinctive characteristics of a type, period, method of construction or style of architecture, represents the work of a master architect, builder, or craftsman, possesses high artistic values, or represents a significant or distinguishable entity whose components have individual distinction and under California Register of Historical Resources **Criterion 3** as a property that embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values. Middlefield Ball Park is of utilitarian design and the field dimensions generally conforms to the regulations set by Little League Baseball, which makes the field itself inherently similar to many other Little League Baseball fields. The bases are approximately 60 feet apart and the distance from home plate to the pitcher's mound is approximately 46 feet conforming to standard Little League regulations. Morgan Stedman based his design of the field on Stanford's Sunken Diamond which was constructed in 1931, however the visual similarities are minimal. Middlefield Ball Park is no more than 3-4 feet below grade, but otherwise resembles nearly any other Little League field in the United States. The sunken field design is not unique for Little League Baseball facilities. The home of the Little League World Series since 1959, Howard J. Lamade Stadium in South Williamsport, Pennsylvania has a sunken field. While the Little League field pre-dates Howard J. Lamade Stadium by seven years, there is no indication that this is the first or the earliest sunken Little League field in the United States. An earlier example is Gene Caporizzo Field in Stamford Connecticut which was constructed prior to 1951 (Stamford American Little League). Howard J. Lamade stadium is a better example of the sunken field design in that it better conveys the utility of that design to maximize the view for spectators. Furthermore, research does not indicate that the field is the first or the oldest Little League field in the United States, California, or Palo Alto. As stated earlier, the first Little League game in Palo Alto was played in 1951 at El Camino Park. The snack bar/ office building is characteristic of buildings of similar use throughout the United States and is common not only to Little League fields, but many other outdoor recreational facilities. It does not convey any distinct architectural style and is utilitarian in design. While research has indicated that Morgan Stedman was a fairly prominent architect in the Palo Alto area, he does not appear to be considered a master. Most of his work appears to have been single-family residences and research has not indicated that he specialized in the design of recreational facilities. Buildings such as the locally designated home located at 12640 La Cresta Drive in Los Altos Hills, CA better represent his body of work. **Therefore, the Subject Property does not appear to meet the criteria for significant under National Register of Historic Places Criterion C or California Register of Historical Resources Criterion 3.**

The Subject Property was evaluated under National Register of Historic Places **Criterion D** for its potential significance and its ability to convey information and under California Register of Historical Resources **Criterion 4** for its potential to yield information important to the prehistory or history of the local area, California, or the nation. The building does not and is not likely to convey information important to the history of the local area, California, or the nation. In order to buildings, structures, or objects to be considered significant under Criterion D, they need to "be, or must have been, the principal source of information." This is not the case for this structure. **Therefore, the Subject Property does not appear to meet the criteria for significance under National Register of Historic Places Criterion D or California Register of Historical Resources Criterion 3.**

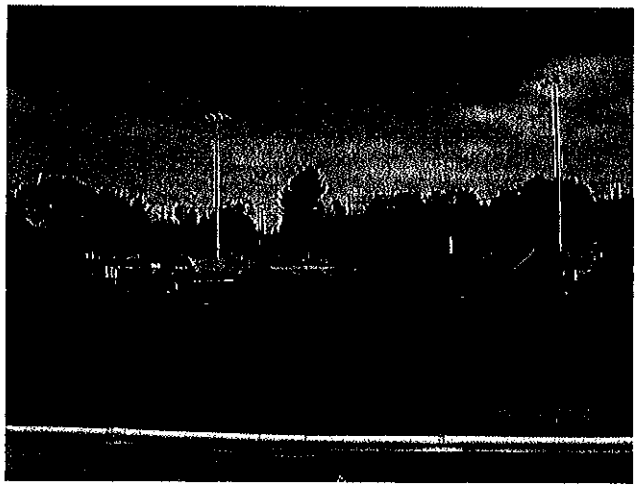
In summary, the Subject Property does not appear to qualify for the National Register of Historic Places under Criterion A, B, C, or D and does not appear eligible for the California Register of Historical Resources under Criteria 1, 2, 3, or 4. Therefore, the Subject Property is not considered to be a historic resource under the National Historic Preservation Act or the California Environmental Quality Act.

(Continued on p. 7 of 9, Continuation Sheet)

*Recorded by: Justin Castells, EBI Consulting *Date: 7/9/2014 ☒ Continuation ☐ Update

(Continued from p. 1 of 9, Continuation Sheet, P5a. Photo or Drawing)

Additional Subject Property Photographs (taken by EBI Consulting on June 3, 2014 unless otherwise noted).



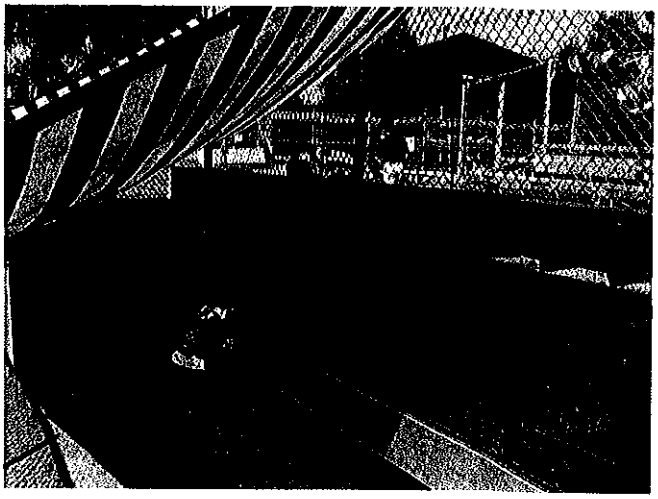
1. Photograph 2 – View of Subject Property, facing north



2. Photograph 3 – View of Subject Property, facing west



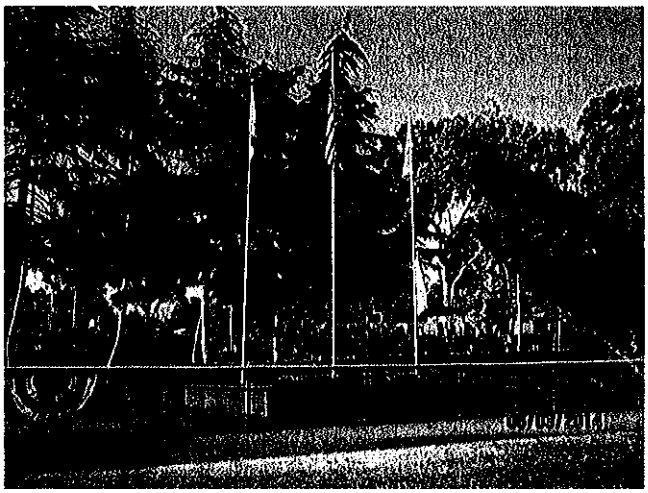
3. Photograph 4 – View of Subject Property, east dugout, facing south east



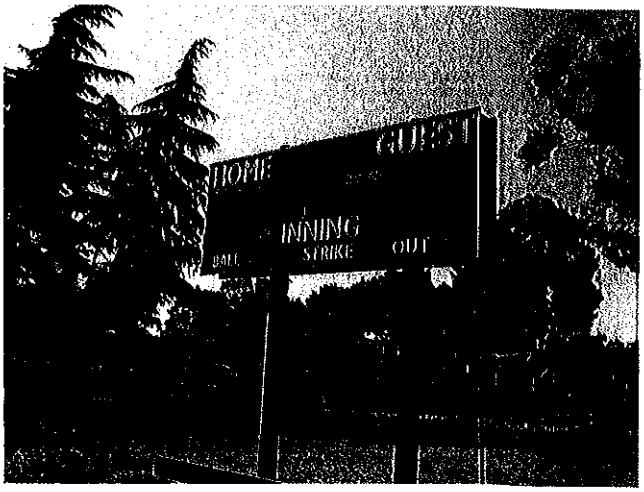
4. Photograph 5 – View of Subject Property, west dugout, facing south west

(Continued on p. 8 of 9, Continuation Sheet)

(Continued from p. 7 of 9, Continuation Sheet)



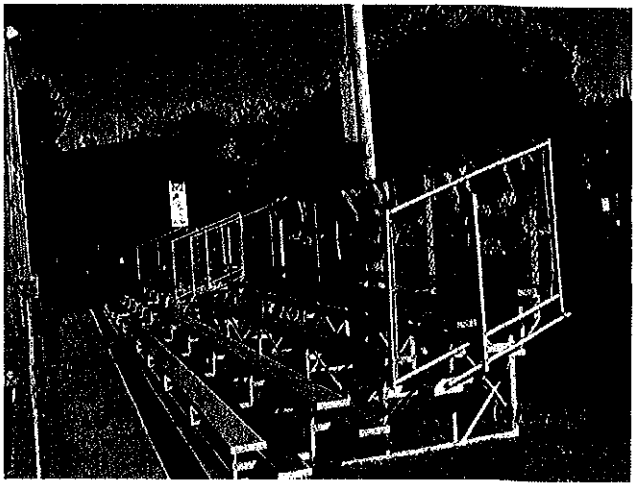
5. Photograph 6 – View of Subject Property, flag poles, facing south



6. Photograph 7 – View of Subject Property score board, facing south



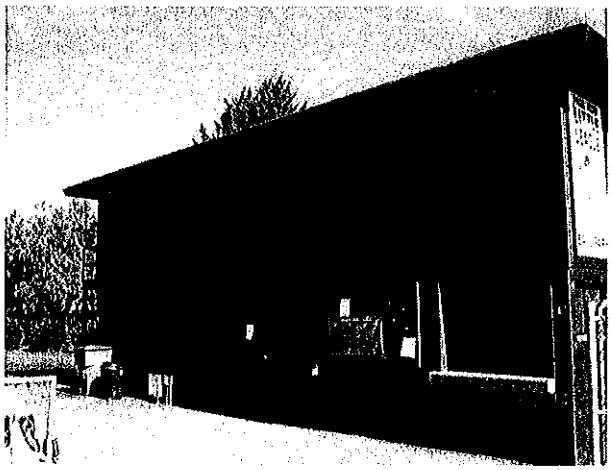
7. Photograph 8 – View of Subject Property, west bleachers, facing south



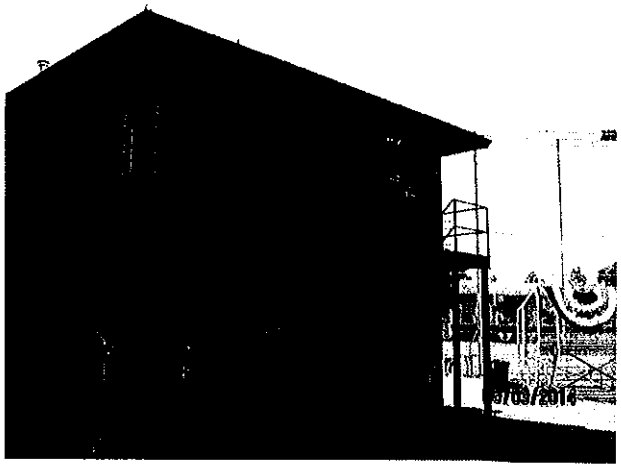
8. Photograph 9 – View of Subject Property, east bleachers facing north

(Continued on p. 8 of 9, Continuation Sheet)

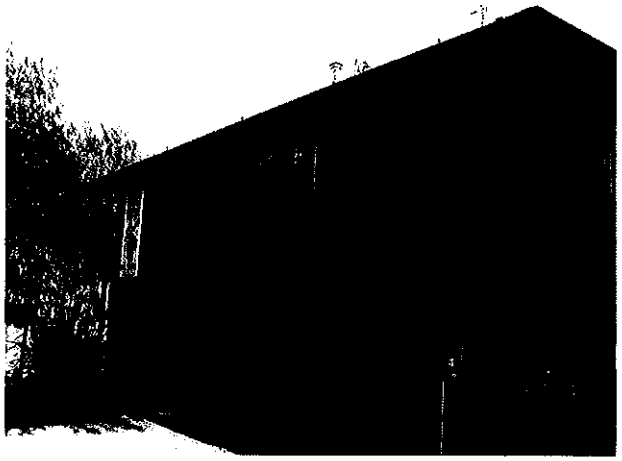
(Continued from p. 7 of 9, Continuation Sheet)



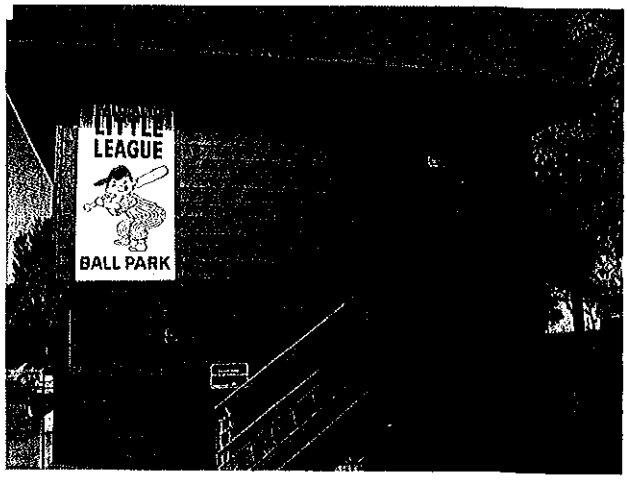
9. Photograph 10 – View of Subject Property snack bar/ office building, facing north



10. Photograph 11 – View of Subject Property, snack bar/ office building, facing south east



11. Photograph 12 – View of Subject Property, snack bar/ office building, facing south



12. Photograph 13 – View of Subject Property, snack bar/ office building, facing west

Attachment F

GROUP

September 5, 2014

City of Palo Alto
Ms. Amy French, Chief Planning Official
250 Hamilton Avenue
Palo Alto, CA 94301

RE: Historic Resource Consistency Analysis
Middlefield Baseball Park
Palo Alto, CA

Dear Ms. French,

Per your request, M-Group has drafted a consistency analysis that identifies how the proposed Verizon Wireless Project meets the Secretary of the Interior's Standards for Rehabilitation. This analysis was performed with the assumption that the Middlefield Ball Park c. 1952 and located at 3672 Middlefield Road in Palo Alto is a historical resource eligible for the California Register of Historic Resources and/or National Register of Historic Places.

The Middlefield Ball Park was considered potentially eligible for listing on the California and/or National Register as of 1998. However, the most recent Historic Resource Evaluation performed by EBI Consulting on July 9, 2014 found that the Middlefield Ballpark does not exhibit a level of significance to warrant listing on the National Register of Historic Places or California Register of Historic Resources. Furthermore, it is highlighted that since 1998, the Ball Park has been altered and materials replaced to such an extent that even it were to be found significant it may not retain sufficient integrity to be considered eligible for listing.

It is understood that the Palo Alto Community has voiced concerns about the proposed project and would like to see the site listed as a Historical resource. As such, M-Group has been asked to evaluate the proposed project's consistency with the Secretary of the Interior's Standards to identify if the proposed Verizon Wireless project complies with those standards should the Middlefield Ballpark be designated a historic resource. Each of the standards is considered individually with discussion limited to those aspects specifically referenced in the Standard. This analysis is not a peer review of past evaluations, but limited to the analysis of the proposed projects consistency with the Secretary of the Interior's Standards and other applicable standards that may be useful to evaluate the project's expected impact on the site.

Project Understanding:

It is our understanding that the Verizon Wireless Project proposes to introduce the following telecommunications equipment several feet west of the existing Middlefield Ballpark playing field. The above ground project components are limited to the replacement of an existing 58-foot 10-inch light pole (c.2008) with a new 65-foot tall wireless light/monopole with (3) antennas inside a new 3-

foot diameter and 5-foot long radome[1] with field lights, matching those of the existing light poles, below. The project also proposes a new 13-foot by 34-foot equipment enclosure immediately north of the light pole. The enclosure will be constructed of green painted CMU block and will have a shingle roof to match the existing office and snack bar serving the little league field. Currently, there are two sheds and a series of three large storage containers within the boundaries of the project site. The two shed buildings are to remain, whereas the storage buildings will be moved slightly in order to accommodate the new telecommunication equipment.

The complete project parameters are outlined below:

1. Replace (1) existing light pole (58'10" tall) with (1) new 65 ft. light pole as shown on the plans
2. Install/mount outdoor equipment cabinets to a new concrete pad measuring 34X13'
3. Attach (3) antennas with (6) Tower mounted amplifiers (TMA's) to new light pole in stealth Radom
4. Route and connect power and Telco to equipment underground
5. Route and connect coaxial cable to antennas underground
6. Construct CMU Wall around equipment with shingle roof cover
7. Install hydrogen fuel cell backup system
8. Install Generator plug for emergency temporary generator
9. Re-install light fixtures at previously approved heights of 58'10"

Existing Conditions

In 1952 Morgan Stedman designed the Middlefield Ball Park and configured it as a regulation Little League Baseball Diamond sunken slightly below grade. The spatial organization followed the distances and locations prescribed by Little League Baseball. It is acknowledged that the design is based (perhaps loosely) on Stanford University's Sunken Diamond Baseball Field (c.1931).

The Character Defining Features of the Ball Park include: [2]

- Spatial Organization
- Baseball Diamond
- Fencing
- Dugouts
- Pitcher's mound
- Bleachers
- Flagpoles
- Scoreboard
- Snack bar/Administrative building

The Ballpark has continued to be used as a Little League Ball Field since its construction in 1952 and has been updated over the past several decades in order to encourage its continued use. Several changes were made in 2004 when the scoreboard, flag pole, bleachers, and pitcher's mound were replaced and in 2008 four light poles were added adjacent to the playing field.

[1] Radome: A dome-shaped radar housing: a dome-shaped protective enclosure for a radar antenna, made from materials that do not interfere with the transmission and reception of radio waves

[2] Character Defining Features as identified in the DPR 523 Form prepared by EBI Consulting, July 9, 2014.

Analysis

The following analysis considers the impact of the Verizon Wireless Project within the context of the Secretary of the Interior's Standards. The Secretary of the Interior's standards are not prescriptive measures, but rather provide a framework that includes guiding principles and best practices that promote responsible stewardship and effective preservation practices. Consistency with the Secretary of the Interior's Standards indicates that the project is likely to have negligible impact to an adjacent historic resource.

SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

The introduction of Verizon Wireless telecommunications equipment adjacent to the Middlefield Ballpark playing field will not impact the use or enjoyment of the property as a Little League Ball Field. The telecommunication's equipment will be located west of the ball field and will be clustered with existing auxiliary buildings such that it does not impede the use of the ball field for the purposes of Little League Baseball. The light pole that will house the antennae will replace an existing non-historic light pole and feature a height increase of 6'9". The proposed project does not propose any changes in use that would preclude the use of the site as a Little League Ball Field. Therefore, the project is consistent with SOIS 1.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

As identified in the Historic Resource Evaluation performed by EBI Consulting in June of 2013, the character defining features of the Middlefield Ballpark include the following: spatial organization; baseball diamond; fencing; dugouts; pitcher's mound; bleachers; flagpoles; scoreboard; snack bar/auxiliary buildings. The most notable features therefore include design, materials and spatial organization and it is these features that are most important for preserving a historical ballpark's integrity. The project does not propose the removal or alteration to any of the features identified as character defining.

Although the project will introduce new above ground features, it is not expected to alter the existing special relationships to the extent that it would adversely impact the integrity of the site. The new pole will replace an existing light pole (c.2008) in the same location and will therefore maintain the existing relationship between the light pole and the rest of the ballpark. The new light pole and antennas will be located outfield and will typically be viewed from a distance such that the height increase and visibility of the radone would be minimized. The field lights will be added back on at the same height as that of the existing pole and will match the height and configuration of other light poles. Such design measures reduce the visual prominence and avoid introducing elements that would degrade the character of the Middlefield Ball Park.

As designed, ballparks inherently focus attention to the interior of the ballpark. The typical Little League Ball Park design orientated bleachers and other viewing points around the field in order to allow for and promote viewership. The surrounding landscape, often suburban or urban in character, serves as a backdrop, but based on its secondary importance to the actual use of the property it is not considered an important character defining feature necessary in retaining the

integrity of the historic resource. The important viewsheds are those on the field, as players might experience them, and the viewshed as seen from the bleachers onto the ball field, as spectators might experience them. As proposed, the project will not impede these important viewsheds.

The siting of the equipment enclosure will be clustered with other existing auxiliary buildings, including two sheds and three large storage containers. The enclosure will measure approximately, 13-feet by 34-feet and feature a height of 9-feet 6-inches. It will be constructed of CMU block and painted green in keeping with the established character of the snack bar and office building. The proposed enclosure will not deviate significantly from the existing character present in that portion of the ball park and will not degrade the setting or character of the site to an extent that its integrity would be adversely impacted. Therefore, based on the sensitive design measures, location sufficiently outside of the ballpark playing field, and the fact that the setting is not considered a character defining feature, the project is assumed to be consistent with SOIS two.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

The Verizon Wireless Telecommunications equipment will introduce features that are clearly associated with the present era and they will not be construed as creating a false sense of history. The Ballparks period of significance was identified as 1952-1964 per the most recent Historic Resource Evaluation performed in July of 2014. As cellular wireless telecommunication was not widespread between 1952 and 1964, such equipment would not create a false sense of historical development nor would it prevent the ball park from being recognized as a physical record of its time. The equipment will be sufficiently outside of the playing field and clustered with other non-historic site features such that it would be associated with more recent introductions to the site. Therefore, the project is consistent with SOIS three.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

The Verizon Wireless telecommunications equipment will not remove or alter any historical features that have acquired significance in the last 50 years. The project is therefore consistent with SOIS four.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

The Verizon Wireless telecommunications project does not propose the removal of distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize the Middlefield Ball Park. The changes to existing features are limited to the slight relocation of the storage bins, which in and of themselves do not constitute distinctive features important to the property's significance, and the replacement of an existing light fixture. However, the light fixture was added in 2008 and is not considered a historic or distinctive site feature. The project is therefore consistent with SOIS five.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture,

and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

As proposed, the project does not involve the repair or replacement of any historic features and as such, it consistent with SOIS six.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

As proposed, the project does not involve physical treatments or cleaning that would adversely impact historic materials. The project is consistent with SOIS seven.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

The Verizon Wireless Project will involve only minimal ground disturbance and ground disturbance is not proposed for any area that has not already been subject to some type of disturbance as warranted by outbuilding construction or erection of light poles. It is not anticipated that construction associated with the project would encounter any significant archeological resources. Therefore, the project is consistent with SOIS eight.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

The erection of a light pole with appurtenant telecommunications equipment and the construction of a wireless equipment enclosure will not destroy any historic materials that characterize the property as both will be stand-alone structures in an area that already contains multiple non-historic stand-alone structures. The removal of the existing light pole and replacement with new 65-foot tall light pole will not destroy historic materials as the existing light poles were installed in approximately 2008 and have not obtained historic significance. Therefore, the project is consistent with SOIS nine.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The Verizon Wireless Telecommunications project will include stand-alone structures that will not directly impact any physical features of the historic property. Should the proposed elements including the 65-foot tall light pole or appurtenant equipment area/enclosure be removed the essential form and the integrity of the ballpark would be unaffected. Therefore, the project is consistent with SOIS ten.

Summary

The consistency analysis above indicates that as proposed, the project would not constitute a significant adverse impact to the historic Middlefield Ballpark and therefore the project would not reduce the integrity of alter the significance of the property. The project would have a limited effect to the property which would be confined to the outer boundary of the Middlefield Ball Park and

which would not impact the Ball Park's character defining features. As proposed, the project exhibits overall consistency with the Secretary of the Interior's Standards for Rehabilitation and is expected to have a negligible effect on the integrity of the Middlefield Ball Park.

FCC PROGRAMATIC AGGREEMENT

It should be further noted that, should the Ballpark be considered a historical resource, the project would be subject to Section 106 Review pursuant to 36 C.F.R Part 800 and the guidelines outlined in the "Programmatic Agreement for Review of Effects of Historic Properties for Certain Undertakings approved by the Federal Communications Commission". Under the programmatic agreement, effects of an FCC approved projects are to be assessed based on 36 CFR-800 5(a) (1) which outlines the criteria for an adverse effect to be:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The FCC agreement further indicates that *"construction of a facility will not cause an adverse effect except where visual setting or visual elements are considered character defining features warranting National Register Eligibility."*

The Visual Setting serves a backdrop and is second in importance to the spatial organization, design and materials of the ball park. The introduction of the above ground facilities including the monopole and equipment enclosure will not result in a significant departure from the existing site conditions and therefore, based on the FCC agreement, the proposed Verizon Wireless Project will not constitute a significant effect.

Conclusion

Based on the FCC criteria and the SOIS the introduction of Verizon Wireless telecommunications equipment on the Ball Park grounds would not constitute an adverse effect and is not expected to negatively impact the integrity of the Middlefield Ball Park.

Should you have any questions or concerns related to the analysis or information referenced therein please do not hesitate to contact me.

Thank you.

Sincerely,

Lilly Blanco, MHP
M-Group | Preservation Specialist
1303 Jefferson St. Suite 100-B
Napa, California 94559
P: 707-259-1790

(1)

Palo Alto Planning division,

I am writing this letter with regard to the health concerns over the 65 foot monopole celltower proposed by Verizon at 3672 Middlefield Road in Palo Alto, which I encourage the City to REJECT.

Please see in two recent Insurance industry premier rags, AM Best's Briefing and The Real Estate Finance Journal, the industry's evaluation of this risk on the basis of the best objective evidence they have been able to collect.

Are the City of Palo Alto and Little League prepared to take on the unacknowledged health risk of installing such towers immediately upon our neighborhood's children?

I acknowledge that the City can not make a decision about this tower based on health concerns, yet if one looks carefully through the property file, there are ample reasons to reject this tower which the community has provided over the past many years...I implore you to make the right decision in rejecting this wireless monopole at3672 Middlefield Road in Palo Alto.

Sincerely,

Ann Xu 4198 King Arthur Ct, PA, 94306

Sidney Xu 4198 King Arthur Ct, PA, 94306

BEST'S BRIEFING
Our Insight, Your Advantage.
U.S. Property/Casualty & Life/Health

February 14, 2013

Emerging Technologies Pose Significant Risks with Possible Long-Tail Losses

It is critical for insurers to maintain vigilant oversight of these new risks.

The insurance industry faces a constantly escalating level of exposure from rapidly developing technologies with risks that are not well understood. In many situations, the science associated with understanding these new risks is in the early stages of development.

A.M. Best believes that it is critical for insurers to maintain vigilant oversight of emerging technologies as a critical component of their enterprise risk management system. Effective enterprise risk management encompasses identifying, evaluating and addressing risks that could threaten the earnings or viability of an insurer. This includes a prospective look at the underwriting exposures so that changes to policy language or underwriting criteria can properly manage losses from these new risks. An exposure which may present only insignificant insured losses at present, may bring future unprecedented losses.

None of the current emerging technologies appears to be the next asbestos, the longest running and most expensive tort in U.S. history, according to the Rand Institute. Asbestos in many ways presented the "perfect storm" of loss characteristics: extreme toxicity; a very lengthy latency period before emergence of illness; a contagion capability through airborne transmission and physical contact; and lengthy exposure to a very large number of workers, their family members and asbestos product users.

A.M. Best recently estimated the U.S. property/casualty industry's ultimate asbestos losses at $85 billion. While losses from emerging technologies may pale in comparison, they still could be extremely significant to the industry. Insurers need to monitor the manner in which emerging technologies are, or are likely to be, deployed; the risks associated with their use; their residual or unintended impacts; and the manner in which the insurance policies may be called upon to cover losses.

Emerging Technology-Based Risks

RF (Radio Frequency) Radiation Risk – Today there are more than 600,000 cell sites in the United States and that number is expected to grow with the demand for faster, more reliable wireless devices. The risks associated with long term use of cell phones, although much studied over the past 10 years, remains unclear. Dangers to the estimated 250,000 workers per year who come in close contact with cell phone antennas, however, are now more clearly established. Thermal effects of the cellular antennas, which act at close range essentially as open microwave ovens can include eye damage, sterility and cognitive impairments. While workers of cellular companies are well trained on the potential dangers, other workers exposed to the antennas are often unaware of the health risks. The continued exponential growth of cellular towers will significantly increase exposure to these workers and others coming into close contact with high-energy cell phone antenna radiation.

Cyber Risk – Significant data breaches have become common (e.g., Citigroup, the International Monetary Fund, JP Morgan Chase & Co., Sony Online Entertainment, Hilton Worldwide, Marriott International Inc., Verizon and Heartland Payment Systems). These can involve, for example, loss of sensitive financial information, personal data, and

Analytical Contact:
Anthony Diodato, Oldwick
+1 (908) 439-2200
Ext. 5704
Anthony.Diodato@ambest.com

Mariza Costa, Oldwick
+1 (908) 439-2200
Ext. 5308
Mariza.Costa@ambest.com

Editorial Management
Carole Ann King

Copyright © 2013 by A.M. Best Company, Inc. ALL RIGHTS RESERVED. No part of this report or document may be distributed in any electronic form or by any means, or stored in a database or retrieval system, without the prior written permission of the A.M. Best Company. For additional details, refer to our *Terms of Use* available at the A.M. Best Company website: www.ambest.com/terms.

proprietary secrets. Identity theft alone is estimated to cost consumers and companies roughly $5 billion and $50 billion, respectively, each year. A 2009 study found that lost data cost U.S. companies in excess of $200 per lost customer file. In a 2011 study conducted among large U.S. companies, more than 80% of information technology executives said that they had detected one or more recent attacks. Such exposures continue to evolve as companies are increasingly storing sensitive and confidential information with cloud vendors – a vendor that provides other companies with an infrastructure on which to store data or run applications – exposing data to new types of breaches.

Fracking Risk – Over the past 10 years horizontal hydraulic fracturing ("fracking") has become a big business and a highly contentious issue. The process involves pumping a pressurized fluid into a rock layer, which causes fracturing of the rock and release of petroleum, natural gas or other substances for extraction. The potential benefits are enormous; however, there are significant risks, including potential release of radioactive substances, radon (a known carcinogen) in the natural gas going into homes and potential chemical contamination of drinking water. The U.S. Environmental Protection Agency has determined that fracking was the likely source of ground water contamination in at least 36 cases. There are a variety of other concerns including the potential for exposed workers to develop silicosis and that the process may lead to earthquakes.

Nanotechnology Risk – A wide variety of consumer and industry products are increasingly constructed at the molecular level, using materials from 1 to 100 nanometers in length (a nanometer is one billionth of a meter). Nanotechnology is employed in an array of products, including medicines and medical devices, glass, coatings, construction products, fire protection materials, vehicles, foods, textiles, cosmetics, optics and sports equipment. Nano-sized particles, however, act differently than materials built at normal scale, and existing chemical risk assessments are not suited for exposures arising from nanoparticles. Considerable concern has arisen that some nanoparticles may be toxic. With the exception of airborne nanoparticles entering the lungs, understanding of the effects of nanoparticle on the human body, including accumulation, metabolism and organ-specific toxicity is extremely limited. Concerns involve both the potential of immediate harms as well as harmful effects appearing after long latency periods. Of the technology risks now emerging, nanotechnology product exposures may be the most similar to asbestos. While it remains unclear whether nanoparticles can lead to asbestos-like losses, insurers need to carefully monitor developments of this emerging technology.

Conclusion

Insurers must evaluate constantly evolving technology exposures with the knowledge that existing scientific/technical understanding is often incomplete. A.M. Best will review companies' understanding of their exposure to emerging risk, and their approaches to mitigating the risks within the framework of their enterprise risk management programs.

A.M. BEST COMPANY WORLD HEADQUARTERS	•	Oldwick, NJ	•	+1 (908) 439-2200
Washington Office	•	Washington, DC	•	+1 (202) 347-3090
Miami Office	•	Miami, FL	•	+1 (305) 347-5188
A.M. Best Asia-Pacific Ltd.	•	Hong Kong	•	+852 2827 3400
A.M. Best Europe Rating Services Ltd.	•	London, UK	•	+44 (0)20 7626-6264
A.M. Best Europe Information Services Ltd.	•	London, UK	•	+44 (0)20 7626-6264
A.M. Best – MENA, South & Central Asia	•	Dubai, UAE	•	+971 43 752 780

Important Notice: A Best's Financial Strength Rating is an independent opinion of an insurer's financial strength and ability to meet its ongoing insurance policy and contract obligations. It is based on a comprehensive quantitative and qualitative evaluation of a company's balance sheet strength, operating performance and business profile. These ratings are not a warranty of an insurer's current or future ability to meet contractual obligations. The Financial Strength Rating opinion addresses the relative ability of an insurer to meet its ongoing insurance policy and contract obligations. The rating is not assigned to specific insurance policies or contracts and does not address any other risk, including, but not limited to, an insurer's claims-payment policies or procedures; the ability of the insurer to dispute or deny claims payment on grounds of misrepresentation or fraud; or any specific liability contractually borne by the policy or contract holder. A Financial Strength Rating is not a recommendation to purchase, hold or terminate any insurance policy, contract or any other financial obligation issued by an insurer, nor does it address the suitability of any particular policy or contract for a specific purpose or purchaser. In arriving at a rating decision, A.M. Best relies on third-party audited financial data and/or other information provided to it. While this information is believed to be reliable, A.M. Best does not independently verify the accuracy or reliability of the information. For additional information, see A.M. Best's Terms of Use at www.ambest.com/terms.html. SR-2013-B-431

Electromagnetic Field Litigation: A Growing Issue for Real Estate and Building Concerns

Bill S. Forcade

There is a growing public concern that electromagnetic fields cause personal injury or property damage. That concern is expressed in toxic tort litigation, commercial property transactions, and insurance considerations. Because the number and variety of conflicts is increasing, it is important for prudent property managers to understand what this conflict is about, what kind of situations prompt EMF conflicts, what the courts have done, and what to do to reduce the risks of an EMF conflict.

Copyright 2002 West Group. This article was originally published in the Summer 2002 issue of the Real Estate Finance Journal and is reprinted with permission.

Wherever there is electric power, electric and magnetic fields are produced by that power. As a general rule, where the power source is direct current, such as industrial electroplating or batteries, the electric and magnetic fields are independent. However, the electric current in electric generating plants, electric transmission lines, industry, businesses and homes is alternating current: current that varies with a frequency of 60 cycles per second (60 Hz.). As the frequency of the electric power variation increases, the electric and magnetic fields become more coupled, and are more properly described as an electromagnetic field. Commonly, EMF are defined as electromagnetic fields with frequencies from 0 to 300 GHz. This includes:

- Static fields (0 Hz): Magnetic levitation trains for public transportation, magnetic resonance imaging devices used in medicine, batteries, and electrolytic devices using direct electric currents for materials processing in industry,
- Extremely low frequency (ELF) fields (0 to 300 Hz): Trains for public transport, any device involved in the generation, distribution or use of (60hz) electric power,
- Intermediate frequency (IF) fields (300 Hz to 10

Bill S. Forcade is a partner in the Chicago office of Jenner & Block. He may be reached at bforcade@jenner.com.

@MAGNETO/MERCURY/TESTAREA/RM/REFJ/FROCADE SESS: 1 COMP: 07/25/02 PG. POS: 1

MHZ): Anti-theft and security devices, induction heaters and video display units, and

- Radio-frequency (RF) fields (10 MHZ to 300 GHz): Mobile telephones or telecommunications transmitters, radars, video display units and diathermy units.

Electric fields are typically measured in Volts per meter ("V/m"), and typical exposures at the home and workplace are from 5 to 10 V/m. Electric fields at ground level under a power transmission line may be 10,000 V/m, which is sufficiently high to cause fluorescent tubes to glow. Transmission line workers may have mean exposure values from 50 to 5,000 V/m. Magnetic fields are measured as magnetic flux density, typically expressed in microtesla ("μT") or milligauss ("mG"), where 1 μT = 10 mG. Typical magnetic field exposures at the home and office range from 0.01 to 0.08 μT.

Concerns About EMF

Generally, people will take some concrete action regarding EMF only if they have a significant perception of risk, and there is a triggering event. Clearly, a large number of people perceive EMF as a potential risk. In 1999, USA Today conducted a survey of 4,567 readers and reported that EMF are the number one environmental concern in America. On August 25, 2000, ZD Net, a popular electronic technology news magazine had an article, "Is Your Cell Phone Frying Your Brain?" ZD Net users were asked, "Do you think cell-phone use is hazardous to your health?" Of the 11,000 people responding, 54% said yes, 24% said no, and 23% said they would wait for completion of the government studies before deciding. Nearly every month some major newspaper or periodical has a significant article on possible links between EMF and an adverse health impact.

Individual perception of risk may vary widely depending on age, gender, background and other factors. People are more likely to accept a perceived risk if they know about it in advance and if they find some personal benefit from the activity. They are less likely to accept the risk if they are not informed in advance, lack personal control over the risk, or derive little personal benefit from the exposure, such as may be the case with installation of new power lines or EMF discovered in schools.

The second factor prompting EMF action is a triggering event. That may be someone developing a serious health effect such as cancer, or the announcement of construction of a nearby high voltage power line. But the triggering event might have a less obvious connection with EMF, such as a business transaction to purchase property or their child starting in a new school.

Once people become concerned about EMF around a triggering event they want to take some action. This may involve only investigating the issue or complaining to responsible parties. However, several factors can exacerbate their fears and prompt vigorous action. Obviously anyone who perceives that they are not receiving accurate, complete or candid information is more likely to take additional action. Second, people may become alarmed if they discover that their exposure levels exceed typical values.

One issue has only marginal impact on the decision to take action: a strong scientific basis for concluding that EMF cause harm. There is a strong scientific connection between exposure to asbestos and specific health consequences. Presently no such data exists for EMF. Any future strong scientific connection between EMF and specific health consequences would greatly increase the likelihood of personal action. But the absence of a strong scientific connection between cause and effect may not preclude such action.

Legal Conflicts

Most people are aware that there has been a great deal of litigation by homeowners against adjacent high power electric lines or cell phone towers and some litigation by cell phone users against manufacturers. But the EMF conflict has a broader scope, including litigation, property transactions, and insurance coverage issues.

EMF litigation typically includes personal injury claims or claims of property damage or devaluation. This toxic tort litigation may be founded in trespass, nuisance, products liability, inverse condemnation, eminent domain or other theories.

Personal injury claims based on EMF exposure have not fared well in the courts, because no one has presented persuasive scientific evidence that EMF cause particular adverse health effects. Property claims have been much more successful in the courts. Most of the property claims have asserted that EMF have diminished the value of the property, because the public fears regarding EMF reduce the amount buyers will pay for property subject to such exposure. These claims are usually brought under theories of trespass, inverse condemnation or eminent domain. Courts have applied four general theories to awarding diminished valuation damages related to public fears: the liberal (majority) view, the intermediate view, the conservative (minority) view, and the preemption view.

The majority, or liberal, view holds that landowners can be compensated for decreased valuation of their property due to public fears, whether that fear is reasonable or not. The leading majority view case, San Diego Gas & Elec. Co. v. Daley,[1] involved a condemnation proceeding for construction of overhead power lines. The jury awarded the property owner $190,000 for the condemned property and $1,035,000 for the diminished value to the remaining property due to public fears from EMF. The Court of Appeals affirmed that the issue before the court was not whether EMF cause health hazards, but whether the fear of danger from the

@MAGNETO/MERCURY/TESTAREA/RM/REFJ/FROCADE SESS: 1 COMP: 07/25/02 PG. POS: 2

power lines affected the property's market value. Daley was also awarded $486,066.68 in interest and in litigation expenses. Similarly, in Florida Power & Light Co. v. Jennings,[2] the court held that "all evidence relevant to the issue of full compensation is admissible in eminent domain proceedings. The public's 'fear' as a factor which may be relevant to the issue of just compensation may be utilized as a basis for an expert's valuation opinion regardless of whether or not this fear is objectively reasonable."

The intermediate view is exemplified by Dunlap v. Loup River Public Power District,[3] involving construction of an overhead power line on a farm. The Nebraska Supreme Court affirmed the award of damages, stating that while general fears should not be compensable, if there is a basis in experience for the fears, and the fears are reasonable and affect the price a purchaser of land is willing to pay, the loss should be compensable. Similarly, in Willsey v. Kansas City Power & Light,[4] the court affirmed a three part test for the intermediate view, originally employed in Texas, ruling that "fear in the minds of the buying public on the date of taking is relevant to the proof of damages when the following elements appear: (1) that there is a basis in reason or experience for the fear; (2) that such fear enters into the calculations of persons who deal in the buying and selling of similar property; and (3) depreciation of market value because of the existence of such fear." Nearly all recent intermediate view case law has allowed diminished valuation damages for public fear of EMF from power lines. Thus the intermediate view provides the same result as the liberal view for such cases.

The minority (conservative) view holds that compensation for loss of value due to public fears is never compensable.[5] Most of the conservative view cases were decided before the current publicity and scientific studies regarding EMS, and the clear direction of recent court decisions is toward the majority view.

A more recent judicial development is the California Supreme court decision that judicial evaluation of property devaluation claims from EMS is preempted. The Covalts owned a single-family residence in San Clemente. They sued San Diego Gas & Electric, which ran electric currents through power lines on adjacent property. The court assumed that the Covalts could establish that EMF radiation substantially and unreasonably interfered with use of their property. However, permitting such a cause of action would interfere with the Public Utility Commission's policy on powerline EMF, which would violate Public Utility Code section 1759. Therefore, judicial evaluation of property value impacts from EMF is preempted by the utility code.[6]

The recovery theories for property devaluation due to EMF are important because of the significant potential impacts nationwide. The July 1992 issue of Science magazine concluded that "over one million homes and 10 million acres of land in the United States are sufficiently close to high-voltage transmission lines that levels of EMF exceed what is considered normal." A one percent loss in property value could result in $1 billion in damages.[7] Some property valuation experts have estimated the property devaluation from EMF and power lines averages 20%.[8] Susan Coveny, president of RE/MAX Prestige, a realty agency in Long Grove, Ill., says a home near a power line can sell for 30 to 35 percent less than a comparable house at some distance away.[9]

Even without a claim of personal injury, damage awards can be quite high. In 1996 a New Jersey jury awarded a couple $762,524 for negligent infliction of emotional distress, trespass, inverse condemnation and nuisance resulting from the utilities construction and operation of an underground power line outside of the right of way. The jury unanimously rejected the plaintiffs' theory that EMF caused his leukemia.[10]

Although most of the EMF litigation is filed against those operating overhead power transmission lines, there are other areas of growing litigation concern. Real estate developers could be subject to litigation by disgruntled purchasers claiming failure to disclose nearby power lines. And, as discussed below, residential and commercial building owners and managers can be subject to suit from tenants based on potentially faulty building wiring that causes high EMF levels.

There are two important unrecognized aspects to past EMF litigation. First, nearly all prior cases have been filed against a public utility, or product manufacturers that are large, well funded entities where EMF are a central aspect of their products or activities. Realistically, these entities cannot settle a case claiming adverse health effects from EMF, or leave an adverse judgment unappealed, for fear that such action would prompt a flood of additional litigation. They must provide a maximum defense against any and all such claims, even if legal and scientific expert costs are quite high. If plaintiffs commence actions against less well funded companies or against entities where EMF are only incidental to their operations, the results may be quite different.

Many large industrial facilities have substantial electrical distribution equipment within their facility that produce EMF. Commercial and residential property owners are responsible for the internal electrical systems, and the EMF, within their premises. There are many small companies that manufacturer products, such as electric blankets, that produce EMF. Schools, in particular, may find it politically difficult to present an aggressive legal defense if they are charged with having high EMF levels in the classroom. If plaintiffs begin to focus on these entities, the defendants may not present as spirited and well funded a defense, or they may settle, or they may accept adverse lower court rulings. This could significantly change the character of the EMF case law.

Second, EMF litigation is profoundly dependent upon the character of the most recent scientific studies on the health effects of EMF. Even a single reputable scientific study showing that EMF are a direct cause of

@MAGNETO/MERCURY/TESTAREA/RM/REFJ/FROCADE SESS: 1 COMP: 07/25/02 PG. POS: 3

an adverse health effect could lead to an explosion in litigation.

Non-Litigation Conflicts

Litigation is not the only area with significant conflicts relating to EMF. Public concerns, including concerns from home owners, businesses, tenants and inside contractors have changed the way we address EMF. Some have added EMF contingency clauses to purchase or lease contracts. Similar concerns are arising in the representations and warranties section of documents for industrial and commercial property transactions.

These concerns have not been lost on the insurance industry. Most commercial general liability insurance policies cover all contingencies that are not specifically excluded. As a result, EMF claims are likely to be covered under the policy. That position may be changing. Some insurers have recently expanded the pollution exclusions to include electric, magnetic, and electromagnetic contaminants and radiation. Some commentators have suggested that now is the time for insurers to act proactively, as with the Y2K problem, and amend insurance coverage forms so as to specifically exclude or limit coverage on claims arising from EMF exposure.[11]

Some states preclude general exclusion of EMF claims in insurance policies. The Maine Department of Professional and Financial Regulation, Bureau of Insurance has policies that preclude a general EMF exclusion for Commercial General Liability and Non-Medical Professional Liability insurance. For programs filed to cover risks associated with a high EMF exposure, any exclusions must be supported by claims data.

Parties Involved In EMF Conflicts

Clearly the public has targeted electricity power lines and cell phone manufacturers as likely EMF targets. But the available data shows that for many individuals these sources may not be the most likely source of high EMF exposure. One frequently overlooked area of significant potential exposure is the buildings in which people live or work.

It is very common for magnetic field interference problems to emerge following a building remodel or upgrade, but these problems can be anticipated and avoided. In one instance measurements, combined with computer projections confirmed that substantial levels -- in the tens of milligauss (mG) -- of magnetic fields would exist in tenant areas adjacent to the new facility, including the second-floor law offices. Corrective action kept actual EMF levels near typical office levels.[12]

Improper wiring can also lead to EMF problems. If a four-wire three-phase circuit (service feeder/riser busway) is unbalanced by more than 15% or the neutral has excessive net, ground, or plumbing currents, then the magnetic field levels become highly elevated and a serious EMF threat. Stray grounding currents in the building steel, HVAC ducts, and metal conduits plus plumbing currents on the water pipes also generate highly elevated levels. Significant ground currents not only produce very high magnetic fields, but are also indicative of electrical wiring problems.

This problem is not unique to the industrial and commercial workspace. In 1994, a faculty member at the Community College in New York City, found very high magnetic field levels between 35-150 mG (waist height) in the college fitness center and two adjoining areas (wrestling room and offices) located above four transformers, four network protectors, and the main electrical room. A subsequent ELF EMF contour survey study found, at the peak spot in the fitness center, the estimated worst case school-in-session floor levels were 850-mG.[13]

Information on EMF levels is becoming widely available. The EMF Measurements Database is a project sponsored by the U.S. Department of Energy through the EMF Research and Public Information Dissemination (EMF RAPID) Program. The purpose of the project is to make measurements of electric and magnetic fields publicly available. Its Web site, http://www.emf-data.org/, allows the public to download a substantial amount of information on EMF levels in a variety of settings.

Reducing Risk

There are several steps for prudent companies to take to minimize exposure to adverse publicity, vexatious litigation, and possible financial awards regarding EMF. First, they should check their general liability and other insurance policies for coverage. If they have transferred property to or from others, the transactional documents or lease may have provisions that might shift the risk to other operations. If companies remain unsatified with insurance coverage or liabilities, they should find acceptable coverage before proceeding with other evaluations (and give serious consideration to a "claims made" policy coverage).

If companies are satisfied that they have appropriate coverage for any potential claims, they may wish to investigate the nature of any EMF associated with their location, their business activities or their product. There are many competent consultants that can give an in-depth EMF report. But, businesses also can purchase simple EMF meters for under $200. Keep in mind that this helps to develop information that may be subject to discovery in any future litigation. Therefore, it may be appropriate to contact legal counsel about having investigative studies conducted under the protections of attorney-client privilege. Because small handheld EMF meters are so inexpensive, it is not unreasonable to assume that employees, tenants, customers or others may measure EMF values, too. In addition to present activities, companies should keep EMF risk management in mind as they acquire or divest properties.

@MAGNETO/MERCURY/TESTAREA/RM/REFJ/FROCADE SESS: 1 COMP: 07/25/02 PG. POS: 4

Investigating the EMF values of business locations, activities or products may help avoid some nasty surprises. In a May 29, 2001 Complaint, in Arthur R. Slater, et al. v. City of Albuquerque,[14] county employees allege that they developed breast cancer because of exposure to electromagnetic field radiation and toxins while working in the basement of the county courthouse. The complaint states that, "The statistical probability that three men working in the same office will get breast cancer by chance alone is less that one in a trillion." The complaint also alleges that the county was aware that EMF exposure, "has been excessively high, at times in excess of 450 milliGaus . The industry standard for EMF strength is 3 milliGaus or less." As mentioned earlier, typical home and office exposures are about 0.01 to 0.08 μT. No one wants the adverse publicity, litigation exposure or surprise of learning their EMF levels are far above average, whether or not those EMF values will cause adverse health effects.

If a company's evaluation shows levels above average, the company could consult an expert on ways to reduce those values. Many high EMF readings are the result of improper wiring or faulty equipment and can be corrected easily and inexpensively. If the problem turns out to be more complex, at least the company can make an intelligent decision on how to proceed.

In addition to evaluating EMF levels, companies may wish to acquire more information about EMF exposure or to distribute appropriate information to employees, tenants, or customers. Be very careful in any such effort. Even a properly conducted educational program intended to reduce public fears can substantially increase the pubic fear of EMF. Efforts to reduce public fears may only make them worse.

---

[1] 253 Cal.Rptr. 144 (Cal.Ct.App.1988).

[2] 518 So.2d 895, 897 (Fla.1987).

[3] 284 N.W. 742 (Neb. 1939).

[4] 631 P.2d 268 (1981).

[5] See, Alabama Power Co. v. Keystone Lime Co., 67 So. 833 (Ala. 1914), Central Ill. Light Co. v. Nierstheimer, 185 N.E.2d 841 (Ill. 1962), and Chesapeake & Potomac Tel. Co. v. Red Jacket Consol. Coal & Coke Co., 121 S.E. 278 (W. Va. Ct. App. 1924).

[6] San Diego Gas & Electric Co. v. Superior Court, 13 Cal.4th 893, 55 Cal.Rptr.2d 724, 920 P.2d 669 (Cal Sup. Ct. Aug. 22, 1996).

[7] Roy W. Krieger, On the Line, A.B.A. Journal, Jan. 1994, at 40, note 7 at 45.

[8] The Philadelphia Inquirer, Friday June 3, 1994, Section E, pg. 1.

[9] Gary Stix, "Are power-line fields a dead issue?" Scientific American, March 1998.

[10] John R. and Sandra H. Altoonian v. Atlantic City Electric Company, No. CPM-L-1342-91; N.J Super., Cape May Co.

[11] David Thamann, "EMF Claims Could Still Overwhelm Insurers, 45 National Underwriter Property & Casualty-Risk & Benefits Management Vol 103, pg. 6 November 8, 1999.

[12] Jon Munderloh, "Unseen, but not Unforeseeable - Tips abound on managing electro-magnetic interference" Buildings, Vol. 93, no. 3, March 1999.

[13] http://www.vitatech.net/pub6.html.

[14] No. 2001-3644, N.M. Dist., Bernillo Co.

@MAGNETO/MERCURY/TESTAREA/RM/REFJ/FROCADE SESS: 1 COMP: 07/25/02 PG. POS: 5

September 1, 2014

Palo Alto Planning,

I object to the proposed celltower at the Little League Ballpark at 3672 Middlefield Road for safety reasons given the presence of hazardous materials within feet of our children in Verizon's proposal. Verizon has disclosed in its application that such materials exist in significant quantity in its equipment shed.

You will find below articles from various industry and government web sites that discuss safety hazards and liability issues with these types of wireless telecommunications installations. These include a) chemical battery issues with back-up batteries: problems including fire, explosion, and leaking of sulfuric acid as well as b) liability for RF interference with a variety of industrial, medical and home electronic equipment in the neighborhood.

While Verizon has not yet disclosed the detail around its batteries, this material provides substantial evidence in written record regarding key public safety issues in order to deny this permit on public safety grounds given its in close proximity to schools, homes, and day care facilities The equipment shelter/hut that is required for the operation of the antennas presents a clear hazard to the safety of the neighborhood. The cost of liability insurance to cover all of these hazards is not something that either Verizon or the Little League of Palo Alto organization has accounted for.

I encourage the City of Palo Alto to REJECT the 65 foot celltower proposal at 3672 Middlefield Road in Palo Alto.

Signed,

PETER Xu 9/1/2014
3785 Middlefield RD
Palo Alto, CA 94303

BATTERY HAZARDS

Several of the authors of these articles were asked to describe a typical battery array for a cellular or PCS base station supporting an antenna site. Typically there are 16 one hundred pound, Lead-Acid 48 volt batteries that are most often filled with sulfuric acid. Their chemistry is similar to automobile batteries. There is some controversy as to whether the EPA regulation which requires notification of the presence of hazardous materials to local fire and safety authorities should apply. Sulfuric Acid is on the EPA list of "Extremely Hazardous Substances" and is present in an array of 16 batteries in sufficient amount to require this notification. As more and more antennas are sited on rooftops, in steeples, and in residential neighborhoods, notification becomes more critical.

http://www.calicorp.com/articles/batteries-hazards.html
Lead-Acid Battery Hazards

http://www.ncs.gov/n5_hp/information_Assurance/HazSec2.htm
Web site of the National Communications System (NCS). In 1962 after the Cuban missile crisis, President Kennedy directed the National Security Council (NSC) to form this interdepartmental committee to examine the communications networks and institute changes. NCS keeps on-going records of all hazards that have affected telecommunications systems in the United States.

From this on-line NCS Report - **2.0 NATURAL AND TECHNOLOGICAL HAZARDS:**
This section provides information concerning major natural and technological hazard threats to NS/EP telecommunications and supporting systems.

2.2.1.3 Experiential Data
Properties wholly dedicated to computer or telecommunications activities are actually a comparatively small part of the U.S. fire problem. From1990 to 1994, computer and data processing centers annually averaged 29 structure fires, no reported deaths, 1 injury, and $1.31 million in direct property damage. All communications, defense, and document facilities combine - including defense radio and radar sites, police and fire communications centers, telephone exchanges, and document centers and record repositories- annually averaged 249 structure fires, no deaths, 6 injuries, and $7.21 million in direct property damage. **The large problem actually occurs in electronic equipment rooms or areas where more than 1,000 structure fires are reported each year to U.S. fire departments.**

See section entitled **"1994 Los Angeles Telephone Exchange Fire"** and paragraph under **Table 2-8 Causes of Fires at Telecommunications Facilities.**

http://www.telecomclick.com
Type in "A battery for all seasons?" in the SEARCH box. Click on GO.

http://www.calicorp.com/advisory.htm
Advisory: Lead-acid Batteries

http://www.telecomclick.com
Type in "Power Struggle: Battling over battery technologies" in the SEARCH box. Click on GO.

http://www.zomeworks.com/tech/H2/H2FAQ.html
Hydrogen FAQ [This article discusses how complex proper venting of a battery shelter/room is. This

company sells shelters as well as designs to properly vent existing shelters.]

"What is the danger of explosion during battery charging?

Battery rooms and cabinets are notorious for explosions when hydrogen created by electrolysis and mixed with oxygen is ignited by a spark.

The proliferation of back up batteries at communications sites has spread the hazard from the private concern of the battery's users to the public at large. Battery cabinets, vaults, and rooms are now scattered like time bombs all around the world, many where explosion could injure or kill unaware bystanders. The danger is not imagined. Many vaults have exploded and recently a communications shelter in Yuma, Arizona, exploded shattering the windows of a neighboring house..."

http://www.powerquality.com/art0060/art1.htm

From the industry journal, *Power Quality Journal.* From the authors of these various articles we learned that a typical cellular/PCS equipment cabinet/hut contains 16 automobile-type batteries to back up the generator that is operated by diesel.
The cogent point in this article is in the first paragraph:
". . . Most battery owners, including some of the biggest companies is the country, do not follow IEEE recommendations. They claim that the full program is too expensive. That is short-term thinking and sooner or later they will pay for it."

http://www.calicorp.com/articles/open-house.html
Fire Department Safety Officers Association - "Open House" Battery Incident

http://www.firehouse.com/news/2000/6/14_APstate.html
Fire Knocks Out State Department Phones

http://www.wa.gov/lni/news/pr051800.htm
All telecommunications contractors must register with Labor & Industry by June 8

http://www.telecomclick.com
Type "Powering wireless telecom basestations" in the SEARCH box. Click on "GO."

http://www.ospmag.com/features/1999/h2_ohno.htm
H2-OhNo! Hydrogen Build-Up Can Cause Battery Cabinets to EXPLODE

http://www.telecomclick.com
Type in "Flirting with disaster" in SEARCH box. Click on GO.

http://www.calicorp.com/articles/osha_special_equip.htm
Electrical Safety Requirements for Special Equipment -
OSHA Regulatory Profile - Special Equipment

http://www.calicorp.com/articles/batteries-buildings.html
Lead-Acid Batteries in Buildings

ENVIRONMENTAL HAZARDS OF BATTERY CHEMICALS

http://www.calicorp.com/articles/osha-articles.html
Industrial Lead-Acid Batteries Are Not Considered "Articles"

http://www.calicorp.com/epa_news_release.htm
EPA News Release - Ten Telecommunications Companies Voluntarily Disclose and Correct Environmental Violations

http://es.epa.gov/oeca/ore/enfalert/vol3num6.html
EPA's "Audit Policy" Offers Opportunity for Telecommunications Industry to Remedy Violations

http://www.americasnetwork.com/issues/2000supplements/20000915cc/cc20000915_finesprint.htm
Smart builders: The Fine(s) Print - EPA takes kindly to telecom companies that catch and report their own mistakes

(3)

9/7/2014

City Planning of Palo Alto,

I am writing to request that you REJECT the application for a Verizon Celltower at 3672 Middlefield Road in Palo Alto as this 65 foot monopole would be in the midst of a residential neighborhood and will certainly decrease our property values.

I have attached substantial documentation to this effect in the form of two nationwide real estate valuation industry standard journal articles.

The first is the Summer 2003 *Assessment Journal* article by Carol McDonough PhD entitled: "The Impact of Wireless Towers on Residential Property Values." It discusses devaluation of residential properties that are in the vicinity of power lines and mobile phone antenna sites. *Assessment Journal* is the publication of the International Association of Assessing Officers.

2005 *Appraisal Journal* published a study on devaluation of residential properties in proximity to cell phone towers. *The Appraisal Journal* is a publication of the Appraisal Institute.

The Appraisal Institute is a global membership association of professional real estate appraisers, with 22,000 members and 92 chapters throughout the world. Organized in 1932, its mission is to support and advance its members as the choice for real estate solutions and uphold professional credentials, standards of professional practice and ethics consistent with the public good.

The Appraisal Institute is the acknowledged worldwide leader in residential and commercial real estate appraisal education, research, publishing and professional membership designation programs. Its extensive curriculum of courses and specialty seminars provides a well-rounded education in valuation methodology.

After careful review of these documents, it is clear that there will be a substantial impact to my property value across the street from this proposed monstrosity as well as to my adjacent neighbors, and therefore by implication to the surrounding community as well.

I therefore am strongly objecting to this proposed celltower and ask that you REJECT the 65 foot celltower proposal at 3672 Middlefield Road in Palo Alto.

Thank you for your consideration.

Signed,

SRIDHAR JASTI
3669 MIDDLEFIELD Rd
PALO ALTO, CA

The Impact of Wireless Towers on Residential Property Values

BY CAROL C. McDONOUGH, PhD

The Telecommunications Act of 1996 authorized the Federal Communications Commission (FCC) to expand the wireless telephone industry by auctioning off six personal communication services (PCS) licenses per geographic area. Because wireless communication antennae must be mounted on high, unobstructed locations, the build out of the PCS industry has led to the need for additional communications towers.

Abutters and neighbors of these communication towers have often opposed their construction, citing aesthetic and health concerns, and alleging a consequent decrease in property values. Such opposition has primarily targeted towers located in residential zones, where such towers are generally less harmonious with surrounding structures. This article examines the impact of proximity to a wireless tower on residential property values.

Mundy (1992) and Patchin (1991) report that a nuisance feature, or source of stigma, typically reduces the market value of a property. It is the perceived undesirability of a source of stigma that leads to reduction in property value. As Farber (1998) explains, perceived risks are a function of subjective risk factors as well as statistical risks; whether the source of the perception is quantitative or subjective, the effect on property values may be the same.

In *Komis v. City of Sante Fe,* the Supreme Court of New Mexico awarded damages for the perceived decline in property value resulting from a source of stigma, even when no objective evidence demonstrated that the perceived nuisance was unsafe, and when market loss was not proven by comparable sales data. The Criscuola decision established the "fear in the marketplace" theory of damages, by allowing fear in the marketplace regarding transmission lines, rather than actual epidemiological evidence of adverse health effects from electromagnetic frequencies (EMF), to affect appraised valuation. The literature (for example, Mundy 1992, Levitt 1995, and Harrison 1989) includes high-tension wires and utility poles as sources of stigma to a property.

Are wireless towers also a source of stigma? Because most wireless towers have been constructed recently, time-series data for a valid empirical study of

Carol C. McDonough, PhD, is professor of economics at the University of Massachusetts in Lowell, Massachusetts.

The statements made or views expressed by authors in Assessment Journal *do not necessarily represent a policy position of the International Association of Assessing Officers.*

the impact of wireless towers on property values are virtually unavailable. Therefore, the first step is to review research on the impact of electric power lines and towers on property values, because they may have effects similar to wireless towers. If it is found that (1) proximity to electrical lines reduces residential property values, and (2) the factors causing reduced valuation near electric lines also apply to proximity to wireless towers, and (3) these factors have led to significant concern about proximity to wireless towers, then it may be inferred that proximity to a wireless tower may reduce residential property values.

Such opposition has primarily targeted towers located in residential zones, where such towers are generally less harmonious with surrounding structures.

POWER LINES AND PROPERTY VALUES: SOME EVIDENCE

The scientific community has conducted numerous studies of the health effects of proximity to power lines. The first epidemiological study linking EMF exposure and cancer incidence was published in 1979. In June of 1998, a panel convened by the National Institute of Environmental Health Sciences concluded that low-frequency EMF should be classified as a Group 2B human carcinogen under the International Agency for Research on Cancer classification scheme. This means the agent is possibly carcinogenic to humans. The California Department of Health's *1999 Fact Sheet on EMF* points out that epidemiology studies of childhood leukemia provide enough evidence to classify EMF as a possible human carcinogen.

Numerous studies have examined the impact of proximity to power lines on property values:

Kinnard (1967) reported that proximity to a tower line had little negative impact on residential market values in several Connecticut subdivisions. Higher priced subdivisions showed slightly greater negative impact from power line proximity.

Colwell (1990) found that proximity to power lines was associated with diminished selling prices in two Illinois subdivisions.

In Delaney and Timmons's (1992) survey of appraisers, 84 percent responded that the market value of residential property is negatively affected when located proximate to a high voltage electric power line; on average, market price is 10.01 percent lower than the price of comparable properties. The most frequently cited factors for property value reduction were visual unattractiveness and issues of health and safety.

Kung and Seagle's attitudinal survey (1992) found that 53 percent of the Tennessee homeowners surveyed considered transmission lines and towers an eyesore. Once informed of possible health risks, 87 percent felt power lines and towers would adversely affect property values.

Kroll and Priestley (1992) reported that the perceived impact of transmission lines cluster's into three areas: health and safety, aesthetics, and property values. They concluded that overhead transmission lines have the potential to reduce the sales price of single-family homes by zero to 10 percent.

Gimmy's (1994)research on power

lines and California residential property values found diminutions of between 18 and 54 percent in lot values from properties abutting power line easements.

Studying residential home prices in Vancouver, Canada, Hamilton and Schwann (1995) reported that properties adjacent to 60 kV power lines lost 6.3 percent of their value due to proximity and the visual impact.

According to the Cowger, Bottemiller, Cahill study (1996), the value of Oregon single-family residential property fell by less than 10 percent because of proximity to overhead transmission lines.

Gregory and von Winterfeldt (1996) determined that the public perception of health risks associated with proximity to power lines led to a reduction in property value: post-1979 property valuation studies showed a decline in values of 5 to 10 percent.

According to Bolton and Sick (1999), real estate professionals, (even those performing studies for power line companies) believed that concern about the adverse health effects of EMF from power lines resulted in a reduction in the values of nearby properties. Bolton's earlier study (1994) found that the general public's perception that EMF were harmful drove down the values of adjacent property.

Jaconetty (2001) concluded that, on a subjective level, most people believe that the electromagnetic fields generated by high-voltage towers and lines adversely influence real property values, primarily because of health concerns.

SIMILARITIES BETWEEN POWER LINES AND WIRELESS TOWERS

According to the studies cited above, proximity to electric lines and towers is associated with a reduction in residential property values because of aesthetic and health concerns. In this section, the similarities between the aesthetic and health effects of electric lines and wireless towers are examined.

Consider first aesthetic similarities. The literature states that the view enjoyed from a property may affect its value—a poor view, such as that of utility poles and high-tension wires, detracts from value. The aesthetic effects of transmission lines and wireless towers are similar. Both electric lines and wireless towers rise above building height in typical single-family neighborhoods; therefore, they are visible for some distance. Unless camouflaged, these structures typically do not complement rural or suburban landscapes.

Are health concerns surrounding electric lines also applicable to wireless towers?

> ...perceived risks are a function of subjective risk factors as well as statistical risks; whether the source of the perception is quantitative or subjective, the effect on property values may be the same.

Technically, radio waves from wireless antennae differ from the electromagnetic fields produced by power lines. Although both radio waves and EMF are part of the electromagnetic spectrum, electric power in the United States operates at 60 Hz, while cellular phones operate at 860–900 MHz, and PCS phones operate at about 2000 MHz. As Moulder (1998) explains, radio waves

are non-ionizing, that is, the energy of the particles is too low to break chemical bonds. Power lines are nonthermal, that is, they produce no significant nonionizing radiation. Fields from power lines do not radiate energy into space, and the fields cease to exist when power is turned off.

However, the technical distinction between radio waves emitted by wireless antennae and low-frequency EMF emitted by electric lines is not generally understood. The federal government has issued guidelines regarding safe levels of exposure for both power lines and wireless antennae, but there is ongoing controversy within the scientific community about whether these government guidelines are too lax. Because a final verdict on the safety of both electric lines and wireless antennae is still moot, many people are fearful about living in proximity to either type of structure. As Rikon (1996) points out, the fear in marketplace argument established by the Criscuola decision regarding EMF has also been invoked regarding health concerns about cell towers.

In other cases, courts have ruled for the wireless companies, finding that community opposition was not sufficient grounds for denying a permit for tower construction.

EVIDENCE OF CONCERNS ABOUT WIRELESS TOWERS

In this section, evidence is presnted about the significant level of concern about the aesthetic and health effects of wireless towers. The evidence is grouped into three categories: (1) lawsuits regarding wireless tower construction, (2) organizations and conferences dealing with the harmful effects of wireless towers, and (3) municipal moratoria on wireless tower construction and mandatory visual impact studies.

Lawsuits

Numerous lawsuits have been filed regarding the actual or proposed construction of wireless towers. As Foster and Carrel (1999) discuss, case law on the issue is somewhat ambiguous. Some courts have ruled for the municipality opposing wireless tower construction. In *Franklin v. Nextel,* for instance, the court found that a 120 foot wireless tower erected in a residential neighborhood was so incongruous and damaging to the neighborhood that it must be dismantled. In Jacksonville, Florida, in 1996, community opposition to a 150 foot tower in a residential neighborhood led the wireless company, InterCel, to take it down.

In other cases, courts have ruled for the wireless companies, finding that community opposition was not sufficient grounds for denying a permit for tower construction. For instance, in *Westinghouse v. Hampton,* the court found that the Telecommunications Act preempts tower regulation based on perceived health concerns and that "aesthetics alone... [are not]... an adequate reason to deny... use of...property." OMP-USA, dealing specifically with the location of towers in residential neighborhoods, found that "towers cannot always be compatible with the character of the surrounding property. [I]n order to meet...demand...towers have to be...located in...residential, commercial, and rural areas.

Organizations, Conferences, and International Concerns

Concerns about wireless towers have resulted in the formation of organizations and the scheduling of conferences to voice these concerns. The EMR Alliance argues that electromagnetic radiation from wireless antennae is hazardous to life and public health. The Communication Workers of America and the EMR Alliance jointly published *Your Community Guide to Cellular Phone Towers* to help consumers mobilize against the placement of wireless transmission facilities that could adversely affect their health, safety, property values, or the aesthetics of the community.

The 2000International Conference on Cell Tower Siting included testimony from numerous scientists on the health effects of exposure to high frequency EMF. Several questioned the safety of current standards for exposure to radiation from wireless antennae.

The US Supreme Court, in January 2001, denied a writ for certiorari filed by the Ad Hoc Association of Parties Concerned about the Federal Communications Commission Health and Safety Rules (AHA). Fifty-four petitioners filed as co petitioners; similar appeals by the Communications Workers of America and The Cellular Phone Task Force were consolidated with the AHA case. The AHA had charged that the FCC's ruling, that adverse health effects cannot be discussed in reviewing zoning rules or permit applications for cell towers, denies the public their first amendment right to free speech.

In Europe, opposition to cell tower construction has led to lawsuits and the destruction of wireless equipment. In an attempt to quell concerns about the health effects of wireless towers, one Italian mobile phone operator, Omnitel, launched an Internet site on which residents can check the amount of electromagnetic radiation emitted by nearby cell phone towers and antennas.

Municipal Regulations

Responding to community concerns about the negative impact of wireless towers, more than 150 municipalities have adopted temporary moratoria on wireless tower construction. Although the Telecommunications Act prevents a municipality from permanently banning wireless tower construction, the Act does allow municipalities to establish criteria based on aesthetic—but not health— considerations.

Community concern has also led to municipal enactment of zoning ordinances regulating wireless tower construction by

- Requiring that the visual impact of wireless towers be disclosed prior to construction
- Limiting tower construction to municipal sites, or encouraging such sites
- Encouraging co-location and the use of concealed structures

In response to community concerns about the aesthetics of wireless towers, so-called stealth towers—in the form of pine and palm trees—have been erected in more than 200 locations in the United States. The issue of the visual impact of wireless towers has also been addressed by placing antennas on silos, church steeples, tall buildings, and water towers.

CONCLUSION

It has been shown that aesthetic and health concerns about electric lines and towers lead to a reduction in the valuation of nearby residential properties. There are similar concerns about wireless towers; these concerns are widespread and have been expressed in multiple venues. Therefore, proximity to a wireless tower needs to be considered as a negative amenity that may reduce residential property valuation. However, the severity of the aesthetic impact may be mitigated by screening and concealment of the wireless towers.

REFERENCES

Albany Law School. 1998. *Case Law Decisions Under the Telecommunications Act of 1996 Local Zoning Provisions (Sec. 704).*

Bolton, David R. 1994. *Properties Near Power Lines and Valuation Issues: Condemnation or Inverse Condemnation?* Institute on Planning, Zoning, and Eminent Domain, 1–10.

Bolton, David R., and Kent A. Sick. (Spring) 1999. Power Lines and Property Values: The Good, the Bad and the Ugly. *The Urban Lawyer* 31:331–334.

Colwell, Peter F. (Spring) 1990. Power Lines and Land Value. *The Journal of Real Estate Research,* 117–127.

Cowger, J.R., Steven C. Bottemiller, and James M. Cahill. (September/October) 1996. Transmission Line Impact on Residential Property. *Right of Way.*

Delaney, Charles J., and Douglas Timmons. (Summer) 1992. High Voltage Power Lines: Do They Affect Residential Property Value? *The Journal of Real Estate Research,* 315–329.

Denison, D.C. (March 28) 2001. Q. Which is the Tower? A. Both, *Boston Globe,* A1, A13.

Farber, Stephen. 1998. Undesirable Facilities and Property Values: A Summary of Empirical Studies. *Ecological Economics* 24:1–14.

Federal Communications Commission Wireless Telecommunications Bureau. (April 23) 1996. *Fact Sheet #1. Washington, DC:FCC.*

Foster, Robert B., and Mitchell A. Carrel. (Fall) 1999. Towers of Babble: The Continuing Struggle Over Wireless Siting Issues Under the Telecommunications Act of 1996. *The Urban Lawyer,* 849–862.

Gimmy, Arthur. 1994. *The Potential Impact of EMF on Property Values.* New Orleans: EMF Regulation and Litigation Institute.

Gregory, Robin and Detlof von Winterfeldt. 1996. The Effects of Electromagnetic Fields from Transmission Lines on Public Fears and Property Values. *Journal of Environmental Management* 48:201–214.

Grissom, Terry. 1994. *Fundamentals of Real Estate Appraisal.,* 6th ed. New York, NY: Real Estate Education Company.

Hamilton, Stanley W., and Gregory M. Schwann. (November) 1995. Do High Voltage Electric Transmission Lines Affect Property Value? *Land Economics* 71:436–444.

Harrison, Henry S. 1989. *Appraising Residences and Income Properties.* New Haven, CT: H2 Company.

International Conference on Cell Tower Siting—Linking Science and Public Health. (June 7–8) 2000. *Proceedings* Salzburg, Austria: International Conference on Cell Tower Siting.

Jaconetty, Thomas A. (May/June) 2001. Do You Want Your Children Playing Under Those Things?: The Continuing Controversy About High Voltage Electromagnetic Fields, Human Health, and Real Property Values. *Assessment Journal,* 23–30.

Kinnard, William N., Jr. (April) 1967. Power Lines and Residential Property Values, *The Appraisal Journal,* 269–284.

Kroll, Cynthia A. and Thomas Priestley. (July) 1992. *The Effects of Overhead Transmission Lines on Property Values.* Edison Electric Institute Siting and Environmental Planning Task Force.

Kung, Hsiang-te, and Charles F. Seagle. (July) 1992. Impact of Power Transmission Lines on Property Values. *The Appraisal Journal,* 413–418.

Levitt, B. Blake. 1995. *Electromagnetic Fields.* New York: Harcourt Brace and Company.

Moulder, John E. (August) 1998. *Electromagnetic Fields and Human Health.* jmoulder@its.mcw.edu.

Mundy, Bill. (January) 1992. Stigma and Value. *The Appraisal Journal,* 7–13.

Naik, Gautam. (January 5) 2001. Towers of Babble: Cell-Phone Sites Fan European Anxieties. *Wall Street Journal,* A1, A6.

Patchin, Peter J. (April) 1991. Contaminated Properties: Stigma Revisited. *The Appraisal Journal,* 167–172.

Rikon, Michael. (January) 1996. Electromagnetic Radiation Field Property Devaluation. *The Appraisal Journal,* 87–90.

Senville, Wayne. (Fall) 1997. A Wireless Miscellany. *Planning Commissioners Journal* 28:10–20.

CASE LAW REFERENCES

Alexandra Cellular Corp. v. Town of Rochester, slip.op (Sup.Ct. Ulster Co. 1997).

American PCS v. Fairfax County ZBA, 40 Va. Cir.211 (Cir. Ct. Va. 1996).

AT&T Wireless v. City of Chamblee, 10 F. Supp. 2d 1326 (N.D. Ga 1997).

AT&T Wireless PCS v. City Council of Virginia Beach, 979 F. Supp. 416 (E.D. Vi 1997).

AT&T Wireless Services of Fla. v. Orange County, slip op.(M.D.Fl.1997).

AWACS v. Hearing Board of Newtown Township, 702 A.2d 604 (Pa. Commw. 1997).

Bell Atlantic Nynex Mobile v. Lonergan, slip op. (Sup. Ct. West. Co. 1997).

BellSouth Mobility, Inc. v. Gwinnett County Board of Commissioners, 944F. Supp.923 (N.D. Ga 1996).

Campanelli v. AT&T Wireless Services, slip op. (Ohio Ct. Appl. 1997).

Cellular Telephone Company v. Town of Oyster Bay, 166 F. 3d 490 (2d Cir. 1999).

Century Cellunet of So. Mich. v. City of Ferrysburg, slip op. (W.D. Mi 1997).

Crown Communications v. Zoning Hearing Board of the Borough of Glenfield, 679 A.2d 271 (Pa. Commw. 1996).

Franklin,MA v. Nextel Comm. (Appeals Ct. Mass, March 2000).

Genesee Telephone Co. Szmigel, slip op. 1997 W.L. 800699 (Sup. Ct. Monroe Co. 1997).

Illinois RSA No.3, Inc. v. County of Peoria, 963 F. Supp 732 (C.D. Ill. 1997).

In re Graeme, 975 F. Supp. 570 (D. Vt. 1997).

Iowa Wireless Services v. City of Moline, 29 F. Supp. 2d 915 (C.D. Ill. 1998).

Kapton v. Bell Atlantic Nynex Mobile, 700 A.2d 581 (Pa. Commw. 1997).

New Brunswick Cellular Telephone Co. v. Borough of South Plainfield Board of Adjustment. 701 A.2d 1281 (N.J. Super. 1997).

Omnipoint Communications MB Operations v. Town of Lincoln, 107 F. Supp. 2d 108 (D. Mass.2000).

OPM-USA Inc. v. Brevard County, 7F. Supp. 2d 1316 (M.D. Fla. 1997).

Paging, Inc. v. Board of Zoning Appeal, 957 F. Supp. 805 (W.D. Va. 1997).

Smart S MR of New York Inc. v. Borough of Fair Lawn Board of Adjustment, slip op. (N.J. 1998).

Sprint Spectrum LP v. Jefferson County, 968 F. Supp. 1457 (N.D. Al. 1997).

Sprint Spectrum L.P. v. Town of Easton, 982 F. Supp.47 (E.D. Mass.1997).

Sprint Spectrum L.P. v. Town of Farmington, 1997 U.S. Dist LEXIS 15832 (D. Conn. Oct. 6, 1997).

Sprint Spectrum v. Medina, 924 F. Supp.

1036 (W.D. Wash. 1996).

Sprint Spectrum LP v. Willoth (Town of Ontario), slip op. (W.D. N.Y. February 19, 1998).

Sprint Spectrum LP v. Zoning Board of Appeals of Guilderland, slip op. (Sup. Ct. Alb. Co. 1997).

Sprint Spectrum LP v. Zoning Hearing Board of East Nottingham Township, slip op. (E.D. Pa. 1997).

Sprint v. Town of West Seneca, slip op (Sup. Ct. Erie Co. 1997).

TCG Detroit v. City .of Dearborn, 977 F. Supp. 836 (E.D. Mi. 1997).

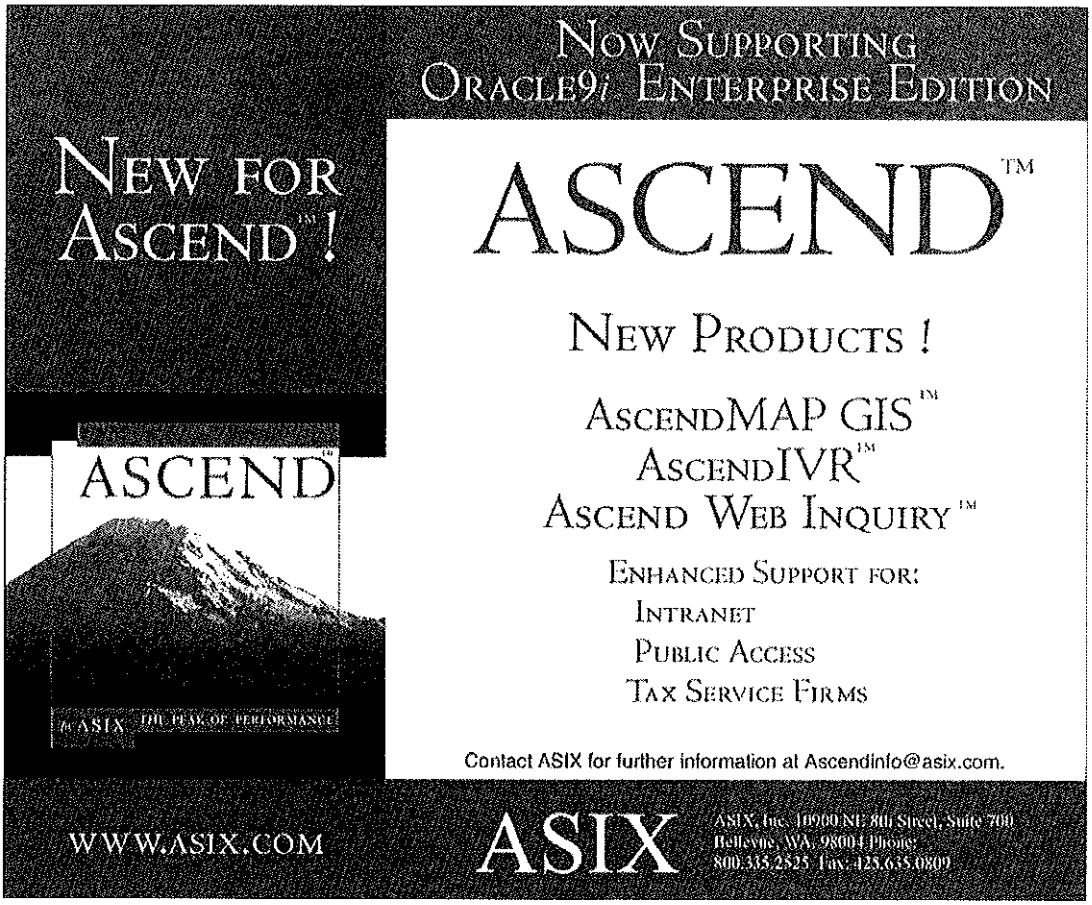
Virginia Metronet v. Board of Supervisors, 984 F. Supp.966 (E.D. Va. 1998).

Westel- Milwaukee Co. v. Walworth County, 205 Wisc. 2d 242, 556 N.W. 2d 107 (Ct. Appl. Wisc. 1996).

Western PCS II Corp. v. Extraterritorial Zoning Authority, 957 F. Supp. 1230 (D.N.M. 1997).

Western PCS II Corporation v. Santa Fe, 957 F. Supp. 1230 (D.N.M. 1997)

Westinghouse Electric Corp. v. Council of Town of Hampton, 686 A.2d 905 (Pa. Commw. 1996).



features

The Impact of Cell Phone Towers on House Prices in Residential Neighborhoods

by Sandy Bond, PhD, and Ko-Kang Wang

abstract

This article examines whether proximity to cellular phone towers has an impact on residential property values and the extent of any impact. First, a survey approach is used to examine how residents perceive living near cellular phone base stations (CPBSs) and how residents evaluate the impacts of CPBSs. Next, a market study attempts to confirm the perceived value impacts reported in the survey by analyzing actual property sales data. A multiple regression analysis in a hedonic pricing framework is used to measure the price impact of proximity to CPBSs. Both the survey and market sales analysis find that CPBSs have a negative impact on the prices of houses in the study areas.

The introduction of cellular phone systems and the rapid increase in the number of users of cellular phones have increased exposure to electromagnetic fields (EMFs). Health consequences of long-term use of cellular phones are not known in detail, but available data indicates that development of nonspecific health symptoms is possible.[1] Conversely, it appears health effects from cellular phone equipment (antennas and base stations) pose few, if any, known health hazards.[2]

A concern associated with cellular phone usage is the siting of cellular phone transmitting antennas (CPTAs) and cellular phone base stations (CPBSs). In New Zealand, CPBS sites are increasingly in demand as the major cellular phone companies there, Telecom and Vodafone, upgrade and extend their network coverage. This demand could provide the owner of a well-located property a yearly income for the siting of a CPBS.[3] However, new technology that represents potential hazards to human health and safety may cause property values to diminish due to public perceptions of hazards. Media attention to the potential health hazards of CPBSs has spread concerns among the public, resulting in increased resistance to CPBS sites.

Some studies suggest a positive correlation between long-term exposure to the electromagnetic fields and certain types of cancer,[4] yet other studies report inconclusive results on health effects.[5] Notwithstanding the research results, media reports indicate that the extent of opposition from some property owners

1. Stanislaw Szmigielski and Elizbieta Sobiczewska, "Cellular Phone Systems and Human Health—Problems with Risk Perception and Communication," *Environmental Management and Health* 11, no. 4 (2000): 352–368.
2. Jerry R. Barnes, "Cellular Phones: Are They Safe?" *Professional Safety* 44, no. 12 (Dec. 1999): 20–23.
3. R. Williams, "Phone Zone—Renting Roof Space to Ma Bell," *The Property Business* 12 (April 2001): 6–7.
4. C. M. Krause et al., "Effects of Electromagnetic Field Emitted by Cellular Phones on the EEG During a Memory Task," *Neuroreport* 11, no. 4 (2000): 761–764.
5. Independent Expert Group on Mobile Phones, *Mobile Phones and Health* (Report to the United Kingdom Government, 2000), http://www.iegmp.org.uk.

affected by the siting of CPBSs remains strong.[6] However, the extent to which such attitudes are reflected in lower property values for homes located near CPBSs is not known.

Understanding the impact of CPBSs on property values is important to telecommunications companies both for planning the siting of CPBSs and for determining likely opposition from property owners. Similarly, property appraisers need to understand the valuation implications of CPBSs when valuing CPBS-affected property. The owners of affected property also want to understand the magnitude of any effects, particularly if compensation claims or an award for damages are to be made based on any negative effects on value.

The research here uses a case study approach to determine residents' perceptions towards living near CPBSs in Christchurch, New Zealand, and to quantify these effects in monetary terms according to an increasing or decreasing percentage of property value. The case study uses both an opinion survey and an econometric analysis of sales transaction data. A comparison of the results can be used to help appraisers value affected property as well as to resolve compensation issues and damage claims in a quantitative way. Further, the results provide a potential source of information for government agencies in assessing the necessity for increased information pertaining to CPBSs.

The following provides a brief review of the cellular phone technology and relevant literature. Then, the next section describes the research procedure used, including descriptions of the case study and control areas. The results are then discussed, and the final section provides a summary and conclusion.

Cellular Telephone Technology[7]

Cellular (mobile) telephones are sophisticated two-way radios that use ultrahigh frequency (UHF) radio waves to communicate information. The information is passed between a mobile phone and a network of low-powered transceivers, called mobile phone sites or cell sites. As mobile sites are very low powered they serve only a limited geographic area (or "cell"), varying from a few hundred meters to several kilometers; they can handle only a limited number of calls at one time. When a mobile phone user on the move leaves one cell and enters another, the next site automatically takes over the call, allowing contact to be maintained.

When a mobile phone call is initiated, the phone connects to the network by using radio signals to communicate with the nearest mobile phone site. The mobile phone sites in a network are interlinked by cable or microwave beam, enabling phone calls to be passed from one cell to another automatically. A mobile phone site is typically made up of a mast with antennas connected to equipment stored in a cabinet. Power is fed into the cabinet by underground cable. The antennas are designed to transmit most of the signal away horizontally, or just below horizontal, rather than at steep angles to the ground.

Mobile phone sites can only accommodate a limited number of calls at any one time. When this limit is reached, the mobile phone signal is transferred to the next nearest site. If this site is full or is too far away, the call will fail.

Cell site capacity is a major issue for telecommunication companies. As the number of people using mobile phones grows, more and more cell sites are required to meet customer demand for reliable coverage. At the end of March 2002, Telecom had more than 1.3 million mobile phone customers and more than 750 mobile phone sites throughout New Zealand. Vodafone had over 1.1 million mobile phone customers.[8] In areas, such as Auckland (the largest city in New Zealand, with close to a third of the NZ population), where almost complete coverage has been achieved, the main issue is ensuring that there is the capacity to handle the ever-increasing number of mobile phones and calls.

Locating Cellular Phone Sites

For cellular phone service providers, the main goals when locating cell sites are (1) finding a site that provides the best possible coverage in the area without causing interference with other cells, and (2) finding a site that causes the least amount of environmental impact on the surrounding area. Service providers usually attempt to locate cell sites on existing structures such as buildings, where antennas can be mounted on the roof to minimize the environmental impact. If this is not possible, a mast will need to be erected to support the antennas for the new cell site.

6. S. Fox, "Cell Phone Antenna Worries Family," *East & Bays Courier*, November 8, 2002, 1.
7. The information in this section was sourced from Telecom, http://www.telecom.co.nz; New Zealand Ministry for the Environment, http://www.mfe.govt.nz; and New Zealand Ministry of Health, http://www.moh.govt.nz.
8. Vodafone, "Cell Sites and the Environment," http://www.vodafone.co.nz/aboutus/vdfn_about_cellsites.pdf (accessed December 19, 2002) and "Mobile Phones and Health," http://www.vodafone.co.nz/aboutus/vdfn_about_health_and_safety.pdf (accessed December 19, 2002); and Telecom, "Mobile Phone Sites and Safety," http://www.telecom.co.nz/content/0,3900,27116-1536,00.html (accessed December 19, 2002).

Service providers prefer to locate cell sites in commercial or industrial areas due to the "resource consent" procedure required by the Resource Management Act 1991[9] for towers located in residential areas.

Despite the high level of demand for better cell phone coverage, the location of cell sites continues to be a contentious issue. The majority of people want better cell phone coverage where they live and work, but they do not want a site in their neighborhood. Thus, cell sites in or near residential areas are of particular concern. Concerns expressed usually relate to health, property values, and visual impact.[10]

In general, uncertainties in the assessment of health risks from base stations are presented and distributed in reports by organized groups of residents who protest against siting of base stations. When the media publishes these reports it amplifies the negative bias and raises public concerns. According to Covello, this leads to incorrect assessment of risks and threats by the public, with a tendency to overestimate risks from base stations and neglect risks from the use of cell phones.[11]

Assessment of Environmental Effects

Under the Resource Management Act 1991 (RMA), an assessment of environmental effects is required every time an application for resource consent is made. Information that must be provided includes "an assessment of any actual or potential effects that the activity may have on the environment, and the ways in which any adverse effects may be mitigated."[12] An assessment of the environmental effects of cell sites would take into consideration such things as health and safety effects; visual effects; effects on the neighborhood; and interference with radio and television reception.

Radio Frequency and Microwave Emissions from CPBSs

According to the Ministry for the Environment, the factors that affect exposure to radiation are as follows:

- Distance. Increasing the distance from the emitting source decreases the radiation's strength and decreases the exposure.
- Transmitter power. The stronger the transmitter, the higher the exposure.
- Directionality of the antenna. Increasing the amount of antennas pointing in a particular direction increases the transmitting power and increases the exposure.
- Height of the antenna above the ground. Increasing the height of an antenna increases the distance from the antenna and decreases the exposure.
- Local terrain. Increasing the intervening ridgelines decreases the exposure.[13]

The amount of radiofrequency power absorbed by the body (the dose) is measured in watts per kilogram, known as the specific absorption rate (SAR). The SAR depends on the power density in watts per square meter. The radio frequencies from cellular phone systems travel in a "line of sight." The antennas are designed to radiate energy horizontally so that only small amounts of radio frequencies are directed down to the ground. The greatest exposures are in front of the antenna so that near the base of these towers, exposure is minimal. Further, power density from the transmitter decreases rapidly as it moves away from the antenna. However, it should be noted that by initially walking away from the base, the exposure rises and then decreases again. The initial increase in exposure corresponds to the point where the lobe from the antenna beam intersects the ground.[14]

Health Effects

According to Szmigielski and Sobiczewska, the analogue phone system (using the 800–900 megahertz band) and digital phone system (using the 1850–1990 megahertz band) expose humans to electromagnetic field (EMF) emissions: radio frequency radiation (RF) and microwave radiation (MW), respectively. These two radiations are emitted from both cellular phones and CPBSs.[15]

For years cellular phone companies have assured the public that cell phones are safe. They state that the particular set of radiation parameters associated with cell phones is the same as any other ra-

9. The Resource Management Act 1991 is the core of the legislation intended to help achieve sustainability in New Zealand; see http://www.mfe.govt.nz/laws/rma.

10. Szmigielski and Sobiczewska; and Barnes.

11. Vincent T. Covello, "Risk Perception, Risk Communication, and EMF Exposure: Tools and Techniques for Communicating Risk Information," in *Risk Perception, Risk Communication and Its Application to EMF Exposure: Proceedings of the World Health Organization and ICNIRP Conference*, ed. R. Matthes, J. H. Bernhardt, M. H. Repucholi, 179–214 (Munich, Germany, May 1998).

12. Section 88(4), (b), Resource Management Act 1991.

13. Ministry for the Environment and Ministry of Health, *National Guidelines for Managing the Effects of Radiofrequency Transmitters*, available at http://www.mfe.govt.nz and http://www.moh.govt.nz (accessed May 21, 2002).

14. Ibid.; and Szmigielski and Sobiczewska.

15. Szmigielski and Sobiczewska.

dio signal. However, reported scientific evidence challenges this view and shows that cell phone radiation causes various effects, such as altered brain activity, memory loss, and fatigue.[16]

According to Cherry, there is also strong evidence to conclude that cell sites are risk factors for certain types of cancer, heart disease, neurological symptoms and other effects.[17] The main concerns related to EMF emissions from CPBSs are linked to the fact that radio frequency fields penetrate exposed tissues.

Public concern regarding both cell phones and CPBSs in many countries has led to establishment of independent expert groups to carry out detailed reviews of the research literature. Research on the health effects of exposures to RF are reviewed by, for instance, the NZ Radiation Laboratory, the World Health Organization, the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Royal Society of Canada, and the UK Independent Expert Group on Mobile Phones. The reviews conclude that there are no clearly established health effects for low levels of exposure. Such exposures typically occur in publicly accessible areas around radio frequency transmitters. However, there are questions over the delayed effects of exposure.

While present medical and epidemiological studies reveal weak association between health effects and low-level exposures of RF/MW fields, controversy remains among scientists, producers, and the general public. Negative media attention has fuelled the perception of uncertainty over the health effects from cell phone systems. Further scientific or technological information is needed to allay fears of the public about cell phone systems.

Radio Frequency Radiation Exposure Standards

International Standards. The reviews of research on the health effects of exposures to RF have helped establish exposure standards that limit RF exposures to a safe level. Most standards–including those set by the ICNIRP, the American National Standards Institute (ANSI), and New Zealand–are based on the most-adverse potential effects.

The 1998 ICNIRP guidelines have been accepted by the world's scientific and health communities; these guidelines are both consistent with other stated standards and published by a highly respected and independent scientific organization. The ICNIRP is responsible for providing guidance and advice on the health hazards of nonionizing radiation for the World Health Organization (WHO) and the International Labour Office.[18]

The New Zealand Standard. In New Zealand, when a mobile phone site is being planned, radio frequency engineers calculate the level of electromagnetic energy (EME) that will be emitted by the site. The level of EME is predicted by taking into account factors such as power output, cable loss, antenna gain, path loss, and height and distance from the antenna. These calculations allow engineers to determine the maximum possible emissions in a worst-case scenario, i.e., as if the site was operated at maximum power all the time. The aim is to ensure that EME levels are below international and NZ standards in areas where the general public has unrestricted access.

All mobile phone sites in New Zealand must comply in all respects with the NZ standard for radio frequency exposures.[19] This standard is the same as used in most European countries, and is more stringent than that used in the United States, Canada, and Japan. Some local communities in New Zealand have even lower exposure-level standards; however, in reality mobile phone sites only operate at a fraction of the level set by the NZ standard. The National Radiation Laboratory has measured exposures around many operating cell sites, and maximum exposures in publicly accessible areas around the great majority of sites are less than 1% of the exposure limit of the NZ standard. Exposures are rarely more than a few percent of the limit, and none have been above 10%.

Court Decisions

Two court cases in New Zealand have alleged adverse effects due to CPBSs: *McIntyre v. Christchurch City*

16. K. Mann and J. Röschke, "Effects of Pulsed High-Frequency Electromagnetic Fields on Human Sleep," *Neuropsychobiology* 33, no. 1 (1996): 41–47; Krause et al.; Alexander Borbely et al., "Pulsed High-Frequency Electromagnetic Field Affects Human Sleep and Sleep Electroencephalogram," *Neurosci Let*, 275, no. 3 (1999): 207–210; L. Kellenyi et al., "Effects of Mobile GSM Radiotelephone Exposure on the Auditory Brainstem Response (ABR)," *Neurobiology* 7, no. 1 (1999): 79–81; B. Hocking, "Preliminary Report: Symptoms Associated with Mobile Phone Use," *Occup Med* 48, no. 6 (Sept. 1998): 357–360; and others as reported in Neil Cherry, *Health Effects Associated with Mobil Base Stations in Communities: The Need for Health Studies*, Environmental Management and Design Division, Lincoln University (June 8, 2000); http://pages.britishlibrary.net/orange/cherryonbasestations.htm.

17. Cherry.

18. Ministry for the Environment and Ministry of Health.

19. NZS 2772.1:1999, "Radiofrequency Fields Part I: Maximum Exposure Levels – 3kHz to 300GHz." This standard was based largely on the 1998 ICNIRP recommendations for maximum human exposure levels to radio frequency. The standard also includes a requirement for minimizing radio frequency exposure. See National Radiation Laboratory, *Cell Sites* (March 2001), 7; available at http://www.nrl.moh.govt.nz/CellsiteBooklet.pdf.

Council[20] and *Shirley Primary School v. Telecom Mobile Communications Ltd.*[21] Very few cell site cases have actually proceeded to Environment Court hearings. In these two cases the plaintiffs claimed that there was a risk of adverse health effects from radio frequency radiation emitted from cell phone base stations and that the CPBSs had adverse visual effects.

In *McIntyre*, Bell South applied for resource consent to erect a CPBS. The activity was a noncomplying activity under the Transitional District Plan. Residents objected to the application. Their objections were related to the harmful health effects from radio frequency radiation. In particular, they argued it would be an error of law to decide, based on the present state of scientific knowledge, that there are no harmful health effects from low-level radio frequency exposure. It was also argued that the Resource Management Act contains a precautionary policy and also requires a consent authority to consider potential effects of low probability but high impact in reviewing an application.

The Planning Tribunal considered residents' objections and heard experts' opinions as to the potential health effects, and granted the consent, subject to conditions. It was found that there would be no adverse health effects from low levels of radiation from the proposed transmitter, not even effects of low probability but high potential impact.

In *Shirley Primary School*, Telecom applied to the Christchurch City Council for resource consent to establish, operate, and maintain a CPBS on land adjacent to the Shirley Primary School. This activity was a noncomplying activity under the Transitional District Plan. Again, the city council granted the consent subject to conditions. However, the school appealed the decision, alleging the following four adverse effects:

- Risk of adverse health effects from the radio frequency radiation emitted from the cell site
- Adverse psychological effects on pupils and teachers because of the perceived health risks
- Adverse visual effects
- Reduced financial viability of the school if pupils withdraw because of the perceived adverse health effects

The court concluded that the risk of the children or teachers at the school developing leukemia or other cancers from radio frequency radiation emitted by the cell site is extremely low, and the risk to the pupils of developing sleep disorders or learning disabilities because of exposure to radio frequency radiation is higher, but still very small. Accordingly, the Telecom proposal was allowed to proceed.

In summary, the Environmental Court ruled that there are no established adverse health effects from the emission of radio waves from CPBSs and no epidemiological evidence to show this. The court was persuaded by the ICNIRP guidelines that risk of health effects from low-level exposure is very low and that the cell phone frequency imposed by the NZ standard is safe, being almost two and one-half times lower than that of the ICNIRP.

The court did concede that while there are no proven health effects, there was evidence of property values being affected by both of the health allegations. The court suggested that such a reduction in property values should not be counted as a separate adverse effect from, for example, adverse visual or amenities effects. That is, a reduction in property values is not an environmental effect in itself; it is merely evidence, in monetary terms, of the other adverse effects noted.

In a third case, *Goldfinch v. Auckland City Council*,[22] the Planning Tribunal considered evidence on potential losses in value of the properties of objectors to a proposal for the siting of a CPBS. The court concluded that the valuer's monetary assessments support and reflect the adverse effects of the CPBS. Further, it concluded that the effects are more than just minor as the CPBS stood upon the immediately neighboring property.

Literature Review

While experimental and epidemiological studies have focused on the adverse health effects of radiation from the use of cell phones and CPBSs, few studies have been conducted to ascertain the impact of CPBSs on property values. Further, little evidence of property value effects has been provided by the courts. Thus, the extent to which opposition from property owners affected by the siting of CPBSs is reflected in lower property values is not well known in New Zealand.

Two studies have been conducted to ascertain the adverse health and visual effects of CPBSs on property values. Telecom commissioned Knight Frank (NZ) Ltd to undertake a study in Auckland in 1998/

20. NZRMA 289 (1996).
21. NZRMA 66 (1999).
22. NZRMA 97 (1996).

99 and commissioned Telfer Young (Canterbury) Ltd to undertake a similar study in Christchurch in 2001. Although the studies show that there is not a statistically significant effect on property prices where CPBSs are present,[23] the research in both cases involves only limited sales data analysis. Further, no surveys of residents' perceptions were undertaken, and the studies did not examine media attention to the sites and the impact this may have on saleability of properties in close proximity to CPBSs. Finally, as the sponsoring party to the research was a telecommunication company it is questionable whether the results are completely free from bias. Hence, the present study aims to help fill the research void on this contentious topic in an objective way.

CPBSs are very similar structures to high-voltage overhead transmission lines (HVOTLs); therefore it is worthwhile to review the body of literature on the property values effects of HVOTLs. The only recently published study in New Zealand on HVOTLs effects is by Bond and Hopkins.[24] Their research consists of both a regression analysis of residential property transaction data and an opinion survey to determine the attitudes and reactions of property owners in the study area toward living close to HVOTLs and pylons.

The results of the sales analysis indicate that having a pylon close to a particular property is statistically significant and has a negative effect of 20% at 10–15 meters from the pylon, decreasing to 5% at 50 meters. This effect diminishes to a negligible amount after 100 meters. However, the presence of a transmission line in the case study area has a minimal effect and is not a statistically significant factor in the sale prices.

The attitudinal study results indicate that nearly two-thirds of the respondents have negative feelings about the HVOTLs. Proximity to HVOTLs determines the degree of negativity: respondents living closer to the HVOTLs expressed more negative feelings towards them than those living farther away. It appears, however, from a comparison of the results, that the negative feelings expressed are often not reflected in the prices paid for such properties.

There have been a number of HVOTLs studies carried out in the United States and Canada. A major review and analysis of the literature by Kroll and Priestley indicates that in about half the studies, HVOTLs have not affected property values and in the rest of the studies there is a loss in property value between 2%–10%.[25] Kroll and Priestley are generally critical of most valuer-type studies because of the small number of properties included and the failure to use econometric techniques such as multiple regression analysis. They identify the Colwell study as one of the more careful and systematic analyses of residential impacts.[26] That study, carried out in Illinois, finds that the strongest effect of HVOTLs is within the first 15 meters, but the effect dissipates quickly with distance, disappearing beyond 60 meters.

A Canadian study by Des Rosiers, using a sample of 507 single-family house sales, finds that severe visual encumbrance due to a direct view of either a pylon or lines exerts a significant, negative impact on property values; however location adjacent to a transmission corridor may increase value.[27] This was particularly evident where the transmission corridor was on a well-wooded, 90-meter right-of-way. The proximity advantages include enlarged visual field and increased privacy. The decrease in value from the visual impact of the HVOTLs and pylons (on average between 5% and 10% of mean house value) tends to be cancelled out by the increase in value from proximity to the easement.

A study by Wolverton and Bottemiller[28] uses a paired-sale analysis of home sales in 1989–1992 to ascertain any difference in sale price between properties abutting rights-of-way of transmission lines (subjects) in Portland, Oregon; Vancouver, Washington; and Seattle, Washington; and those located in the same cities but not abutting transmission line rights-of-way (comparisons). Subjects sold during the study period were selected first; then a matching comparison was selected that was as similar to the subject as possible. The study results did not support a finding of a price effect from abutting an HVTL right-of-way. In their conclusion, the authors

23. Mark Dunbar, Telfer Young research valuer, personal communication with Bond, 2002. The results of these studies have not been made publicly known. The study by Knight Frank of Auckland was conducted by Robert Albrecht.

24. S. G. Bond and J. Hopkins, "The Impact of Transmission Lines on Residential Property Values: Results of a Case Study in a Suburb of Wellington, New Zealand," *Pacific Rim Property Research Journal* 6, no. 2 (2000): 52–60.

25. C. Kroll and T. Priestley, "The Effects of Overhead Transmission Lines on Property Values: A Review and Analysis of the Literature," Edison Electric Institute (July 1992).

26. Peter F. Colwell, "Power Lines and Land Value," *Journal of Real Estate Research* 5, no. 1 (Spring 1990): 117–127.

27. François Des Rosiers, "Power Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement," *Journal of Real Estate Research* 23, no. 3 (2002): 275–301.

28. Marvin L. Wolverton and Steven C. Bottemiller, "Further Analysis of Transmission Line Impact on Residential Property Values," *The Appraisal Journal* (July 2003): 244–252.

warn that the results cannot and should not be generalized outside of the data. They explain that

> limits on generalizations are a universal problem for real property sale data because analysis is constrained to properties that sell and sold properties are never a randomly drawn representative sample. Hence, generalizations must rely on the weight of evidence from numerous studies, samples, and locations.[29]

Thus, despite the varying results reported in the literature on property value effects from HVOTLs, each study adds to the growing body of evidence and knowledge on this (and similar) valuation issue(s). The study reported here is one such study.

Opinion Survey Research Objectives and Methodology

Research by Abelson;[30] Chalmers and Roehr;[31] Kinnard, Geckler and Dickey;[32] Bond;[33] and Flynn et al.,[34] recommend the use of market sales analysis in tandem with opinion survey studies to measure the impact of environmental hazards on residential property values. The use of more than one approach provides the opportunity to compare the results from each and to derive a more informed conclusion than obtained from relying solely on one approach. Thus, the methods selected for this study include a public opinion survey and a hedonic house price approach (as proposed by Freeman[35] and Rosen[36]). A comparison of the results from both of these techniques will reveal the extent to which the market reacts to cell phone towers.

Public Opinion Survey

An opinion survey was conducted to investigate the current perceptions of residents towards living near CPBSs and how this proximity might affect property values. Case study areas in the city of Christchurch were selected for this study. The study included residents in ten suburbs: five case study areas (within 300 meters of a cell phone tower) and five control areas (over 1 kilometer from the cell phone tower). The five case study suburbs were matched with five control suburbs that had similar living environments (in socioeconomic terms) except for the presence of a CPBS.

The number of respondents to be surveyed (800) and the nature of the data to be gathered (perceptions/personal feelings towards CPBSs) governed the choice of a self-administered questionnaire as the most appropriate collection technique. Questionnaires were mailed to residents living in the case study and control areas.

A self-administered survey helps to avoid interviewer bias and to increase the chances of an honest reply where the respondent is not influenced by the presence of an interviewer. Also, mail surveys provide the time for respondents to reflect on the questions and answer these at their leisure, without feeling pressured by the time constraints of an interview. In this way, there is a better chance of a thoughtful and accurate reply.

The greatest limitation of mail surveys is that a low response rate is typical. Various techniques were used to help overcome this limitation, including careful questionnaire design; inclusion of a free-post return envelope; an accompanying letter ensuring anonymity; and reminder letters. An overall response rate of 46% was achieved for this study.

The questionnaire contained 43 individual response items. The first question acted as an identifier to determine whether the respondent was a homeowner or tenant. While responses from both groups were of interest, the former was of greater importance, as they are the group of purchasers/sellers that primarily influence the value of property. However, it was considered relevant to survey both groups as both are affected by proximity to a CPBS to much the same extent from an occupiers' perspective, i.e., they both may perceive risks associated with a CPBS. It was hypothesized that tenants, being less-permanent residents, would perceive the effects in a similar way, but to a much lesser degree.

Other survey questions related to overall neighborhood environmental desirability; the timing of

29. Ibid., 252.

30. P. W. Abelson, "Property Prices and Amenity Values," *Journal of Environmental Economics and Management* 6 (1979): 11–28.

31. James A. Chalmers and Scott Roehr, "Issues in the Valuation of Contaminated Property," *The Appraisal Journal* (January 1993): 28–41.

32. W. N., Kinnard, M. B. Geckler, and S. A. Dickey, "Fear (as a Measure of Damages) Strikes Out: Two Case Studies Comparisons of Actual Market Behaviour with Opinion Survey Research" (paper presented at the Tenth Annual American Real Estate Society Conference, Santa Barbara, California, April 1994).

33. S. G. Bond, "Do Market Perceptions Affect Market Prices? A Case of a Remediated Contaminated Site," in *Real Estate Valuation Theory*, ed. K. Wang and M. L. Wolverton, 285–321 (Boston: Kluwer Academic Publishers, 2002).

34. James Flynn et al., "Survey Approach for Demonstrating Stigma Effects in Property Value Litigation," *The Appraisal Journal* (Winter 2004): 35–45.

35. A. Myrick Freeman, *The Benefits of Environmental Improvement: Theory and Practice* (Baltimore: John Hopkins Press, 1979).

36. Sherwin Rosen, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy* 82, no. 1 (Jan/Feb 1974): 34–55.

the CPBS's construction and its proximity in relation to the respondent's home; the importance placed on the CPBS as a factor in relocation decisions and on the price/rent the respondent was prepared to pay for the house; how a CPBS might affect the price the respondent would be willing to pay for the property; and the degree of concern regarding the effects of CPBSs on health, stigma, aesthetics, and property values. The surveys were coded to identify the property address of the respondent. This enabled each respondent's property to be located on a map and to show this in relation to the cell site.

Eighty questionnaires[37] were distributed to each of the ten suburbs (five case study and five control areas) in Christchurch. Respondents were instructed to complete the survey and return it in the free-post, self-addressed envelope provided. The initial response rate was 31%. A month later, a further 575 questionnaires with reminder letters were sent out to residents who had not yet responded. A total response rate of 46% was achieved. Response rates from each suburb ranged from 33% (Linwood) to 61% (Bishopdale).

The questionnaire responses were coded and entered into a computerized database.[38] The analysis of responses included the calculation of means and percentage of responses to each question to allow for an overview of the response patterns in each area.

Case Study and Control Areas

The suburbs of Beckenham, Papanui, Upper Riccarton, Bishopdale, and St Albans were selected for the case study because there is at least one CPBS within each of these communities. Census data, providing demographic and socioeconomic characteristics of geographic areas, was used to select the control suburbs of Spreydon, Linwood, Bromley, Avonhead, and Ilam.[39] The control areas are located further away (over 1 kilometer) from the CPBS in their matched case study area. As well as matching demographic and socioeconomic characteristics, each suburb was selected based on its similarity to its matched case study area in terms of living environment and housing stock, distance to the central business district, and geographic size; the only dissimilarity is that there are no CPBSs in the control areas. (See Appendix I for a location map.)

Demographic statistics show that Bromley and Ilam comprise a younger population (median age about 33), with Bishopdale and Upper Riccarton having an older population (median age about 40). The ethnic breakdown of each suburb indicates that Papanui and Spreydon have the highest proportion of Europeans (about 90%), Bromley has the highest proportion of both Maoris and Pacific Islanders (13.9% and 8.5% respectively), while Ilam, Avonhead, and Upper Riccarton have the highest proportion of Asians (16.1% to 18.5%).[40]

Median household and median family incomes (MHI and MFI) are highest in Ilam and Avonhead (MHI: $34,751NZ, $53,405NZ; MFI: $51,530NZ, $65,804NZ, respectively) and lowest in Linwood and Beckenham (MHI: $22,275NZ, $26,398NZ; MFI: $29,673NZ, $33,847NZ respectively).[41] Residents of St Albans West have the highest levels of education (21.7% have a degree or a higher degree) followed by Upper Riccarton (18.7%), Ilam (16.7%), and Avonhead (16.2%). These same suburbs have the highest proportion of professionals by occupational class (20.3% to 27.3%). Residents of Bromley have the lowest education (40% have no qualification) and the lowest proportion of professionals (5.5%).[42]

In summary, the socioeconomic data shows that Ilam is the more superior suburb, followed by Avonhead, Upper Riccarton, St Albans West, and Papanui. The lower socioeconomic areas are, in decreasing order, Spreydon, Bishopdale, Bromley, Beckenham, and Linwood.

Survey Results

A summary of the main findings from the survey is presented in Appendix II, and the survey results are discussed in the following.

Response Rates

Of the 800 questionnaires mailed to homeowners and tenants in the case study and control areas (400 to each group), 50% from the case study area and 41%

37. Approved by the University of Auckland Human Subjects Ethics Committee (reference 2002/185).

38. The computer program SPSS was selected as the appropriate analytical tool for processing the data.

39. The census is conducted in New Zealand every five years, and the data used to define the control areas is from the latest census conducted in 2001, see Christchurch City Area Unit Profile, 2001 at http://www.ccc.govt.nz/Census/ChristchurchCityAreaUnitProfile.xls.

40. Christchurch City Area Unit Profile statistics.

41. $1NZ = $0.65US, thus, $34,751NZ = $22,588US.

42. The median house price for Christchurch city in August 2003 was $185,000NZ/$120,000US (New Zealand national median house price at this time was $215,000NZ/$140,000US), http://www.reinz.co.nz/files/HousingFacts-Sample-Pg1-5.pdf (accessed March 17, 2004). Median house prices in each individual suburb could not be obtained as the median sales data from the Real Estate Institute of NZ (REINZ) contains more than one suburb in each location grouping.

from the control area were completed and returned. Over three-quarters (78.5%) of the case study respondents were homeowners compared to 94% in the control area.

Desirability of the Suburb as a Place to Live

More than half (58.3%) the case study respondents have lived in their suburb for more than five years (compared to 65% in the control group) and a quarter (25%) have lived in their suburb between 1 and 4 years (compared to 28% in the control group).

Around two-thirds (65% of the case study respondents and 68% of the control group respondents) rated their neighborhoods as either above average or superior as a place to live when compared with other similar named suburbs. The reasons given for this include close proximity to amenities (shops, library, medical facilities, public transport, and recreational facilities) and good schools.

Reasons given for rating the case study neighborhoods inferior to other similar neighborhoods include lower house prices, older homes, more student housing and lower-income residents. The reasons given by the control group respondents for an inferior rating include distance from the central business district (Avonhead); smell from the sewerage oxidation ponds and composting ponds (Bromley); and lower socioeconomic area and noise from the airport (Linwood).

Feelings About a CPBS as an Element of the Neighborhood

In the case study areas, a CPBS had already been constructed when only 39% of the respondents bought their houses or began renting in the neighborhood. Some responded that they were not notified that the CPBS was to be built, that they had no opportunity to object to it, and that they felt they should have been consulted about its construction. For the respondents who said that proximity to the tower was of concern to them, the most common reasons given for this were the impact of the CPBS on health, aesthetics, and property values. Nearly three-quarters (74%) of the respondents said they would have gone ahead with the purchase or rental of their property anyway if they had known that the CPBS was to be constructed.

In the control areas nearly three-quarters (72%) of the respondents indicated they would be opposed to construction of a CPBS nearby. The location of a CPBS would be taken into account by 83% of respondents if they were to consider moving. As with the case study respondents, the control group respondents who were concerned about proximity to a CPBS were most often concerned about the effects of CPBSs on health, aesthetics, and property values.

Impact on Decision to Purchase or Rent

In the case study areas, the tower was visible from the houses of 46% of the respondents, yet two-thirds (66%) of these said it was barely noticeable, and one-quarter said it mildly obstructed their view. When asked in what way the CPBS impacts the enjoyment of living in their home, 37% responded that its impact was related to health concerns, 21% said it impacted neighborhood aesthetics, 20% said it impacted property value, and 12% said it impacted the view from their property.

When asked about the impact that the CPBS had on the price/rent they were prepared to pay for their property, over half the case study respondents (53.1%) said that the tower was not constructed at the time of purchase/rental, and 51.4% of the respondents said the proximity to the CPBS did not affect the price they were prepared to pay for the property. Nearly 3% said they were prepared to pay a little less, 2% said they were prepared to pay a little more. For the control group respondents, 45% of the respondents would pay substantially less for a property if a CPBS were located nearby, over one-third (38%) were prepared to pay just a little less for such a property, and 17% responded that a CPBS would not influence the price they would pay.

Only 10% of the case study respondents gave an indication of the impact that the CPBS had on the price/rent they were prepared to pay for the property; one-third of these felt it would decrease price/rent by 1% to 9%. For the control group, over one-third (38%) of the respondents felt that a CPBS would decrease price/rent by more than 20%, and a similar number (36%) said they would be prepared to pay 10% to 19% less for property located near a CPBS. The responses are outlined in Table 1.

Table 1 Impact of a CPBS on Purchase/Rental Price Decision

Price/Rent Effect	Percent of Case Study Respondents (Control Group Responses)
20% more	5% (3%)
10–19% more	10% (2%)
1–9% more	14% (2%)
1–9% less	33% (19%)
10–19% less	24% (36%)
20% or greater reduction in price/rent	14% (38%)

Interestingly, it would seem that those living farther away from the CPBSs (the control group) are far more concerned about proximity to CPBSs than those living near CPBSs (the case study group); they indicated that a CPBS would have a greater price/rent effect. The possible explanations for this are discussed in the survey results section.

Concerns About Proximity to the CPBS

Most case study respondents were not worried about the effects of proximity to a CPBS related to health (50%), stigma (55%), future property value (61%), or aesthetics (63%). About one-quarter to one-third of these respondents were somewhat worried about the impact of proximity to a CPBS on health (38%), stigma (34%), future property value (25%), or aesthetics (25%). From the list of issues, respondents were most worried about future property value, but only 13.5% of the respondents responded this way.

Here again, control group respondents were much more concerned about the effects of proximity to a CPBS than their case study counterparts. Of the possible concerns about CPBSs on which respondents were asked to comment, control group respondents were most worried about the negative effects on future property values and aesthetics. Nearly half the respondents were worried a lot about these issues. Similar responses were recorded for the possibility of harmful health effects in the future from CPBSs (42% were worried a lot about this) and stigma associated with houses near CPBSs (34% were worried a lot). The responses regarding concerns about living near a CPBS are shown in Table 2.

In both the case study and control areas, the issue of greatest concern for respondents was the impact of proximity to CPBSs on future property values. The main concerns related to CPBSs were the unknown potential health effects, the possible socioeconomic implications of the siting of CPBSs, and how CPBSs affect property values. There also were concerns that the city council was not notifying the public about the possible construction of CPBSs.

Discussion of the Survey Results

The results were mixed, with responses from residents ranging from having no concerns to being very concerned about proximity to a CPBS. In general, those people living in areas farther from CPBSs were much more concerned about issues related to proximity to CPBSs than residents who lived near CPBSs.

Over 40% of the control group respondents were worried a lot about future health risks, aesthetics, and future property values compared with the case study areas, where only 13% of the respondents were worried a lot about these issues. However, in both the case study and control areas, the impact of proximity to CPBSs on future property values is the issue of greatest concern for respondents. If purchasing or renting a property near a CPBS, over a third (38%) of the control group respondents said a CPBS would reduce the price of their property by more than 20%. The perceptions of the case study respondents were again less negative, with a third saying they would reduce the price by only 1%–9%, and 24% saying they would reduce the price by 10%–19%.

The lack of concern shown by the case study respondents may be due to the CPBSs being either not visible or only barely visible from their homes. The CPBSs may be far enough away from respondents' properties (as was indicated by many respondents, particularly in St Albans West, Upper Riccarton, and Bishopdale) or hidden by trees and consequently not perceived as affecting the properties. The results may have been quite different had the CPBS being more visually prominent.

Alternatively, the apparent lower sensitivity to CPBSs of case study residents compared to the control group residents may be due to cognitive dissonance reduction. In this case, respondents may be unwilling to admit, due to the large amounts of money already paid, that they may have made a poor purchase or rental decision in buying or renting property located near a CPBS. Similarly, the homeowners may be unwilling to admit there are concerns about CPBSs when the CPBSs were built

Table 2 Concerns about Living Near a CPBS*

Concern	Does not worry me	Worries me somewhat	Worries me a lot
Possibility of harmful health effects	50% (20%)	38% (38%)	12% (42%)
Stigma effect	55% (21%)	34% (45%)	12% (34%)
Effect on future property values	61% (15%)	25% (37%)	13% (47%)
Aesthetics	63% (18%)	25% (37%)	11% (45%)

* Percent of case study respondents having that concern (control group respondents). All numbers are rounded.

after they had purchased their homes, because to do so might have a negative impact on property values.

Regardless of the reasons for the difference in responses from the case study and control groups, the overall results show that residents perceive CPBSs negatively. In both the case study and control areas, the impact of proximity to CPBSs on future property values was the issue of greatest concern for respondents. Overall, respondents felt that proximity to a CPBS would reduce value by from 10% to over 20%. The second part of the study outlined below, involving an econometric analysis of Christchurch property sales transaction data, helps to confirm these results.

Respondents' comments added at the end of the survey indicate that residents have ongoing concerns about CPBSs. Although some people accepted the need for CPBSs, they said that they did not want them built in their back yard, or they preferred that they be disguised to blend better with their environment.

Market Study Research Objectives and Methodology

A market study was undertaken to test the hypothesis that in suburbs where there is a CPBS it will be possible to observe discounts to the selling price of homes located near these structures. Such discounts would be observed where buyers of proximate homes view the CPBSs in negative terms due to a perceived risk of adverse effects on health, aesthetics, and property value.

The literature dealing specifically with the measurement of the impact of environmental hazards on residential sale prices (including proximity to transmission lines, landfill sites, and ground water contamination) indicates the popularity of hedonic pricing models, as introduced by Court[43] and later Griliches,[44] and further developed by Freeman[45] and Rosen.[46] The more recent studies, including those by Dotzour;[47] Simons and Sementelli;[48] and Reichert,[49] focus on proximity to an environmental hazard and demonstrate that this reduces residential house prices by varying amounts depending on the distance from the hazard.[50] However, there are no known published studies that use hedonic housing models to measure the impact of proximity to a CPBS on residential property values.

As in the previous residential house price studies, the standard hedonic methodology was used here to quantify the impact of a CPBS on sale prices of homes located near a CPBS. The results from this study in tandem with the opinion survey results will help test the hypothesis that proximity to a CPBS has a negative impact on property value and will reveal the extent to which the market reacts to CPBSs.

Model Specification

A hedonic price model is constructed by treating the price of a property as a function of its utility-bearing attributes. Independent variables used in the model to account for the property attributes are limited to those available in the data set and known, based on other well-tested models reported in the literature and from valuation theory, to be related to property price. The basic model used to analyze the impact on sale price of a house located near a CPBS, is as follows:

$$P_i = f(X_{1,i}, X_{2,i} \ldots \ldots \ldots \ldots \ldots X_{n,i})$$

where:

P_i = property price at the i th location

$X_{1,i} \ldots X_{n,i}$ = individual characteristics of each sold property (e.g., land area, age of house, floor area, sale date, construction materials, house condition, CPBS construction date, etc.)

The more recent hedonic pricing studies that demonstrate the effects of proximity to an environmental hazard use different functional forms to represent the relationship between price and various property characteristics.[51] In hedonic housing models the linear and log-linear models are most popular. The linear model implies constant partial effects between house prices and housing characteristics, while the log-linear model allows for nonlinear price effects and is shown in the following equation:

43. A. T. Court, "Hedonic Price Indexes with Automotive Examples," in *The Dynamics of Automobile Demand* (New York: General Motors, 1939).

44. Zvi Griliches, ed. *Price Indexes and Quality Change* (Cambridge, Mass.: Harvard University Press, 1971).

45. Freeman.

46. Rosen.

47. Mark Dotzour, "Groundwater Contamination and Residential Property Values," *The Appraisal Journal* (July 1997): 279–285.

48. Robert A. Simons and Arthur Sementelli, "Liquidity Loss and Delayed Transactions with Leaking Underground Storage Tanks," *The Appraisal Journal* (July 1997): 255–260.

49. Alan K. Reichert, "Impact of a Toxic Waste Superfund Site on Property Values," *The Appraisal Journal* (October 1997): 381–392.

50. Only Dotzour found no significant impact of the discovery of contaminated groundwater on residential house prices. This was likely due to the nonhazardous nature of the contamination where the groundwater was not used for drinking purposes.

51. See for example L. Dale et al., "Do Property Values Rebound from Environmental Stigmas? Evidence from Dallas," *Land Economics* 75, no. 2 (May 1999): 311–326; Dotzour; Simons and Sementelli; and Reichert.

$$\ln P_i = b_0 + b_1 \times X_{1,i} + b_2 \times X_{2i} + b_3 \times X_{3i} \ldots \ldots \ldots + b_n \times X_{n+1} + a_0 \times D_0 + \ldots \ldots + a_m \times D_m + e_0$$

where:

$\ln P_i$ = the natural logarithm of sale price

b_0 = the intercept

$b_1 \ldots b_n$; $a_0 \ldots a_m$ = the model parameters to be estimated, i.e., the implicit unit prices for increments in the property characteristics

$X_1 \ldots X_n$ = the continuous characteristics, such as land area

$D_0 \ldots D_m$ = the categorical (dummy) variables, such as whether the sale occurred before (0) or after (1) the CPBS was built

Sometimes the natural logarithm of land area and floor area is also used. The parameters are estimated by regressing property sales on the property characteristics and are interpreted as the households' implicit valuations of different property attributes. The null hypothesis states that the effect of being located near a CPBS does not explain any variation in property sale prices.

The Data

Part of the process for selecting appropriate case study areas was identifying areas where there had been a sufficient number of property sales to provide statistically reliable and valid results. Sales were required for the period before and after the CPBS had been built in order to study the impact of the CPBS on the surrounding properties' sale prices.

Further, due to the multitude of factors that combine to determine a neighborhood's character, such as proximity to the central business district, standard of schooling, recreational facilities provided, standard of housing, proximity to amenities, and the difficulty in allowing for these separately, sales located in areas with comparable neighborhood characteristics were preferred.

Four of the suburbs in the survey case study met the criteria for the market study: St Albans, Beckenham, Papanui, and Bishopdale. No sales data was available for Upper Riccarton after the CPBS was built in this suburb, hence this suburb was not included in the market analysis study. As each CPBS was built at a different date, the sales from each suburb were separately analyzed. The uniformity of locational and neighborhood characteristics in each of these suburbs allows the analysis to be simplified and to focus on the properties' physical attributes. The relative homogeneity of housing, locational, and neighborhood attributes was verified through field inspections.

The dependent variable is the property sale price. The data set includes 4283 property sales that occurred between 1986 and 2002 (approximately 1000 sales per suburb).[52]

The independent data set was limited to those variables that correspond to property attributes known and suspected to influence price. These variables are floor area (m^2); land area (ha); age of the house (the year the house was built); tower (a dummy variable indicating whether the sale occurred before or after the CPBS was built); sale date (month and year); time of sale based on the number of quarters before or after the CPBS was built (to help control for movements in house prices over time); category of residential property (stand-alone dwelling, dwelling converted into flats, ownership unit, etc); quality of the principal structure (as assessed by an appraiser); and roof and wall materials. The number of bedrooms was not available in the data set, but would not have been included as an independent variable since the number of bedrooms is highly correlated with floor area.

Since the GIS coordinates of properties for the initial analysis were not available, street name was included as an independent variable instead. To a limited extent, street name helped to control for the proximity effects of a CPBS. It was suspected that houses on a street close to a CPBS may, on average, sell for less than houses on a street farther away from the CPBS.

While views, particularly water views, have been shown in previous empirical studies to be an important attribute affecting sale price, in the present study the flat contour of the landscape where the homes are located, together with the suburban nature of the environment surrounding these, precluded any significant views. Thus, views were not included in the analysis. Further, due to the large number of sales included in the analysis, inspections of each individual property were not made to determine the view, if any, of a CPBS from each house. It was felt that it is not merely the view that may impact on price, but also proximity to a CPBS due to the potential effect this may have on health, cell phone coverage, and neighborhood aes-

52. These sales were obtained from Headway Systems Ltd, a data distribution and system development company. Headway is the major supplier of property market sales information to New Zealand's valuation profession; it is jointly owned by the NZ Institute of Valuers (NZIV) and PT Investments, a consortium of 28 shareholders from within the property industry.

thetics. Hence, view of a CPBS was not included as an independent variable. The variable descriptions are listed in Table 3. Variable codes are shown in Appendix III and basic descriptive statistics for selected quantitative variables are shown in Appendix IV.

Table 3 Variable Descriptions

Variable*	Definition
SLNETX	Sale price of the house (NZ$)
SITSTX	Street name
CATGYX2	Category of dwelling: D, E, etc.†
CATGYX4	Quality of the structure: A, B, C†
TIMESOLD.Q	Using the time the cell phone tower was built as a baseline quarter, the number of quarters before (–) and after (+) it was built
AGE	Year the house was built
LANDAX	Land area (ha)
MATFAX	Total floor area (m^2)
WALLCNX	Wall construction: W, B, C, etc.†
ROOFCNX	Roof construction: W, B, C, etc.†
TOWER	An indicator variable: 0 if before the cell phone tower was built, or 1 after it was built

* Sale price is the dependent variable.

† See Appendix III for explanation of variable codes.

Market Study Results

An econometric analysis of Christchurch property transaction data helped to confirm the opinion survey results. In the analysis of selected suburbs, the sales data from sales that occurred before a CPBS was built was compared to sales data from after a CPBS was built to determine any variance in price, after accounting for all the relevant independent variables.

Empirical Results

The model of choice is one that best represents the relationships between the variables and has a small variance and unbiased parameters. Various models were tested and the results are described in the next section. The following statistics were used to help select the most appropriate model: the adjusted coefficient of determination (adjusted R^2); the standard error of the regression equation; the AIC[53] and BIC[54] statistics; and *t*-test of significance of the coefficients and *F*-statistic.

Significance of Variables and the Equation: St Albans

As hedonic prices can vary significantly across different functional forms, various commonly used functional forms were examined to determine the model specification that best describes the relationship between price and the independent variables. Also, to test the belief that the relationship between *Price* and *Land Area* is not a linear function of *Price*, the variable *LANDAX* (land area) was transformed to reflect the correct relationship. Several transformations were tested including: linear of *SLNETX* (sale price) and log of *LANDAX*; log of *SLNETX* and linear of *LANDAX;* and log of *SLNETX* and log of *LANDAX*. All dummy variables remained in their linear form in each model.

It was found that the best result was obtained from using the log of *SLNETX* and log of *LANDAX*, and the linear form of all the dummy variables. Taking the log of an independent variable implies diminishing marginal benefits. For example, an extra 50 square meters of land area on a 550-square-meter site would be worth less than the previous 50 square meters. The log-log model shows the percent change in price for a one-percent change in the independent variable, while all other independent variables are held constant (as explained in Hill, Griffiths, and Judge).[55]

In the semilogarithmic equation the interpretation of the dummy variable coefficients involves the use of the formula: $100(e^{b_n} - 1)$, where b_n is the dummy variable coefficient.[56] This formula derives the percentage effect on price of the presence of the factor represented by the dummy variable and is advocated over the alternative, and commonly misused, formula of 100. (b_n). The resulting model included all the available variables as follows:

$$\begin{aligned}\log(SLNETX) = \alpha &+ \beta_1 \times TOWER + \beta_2 \times SITSTX \\ &+ \beta_3 \times CATGYX2 + \beta_4 \times CATGYX4 \\ &+ \beta_5 \times TIMESOLD \times Q + \beta_6 \times AGE \\ &+ \beta_7 \times \log(LANDAX) \\ &+ \beta_8 \times MATFAX \\ &+ \beta_9 \times WALLCNX \\ &+ \beta_{10} \times ROOFCNX\end{aligned}$$

53. AIC is the Akaike Information Criterion, and is a "goodness of fit" measure involving the standard error of the regression adjusted by a penalty factor. The model selected is the one that minimizes this criterion (Microsoft SPSSPC Online Guide, 1997).

54. The BIC is the Bayesian Information Criterion. Like the AIC, BIC takes into account both how well the model fits the observed data, and the number of parameters used in the model. The model selected is the one that adequately describes the series and has the minimum SBC. The SBC is based on Bayesian (maximum-likelihood) considerations. (Microsoft SPSSPC Online Guide, 1997).

55. R. Carter Hill, William E. Griffiths, and George G. Judge, *Undergraduate Econometrics* (New York: John Wiley & Sons, 1997).

56. See Robert Halvorsen and Raymond Palmquist, "The Interpretation of Dummy Variables in Semi-Logarithmic Equations," *American Economic Review* 70, no. 3 (1980): 474–475.

From the regression output, the variables *ROOFCNX* and *WALLCNX* were found to be insignificant so these were removed from the model and the regression was rerun. The table in Appendix V summarizes these results. The *F*-statistic (123) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 4 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variables *ROOFCNX* and *WALLCNX* is superior to the regression that includes them (AIC and BIC are minimized). For this reason, the model excluding these variables was selected for analysis, and it is discussed next.

Table 4 Test Statistics — St Albans

	Adjusted R^2	AIC	BIC
Full Model	0.82	-118.38	36.55
Sub Model	0.82	-121.64	5.95

Tests for normality, heteroskedasticity, and multicollinearity generally indicated that the model was adequately specified and that the data were not severely ill conditioned (heteroskedasticity and multicollinearity were diminished when the data were transformed).

The coefficient of determination (R^2) indicates that approximately 82% of the variation in sale price is explained by the variation in the independent variable set. All variable coefficients had the expected signs,[57] except for *TOWER*, which was positive. The positive coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a CPBS in St Albans, the price of a house would increase by $e^{0.1135} \approx 1.12$ (12%). A possible explanation is that cell phone technology was quite new at the time (1994), and as there had been little in the media about possible adverse health effects from CPBSs, people may have perceived it as a benefit as they were likely to get better cell phone coverage.

The most significant variables were *TIMESOLD.Q* (the quarter in which the sale occurred before or after the CPBS was built), *log(LANDAX)* (log of land area), and *MATFAX* (total floor area) and all have a positive influence on price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built (1994), but only to a limited extent (1.38%). The positive log of land area and total floor area shows that prices increase with increasing size.

The regression coefficient on *log(LANDAX)* is 0.3285, which indicates that, on average, a 10% increase in *LANDAX* will generate a 3.285% increase in price. The positive coefficient for *MATFAX* indicates that, when all the other variables are held constant, for each additional m^2 the price would increase by $e^{0.0022314} \approx 1.0022314$ (0.22% increase).

Significance of Variables and the Equation: Papanui

The same functional form used for St Albans was used for Papanui. From the regression output, the variable *CATGYX2* was found to be insignificant so it was removed from the model and the regression was rerun; Appendix VI summarizes the results. The *F*-statistic (152) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 5 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *CATGYX2* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding this variable was selected for analysis, and is discussed next.

Table 5 Test Statistics — Papanui

	Adjusted R^2	AIC	BIC
Full Model	0.87	-509.91	-371.99
Sub Model	0.87	-510.57	-381.56

The coefficient of determination (R^2) indicates that approximately 87% of the variation in sale price is explained by the variation in the independent variable set. This would be considered high in comparison with the amount of explanation obtained in similar hedonic house studies reported in the literature.[58] All variable coefficients had the expected signs.

The most significant variables were *TIMESOLD.Q*, *MATFAX* (total floor area), and *TOWER*. The former two have a positive influence on price. The positive *TIMESOLD.Q* indicates that the

57. Note that the variable *AGE* is positive as this variable indicates the year the house was built; therefore, the higher the year, the younger the home. Newer houses have less wear and tear than older homes and sell, on average, for more than older homes.

58. For example, Reichert obtained an adjusted R^2 of 84%; Simons and Sementelli, 78%; Abelson, 68%; Dotzour, 56%–61%.

market was increasing over time since the CPBS was built (2000), but only by 1.4% per quarter. The positive coefficient for *MATEAX* indicates that, when all the other variables are held constant, the price would increase by $e^{0.0042576} \approx 1.00427$ (0.43%), with increasing size. The negative coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a CPBS in Papanui, the price of a house would decrease by $e^{-0.2340} \approx 0.79$ (21% decrease).

Significance of Variables and the Equation: Beckenham

The same functional form used for Papanui and St Albans was used for Beckenham. From the regression output, the variable *ROOFCNX* was found to be insignificant so it was removed from the model and the regression was rerun; Appendix VII summarizes these results. The *F*-statistic (214) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 6 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *ROOFCNX* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding this variable was selected for analysis.

Table 6 Test Statistics — Beckenham

	Adjusted R^2	AIC	BIC
Full Model	0.89	-819.00	-641.39
Sub Model	0.89	-818.66	-650.66

The coefficient of determination (R^2) indicates that approximately 89% of the variation in sale price is explained by the variation in the independent variable set. Again, as with the model for Papanui this amount of explanation would be considered high.

The most significant variables were *TIMESOLD.Q*, *MATEAX*, and *TOWER*. The former two have a positive influence on price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built in 2000, but only by 1.91% per quarter. The positive coefficient for *MATEAX* indicates that, when all the other variables are held constant, the price would increase by $e^{0.0042054} \approx 1.00421$ (0.42%), with increasing size. The negative coefficient for *TOWER* shows that, when all the other variables are held constant, after the installation of a CPBS in Beckenham, the price of a house would decrease by $e^{-0.23019} \approx 0.793$ (20.7% decrease).

Significance of Variables and the Equation: Bishopdale

The same functional form used for the other three suburbs was used for Bishopdale. From the regression output, the variables *ROOFCNX* and *CATGYX* were found to be insignificant so these were removed from the model and the regression was rerun; Appendix VIII summarizes these results. The *F*-statistic (122) shows that the estimated relationship in the model is statistically significant at the 95% confidence level and that at least one of the coefficients of the independent variables within the model is not zero.

Table 7 Test Statistics — Bishopdale

	Adjusted R^2	AIC	BIC
Full Model	0.79	-927.48	-775.71
Sub Model	0.79	-929.32	-796.52

Table 7 summarizes the model selection test statistics. Based on the AIC and BIC, the regression that excludes the variable *ROOFCNX* and *CATGYX* is superior to the regression that includes it (AIC and BIC are minimized). For this reason, the model excluding these variables was selected for analysis.

Again, the most significant variables were *TIMESOLD.Q* and *MATEAX*; the variable of interest, *TOWER*, was not a significant variable in the model so it is not discussed further. The former two variables have a positive influence on price. The positive *TIMESOLD.Q* indicates that the market was increasing over time since the CPBS was built in 1994, but only at 0.98% per quarter. The positive coefficient for *MATEAX* indicates that, when all the other variables are held constant, the price would increase by $e^{0.0039665} \approx 1.004$ (0.40%), with increasing size.

Summary of Results

The above analysis shows that the most significant variables and their impact on price were similar between suburbs. This indicates the relative stability of the coefficients between each model. Interestingly, the impact of *TOWER* on price (a decrease of between 20.7% and 21%) was very similar in the two suburbs where the towers were built in the year 2000. This may be due to the much greater media publicity given to CPBSs after the two legal cases in Christchurch (*McIntyre* and *Shirley Primary School*

in 1996 and 1999, respectively). The two suburbs where *TOWER* was either insignificant or increased prices by around 12%, were suburbs where towers had been built in 1994, prior to the media publicity.

Limitations of the Research

The main limitation affecting this survey was in the selection of the case study areas. Specifically, the areas selected had CPBSs that were not highly visible to residents. If more-visible CPBSs had been selected, the results may have been quite different. Thus, caution must be used in making generalizations from this study or applying the results directly to other similar studies or valuation assignments. Factors that could affect results are the distance of homes from the CPBS, the style and appearance of the CPBS, how visible the CPBS is to residents, the type of home (single family, multifamily, rental, etc.), and the socioeconomic make-up of the resident population.

To help address the proximity factor, a study is in progress examining the role of distance to the CPBSs and price effects; that study uses GIS analysis to determine the impact this has on residential property prices. It is expected that this will provide a more precise estimation of the impact of a CPBS on price.

It must be kept in mind that these results are the product of only one case study carried out in a specific area (Christchurch) at a specific time (2003). The above results indicate that value effects from CPBSs may vary over time as market participants' perceptions change. Perceptions toward CPBSs can change either positively or negatively over time. For example, as the World Health Organization's ten-year study of the health effects from CPBSs is completed and becomes available, consumers' attitudes may become more positive or negative depending on the outcome of that study. Consequently, studies of the price effects of CPBSs need to be conducted over time.

Areas for Further Study

This research has focused on residents' perceptions of negative effects from proximity to CPBSs and how these impact property values, rather than the scientific or technological estimates of these risks. The technologists' objective view of risk is that risk is measurable solely in terms of probabilities and severity of consequences, whereas the public, while taking experts' assessments into account, view risk more subjectively, based on other factors. Further, the results of scientific studies about the health effects of radio frequency and microwave radiation from CPBSs are not consistent. Residents' perceptions and assessments of risk vary according to a wide range of psychological, social, institutional, and cultural processes, and this may explain why their assessments differ from those of the experts.

Given the public concerns about the potential risks arising from being located nearby a CPBS, it is important for future studies to focus more attention on the kinds of risks the public associates with CPBSs and the level of risk perceived. How far away from the CPBS do people feel they have to be to be safe? What CPBS design, size, and surrounding landscape would help CPBSs to be more publicly acceptable? What social, economic, educational, and other demographic variables influence how people perceive the risks from CPBSs? Do residents that are heavy users of cell phones have a different perception of CPBSs than residents who make little use of this technology? Are these perceived risks reflected in property values and to what extent? Do these perceived risks vary over time and to what degree?

Answers to these questions, if shared among researchers and made public, could lead to the development of a global database to assist appraisers in determining the perceived level of risk associated with CPBSs and other similar structures.[59] Knowledge of the extent that these risks are incorporated into property prices and how they vary over time will lead to more accurate value assessments of properties in close proximity to CPBSs and other similar structures.

Summary and Conclusions

Focusing on four case study neighborhoods in Christchurch, New Zealand, this article presents the results from both an opinion survey and market sales analysis undertaken in 2003 to determine residents' perceptions towards living near a CPBS and how this may impact property prices. From the results, it appears that people who live close to CPBSs perceive the sites less negatively than those who live farther away.

The issue of greatest concern for survey respondents in both the case study and control areas is the impact of proximity to CPBSs on future property values. Overall, respondents would pay from 10%–19% less to over 20% less for a property if it were in close proximity to a CPBS.

The opinion survey results were generally confirmed by the market sales analysis using a hedonic house price approach. The results of the sales analysis show prices of properties were reduced by around 21% after a CPBS was built in the neighborhood. How-

59. For example, high-voltage overhead transmission lines.

ever, this result varies between neighborhoods, with a positive impact on price being recorded in one neighborhood, possibly due to the CPBS being built in that suburb before any adverse media publicity about CPBSs appeared in the local Christchurch press.

Research to date reports no clearly established health effects from radio frequency emissions of CPBSs operated at or below the current safety standards, yet recent media reports indicate that people still perceive that CPBSs have harmful effects. Thus, whether or not CPBSs are proven to be free from health risks is only relevant to the extent that buyers of properties near CPBSs perceive this to be true. Even buyers who believe that there are no adverse health effects from CPBSs, knowing that other potential buyers might think the reverse, will probably seek a price discount for a property located near a CPBS.

The comments of survey participants indicate the ongoing concerns that residents have about CPBSs. There is the need to increase the public's understanding of how radio frequency transmitting facilities operate and the strict exposure-limit standards imposed on the telecommunication industry. As more information is discovered that refutes concerns regarding adverse health effects from CPBSs, and as information about the NZ safety standards are made more publicly available, the perception of risk may gradually change, eliminating the discounts for neighboring properties.

Sandy Bond, PhD, MBS, ANZIV, SNZPI, is a senior member of the New Zealand Property Institute (NZPI), a director on the Board of the International Real Estate Society, and a past president of the Pacific Rim Real Estate Society (PRRES). She was awarded the PRRES Achievement Award in 2002 and the NZ Institute of Valuers' Presidential Citation in 1997. Before commencing her academic career in 1991, she worked as an appraiser in both New Zealand and London, UK.

Contact: dr_sandybond@yahoo.com

Ko-Kang (Kevin) Wang is a recent graduate from the University of Auckland and has been a tutor in the Statistics Department at the university. Wang has recently commenced doctoral studies in Australia.

Contact: Kevin.Wang@anu.edu.au

Acknowledgements

The authors thank Mark Dunbar of Telfer Young and Robert Albrecht of DTZ for sharing the results of their cell phone research on valuation impacts from proximity to CPBSs, and Maya Marshall, Project Administrator at Telecom NZ, and Rapheal Hilbron, Community Relations Manager at Vodafone NZ, for information about CPBS locations and environmental impacts from these.

Additional Reading

Appraisal Institute. *Proposed USPAP Statement on Appraisal Standards–First Exposure Draft: Utilization of Statistical and Market Survey Techniques in Real Estate Research, Appraising, Counselling, and Consulting Assignments.* Report of Task Group for the Development of Standards for Determining the Acceptability of Applications of Statistical and Market Survey Techniques to the Valuation of Real Property. Chicago: Appraisal Institute, 2000.

Burch, J. B., J. S. Reif, M. G. Yost, T. J. Keefe, and C.A. Pittrat. "Nocturnal Excretion of Urinary Melatonin Metabolite Among Utility Workers." *Scand J Work Environ Health* 24, no. 3 (1998): 183–189.

Christchurch City Council Web site, http://www.ccc.govt.nz/index.asp.

Fesenko, E. E., V. R. Makar, E. G. Novoselova, and V. B. Sadovnikov. "Microwaves and Cellular Immunity: Effect of Whole Body Microwave Irradiation on Tumour Necrosis Factor Production in Mouse Cells." *Bioelectrochem Bioenerg* 49, no. 1 (1999): 29–35.

Khudnitskii, S. S., E. A. Moshkarev, and T. V. Fomenko. "On the Evaluation of the Influence of Cellular Phones on Their Users." [In Russian] *Med Tr Prom Ekol* 9 (1999): 20–24.

International Commission on Non-Ionizing Radiation Protection. "Health Issues Related to the Use of Hand-Held Radio Telephone and Base Transmitters." *Health Physics* 70, no. 4 (April 1996): 587–593.

International Commission on Non-Ionizing Radiation Protection. "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (Up to 300 GHz)." *Health Physics* 74, no. 4 (April 1998): 494–522.

Priestley, T., and G. Evans. *Perception of a Transmission Line in a Residential Neighbourhood: Results of a Case Study in Vallejo, California.* San Francisco: Southern California Edison Environmental Affairs Division, December 1990.

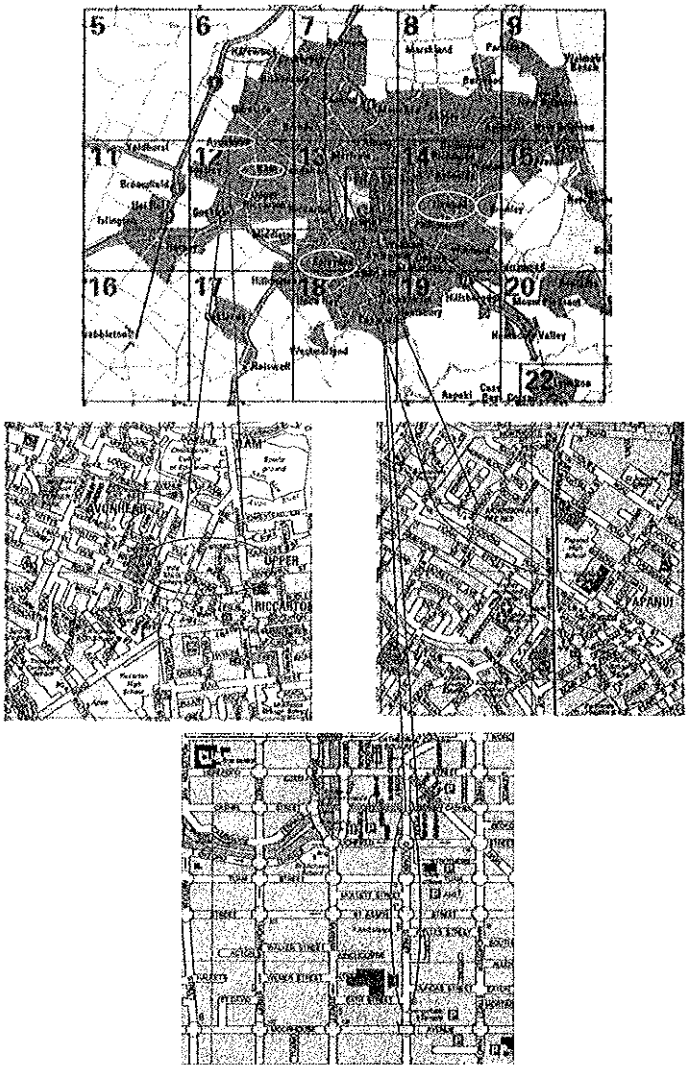
Priestley, T., and P. C. Ignelzi. *A Methodology for Assessing Transmission Line Impacts in Residential Communities.* Washington, DC: Edison Electric Institute, June 1989.

Repacholi, M. H., A. Basten, V. Gebski, D. Noonan, J. Finnie, and A. W. Harris. "Lymphomas in E mu-Pim1 Transgenic Mice Exposed to Pulsed 900 MHZ Electromagnetic Fields." *Radiat Res* 147, no. 5 (1997): 631-640.

Royal Society of Canada. *A Review of the Potential Health Risks of Radiofrequency Fields from Wireless Telecommunication Devices: An Expert Report Prepared at the Request of the Royal Society of Canada for Health Canada.* Ottawa, Ontario: Royal Society of Canada, March 1999. http://www.rsc.ca//files/publications/expert_panels/RF//RFreport-en.pdf.

World Health Organization. *Electromagnetic Fields (300 Hz to 300 GHz).* Environmental Health Criteria 137. Geneva: World Health Organization, 1993.

Appendix I Location Map



Areas circled in white at the top are without a cell phone tower, while areas circled in the bottom three maps have a cell phone tower.
Source: http://www.ccc.govt.nz/maps/Wises/

Appendix II Summary of the Survey Results

Variable	Responose	Valid Percent (%)	
		Case Study	Control
Occupancy	Homeowner	78.5	94.2
	Tenant	21.5	5.8
How long have you lived there?	Less than 6 months	8.0	2.6
	6 months–1 year	8.6	4.5
	1–4 years	25.1	27.7
	More than 5 years	58.3	65.2
How would you rate the desirability of your neighborhood?	Superior	27.4	30.9
	Above Average	37.4	36.8
	Average	28.5	27.0
	Below Average	5.6	4.6
	Inferior	1.1	0.7
Would you be opposed to construction of a cell phone tower nearby?	Yes		72.1
	No		27.9
When you purchased/began renting was the cell phone tower already constructed?	Yes	39.3	
	No	60.7	
Was the proximity of the cell phone tower a concern to you?	Yes	20.0	
	No	80.0	
Would you have gone ahead with rental/purchase if you had known a cell phone site was to be constructed?	Yes	73.9	
	No	26.1	
Is location of a cell phone tower a factor you would consider when moving?	Yes		83.4
	No		16.6
Is the cell phone tower visible from your house?	Yes	45.7	
	No	54.3	
If yes, how much does it impact on your view?	Very obstructive	9.6	
	Mildly obstructive	24.5	
	Barely noticeable	66.0	
In what way does it impact on the enjoyment of living in your house?	Views	11.8	
	Aesthetics	20.6	
	Health concerns	36.8	
	Change in property value	19.9	
	Other	11.0	
Effect a nearby cell phone tower would have on the price/rent you would pay for the property	Tower wasn't constructed	53.1	
	Pay substantially more	0.0	0.0
	Pay a little more	2.3	0.0
	Pay a little less	2.8	37.6
	Pay substantially less	0.6	45.4
	Not influence price	51.4	17.0
% Effect a nearby cell phone tower would have on the price/rent you would pay for the property	20% higher or more	5	3.2
	10–19% more	10	1.6
	1–9% more	14	2.4
	1–9% less	33	19.2
	10–19% less	24	36.0
	20% or a greater reduction	14	37.6
Concern about the possibility of harmful health effects in the future	Does not worry me	50.3	19.9
	Worries me somewhat	38.0	38.4
	Worries me a lot	11.7	41.7
Concern about the stigma associated with houses near the cell phone sites	Does not worry me	54.6	20.8
	Worries me somewhat	33.9	45.0
	Worries me a lot	11.5	34.2
Concern about the affect on your properties value in the future	Does not worry me	61.3	15.4
	Worries me somewhat	25.4	37.2
	Worries me a lot	13.3	47.4
Concern about the aesthetic problems caused by the tower	Does not worry me	63.3	18.2
	Worries me somewhat	25.4	37.0
	Worries me a lot	11.3	44.8

Appendix III Variable Codes

Category of Dwelling

Code	Definition
D	Dwelling houses are of a fully detached or semi-detached style situated on their own clearly defined piece of land.
E	Converted dwelling houses that are now used as rental flat.
F	Ownership home units which may be single storey or multi-storey and which do not have the appearance of dwelling houses.
H	Home and income. The dwelling is the predominant use, and there is an additional unit of use attached to or associated with the dwelling house that can be used to produce income.
R	Rental flats that have been purpose built.

Quality of the Principal Structure

Code	Definition
A	Superior design and quality of fixtures and fittings is first class.
B	The design is typical of its era and the quality of the fixtures and fittings is average to good.
C	The design is below the level generally expected for the era, or the level of fixtures and fittings is barely adequate and possibly of below average quality.

Building Materials: Walls and Roof

Code	Definition
W	Wood
B	Brick
C	Concrete
S	Stone
R	Roughcast
F	Fibrolite
M	Malthoid
P	Plastic
I	Iron
A	Aluminium
G	Glass
T	Tiles
X	*

Appendix IV Descriptive Statistics

Variable	Mean	Std. dev.	Median	Minimum	Maximum	Range
St Albans:						
Sale Price ($)	221,957	110,761	200,000	42,000	839,000	797,000
Land Area (ha)	0.0658	0.0331	0.0579	0.0261*	0.3794	0.3533
Floor Area (m^2)	161	70.40	150	50	450	400
Beckenham:						
Sale Price ($)	116,012	50,037	111,000	21,500	385,000	363,500
Land Area (ha)	0.0601	0.0234	0.0553	0.0164*	0.2140	0.1976
Floor Area (m^2)	115	32.50	110	40	340	300
Papanui:						
Sale Price ($)	127,661	51,114	119,000	43,000	375,000	332,000
Land Area (ha)	0.0685	0.0289	0.0675	0.0310	0.3169	0.2859
Floor Area (m^2)	122	34.60	110	56	290	234
Bishopdale:						
Sale Price ($)	136,786	41,390	134,500	56,000	342,000	286,000
Land Area (ha)	0.0679	0.0163	0.0653	0.0400	0.2028	0.1628
Floor Area (m^2)	125	31.20	118	64	290	226

* These small land areas are related to apartments or units in a block of apartments/units that have the land area apportioned on a pro rata basis.

Appendix V Regression Model: St Albans

log(*SLNETX*) = *TOWER* + *CATGYX2* + *CATGYX4* + *TIMESOLD.Q* + *AGE* + log(*LANDAX*) + *MATFAX* + *SITSTX*

Residuals:	**Min**	**1Q**	**Median**	**3Q**	**Max**
	-0.72855	-0.15032	0.01593	0.14263	0.72047

Coefficients:	**Estimate**	**Std. Error**	***t*-value**	**Pr(>|t|)**
(Intercept)	9.1781868	0.6769096	13.559	< 2e-16 ***
TOWER	0.1133186	0.0318188	3.561	0.000395 ***
CATGYX2D	0.1846417	0.0702520	2.628	0.008776 **
CATGYX2O	0.0334663	0.1008594	0.332	0.740134
CATGYX4B	-0.1551409	0.0245485	-6.320	4.75e-10 ***
CATGYX4C	-0.1483169	0.0722959	-2.052	0.040600 *
TIMESOLD.Q	0.0136663	0.0008208	16.650	< 2e-16 ***
AGE	0.0016408	0.0003521	4.660	3.81e-06 ***
log(LANDAX)	0.3285367	0.0283610	11.584	< 2e-16 ***
MATFAX	0.0022314	0.0001962	11.373	< 2e-16 ***
SITSTXAIKMANS RD	0.4029259	0.0533671	7.550	1.41e-13 ***
SITSTXBEVERLEY ST	0.2330787	0.0803137	2.902	0.003827 **
SITSTXBRISTOL ST	0.1706840	0.0521716	3.272	0.001124 **
SITSTXBROWNS RD	0.2492536	0.0720854	3.458	0.000579 ***
SITSTXCOX ST	0.3055798	0.0581672	5.253	2.00e-07 ***
SITSTXGORDON AVE	0.0823422	0.0679833	1.211	0.226236
SITSTXKNOWLES ST	0.1690979	0.0558911	3.025	0.002576 **
SITSTXMANSFIELD AVE	0.2954242	0.0652983	4.524	7.16e-06 ***
SITSTXMCDOUGALL AVE	0.3303105	0.0623720	5.296	1.60e-07 ***
SITSTXMURRAY PL	0.3613773	0.0629166	5.744	1.40e-08 ***
SITSTXOFFICE RD	0.3681146	0.0543368	6.775	2.71e-11 ***
SITSTX Other	0.0618491	0.0736629	0.840	0.401416
SITSTXPAPANUI RD	0.1940369	0.0560474	3.462	0.000570 ***
SITSTXRANFURLY ST	0.1701716	0.0617504	2.756	0.006012 **
SITSTXST ALBANS ST	0.1458665	0.0571172	2.554	0.010873 *
SITSTXWEBB ST	0.1895432	0.0725061	2.614	0.009143 **
SITSTXWESTON RD	0.2084419	0.0527555	3.951	8.60e-05 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.2175 on 677 degrees of freedom
Multiple *R*-Squared: 0.8253, Adjusted *R*-squared: 0.8186
F-statistic: 123 on 26 and 677 DF, *p*-value: < 2.2e-16

Appendix VI Regression Model: Papanui

ln(formula = log(*SLNETX*) ~ *TOWER* + *SITSTX* + *TIMESOLD.Q* + *AGE* + log(*LANDAX*) + *MATFAX* + *WALLCNX* + *ROOFCNX* + *CATGYX4*, data = *Papanui.final*)

Residuals:	**Min**	**1Q**	**Median**	**3Q**	**Max**
	-0.484987	-0.098006	0.003859	0.106253	0.563126

Coefficients:	**Estimate**	**Std. Error**	***t*-value**	**Pr(>|t|)**
(Intercept)	5.9482316	0.6998186	8.500	< 2e-16 ***
TOWER	-0.2339640	0.0240908	-9.712	< 2e-16 ***
SITSTXHOANI ST	-0.1966982	0.0265429	-7.411	4.26e-13 ***
SITSTXLANGDONS RD	-0.1192547	0.0281242	-4.240	2.58e-05 ***
SITSTXLEANDER ST	0.0305555	0.0449437	0.680	0.496853
SITSTXMATSONS AVE	0.0949636	0.0292461	3.247	0.001231 **
SITSTXMORELAND AVE	-0.0892332	0.0397622	-2.244	0.025183 *
SITSTXMORRISON AVE	-0.1984492	0.0289772	-6.848	1.84e-11 ***
SITSTXOther	-0.1543194	0.0337436	-4.573	5.83e-06 ***
SITSTXSAILS ST	-0.0761412	0.0433455	-1.757	0.079490 .
SITSTXSAWTELL PL	0.1840793	0.0393904	4.673	3.66e-06 ***
SITSTXSAWYERS ARMS RD	0.0872393	0.0201388	4.332	1.73e-05 ***
SITSTXST JAMES AVE	0.2497688	0.0289940	8.615	< 2e-16 ***
TIMESOLD.Q	0.0138914	0.0004137	33.575	< 2e-16 ***
AGE	0.0029307	0.0003512	8.345	4.85e-16 ***
log(LANDAX)	0.0904764	0.0270812	3.341	0.000886 ***
MATFAX	0.0042576	0.0002410	17.664	< 2e-16 ***
WALLCNXC	0.0054100	0.0200666	0.270	0.787558
WALLCNXF	-0.0980851	0.0464442	-2.112	0.035106 *
WALLCNXO	-0.1158407	0.0468334	-2.473	0.013655 *
WALLCNXR	-0.0670051	0.0244382	-2.742	0.006291 **
WALLCNXW	-0.0679166	0.0192628	-3.526	0.000454 ***
WALLCNXX	-0.0571365	0.0358369	-1.594	0.111381
ROOFCNXI	0.1502973	0.1139845	1.319	0.187810
ROOFCNXO	0.0870092	0.1164152	0.747	0.455111
ROOFCNXT	0.0954874	0.1138506	0.839	0.401965
CATGYX4B	-0.0623758	0.0343487	-1.816	0.069872 .
CATGYX4C	-0.3669901	0.0905659	-4.052	5.74e-05 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.1579 on 604 degrees of freedom
Multiple *R*-Squared: 0.8718, Adjusted *R*-squared: 0.8661
F-statistic: 152.2 on 27 and 604 DF, *p*-value: < 2.2e-16

Appendix VII Regression Model: Beckenham

lm(formula = log(*SLNETX*) ~ TOWER + *SITSTX* + *CATGYX4* + *TIMESOLD.Q* + *AGE* + log(*LANDAX*) + *MATFAX* + *WALLCNX* + *CATGYX2*, data = *Beckenham.final*)

Residuals:	**Min**	**1Q**	**Median**	**3Q**	**Max**
	-0.64490	-0.09026	0.01142	0.10112	0.40993

Coefficients:	**Estimate**	**Std. Error**	**t-value**	**Pr(>|t|)**
(Intercept)	9.2062865	0.4725194	19.483	< 2e-16 ***
TOWER1	-0.2301918	0.0182774	-12.594	< 2e-16 ***
SITSTXBECKENHAM ST	0.1648069	0.0515406	3.198	0.001436 **
SITSTXBOON ST	-0.0616738	0.0484966	-1.272	0.203817
SITSTXBRADFORD AVE	0.0923843	0.0494942	1.867	0.062300 .
SITSTXCOLOMBO ST	0.0623765	0.0467234	1.335	0.182223
SITSTXDEVON ST	-0.0959430	0.0457562	-2.097	0.036299 *
SITSTXDUNN ST	-0.0207886	0.0427676	-0.486	0.627031
SITSTXFISHER AVE	0.2271245	0.0400288	5.674	1.90e-08 ***
SITSTXLONGFELLOW ST	-0.0186953	0.0451597	-0.414	0.678990
SITSTXOTHER	-0.0222126	0.0467607	-0.475	0.634888
SITSTXPERCIVAL ST	-0.0347190	0.0517740	-0.671	0.502663
SITSTXROXBURGH ST	0.1029109	0.0466753	2.205	0.027729 *
SITSTXSOMERFIELD ST	0.0186495	0.0428968	0.435	0.663851
SITSTXSOUTHAMPTON ST	-0.0243265	0.0402926	-0.604	0.546171
SITSTXSOUTHEY ST	-0.0324513	0.0429880	-0.755	0.450520
SITSTXSTRICKLAND ST	-0.0819418	0.0407196	-2.012	0.044494 *
SITSTXTENNYSON ST	0.1165007	0.0393410	2.961	0.003147 **
SITSTXWEMBLEY ST	0.0648226	0.0458033	1.415	0.157359
CATGYX4B	0.0275481	0.0373405	0.738	0.460864
CATGYX4C	-0.1168640	0.0469787	-2.488	0.013049 *
TIMESOLD.Q	**0.0189904**	0.0003396	**55.928**	< 2e-16 ***
AGE	0.0010988	0.0002426	4.530	6.74e-06 ***
log(LANDAX)	0.1546535	0.0195655	7.904	8.19e-15 ***
MATFAX	**0.0042054**	0.0002138	**19.674**	< 2e-16 ***
WALLCNXC	-0.0208433	0.0378338	-0.551	0.581833
WALLCNXF	-0.1171637	0.0394091	-2.973	0.003031 **
WALLCNXO	-0.0445073	0.0399745	-1.113	0.265849
WALLCNXR	-0.1119164	0.0235736	-4.748	2.41e-06 ***
WALLCNXW	-0.0629968	0.0222366	-2.833	0.004718 **
WALLCNXX	-0.0992564	0.0398493	-2.491	0.012933 *
CATGYX2D	0.1445276	0.0399650	3.616	0.000316 ***
CATGYX2F	0.3069113	0.0744524	4.122	4.11e-05 ***
CATGYX2R	0.2927391	0.1222453	2.395	0.016847 *

Signif. codes:0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.1515 on 864 degrees of freedom
Multiple *R*-Squared: 0.8911, Adjusted *R*-squared: 0.8869
F-statistic: 214.2 on 33 and 864 DF, *p*-value: < 2.2e-16

Appendix VIII Regression Model: Bishopdale

lm(formula = log(*SLNETX*) ~ *TOWER* + *TIMESOLD.Q* + *AGE* + log(*LANDAX*) + *MATFAX* + *WALLCNX* + *SITSTX*, data = *Bishopdale.final*)

Residuals:	**Min**	**1Q**	**Median**	**3Q**	**Max**
	-0.53633	-0.08893	0.01446	0.08850	0.49048

Coefficients:	**Estimate**	**Std. Error**	**t-value**	**Pr(>|t|)**
(Intercept)	9.0005033	0.6988891	12.878	< 2e-16 ***
TOWER	0.0262575	0.0182796	1.436	0.151259
TIMESOLD.Q	**0.0097887**	0.0004834	**20.251**	< 2e-16 ***
AGE	0.0013236	0.0003598	3.679	0.000249 ***
log(LANDAX)	0.1357753	0.0333622	4.070	5.16e-05 ***
MATFAX	**0.0039665**	0.0001855	**21.389**	< 2e-16 ***
WALLCNXC	-0.0169935	0.0108641	-1.564	0.118160
WALLCNXO	0.0785660	0.0336688	2.333	0.019863 *
WALLCNXR	-0.0693225	0.0300511	-2.307	0.021313 *
WALLCNXW	-0.0815023	0.0230110	-3.542	0.000420 ***
SITSTXCARDOME ST	0.0610536	0.0314227	1.943	0.052360 .
SITSTXCHEDWORTH AVE	0.0330487	0.0317738	1.040	0.298589
SITSTXCLOTILDA PL	**0.2252988**	0.0420078	5.363	1.06e-07 ***
SITSTXCOLESBURY ST	0.0528749	0.0302668	1.747	0.081018 .
SITSTXCOTSWOLD AVE	0.0604953	0.0286474	2.112	0.035012 *
SITSTXEASTLING ST	0.0551537	0.0319833	1.724	0.085003 .
SITSTXFARRINGTON AVE	-0.0001768	0.0238544	-0.007	0.994087
SITSTXHAREWOOD RD	0.0204412	0.0252674	0.809	0.418753
SITSTXHIGHSTED RD	0.0391760	0.0253953	1.543	0.123302
SITSTXKILBURN ST	-0.0176756	0.0366951	-0.482	0.630155
SITSTXKINGROVE ST	-0.0052772	0.0375965	-0.140	0.888406
SITSTXLEACROFT ST	0.1058243	0.0333633	3.172	0.001571 **
SITSTXMURMONT ST	0.1825316	0.0365287	4.997	7.12e-07 ***
SITSTXNEWMARK ST	-0.0342136	0.0272490	-1.256	0.209621
SITSTXOTHER	0.0525437	0.0253634	2.072	0.038612 *
SITSTXRALEIGH ST	0.0470151	0.0314032	1.497	0.134740
SITSTXSTACKHOUSE AVE	0.0235719	0.0278844	-0.845	0.398165

Signif. codes:0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.137 on 821 degrees of freedom
Multiple *R*-Squared: 0.7946, Adjusted *R*-squared: 0.7881
F-statistic: 122.1 on 26 and 821 DF, *p*-value: < 2.2e-16

9/8/2014

Russ Reich and City Planning,

I am writing this letter to ask you to reject the 65 foot monopole tower proposal at 3672 Middlefield Road's Little League Ballpark where our children play here in Palo Alto, as I am convinced that such an industrial structure in our residential neighborhood will destroy home values.

It is clear that such monopoles significantly affect home values (as opposed to more innocuous localized forms like DAS).

In its book published in 1996, the Appraisal Institute listed the top 50 environmental hazards to the value of one's home in its book The Home Environmental Sourcebook: 50 Environmental Hazards to Avoid When Buying, Selling, or Maintaining a Home. Wireless base stations are included in their list of 50.

Even the American Bar Association Annual Meeting on Environmental Law Activities, in its Session on Monday, August 3, 1998 entitled Stigmas, Contamination and the Environment: Their Influence on Property Valuation for Tax Purposes noted that microwave and cellular towers are included in the list of stigmas.

I attach evidence of such a case in another community in which the local tax assessor is documented as needing to lower the property valuations of homes near a cellular tower. The County review board then upheld his determination.

It is the City's job to protect the value of the homes to "preserve property values" in the City of Palo Alto and for that reason, the City needs to reject this application at 3672 Middlefield Road.

Thank you,

Ran Hu 9/8/2014
3785 Middlefield Road
Palo Alto, CA 94303

BARRINGTON COURIER-REVIEW — Feb. 11, 1999

Tower opponents ring up a victory

BY PHIL BROZYNSKI
STAFF WRITER

Cellular towers may be beneficial to the customers they serve and to the owners of the property on which they are built.

But they still can be eyesores.

The Lake County Board of Review sustained Tuesday the decision of Cuba Township Assessor Fred Foersterling to lower the assessments of 12 homes whose market values he determined were adversely affected by the presence of a new cellular tower built on the North Barrington Village Hall property.

The board ruled that evidence and testimony submitted at a hearing Jan. 21 by the village of North Barrington and representatives of Ameritech were not sufficient to warrant a change in Foersterling's assessment.

"It is very good news," said Larry DeBoer, whose property on state Route 22 and Old Barrington Road adjoins the North Barrington Village Hall lot to the south. The tower is just 60 feet from DeBoer's property line and only 270 feet from his home. "It confirms what the plaintiffs in the lawsuit against North Barrington and Ameritech said all along — that a cellular tower in the midst of a beautiful, residential neighborhood diminishes the value of surrounding properties."

Ameritech paid North Barrington $300,000 to allow construction of the tower in March of 1998. Surrounding residents who opposed construction filed suit complaining that the rezoning of the Village Hall property was illegal.

As part of their suit, residents hired Howard Richter of Howard Richter& Associates of Chicago to determine if the tower impacted home values in the area. Richter concluded the presence of the tower diminished the market value of DeBoer's home by as much as 15 percent.

Foersterling considered Richter's report when he lowered the assessment of the DeBoer property and 11 other surrounding properties. He lowered the assessment of the 12 properties between 4.6 and 11.2 percent.

The village appealed Foersterling's decision to the board of review, presenting testimony from its own appraisers who said the tower had little or no affect on home values in the area.

"Here is an independent source with no ax to grind either way saying yes, the tower does harm property values," DeBoer said.

The village also argued that the assessor's action would pave the way for any property owner who lived within sight of water towers, standard roadside utility poles or other objects they decided spoiled the view from their home to obtain a lower real estate assessment.

However, Foersterling contended that market values in the Barrington area are extremely sensitive to change like the construction of a tower, the widening of a road or the presence of power lines and based his lower assessments on the negative impact of the tower.

"I have to congratulate Fred," DeBoer said. "He stood up for what he believed. He took a lot of political heat but did not waver. He was affirmed in his belief."

The decision could also benefit the homeowners' lawsuit against the village.

"This decision is definitely a feather in our cap, but who knows how much affect it will have (on the suit)," DeBoer said.

Marty Paulson, assistant supervisor of assessments for Lake County, said the case was unique in that most appeals that are heard by the board of review are from individuals seeking to have their assessments lowered.

"This situation was unique because an assessor made an adjustment and the municipality that allowed the tower to come in said that these assessments need to be raised," Paulson said. "We don't see a lot of situations like that."

"In this type of case, it's very difficult for the objector to prove that the assessment needs to be raised," he added.

The village may appeal the board's decision to the State of Illinois Property Tax Appeal Board within 30 days.

North Barrington officials had no comment on the decision.

"I am pleased that we won, but I do not think we have heard the end of all of this," Foersterling said.

Copyright© 2002, Digital Chicago Inc.

(5)

9/1/2014

City of Palo Alto Planning,

Given the risk to property values of having such an unsightly 65 foot tower near our homes in Palo Alto, I would encourage the City to please reject the Verizon celltower application at 3672 Middlefield Road in Palo Alto.

To me it is a question of liability insurance question. What liability coverage does the Little League of Palo Alto, the field owner, have to cover potential loss of property value for all the homeowners who live close to the proposed tower site?

I am attaching information from a court case in which an insurance company will not cover claims of reduction in property value or personal injury from mobile phone base stations. See the original complaint filed by attorney John Hamilton of South Bend, Indiana, last summer. The complaint of the four families who are party to this suit includes reduction of property value due to nuisance of towers and antennas, personal injury due to the nuisance, radiation is an invasive and chronic source of illness and substantial distress, and that plaintiffs are entitled to an injunction prohibiting defendants' continued operation of the tower as a source of microwave emissions and mandating removal of such tower. The insurance company filed a motion for declaratory judgment, so this is a matter of public record.

See the attached Complaint of a Declaratory Judgment from Cincinnati Insurance Company. It states, "This policy states in pertinent part as follows:

> Pollutant
>
> (a) At or from any premises, site or location which is or was at any time owned or occupied by, or rented or leaned to, any insured. We shall have no duty to defend or pay damages for any person or organization that is not a named insured.
>
> Pollutants means any solid, liquid, gaseous or thermal irritant or contaminant, including smoke, vapor, soot, fumes, acids, alkalis, chemicals and waste.
>
> The underlying facts of this cause, together with the pertinent policy provisions, affirmatively establish that Horvath Communications is not entitled to either a defense nor indemnity incurred in the underlying litigation under the Cincinnati policies issued to Horvath Communications since the damages alleged by the plaintiffs do not constitute an "occurrence", and further that the alleged damages caused by the microwave radiation were reasonably expected by the insured, and further that the microwave radiation which the plaintiffs complain is a pollutant, and therefore coverage is excluded.

City of Palo Alto, this means that the Little League of Palo Alto in such a similar case as the one below, would be required to reimburse neighbors for any damages, which they are not able to do.

For this reason alone, I encourage you to reject the application for a 65 foot celltower at 3672 Middlefield Road, Palo Alto.

Jack Sun Jack Sun 689 Los Robles Ave.
Wenyi Shao Wenyi Shao Palo Alto, CA 94306

STATE OF INDIANA, ST. JOSEPH COUNTY

ST. JOSEPH CIRCUIT COURT

WILLIAM HICKS, BONNIE HICKS, BRETT ONNINK, LESLEE ONNINK, PAUL BARBER, PEGGY BARBER, and LOUANN PENNINGTON,	)	
Plaintiffs,	)	
v.	)	Cause No. 71C01-0107-CP-
CHARLES S. HAYES, CHARLES S. HAYES, INC., JACQUELINE L. HORVATH and HORVATH COMMUNICATIONS, INC.,	)	
Defendants.	)	

COMPLAINT FOR DAMAGES AND
INJUNCTIVE RELIEF RE NUISANCE
WITH JURY DEMAND AS TO DAMAGES

Plaintiffs William Hicks, Bonnie Hicks, Brett Onnink, Leslee Onnink, Peggy Barber, Paul Barber and LouAnn Pennington for their complaint allege as follows:

Jurisdiction and Parties

1. Plaintiffs William Hicks and Bonnie Hicks own and reside at 55685 Clover Road, Mishawaka, IN within the County of St. Joseph, State of Indiana.

2. Plaintiffs Brett Onnink and Leslee Onnink own and reside at 3112 Mishawaka Avenue, South Bend, IN within the County of St. Joseph, State of Indiana.

3. Plaintiffs Paul Barber and Peggy Barber own and reside at 352 Weber Street, Roseland, IN within the County of St. Joseph, State of Indiana.

4. Plaintiff LouAnn Pennington owns and resides at 55650 Clover Road, Mishawaka, IN within the County of St. Joseph, State of Indiana.

5. Defendants Charles S. Hayes and Jacqueline L. Horvath are each individuals resident in the County of St. Joseph, State of Indiana. Such defendants are either the agents of defendants Charles S. Hayes, Inc. and Horvath Communications, Inc. and are personally responsible for the nuisances alleged hereafter as such, or they are principals of such corporations, the corporations themselves merely shells through which such defendants operate

their business of constructing, owning and operating cellular telephone towers throughout St. Joseph County.

6. Defendants Charles S. Hayes, Inc. and Horvath Communications, Inc. are each a corporation established pursuant to the laws of the State of Indiana with its principal place of business in St. Joseph County.

Facts: Defendants and Plaintiffs

7. Defendants own, operate and maintain cellular telephone towers, scattered across St. Joseph County, many in close proximity to residential property, schools and other places of human congregation; each are equipped with a number of antennae each of which emit microwave electromagnetic radiation.

8. The homes of plaintiffs William Hicks and Bonnie Hicks and Lou Ann Pennington are located within 700 feet of the defendants' 235 foot high cellular telephone tower at 2010 Mick Court, Mishawaka.

9. Plaintiffs Brett Onnink and Leslee Onninks' property abuts the defendants' 187 foot high cellular telephone tower which is located at 3108 Mishawaka Avenue, South Bend; in fact defendants' installation encroaches on the Onninks' property.

10. Plaintiffs Paul Barber and Peggy Barbers' property is located within 100 feet of the defendants' 199 foot high cellular telephone tower, which has as its address 436 McComb, Roseland.

11. William Hicks and Bonnie Hicks have one child, Cody, who is 3 years of age.

12. Brett Onnink and Leslee Onnink have two children, Marshall, 4 and Reid, 3.

13. Paul Barber and Peggy Barber have one child Kimberly, aged 6.

14. Lou Ann Pennington has one child living with her, Kris, a college student, aged 20.

Facts: Nature and Impact of Cellular Telephone Towers

15. Growing numbers and varieties of scientific studies of microwaves emitted from cellular telephone base stations, or towers, have reported disturbing health effects in areas relatively close to such towers.

16. For example a study of generations of laboratory mice placed near microwave towers in the vicinity of Thessalonika, Greece, show increasing levels of sterility, until, by only the fourth generation, the mice subject to the study had shown complete sterility.

17. Other research has demonstrated a variety of adverse health developments associated with microwave towers, including weakened immune systems, tumors, neurological disorders, learning and memory problems, sleep disturbances, headaches and even skin rashes.

18. The variety of symptoms just recited likely is explained by the fact that microwave radiation in the

vicinity of such towers interfere in a way similar to cell phone interference with landing commercial aircraft: they conflict with, or resonate with (or against), the essentially electrical process of human cells. As to landing aircraft, cell phones are ordered turned off; no such order exists for humans living under microwave base stations.

19. Scientific studies are already showing some disturbing incidences of pre-cancerous cell breakdown as a result of microwave impact; in fact scientists have observed changes associated with microwave radiation in DNA, the very fabric of life. 20. Exhibit A attached hereto is a listing of studies only through 1997 reflecting microwave effects on human and animal tissue.

21. The foregoing scientific developments are, by process of publication and growing citizen and political debate, becoming well known, with the result that the public's concern about living, or even attending school or working for substantial periods of time in the near vicinity of microwave base stations, is and has been growing at an increasing rate.

22. That growing concern includes a developing realization among many that any single or microwave tower may carry a multitude of antennae, each of which emits its own pattern of microwaves on its own set of wave lengths, with the result that a single tower can emit several different patterns of relatively intense signals, or "lobes" of such signals, some of which may change on a daily basis, to homes, schools and businesses within hundreds of feet of the tower.

Count I: Reduction in Property Value Due to Defendants' Towers as Nuisances (Onninks)

23. Brett and Leslee Onnink purchased their home at 3112 Mishawaka Avenue on December 6, 1996.

24. The Onninks purchased their home long before defendants constructed their 187 foot high tower, immediately next door, indeed such that the defendants' installation encroaches on the Onninks' property -- in an area of dense population, a characteristic of many of the defendants' towers situated in urbanized parts of St. Joseph County.

25. The defendants' tower carries several antennae, the total number, manufacturer, owner or operator and purpose of each of which is unknown.

26. Subject to discovery, the number and size of such antennae may be physically too great in terms of weight and surface dimension for the tower safely to bear.

27. The tower's emissions interfere with and in some cases make impossible the operation of the

Onninks' electrical appliances and other electrical products, including but not limited to garage door opener, radio, television, VCR, cordless phones and the childrens' baby monitors.

28. The tower's regular operation produces a constant drone of noise which necessarily affects, and reduces, the Onninks' quiet enjoyment of their home.

29. Because, in the Onninks' case, the tower is so close to their home, when the defendants have the tower serviced or modified, the Onninks have been asked, in the interest of their safety from debris falling from the tower, to leave their own home; the noise created by the defendants servicing the tower has also injured the enjoyment of their home; furthermore, service trucks block or interfere with ingress to and egress from their property.

30. In addition, in the Onninks' case, they are required, on a regular basis, to remove from their property debris fallen from the tower including cable ties, plastic bags, hats, bolts, cigarettes, electrical tape as well as a multitude of dead birds.

31. Because the tower attracts birds and because the tower is only 20 feet away, the Onninks' home and yard are constantly barraged by bird droppings.

32. In addition to the foregoing, the very existence of a 187 foot microwave tower next to their home has caused a substantial and irremediable reduction in the value of the Onninks' home due to the following characteristics, characteristics shared by any such tower sited within close proximity to homes, schools and businesses:

(a) the public's growing concern that sustained microwave radiation, even at allegedly low levels of intensity, may cause serious short term and long term harmful health effects;

(b) the tower's negative impact on the appearance of the neighborhood.

33. The foregoing reduction in property value has forced plaintiffs to discontinue plans to improve or add to their home.

34. All of the foregoing, individually or in combination, constitute a nuisance which has seriously and permanently reduced the value of the plaintiffs' real property.

Count II: Reduction in Property Value Due to Defendants' Towers as Nuisances (Hicks)

35. Paragraphs 1 to 22, 25, 33 and 34 are incorporated.

36. William and Bonnie Hicks purchased their property at 55685 Clover Road in 1990 and built a home and moved in in July 1993, long before defendants constructed their 235 foot high tower within 700 feet of the Hicks' home.

37. The tower's emissions interfere with and in some cases make impossible the operation of the Hicks' electrical appliances and other electrical products, including but not limited to their telephone, television, garage door opener, radio controlled cars and other toys and their baby monitor.

38. The tower's existence within 700 feet of the Hicks' property has caused a substantial and irremediable reduction in the value of the Hicks' home due to its following characteristics:

(a) the public's growing concern that sustained microwave radiation, even at allegedly low levels, may cause serious short term and long term harmful health effects;

(b) the tower's negative impact on the appearance of the neighborhood.

Count III: Reduction in Property Value Due to Defendants' Towers as Nuisances (Barber)

39. Paragraphs 1 to 22, 25, 33 and 34 are incorporated.

40. Paul and Peggy Barber purchased their home at 352 Weber Street in Roseland in November 1990, long before defendants constructed their 199 foot high tower within 100 feet of the Barbers' home.

41. The tower's emissions interfere with and in some cases make impossible the operation of the Barbers' electrical appliances and other electrical products, including but not limited to telephones, VCR and television.

42. The tower's existence within 100 feet of the Barbers' property has caused a substantial and irremediable reduction in the value of the Barbers' home due to its following characteristics:

(a) the public's growing concern that sustained microwave radiation, even at allegedly low levels, may cause serious short term and long term harmful health effects;

(b) the tower's negative impact on the appearance of the neighborhood.

Count IV: Reduction in Property Value Due to Defendants' Towers as Nuisances (Pennington)

43. Paragraphs 1 to 22, 25 and 34 are incorporated.

44. LouAnn Pennington purchased her home at 55650 Clover Road in September 1990, long before defendants constructed their 235 foot high tower within 700 feet of her home.

45. The tower's emissions interfere with and in some cases make impossible the operation of the Ms. Pennington's electrical appliances and other electrical products, including but not limited to telephone, television and VCR.

46. The tower's existence within 700 feet of Ms. Pennington's property has caused a substantial and irremediable reduction in the value of her home due to its following characteristics:

(a) the public's growing concern that sustained microwave radiation, even at allegedly low levels, may cause serious short term and long term harmful health effects;

(b) the tower's negative impact on the appearance of the neighborhood.

Count V: Personal Injury Due to Nuisance (Hicks)

47. Paragraphs 1 to 22, 25, 33, 34 and 36 to 38 are incorporated.

48. The defendants' tower at 2010 Mick Court, Mishawaka, emits microwaves in patterns, wave lengths and from antennae owned or operated by various third parties, all of which is unknown to plaintiffs.

49. On information and belief, the foregoing emissions of microwaves have resulted, since the defendants' tower began operating, in the plaintiffs Hicks experiencing and suffering the following effects:

- heart palpitations
- loss of peripheral vision
- interference with hearing
- recurring headaches including migraine headaches
- short term memory loss
- repeated sleep disturbance

50. In addition to the foregoing observable symptoms, plaintiffs live in fear of sub- cellular breakdown or change and advanced cellular aging, another effect of microwave radiation reported in scientific literature.

51. The foregoing effects have imposed on plaintiffs medical expenses as well as substantial mental distress including adverse effects on the plaintiffs' intra-family relations.

Count VI: Personal Injury Due to Nuisance (Onnink)

52. Paragraphs 1 to 34, 50 and 51 are incorporated.

53. The defendants' tower at 3108 Mishawaka Avenue, South Bend, IN emits microwaves in patterns, wave lengths and from antennae owned or operated by various third parties, all of which is unknown to plaintiffs.

54. On information and belief, the foregoing emissions of microwaves have resulted, since the defendants' tower began operating, in the plaintiffs Onninks experiencing and suffering the following effects:

- multiple tumors
- loss of peripheral vision
- weakened immune system
- recurring headaches and migraines
- repeated sleep disturbances
- glandular problems
- short term memory loss
- allergies
- chronic fatigue

Count VII: Personal Injury Due to Nuisance (Barber)

55. Paragraphs 1 to 22, 25, 33, 34, 40 to 42, 50 and 51 are incorporated.

56. The defendants' tower in the vicinity of 436 McComb, Roseland, IN emits microwaves in patterns, wave lengths and from antennae owned or operated by various third parties, all of which is unknown to plaintiffs.

57. On information and belief, the foregoing emissions of microwaves have resulted, since the defendants' tower began operating, in the plaintiffs Barbers experiencing and suffering the following effects:

- loss of peripheral vision
- interference with hearing
- recurring headaches
- weakened immune system
- short term memory loss
- repeated sleep disturbance
- learning capacity diminished
- chronic fatigue
- heart palpitations
- miscarriage

Count VIII: Personal Injury Due to Nuisance (Pennington)

58. Paragraphs 1 to 22, 25, 34, 44 to 46 and 50 are incorporated.

59. The defendants' tower at 2010 Mick Court, Mishawaka, IN emits microwaves in patterns, wave lengths and from antennae owned or operated by various third parties, all of which is unknown to plaintiffs.

60. On information and belief, the foregoing emissions of microwaves have resulted, since the defendants' tower began operating, in the plaintiff Pennington experiencing and suffering the following effects:

- recurring headaches
- repeated sleep disturbance
- weakened immune system
- chronic fatigue

61. The foregoing effects have imposed on plaintiff medical expenses as well as substantial mental distress.

Count IX: Injunctive Relief (Hicks and Pennington)

62. Paragraphs 1 to 22, 25, 33, 34, 36 to 38, 44 to 46, 48 to 51, 60 and 61 are incorporated.

63. Monetary damages are inadequate to remedy the plaintiffs' physical, mental and proprietary injuries.

64. Because emissions from defendants' towers are invasive, chronic and seriously deleterious as alleged above, plaintiffs are entitled to injunctive relief that will prohibit the defendants from imposing on plaintiffs a level of microwave radiation greater than the background level of microwave radiation in the South Bend-Mishawaka region.

Count X: Injunctive Relief (Barber)

65. Paragraphs 1 to 22, 25, 33, 34, 40 to 42, 50, 51, 56, 57, 63 and 64 are incorporated.

Count XI: Injunctive Relief (Onnink)

66. Paragraphs 1 to 34, 50, 51, 53, 54 and 63 are incorporated.

67. Because defendants' tower installation physically intrudes on plaintiffs' property, is a clear and present danger to plaintiffs' physical well-being as well as, due to the microwaves it emits, an invasive and chronic source of physical illness as well as substantial mental distress, plaintiffs are entitled to an injunction prohibiting defendants' continued operation of the tower as a source of microwave emissions and mandating removal of such tower.

WHEREFORE, plaintiffs pray for judgment as follows:

1. On Counts I through IV, for damages sufficient to compensate plaintiffs for loss of the value of their real property.

2. On Counts V through VIII for damages according to proof.

3. On Counts IX and X for injunctive relief sufficient to shield plaintiffs from microwave radiation greater than background radiation in the South Bend-Mishawaka region by means short of termination of all emissions from such towers if technically and physically feasible, but if not, termination of all emissions from such tower.

4. On Count XI for removal of the tower adjacent to the Onninks' home or, in the alternative, injunctive relief sufficient to shield plaintiffs from microwave radiation greater than background radiation in the South Bend-Mishawaka region by means short of termination of all emissions from such towers if technically and physically feasible, but if not, termination of all emissions from such tower.

5. For plaintiffs' cost of suit incurred herein.

6. For such other relief as the Court deems just.

ϑΥΡΨ ΔΕΜΑΝΔ

Πυρσυαντ το Τριαλ Ρυλε 38 πλαιντιφφσ ρεθυεστ Χουντσ Ι τηρουγη ϛΙΙΙ βε τριεδ το α φυρψ.

Respectfully submitted,

THE HAMILTON LAW FIRM
John C. Hamilton (7416-71)
Wayne Place, Suite 200
103 West Wayne Street
South Bend, IN 46601
(219) 289-9987
Facsimile (219) 289-8138

Attorneys for Plaintiffs

(6)

9/1/2014

City of Palo Alto Planning,

While I am aware that the City is not permitted by the Telecommunications Act of 1996 today to approve or deny cell towers on the basis of the health concerns of radio frequency, the following is something worth looking at and understanding before making a decision regarding the 3672 Middlefield Road, Palo Alto Little League Ballfield proposed Verizon tower

And it is worth knowing that European regulations stipulate, based on health research of people living within proximity to towers, that towers such as the one that is being evaluated are never placed within 1000-1500 meters of public facilities like schools, childcare centers, children's playing fields, libraries, parks...all of which exist in this "ground zero" location for our neighborhood in Palo Alto. In Europe, the regulations stipulate an even higher distance from children's facilities like this one, as little bodies are more rapidly metabolizing than big bodies and therefore more at risk.

While the issue of health concerns near celltowers is far from resolved, a conscious decision maker must err on the side of caution and prudence with such a decision if there is any question whatsoever as to safety.

Please read the below carefully, from the industry magazine Business Insurance, and consider the implications for the City of Palo Alto, the Little League Ballpark, and the children in our community.

While there are many grounds upon which to reject this application, I do urge you to reject the celltower proposal for 3672 Middlefield Road, which is the community ballfield for all of Palo Alto.

Very Concerned,

Jane Liu
606 Wellsbury Ct.
Palo Alto, CA 94306

Could Wireless Antennas Be the Next Asbestos?

September 14, 2010

Read the entire article by Gloria Vogel in the September 13, 2010 issue of *Business Insurance.* www.businessinsurance.com/apps/pbcs.dll/article?AID=%2F20100912%2FISSUE0401%2F309129980

Ms. Vogel is the managing director of New York-based Vogel Capital Management. She begins her analysis stating:

. . . an issue that mimics asbestos and is being ignored by insurers could soon hit their pocketbooks. Simply stated, everyone's favorite form of wireless communication and commerce depends on radio frequency-producing base station antennas, which emit radio waves and microwaves that can harm humans.

Few insurance claims have been filed to date; but in all respects, RF radiation closely tracks with the early development of asbestos claims.

She continues:

Based upon data from the Bureau of Labor Statistics and U.S. Census Bureau, it is estimated that as many as 250,000 workers a year are compelled to work in close proximity and in front of RF transmitting antennas. When combined with the 15 years this issue has been in existence, the pool of potential claimants could be staggering.

Ms. Vogel clearly delineates the breadth of the issue in her definition of "the wireless ecosystem:"

The wireless ecosystem should not be confused with the much smaller commercial telecom industry. The wireless ecosystem encompasses all FCC licensees (federal, state, local and commercial), site owners, property managers, contractors, third-party workers, the utility industry, hospitals, schools and universities, church organizations, banks/financial institutions, and the insurance industry. It involves every person or entity that may be physically or financially harmed by RF radiation.

Ms. Vogel explains how workers' antenna exposure differs from cellphone exposure and references the legal precedent from Alaska that awarded total disability to a worker whose antenna exposure only slightly exceeded the FCC RF radiation safety limit:

The significance of this topic is overlooked by insurers because of confusion between the harmful effects of cell phones and the damage caused by wireless antennas. Because there is no proven link yet established between cell phones and cancer, insurers see little exposure from this risk.

However, there is a marked difference between radiation exposure from cell phones and exposure from wireless antenna systems: The antennas are hundreds of times more powerful. More importantly, there already is peer-reviewed science from the Institute of Electrical and Electronics Engineers linking RF radiation exposure to cognitive injuries.

In addition, legal precedent has been established for such claims in AT&T Alascom and Ward North America Inc. vs. John Orchitt; State of Alaska, Department of Labor and Workforce Development, Division of Workers' Compensation. The July 2007 ruling affirmed a 100% disability award to a worker exposed to RF radiation that only slightly exceeded the FCC human exposure limits.

By doing so, the Alaska Supreme Court established a legal precedent that recognizes the causal link between an RF radiation exposure and cognitive or psychological injuries including reduced brain function, memory loss, sleep disorders, mood disorders and depression.

Ms. Vogel concludes by encouraging the insurance industry to be proactive about worker RF radiation safety and push for a solution from the private sector rather than to wait for government to act:

The insurance industry tends to look backwards at historical claims to project future losses. In cases of emerging risk such as the issue of third-party worker overexposure to RF radiation, it would be far better for the industry to be anticipatory rather than reactive, as claims could develop quickly. It would be in the industry's best interests to pre-empt the plaintiffs' bar on this issue and secure a safe workplace for those third-party workers.

(7)

City Council, ARB, Planning,

I have a significant concern over the safety of our children playing on the Little League Ballfield at 3672 Middlefield Road if the celltower that is proposed by Verizon passes. And I do not believe that Little League of Palo Alto has sufficient liability insurance to cover this concern.

Do not for a moment think that this is your average minor city cellular facility application....indeed, if approved, it would be THE TALLEST CELLTOWER IN A PALO ALTO RESIDENTIALLY ZONED AREA... and one of the handful of tallest towers in the entire city... this is no radio affixed to the top of a utility pole.

For this reason there are a number of things that must be taken into consideration from a safety perspective when approving a high voltage 65 foot 18 inch wide monopole.

The likelihood of lightning with celltowers which stand as the highest pinnacle in the area (which this proposed celltower would be) is dramatically increased, which is not as publicly known but the attached documentation amply evidences. As near as the top of this proposed tower would be to the eucalyptus tree wall separating it from Mitchell Park (ie only a matter of 5 feet)...this represents a significant fire threat from lightning and fire to the trees and to the adjacent buildings, including residential homes.

Please review the attached substantial written evidence which substantiates this threat to fully understand the risks which I am mentioning.

For reasons of safety, please reject this celltower application at 3672 Middlefield Road.

Sincerely,

Charlene Liao

3751 Middlefield Rd
Palo Alto. CA 94303

Strike back at lightning

By Vicki W. Kipp

Site Management & Technology, Sep 1, 2002

While humans have 1 in 6,000 odds of being struck by lightning, towers have 1 in 1 odds of being struck. It's basically inevitable.

How lightning works

When the equilibrium of electrical charges between the atmosphere and the earth becomes unbalanced, nature uses lightning to restore the balance.

The atmosphere is composed of atoms. Warm air moving upward and atmospheric turbulence from storms cause atoms to dissociate into separate groups of charged ions. Negatively charged ions accumulate at the base of the clouds in the lower atmosphere while positively charged ions ascend to the upper atmosphere (Figure 1). Normally, the surface of the earth has a negative charge.

However, when negative charges build up in the lower atmosphere, they repel the negative charges on the surface of the earth.

Consequently, the earth takes on a large positive charge.

Since opposite charges attract, the negative ions in the lower atmosphere are now attracted to the positive surface of the earth. Negative ions are very light so they can move towards positive charges with speed and ease. The negative charges move swiftly toward the earth, creating a phenomenon known as lightning. As the negative ions head toward the ground, positive ions on the surface of the earth are drawn upward slowly. Initially, the ions flow slowly because air is a poor conductor. However, the attraction between the negative and positive ions becomes so great that they overcome the resistance of the air.

When negative ions move down through the air, their flow is called a "step leader" or "pilot streamer" because of the erratic path that electrons take as they seek the earth. The negative ions flow downward until the resistance of the air becomes too great, and then they travel horizontally, followed by further downward movement.

Finally, the downward moving negative ions are met by the upward moving positive ions. When negative and positive ions connect, a conductive path from the cloud to the ground is formed (Figure 2). Negative ions hurry down the path creating an observable stroke. New negative ions flow into the void left by the discharge of negative ions. These new negative ions rush along the path.

Additional negative ions come from neighboring clouds. Negative ions continue to flow until equilibrium returns between the atmosphere and earth.

There is a long-standing argument about whether lightning strikes up or down. Although the negative charges are moving downward, it is the fast-moving charges that create the light. Hence the visible lightning stroke in fact moves upward.

Lightning seeks towers

Observing an NTSC antenna from the Candelabra as it lay on the ground during tower work, I noticed that the antenna grounding rods were covered with sizzle marks where they had been branded by the tips of lightning bolts. According to Winton Wilcox of ComTrain, "Towers are struck by lightning more than any other man-made structure." Towers are frequent targets for lightning because they are so high above ground level. For an optimum coverage area, broadcast towers are intentionally designed to be taller than neighboring buildings.

Besides the height factor, towers attract lightning because they are built of conductive steel. Positive ions from the earth can travel up a steel tower much easier than they could travel up through air alone. The highest point at the top of the tower is where the positive charges will accumulate.

Lightning damage

When lightning strikes a tower, various types of damage can occur. Under certain circumstances, a lightning strike could lead to collapse of the tower structure. Lightning can melt the insulation on the guy wires or cause cracks in the concrete guy anchor. Transmission lines and voltage sensitive devices can be damaged by large peak voltages from lightning. Electrical current from lightning can generate heat and transfer energy.

Guyed towers can tolerate lightning better than self-supporting towers because guyed towers deflect the lightning charge down the guy wires to the ground. Assuming that the guy anchors are grounded properly, a great deal of energy is dissipated into the ground away from the base of the tower.

For proper grounding, grounding components should be attached to the guy wires above the preforms, turnbuckles, and anchor heads.

Minimizing damage

Grounding allows some control of where energy will go when lightning strikes a tower. Experts remind us that grounding is meant to be a lightning protection system, not a lightning prevention system. Grounding involves applying a system to allow an electrical surge to pass through a conductor rather than lingering at and causing damage to the conductor.

Grounding also shields tower structures, such as a fence or site building, from the antenna's radiation pattern. This prevents the tower accessories from absorbing and then re-transmitting RF, causing a skewed signal pattern.

Believe it or not, there are some people who are opposed to grounding systems. They argue that installing a grounding system provides a path to the top of the tower for positive charges to climb. The anti-grounding faction feels that grounding almost guarantees that the tower will be struck by lightning.

Grounding advocates point out that if a tower is struck by lightning and a grounding path has not been provided, the tower will be subjected to the excess charges. They claim that it is easier and more cost-effective to build

lightning protection and grounding into a tower site than to repair lightning damage.

Grounding system

A successful lightning grounding system needs to rapidly disperse large quantities of electrons from a strike over a broad area. A tower grounding system must meet the specifications set in the 1996 TIA/EIA-RS-222-F standard. To be effective, the grounding system requires a low impedance path to earth, and a low resistance interface with earth ground.

A tower grounding system (Figure 3) usually includes a lightning rod or lightning dissipater, secondary ground, primary ground, and ground rods.

Lightning rod

A lightning rod, or collector, is placed at the top of a tower to extend at least two feet above all other tower hardware. The purpose of the lightning rod is to receive a strike and pass it through to the next element of the grounding system. The rod is usually made of copper clad steel.

Lightning dissipator

An alternative to placing a lightning collector on top of the tower is to place a lightning dissipater on top. A dissipater acts as a shield by reducing the potential between the tower and a storm cloud. Performing controlled leakage of the positive charge, it transfers the positive electrical charge to nearby ionizing air molecules. In theory, this action reduces the likelihood of a strike.

If the electric charge accumulation rate at the top of the tower significantly exceeds the dissipation rate and lightning strikes, the dissipater will redirect the lightning away from equipment toward a safe, planned path to earth.

Secondary ground

A conducting connection should be run between any tower appurtenance such as an antenna, bracket, or platform and the tower. For transmission line, a grounding connection should be made at the top of the tower, bottom of the tower, at the entry port to the building, and at every 200 feet of run.

This connection is called the secondary ground. The secondary ground provides a low resistance path to ground. It discharges static charges, lightning, or other electrical phenomena away from the tower structure. The term "down lead" is often used to describe the wire that runs between tower attachments and the primary ground. Copper wire is often used for the secondary ground.

Unfortunately, rain can cause a reaction between the copper strap and the steel tower that leaches away the copper.

Primary ground

The primary ground is the link between the tower and the earth or a conducting element used in place of earth

ground.

Grounding straps (Figure 4) run as radials between the tower structure and the ground halo.

Flat wire is more effective than round wire for grounding straps since it has greater surface area.

Bus bar

A bus bar is a piece of highly conductive copper or copper-clad steel that collects energy from numerous sources and conducts it down a common path to ground. With dimensions of ¾ inch thick, 4 inches wide, and 18 inches long, a bus bar is connected to the ground with a ground strap.

A bus bar should be mounted to the exterior of the building where transmission lines enter the building and to the interior of the building just below the entry ports. The exterior bus bar is insulated from the building and grounded to the ground halo. Transmission lines are grounded to the exterior bus bar.

The bus bar that is mounted inside the building is called a ground window. The repeater equipment; entry hatches for transmission line (if they are a conductive material); door frames, window frames, ventilation louvers, and any other sheet metal surfaces; cable trays; AC power line and breaker panel box; telephone lines, blocks and related parts; any peripheral conductive item within 6 feet of any other conductive surface; metal battery racks; utility conduit and pipes; transmitter combiner; receive multicoupler; and any surge suppressor equipment should all be grounded to the common collection point of the ground window.

Ground halo

The purpose of a ground halo is to allow single point grounding. Single point grounding directs all charges down one path to one exit point. A ground halo is often built around a site building and is also built below ground to connect the ground rods. The underground ground halo connects to and transfers energy to all of the ground rods.

Foundation grounding

Controversy surrounds the premise that reinforcing bar in the foundation of site buildings should be grounded. Some argue that rebar is insulated inside the concrete, and does not need to be grounded. The debate centers on the conductivity of concrete.

Under normal circumstances, concrete is not conductive.

However, when the ground is wet and lightning strikes, rebar that is close to the surface could collect energy. There is a risk that the energy passing through concrete could turn the water portion of the concrete into steam, cracking the concrete.

Ufer grounding, named after the engineer who originated the concept, can protect against this risk. With Ufer grounding, the rebar is grounded inside the concrete block, and a ground strap is run along the underside of the foundation to a ground rod. Charges in the concrete are dissipated down into the earth.

Ground rods

Ground rods are conductive metal poles placed in the ground for the purpose of dissipating electric charges to the soil. They are made of steel and coated in a stainless cover of copper cladding or galvanized coating. The coating on the rod prevents rust. This is important since rust is a poor conductor of electrical charges.

A typical ground rod has a diameter of one-half inch to one inch, and length of eight to ten feet. Most ground systems contain at least four ground rods.

The successfulness of a ground system is influenced by the depth of the ground rods, conductivity and resistivity of the soil, and distance between the rods. Ground rods are inserted horizontally underground at a depth of at least two to six feet below ground level. Moist clay bearing soil is desirable for setting up a grounding system. The conductivity of the soil can be improved with soil treatment techniques such as electrolyte fill.

Installation of ground rods requires that the rods be driven into the ground forcefully instead of placing the rods in pre-drilled holes. Pressure must be used when inserting the rods so that the soil will be compacted to form a connection with the surface of the rod.

When ground rods are installed, the correct distance between the rods must be determined for proper placement. Traditionally, the minimum separation between rods should be greater than the sum of the lengths of two adjacent rods. The sphere of influence(Figure 5) of a rod is the amount of soil used in dissipating the charge from one rod. The area of the sphere of influencehas a radius and depth equivalent to the length of the rod.

For example, the sphere of influence of a 10-foot ground rod would have a diameter of 20 feet around the rod and would be 10 feet deep.

It is essential to determine the correct separation distance between rods. When rods discharge they will saturate the soil in their immediate area. Inefficiency will result if a rod tries to dissipate charge in soil already saturated by another rod.

If the charge being dissipated by a ground rod is too great for the soil to absorb, the rod could actually fuse into glass. A glass ground rod makes a great insulator, and a poor conductor of charges.

Conclusion

Humans face a relatively slim risk of being struck by lightning. If such misfortune should occur, there is a lightning strike survivors support group that they can join. Towers have an extremely high risk of being struck by lightning.

There isn't a support group for towers, but there is.a multitude of grounding hardware available to make a lightning strike less harmful.

© 2003, PRIMEDIA Business Magazines & Media Inc. All rights reserved. This article is protected by United States copyright and other intellectual property laws and may not be reproduced, rewritten, distributed, redisseminated, transmitted, displayed, published or broadcast, directly or indirectly, in any medium without the prior written permission of PRIMEDIA Business Corp.

Lightning strikes rooftop mobile phone and paging antennas
Two people sent to the hospital

Mecosta County, Michigan 7/19/02

Reported by WPNB-WTOM TV Traverse City, MI

Two people are sent to the hospital after lightning strikes just blocks from a crowded sidewalk sale. The lightning struck near the corner of Maple Street and Michigan Avenue in downtown Big Rapids, Thursday afternoon.

Fortunately no one at the outdoor sale was injured, but employees at some nearby businesses were not so lucky. Some workers had just headed outside to grab a bite to eat when they saw the sky light up.

Brian Goodenow, manager of Net-Port, "It was just like an explosion and then accompanied by a crackling sound you'd associate with electricity. That's when i knew it had hit our building or very close to our building."

The lightning bolt actually struck the tower directly on top of the building that holds Net-Port and Select Cellular and Paging. And the scary bolt did more than just physical damage to the stores. It sent a shock to employees below.

A woman who was sitting at a workstation had the electricity travel through the keyboard and apparently into her body. She started feeling a little faint and co-workers drove her to Mecosta County General Hospital where she was kept overnight for observation.

Next door at Select Cellular, the only employee in the business at the time drove herself to the emergency room feeling some of the same effects.

In addition to the injured employees, a lot of the Net-Port business equipment was damaged by the strike. Three workstations were also destroyed by the power surge. And Net-Port employees are still finding glitches around the office as they try to cleanup. But they say none of their major.

Health officials warn to stay away from water and electrical equipment during storms. And if you are outside, get low to the ground to avoid being struck by lightning.

NATE Conference Speakers Address Economy, Safety And Advances

By Mark Dziatkiewicz

February 25, 2002

(c) 2003, Reed Business Information, a division of Reed Elsevier Inc. All Rights Reserved.

ORLANDO, Fla. Despite the doldrums in the wireless industry, the tower sector is proving once again there's no bad time to be concerned about safety.

Neither the dampened economy nor travel worries kept a record crowd of tower professionals from the National Association of Tower Erectors conference and exposition here last week. Dedicated to improving safety and promoting uniform standards throughout the tower construction, service and maintenance industry, the group got down to the nitty-gritty in its seventh annual gathering.

Keynote speaker Larry Nelson, executive vice president of development and general manager at CommScope Inc., kicked off the proceedings by putting a positive spin on the wireless industry's current economic downturn.

Pointing to the traditional growth curve for new technology, Nelson suggested the "wireless industry is fundamentally sound" despite its current position. He applauded the assembly of infrastructure builders for

contributing to what he says will go down in history as "a great monument to technical achievement."

Nelson also touched on the industry's concern and caution surrounding ultrawideband technology. Considered by many to be potentially disruptive, it nevertheless could prove a boon to the tower industry because many antenna sites are required, he said.

Staying true to its focus on safety and construction, the conference featured presentations by the Occupational Safety and Health Administration and National Institute of Occupational Safety and Health. The discussions provided a rare opportunity for both sides of the safety issue to explore their concerns together in a neutral, non-worksite environment.

Even topics such as rope and rigging safety demonstrated ongoing technological advances are worth considering for a safe work environment. Willie Crear, a presenter from Sterling Rope Company Inc., discussed the wide variety of rope types and their potential tower applications.

Crear stressed that cost shouldn't be the only factor when selecting from various rope options because manufacturing methods often determine the ultimate price, not tensile strength alone. But rope pricing does vary widely, from low-end nylon up to Kevlar and zylon at nearly 60 times the cost.

Tensile strength and weight are the overriding factors in choosing the right rope for a particular application. In tower situations, weight is often a major consideration because of its relationship to climbing fatigue.

Crear offered a number of helpful tips on keeping ropes in good condition, including avoiding prolonged exposure to sunlight. Saltwater and rope also can be a dangerous combination if the rope is later exposed to cold or freezing temperatures. And while it may sound like rope trivia, a single knot can reduce a rope's tensile strength by up to 40 percent.

Grounding towers and equipment for lightning protection were other topics. Despite decades of experience with towers and lightning strikes, it still is a subject that often is misunderstood.

Ernest Duckworth, strategic accounts manager for SNC Manufacturing Co., spoke at length about the damage caused by lightning strikes, some $26 billion annually, a good portion of that to telecommunications equipment.

Suggesting that lightning strikes and grounding issues aren't totally understood even by telecom engineers, Duckworth cited an example of a cell site building that was destroyed after a nearby tower was hit by lightning. He attributed it to ground potential rise, a phenomenon that kills people and animals without a direct lightning hit.

Duckworth contends that telecom equipment is not protected the way it should be and national codes provide little in the way of guidance. The issue becomes more important and critical, he says, as operators place equipment at the top of towers and move to the more sophisticated, and costly, electronics associated with next-generation wireless equipment.

FIRE: Blendon firefighters cut through the roof of Russ' communications to get at the fire, Monday afternoon.
Sentinel/Brian Forde

Web posted Tuesday, July 24, 2001

Lightning burns fire chief's home

By NATE REENS
Staff writer

A lightning bolt to a 199-foot communications tower likely caused a Monday blaze at the business and home of Blendon Fire Chief Russ Hirdes and his wife, according to Assistant Chief Tom Meeuwsen.

The flames, which ignited at about 10:30 a.m. and kept Olive firefighters occupied until 4 p.m., severely damaged the video, electronic, and bait and tackle shop Hirdes runs from a building attached to his home at the southwest corner of Port Sheldon Street and 96th Avenue.

Hirdes' wife also operates a real estate and lease management business from the building, according to the couple's daughter, Laurel von Douschutz.

Hirdes, a 27-year veteran fireman, was in Lansing for a firefighting convention and could not be reached Monday afternoon, according to his daughter and Meeuwsen.

"The radio service and equipment is likely a total loss, but the structure itself appears to be in good shape," Meeuwsen said. "We'll have to wait until he gets back to determine exactly what works and what doesn't."

Firefighters battled the blaze by ripping off the building's siding and cutting holes in the roof to gain access to the persistent flames, which shrugged off heavy rains and caused "light structural damage to the attic."

Meeuwsen said Hirdes' home received smoke damage, but was otherwise unaffected by the fire.

"My mom will probably cry and I don't know what Dad will do," a rain-soaked von Douschutz said at the scene of the fire. "He had a lot of inventory in there and has been in business for 30 years."

Von Douschutz said the tower, which stands adjacent to the business portion of the structure, has been hit before during severe thunderstorms.

Meeuwsen said Hirdes would be glad his department saved what they were able to, considering the force also was aiding Robinson Township firefighters battle a large barn fire near 112th Avenue and Pierce Street.

"I think he'd be pretty proud of the guys," the assistant chief said. "They did a good job."

All contents ©Copyright 2000 Morris Digital Works and The Holland Sentinel.
Please read our Privacy Policy * Contact us * Content Rating

Sept 5, 2014

City Council, ARB, Planning,

I have a significant concern over the safety of our children playing on the Little League Ballfield at 3672 Middlefield Road if the celltower that is proposed by Verizon passes. And I do not believe that Little League of Palo Alto has sufficient liability insurance to cover this concern.

Do not for a moment think that this is your average minor city cellular facility application....indeed, if approved, it would be THE TALLEST CELLTOWER IN A PALO ALTO RESIDENTIALLY ZONED AREA... and one of the handful of tallest towers in the entire city... this is no radio affixed to the top of a utility pole.

For this reason there are a number of things that must be taken into consideration from a safety perspective when approving a high voltage 65 foot 18 inch wide monopole.

I have significant concerns about the proximity of this tower to many other structures nearby and believe that the setback from these structures is far from insufficient. This 65 foot tower is proposed to be placed 30 feet from Mitchell Park and 90 feet from the Covenant Community Childcare children's play yard. It is 150 feet from the major Palo Alto electrical utility substation next door. And it is 25 feet from numerous storage structures, including one which is the telecommunications shack which contains chemicals and high powered electrical equipment. The cellular monopole is only 2 feet from the playing field itself, which means that its fall zone covers the entire right outfield. The cellular equipment sheds with hazardous chemicals and electrical equipment are 10 feet from the pitchers warmup area, 15 feet from parked automobiles, and 60 feet from the metal caged batting area. The top of the tower itself would only a few feet from the existing eucalyptus branches, so some significant trimming may be required.

With an eye toward the future, what is the Palo Alto ordinance's setback requirement for a 90', 100', 120' tower? Future modifications of this proposed tower must be considered given the passage of the Middle Class Tax Relief and Job Creation Act of 2012 (below), which makes it illegal for local and state governments to deny additional height and carrier antennas. In fact, this 2012 law requires co-location on existing towers.

Having just had the strongest earthquake in the area in 25 years on August 24th, 2014, which we felt vividly and woke the whole household just 100 feet from the proposed site, it is worth evaluating the certainty of a significant earthquake in the coming years in our area of even larger magnitude. Napa experiences hundreds of injuries, power outages, fires, and ruptured gas lines, among other things.

In the case of an **earthquake** in our area, which we know is inevitable as we were recently reminded of, it is the case the "fall zone" of the proposed tower covers approximately one third of the surface area of playing field which the children are playing on. It is also right near the Covenant Community Center, the neighboring Mitchell Park parking lot, a Palo Alto Utilities substation, and our Mitchell Park Library.

We also know that this area of Palo Alto has soft claylike soil and is at approximately 10-20 feet above sea level, with a high water table which typically makes the impact of earthquakes, even as far away as the North Bay, felt in a significant way, which is not the case, for example in other cities in the hills like Portola Valley...making the area most susceptible to feeling the effect of earthquakes even a hundred miles away.

This also makes our area a high risk area for soil liquefaction. What is the liquefaction of the soil? "Liquefaction occurs when ground shaking causes wet granular soils to change from a solid to a liquid state. This results in the loss of soil strength and three potential types of ground failure: lateral spreading, flow failure, and loss of bearing strength. Buildings and their occupants are at risk when the ground no longer support buildings and structures. Areas susceptible to liquefaction include areas with high ground water tables and sandy soils."

Please see attached substantial documentation regarding the risk and substantial costs of a tower fall James S. Cohen, P.E. MASCE , The information was compiled primarily from newspapers articles and telephone interviews, but also from a multitude of other sources. The database currently lists 140 such failures of towers, ranging in height from 40 to 2000 ft. above ground level, dating as far back as 1959. For each case...the following information [is being compiled]: 1) structural characteristics of the towers, 2) the geographic location and topography, 3) a description of the collapse, 4) concurrent weather, and 5) damage. The database is growing and therefore not fully analyzed. In many cases, data in all these topic areas do not exist or are not available; some data... [is yet to be obtained.]Trends in the current information are presented."

Also attached is research on the typically safe radius in the case of a tower fall (which typically spreads much further than just the radius, in fact the impact zone spreads to two times the radius or 130 feet beyond the site location as the study shows). These clearly outline the risk and caution when approving such a tall, top heavy, high voltage electricity laden structure near children and neighborhood buildings.

Lastly, attached is Law journal article on liability considerations for all parties in a tower collapse situation.

<u>I encourage you to REJECT the celltower application, as it is simply in the wrong location for our neighborhood...in fact, could not be in an more dangerous location than that which has been proposed.</u>

Signed,



Suwen Wang, Ph.D.
911 Elsmore Dr
Palo Alto, CA 94303

TOWER FAILURE SURVEY:

CURRENT EFFORTS AND PRELIMINARY RESULTS

James S. Cohen, P.E. MASCE[1]

Abstract

Although it is widely known that towers have, on occasion, collapsed, and that problems have arisen with their performance, the frequency of these problems has not been previously investigated. Therefore, a survey of tower structural and serviceability failures has been commenced through the Committee on Telecommunications Facilities (CTF) of the American Society of Civil Engineers (ASCE). This paper presents the first preliminary results of the survey, including the method of data collection.

Introduction

It is known that telecommunications and other towers suffer structural failures and collapse due to extreme loads, poor construction methods, excessive corrosion and misuse. However, the frequency of these failures has not been previously investigated and therefore remains unknown. Common causes of failure also remain unquantified. Similarly, data reflecting problems of overall tower performance have not been previously collected. These problems can include: loss of signal strength; transmission or reception failure due to excessive deflection or vibration; excessive, difficult or excessively costly maintenance; poor provision for access; lack of necessary resistance to vandalism; inattention to corrosion protection; insensitivity to later needs for tower expansion or increased aerial complement; or other unsatisfactory performance of the structures, as perceived by the owner or user. This paper preliminary results in attempts to survey this data.

Previous Surveys

The author is aware of only two previous survey attempts. The first, carried out by the International Association of Shell and Spatial Structures Working Group No. 4 on Towers, appears to have been restricted to the direct experience of the Working Group?s membership with very tall towers. Due to the limited and restricted membership, results of the survey, however interesting, appear to have very limited value.

The second survey was carried out by Nathan Mulherin at the Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire. This funded telephone survey was directed towards failures of towers solely from ice accretion. Results of the survey, providing details of 140 tower failures are published elsewhere.[2]

---

[1] Director, James Cohen Consulting, PC, Pennington, New Jersey

[2] Mulherin, Nathan D., *Atmospheric Icing and Tower Collapse in the United States,* presented

CTF Survey

Until tower performance data is collected and recurring problems identified and prioritized, efforts to improve design, construction and maintenance practices will remain haphazard. For this reason a survey has been commenced inclusive of both serviceability and ultimate load failures. This survey is intended to be the beginning of a longterm data collection effort. For this reason, and to encourage response, the initial survey was limited in length to only two pages of data entry, following a fill-in-the-blank format and is presented at the end of this paper. Pages 1 and 4 of the survey, not included in this paper, comprise a cover sheet with explanatory and contact information for use by the respondent and a final page of optional followup contact information. All data is considered confidential, to the extent that the specific structures, owners, designers and contractors cannot be identified, unless otherwise authorized. During data collection it is stressed that the results will be publicly available and for non-commerical use. Further to this, basic contact information is directed through ASCE headquarters in Virginia, rather than directly to the author.

The survey at the time of writing this paper is in its sixth month. Initially, it was hoped to distribute the survey during national conventions of interested organizations, such as the Society of Broadcast Engineers (SBE) or the National Association of Broadcasters (NAB). However, this was not found to be practical: methods of distribution required greater coordination than could be provided on a voluntary basis without the support of a larger organization such as ASCE. Simple items, such as copying and collating, were quickly seen to be impediments to this method of distribution.

The Internet offered an alternative low-cost method of publicizing and distributing the survey. There are many E-mail news groups related to broadcasting, but none with a specific interest in towers. [Note: E-mail news groups, in contrast to bulletin boards or ?chat rooms? operate through coordinated distribution of E-mail messages to a pre-defined membership, which may be open to the general public at the discretion of the news group organizer or moderator. The ?audience? is therefore targeted towards specific and active interests.] Although targeting these news groups was very successful in advertising the survey, the response has continued to be very low with regard to direct solicitation of news group members. However, continued efforts at initiating open discussions on tower problems are beginning to provide actual data which can be constructively used.

SBE and NAB were also contacted directly via the Internet for assistance with the survey. Both organizations have responded very positively and posted notices on their home pages encouraging participation by their members. Unfortunately, this, too, did not generate more than a few responses. Attempts at publicizing the survey through bulletin boards have, so far, been equally unsuccessful. More recently, NAB has sent a notice of the survey through their newsletter which is generating an increased interest in the survey. *Radio World* has additionally published a notice which has provided some additional data. ASCE has been approached with regard to funding a direct mailing to SBE members, comprising the individuals throughout the United States most closely involved in the day-to-day operations of braodcasting towers. Additionally, the National Association of State Telecommunication

Directors has provided a mailing list of members for distribution of the survey. This will be taking place shortly.

The insurance industry has also been contacted and is has already provided significant data. An underwriters association for tower insurers has provided summary claims information for the past five years. The type of loss is divided into 9 categories: fire, lightning, explosion and smoke; windstorm and hail; breakage, collision and upset; water damage; theft, burglary and robbery; vandalism, rior and other civic disturbances; collapse from volcanic action and earthquake; flood; and, ?all other?. A total loss of $76 million was reported for the period for 1989-1993. Although it is understood that this data includes ancillary buildings and structures, such as cable gantries, the primary losses are associated with the towers. This is tabulated below, in millions of dollars:

Year	1989	1990	1991	1992	1993
Value	$ 28.5 m	$9.4 m	$14.8 m	$12.3 m	$11.2 m

Table 1 - Total Reported Losses Radio and TV - By Year

Total losses for 1989-1993 for each of the categories was provided as follows:

Category	Value	Percent of Total	Number of losses
Fire, Lightning, Explosion and Smoke	$21.6 million	28.4%	2,215
Windstorm and Hail	$12.4 million	16.4%	637
Breakage, Collision and Upset	$2.6 million	3.4%	126
Water Damage	$1.6 million	2.1%	217
Theft, Burgalry and Robbery	$3.9 million	5.2%	902
Vandalism, Riot and Civil Disturbance	$2.1 million	2.8%	179
Collapse from Volcanic Action and Earthquake	$3.1 million	4.1%	51
Flood	$3.1 million	4.1%	105

All Other	$25.5 million	33.6%	1,107

Table 2 - Total Reported Losses Radio and TV - By Category

As can be seen, data is available and losses are significant. In summary, the survey appears to have direct application towards improvements in tower design and construction. More work is needed to enhance data collection and interpretation of the survey results.

Calculations on the Mechanical Safety Area at Transmitter towers

determining the endangered area at transmitter towers for a worst case of mechanical failure.

The transmitter towers for telecommuniction are normally from 200 ft (ca. 60m) to 350 ft (ca. 100m) high, and in some cases even more, depending on the local elevation. To accomodate the *construction* a site is required, being a square with a sidelength of about twice the towers height. However, if available properties in desired locations are not big enough to accommodate this, in an area with lower wind activity the steel ropes (guys), that hold the tower in place, are set at a steeper angle requiring a smaller area for construction, thus the square size is reduced allowing the use of a smaller piece of property. In higher wind load areas, where a steeper angle may not secure the tower safely, a big enough site must be found. But according to the local office of Industry Canada in Belleville, ON the above outlined square size is not regulated and since those towers are considered *utility structures* local building codes do not apply..

The size of the square depends only on the area needed for the actual construction of the tower with the anchors. Furthermore, the size of the security area (fence) is set to protect the site from outside hazards, and not to protect the public from hazards caused by the installation. This distance by itself is therefore inadequate as a safety zone, because it is does not give a safe area in case of a serious mechanical failure at the tower. This is a serious flaw in the site selection process.

The following calculations are based on a worst case scenario to determine the area endagered in such a situation by mechanical failure at the tower. We assume for a worst case scenario a total mechanical failure that can be caused by stress, extreme overload, defect in material, fatige, corrosion, poor workmanship, insufficient maintenance, and sabotage, as well as any combination of these factors.

In the following calculations the letter ***h*** represents the height of a given tower.

CASE A) The tower falls over

For a rigid structure (e.g. a pole or even a tree) the endangered zone is a circle with a radius of the structure's (tower) height, that is twice the height in diameter, it is accomodated by a square with such a sidelength, that is 2 x ***h***. Most sites have exactly this size and are therefore declared sufficient by the operating company.

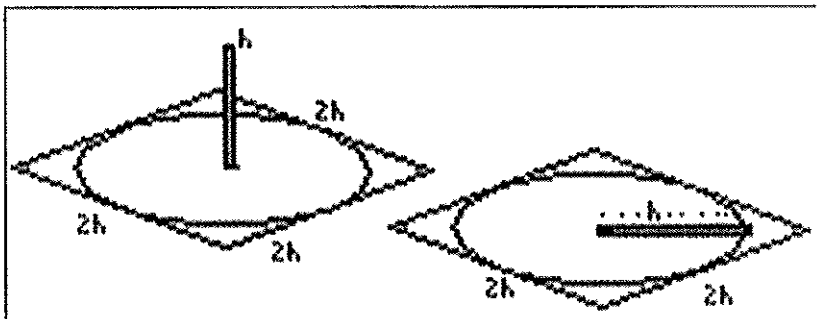


FIGURE 1: CASE A

However, most of these towers are not single pole structures; they are cage element structures secured with steel ropes (guy wires) to ground anchors. The possible hazards of these wires add to the endangered area. The upper ones of these wires are reaching up to at least about 90% of the height of the tower, that is 0.9 ***h***. They are secured to an anchor in the ground that is positioned within the square. For the calculations the anchors are assumed to be at a distance equal to 90% of the height from the center of the tower, that is also 0.9 ***h***. The length of the highest reaching wires calculates then to about 1.27 times the height of the tower, that is 1.27 ***h***.

(*apply Highschool Math* -[Pythagoras]: guy wire length = sqare-root of { (0.9 *h*) ^{2} + (0.9 *h*) ^{2}} = 1.27 *h*)

CASE B) The guy wire snaps at the top - lashing out.

The whip-lashing and falling steel rope endangers an area with a radius given by it's length around the anchor. The guy anchors are assumed to be located at 90% of the height, that is 0.9 h , from the center of the tower. Therefore the endangered zone is 0.9 ***h*** + 1.27 ***h*** = 2.17 ***h*** reaching 1.17 ***h*** outside the normal tower site (a 2 ***h*** square).
With tie wires this risk could be reduced, but a tie wire may give way under such conditions too. The theoretical distance endagered by such a wire is therefore 2.17 ***h*** from the tower center. Taking in account bends in the falling wire and obstructions in the path, a reasonable reduction of this distance by 10 % can be made. The real danger zone for mechanical failure is therefore 90% of this distance, that is 0.9 x 2.17 ***h*** = 1.953 h , rounded to 2.0 ***h***, from the center of the tower. The danger area is a circle with 4 ***h*** in diameter
Therefore, only if the site is a square with a side of at least 4 times the height of the tower, it encloses the danger zone in case of severe mechanical failure!

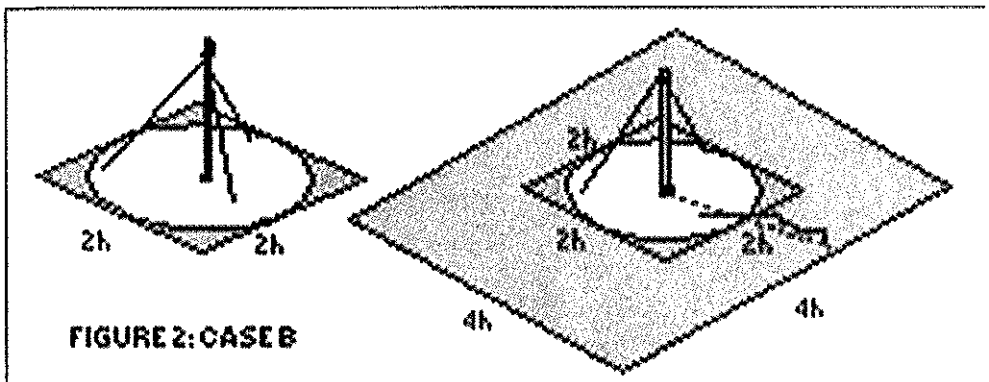


FIGURE 2: CASE B

CASE C) The wires snap at the anchor, and the tower falls.

The falling tower causes the guy wires to whip out in the direction of its fall. The longest wire is connected at 90% of the towers height. Hence, the calculations have the same numbers and the result as in case B). The distance of danger is 2 x ***h*** from the center of the tower. The radius of danger is given by this distance = 2 ***h.*** The area is a circle with 4 ***h*** in diameter
Again here, only a square with a side of 4 times the height of the tower encloses the danger zone.

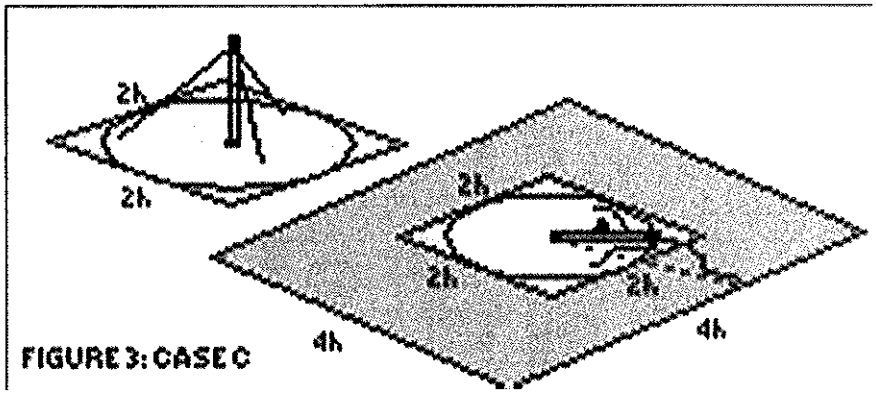


FIGURE 3: CASE C

CASE D) The top wire snaps at one anchor the top cage element breaks off and lashes out tied to a remaining anchor .

The total mechanical length is 2x wire length plus anchor distance from center that calculates to (0.9 + 2.54) ***h*** = 3.44 ***h*** applying bend and drag reduction the safe distance in this case easily calculates to 0.9 ***h*** + 0.9 x 1.27 ***h*** + 0.4 x 1.27 ***h*** = (0.9+1.143 + 0.508) ***h*** =2.551 ***h.*** The safety zone is a circel with about 5 ***h*** in diamenter requiring a squre of this side length .
The 40% drag-lash length is a favourable assumption - applying the full length of this "debris" 3.44 ***h*** *from center would require a square of about 7* ***h*** *to ensure 100% safety.*

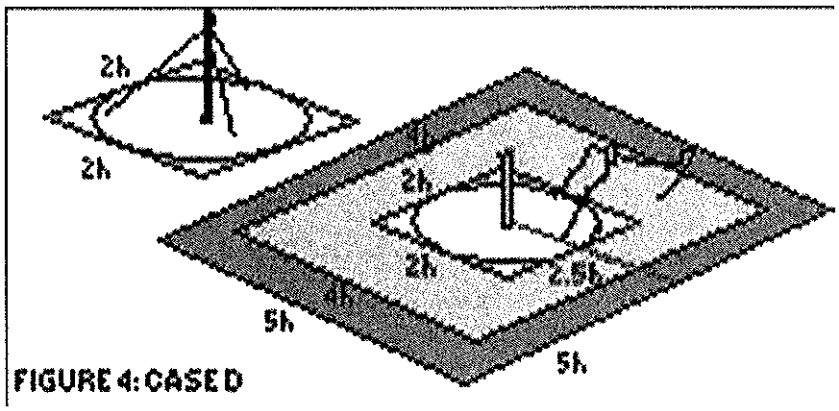


FIGURE 4: CASE D

The fenced area may be smaller, depending on regulations, but the tower must then be removed from a neighbouring property by the above calculated lengths to be at a safe distance.Therefore, any such tower should be distanced at least **twice the height** better **two and a half times the towers height** from any neighbouring property line **or even road!**

---

copyright © 1997 by Wolfgang W. Scherer

The Legal Landscape When a Tower Collapses

http :// www.mobar.org/journal/2001/julaug/oflaherty.htm

The Legal Landscape When a Tower Collapses

by Vincent F. O'Flaherty[1]

Towers are increasing as our communication needs expand. When a tower collapses or there is an accident, the legal duties and rights of tower owners, engineers who design towers, and the contractors who build and service towers come into scrutiny. This article provides in summary form a discussion with applicable case law of the legal ramifications to the tower industry.

The proliferation of towers across our national landscape has been a direct response to increased appetite for radio, television and telephone communications. The structures have also increased in size, complexity and design. Now, with the advent of a world hungry for wireless access to telephone, internet and e-mail services, the role of towers as a key "brick and mortar" component of the broadcast, internet and telecommunications industry is being fully recognized.

The legal setting, duties and responsibilities for tower owners and contractors has changed since the first broadcast towers were built. Nevertheless, many towers built 30 or 40 years ago are still in working service. The age or useful life considerations of these towers are especially relevant as television stations contemplate the transition to digital television (DTV) by choosing between installing DTV antennas on existing towers or building new towers. Decisions on whether to maintain costs while keeping aging structures warrant a recognition by tower owners of their legal duties. Also, those hired by tower owners in such projects, namely design and consulting engineers and general contractors and subcontractors, need to be aware of increasing liability risks as the tower owners upgrade, modify and replace existing towers.

An accident involving all or part of a tower is naturally a high profile event that will obtain maximum media scrutiny. This is in part because of the desire of competing stations and/or entities to capitalize on the tremendous impact of a tower collapse as well as the newsworthiness of the event.

The legal fallout from a collapse can continue for many years. An example is the collapse of the KELO television tower in South Dakota in 1968. The resulting litigation lasted more than 14 years.[2]

Today's marketplace has many towers with an increasing number of tenants leasing space that can be adversely impacted by damage. Property damage is not the only consideration. Loss of use and lost income, as well as personal injury claims from those injured in a tower collapse, are also involved. Therefore, this article will identify the major duties and responsibilities a court will look for in the event of a tower accident for the following three groups: (1) tower owners and lessors; (2) design and consulting engineers; and (3) contractors and those performing work.

I. The Duties and Responsibilities of Tower Owners/Lessors

Tower owners and lessors are not immune from claims asserted against them following a tower collapse. Courts have examined the following issues in the tower owner context: (1) theories of negligence, (2) liabilities of previous owners, (3) an owner's liability for work done by contractors, and (4) insurance coverage.

A. Negligence Theories

Generally speaking, owners and those responsible for maintaining and leasing towers have a legal duty to act reasonably to prevent and warn of those dangers which they know or should know and are not openly obvious to those working on or near towers for a particular business purpose.[3] A failure to do so is negligence.

The negligence of the tower owners can be asserted in two ways. The first way is as a defense by a person or company accused by the owner to have damaged or destroyed a tower. Such a party can rightfully assert that the damages claimed by the owner should be barred or reduced due to the owner's own fault in failing to advise or warn the person or company of all dangers the owner knew of, or should have expected to have known. The owner is in the unique position of having, in the case of some broadcast towers, more than 30 to 40 years of knowledge and documentary history. Inadequate record keeping, changes in management and engineering personnel over the years, and various consultants' reports can be pieced together as evidence of an owner's negligence. Failure to provide those working on towers access to tower records and work history will expose owners to the possibility of significant damage reduction in the event of a catastrophic claim.

This is particularly important given the age of many towers in existence and the increasing body of knowledge and understanding of tower dynamics. Owners who are hiring contractors will be found to have knowledge and responsibility for all upgrades, additions and other work performed on a tower over the years of its life. A failure to properly maintain such work records and/or a failure to supply contractors with access to any and all applicable records for their review will render tower owners with increasingly shared responsibility in the event of an accident.

Whether or not the injured party knew of, or in the exercise of ordinary care could have known, of the condition that controlled is a necessary fact in examining liability issues. However, in an age of comparative fault, even an injured party's knowledge of the risk will not always absolve an owner of liability.[4]

The second way to assert negligence of an owner is by way of a direct claim by a person suffering personal injury as a result of a collapse. It is a general rule of law that owners who contract with independent contractors to do work are not liable for harm caused to another by the acts or omissions of the contractor.[5] There are several exceptions to the rule that fall into three broad categories: (1) the

"non delegable duty" doctrine, which does not permit an owner to shift liability risks to a contractor in certain areas; (2) negligence in selecting, instructing or supervising a contractor; and (3) certain tasks that are inherently or especially dangerous. Each state has its own complex set of rules to apply in this situation, and must be examined proactively.

An attempt at holding an owner liable for injuries to a tower contractor's employee was asserted in *Kelly v. LIN Television of Texas, L.P.*[6] A 1,500-foot television tower collapsed when a 10,000 pound piece of equipment broke free from the tower and struck a guy wire. Two of the independent contractor's employees were killed in the collapse. The families of the deceased workers asserted wrongful death claims against the tower owner and others. The claim was made under Texas law that the tower owner was negligent because it exercised or retained control over the manner in which the work was performed. Further, it was asserted the tower owner had actual knowledge of the danger or condition resulting in the deaths and failed to warn of such danger. Claims presented included "negligence, negligence per se, res ipsa loquitur, negligent misrepresentation, fraudulent misrepresentation and constructive fraud." The court held that the plaintiffs failed to present sufficient evidence that the station owner retained control over the workplace. The presence of the owner's maintenance supervisor at the site, who observed the work being done but was not in charge of the manner in which the subcontractor performed, was critical to the court's decision. Additionally, evidence that the station owner discussed the status of the project with the independent contractor and oversaw reductions to power did not support an inference of control over the workplace.

Also, in *Campbell v. Barnett,*[7] a claim was asserted for an owner's negligence. In that case, a 1,610-foot tower in New Mexico collapsed during a snow, sleet and windstorm in 1960. The plaintiff was injured when portions of the tower crushed him in a nearby building. Plaintiff asserted that the owner was liable for the negligence of the tower designer in failing to design and build the tower with sufficient strength and stability to withstand wind and ice conditions. The court noted that state law permitted an owner to be liable if the owner discovered a danger, or it was obvious to him and that foreseeable danger would result. The court permitted the case to go to the jury, where a verdict was rendered in favor of the owner. This verdict was affirmed on appeal.

B. Liability of Prior Owners

The general rule is that prior tower owners owe no duty to keep a property safe after sale or transfer.[8] Prior tower owners, however, have been subjected to claims by tower purchasers following a tower's demise. One way such a claim has been asserted has been through the body of law stated in the Restatement (Second) of Torts § 353, which provides for an exception to the general rule of no liability for prior owners.[9] Section 353 requires a showing that the prior owners knew or should have known that a dangerous condition existed on the tower and failed to disclose that dangerous condition. If such a duty does exist, § 353 also provides that the prior owner's liability continues only until the new owner has had a reasonable opportunity to discover the condition and take precautions.

A claim of liability against prior owners was asserted in *Kelly v. LIN.*[10] The court refused to impose

liability on the prior owners. There was evidence that the prior owners transferred all tower records to the new owner and that all maintenance employees were transferred as well. Additional evidence of tower maintenance being regularly performed helped to shield the prior owner from liability. The court found there was a lack of any duty on the part of the prior owner.

A similar claim against a prior tower owner was made in *Woodward Communications Inc. v. Shockley Communications Corp.*[11] In 1996 Shockley sold to Woodward the assets of a radio station. Included within the assets was a 640-foot communications tower. This tower had been built in 1948. The closing for the sale took place in July, 1996. The tower collapsed during a wind and ice storm on December 31, 1996. It was determined that the tower failed when a metal bolt broke.

Woodward brought breach of contract and breach of express warranty claims against Shockley. Woodward cited to sales documentation containing a representation from the seller that it would "keep in good repair and operating efficiency, all tangible personal property." The tower was defined to be tangible personal property. The issue before the court was whether or not the failed metal bolt was a latent defect that led to the tower not being in good repair and operating efficiently at the time of the sale.

The court found in favor of the seller and refused to impose liability for breach of contract or breach of warranty. The court found that the language "keep in good repair and operating efficiency" was a commonly understood term. The seller did not represent or warrant at the sale that there were no latent or hidden defects in the tower. The court held that the seller did not have any obligation or responsibility with regard to the latent defect. Also of significance to the court was the fact that an inspection report just prior to the sale indicated that the condition of the tower was good. There was no evidence that any repairs were necessary to keep the tower in good repair and operating efficiency. Therefore, the seller met all of its obligations.

Owners can deal with these risks by way of indemnity agreements with a contractor and insurance protection. However, this does not absolutely relieve the owner from liability exposure.

C. Insurance Coverage Issues

Insurers are becoming more cautious in their underwriting and renewal of coverage for towers. A tower owner should be cognizant that insurance companies may attempt to deny and/or limit coverage for property damage following a tower's collapse. Additionally, contractors performing work on a tower may have their coverage challenged following an accident. An insurance carrier's denial of coverage for its insured contractor weakens an owner's ability to obtain full compensation following a calamity.

In *TV-3, Inc. v. Royal Ins. Co. of Am.*,[12] a 2000-foot tower collapsed in October, 1997 in Mississippi. The TV-3 litigation followed the carrier's denial of insurance benefits to its insured, the TV station. The station brought suit for breach of contract, breach of duty of good faith and fair dealing, fraud and unfair or deceptive trade practices. The carrier denied coverage based upon an exception in its policy for

towers "in the course of construction or undergoing repairs or alterations, other than routine maintenance." While the opinion was concerned with a motion to transfer venue the case is instructive on insurance risks that an owner may face following a collapse.

Another insurance scenario facing tower owners is the potential lack of coverage for a contractor doing work on a tower at the time of its collapse. In *National Union Fire Ins. Co. of Pittsburgh v Structural Sys. Technology, Inc.,*[13] three employees of a tower contractor were killed when a 2,000-foot tower collapsed in Missouri in 1988. The court interpreted a commercial general liability policy and products-completed operation policy for the general contractor. The contractor's carrier denied coverage, which placed the station at risk for having a large part of its business interruption damages uninsured. The owner was named in the suit and argued in favor of coverage. The court found coverage to exist.

II. The Duties and Responsibilities of Tower Contractors and Others Performing Work

Tower contractors have three sets of concerns in the event of an accident, including: (1) contractual and liability claims from its customer, the owner; (2) liability claims of those who did not hire the contractor, including lessees and personal injury claims; and (3) governmental oversight from OSHA or other applicable institutions.

A. Contractual and Liability Claims

The first place to start in examining a contractor's liability in the event of a tower collapse or accident will be the contractual relationship between the owner and the contractor. To the extent the contractor breached any affirmative duty to the owner, a common law cause of action for breach of an express contract would arise. Express warranties can also be found in product literature provided to an owner before entering into the contract.

Related contractual theories concerning breaches of implied warranties may also be asserted. Under a contract theory the issue of the comparative fault of the tower owner is not a determinative factor. However, it will be asserted by the contractor that any failure by the tower owner to warn of any blatant defects in the tower structure that causily related to the tower's collapse would amount to a material breach of the contract.

Beyond contractual theories, other theories of liability - including negligence, res ipsa loquitur and strict liability - will be asserted against a tower contractor. It is acknowledged that a contractor who is paid to render services to a tower owner is subject to liability for any physical harm resulting from the contractor's failure to exercise reasonable care if the tower owner suffered harm because of reliance upon the contractor. Such a failure is negligence.

Another theory of liability related to negligence is the long recognized doctrine of "res ipsa loquitur." Res ipsa loquitur is Latin for "the thing speaks for itself." It is a theory whereby negligence can be

inferred by the mere fact the accident happened and that absent someone being negligent or at fault, the accident would not have happened. The key element is that the contractor have exclusive control of the damaged product and that the event would not ordinarily have happened if reasonable care had been used.[14]

An additional cause of action is strict liability. This is the theory that holds a contractor liable if it sold a product that was in a defective condition unreasonably dangerous to a user or consumer, and the contractor has liability for any physical harm caused by the defective product.[15]

B. Responsibility for a Subcontractor's Negligence

Another consideration involves situations in which a general contractor is held liable for the negligence of subcontractors performing work on towers. In *Channel 20, Inc. v. Worldwide Tower Servs., Inc.,*[16] the court concluded that a general contractor who was in control of the premises owed a duty to the employees of subcontractors similar to that owed by an owner or occupier of land to its invitees. The court found the duty attaches regardless of whether the general contractor is in actual physical possession of the premises. Actual possession was not a necessary element of control so long as there was a right to manage, whether or not it was ever actually exercised. Therefore, the court found it proper to hold a general contractor liable for failing to discover hidden dangerous conditions and to warn the subcontractor or its employees of such conditions.

III. The Duties and Responsibilities of Design and Consulting Engineers

The role of the design and consulting engineer in a tower accident cannot be under-evaluated. As professionals carrying duties and responsibilities that go with their professional licenses, engineers owe a duty to the tower owners who hire them and the public to exercise that degree of skill, learning and care ordinarily exercised and practiced by other professionals and engineers under the same or similar circumstances. A failure to do so will be recognized as negligence, thereby exposing engineers to liability for damages associated with a tower's collapse.

Each state's laws impose varying rules for examining liability of professional engineers in the event of a tower's collapse. In addition to negligence theories based upon active negligence and/or failure to warn, other areas looked at by the courts include breach of contract, strict liability and fraud.

A. Express Warranty

A television station that truly experienced bad luck was KELO in South Dakota. In 1968 it lost a new 2,000-foot tower when it was struck by an airplane. Thereafter, a 2,000-foot tower was built. Unfortunately, in January, 1975 this tower collapsed during a blizzard. The design engineer of the second tower, Dresser Industries, Inc. was subjected to several suits in which its liability as a designer was examined. In *Community Television Servs., Inc. v. Dresser Indus.,*[17] the designer was sued under

2000).

[12] *TV-3, Inc. v. Royal Ins. Co. of Am.*, 28 F. Supp. 2d 407 (E.D. Tex. 1998).

[13] *National Union Fire Ins. Co. of Pittsburgh v Structural Sys. Tech., Inc.*, 964 F.2d 759 (8th Cir. 1992).

[14] *Larry D. Hudson, LDH, Inc. v. Townsend Assocs., Inc.*, 704 F. Supp. 207 (D. Kan 1988).

[15] Restatement (Second) of Torts § 402(A) (1966).

[16] *Channel 20, Inc. v. World Wide Towers Servs., Inc.*, 607 F. Supp. 551 (S.D. Tex. 1985).

[17] *Community Television Servs., Inc.*, 435 F. Supp. 214.

[18] *KSLA-TV, Inc. v. Radio Corp. of Am.*, 693 F.2d 544 (5th Cir. 1982).

[19] *Mt. Hood Radio & Television Broadcasting Corp. v. Dresser Indus., Inc.*, 530 P.2d 72 (Ore. 1974).

[20] *City of Kennetti v. Akers*, 564 S.W.2d 41 (Mo. banc 1978).

[21] *Northern States Power Co. v. ITT Meyer Indus.*, 777 F.2d 405 (8th Cir. 1985).

[22] *Moerch v. Srepco Electronics*, 1988 Oh. App. LEXIS 1181 (Ohio Ct. App. 1988).

[23] *Loos v. American Energy Savers, Inc.*, 522 N.E. 2d 841 (Ill. App. Ct. 1988).

(9)

September 8, 2014

Russ Reich and City of Palo Alto,

I am writing to ask you to DENY the application for a celltower at 3672 Middlefield Road for reasons of health and safety of our children from new environmental factors brought into the site with the installation of such a tower.

The equipment shed will emit objectionable odors of a running backup generator, **exposing the general public and children to toxic air contaminants**. This generator is called out in the initial proposal, and the cell tower operator can add it at any time later to meet the colocation requirements of a second or third carrier loaded onto the monopole, which is fully anticipated in the application.

The proposed site would be creating a hazard to the public of the environment as a result of **routine transport and use of hazardous materials**, within less than one quarter mile of multiple schools and library (Fairmeadow School, Challenger School, Covenant Childrens Center, Mitchell Park, Mitchell Park Library and Community Center), and creating a hazard to users of the site to contamination in soil or groundwater.

Moreover, this celltower and its significantly sized equipment shed immediately next to the batting cages, the ballfield, the other equipment sheds which are open ever day...and with high voltage electrical equipment and hazardous materials inside will be an **attractive nuisance**, tempting kids to climb it and possibly hurt themselves by falling off, or break inside leading to personal injury.

For these reasons of public health and safety near our children who are at this site every day of the week, I ask you to deny the celltower application at 3672 Middlefield Road in Palo Alto.

Sincerely,

Amy Lutz
3223 Alma Street
Palo Alto, CA 94306

(10)

We Oppose the New 65' Cell Tower at Little League Ballpark

Verizon Wireless is proposing a new 65' cell tower at the Palo Alto Little League Ballpark located at 3672 Middlefield Road. It has faced neighbors' strong resistance over the last 4 years.

Neighbors' Arguments Against the Proposed Towers

Once established, cell towers are no longer subject to Palo Alto City Code/Ordinances/Control: Per the fcc.gov site, typical cell towers can be up to 200 feet tall. Today's 65 feet cell tower can grow to much higher and uglier.

Property value erosion: Peer reviewed studies (email if you'd like them forwarded to you) show 20% lower property values near such huge towers. With all property values being based in large part on neighborhood "comps," the ripple effect negatively impacts property values well beyond those that can "see" the tower.

Defacing A 60+ Year Old Historical Property: The ballpark was the first Little League field in the County. Established in the early 1950s, it was formally deemed by the City of Palo Alto as potentially eligible as a California Historic Resources site in 1998.

Safety: The Ballpark is the neighborhood hub for kids and all Palo Alto Little League ball players. It is immediately adjacent to Mitchell Park, the new Mitchell Park Library and Community Center, and Covenant Children's Center. This is not a place to add a top-heavy, 65' tall (initially), 24" diameter tower, plus electrical equipment sheds, and hydrogen fuel cell batteries.

Failure of Wireless Co to demonstrate need/exhaust all other locations: Verizon has the best coverage of any carrier in this particular neighborhood. According to its own website, they have 100% coverage at this location.

Nuisance/Invasion of Privacy, Lack of Fit with Residential Neighborhood: Such an installation would involve regular industrial maintenance truck incursions. The air conditioning unit and radios emit a droning sound 24 hours a day, 365 days a year.

Dangerous Approval Precedent to set for R-1 neighborhoods: Approving these towers in this R-1 zoned neighborhood surrounded by homes, schools, and public parks would set a dangerous precedent which could lead the City to ignore its own R-1 zoning and put such towers anywhere they deemed finacially advantagious.

R-1 Property and Neighborhood Is Incompatible with 65' Commercial Cell tower: The Ballpark is three acres zoned as Single Family Residential. Little League of Palo Alto was given the opportunity to re-zone as a Public Facility Zone instead of R1 but declined the opportunity.

Palo Alto Little League Out of Compliance: The Ballpark is currently zoned as R-1 and operates under a variance as a ballpark. It also operates lights in the evening under a variance for the height of the light poles and a Conditional Use Permit from Palo Alto, which it is in violation of. Before PALL receives a further CUP for a cell tower, it needs to be compliant with the one it has.

Aesthetically Destructive: A 65 foot celltower (potentially much taller in the near future) in plain sight above nearby locations,, with a 9.5 foot tall 440 square foot chainlink-ringed structure.

We Oppose the New 65' Cell Tower at Little League Ballpark

Signatures on subsequent pages.

(1)

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
	Michelle Cai	3826 Nathan Way, Palo Alto
	T. Rankhorst	2220 Waverley St. Palo Alto 94301
8/31/14	Emma Ng	1083 Moffett Circle, PA, CA 94303
	Francesa Mazzanti	476 Maureen Ave PA 94306
	Brendon Kim	3810 May Ct Palo Alto CA 94303
	ALBERTO POGGESI	3809 Middlefield Rd
	Jane Liu	606 Wellsbury Ct.
	Seem Qiu	606 Wellsbury Ct.
	Amy Lutz	3223 Alma St

(2)

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
Fengli	Fengli	789. Encina Grande Dr. Palo Alto. CA 943
Li Tang	Li Tang	550 GEORGIA AVE, Palo Alto, CA 94
Chiang	Chiang Z	3586 La Donna Ave. Palo Alto, CA 94306
Sophie	Sophie Ue	3416 Cowper St. Palo Alto, CA 94306
SherrieZheng		3104 David Ave CA 94305
	Jean Qiu	110 E Charleston PA CA 94306
Melody Song	Melody Song	792 Los Robles Ave. PA 9439
	Yan Fei	719 Rosewood DR, 9430
		841 Ames Ave. 94303
M Heneng	M. Heneney	4101 Park BLVD 94306
	Xiangyang Gu	3179 Ramona St, 94306
	HELEN P YOUNG	3387 KIPLING ST. 94306

(3)

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
	Ann Xu	4198 King Arthur Ct., PA 9430
	Maria Mew	782 Encina Grande. Dr. 943
	Diane Sun	628 Georgian Ave, PA 94
	Grace Mah	758 Christine Dr., PA 94303
	Xiaoyi Xu	804 Los Robles Ave. 943
Xiang Ying wen	Xiang Ying wen	curter Ave PA306
	Jessica Yen	991 Amarillo Ave 94303
	Wei-Jing Zeng	4161 King Arthur Ct, 943
Helen Wang		
Jianhui	Jianhui Miao	182 Hemlock Ct CA 94306
Xanhua Xiao		3831 May Ct palo alto
	Bin He	478 King Arthur Ct, CA 94306

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
	ARNOLD	711 MAGNOLIA AVE
		ALAMEDA PA 94303
	Shixue Jin	3803 Ross Rd. PA 94303
	Dayi Pu	3803 Ross Rd. PA 94303
	Peter Xu	3785 Middlefield RD 94303
	Ran Hu	3785 Middlefield Road 94303
	SRI JASI	3669 MIDDLEFIELD Rd 94303
	Carole Tait	940 Embarcadero Rd 94303
	Hope Wu	3548 South Court 94306
	Betty Yang	3805 Louis Rd. PA 94303
	Jianying Wang	4270 Wilkie Way
	Chalia Sinai	2210 Rock St #206
	Meili Liu	~~850 81 3 0012~~
		410 Wilton Ave.
8/31/14	Charlene Hao	Palo Alto, 3751 Middlefield Rd. PA. CA 94303

(5)

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
	Hong Li	3470 Jamie Way, Palo Alto
	Lizhu Zhang	656 Cypress Ave. Apt 7125 Palo Alto
		649 University Ave. Apt H421 Palo Alto CA 94301
Zhenlin yang		
Corinne Shi		481 Maureen Ave Palo Alto. CA 94306
Susie Pom	Susie Pon	210 Walter Hays Dr.
Peggy Sie	Peggy Sie	1021 S. Velarde St Alhambra CA 91801
D. Nguyen	DINGUYEN	771-A Loma Verde, P.A. 94303
Jacquelyn L. Criner	Jacquelyn Criner	3313 Vernon Terrace PA 94303
Swati Solanki	Swati Solanki	
	Jie Lin Leng	jieleng88@yahoo.com 906 Amarillo Ave. Palo Alto. CA 94303
		08-31-14
Kailian Luo	Kailian Luo	3751 Middlefield Rd. Palo Alto, CA 94303

(6)

WE OPPOSE VERIZON'S 65 FT TALL CELL TOWER AT THE PALO ALTO *LITTLE LEAGUE BALLPARK*, A Historical Site in the Heart of Our Residential Neighborhood

Signature	Name	ADDRESS
[illegible]	Linda Xu	847 sycamore Dr.
Zhi Yi	ZHI YI	214 Greenoaks Dr. Atherton. CA. 94027
8/31/14 Funda Y	TEUDIRA Nico	705 Newell Rd, Palo Alto
Elyse Feldman	ELYSE Feldman	791 Christine Dr PA 94303
Mei Chung		2972 clara Dr. PA 94303
Mei		
Sandra Wang		758 Mayview Ave PA, 94303
[illegible]		
[illegible]	Shahdad Afshar	700 Mayview Ave. Palo Alto, CA 94303
connie	Connie Cho	3751 Mt Middlefield Rd PA CA 94303

(11)

9/7/2014

Russ Reich and City Planning,

I oppose the application to site a Personal Wireless Services Facility (PWSF - cell tower and antenna base station) on the grounds of our local Little League Ballpark at 3672 Middlefield Road, Palo Alto, California which is zoned R-1 (8000).

It is clearly an inappropriate residential zone location to place a 65 foot cell tower based on the following court information and legal precedent:

- Local government control of land use i.e. zoning, in the United States dates back to 1916. A 1926 Supreme Court decision, *Euclid v. Ambler Realty Co.*, reinforces the principle that the single-family residential use is at the top of the hierarchy of land uses to be protected by zoning regulations. Zoning regulations are written to implement municipal planning priorities whose purpose is to mitigate negative externalities that one real estate owner's use could impose on other members of the community.

- While upholding local siting authority, the Telecommunications Act of 1996 (TCA) requires that towns not prohibit personal wireless services (PWS). It requires that zoning permit applications be acted upon in a timely manner. It requires that local government not discriminate among providers of functionally equivalent services. It requires that local government base its decisions on "substantial evidence in a written record."

- Local government is not required to issue a zoning permit unless and until an application for a Personal Wireless Services Facility proposal demonstrates that it is in compliance with locally enacted zoning regulations. The technical specifications of the antennas proposed for the site must be included in every application so that local government can evaluate whether the proposed site is the only option available. Local government should seek the expertise of an independent radiofrequency consultant to evaluate the technical specifications of each application to site PWSFs.

Both professional real estate appraisal literature and federal court decisions validate property devaluation arguments.

- In the Summer 2005 issue of *The Appraisal Journal*: volume 73/3, pp. 257-277, authors Sandy G. Bond, PhD of Auckland University, New Zealand, and a director of the International Real Estate Society, and co-authors published the study entitled, "The impact of cell phone towers on house prices in residential neighborhoods." Both the survey examining residents' perception of living near cellular phone base stations (CPBS) and the market sales study analyzing actual property sales data found that CPBS have a negative impact on the prices of houses in the study areas.

- Based on their professional experience, Real Estate brokers and agents recognize that the presence of a nearby cell tower brings on a definite and ultimate decline in the potential buyers pool for homes in the vicinity. They point out that allowing construction of a cell tower which is a commercial/industrial use in a designated residential zone alters the character and aesthetics of the surrounding area. They have stated that this shrinking of the buyer pool can translate to a loss of 30 to 50% in the value of a home. Some homes in this situation are impossible for agents to sell.

- A Pennsylvania decision from the U. S. Federal Court of Appeals for the 3rd Circuit defines the TCA's requirement that a municipality provide wireless service.

> *In Penn Township we established a two-prong test to determine if the decision of a local zoning authority has 'the effect of prohibiting the provision of personal wireless services.' 47 U.S.C. S 332(c)(7)(B)(i)(II). It requires that the service provider first 'show that its facility will fill an existing significant gap in the ability of remote users to access the national telephone network.' Penn Township, 196 F.3d at 480. If this burden is met, the provider must still prove 'that the manner in which it proposes to fill the significant gap in service is the least intrusive on the values that the denial sought to serve.'*

- The "least intrusive manner" takes into consideration the adverse impacts of the development on the character of the neighborhood in which the site is found, and the potential for property devaluation of the adjoining landowners.

- In Massachusetts decision from the U.S. Federal Court of Appeals for the 1st Circuit (found at: http://laws.findlaw.com/1st/001164.html), the judge determined that a cellular tower is a "visual intrusion" that will affect property values in a residential neighborhood. The plaintiff, Southwestern Bell, applied for a permit to build a 150-foot cellular phone tower in the center of a small town (Leicester, MA). Southwestern Bell claimed that it needed the tower to provide adequate coverage in the area. The town board unanimously denied the application after the public demonstrated significant opposition to it at the permit hearings. The board's written denial said that the tower would be an "attractive nuisance" because it was close to the schools, would adversely affect property values, and didn't satisfy the requirement of "minimum visual impact" because there were no trees to hide it.

  Southwestern Bell argued that the denial violated the Telecommunications Act, 47 U.S.C. Sect. 332(c)(7), because there wasn't "substantial evidence" in the record to support it. But the court said that:

> *[a]lthough some of the evidence before the board did consist of general statements that the tower was an eyesore...[t]he majority of the objections to the visual impact of the tower specifically addressed whether this 150-foot tower was appropriate for this particular location, on the top of a fifty-foot hill in the middle of a cleared field...*
>
> *The location has no trees, was in the geographic center of town, would be visible at all seasons of the year, and would be seen daily by approximately 25% of the town's population. It was also located in close proximity to three schools and two residential subdivisions...Indeed, the evidence supports a conclusion that the proposed tower was of a different magnitude than anything else in the vicinity. When combined with the other evidence demonstrating that the tower was out of keeping with the residential uses in close proximity to it, we conclude that reasonable minds would find adequate evidentiary support for the denial of...[the] permit application.*

The court also denied Southern Bell's argument that it was the zoning board's responsibility to find alternative sites where there would be less visual impact.

We see nothing in the [Act] that would support placing a burden upon the board to present evidence that there were other sites available to Southwestern Bell with a lesser minimal visual impact...The burden would be on Southwestern Bell.

- The AT&T v. Virginia Beach decision from the 4th Federal Circuit Court of Appeals describes the judges' expectation that a municipality and its concerned citizens build "substantial evidence in a written record" in order to be able to deny a wireless permit application under the terms of the TCA of 1996. This denial was based on the argument that a PWS tower was out of character with the scenic value of the neighborhood of the proposed site. The decision is found at: http://laws.findlaw.com/4th/972389.html

- In the Ho-Ho-Kus, NJ decision from the 3rd Federal Circuit Court, the judge upheld the property devaluation argument of the expert witness hired by the citizens group. This decision is available at: http://laws.findlaw.com/3rd/992322p.html

The local government officials of the City of Palo Alto must not leave it up to tower site developers or PWS providers to interpret the requirements of the TCA of 1996. There is an ample record from the federal courts and from professional real estate appraisers and agents to justify denying permits for inappropriate tower site proposals. Denying a specific permit does not equal denying wireless service. Local authority to preserve property values has not been removed by the language of the TCA of 1996.

For these reasons and as a neighbor close to the property, I ask that the City of Palo Alto REJECT the Verizon application to place an unsightly 65 foot monopole celltower, clearly visible from both Middlefield Road, all the homes adjacent to the ballpark, the adjacent Covenant Childcare Center (which it hovers over), and the second floor of our new Flagship Library in Palo Alto which is next door and is scheduled to open in just a few months.

Signed,

Mary L. Yotopoulos
315 Homer Avenue #101
Palo Alto,
CA. 94301

(12)

September 1, 2014

City of Palo Alto Planning,

I request that the City of Palo Alto REJECT the celltower application for 3672 Middlefield Road, as it will destroy the cultural environment of one of Palo Alto's most historic sports facilities, one that has relevance to California and perhaps even nationwide...the Palo Alto Little League Ballpark. Why we would mar this historic property as a City is beyond me.

This site deserves recognition as such and for this reason some of the founders' families have banded together to submit this property to the Palo Alto Historic Inventory, having done all the research in conjunction with the relevant Palo Alto historic experts.

The City of Palo Alto's Historic Inventory lists noteworthy examples of the work of important individual designers and architectural eras and traditions, as well as structures whose background is associated with important events or trends in the history of the city, state, or nation. The city classifies buildings at the local level into the following categories:

-Category 1 (Exceptional Building): any building or group of buildings of preeminent national or state importance, meritorious work of the best architects or an outstanding example of the stylistic development of architecture in the United States. An exceptional building has had either no exterior modifications or such minor ones that the overall appearance of the building is in its original character.

In addition, the City has specific criteria:

-The structure or site is identified with the lives of historic people or with important events in the city, state, or nation

-The structure or site is particularly representative of an architectural style or way of life important to the city, state, or nation

-The structure or site is an example of a type of building, which was once common, but is now rare

-The structure or site is connected with a business or use, which was once common, but is now rare

-The architect or building was important

-The structure or site contains elements demonstrating outstanding attention to architectural design, detail, materials or craftsmanship

The historic Little League ballpark clearly meets the above criteria.

If this celltower is constructed in this location, it will change the fundamental use of the property from what has been over the past 65 years exclusively baseball to a new commercial usage, and **the property will no longer be eligible for the California or National Register, as new construction will**

fundamentally alter the landscape and dedicated use which has been substantially preserved since its founding.

The community is concerned with the defacing of a 60+ year old Historical Palo Alto property. Little League of Palo Alto would be giving Verizon and other carriers extensive easements across their property for maintenance and build-out that would severely hamper future uses of the ballpark property. To erect cell towers here would violate the intent and history of the property and all those who donated the funds to purchase the property in the early 50s, such as Bill Alhouse who was commemorated as a Palo Alto Tall Tree Honoree and outstanding citizen for this.

The property is comprised of a stadium/sports arena and its clubhouse and is well over 40 years old. The property is historic with mid-century modern architecture. A State of California placard commemorating the founders resides on the exterior of the Little League Ballpark Clubhouse building and identifies the historic property having been created as the region's first such ballpark in 1952. The property and its structures are clearly designated in the City of Palo Alto GIS system and the County's Parcel Report system as having been "Deemed Potentially Eligible for the California Register of Historic Resources in 1998"...one of a select group of such eligible sites in Palo Alto. The property was also flagged for the architecture of its structure (the 1946 clubhouse) as being (at a minimum) CRHR eligible in the "windshield drive by" Palo Alto Historic Survey Update (Corbett and Bradley for Dames & Moore in 2000), which took into account only the physical structure and not the cultural landscape, events, or persons associated with the property. It has not yet been formally evaluated for National Register, California Register, or Palo Alto Historic Inventory.

You will find below substantial documentation as to the Ballpark's historic relevance. Please consider them carefully.

It appears that the ballpark is the first dedicated Little League baseball field under private ownership (owned by the Palo Alto Little League organization) in California and may be the oldest privately owned dedicated Little League field in the nation (to be confirmed). It still exists in operation to this day with the same original purpose- indicating significant post-war foresight by its founders who initiated a vision that just years later would have been prohibitively expensive given the significant growth of Stanford and the new City of Palo Alto. Since inception, this ballpark has had one dedicated purpose, has been privately owned, and has continued to function exclusively as a Little League field for the community. This was quite unusual for its time when Little League in most communities was a public function held on public fields. By virtue of its private ownership, it avoided the financial challenges and repatriation of land that many municipalities have faced in the past 60+ years, severely impacting the staying power of such Little League fields. The site remains Northern California's flagship Little League ballpark in use to this day.

Moreover, it also appears that this ballpark was at least among the first (founders and neighbors can find no evidence that it is not the first) sunken diamond-design Little League ballparks in the nation. It precedes the famous Howard J Lamade Stadium in South Williamsport, Pennsylvania, the home of the Little League World Series since 1959, which also has a sunken diamond design but was constructed 7 years later.

Additionally, the Palo Alto Little League appears to be among the first created in California (perhaps the very first), created in 1951, the same year as San Bernardino's). Notably, Palo Alto Little League's ballpark was built within one year of organizing, quite unusual for an newly established organization to have the means to finance and build a ballpark so quickly.

The first two Little League organizations ever created in California were the Palo Alto American Little League in Palo Alto and the Jaycee Little League in San Bernardino, both formed in 1951. It is unclear which was created first, although it the Jaycees did play in the 1951 Little League World Series, whereas Palo Alto did not field a team that year. The Palo Alto National Little League was also formed in 1952. Both these leagues were created by the founders of this property. The Little League organization itself was created on the east coast in 1939.

The Little League Ballpark's opening ceremony for the property was on 6/29/52 and was attended by Palo Alto Little League's first President and League Commissioner, baseball great Ty Cobb. It was a **historical event** which marked the movement of youth baseball into the West Coast and featured both Ty as one of first men ever voted into the Baseball Hall of Fame and his family. Cobb spoke at the opening (and they could scarcely get him off the field to start the game). The Ballpark's 50th Anniversary featured Ty Cobb's grandson and great grandson throwing out the first ball of the day. Ty Cobb is regarded by some historians and journalists as the best player of the dead-ball era, and is generally seen as one of the greatest players of all time (wikipedia). He still holds the highest career batting average ever. The opening day also featured Pop Warner (creator of Pop Warner football), one of college football's greatest coaches, inducted into the Coach's Hall of Fame in 1951.

The Ballpark's founders clearly include **individuals whose lives were nationally significant in our past**:

-Bill Alhouse, National Little League Hall of Fame inductee, American Baseball Coaches Hall of Fame and ex-Brooklyn Dodgers player, who with others bought the land.

-John Hurlbut, Vice-President of the NCAA, Professor of Law at Stanford University who taught Chief Justice William Rehnquist and Associate Justice Sandra Day O'Connor of the Supreme Court of the US

-Joe Eichler, American 20th Century post-war real estate developer known for developing residential subdivisions of Mid-Century modern style tract housing in California. He was one of the influential advocates of bringing modern architecture from custom residences and large corporate buildings to general public availability (from Wikipedia)

John Arrilaga Sr, American billionaire real estate mogul and philanthropist, one of the largest landowners in Silicon Valley and the man to help create many of the structures that make up Silicon Valley today (from Wikipedia) later supported the further buildout of the property with paving, walls, etc.. John donated money for these structures under the guideline that the ballpark was never to be a commercial venue (for example, with any form of advertisement, etc.), a stipulation which is still known and respected by the Little League Ballpark Board to this day.

Dozens of professional players like Frank Farmer (pro baseball, '41) and Hank Norberg (pro football '46-'48) coached the kids on this field, and storied coaches like Ted Tollner (USC, SD State, Raiders) learned to play baseball on this very field as youth.

The project was architected by prominent Bay Area architect Morgan Stedman (who has at least one of his properties listed as a Local Historic Resource). Stedman was a licensed architect for over 30 years, working in his profession for about 50 years, most prominently in the 50s and 60s. He reached fellowship status in the AIA in the 1970s, a program developed by the national organization to elevate those architects who have made a significant contribution to architecture and society, and who have achieved a standard of excellence in the profession.

The sunken field design appears to be the first in Little League history in California and perhaps the nation. The **property embodies distinctive characteristics of the period that represent** the work of a master and posesses high artistic values, apparently being the first sunken diamond Little League Ballfield designed as an exact replica to the Stanford University legendary Sunken Diamond created in 1931, down to the fact that the field was positioned so that the shadow at the end of the day slides right down the right field foul line at dusk in an identical way as it does at Stanford directionally by way of latitude and longitude. This meticulous attention to detail and the exhaustive work of removing a significant depth of soil across the entire face of the field (many tons of soil) and relocating it took significant dedication by a committed team of community leaders to create something unique which remains today.

The two story clubhouse design is unique to its era, with the club above and concession, restrooms below. The property appears to be nationally unique in that it is one of the few privately owned Little League fields and clubhouses, which required a great deal of foresight by its founders in the late 40s and early 50s.

Overall, the property has a high degree of integrity, never having been moved or substantially altered inside or outside, with many of its original features still intact. Its orientation and surroundings have not changed and continue to be city park and residences, consistent with the original grid of Palo Alto.

The ballpark's character defining features are its sunken diamond design, historical clubhouse with club above and restrooms/concession stand below, and dedication of function exclusively as a Little League ballpark...all of which exist today. There appear to be no other examples in the Bay Area, California, or even the nation, as far as we can determine, of such an early Little League sunken ballpark with clubhouse. Moreover, 3672 Middlefield appears to be a first as a privately owned Little League ballpark.

For the above reasons, we encourage that the City of Palo Alto consider the historic nature and current application of the Palo Alto Little League Ballpark at 3672 Middlefield Road to the Palo Alto Historic Resources Board for the Palo Alto Historic Inventory in its evaluation of whether to permit the construction of an 18 inch wide, 65 foot tall monopole celltower and new equipment shed on this historic property.

I request that the City of Palo Alto REJECT this proposal at 3672 Middlefield Road.

Signed,

Jason Yotopoulos

3737 Middlefield Road

Palo Alto, CA 94303

(13)

September 6, 2014

Amy French,

Thank you for forwarding the historic nomination process information to Beth Bunnenberg, and I understand from Steve Staigner of the Palo Alto Historical Association and members of the Palo Alto Historic Resources Board that Brian Backlund, the City of Palo Alto's Historic Preservation Planner, has retired, that his boss Steven Turner has also recently left, which makes you Acting Historic Resources Officer for the City of Palo Alto.

A groundswell of support for nominating the Little League Ballpark has developed and a group has pulled together a set of well documented historical material, with Steve Staigner's support and the support of founders' families, old coaches, etc.

As a result, we would like to accept Beth Bunnenberg's warm invitation for a study session with the Historic Review Board over the next few weeks to review the application to nominate the Palo Alto Little League Ballpark at 3672 Middlefield Road for the Palo Alto Historic Inventory, with myself as the founder's family member sponsoring the application.

Amy, please confirm the date that would be best for the group to meet with the Historic Resources Board over the next few weeks so that I can inform the group of founders and we are prepared to present the case for the Ballpark at that time. I can be reached best via email at cdgamage@juno.com with your confirmation.

Sincerely,

Crystal Gamage

Crystal Gamage

ATTACHMENT H
COMPREHENSIVE PLAN TABLE
3672 Middlefield Road / File No. 14PLN-00071

Policy L-7: Evaluate changes in land use in the context of regional needs, overall City welfare and objectives, as well as the desires of surrounding neighborhoods.	The addition of the cell tower use to the site improves wireless coverage for the area while having a very minimal visual impact to the site. It also has no impact on the existing use of the property. Some in the surrounding neighborhood oppose the tower for various reasons but others have expressed the desire to have the tower to improve their cell service.
Policy L-12: Preserve the character of residential neighborhoods by encouraging new structures or remodel structures to be compatible with the neighborhood and adjacent structures.	This cell tower design, a 65 foot tall pole now reduced to an 18 inch diameter to support antennas at the top and lighting at 60 feet, would not be incompatible with adjacent structures (particularly, the 60 foot tall light poles) nor with the residential neighborhood located across Middlefield Road. Some neighbors have made statements that the placement of a cell tower in a residential neighborhood should not be allowed and that they should be limited to commercial areas of town only. For residents to have good cellular phone service, cell towers are necessary in one form or another within residential neighborhoods. Placing them only in commercial areas would be inadequate to provide service to the neighborhoods, unless they were much taller, which could cause significant visual impact to the community. There are already several existing cell tower facilities in close proximity to the project site within the neighborhood. This application preserves the neighborhood by proposing a tower that would have a minimal visual impact to the neighborhood. The four 60 foot ball park light towers are already a part of the neighborhood fabric. The addition of 5 feet in height for the new antennas is a very minor change.
Policy L-48: Promote high quality, creative design and site planning that is compatible with surrounding development and public spaces	The proposed facility would be compatible with surrounding development and public spaces, since the proposed design is a stealth facility tower that also functions as one of four ball field light towers on the site. It would be five feet taller and

	would have a thicker pole structure (by six inches), but the visual impact of these modifications are very minor in comparison to other possible alternatives such as adding additional height to other cell towers on nearby Middlefield Road properties (specifically, the "flagpole" at Station 4 or the "tree" at Acheive. The design of the tower and its equipment shelter purposefully integrate with the existing ballpark property. The height of existing trees as well as the other light towers, help to minimize the visual impact of the proposed tower.
Policy L-51: Encourage public and private upkeep and preservation of resources that have historic merit, including residences listed in the historic inventory.	While the subject property is not a designated historic resource, there are some members of the community that have begun an effort to have the property designated as a historic resource. The proposed cell tower application has been analyzed by a qualified outside consultant to determine if the project would negatively impact the property, if it was in fact found to be a historic resource. The analysis concluded that the project would not impact the resource. Income from the project may help the property owner to preserve, maintain, and rehabilitate the remaining historic structures on the site, and continue to use the site as a ballfield..
Policy L-79: Design public infrastructure including paving, signs, utility structures, parking garages and parking lots to meet high quality urban design standards. Look for opportunities to use art and artists in the design of public infrastructure. Remove or mitigate elements of existing infrastructure that are unsightly or visually disruptive.	While the proposed Verizon facility is not a piece of the public utility infrastructure, it is a private component of the utility infrastructure within the City. The communications network is a vital service for the community that is proposed to be improved by this application. This improvement is proposed in such a way that is does meet high quality urban design standards as it is designed to have the least visual impact and fit into the site and neighborhood. Art was not used in this installation as it would potentially call greater attention in an instance that less visual impact is desired. One does not need to look very far to see our utility infrastructure. It is everywhere we look. Large transformers and unattractive utility poles are a common part of the neighborhood fabric. This application has proposed a utility facility that would present a kinder and gentler

	design aesthetic than that which already exists. This is the goal of the design review process and this application represents a good example of how an otherwise unattractive utility feature (a cell tower) has been thoughtfully designed such that it is well integrated into the built environment.
Goal H-1: Ensure the preservation of the unique character of the city's residential neighborhoods. And **Goal H-2:** Support the construction of housing near schools, transit, parks, shopping, employment, and cultural institutions.	Some members of the community have commented that the approval of the cell tower at the ball park site would violate the City's Comprehensive Plan related to the preservation of residential uses and the preservation of residential neighborhoods. This is not accurate. The approval of the cell tower application would not convert a residentially zoned property to a commercial use. The current use is not residential. The primary use of the site would remain a private recreational facility, the same use that has existed on the site for over 60 years. The cell tower would not impact the existing use or the neighborhood nor would it prevent the property from being developed for single family housing in the future. The cell tower proposal does not represent the redevelopment of the site for a new use; the existing use will remain.
Policy N-17: Preserve and protect heritage trees, including native oaks and other significant trees, on public and private property.	The proposal preserves all the significant trees on the property. No trees would be impacted by the proposed development.
N-27: Reduce emission of particulates from wood burning stoves, construction activity, and automobiles, and other sources. **Policy N-30:** Minimize the use of toxic and hazardous materials. Encourage the use of alternative materials and practices that are environmentally benign.	The proposal includes a hydrogen fuel cell backup power supply that has no emission of particulates or toxics rather than the typical diesel generator. The hydrogen fuel cell system is a superior environmentally friendly alternative to diesel. It is quieter, has no toxic air emissions and eliminates the need for the storage of gallons of diesel fuel on site.
Policy N-39: Encourage the location of land uses in areas the compatible noise environments. Use the guidelines in the table "Land Use Compatibility for Community Noise Environment" to determine compatibility. **Policy N-40:** Evaluate the potential for noise pollution and ways to reduce noise	The proposed facility would not generate noise that would exceed these guidelines nor would it generate any noise that would impact adjacent uses or residences. A noise study has been conducted to ensure that any noise source will comply with the City's noise ordinance and these Comprehensive Plan Policies.

impacts when reviewing development and activities in Palo Alto and surrounding communities.	
Policy B-13: Support the development of technologically-advanced communication infrastructure and other improvements that will facilitate the growth of emerging telecommunications industries. **Policy B-14:** Work with electronic information network providers to maximize potential benefits for Palo Alto businesses, schools, residences, and other potential users.	Approval of the wireless cell tower application would support this advanced communication technology (wireless communication) and improve service to the community.

Attachment I





verizon wireless

Meadow Middlefield **Site # 117403** **Looking West from Parking Lot**

3672 Middlefield Road
Palo Alto, CA 94303

View #1

3/14/14

Applied Imagination 510 914-0500





verizon wireless

Meadow Middlefield **Site # 117403** **Looking West from Parking Lot**

3672 Middlefield Road
Palo Alto, CA 94303

View #1

9/11/14

Applied Imagination 510 914-0500





verizon wireless

Meadow Middlefield **Site # 117403** **Looking North**

3672 Middlefield Road
Palo Alto, CA 94303

3/14/14

View #2

Applied Imagination 510 914-0500

Attachment I: Project Plans (ARB Members Only) or they are also available on the City's
website at <http://goo.gl/95W5lM>