Summary of Questions for the ARB

Design Configurations

Is there a preference between a pole mounted or ground mounted cabinet for the emergency battery backup?

Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1&3 or horizontal as in Config 2), even if no battery exists on the pole?

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?

Ground Cabinet

If a ground based cabinet is used, does the ARB prefer a cabinet painted to blend in with surroundings or the use of street furniture to “stealth” the emergency battery backup?

If the ground cabinet is to be painted, Verizon Wireless is seeking feedback from the Architectural Review Board on a shade of green paint to be used for ground based emergency battery equipment.

Is street furniture preferred over an art wrap for the ground based emergency battery cabinet?

If street furniture is preferred, is there a favored design?

If an art wrap is preferred, are there suggestions for ways to incorporate the community into the design?

Model Small Cell

Verizon Wireless is seeking the feedback of the Architectural Review Board on the design for the ground cabinet at the proposed model small cell (Permit 17PLN-00063). If a wrap is chosen, it may create a unique opportunity for a community art project in collaboration with the City Art Department.
Verizon Wireless – Project Description

Verizon Wireless is seeking a Preliminary Review for the design of proposed small cell attachments on wood poles owned and operated by the City of Palo Alto Utilities (CPAU). A brief overview is provided of Verizon Wireless’ citywide efforts to provide more robust wireless service to the City of Palo Alto through the colocation of small cells on existing city-owned infrastructure. Small cells are currently proposed in three (3) configurations that are dependent on whether emergency battery backup is needed at a location, as well as the design opportunities and constraints of specific pole locations. Details of the design options for the proposed three (3) configurations are presented here for consideration and feedback by the Architectural Review Board.

Project Overview

Verizon Wireless has entered a Master License Agreement (“MLA”) with the City of Palo Alto allowing the attachment of antennas and other equipment (“small cells”) on city owned infrastructure in the right-of-way (ROW). Based on the need to provide network coverage and capacity, Verizon Wireless Radio engineers identify locations throughout the city that require service. Ninety-two (92) such wireless communication facility (“WCF”) installations are currently planned to be co-located on wood utility poles and metal streetlights. Eighty (80) of these small cells are proposed to be co-located on existing wood utility poles; only twelve (12) small cells are proposed to be installed on existing city streetlights. Verizon Wireless and CPAU are still working out the specifics for streetlight locations, so their design is not addressed in this application. These small cells will provide the City of Palo Alto much needed improvements in network capacity and coverage.

Submissions for formal review by the ARB will be in groupings of applications or “clusters”, the first of which (Cluster 1) contains eighteen (18) proposed small cells. Cluster 1 contains only wood utility poles, therefore at this time Verizon Wireless is seeking design feedback from the Architectural Review Board exclusively for the configuration and design of only small cells located on wood poles. Additionally, of the ninety-two (92) currently anticipated citywide small cell locations, eighty (80) are conceived on wood poles, so this design warrants an in-depth discussion.

Community Need for Small Cells

The unprecedented current and future demand for wireless service requires the densification of existing cellular networks. As a result, wireless communication facilities are diminishing in height and being located closer to the user to meet both daily needs as well as provide essential coverage for emergency personnel. While terrain is relatively flat, the dense foliage of the tree canopy combined with difficulty in permitting macro wireless communication facilities presents unique challenges in the provision of coverage to the City of Palo Alto. Verizon Wireless must increase both coverage and capacity throughout the city to meet current and future customer demand. Attachment A – Coverage Maps contains coverage maps that depict this need for coverage in the city. As the map demonstrates, there are significant gaps in the coverage area where Verizon Wireless has proposed the eighteen (18) Cluster 1 small cells.

Small Cells are the least visually intrusive method to provide the City of Palo Alto the required capacity and coverage. The miniaturization of the equipment used for cellular communications allows for these
small cells to be located on existing infrastructure, reducing the need for new WCF structures and minimizing visual impact to the surrounding community. Additionally, these small cells are able to be located in areas where traditional “macro” wireless communication facilities cannot be located, so that essential communication services can be provided to critical areas all while co-locating on existing infrastructure. Furthermore, the addition of these small cells will both meet the current coverage and capacity needs, as well as provide the road map to future technologies for the next generation of wireless capability to the community in Palo Alto.

**Siting Guidelines**

Small cells differ from traditional “macro” cells in that their miniature quality dictates that they cover only a very small area and therefore can only move a short distance (measured in feet) within an identified area of need. In selecting a specific pole to serve an area, Verizon Wireless performs a thorough analysis of the existing infrastructure utilizing the Siting Guidelines from *Attachment B – Siting Guidelines* to determine the most appropriate location.

The standards contained in the Small Cell Siting Guidelines working document have been developed by compiling the criteria and constraints of various regulating agencies. In siting small cells, Verizon Wireless is required to adhere to the standards of the California Public Utilities Commission (General Order 95 Requirements, Rule 94); the engineering and real estate requirements of property owner City of Palo Alto Utilities (CPAU); Development Standards for wireless communication facility (WCF) locations from PAMC §18.42.110(i); and the Architectural Review Findings of PAMC §18.76.020. Criteria have been further adjusted as city staff from Planning, Urban Forestry, CPAU, and the Art Department have all made time to attend site walks with Verizon Wireless real estate, engineering and construction teams in their fielding efforts. Additionally, previous small cell and DAS installations in the City of Palo Alto were analyzed to take into account previous findings and recommendations by staff, the public and reviewing bodies.

**Pole Selection / Alternative Site Analysis**

Based on the need to provide network coverage and capacity, Verizon Wireless Radio Frequency engineers identify locations or “nodes” throughout the city to improve and optimize network performance. Each proposed node is then visited by a team to identify existing city-owned structures available for colocation within the proposed coverage area. During this fielding walk, criteria and constraints are applied by City of Palo Alto Utilities Engineering, as well as Verizon Wireless Engineering, Real Estate and Construction to determine the most suitable pole, subsequently identified as the “primary” location. Additional poles within the coverage area are either designated as viable alternatives or eliminated for the various reasons outlined in the guidelines. These criteria have been compiled into the Small Cell Siting Guidelines previously mentioned and contained in *Attachment B – Siting Guidelines*.

Beyond the Engineering Criteria, pole selection is based on a thoughtful consideration of the surrounding environment in which the proposed small cell is located. Poles with existing favorable site features such as landscaping and tree foliage are prioritized to provide natural screening to reduce the visual impact of small cell attachments. Poles are selected to reduce the impact on views from streets as well as adjacent residences. Site selection was further constrained to avoid poles located in private residential easements (e.g. backyards) and close proximity to second story windows.
Because small cells have less flexibility in where they can be located, they can only be moved a short distance while maintaining the required performance. In Attachment C – Prelim ARB Alternative Siting Analysis, Verizon Wireless has prepared three (3) examples for the Architectural Review Board to demonstrate some of the opportunities and constraints that determine which pole has been selected for a particular small cell location. For each node, a map of poles considered has been provided, along with a detailed table outlining the reasons why the alternate poles were not feasible.

As those alternative site analyses demonstrate, many seemingly suitable poles must be eliminated for engineering or other reasons.

Quite often, as these three (3) examples demonstrate, there is only one suitable pole for a small cell within a designated coverage area.

**Small Cell Node Design Requirements**

Verizon Wireless has engineered these small cells utilizing the most streamlined equipment available to meet the capacity and coverage requirements. For each small cell, Verizon Wireless network engineering requires one (1) antenna, three (3) radios, one (1) small electrical disconnect box, in some cases a battery backup unit located either on the pole or on the ground adjacent to the pole, and associated conduit for RF and electrical cabling. Details of how this equipment is attached to wood poles are depicted in *Attachment D – Proposed Configurations*. Further specifications of each piece of equipment are outlined on the detail pages (D-1, D-2) of the site plans contained in *Attachment D – Configurations 1, 2, and 3*.

Much of the pole-mounted equipment design has been determined by regulatory agencies, such as the California Public Utilities Commission (CPUC). It would be impossible within the scope of this document to cover the breadth, but in its General Order 95, the CPUC outlines a set of standards relating to attachments meant to ensure safety for the public, workers and equipment. To maintain the required clearance from power distribution, the antenna is mounted on a GO95 approved seven-foot (7’) pole-top bayonet mount. Placement of the radios and associated equipment is also fairly constrained. All pole mounted equipment must be located a minimum seven-foot (7’) clearance from the ground. The required minimum four-inch (4”) horizontal clearance from the pole is maintained using a sled-style mount. Radios and associated equipment are attached to this mount as flush as is possible, given existing pole conditions, and in no case, is the distance greater than twelve inches (12”). This equipment must also be arranged on the pole in a manner that will preserve climbing space, ensuring that utility workers have safe and reliable access. Required small cell equipment specifications further constrain the way equipment can be attached. For example, the coaxial cable used to connect radios to the antenna must maintain a minimum bend radius of six inches (6”); anything less would cause damage to the cable compromising the performance.

To further its commitment to provide essential communications during a disaster resulting in loss of power, Verizon Wireless has proposed four (4) hours of battery backup on the most essential small cell nodes. Battery backup will provide critical network coverage for First Responders and users should power be lost. The City of Palo Alto Emergency Management Services uses the Verizon Wireless network for their cellular communication. Verizon Wireless Engineering has a strong preference to have emergency battery back up on all eighteen (18) nodes in Cluster 1. However, Verizon Wireless recognizes the increased visual effect of additional batteries and to reduce that impact, has selected only the most essential locations. For each site with battery back up the small cell will also require either one (1) ground mount battery cabinet or one (1) pole mount battery backup with an additional
disconnect, and the additional associated cabling to the cabinet. *Is there a preference between a pole mounted or ground mounted cabinet for the emergency battery backup?*

Required equipment has been arranged into the three (3) aforementioned proposed configurations, with selection dependent on the engineering requirements of a small cell coverage area, as well as the constraints of a particular pole location. If the location is suitable for a ground box, then that is the preferred method of providing critical battery backup and radios are then arranged vertically on the pole. If emergency battery backup is required, but the pole location is not suitable for a ground based cabinet, then the battery unit is placed on the pole and the radios are arranged horizontally. It is assumed that both fiber and power will be provided via an aerial drop from above on the pole.

The assignment of configurations for each proposed small cell in Cluster 1 is provided in *Attachment D – Cluster 1 Configurations*; a map is provided in *Attachment G – Map of Cluster 1 Configurations*.

*Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1&3 or horizontal as in Config 2), even if no battery exists on the pole?*

As currently conceived, wood pole designs would require all pole mounted equipment to be painted brown to blend with the pole. Paint samples (Kelly Moore: Railroad Ties KMA67, Log Cabin KMA76 and Clay Bath KM4595) are included in *Attachment H – Proposed Paint Samples*.

*Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?*

**Configuration 1: Emergency battery backup critical**

The proposed Configuration 1 is designed with one (1) antenna, three (3) radios, and one (1) disconnect arranged vertically on the pole and the emergency battery backup cabinet installed on the ground adjacent to the pole. This is the Verizon Wireless Engineering preferred design as it contains emergency battery backup to maintain coverage for all three (3) radios for a total of four (4) hours, in case of a disaster resulting in loss of power. It is assumed that both fiber and power will be provided via an aerial drop from above on the pole minimizing the ground disturbance to a small (approximately five (5) to ten (10) feet) trench for this scenario.

For Configuration 1 only, the ground box is placed on a 32" x 32" concrete pad, with a 54" tall cabinet, and is currently conceived to be painted a green color to blend in with surrounding landscaping. If natural screening does not exist, it will be proposed. *Paint samples (Kelly Moore: Lone Pine KM4798 and Acanthus Leaf KM4796) are included in Attachment H – Proposed Paint Samples and Verizon Wireless is seeking feedback from the Architectural Review Board on a final selection.*

In addition to paint Verizon Wireless has engineered some street furniture options to provide further stealthing in areas where deemed necessary. Available street furniture options include benches, a green relay mailbox or trash can. The emergency battery cabinet also creates a unique opportunity for public art projects such as art wraps. All options are outlined in *Attachment I – Proposed Ground Cabinet Stealth Options*. *Verizon Wireless is seeking feedback from the Architectural Review Board for the street furniture as well as the art wrap concept.*
Three (3) nodes of Cluster 1 are designed with Configuration 1. For reference, these locations are shown in Attachment G – Map of Cluster 1 Configurations and Attachment D – Configuration 1, contains more details of the design. Node 143 is the example provided for this configuration and detailed site plans are contained in the plan set.

Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1&3 or horizontal as in Config 2), even if no battery exists on the pole?

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?

If a ground based cabinet is used, does the ARB prefer a cabinet painted to blend in with surroundings or the use of street furniture to “stealth” the emergency battery backup?

If the ground cabinet is to be painted, Verizon Wireless is seeking feedback from the Architectural Review Board on a shade of green paint to be used for ground based emergency battery equipment.

Is street furniture preferred over an art wrap for the ground based emergency battery cabinet?

If street furniture is preferred, is there a favored design?

If an art wrap is preferred, are there suggestions for ways to incorporate the community into the design?

**Configuration 2: Emergency battery backup essential, but no space**

The proposed Configuration 2 is designed with one (1) antenna, three (3) radios, two (2) disconnects, and emergency battery cabinet, all located on the pole. Verizon Wireless selects this scenario for locations where battery is required, but there is insufficient space for a ground cabinet. The radios are arranged horizontally on the pole, so there is space for the battery cabinet. The modification from a ground cabinet to a pole mounted design for the emergency does entail a significant concession in the capability. Configuration 2 will provide four (4) hours of battery backup for only one (1) radio on the small cell. In comparison, the ground mounted cabinet from Configurations 1 will provide a full four (4) hours of battery backup for all three (3) radios. As a result, when Configuration 2 is installed, in case of a disaster resulting in loss of power, there would be reduction in network capacity at this particular location. It is assumed that both fiber and power will be provided via an aerial drop from above on the pole.

Two (2) nodes of Cluster 1 are designed with Configuration 2. For reference these locations are shown in Attachment G – Map of Cluster 1 Configurations and Attachment D – Configuration 2, contains more details of the design. Node 135 is the example provided for this configuration and detailed site plans are contained in the plan set.

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?
**Configuration 3: Emergency battery backup currently not proposed**

The proposed Configuration 3 is designed with one (1) antenna, three (3) radios, and one (1) disconnect installed. Battery backup is not proposed in this design.

As previously mentioned, Verizon Wireless Engineering prefers emergency battery backup at all small cell locations. However, given the potential visual impact, Verizon has decided at this time not to request the additional equipment required to provide backup battery service. While the pole mounted battery in Configuration 2 represents a significant concession in emergency battery capability, it is critical to emphasize that Configuration 3 provides absolutely no emergency battery backup and in case of a disaster resulting in loss of power, there would be a significant reduction in network capacity and coverage at this particular location. It is assumed that both fiber and power will be provided via an aerial drop from above on the pole.

Thirteen (13) nodes of Cluster 1 are designed with Configuration 3. For reference, these locations are shown in in Attachment G – Map of Cluster 1 Configurations and Attachment D – Configuration 3, contains more details of the design. Node 139 is the example provided for this configuration and detailed site plans are contained in the plan set.

Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1&3 or horizontal as in Config 2), even if no battery exists on the pole?

*Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?*

**Submission in Clusters**

Based on detailed discussions with the city, Verizon Wireless will submit its Conditional Use and Architectural Review (CUP/ARB) applications for consideration in five separate “clusters”, easing the burden on staff so that they may prepare one staff report per cluster. The currently planned small cells have been divided based on geography and therefore these groupings by neighborhood will aid Verizon Wireless in their community outreach for the project.

Even though these proposed small cells will be submitted in clusters and are linked to the greater Verizon Wireless network, it is important to note that each wireless communication facility (WCF) acts independently of any other small cell. The utility of each node is not dependent on a neighbor or any other node.

**Model Small Cell**

To make transparent for staff and the community how a small cell will look in the real world, Verizon Wireless has applied for Architectural Review (Permit #17PLN-00063) to locate a mock-up on the CPAU wood pole adjacent to 1350 Newell Road. Both pole mounted equipment and the ground mounted emergency battery backup cabinet are proposed to be located here (Configuration #1). The equipment would not be operational while the pole is used for a model small cell. The proposed location as well as
a photo simulation of the model small cell are shown in a photo in Attachment J – Proposed Model Small Cell.

Verizon Wireless is seeking the feedback of the Architectural Review Board on the design for the ground cabinet at the proposed model small cell (Permit 17PLN-00063). Because there is already a park bench at this location, it may be more suitable to a ground box. If a wrap is chosen for the box, it may create a unique opportunity for a community art project in collaboration with the City Art Department.
Existing coverage area – small cells in Cluster 1 turned **OFF**.
Proposed Coverage – small cells in Cluster 1 turned ON.
Attachment B – Small Cell Siting Guidelines

Vinculums Services has created this working document, a compilation of criteria and constraints of various regulating agencies, on behalf of Verizon Wireless in its efforts to site small cells in Palo Alto. Verizon Wireless is required to adhere to the standards of the California Public Utilities Commission (General Order 95 Requirements); the engineering and real estate requirements of property owner City of Palo Alto Utilities (CPAU);

City of Palo Alto Development Standards for wireless communication facility (WCF) locations from PAMC §18.42.110(i); and the Architectural Review Findings of PAMC §18.76.020.

Engineering Criteria

Nature of Small Cells--small cells differ from traditional “macro” cells in that their miniature quality dictates that they can only move a very small distance (measured in feet) and still serve their intended purpose.

Verizon Wireless engineering proposed locations are fielded using the criteria below to select a utility pole or streetlight from existing city infrastructure:

City of Palo Alto Utility (Pole Owner) Pole Attachment Mandates

- All Attachments must meet California Public Utilities General Order 95
  - Climbing space
  - Clearances between power and/or other attachments
  - Required distances for separation between pole and equipment
  - Required distances for separation between equipment
- City of Palo Alto Utilities (CPAU) prioritizes the provision of service to its customers. The siting of attachments on poles is secondary and therefore:
  - No attachments allowed on poles with primary power risers
  - No attachments allowed on poles with transformers or other special equipment
  - Primary Line and Buck (primary power lines attaching to the pole at 90 degrees or in perpendicular fashion) situations have a modified climbing space requirement, requiring more pole real estate than otherwise required under State Public Utility Code
  - Various other situations where the provision of electrical service would be compromised by attachment
City of Palo Alto Utility Preferences (in order of importance)

1. Guy stubs - Poles that do not have any electrical or communications; they simply provide a structural tie point for a guy wire for a neighboring pole
2. Poles with overhead secondary power conductors only – Secondary power (typically) being the second from the top level of power on the pole and which provides residential power (120/240 Volts AC)
3. Primary dead-end poles – A pole at the end of a line of poles which no poles further down the line
4. Primary poles with no transformers downstream on the poles to end of line of poles
5. Primary poles with no electric utility equipment on the poles on either side of the proposed pole

Development Criteria

Development Standards from PAMC §18.42.110(i)

- Shall utilize the smallest footprint possible
- Shall be designed to minimize the overall height, mass, and size of the cabinet and enclosure structure
- Be screened from public view
- Be architecturally compatible with the existing site
- Be placed at a location that would not require the removal of any required landscaping or would reduce the quantity of landscaping to a level of noncompliance with the Zoning Code
- An Antenna, Base Station, or Tower shall be designed to minimize its visibility from off-site locations and shall be of a "camouflaged" or "stealth" design, including concealment, screening, and other techniques to hide or blend the Antenna, Base Station, or Tower into the surrounding area

Planning and Residential Considerations

- Only poles located in the right-of-way (ROW) are selected. Poles on private property are not selected for attachment.
- Prioritize poles which have tree foliage close to help camouflage the pole mounted equipment
- Prioritize poles that are located near evergreen trees, rather than deciduous trees
- Select a location for ground based emergency battery equipment that meets standards identified in Tree Technical Manual
- Face the pole mounted equipment away from direct views of the adjacent home, toward the street when no foliage is present to hide the equipment
- Consolidate equipment to reduce the visual clutter; move the ground mounted equipment onto the pole when there is not enough right-of-way or deemed too obtrusive to the residents
- In general, prefer locations mid-block instead of at more visible corners/intersections
- Determine the most advantageous height that is least disruptive to views from both pedestrian and the adjacent residences
Attachment C – Prelim ARB Alternative Siting Analysis

Prelim ARB - Proposed Small Cell Nodes

Alternative Site Analysis follows for each of the following proposed nodes:

<table>
<thead>
<tr>
<th>Node ID</th>
<th>Config</th>
<th>Verified Pole Height</th>
<th>Adjacent Address</th>
<th>Adjacent APN</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF PALO ALTO 143</td>
<td>Configuration 1</td>
<td>38.26</td>
<td>419 EL VERANO AVE PALO ALTO, 94306-3007</td>
<td>13215017</td>
</tr>
<tr>
<td>SF PALO ALTO 135</td>
<td>Configuration 2</td>
<td>42.86</td>
<td>795 STONE LN PALO ALTO, 94303-4413</td>
<td>12747001</td>
</tr>
<tr>
<td>SF PALO ALTO 139</td>
<td>Configuration 3</td>
<td>39.59</td>
<td>2793 RANDERS CT PALO ALTO, 94303</td>
<td>12734115</td>
</tr>
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</table>
### Alternative Siting Analysis - Map and Details

#### Table of Alternate Candidates

<table>
<thead>
<tr>
<th>Alternate Candidate</th>
<th>Structure Type</th>
<th>Fallout Reason</th>
<th>Pole #</th>
<th>Fallout Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>143-A</td>
<td>Wood Pole</td>
<td>CPAU Engineering</td>
<td>3866</td>
<td>Utility engineering constraints would not allow an attachment. Switch located on pole. Additionally, poles located in private property (residential easements) are only selected as a last resort, given potential disturbance to adjacent neighbor.</td>
</tr>
<tr>
<td>143-B</td>
<td>Wood Pole</td>
<td>CPAU Engineering</td>
<td>3889</td>
<td>Utility engineering constraints would not allow an attachment. Transformer located on pole - wireless equipment not permitted.</td>
</tr>
<tr>
<td>143-C</td>
<td>Wood Pole</td>
<td>Planning</td>
<td>Unknown</td>
<td>Poles located on private property (residential easement) are only selected as a last resort, given potential disturbance to adjacent resident. Could not get pole number as it is located in backyard.</td>
</tr>
<tr>
<td>143-D</td>
<td>Metal Street Light</td>
<td>Planning</td>
<td>18</td>
<td>Viable location, but not selected as primary because 1) antenna location on streetlight is lower than on wood pole; 2) high visibility corners are not preferred per the planning siting guidelines; and 3) streetlights are a lower preference than wood poles per the planning siting guidelines.</td>
</tr>
<tr>
<td>143-E</td>
<td>Wood Pole</td>
<td>Planning</td>
<td>Unknown</td>
<td>Poles located on private property (residential easement) are only selected as a last resort, given potential disturbance to adjacent resident. Could not get pole number as it is located in yard.</td>
</tr>
</tbody>
</table>
### SF PALO ALTO 135 - Alternative Siting Analysis - Map and Details

![Map of SF PALO ALTO 135 showing possible locations for primary and alternate poles.](image)

<table>
<thead>
<tr>
<th>Alternate Candidate ID</th>
<th>Structure Type</th>
<th>Fallout Reason</th>
<th>Pole #</th>
<th>Fallout Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>135-A</td>
<td>Wood Pole</td>
<td>Planning</td>
<td>3611</td>
<td>Development constraints around this particular pole. Attachment could impede access to existing Santa Clara Valley Water District canal.</td>
</tr>
<tr>
<td>135-B</td>
<td>Wood Pole</td>
<td>Planning</td>
<td>3371</td>
<td>Pole not selected as it appears to have higher visual impact--located near driveway.</td>
</tr>
<tr>
<td>135-C</td>
<td>Metal Street Light</td>
<td>Planning</td>
<td>342</td>
<td>High visibility corners are not preferred per the planning siting guidelines.</td>
</tr>
<tr>
<td>135-D</td>
<td>Wood Pole</td>
<td>Planning</td>
<td>3609</td>
<td>High visibility corners are not preferred per the planning siting guidelines.</td>
</tr>
</tbody>
</table>
SF PALO ALTO 139 - Alternative Siting Analysis - Map and Details

[Map showing locations 139-A, 139-B, 139-C, 139-D, 139-E with primary pole and alternate candidate markers.]

<table>
<thead>
<tr>
<th>Alternate Candidate ID</th>
<th>Structure Type</th>
<th>Fallout Reason</th>
<th>Pole #</th>
<th>Fallout Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>139-A</td>
<td>Metal Street Light</td>
<td>VZW Engineering</td>
<td>272</td>
<td>Not selected as primary because 1) antenna location on streetlight is lower than on wood pole; and 2) streetlights are a lower preference than wood poles per the planning siting guidelines.</td>
</tr>
<tr>
<td>139-B</td>
<td>Wood Pole</td>
<td>CPAU Engineering</td>
<td>2490</td>
<td>Utility engineering constraints would not allow an attachment. Transformer on pole - wireless equipment not permitted.</td>
</tr>
<tr>
<td>139-C</td>
<td>Metal Street Light</td>
<td>VZW Engineering</td>
<td>271</td>
<td>Not selected as primary because 1) antenna location on streetlight is lower than on wood pole; and 2) streetlights are a lower preference than wood poles per the planning siting guidelines.</td>
</tr>
<tr>
<td>139-D</td>
<td>Wood Pole</td>
<td>CPAU Engineering</td>
<td>2488</td>
<td>Utility engineering constraints would not allow an attachment. Risers on pole - wireless equipment not permitted. If pole was viable for CPAU Engineering, it would not be selected as primary because 1) high visibility corners are not preferred per the planning siting guidelines; and 2) tree canopy exposure.</td>
</tr>
<tr>
<td>139-E</td>
<td>Wood Pole</td>
<td>CPAU Engineering</td>
<td>2487</td>
<td>Utility engineering constraints would not allow an attachment. Transformer on pole - wireless equipment not permitted.</td>
</tr>
</tbody>
</table>
Attachment D – Proposed Configurations

Below is a simplified elevation drawing of all proposed equipment Configurations 1, 2 and 3. See plan set provided for examples of each proposed configuration on wooden poles.
Attachment D – Configuration 1

Wood Utility Pole with Ground Mounted Emergency Battery Backup

Verizon Wireless requires emergency battery backup the proposed small cell located near 419 El Verano Ave. (Node 143). The emergency battery equipment is currently proposed to be located in existing landscape strip located within the right-of-way. See attached site plan with pole elevations and equipment detail. The photo simulation for this small cell can be found in Attachment E.

See plan set provided for design details of Configuration 1.

Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1&3 or horizontal as in Config 2), even if no battery exists on the pole?

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?

If a ground based cabinet is used, does the ARB prefer a cabinet painted to blend in with surroundings or the use of street furniture to “stealth” the emergency battery backup?

If the ground cabinet is to be painted, Verizon Wireless is seeking feedback from the Architectural Review Board on a shade of green paint to be used for ground based emergency battery equipment.

Is street furniture preferred over an art wrap for the ground based emergency battery cabinet?

If street furniture is preferred, is there a favored design?

If an art wrap is preferred, are there suggestions for ways to incorporate the community into the design?
Attachment D – Configuration 2

Wood Utility Pole with Pole Mounted Emergency Battery Backup

The proposed small cell located near 795 Stone Lane (Node 135) is located on a Santa Clara Valley Water District canal. Verizon Wireless requires emergency battery backup in this location. However, location of ground mounted equipment cabinet could interfere with the Water District’s operation. Therefore, Verizon Wireless has proposed a pole mounted location for this scenario. See attached site plan with pole elevations and equipment detail. The photo simulation for this small cell can be found in Attachment E.

See plan set provided for design details of Configuration 2.

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?
Attachment D – Configuration 3

Wood Utility Pole without Emergency Battery Backup

The proposed small cell located near 2793 Randers Court (Node 139) is located within a residential area. As such, Verizon Wireless has proposed only pole mounted equipment at this location. See attached site plan with pole elevations and equipment detail. The photo simulation for this small cell can be found in Attachment E.

See plan set provided for design details of Configuration 3.

Verizon Wireless is seeking feedback on the configuration of the pole mounted equipment: what does the ARB prefer for the alignment of the radios on the pole (vertical as in Config 1 & 3 or horizontal as in Config 2), even if no battery exists on the pole?

Verizon Wireless is seeking feedback from the Architectural Review Board on a final shade of brown paint for equipment attached to wood poles. Additionally, should all pole mounted equipment including mounts, cabling and conduits be painted?
Attachment E – Photo Simulations of Configurations

Configuration 1: Ground mounted emergency battery
Configuration 1: Ground mounted emergency battery – Detail View

Photosimulation of the view standing right in front of the pole.
Configuration 2: Pole mounted emergency battery
Configuration 2: Pole mounted emergency battery – Detail View

Photosimulation of the view standing right in front of the pole.
Configuration 3: Pole mounted equipment only. No emergency battery.
Configuration 3: Pole mounted equipment only. No emergency battery.
Attachment F – Cluster 1 Configurations

Cluster 1 contains 18 proposed small cell nodes.

<table>
<thead>
<tr>
<th>Node</th>
<th>1A Verified Adjacent Address</th>
<th>Pole Type</th>
<th>Config</th>
<th>CPAU Pole #</th>
<th>1A Verified Adjacent APN</th>
<th>Adjacent APN Zoning Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF PALO ALTO 127</td>
<td>820 WARREN WAY</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>3112</td>
<td>12730045</td>
<td>R-1</td>
</tr>
<tr>
<td>SF PALO ALTO 129</td>
<td>2490 LOUIS RD</td>
<td>Wood Utility</td>
<td>Config 1</td>
<td>3121</td>
<td>12730062</td>
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<tr>
<td>SF PALO ALTO 130</td>
<td>2802 LOUIS RD</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>2461</td>
<td>12728046</td>
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<tr>
<td>SF PALO ALTO 131</td>
<td>3120 LOUIS 891 ELBRIDGE WY</td>
<td>Wood Utility</td>
<td>Config 2</td>
<td>3315</td>
<td>12726067</td>
<td>R-1</td>
</tr>
<tr>
<td>SF PALO ALTO 133</td>
<td>925 LOMA VERDE AVE</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>2857</td>
<td>12724023</td>
<td>R-1</td>
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<tr>
<td>SF PALO ALTO 134</td>
<td>3409 KENNETH DR</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>2964</td>
<td>12709028</td>
<td>R-1 (7000)</td>
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<tr>
<td>SF PALO ALTO 135</td>
<td>795 STONE LN</td>
<td>Wood Utility</td>
<td>Config 2</td>
<td>3610</td>
<td>12747001</td>
<td>R-1 (8000)</td>
</tr>
<tr>
<td>SF PALO ALTO 136</td>
<td>3191 MANCHESTER CT</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>3298</td>
<td>12758024</td>
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</tr>
<tr>
<td>SF PALO ALTO 137</td>
<td>795 STERN 3090 ROSS RD</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>3351</td>
<td>12752031</td>
<td>R-1</td>
</tr>
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<td>SF PALO ALTO 138</td>
<td>836 COLORADO AVE</td>
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<td>Config 3</td>
<td>2479</td>
<td>12727063</td>
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<tr>
<td>SF PALO ALTO 139</td>
<td>752 COLORADO 2793 RANDERS CT</td>
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<td>2489</td>
<td>12734115</td>
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<tr>
<td>SF PALO ALTO 140</td>
<td>450 LOMA VERDE AVE</td>
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<td>Config 3</td>
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<td>13215077</td>
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<tr>
<td>SF PALO ALTO 141</td>
<td>2801 SOUTH CT</td>
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<td>13214023</td>
<td>R-1</td>
</tr>
<tr>
<td>SF PALO ALTO 143</td>
<td>3299 Waverley or 419 EL Verano Ave</td>
<td>Wood Utility</td>
<td>Config 1</td>
<td>3867</td>
<td>13215017</td>
<td>R-1</td>
</tr>
<tr>
<td>SF PALO ALTO 144</td>
<td>201 LOMA VERDE AVE</td>
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<td>13248015</td>
<td>RM-30</td>
</tr>
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<td>SF PALO ALTO 145</td>
<td>733 LOMA VERDE AVE</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>3288</td>
<td>12764001</td>
<td>R-1 (7000)</td>
</tr>
<tr>
<td>SF PALO ALTO 146</td>
<td>2901 Middlefield Rd or 705 Ellsworth</td>
<td>Wood Utility</td>
<td>Config 1</td>
<td>7647</td>
<td>12735194</td>
<td>R-1 (RM-15)</td>
</tr>
<tr>
<td>SF PALO ALTO 147</td>
<td>181 EL VERANO AVE</td>
<td>Wood Utility</td>
<td>Config 3</td>
<td>1494</td>
<td>13227072</td>
<td>R-1</td>
</tr>
</tbody>
</table>
Eighteen (18) proposed nodes from Cluster 1 are identified, along with their proposed Configurations 1, 2 and 3.

**Config 1:** Emergency battery backup critical, placed in ground mounted box adjacent to pole.

**Config 2:** Emergency battery backup essential, but no space; small battery placed on pole.

**Config 3:** Emergency battery backup currently not required. No emergency battery.
Attachment H – Proposed Paint Samples

Pole Mounted Equipment (all Kelly Moore durable metal paint)

Railroad Ties (KMA67)

Log Cabin (KMA76)

Clay Bath (KM4595)

Ground Mounted Equipment (all Kelly Moore durable metal paint)

Lone Pine (KM4798)

Acanthus Leaf (KM4796)
Attachment I – Proposed Ground Cabinet Stealth Options

Landscaping

Ground mounted emergency battery equipment with landscaping.

Street Furniture Options

Concrete Bench
Art-Wrapped Cabinets

Ground mounted emergency battery cabinet **without** wrap.

**Examples of Existing Art Wraps (located Downtown Walnut Creek)**

Please note that these cabinets may differ in size than the proposed emergency battery cabinet, which is placed on a 32" x 32" concrete pad, with a 54" tall cabinet.
Attachment J – Proposed Model Small Cell Location

Photosimulation of the view looking northwest from across Newell Road, looking towards Hopkins Ave.