

EXHIBIT “A” - To Ordinance No. 3473

Small Cell Wireless Facilities Design Manual

This document shall be known as the “Small Cell Wireless Facilities Design Manual” (Design Manual).

A. *Purpose.*

1. The City of North Richland Hills (City) recognizes that the State of Texas has delegated to the City the fiduciary duty, as a trustee, to manage the public right-of-way for the health, safety, and welfare of the public to Texas municipalities.
2. The standards and procedures provided in this Small Cell Wireless Facilities Design Manual are adopted to protect the health, safety, and welfare of the public by minimizing and reducing impacts to public safety within the City’s rights-of-way.

B. *Applicability; Authority.*

1. These design *standards* are for siting and criteria for the installation of wireless facilities, including micro network nodes, network nodes, node support poles, and related ground equipment being installed pursuant to Loc. Gov. Code, Chapter 284.
2. These design standards shall apply to any sitings, installations, collocations in, on, over, or under the public rights-of-way of network nodes, node support poles, micro network nodes, distributed antenna systems, microwave communications, or other wireless facilities, by whatever nomenclature, whether they are installed pursuant to Chapter 284, or installed pursuant to an agreement as agreed to and consented by the City in its discretion, or installed as may otherwise be allowed by state law.
3. This Design Manual is subject to and is administered in accordance with Chapter 284 of the Texas Local Government Code and the City’s Small Cell Wireless Facilities Right-of-Way Use Ordinance (Small Cell Ordinance).
4. The processes and procedures set forth in this Design Manual shall be administered by the City Engineer or his designee.

C. *Definitions.*

The definitions as used in Chapter 284, Sec. 284.002, and in the City’s Small Cell Ordinance shall be used in this Design Manual, unless otherwise noted below.

For purposes of this Design Manual, the following terms shall have the same meanings herein. Words used in the singular number include the plural number and the plural number includes the singular number, unless the context of the particular

usage clearly indicates otherwise. The words "shall," "must," and "will" are mandatory in nature, establishing an obligation or duty to comply with the particular provision. The words "may" and "should" are permissive in nature.

1. *Abandon* means with regard to Wireless Facilities and Transport Facilities, and all equipment installed in the public right-of-way (including but not limited to: poles, wires, conduits, manholes, hand holes, cuts, network nodes, node support poles, equipment, or any portion thereof) that have been left by a Network Provider in an unused or non-functioning condition for more than 120 consecutive days, unless, after notice to the Network Provider, Network Provider has established to the reasonable satisfaction of the City that the applicable facility, or portion thereof, is still in active use.
2. *Accessory Equipment or Ancillary Equipment or Equipment* means any equipment used in conjunction with a wireless facility, node support pole, utility pole, or service pole, including but not limited to, electric meters, transmission lines and equipment for telecommunications and electric power, power storage, power transfer switches, cut-off switches, generation or control equipment, cables, wiring, equipment buildings, cabinets and shelters, concealment elements, or grounding equipment.
3. *Antenna* means communications equipment that transmits or receives electromagnetic radio frequency signals used in the provision of wireless services.
4. *Applicable Codes* means (1) uniform building, fire, electrical, plumbing, or mechanical codes adopted by a recognized national code organization; and (2) local amendments to those codes to the extent not inconsistent with Chapter 284.
5. *Chapter 284* means Texas Local Government Code, Chapter 284.
6. *City* means the City of North Richland Hills, Texas, and the City's officers and employees.
7. *Collocate and Collocation* means the installation, mounting, maintenance, modification, operation, or replacement of network nodes in public right-of-way on or adjacent to a pole. Collocation also means the location of two (2) or more wireless services providers with small cell facilities on a single pole.
8. *Concealment or Camouflaged* means any wireless facility or pole that is covered, blended, painted, disguised, camouflaged, or otherwise concealed such that the wireless facility blends into the surrounding environment and is visually unobtrusive, as allowed as a condition for the City to advance approval under Chapter 284, Sec. 284.105 in Historic or Design Districts. A concealed or camouflaged wireless facility or pole also includes any wireless facility or pole conforming to the surrounding area in which the wireless facility or pole is located and may include, but is not limited to, hidden beneath a façade,

blended with surrounding area design, painted to match the supporting area, or disguised with artificial tree branches.

9. *Decorative Pole* means a streetlight pole specially designed and placed for aesthetic purposes and on which no appurtenances or attachments, other than specially designed informational or directional signage or temporary holiday or special event attachments, have been placed or are permitted to be placed according to nondiscriminatory municipal codes.
10. *Design District* means an area that is zoned, or otherwise designated by municipal code, and for which the City maintains and enforces unique design and aesthetic standards on a uniform and nondiscriminatory basis.
11. *Distributed Antenna System (DAS)* means a type of network node.
12. *Easement* means and shall include any public easement or other compatible use created by dedication, or by other means, to the City for public utility purposes or any other purpose whatsoever. Easement shall include a private easement used for the provision of utilities.
13. *Furnishing Zone* means the paved portion of the streetscape zone typically located between the back of curb and the sidewalk. The furnishing zone typically includes street light poles and lights, utility poles, regulatory signage, traffic signal equipment and street trees. In some instances, a streetscape zone may not have a furnishing zone.
14. *Highway* means right-of-way adjacent to a State or Federal highway.
15. *Historic District* means an area that is zoned or otherwise designated as a historic district under municipal, state, or federal law.
16. *Macro tower* means a guyed or self-supported pole or monopole greater than the height parameters prescribed by Chapter 284, Section 284.103 and that supports or is capable of supporting antennas.
17. *Micro Network Node* means a network node that is not larger in dimension than 24 inches in length, 15 inches in width, and 12 inches in height, and that has an exterior antenna, if any, not longer than 11 inches.
18. *Municipal Park* means the various properties zoned or designated by the City or state law as a municipal park and which are under the direction, control and supervision of the City's Managing Director of Community Services pursuant to the authority granted by City Council and the City Code of Ordinances.
19. *Municipally Owned Utility Pole* means a utility pole owned or operated by a municipally owned utility, as defined by Section 11.003, Utilities Code, and located in a public right-of-way.
20. *Network Node* means equipment at a fixed location that enables wireless communications between user equipment and a communications network. The term:
 - a. Includes:

- (1) Equipment associated with wireless communications;
 - (2) a radio transceiver, an antenna, a battery-only backup power supply, and comparable equipment, regardless of technological configuration; and
 - (3) coaxial or fiber-optic cable that is immediately adjacent to and directly associated with a particular collocation; and
- b. does not include:
 - (1) an electric generator;
 - (2) a pole; or
 - (3) a macro tower.
- 21. *Network Provider* means:
 - a. A wireless service provider; or
 - b. A person that does not provide wireless services and that is not an electric utility but builds or installs on behalf of a wireless service provider:
 - (1) Network nodes; or
 - (2) Node support poles or any other structure that supports or is capable of supporting a network node.
- 22. *Node Support Pole* means a pole installed by a network provider for the primary purpose of supporting a network node.
- 23. *Parkway Strip* means the unpaved portion of the right-of-way between the back of curb and the sidewalk. The parkway strip typically includes street light poles and lights, utility poles, regulatory signage, traffic signal equipment, and street trees. In some instances, a streetscape zone may not have a parkway strip.
- 24. *Pedestrian clear zone* means the unencumbered paved or sidewalk portion of the streetscape zone inside the right-of-way. The pedestrian clear zone may or may not be separated from the travel lane by a furnishing zone or parkway strip.
- 25. *Permit* means a written authorization for use of the public right-of-way or collocation on a service pole required from the City before a Network Provider may perform an action or initiate, continue, or complete a project over which the City has police power authority.
- 26. *Pole* means a service pole, municipally owned utility pole, node support pole, or utility pole.
- 27. *Public Right-of-Way* means the area on, below, or above a public roadway, highway, street, public sidewalk, alley, waterway, or utility easement in which the municipality has an interest. The term does not include a private easement or the airwaves above a public right-of-way with regard to wireless telecommunications.

28. *Replacement* means constructing a new Pole of comparable proportions and of comparable height to a preexisting Pole in order to accommodate collocation of small cell wireless facilities; and the associated removal of the preexisting Pole and or wireless facilities.
29. *Residential area* means a single-family residential lot or other multifamily residence or undeveloped land that is designated for residential use by zoning.
30. *Service pole* means a pole, other than a municipally owned utility pole, owned or operated by a municipality and located in a public right-of-way, including
 - a. A pole that supports traffic control functions;
 - b. A structure for signage;
 - c. A pole that supports lighting, other than a decorative pole; and
 - d. A pole or similar structure owned or operated by a municipality and supporting only network nodes.
31. *Small cell antenna* shall be included as a type of network node.
32. *Street* means only the paved portion of the right-of-way used for vehicular travel, being the area between the inside of the curb to the inside of the opposite curb, or the area between the two parallel edges of the paved roadway for vehicular travel where there is no curb. A 'street' is generally part of, but smaller in width than, the entire right-of-way. While a right-of-way may include sidewalks and utility easement, a 'street' does not. A 'street' does not include the curb or sidewalk, if either are present at the time of a permit application or if added later.
33. *Traffic signal* means any device, whether manually, electrically, or mechanically operated by which traffic is alternately directed to stop and then proceed.
34. *Transport facility* means each transmission path physically within a public right-of-way, extending with a physical line from a network node directly to the network, for the purpose of providing backhaul for network nodes.
35. *Underground requirement area* means an area where poles, overhead wires, and associated overhead or above-ground structures have been removed and buried or have been approved for burial underground pursuant to municipal ordinances, zoning regulations, state law, private deed restrictions, and other public or private restrictions, that prohibit installing above-ground structures in a public right-of-way.
36. *Utility Pole* means a pole that provides:
 - a. electric distribution with a voltage rating of not more than 34.5 kilovolts; or,
 - b. services of a telecommunications provider as defined by Chapter 284, Section 51.002, Utilities Code.
37. *Wireless Service* means any service, using licensed or unlicensed wireless spectrum, including the use of Wi-Fi, whether at a fixed location or mobile, provided to the public using a network node.

- 38. *Wireless service provider* means a person that provides wireless service to the public.
- 39. *Wireless Facilities* means micro network nodes, network nodes, node support poles, transport facilities, and any related equipment, including, but not limited to, ground or underground equipment, and not macro facilities.

D. *Prohibited and Preferred Locations of Micro Network Node, Network Node, Node Support Pole, and Related Ground Equipment.*

- 1. The following are prohibited or restricted areas for certain wireless facilities, except with separate City agreement or subject to concealment conditions.
 - a. Municipal parks and residential areas.
 - (1) In accordance with Chapter 284, Sec. 284.104(a), a Network Provider shall not install a wireless facility in a public right-of-way without the City's discretionary, nondiscriminatory, and written consent if the public right-of-way is in a municipal park or is adjacent to a street or thoroughfare that is:
 - (a) not more than 50 feet wide; and
 - (b) adjacent to a residential area.
 - (2) Each permit application shall disclose if the wireless facilities are within a municipal park and residential area as described above.
 - b. Historic districts and design districts.
 - (1) In accordance with Chapter 284, Sec. 284.105, a Network Provider must obtain written approval from City before collocating network nodes or installing node support poles in a historic district or design district with decorative poles.
 - (2) Each permit application shall disclose if the wireless facilities are located within a historic district or design district with decorative poles, or in an area of the city zoned or otherwise designated as a design district or historic district.
 - (3) As a condition for approval of wireless facilities in a historic district or design district with decorative poles, the Network Provider shall install wireless facilities utilizing concealment measures (see Exhibit 1). Any request for installations in a historic district or design district with decorative poles shall be accompanied with proposed concealment measures in the permit applications.
 - (4) A Network Provider shall comply with and observe all applicable laws, including but not limited to, Section 106 of the National Historic Preservation Act.
 - c. Compliance with Undergrounding Requirements.

- (1) In accordance with Chapter 284, Sec. 284.107, a Network Provider shall comply with all nondiscriminatory undergrounding laws, regulations, and requirements that prohibit installing above-ground structures in public right-of-way without first obtaining zoning or land use approval.
 - (2) Areas may be designated from time to time by the City as underground requirement areas in accordance with filed plats and/or conversions of overhead to underground areas, as may be allowed by law.
 - (3) Each permit application shall disclose if the wireless facilities are located within a designated underground requirement area.
2. Least preferable locations.
 - a. Municipal parks and residential areas.
 - b. Historic districts and design districts. Installing wireless facilities on Main Street in the Smithfield Transit Oriented Development district is strongly discouraged.
 - c. Historic landmarks. A Network Provider is discouraged from installing wireless facilities within three-hundred (300) feet of a historic site, structure, or historic landmark recognized by the City, State, or Federal government, as of the date of the submission of the permit. See, for example, and not limited to, §442.001(3) Texas Government Code, and 16 U.S.C. §470.
 - (1) The City requests that a Network Provider explore the feasibility of using concealment measures to improve the aesthetics and design of the wireless facilities to minimize the adverse impact to the historic landmark, site, or structure.
 - (2) A Network Provider shall comply with and observe all applicable laws, including but not limited to, Section 106 of the National Historic Preservation Act.
 - (3) Each permit application shall disclose if the wireless facilities are located within three-hundred (300) feet of a historic landmark.
3. Most preferable locations.
 - a. Industrial areas, if not adjacent to a municipal park, residential area, historic district, or design district.
 - b. Highway areas, if not adjacent to a municipal park, residential area, historic district, or design district.
 - c. Retail and commercial areas, if not adjacent to a municipal park, residential area, historic district, or design district.
 - d. Consult City staff for information regarding current historic districts and design districts.
4. Designated areas. Under Chapter 284.105, the City Council may designate an area as a design district or historic district at any time.

- a. Currently designated design districts:
 - (1) HomeTown (Town Center zoning district)
 - (2) Iron Horse transit oriented development district
 - (3) Smithfield transit oriented development district
 - (4) City Point
 - b. The failure to designate an area in this document shall not mean that such an area is not within a defined district, if so designated by the City Council.
 - c. While Chapter 284 does not require the City to designate underground compliance areas to prohibit above-ground wireless facilities, the City may, from time to time, designate such areas.
5. By its discretionary consent and agreement, the City may grant exceptions to the above prohibited locations and sizes, but only in a non-exclusive and non-discriminatory manner, as allowed or required by Chapter 284, Sec. 284.109 and Sec. 284.110.

E. Order of preference regarding attachment and placement of wireless facilities in the public right-of-way.

- 1. Micro network nodes shall only be lashed on existing communication lines between existing utility poles (electric poles or telephone poles), with notice to the pole owner as required by applicable laws, including but not limited to, the Federal Pole Attachment Act, 47 U.S.C. §224, and not placed on utility poles, node support poles, or service poles.
- 2. Existing utility poles (electric poles or telephone poles) shall be the preferred support facility for network nodes and related ground equipment.
- 3. Municipal service poles in the following order of preference:
 - a. Non-decorative street lights with a height of more than twenty (20) feet (see Exhibit 2).
 - (1) be encased in a separate conduit than the street light electronics;
 - (2) have a separate electrical power connection than the street light structure; and
 - (3) have a separate access point than the street light structure.
 - b. Street signage shall be a low priority for attachment of a network node. Installations on all street signage structures shall not interfere with the integrity of the facility in any way that may compromise the safety of the public. Installation of wireless facilities on any street signage structures that have electronics shall:
 - (1) be encased in a separate conduit than any City signage electronics;

- (2) have a separate electric power connection than the signage structure; and
 - (3) have a separate access point than the signage structure.
- c. Decorative street lights (see Exhibit 4) shall:
 - (1) be encased in a separate conduit than any street light electronics;
 - (2) have a separate electric power connection than the street light structure; and
 - (3) have a separate access point than the street light structure.
- d. Traffic signal structures (see Exhibit 3), when such installation will not interfere with the integrity of the facility and will not interfere with the safety of the public, and in accordance with an agreement, as allowed by Chapter 284, Sec. 284.056 and Sec. 284.101(a)(3) and (b). Installation of wireless facilities on any traffic signal structures shall:
 - (1) be encased in a separate conduit than the traffic light electronics;
 - (2) have a separate electrical power connection than the traffic signal structure; and
 - (3) have a separate access point than the traffic signal structure.
- e. Other municipal service pole use is discouraged.
- 4. New node support poles shall be the least preferred type of allowed facility for attachment of network nodes.

F. Prior to applying for a permit.

- 1. Prior to applying for a permit for installation of a network node or network support pole, network providers shall obtain an address for each network node or node support pole from the Planning & Zoning Department.
- 2. Network Providers and their contractors shall register as commercial general contractors with the Building Inspections Department prior to submitting an application.
- 3. Network Providers shall be an active member of the Texas811 one-call contact center. Paint used to mark underground utilities shall be water based paint.
- 4. For non-City owned property within the public right-of-way, Network Providers are responsible for obtaining permission from the owners of such non-City owned property.
- 5. It shall be the responsibility of the Network Provider to evaluate, prior to submitting a permit application, the compatibility between the existing City infrastructure and Provider's proposed network node. A network node shall not be installed in a location that causes any interference with existing City infrastructure. Network nodes shall not be allowed on City's public safety radio infrastructure.

G. Permitting.

1. Network Providers shall provide evidence of such permission to attach or use non-City owned property and right-of-way. If the project lies within a highway, the applicant must provide evidence of a permit from the State or Federal government, as applicable.
2. Prior to installing wireless facilities, Network Providers shall complete and submit an application for a wireless facilities permit. The following are the required documents for each application.
 - a. Plans and drawings prepared and sealed by a professional engineer licensed in the State of Texas that provide detailed drawings with calculations indicating strict conformity to the size limitations as set forth in Chapter 284, in accordance with, but not limited to, Sec. 284.002, Size of a Micro Network Node, Sec. 284.003, Size of Network Nodes, and Sec. 284.103, Maximum Pole Height. Plans must include geotechnical information from a bore in the immediate vicinity of the proposed pole. The proposed foundation design must be based on the geotechnical conditions as defined in the geotechnical report performed by a licensed professional engineer.
 - b. Installations on all utility poles and service poles shall include an industry-standard pole load analysis indicating that the service pole to which the network node is to be attached will safely support the load, in accordance with Chapter 284, Sec. 284.108.
 - c. Site plan and plat that includes the following:
 - (1) Indication of current right-of-way line and other easements and encumbrances.
 - (2) Indication of spacing from existing curb, driveways, sidewalk, trees, utilities, other poles, and existing buildings.
 - (3) Width of pedestrian clear zone.
 - (4) Proposed underground conduit and equipment and its spacing from other utilities.
 - (5) A sectional profile of the right-of-way identifying all existing utilities and existing utility conflicts. All electrical lines must be placed in rigid steel conduits. All conduit shall be located a minimum of thirty-six (36) inches away from existing utilities, not less than five (5) feet from edge of pipe for water or sanitary sewer mains, and three (3) feet above or below water or sanitary sewer mains when crossing perpendicularly. Written approval from the City Engineer is required if the conduit crosses a water or sanitary sewer main.
 - d. Scaled and dimensioned drawings of the proposed attachments of the network node to a service pole or node support pole of a scale of not less than one inch equals forty feet (1" = 40').

- e. Photo simulations are required (see Exhibit 5).
 - f. Copy of the node ID sticker.
 - g. Longitude and latitude for each network node and node support pole.
 - h. An analysis, including test results, demonstrating that the proposed wireless facilities do not cause any interference with the City's public safety radio system, traffic signal light system, or other City safety communications components, in accordance with Chapter 284, Sec. 284.304.
3. In the event that placement or maintenance of wireless facilities conducted by the Network Provider requires streets or traffic lanes to be closed or obstructed, the Network Provider shall submit a traffic control plan. A storm water pollution and prevention plan and trench safety plans may be required depending on the scope of work. Network Providers shall avoid placing any wireless facility over an existing drainage easement. Wireless facilities shall be located no farther into the drainage easement than three (3) feet. The City retains the right to determine these conflicts and may require the relocation of the wireless facility during review.
 4. Network Providers shall obtain an electrical permit and inspection by City prior to the installation of an electrical meter.
 5. Site coordination meeting with City staff are required if the wireless facility is to be located in a historic district or design district.
 6. Network Providers shall pay all fees and rates as established in Appendix A – Fee Schedule.

H. *Standards and guidelines on wireless facilities.*

1. General
 - a. In accordance with Chapter 284.102, a Network Provider shall construct and maintain wireless facilities in a manner that does not:
 - (1) Obstruct, impede, or hinder the usual travel or public safety on a public right-of-way;
 - (2) Obstruct the illumination of street lights;
 - (3) Obstruct the legal use of a public right-of-way by other utility providers;
 - (4) Violate nondiscriminatory applicable codes;
 - (5) Violate or conflict with the City's Small Cell Wireless Facilities right-of-way use ordinance or this Design Manual;
 - (6) Violate the federal Americans with Disabilities Act of 1990 (42 U.S.C. Section 12101 et seq.).
 - b. In historic districts and design districts with decorative poles, the following shall apply:

- (1) A Network Provider must obtain advanced approval from the City before collocating new network nodes or installing new node support poles.
- (2) Concealment of wireless facilities shall be required in historic districts and design districts with decorative poles, pursuant to Chapter 284.105. Network providers shall submit proposals for concealment with the documents required for permitting.
- (3) The new network nodes or node support poles shall be concealed or enclosed in an equipment box, cabinet, or other unit that may include ventilation openings.
- (4) Only one (1) network node shall be permitted on any one (1) pole (see Exhibit 6).
- c. Network Providers shall not install wireless facilities on public art without written permission from the City, in order to prevent issues of potential intellectual property infringement.
- d. Transport facilities shall be underground. Aerial power and fiber connections shall not be permitted (see Exhibit 7).
- e. All attachments on service poles shall be at least twelve (12) feet above grade, in accordance with Chapter 284, Sec. 284.108(a)(1)-(2). If a wireless facility's attachment is projected toward the street, for the safety and protection of the public and vehicular traffic, the attachment shall be installed no less than sixteen (16) feet above grade (see Exhibit 8).
- f. Caution shall be exercised during the construction and installation of new support poles and network nodes so they do not interfere or conflict with existing building overhangs and awnings.

2. Location

- a. All wireless facilities shall be located to avoid any physical or visual obstruction to pedestrian or vehicular traffic, or in any manner create safety hazards to pedestrians or motorists.
- b. Where available, all wireless facilities shall be located in the furnishing zone or parkway strip in line with existing street trees and decorative poles. In no instance when a furnishing zone or parkway strip is available shall wireless facilities be located in a pedestrian clear zone. Wireless facilities equipment in the furnishing zone shall generally be placed in the center of the furnishing zone or parkway strip and shall meet minimum Texas Department of Transportation and City public works design manual setback requirements from the back of curb, generally eighteen (18) to twenty-four (24) inches (see Exhibit 12).
- c. Where there is no furnishing zone or parkway strip, wireless facilities shall maintain either a minimum five (5) foot wide pedestrian clear zone from back of curb to the inward edge of the wireless facilities, or a minimum five (5) foot wide pedestrian clear zone between the outward edge of the wireless facilities and the back of sidewalk (see Exhibit 12).

- d. In a historic district or design district, wireless facilities shall maintain either a minimum seven (7) foot wide pedestrian clear zone from back of curb to the inward edge of the wireless facility, or a minimum seven (7) foot wide pedestrian clear zone between the outward edge of the wireless facility and the back of sidewalk.

3. Height

- a. In residential zoning districts, historic districts, and design districts with decorative poles, height is a factor when determining sufficient concealment.
- b. In all other districts and in accordance with Chapter 284, Sec. 284.103, a node support pole, a new, modified or replacement utility pole, or service pole may not exceed the lesser of:
 - (1) ten (10) feet in height above the tallest existing utility pole located within five hundred (500) linear feet of a new pole in the same public right-of-way; or
 - (2) Fifty-five (55) feet above grade.

4. Separation

- a. The separation between wireless facilities shall be a minimum of two hundred fifty (250) feet in historic districts and design districts with decorative poles, and two hundred (200) feet in all other areas, per block face, to minimize the hazard of multiple poles adjacent to roadways and to minimize the effect on property values and aesthetics of the area (see Exhibit 13).
- b. In residential zoning districts, wireless facilities shall be located where the shared property line between two residential parcels intersect the public right-of-way (see Exhibit 14).
- c. In non-residential zoning districts, wireless facilities shall be located between tenant spaces, storefront bays, or adjoining properties where their shared property lines intersect the right-of-way.
- d. Wireless facilities shall not be located in front of a building entrance or exit.

5. Network nodes

- a. Network nodes shall be mounted in an inconspicuous location and painted to match the existing pole.
- b. Network node placement shall not impair light, air, or views from adjacent windows (see Exhibit 15).
- c. The following guidelines are preferred for installation of wireless facilities.
 - (1) Use antenna models that include GPS antenna, if needed, integrated into the same cylindrical shape on top of the main antenna.
 - (2) Minimal profiles and shrouds are preferred.
 - (3) Use antennas with electronic tilt mechanisms that reduce the need for bulky mechanical tilt brackets.

- (4) A top-mount antenna with a very tall extension arm may look out of character in a low-lying residential neighborhood, but a top mount antenna that is relatively narrow and nearly flush with the top of the pole may offer a very minimal profile, which is preferred.
- (5) Use single element side-arms instead of dual parallel side-arms. Evaluate opportunities to utilize cylindrical antennas in lieu of panel antennas. If panel antennas are utilized, consider the use of mini shrouds below each panel antenna to reduce the visibility of the cable loops. Avoid the use of large bracket systems for panel antennas, which create a significant offset from the pole.
- (6) For side-mounted antennas, consider using an arm that features flanges/channels so that cabling and passive radio frequency gear can be better hidden from view.
- (7) For top-mounted antennas, consider using a shroud around the base of the antenna, especially for antenna models with four or more cabling ports, as cable systems without a shroud at the base of the antenna can appear cluttered. If a shroud cannot be used, utilize Velcro ties or wire ties to neatly arrange cabling.
- (8) Pole top extension arms shall not appear offset from the pole. Utilize an arm that is as wide as the top of the pole and tapers toward the antenna.

6. New node support poles

- a. Node support poles shall be set back beyond the signal conduit at an intersection so as not to interfere with or obstruct underground signal functionality. The City Engineer may require greater setbacks from these and other fixtures in the right-of-way to ensure proper sight lines for public safety purposes.
- b. All new node support poles shall be black-coated metal poles. All poles shall be mounted on a frangible metal base or system of breakaway couplings. The design of the breakaway feature shall be in accordance with the requirements of the AASHTO 'Roadside Design Guide'. Wooden support poles are prohibited.

7. Equipment

- a. Equipment, as defined in Chapter 284, Sec. 284.003 and in the Small Cell Ordinance, shall be minimized and consolidated as much as possible. Ground equipment shall be minimal and the least intrusive.
- b. In historic districts and design districts with decorative poles, equipment shall be designed to be inside a pole or utility enclosure that is already present in the environment, or in a pole that matches the design used on the street already. Equipment shall be incorporated into the design of the infrastructure when possible.
- c. For the safety of municipal park patrons and to allow full line of sight near municipal park property, Network Providers shall not install ground equipment

in a right-of-way that is within a park, unless written approval is provided by the City Engineer.

- d. Collocation of ground equipment is encouraged.
 - e. In accordance with Chapter 284.102(1), in order to maximize the line of sight at street corners and intersections, and to minimize any obstruction, impediment, or hindrance to the usual travel or public safety on a public right-of-way, ground equipment shall not be installed within two hundred fifty (250) feet of a street corner or a street intersection.
 - f. Equipment enclosures and equipment mounting base plates shall be the same width as the pole or structure that they are attached to, even if they need to be slightly longer as a result. Narrow equipment enclosures are less likely to impede pedestrian traffic, impair views of buildings and scenic resources, or to detract from streetscapes (see Exhibit 16).
 - g. Equipment attached to a pole shall be installed at least twelve (12) feet above the ground in accordance with Chapter 284, Sec 284.108. If a network node attachment is projecting toward the street, for the safety and protection of the public and vehicular traffic, the attachment shall be installed no less than sixteen (16) feet above the ground (see Exhibit 9).
 - h. In accordance with Chapter 284, Sec. 284.003 (a)(1)(C), Sec. 284.003(a)(2)(C), and Sec. 283.004(a)(3)(B), no protrusion from the outer circumference of the existing structure or pole shall be more than two (2) feet.
 - i. The color of all equipment shall match or complement its location.
 - j. Equipment shall be stacked close together and on the same side of the pole or be collocated with other ground equipment. If a long rectangular disconnect switch is used, the enclosure must be rotated so the elements can be stacked closer together on the pole. Avoid offsets of more than four (4) inches of equipment enclosure brackets from the pole.
 - k. Equipment shall be oriented away from nearby residential windows, doorways, entrances, and the primary pedestrian travel direction.
 - l. Equipment shall not be placed adjacent to the walkway in a manner that diminishes the comfort of pedestrians or be located within the pedestrian clear zone (see Exhibits 10 and 11).
8. Electrical supply
- a. Network Providers shall be responsible for obtaining any required electrical power 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 the public utility serving the structure or the act or omission of any other tenant or Network Provider of the structure, or for any other case beyond the control of the City.

- b. A Network Provider shall not allow or install generators or back-up generators in the right-of-way in accordance with Chapter 284, Sec. 284.002(12)(B)(1).
 - c. Network Providers shall utilize a line drop (no electric meter enclosure), if allowed by the utility company, or use the narrowest electric meter and disconnect available. Meter and other enclosures shall match the infrastructure to which it is attached and shall be well maintained, including regular painting, and the use of a graffiti-resistant paint.
 - d. The disconnect switches 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 utility company. Electric meters and disconnect switches shall not be located on the side of the pole that faces the sidewalk. Conduit leading to the electric meter box and disconnect switch shall match the color of the pole.
 - f. If the electric meter is not attached to the pole, it shall be located in a cabinet with a concrete base.
9. Logos, decals, flashing lights, RF warning sticker, and node IDs
- a. Network Provider shall post its name, identifying information, permit number, and emergency telephone number in an area on the cabinet of the wireless facility that is visible to the public. Signage required under this section shall not exceed two (2) inches by four (4) inches, unless otherwise required by law.
 - (1) The node ID sticker must be placed on the underside of the equipment enclosure so it is only visible when standing next to the pole and looking up. If the node ID sticker cannot be placed on the underside of the main equipment area, the sticker must be placed on the side of the enclosure facing in the direction of travel (e.g., north-facing for a pole on the right hand side of the street on a north-south street). Alternatively, the disconnect information should be combined with the node ID information.
 - (2) Sticker colors must be muted, complementary, or the same color as the equipment, but with white lettering.
 - (3) The smallest and lowest visibility radio-frequency (RF) sticker required by government or electric utility regulations must be used. The sticker must be placed as close to the antenna as possible, facing directly out toward the street, or directly away from the street if there is no window or doorway within twenty-five (25) feet of the pole.
 - b. All equipment manufacturer decals shall be removed. Except as required by law or by the utility pole owner, Network Provider shall not post any other signage or advertising on the wireless facility (see Exhibit 17).
 - c. Equipment shall not have flashing lights.
 - d. All visibly depressed manufacturer logos on equipment boxes shall be filled in.

10. Cabling

- a. Exposed wiring is prohibited. Above the electric meter and disconnect switch, all conduit and wiring shall be located inside the pole (see Exhibit 10).
- b. The use of shrouds, risers, or conduit to reduce the appearance of cluttered or tangled cabling is required. Excess loose cabling, exceed decals or stickers, and the cluttered appearance of equipment cabinets is prohibited (see Exhibit 17).
- c. In some instances, installation practices such as using equipment enclosures with specific port locations, or crossing wires below a down-facing port on an equipment enclosure, can reduce the likelihood that cabling will appear cluttered or bend outward from the pole and further away from the enclosure.
- d. Instructional notes for the installer shall be included on the plan drawings in a checklist format in order to ensure property field installation.

11. Paint

- a. The color of the equipment enclosures shall match the infrastructure to which it is attached. Antennas, brackets, and cabling shall match the color of the equipment, including the fiber termination enclosure. All equipment shall match the pole, including PVC, steel risers, or other materials.

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 public right-of-way is prohibited, unless the Network Provider has obtained authorization from the City.
- b. All such normal tree or vegetation trimming by the Network Provider must be performed in accordance with the requirements of existing or subsequently enacted City ordinances and shall be at the Network Providers own expense.
- c. All other removal, cutting, marring, defacing, or destruction of any trees or other vegetation, other than grass, by the Network Provider shall be subject to the supervision and direction of the City or other appropriate governmental authority. If the Network Provider either (i) fails to engage in normal tree or vegetation trimming on public property and such failure results in the Network Provider's wireless facilities causing damage or injury to any property or person, or (ii) engages in normal tree or vegetation trimming on public property and through such action causes damage or injury to any property ow person, then the Network Provider, by act of registering hereunder, agrees to **INDEMNIFY, HOLD HARMLESS, AND DEFEND THE CITY FOR ANY LIABILITY RESULTING FROM SUCH DAMAGE OR INJURY**. The Network Provider may contract for such services provided any firm or individual so retained shall receive City approval prior to commencing such activity.

13. Installation

- a. A Network Provider shall, at its own cost and expense, install and construct the wireless facilities in a good and workmanlike manner and in accordance with the requirements promulgated by the City Engineer, as such may be amended from time to time. Network Provider's work shall be subject to the regulation, control and direction of the City through the City Engineer. All work done in connection with the installation, operation, maintenance, repair, modification and replacement of wireless facilities shall be in compliance with all applicable local, State and Federal laws, ordinances, codes, rules and regulations.
- b. In an effort to minimize the adverse impact on the public rights-of-way and other municipal improvements, a Network Provider may be required to coordinate the placement or maintenance of its wireless facilities with any work, construction, installation in or repairs of the subject public rights-of-way or other facilities therein that is occurring or is scheduled to occur within a reasonable time from application for a permit. Every Network Provider shall make space in its trench and conduit within the public rights-of-way available to other providers, consistent with all applicable laws. Every Network Provider shall utilize existing conduits, pathways and other facilities whenever possible, and shall not place or maintain any new, different, or additional poles, conduits, pathways or other facilities, whether in the public rights-of-way or on privately owned property, until written approval is obtained from the City or other appropriate governmental authority, and, where applicable, from the private property owner.
- c. Potholing by hydro excavation method shall be required when conduit crosses a water or sanitary sewer mains.
- d. Excavation, staging, or other construction work shall not be allowed outside the public right-of-way as part of the installation of a wireless facility within the right-of-way unless written permission is granted by the property owner.
- e. Oversight by a City inspector is required during construction for all wireless facilities.
 - (1) Work days and hours for installation shall be Monday through Friday, 8:00 AM to 5:30 PM, except for those days on which the City is closed in observance of a holiday.
 - (2) Work beyond regular hours stated above will require the availability of a construction inspector and a fee of \$75 per hour for overtime.
- f. All work shall conclude ten (10) calendar days from commencement of installation of each wireless facility.

14. Restoration

- a. Network Provider shall repair any damage to the right-of-way, or any facilities located within the right-of-way, and the property of any third party resulting from Network Provider's removal or relocation activities (or any other of

Network Provider's activities hereunder). Repairs shall be completed within 10 calendar days following the date of such removal or relocation, at Network Provider's sole cost and expense, including restoration of the right-of-way and such property, to the same condition as it was immediately before the date Network Provider was granted a permit for the applicable location or did the work at such location (even if Network Provider did not first obtain a permit), including restoration or replacement of any paving system, damaged trees, shrubs or other vegetation. Such repair, restoration and replacement shall be subject to the sole, reasonable approval of the City Engineer.

- b. If the Network Provider fails to make such restoration within ten (10) days following the completion of such placement or maintenance, the City may perform such restoration and charge the costs of the restoration to the Network Provider. The City will issue an invoice for such cost. The invoice must be paid within thirty (30) calendar days. The Network Provider shall, to the satisfaction of the City Engineer, maintain and correct any restorations made pursuant hereto for a period of twelve (12) months following the date of its completion, including any restorations made by the City. Failure to comply shall be deemed sufficient grounds for denial of any future permits for the placement or maintenance of wireless facilities.

15. Inspections

- a. The City Engineer or designee reserves the right to perform visual inspections of any wireless facility located in the public right-of-way as the City Engineer deems appropriate. A Network Provider may have a representative present during such inspection.

16. Effect of approval

- a. A wireless facility that has received City approval in the form of a permit shall be considered an existing wireless facility as long as such approval is current and not expired.
- b. Permits for wireless facilities shall become null and void if the work authorized by the permit is not commenced within six (6) months from the date of issuance. Upon expiration of the permit, the Network Provider must reapply.
- c. A Network Provider shall maintain as-built plans, accurate maps, and other appropriate records of its wireless facilities as they are actually constructed in the public right-of-way. The use of AutoCAD and GIS digital formats is recommended. A Network Provider shall provide additional maps to the City upon request.

17. Waivers

- a. By its discretionary consent and agreement, the City may grant exceptions to the above restricted locations and size, but only in an exclusive and non-discriminatory manner, as allowed by Chapter 284, Sec. 284.109 and Sec. 284.110.

18. Permit Review Process; Appeal

- a. All applications for a permit for wireless facilities shall be reviewed and decided in the manner required by Chapter 284, Sec. 284.154.
- b. All appeals from a decision of the City Engineer related to this Design Manual will be heard and decided by the City Manager or designee and must be made in writing. An appeal must be made within thirty (30) calendar days of the Network Provider receiving a final decision from the City Engineer. In considering an appeal of the decision of the City Engineer, the following shall be submitted and considered:
 - (1) Revised completed application requesting the installation of wireless facilities;
 - (2) The City Engineer's decision, and specific documentation setting out the basis for the denial;
 - (3) The applicant's written statement of the grounds of the appeal; and
 - (4) The specific provisions of this Design Manual, Chapter 284, or the City's Small Cell Ordinance upon which such denial is based.
 - (5) Any appeal under this section must be limited to the deficiencies cited in the denial documentation.
- c. If a written decision on the appeal is not rendered within ninety (90) calendar days from the date the appeal is received, the requested accommodation shall be deemed granted.
- d. The decision of the City Manager or designee is final and shall exhaust all administrative remedies.

19. Improperly located wireless facilities and penalty

- a. Wireless facilities shall not impede pedestrian or vehicular traffic in the right-of-way. If any wireless facilities are installed in a location that is not in accordance with the plans approved by the City Engineer and impedes pedestrian or vehicular traffic, or does not comply or otherwise renders the right-of-way non-compliant with applicable laws, including the Americans with Disabilities Act, the Network Provider shall promptly remove the wireless facilities at the sole cost and expense of the Network Provider. If the Network Provider does not remove the wireless facility within fifteen (15) calendar days of receiving notice from the City of such improper location, then the City shall remove the wireless facility. The Network Provider shall reimburse the City for the cost of removal.

20. All fines and penalties as per City Code of Ordinances Chapter 1, Sec. 1-13 shall apply for all violations of the Design Manual.

21. Graffiti abatement

- a. As soon as practical, but not later than ten (10) calendar days from the date the Network Provider receives notice thereof, Network Provider shall remove all graffiti on any of its wireless facilities 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.

22. Insurance, Indemnity, Bonding, and Security Deposits

- a. Insurance, bonding, and security deposits shall be in strict accordance with the City requirements for utility work within the public right-of-way.
- b. Indemnity shall be in accordance with Chapter 284, Sec. 284.302, as provided for in Chapter 283, Sec. 283.057(a) and (b) of the Texas Local Government Code.

23. Network Providers responsibility

- a. The Network Provider shall provide written notice to the City Engineer at least ten (10) days prior to any upgrading or maintenance on a wireless facility.
- b. Network Providers are strongly encouraged to have procedures in place to ensure their employees positively and politely interact with citizens when dealing with issues pertaining to its wireless facilities in the public right-of-way. If, in the opinion of the City Engineer, the Network Provider, or its employees, representatives or agents, are not interacting in a positive and polite manner with citizens, the City will request the Network Provider take all remedial steps to conform to these standards. For the safety and security of citizens, Network Providers shall ensure that its employees carry proper identification, drive appropriately marked vehicles to identify that he/she is an employee of Network Provider.

24. Removal and relocation by the Network Provider

- a. If the Network Provider removes or relocates a wireless facility at its own discretion, it shall notify the City Engineer in writing not less than ten (10) calendar days prior to removal or relocation. Network Provider shall obtain all permits required for relocation or removal of its wireless facilities prior to relocation or removal.
- b. In accordance with Chapter 284, Sec. 284.303, except as provided in existing state and federal law, a Network Provider shall relocate or adjust wireless facilities in a public right-of-way within three (3) months of approval of the permit and without cost to the City.
- c. The City shall not issue any refunds for any amounts paid by Network Provider for wireless facilities that have been removed.

25. Removal and relocation required for a City project

- a. Network Provider understands and acknowledges that the City may require Network Provider to remove or relocate its wireless facilities, or any portion thereof from the right-of-way for City construction projects as allowed by state and federal law, including the common law.
- b. Network Provider shall, at the City Engineer's direction, remove or relocate its wireless facilities, or any portion thereof from the public right-of-way at Network Providers sole cost and expense, except as otherwise provided in

existing state and federal law, whenever the City Engineer reasonably determines that the relocation or removal is needed for any of the following purposes: water or sanitary sewer main breaks, and required for the construction, completion, repair, widening, relocation, or maintenance of, or use in connection with, any City construction or maintenance project of a street or public right-of-way to enhance the public's use for travel and transportation.

- c. If Network Provider fails to remove or relocate the wireless facility, or portion thereof, as requested by the City Engineer within ninety (90) calendar days of receipt of the request, then the City shall be entitled to remove the wireless facility, or portion thereof, at Network Provider's sole cost and expense, without further notice to the Network Provider.
- d. Network Provider shall, within thirty (30) calendar days following issuance of invoice for the same, reimburse the City for its reasonable expenses incurred in the removal, including without limitation, overhead and storage expenses, of the wireless facility or portion thereof.

26. Removal required by City for safety and imminent danger reasons

- a. Network Provider shall, at its sole cost and expense, promptly disconnect, remove, or relocate the wireless facility within the time frame and in the manner required by the City Engineer if it is reasonably determined that the disconnection, removal, or relocation of any part of a wireless facility (a) is necessary to protect the public health, safety, welfare, or City property; (b) the wireless facility, or portion thereof, is adversely affecting proper operation of streetlights or City property; or (c) Network Provider fails to obtain all applicable licenses, permits, and certifications required by law for its wireless facilities, or use of any location under applicable law in strict accordance with the City's Small Cell Ordinance, and other applicable ordinances, except to the extent not consistent with Chapter 284. If the City Engineer reasonably determines that there is imminent danger to the public, then the City may immediately disconnect, remove or relocate the applicable wireless facilities equipment at the Network Provider's sole cost and expense.
- b. The City Engineer shall provide thirty (30) calendar days' written notice to the Network Provider before removing a wireless facility under this Section, unless there is imminent danger to the public health, safety, and welfare.
- c. Network Provider shall, within thirty (30) calendar days following the issuance of invoice for the same, reimburse City for its reasonable expenses incurred in the removal and relocation, including without limitation, overhead and storage expenses, of the wireless facility or portion thereof.

27. Abandonment

- a. Network Providers shall remove wireless facilities when such wireless facilities are abandoned, regardless of whether or not it receives notice from the City. Unless the City sends notice that removal must be completed

- immediately for failure to pay any fee or to ensure public health, safety, and welfare, the removal must be completed within the earlier of ninety (90) calendar days of the wireless facility being abandoned or within ninety (90) calendar days of receipt of written notice from the City. Failure to remove within the stated time will be considered abandonment. When Network Provider removes, or abandons permanent structures in the right-of-way, the Network Provider shall notify the City Engineer in writing of such removal or abandonment and shall file with the City Engineer the location and description of each wireless facility removed or abandoned. The City Engineer may require the Network Provider to complete additional remedial measures necessary for public safety and the integrity of the right-of-way. Should the Network Provider fail to remove the abandoned wireless facility, the City may remove the abandoned wireless facility at the Network Provider or end user's expense.
- b. Network Provider shall, within thirty (30) calendar days following the issuance of invoice for the same, reimburse City for its reasonable expenses incurred in the removal, including without limitation, overhead and storage expenses, of the wireless facility or portion thereof.

28. Pole ownership

- a. The City owns all non-utility poles in the public right-of-way and shall continue to own any and all poles even if such poles are replaced or relocated by a Network Provider. No part of a wireless facility erected or placed on a pole or otherwise on the public right-of-way by a Network Provider will become, or be considered by the City as being affixed to or a part of, the public right-of-way. All portions of the wireless facility constructed, modified, erected, or placed by a Network Provider in, on, or above the public right-of-way will be and remain the property of Network Provider and may be removed by Network Provider at any time, provided the Network Provider shall notify the City, in writing, prior to any work in the public right-of-way.

29. Design Manual Updates

- a. Placement or modification of wireless facilities shall comply with this Design Manual at the time the application for installation or modification is submitted.
- b. This Design Manual may be updated from time to time in accordance with Chapter 284, the Small Cell Ordinance, or as otherwise modified by the City Manager or designee, or by City Council.

Exhibit 1. Unique and creative design solutions are encouraged and should be contextual to the location of the wireless facility.



Exhibit 2. Non-decorative street lights with a height of more than 20 feet.



Exhibit 3. Traffic signal structure.



Exhibit 4. Decorative street light with public art.



Exhibit 5. Example of a photo simulation.



Exhibit 6. In historic districts and design districts with decorative poles, more than one network node is not allowed because it fails to meet the concealment standards.



Exhibit 7. Aerial power and fiber connections are not permitted. They create additional visual clutter and may require extra tension and structural support.



Exhibit 8. All attachments on all service poles shall be at least 12 feet above grade. If a wireless facilities attachment is projecting toward the street, the attachment shall be at least 16 feet above grade.



Exhibit 9. The pole on the right has the wireless facility in an inconspicuous location and painted to match. The pole on the left has a wireless facility of a different color with exposed conduit.

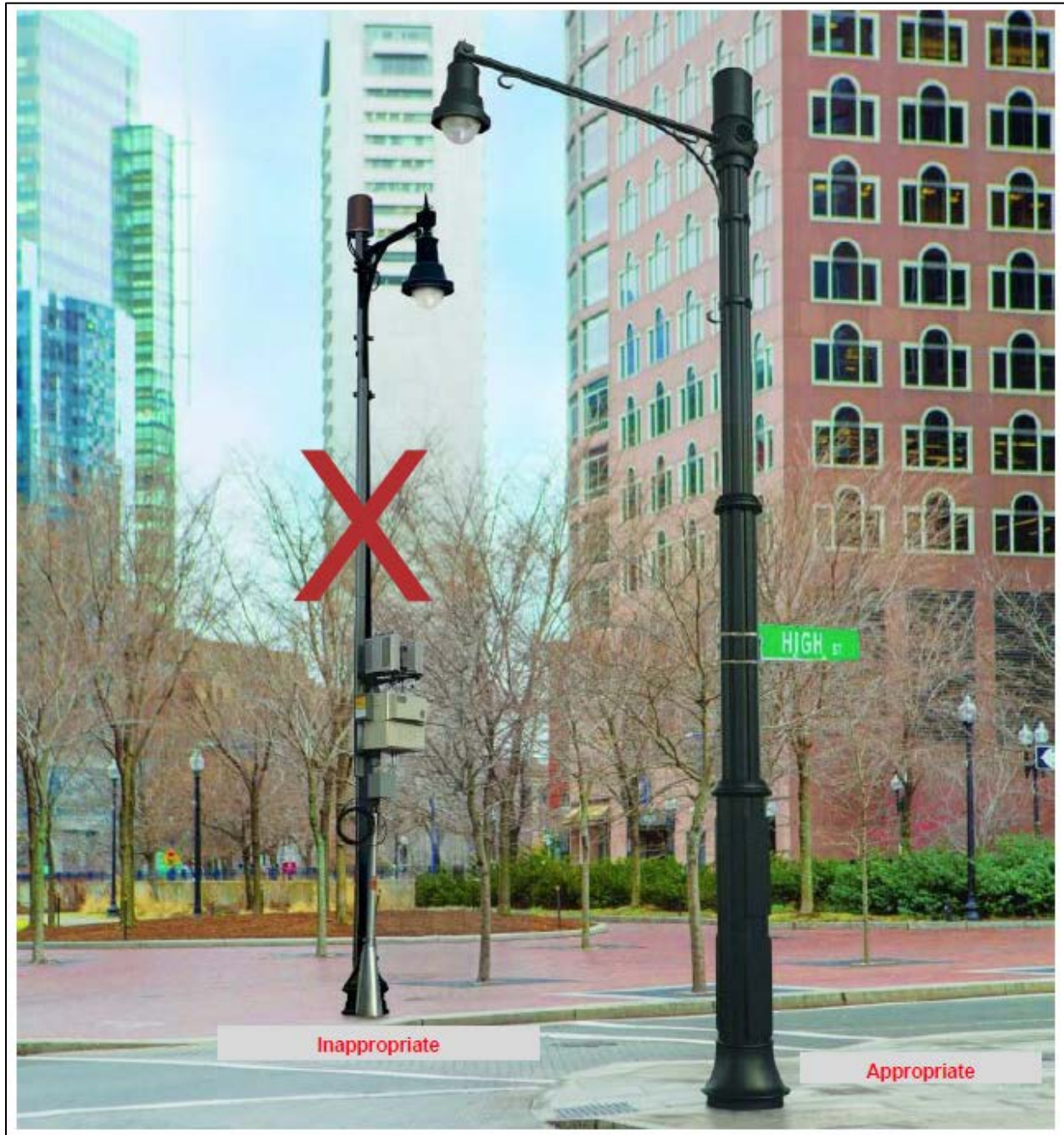


Exhibit 10. Exposed wiring is prohibited. Above the electric meter and disconnect switch, all conduit and wiring shall be located inside the pole. All equipment is located inside the pole and avoids creating a physical or visual obstruction to pedestrian and vehicular traffic.



Exhibit 11. Equipment shall not be placed adjacent to the walkway in a manner that diminishes the comfort of pedestrians or be located within the pedestrian clear zone.



Exhibit 12. Where available, all wireless facilities shall be located in the furnishing zone or parkway strip in line with existing street trees and decorative poles. In no instance shall the wireless facility equipment be located in the pedestrian clear zone.

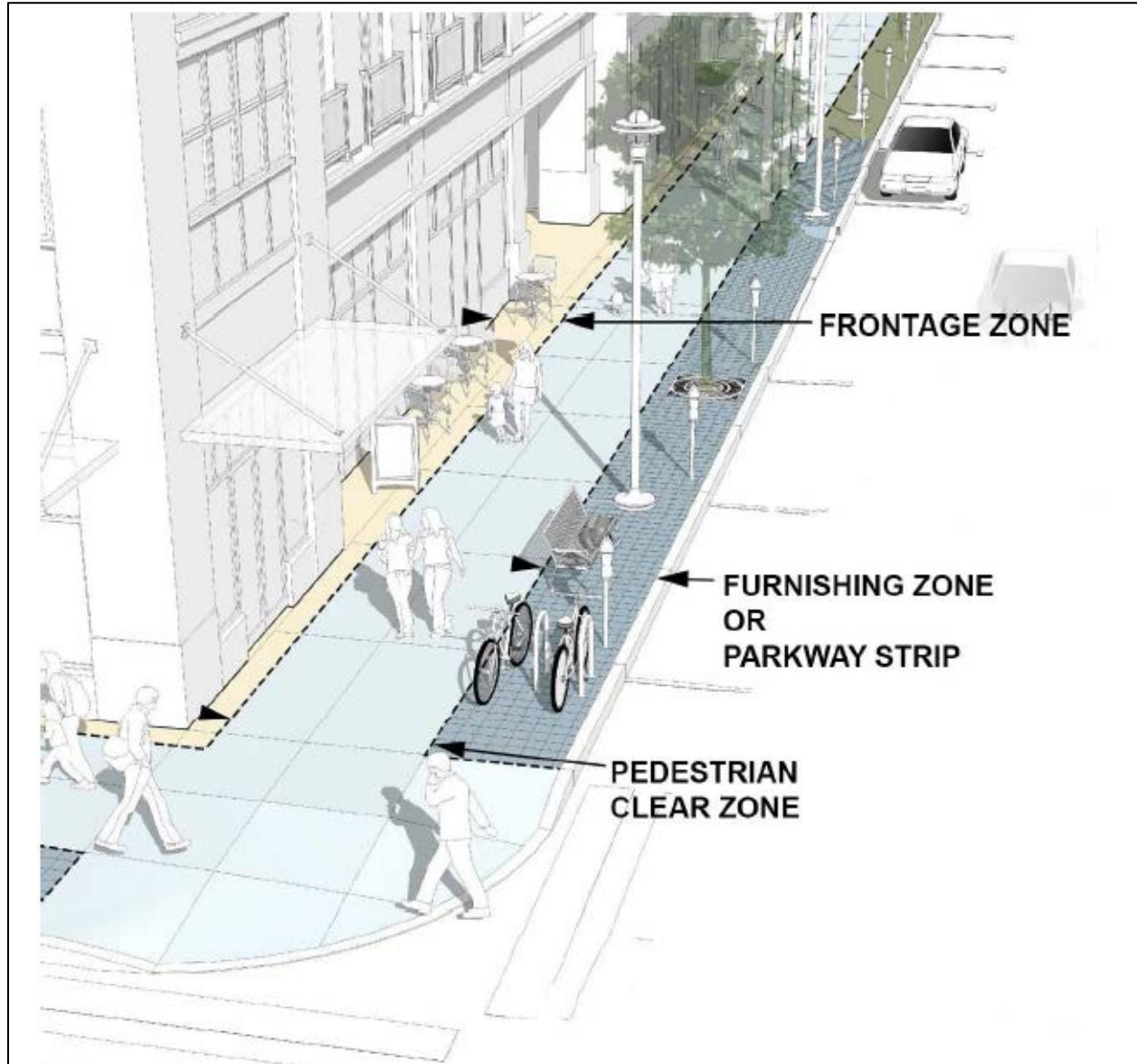


Exhibit 13. The separation between wireless facilities shall be a minimum of 200 feet or 250 feet in historic districts and design districts with decorative poles, per block face, to minimize the hazard of multiple poles adjacent to roadways and to minimize the effect on property values and aesthetics in the area.

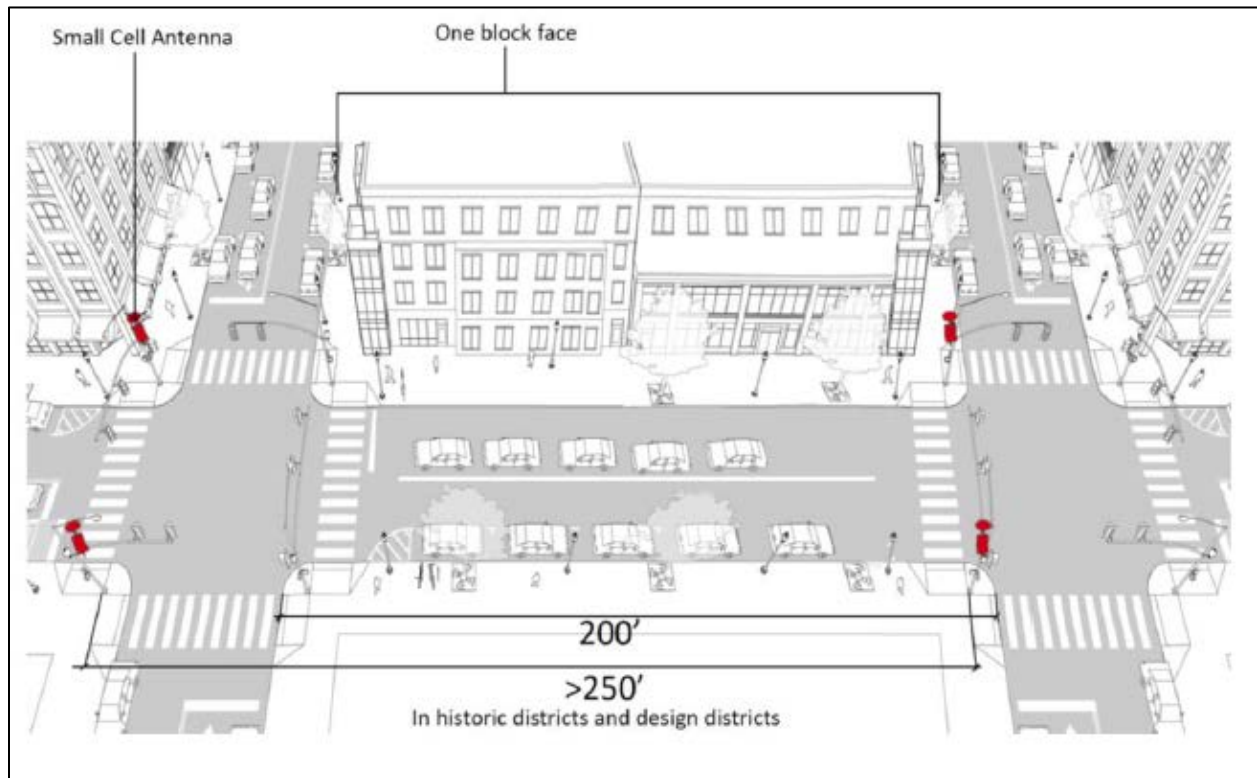


Exhibit 14. The wireless facility is located in front of the residential building. Wireless facilities shall be located where shared property lines intersect the public right-of-way.



Exhibit 15. Network node placement shall not impair light, air, or views from adjacent windows.



Exhibit 16. Equipment enclosures and equipment mounting base plates shall be the same width as the pole or structure that they are attached to, even if they need to be slightly longer as a result. Narrow equipment enclosures are less likely to impede pedestrian traffic, impair views of buildings and scenic resources or to detract from streetscapes (see exhibit 14).



Exhibit 17. The cabling that is cluttered & tangled. Excess loose cabling, excess decals/stickers, and cluttered appearance of equipment cabinets are not allowed. Repetitive, and highly visible RF warning stickers, and equipment manufacturer decals located near bottom of pole and visible to pedestrians are not allowed. This graphic shows the presence of multiple stickers and manufacturer logos, which should be removed or painted over.



The photographs and images in this Design Manual are strictly for non-commercial use and are used to comment and provide visual examples of the types of uses that are allowed, preferred, discouraged and or prohibited under this Design Manual, Chapter 284 or the City's Small Cell Ordinance.