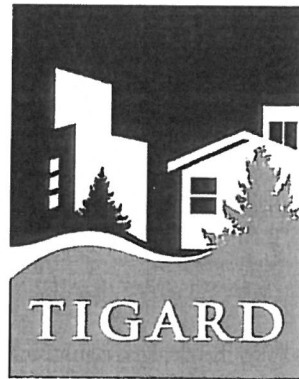


# CITY OF TIGARD

## PUBLIC IMPROVEMENT DESIGN STANDARDS Wireless Facilities



City of Tigard

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Approved by:



Lori Faha, City Engineer

These standards are adopted pursuant to Tigard Community Development Code 18.910.020.B.

# **Wireless Facilities Design & Construction Standards**

## **1 Permitting Process**

A Network Provider shall comply with the following permitting process when seeking to install Wireless Facilities in the public right-of-way (ROW):

- a. Obtain a City of Tigard franchise or license;
- b. File a land use application, where applicable; and
- c. Obtain a Public Facilities Improvement (PFI) Permit

## **2 General Provisions**

- A. Network Provider, for the purposes of these standards, refers to the owner or operator of a wireless facility.
- B. Wireless Facilities, for the purposes of these standards, includes any pole, conduit/cabling, cabinets, equipment or other materials used for the provision of wireless services.
- C. A Network Provider shall construct and maintain Wireless Facilities in a manner that does not:
  - a. Obstruct, impede or hinder the usual travel or public safety on the public ROW;
  - b. Obstruct the legal use of the public ROW by other providers;
  - c. Violate or conflict with any Laws, including but not limited to the City of Tigard ordinances or standards;
  - d. Obstruct, impede, or hinder any operations of the City's infrastructure or systems, including but not limited to Smart City equipment, street light equipment, traffic signal equipment, etc.
  - e. Any items installed after the initial application will require an additional approval process with the City through a PFI Permit. Newly installed or updated equipment will be required to comply with any currently adopted standards at the time of installation.
- D. Poles within the ROW will be categorized as follows:
  - a. Street Light Poles: Poles that include a street light.
  - b. Network Provider Poles: Poles with or without a street light that are Network Provider installed for the purpose of wireless facilities.

- c. Utility Poles: To be classified as a utility pole, the pole may not have a street light on it or be installed by a Network Provider for the primary purpose of providing wireless facilities. A Network Provider may upgrade an existing utility pole in the same location for height or foundation requirements to support their wireless facilities without being considered a Network Provider Pole.
- E. In locations where a new street light or Network Provider pole is installed, the City requires the pole be designed to internally conceal and hold all Wireless Facilities equipment. In instances where an existing pole is located in the desired location, and the existing pole is shown to be structurally sound to support the proposed network equipment and sealed by a licensed Professional Structural Engineer in the State of Oregon, the Wireless Facilities may attach to the existing pole so long as every effort is made to conceal the equipment inside the pole. In the event the proposed equipment cannot reasonably fit within the existing pole itself, and with the approval of the City Engineer, the Wireless Facilities shall be installed consistent with Section 5 of this standard.
- F. Any newly installed street light poles shall be PGE Option A.
- G. There shall be no surface mounted conduit or exposed wiring on any exterior surface of the supporting pole, except when wireless facilities are installed on a utility pole.
- H. There shall be no more than one (1) Network Provider on any one (1) Pole.
- I. Wireless Facilities installed on a street light pole must connect to a PGE power source that is separate from the power supply to the street light pole.
- J. Aerial cable spans or aerial span power connections are not permitted, except for on utility poles where the existing power supply is aerial.
- K. Network Provider installations are limited within the public ROW to installation on:
  - a. Street light poles
  - b. Utility poles
  - c. Network Provider poles, which may require a separate land use approval process. See City of Tigard Community Development Code for additional information.
- L. Network Providers are required to send the City of Tigard a Geographical Information System (GIS) file of all current installations within the City's geographical boundary and ROW on an annual basis. Current installations are defined as those that are active/in use or contain installed equipment waiting to be activated. Data in the GIS file must include locational coordinates, facility type, support type, mounting height, installation date, PGE pole ID (where applicable) and other data the City deems necessary for inventory management.

- M. Complete Construction plans for the proposed infrastructure must be submitted through a PFI permit application and bundled into a single PDF file, formatted to 11"x 17" sheets, sealed by a Professional Engineer licensed in the State of Oregon, and including:
- a. Each pole represented by a set of plans within the overall file, designed so that if any single pole is removed from the application, the remaining plan set remains valid. Overall sheets including details & notes are encouraged.
  - b. Structural analysis for each identified pole sealed by a Professional Engineer in the State of Oregon indicating the pole and foundation can handle the proposed equipment load, and where an existing pole is utilized, any existing loading. Street light pole analysis must also be approved by PGE. Utility pole analysis must also be approved by the utility pole owner.
  - c. Electrical load analysis showing that the existing transformer, circuit and any associated wiring can handle the additional demand from the proposed equipment, or any proposed upgrades as needed, and approval of the design by PGE.
  - d. Each plan set shall include the following:
    1. A cover sheet containing a scaled City map including all pole locations included in the subject application, a list of each pole location including GPS coordinate, PGE pole ID (where applicable) or utility pole owner ID, and a legend of all sheets.
    2. A page for each specific pole location referenced with pole title, name, location information, PGE pole ID (where applicable) or utility pole owner ID, and photograph of the proposed location of the pole.
    3. "Required Notes for Each set of Pole Plans" only if unique to the location and as such cannot be part of Overall sheet notes.
    4. Labeled and dimensioned site plan and elevation plan, including the following as applicable:
      - i. Key symbols, ROW lines, property lines, etc.
      - ii. Street information including names, curb-lines, sidewalk, street amenities, vegetation, existing and proposed utilities
      - iii. Identification of immediately adjacent property uses and public easements
      - iv. Structural Plans for pole and associated foundations that reference structural calculations and include depth, diameter, grounding, reinforcing, and foundation information as necessary
      - v. Labeled construction materials, color, finish, etc.
      - vi. Pole dimensions and total max height from adjacent grade
      - vii. Size and dimension of any projection(s) from pole
      - viii. Detail of proposed communication conduit and electrical connection location
      - ix. Typical conduit / duct bank installation section detail
      - x. All existing utilities, including but not limited to:

- 1) Storm & Sanitary Sewer pipes and appurtenances
  - 2) Any utilities 24" and greater depicted as double-lines
  - 3) Gas line (indicate size, High Pressure, services, etc.).
  - 4) Electric lines (indicate power pole number, anchor pole, overhead line, and duct bank in actual dimensions)
  - 5) Water infrastructure including valves, fire hydrants, etc.
  - 6) Adjacent private service line locations where known
5. Certification for each proposed site showing the wireless facility operates within radio frequency exposure guidelines as established by the FCC.

N. Once installation is complete, the applicant is required to provide the City with a complete set of as-built drawings meeting the same information and requirements as the application set outlined in item M of this section but updated for any approved changes that occurred in the field.

### **3 Location**

- A. All Wireless Facilities shall be located to avoid any physical or visual obstruction to pedestrian or vehicle traffic, or in any manner create safety hazards to pedestrians, bicyclists or motorists.
- B. All Wireless Facilities shall be positioned to not encroach or effectively narrow the clear path of any pedestrian, bicycle, or roadway facility.
- C. Where a new pole is installed, or an existing pole replaced, that is located where disruption may occur to an identified pedestrian travel way (i.e. sidewalk, ramp, etc.), the Network Provider is required to replace/upgrade any disturbed or impacted area to be compliant with the Americans with Disabilities Act and City of Tigard Design & Construction Standards.
- D. Wireless facilities proposed to be sited in the ROW shall be sited according to the following priorities, in descending order of preference. If the priority is not followed, the owner must provide evidence why a higher priority location is not practical for use. For purposes of this subsection, streets shall have the classification set forth in the Tigard Transportation System Plan.
  - a. First priority: principal arterials;
  - b. Second priority: arterials;
  - c. Third priority: collectors;
  - d. Fourth priority: neighborhood routes;
  - e. Fifth priority: local residential streets.

## **4 Separation**

- A. The separation between Wireless Facilities and City of Tigard or its agency partners owned/operated Smart City technology shall be a minimum of three hundred (300) feet. The City Engineer may provide an exception to this standard if the Network Provider is able to demonstrate that their Wireless Facilities do not create any disruption or degradation in the service of the Smart City technology. If disruption is identified at any future date, the City reserves the right to require the Network Provider to mitigate the issue and restore the Smart City technology back to full operational capacity.
- B. In residential areas, the Wireless Facilities shall be located where the shared property line between two residential parcels intersects the public ROW, where technically feasible.
- C. A Wireless Facility be not located in front of a building entrance or exit.

## **5 Wireless Facilities**

### **Cabinets and Equipment**

- A. Where Wireless Facilities are installed in the location of an existing street light pole, and the additional structural load cannot be accommodated by the existing street light pole and foundation, a new street light pole and foundation shall be installed and all equipment shall be concealed and located inside the pole, except for the antenna.
- B. Where Wireless Facilities are installed and the additional structural load can be accommodated by the existing street light pole and foundation, every effort must be made to conceal the equipment inside the pole. In instances where the proposed equipment cannot reasonably be accommodated within the existing pole, the Wireless Facilities shall be concealed or enclosed in an equipment box, cabinet or other unit that may include ventilation openings as follows:
  - a. The Network Provider shall not install ground mounted cabinets or other equipment.
  - b. The base of all cabinets and equipment attached to poles shall be installed at least eight (8) feet above the ground, and if any Wireless Facilities are projecting toward the street or bicycle facilities, for the safety and protection of the public and vehicular traffic, the base of the attachment shall be installed no less than seventeen (17) feet above the bicycle facility or street.
  - c. No protrusion from the outer circumference of the pole shall be more than eighteen (18) inches.
  - d. The color of all cabinets and equipment shall match its location.

- e. The total volume of all installed equipment external to the pole (including, but not limited to cabinets, vaults, boxes, antennas) shall not exceed not exceed twenty-eight (28) cubic feet. This maximum applies to all equipment installed at the time of original application and includes any equipment to be installed at a future date. If a Network Provider wishes to install equipment that exceeds this maximum, the installation will be redefined as a Macro site installation and all the associated standards and rates for Macro installations will be applied.
  - f. Equipment shall be orientated away from nearby residential windows, doorways and entrances, to the extent practical.
  - g. Where permitted, equipment located on poles must be attached with stainless steel banding sized to support the required equipment load, unless the Network Provider provides documentation that the pole owner approves of an alternative means and the alternative means is shown structural sound by the licensed Professional Engineer.
  - h. Equipment shall not be placed adjacent to the walkway in a manner that diminishes the usability of the Pedestrian Walkway.
- C. Where Wireless Facilities are installed on new Network Provider poles (i.e. not replacing an existing street light pole or utility pole in its current location), the Network Provider pole and foundation shall be installed and all equipment shall be concealed and located inside the pole, except for the antenna.
- D. Where Wireless Facilities are installed in the same location of an existing utility pole, and either the existing utility pole or a newly installed utility pole and foundation are used, the installation must also comply with the following criteria:
- a. For new utility poles only, the new installation may be fabricated using the same material as the pole to be replaced (i.e. an existing wood pole may be replaced with a wood pole).
  - b. In instances where a new pole is fabricated using the same material as the existing pole, and the existing pole is solid in nature, wiring may be externally mounted. If the pole is not solid in nature (i.e. is partially hollow), all wiring must be internally contained.
  - c. The Network Provider shall not install ground mounted cabinets or other equipment.
  - d. The base of all cabinets and equipment attached to poles shall be installed at least eight (8) feet above the ground, and if any Wireless Facilities are projecting toward the street or bicycle facilities, for the safety and protection of the public and vehicular traffic, the base of the attachment shall be installed no less than seventeen (17) feet above the bicycle facility or street.

- e. The color of all cabinets and equipment shall match its location.
  - f. The total volume of all installed equipment external to the pole (including, but not limited to cabinets, vaults, boxes, antennas) shall not exceed not exceed twenty-eight (28) cubic feet. This maximum applies to all equipment installed at the time of original application and includes any equipment to be installed at a future date. If a Network Provider wishes to installed equipment that exceeds this maximum, the installation will be redefined as a Macro site installation and all the associated standards and rates for Macro installations will be applied.
  - g. Equipment shall be orientated away from nearby residential windows, doorways and entrances, to the extent practical.
  - h. Where permitted, equipment located on poles must be attached with stainless steel banding sized to support the required equipment load, unless the Network Provider provides documentation that the pole owner approves of an alternative means and the alternative means is shown structural sound by the licensed Professional Engineer.
  - i. Equipment shall not be placed adjacent to the walkway in a manner that diminishes the usability of the Pedestrian Walkway.
- E. If a network provider wishes to install cabinets and equipment that exceeds these limitations, the installation will be redefined as a Macro site installation and all the associated standards and rates for Macro installations will be applied.

### **Antennas**

- A. Antennas shall be built into any newly installed poles.
- B. Where the Network Provider has demonstrated an existing pole can be used, the antenna must be mounted to existing pole in a manner that preserves the structural integrity and aesthetics of the pole and painted to match the existing pole.
- C. Antenna structure may not exceed:
  - a. Maximum ten (10) feet in height;
  - b. Maximum diameter/width of twelve (12) inches; and
  - c. Maximum three (3) cubic feet in volume.
  - d. If a network provider wishes to install an antenna that exceeds these limitations, the installation will be redefined as a Macro site installation and all the associated standards and rates for Macro installations will be applied.



- D. For Equipment that include a GPS antenna, integrate the GPS antenna into the same cylindrical shape on top of the main antenna in order to form the appearance of a single unit.
- E. Panel antennas are not permitted, unless the Network Provider provides evidence as to why a cylindrical antenna is not technically feasible.
- F. Pole top antenna mounts should not appear offset from the pole.
- G. Only two (2) antenna shall be allowed per pole. If a Network Provider wishes to upgrade or replace their antenna at any point during their permitted use of the right-of-way, they must remove any existing antenna so the maximum number of antennas at any time does not exceed two (2).

## **6 Poles**

- A. Newly installed street light or Network Provider poles must be designed to be consistent in size, color, and character with the existing street lighting within the project area or block face. This includes tapering the poles so they have the appearance of street lighting.
- B. Newly installed poles that include street lighting must be submitted with an accompanying photometric analysis that meets the Illuminating Engineering Society (IES) RP-08-14 for street lighting. The photometric analysis must be sealed by a Professional Engineer in the State of Oregon.
- C. The maximum diameter of any Network Provider installed pole shall not exceed four and a half feet (4.5').
- D. Newly installed poles must be set back from curbs, offset from driveways and offset from street trees as outlined in the City's Design & Construction Standards.
- E. Newly installed poles, or poles that are replaced in any manner, and accessory equipment, cannot be located within ten (10) feet of any energized line. Installation will conform to OAR 437-002-0047 and 437-002-2316.
- F. Caution shall be exercised during design and installation of newly installed poles so they do not interfere or conflict with existing building overhangs and awnings.
- G. Newly installed or replaced Network Provider poles and street light poles must use breakaway technology.

## **7 Electrical Service**

- A. The Network Provider shall be responsible for coordinating with PGE for electrical service to the Wireless Facility. The City shall not be liable to the Network Provider for any stoppages or shortages of electrical power furnished to the Wireless Facilities, including without limitation, stoppages or shortages caused by any act, omission or requirement of a public utility serving the structure or the act or omission of any other tenant or Network Provider of the structure, or for any other cause beyond the control of the City.
- B. The Network Provider shall not receive power via a service used to supply power to any street lights, traffic signals, or other City asset without accompanying documentation from PGE that demonstrates to the City's satisfaction that measures are in place to ensure the City and Network Provider usages are tracked separately for billing purposes.
- C. Meter and other enclosures shall match the infrastructure that it is attached to and shall be maintained, including regular painting and use of a graffiti-resistant paint. For all work in the right-of-way, Network Provider must comply with Tigard Municipal Code 15.04.
- D. Disconnect switches must be present and accessible by City and local utility staff for each Wireless Facility installation and shall be stacked above or below the meter, instead of attached to the side of the meter.
- E. Electric meters and disconnect switches shall be located as required by the City and local utility company. Electric meters and disconnect switches shall not be located on the side of the pole that faces the sidewalk.
- F. All electrical service conduit and wiring shall be located inside the pole.
- G. A Network Provider shall not allow or install generators or backup generators in the public right-of-way.

## **8 Logo, Decals, Flashing Lights, and RF Warning Sticker**

- A. The Network Provider shall post its name, identifying information, permit number and 24-hour emergency telephone number in an area of the Wireless Facility that is visible to the public. Signage required under this section shall also comply with FCC requirements.
- B. All equipment manufacturer decals shall be removed. Except as required by law or by the utility pole owner, Network Provider may not post any signage or advertising on the Wireless Facilities.
- C. Equipment may not have static or flashing light that are visible when the enclosures are closed.

- D. Equipment related features (e.g. cooling system fans) shall not exceed 50 decibels during the day and 40 decibels at night.

## **9 Conduit and Cabling**

- A. Electrical systems for Wireless Facilities located within street light poles shall be contained in a dedicated conduit labeled to identify its dedicated use for Wireless Facilities.
- B. All conduit runs must be marked with an underground marking tape per 00960.42(e) of the *Oregon Standard Specifications for Construction* and contain locate wires.
- C. All conduits shall be Schedule 40 PVC and all elbows shall be fiberglass.
- D. Install bushings on all conduit ends and seal the ends with an approved conduit plug.
- E. All in ground conduit must be located in the public utility easement (PUE) where available.
- F. Where the Network Provider plans to install fiber optic cable as part of their Wireless Facilities installation, the City may, at its discretion, request that the Network Provider install dedicated conduit, fiber, and associated equipment on behalf of the City for which the City will reimburse the Network Provider their documented costs.

## **10 Equipment and Structure Finishes**

- A. Pole colors shall match the existing street light pole color scheme.
- B. The antennas, mounting brackets, PVC, steel risers, strap, or other materials used in installation must match the color of the infrastructure to which it is attached, unless otherwise approved by the City Engineer
- C. Poles and associated wireless facilities equipment shall be prepared and powder coated consistent with Section 00593 of the 2018 ODOT Standard Specifications.

## **11 Graffiti Abatement**

As soon as practical, but not later than ten (10) calendar days from the date that the Network Provider receives notice thereof, Network Provider shall remove all graffiti on any of its Wireless Facilities, and related equipment located in the right-of-way. The foregoing shall not relieve the Network Provider from complying with any City graffiti or visual blight ordinance or regulation. For all work in the right-of-way, Network Provider must comply with Tigard Municipal Code 15.04.

## **12 Trees and Vegetation**

- A. Except in cases where normal tree or vegetation trimming is necessary to ensure the safe operation of the communications service or to protect the Network Provider's Wireless Facilities, the removal, cutting, marring, defacing or destruction of any trees or other vegetation (other than grass) by Network Providers within the right-of-way is prohibited.
- B. All such normal tree or vegetation trimming by the Network Provider must be performed in accordance with the requirements of Tigard Municipal Code 15.04