LAND USE PLANNING FOR WIRELESS TELECOMMUNICATIONS TASK FORCE

FINAL RECOMMENDATIONS

September 2020

WESTCOG

Task Force Members:

George Benson, Director of Planning, Town of Newtown

Ralph Blessing, Land Use Bureau Chief, City of Stamford

Ira Bloom, Senior Partner, Berchem Moses PC

Sara Harris, Operations Director, Town of Westport

Rudy Marconi, First Selectman, Town of Ridgefield

Roger Palanzo, Director of Business Advocacy, City of Danbury

Jayme Stevenson, First Selectman, Town of Darien

Lynne Vanderslice, First Selectwoman, Town of Wilton

Michael Wrinn, Director of Planning and Land Use Management, Town of Wilton

Managing WestCOG Staff:

Francis Pickering, Executive Director

Charles Vidich, Senior Project Manager

Kristin Floberg, Planner

Western Connecticut Council of Governments

1 Riverside Road

Sandy Hook, CT 06482

Phone: (475) 323-2060

CHAPTER 1: INTRODUCTION

The Western Connecticut Council of Governments (WestCOG) established a task force on October 17, 2019 to develop a coordinated strategy to make the region a digital leader (see Appendix H for task force mission statement). The Land Use Planning for Wireless Telecommunications Task Force held its first meeting on March 2, 2020 with representation from chief elected officials, town planners, and a town attorney. The task force met on a regular basis over the next six months to develop telecommunications strategies to address the emergence of fifth generation mobile broadband services. The task force was briefed by a variety of subject matter experts from the telecommunications industry, the legal profession and Senator Blumenthal's office who provided insights into the challenges of managing the anticipated expansion of small wireless facilities across the state of Connecticut and in the eighteen municipalities of Western Connecticut.

The COVID-19 pandemic struck the nation just as the task force was beginning its work. The result was that the task force held all but the first meeting virtually. COVID-19, while certainly posing a threat to the health of our citizens, made it apparent that high speed digital communication became even more important for the region's economy. With Governor Lamont's orders for social distancing, and remote work – for those capable of doing so – digitally enabled services skyrocketed in importance taking tele-medicine from a futuristic concept to real-time reality. Similarly, digital access to local governmental services including emergency preparedness support, planning and zoning administration, public health testing for COVID-19 and numerous other local services depended on the digital infrastructure available within each municipality.

The task force reviewed the working documents prepared by WestCOG staff over the last six months and these documents have been incorporated into the final report presented herein. Because of differences in population density, community character, proximity to major transportation corridors and fiscal priorities, municipalities within the region will need to identify which strategies – if any – are best suited to meet their immediate telecommunication needs. Despite differences in local readiness for fifth generation mobile broadband services, the task force has identified a series of recommendations that will enable the growth of wireless telecommunication services consistent with the economic development and community character concerns of Western Connecticut.

Specific municipal strategies to guide the development of fifth generation wireless telecommunication services include the adoption of a municipal ordinance, a right of way ordinance, revised zoning regulations, and a municipal licensing strategy. These options are not mutually exclusive as discussed in the section titled strategies for managing the deployment of 5G wireless facilities. The model municipal ordinance, the model right of way ordinance and ten things local zoning commissions can do to comply with the 2018 Federal Communication Commission regulations and public concerns are contained in the appendix to this report.

CHAPTER 2: STRATEGIES FOR MANAGING THE DEPLOYMENT OF 5G SMALL WIRELESS FACILITIES IN WESTERN CONNECTICUT

In October 2018, the Federal Communications Commission issued regulations that require municipalities to adjust their review and approval procedures for small wireless facilities (SWF) designed to expand the speed of communication for the nation's broadband service providers. This initiative is part of the FCC's broader effort to enable fifth generation (also called 5G) broadband services across the nation to provide a wide range of wireless services in support of economic development, emergency preparedness services, smart cities, smart homes and the Internet of Things. The strength of the nation's economy is directly linked to the speed of broadband services as local governments, businesses, industries, educational institutions and American citizens increasingly rely on fast download and upload capabilities for their mobile devices and for a wide range of services associated with the Internet of Things.

Background

The FCC, in an effort to move the nation into the fifth generation of broadband services, has recently made significant changes to the authorities delegated to local and state governments to minimize the administrative delays associated with the deployment of the 5G program. The October 2018 FCC regulations establish "shot clock" standards designed to expedite the review and approval of SWF across the nation by limiting the time required to review and approve these projects to 60 days for proposals on existing poles or other structures and 90 days for new locations. Batched proposals must adhere to the same shot clock standards unless the application includes a mix of existing and new locations, then the longer review period would prevail. The range of issues that local governments can consider have also been limited including prohibiting local governments from considering health and safety concerns associated with radio frequency emissions provided FCC declares small wireless facilities in compliance with their regulations. The rules also affect all local permitting procedures that may impact the approval of a SWF including zoning, building, electrical, plumbing, right of way, licenses, design reviews, historic and environmental reviews and viewshed analyses.

While the FCC regulations have been successfully contested in federal court in the District of Columbia (i.e., due to a failure to give proper consideration to environmental and historic preservation issues; U.S. Court of Appeals for DC Circuit Court, Decided August 9, 2019), the FCC recently corrected the identified deficiencies with the result that the fifth generation deployment of broadband services is expected to move forward to dramatically expand the speed, security and data density offered to users of the internet. On August 12, 2020, the U.S. Court of Appeals for the Ninth Circuit upheld the FCC's small cell wireless facility regulations with only one minor exception – the court ruled the agency's requirement for "objective" aesthetic standards was arbitrary and capricious. Municipalities must still adopt "reasonable" aesthetic standards to comply with the court's ruling.

Since there are multiple ways of managing the anticipated impacts of the 5G deployment of small wireless facilities, this position paper focuses on some of the emerging approaches that appear to offer the best means for municipal regulation of their impacts. Based on a review of the approaches taken at more than two dozen municipalities across the

nation, Small wireless facilities are being regulated in six different ways; 1) through zoning ordinances; 2) through a municipal ordinance; 3) through a municipal ordinance coupled with zoning amendments; 4) through revised design guidelines; 5) through the preparation of FCC authorized Environmental Assessments and 6) through licensing agreements with broadband providers. Each of these approaches has costs and benefits which are summarized in the table below. A brief description of the benefits of each approach is useful since there is no right answer on how any given municipality should proceed with the regulation and/or oversight of small wireless facilities.

Zoning Ordinance

Connecticut municipalities are accustomed to delegating land use decisions to zoning commissions when projects impact the public health, safety and general welfare. Zoning administrators are in a good position to determine the appropriate siting considerations for SWF as well as their design and viewshed impacts. Their authority overlaps with that of the Connecticut Siting Council (CSC) with respect to communication towers and with the Public Utilities Regulatory Authority (PURA) with respect to SWF located on utility poles. Both CSC and PURA have the final authority over the siting of Small Wireless Facilities, but these agencies must consider local land use policies in their decision-making process. For this reason, zoning regulations play an important role for a range of public health, safety and general welfare issues including ensuring land uses conflicts are properly addressed when SWF are placed in residential zones and special zones dedicated to natural resource and recreation protection purposes. However, the deployment of small wireless facilities involves many other local governmental responsibilities besides land use concerns. Small wireless facilities require a variety of other local permits and licenses – including building and electrical permits and building, utility and right of way access agreement that go beyond their regulatory domain.

Municipal Ordinance

Another strategy adopted by numerous municipalities in other parts of the nation is the creation of a municipal ordinance that identifies the full range of permits, licenses and other approvals required before a SWF can be installed. A municipal ordinance requires the approval of the chief governing body of the municipality and has the advantage of establishing procedures to coordinate the inter-departmental review and approval procedures that will be triggered by SWF. Municipal ordinances can be designed to address all local coordination, review and approval procedures which would not be possible by simply revising the zoning regulation to address SWF issues. Municipal ordinances can address a wide range of legal and regulatory issues that go far beyond land use considerations including right of way management and licensing, unified fee schedules, ongoing maintenance of SWF installations, and establishment of a single point of contact for the administration of small wireless facilities. Because of the economic development benefits offered by 5G deployment, it is expected that local governments may wish to consider consolidating all of the required approvals associated with the deployment of SWF to

ensure compliance with FCC "shot clock" requirements.

Source 1: Aspen Daily News

Municipal Ordinance and Zoning Ordinance

Numerous municipalities have recognized the need to revise their zoning regulations as well as to establish a municipal ordinance to administer all the other non-land use related issues connected with the deployment of the fifth-generation broadband services. In many cases, the director of planning is given the role of administering and expediting the multi-departmental approval processes required to comply with FCC shot clock requirements. In larger cities, this role may be given to a specialist whose responsibility is to obtain a unified and fast-tracked review from all relevant municipal departments. To expedite the process, some municipal zoning regulations have delegated the review and approval of SWF projects to the Director of Planning under detailed review and approval procedures authorized by the planning and zoning commission. By taking this approach, the entire commission is not burdened with administrative responsibilities that would likely result in exceeding the shot clock timetables set by the FCC.

Design and Historic Preservation Guidelines

Some municipalities in other parts of the nation have adopted design guidelines for small wireless facilities to standardize the appearance of the equipment and to set criteria on the types of poles and other structures that can be used to install the antennas and accessory equipment. In Western Connecticut, design guidelines have been established by zoning commissions and delegated to design review boards with specific responsibilities set forth in Section 8-2J of the Connecticut General Statutes governing Village Districts. Design Guidelines are not a complete solution to the management of fifth generation broadband services since not all areas of a municipality fall within the jurisdiction of design review boards. Nevertheless, design review boards, in cooperation with the municipal zoning commission, will need to update their design standards to address concerns raised by small wireless facilities.

Similarly, historic district commissions in Western Connecticut will also need to address the potential impacts of SWF within historic districts and properties impacted by the deployment of SWF antennas and accessory equipment. It is important to recognize that in 2016 the Federal Communication Commission established a *Nationwide Programmatic Agreement for the Collocation of Wireless Antennas* with the Advisory Council on Historic Preservation and the National Conference of

State Historic Preservation Officers, designed to minimize the level of historic preservation review for small wireless facilities that meet defined siting, size and design criteria. While this programmatic agreement provides important guidance for the review of federally regulated properties of historic importance, it leaves significant gaps in the fabric of federal historic preservation design standards which can only be rectified by a greater level of scrutiny conducted by local historic district commissions. For example, the FCC programmatic agreement does not place sufficient emphasis on potential impacts to archaeological sites that may be disturbed by the installation of small wireless facilities nor does it give sufficient consideration to viewshed corridors within historic districts that may be impacted by multiple small cell wireless antennas attached to utility poles or other structures. Indeed, the programmatic agreement gives far more latitude to the deployment of multiple SWF on poles (e.g., up to 6 antennas per pole) than would be acceptable to municipalities in Western Connecticut. While there are numerous limitations to the use of the programmatic agreement as a guide for local historic preservation decision making, it does authorize local governments or concerned citizens to raise complaints about the potential impacts of the 5G deployment plan to the Federal Communication Commission. This is an important tool that should be incorporated into local strategies to manage the 5G deployment in Western Connecticut.

Environmental Assessment

The Federal Communication Commission authorizes the preparation of an environmental assessment whenever a proposed small wireless facility would; 1) be located in a wilderness area or wildlife preserve; 2) affect a listed or threatened endangered species; 3) have adverse effects on historic districts, sites, buildings, structures or objects significant in American history, architecture, archaeology, engineering or culture that are listed or eligible for listing in the National Register of Historic Places; 4) affect Indian religious sites; 5) be placed in floodplains that are not at least one foot above the base flood elevation; 6) involve significant change in surface features such as wetland fill, deforestation or water diversion; 7) be equipped with high intensity white lights in residential neighborhoods as defined by applicable zoning law; or 8) cause human exposure to levels of radio frequency radiation in excess of FCC defined limits by the operation of SWF transmitters. The FCC also authorizes the preparation of an Environmental Assessment if a local government or "interested person alleges that a particular action, otherwise categorically excluded, will have a significant environmental effect, the person shall submit to the Bureau responsible for processing that action a written petition setting forth in detail the reasons justifying or circumstances necessitating environmental consideration in the decision-making process (see 47 CFR, Subpart 1, 1.307(c))." In addition, if an applicant for a proposed small wireless facility would cause non-compliance with the FCC exposure limits due to emissions from multiple fixed transmitters, there is a potential case to be made that an Environmental Assessment should be prepared – even though the FCC regulations appear to gloss over this potential health issue with respect to small wireless facilities.

License Agreement

Several large cities have chosen to create license agreements with the broadband service providers operating within their jurisdiction. Unlike a municipal ordinance, a license agreement is a bilateral legal instrument that establishes rights, responsibilities and long-term coordination and communication requirements that are mutually binding upon both parties. License agreements offer many significant benefits that are not available through a zoning ordinance or municipal ordinance including the ability to terminate broadband services if the service provider fails to comply with the licensing agreement. Like a municipal ordinance, a license agreement can establish a SWF ombudsman to coordinate and expedite the multiple approval procedures associated with the installation of small wireless facilities. A license agreement also establishes mutual financial interests and responsibilities between a local government and a broadband service provider that would not be feasible under a municipal ordinance. Broadband providers can be expected to pay reasonable fees for the use of local government property where antennas are deployed, and these fees go beyond fees imposed for the review and approval of small wireless facilities. Such use fees can be effectively managed by a license agreement since a license establishes an ongoing business relationship between the two affected parties – not merely a single transactional event associated with the installation of 5G broadband services.

Municipal Internet Service License Agreement

Another opportunity offered through a license agreement is the collaborative creation of high-speed fiber optic services to all residents. Under Connecticut General Statutes 16-233, local governments can "occupy and use for any purpose, without payment therefor, one gain upon each public utility pole or in each underground communications duct system installed by a public service company within the limits of any such town, city or borough or district. The location of any such gain shall be prescribed by the Public Utilities Regulatory Authority." A recent Connecticut Superior Court decision (CCM et.al. v PURA, November 12, 2019) concluded that municipalities in Connecticut have the right to develop fiber optic services for their citizens to improve internet services and to use it "to meet any legitimate goal, including providing internet service." (p. 16 of the decision). This Connecticut Supreme Court decision clearly lays out a strategy for municipal ownership of internet services. The advantages offered by municipal ownership or licensing of internet services are significant – especially if fiber optic cable is deployed to all residents. Rather than merely focusing on the development of small wireless facilities that provide outdoor access to broadband services, a municipally owned internet strategy would ensure businesses and residents have the best indoor service as well.

Do Nothing

There are some municipalities that have chosen to do nothing to address the new FCC regulations – either because they do not believe the new requirements will have an immediate impact on their communities (e.g., very rural areas of Connecticut) or because they would prefer to wait until it is clear that broadband providers are interested in providing services to their communities. The

"waiting strategy" has certain advantages in so far as it enables local governments to learn from the management strategies of "early adopters" of municipal ordinances, licensing agreements and other regulatory approaches. Letting other municipalities go first reduces the administrative burdens of developing management strategies on one's own time. However, the "Do Nothing" strategy is not an approach taken by most of America's largest cities which are in fierce competition to enhance their broadband services to support such initiatives as "Smart Cities", "Smart Homes", the "Internet of Things" and enhanced industrial processes. The "Do Nothing" strategy is clearly an interim strategy that best suits some rural and suburban municipalities that do not anticipate benefiting from the immediate deployment of fifth generation broadband and/or are not keen on taking advantage of the economic development benefits it offers. The danger of the "Do Nothing" strategy is that broadband providers could deploy large batches of small cell antennas without restrictions that might be imposed by zoning regulations tailored to the concerns raised by 5G deployment. Federal law requires municipalities to review and approve small cell antenna installations on pre-established shot clock timetables. When a municipality fails to meet these federal mandates, a broadband provider has immediate recourse to the federal court system to overturn local decisions denying, or failing to approve, small cell antenna applications. In summary, the "Do Nothing" scenario represents a calculated risk by rural and suburban municipalities that they do not fall within priority deployment areas as identified in Broadband marketing plans.

The table below provides a summary of some of the major advantages of the various management strategies available to municipal governments in Western Connecticut. It is important to recognize the costs and benefits of managing the specific issues created by small wireless facilities may not be identical across the range of strategies listed in the table. For example, a municipality may establish design standards for municipal poles used by small wireless facilities either through a zoning ordinance, a municipal ordinance, a license agreement, an historic district regulation or a village district regulation. However, each of these strategies will not necessarily achieve municipal design objectives on their own. Design standards for municipal poles may be easier to administer through a municipal ordinance than through a zoning ordinance – especially when local governments have exempted municipal properties from zoning regulation. For this reason, the potential strategies for managing the impacts of small wireless facilities listed in the table are not all equal. It important to view the table as a starting point for determining which strategies will work best in any given municipality based on its unique needs and resources.

Table 2-1: Comparison of Potential Administrative Strategies for Local Regulation of Small Wireless Facilities in Western Connecticut						
Criteria for Managing Small Wireless Facilities (SWF)	**Zoning Ordinance**	**Municipal Ordinance**	**License Agreement**	**Zoning & Municipal Ordinance**	**Design & Historic Guidelines**	**Do Nothing**
Environmental, Historic & Design Considerations						
Viewshed analysis	X	X		X	X	
Required Historic Preservation Reviews		X	X	X	X	X
Design Standards for Municipal Poles	X	X	X	X	X	
Preapproved Designs for SWF Poles	X	X	X	X	X	
Program Administration						
10 Day Application Review for Completeness	X	X	X	X		
Management of Co-located SWF	X	X	X	X	X	
Multiple Permit Coordination Strategies		X	X	X		
Single Point of Contact for SWF Program		X	X	X		
Coordinating Services of multiple Broadband Providers		X	X	X		
Administrative Policies to manage SWF Program		X	X	X		
Minimizing administrative impact of SWF program		X	X	X		
Public Participation in Decision Making						
Public input on Specific SWF Installations	X	X	0	X	X	
Public input on batched SWF Installations	X	X	0	X	X	
Public Informational Hearing on SWF Strategies	X	X	0	X		
Legal, Insurance, Fiscal Mgt & compliance						
Indemnification of Municipality for SWF work		X	X	X		
Bilateral Coordination of SWF Program with ISP			X			
Right to Close Down SWF if Impacting EMS		X	X	X		
Bond for work not covered by Insurance	X	X	X	X		
Required Liability Insurance	X	X	X	X		
Right to Terminate Work if not in Compliance	X	X	X	X		
Right to Terminate Program if not in Compliance			X			
SWF Ownership Transfers to successor Orgs.			X			
Health & Safety Considerations						
SWF Exposure Based Siting Considerations*	X	X	X	X	X	
Radio Frequency Compliance Report	X	X	X	X		
SWF Siting Considerations						
No Disruption of existing utilities		X	X	X		
Limits placed on Underground Work	X	X	X	X	X	
Pole License Agreement		X	X	X		
Post Installation Certification	X	X	X	X	X	
SWF Location Preference Standards	X	X	X	X	X	
Prohibited certain Support Structures	X	X	X	X	X	
Non-Interference with Other Uses	X	X	X	X	X	X
New Pole Placement Standards	X	X	X	X	X	

Table 2-1: Comparison of Potential Administrative Strategies for Local Regulation of Small Wireless Facilities in Western Connecticut						
Criteria for Managing Small Wireless Facilities (SWF)	**Zoning Ordinance**	**Municipal Ordinance**	**License Agreement**	**Zoning & Municipal Ordinance**	**Design & Historic Guidelines**	**Do Nothing**
Signs & Advertising pertaining to SWF	X	X	X	X	X	
Antenna Shrouding	X	X	X	X	X	
Height Restrictions	X	X	X	X	X	X
Size of Accessory Equipment	X	X	X	X	X	X
Minimum Vertical Clearance for Accessory Equip.	X	X	X	X	X	
Ground v. Base Mounted Accessory Equip.	X	X	X	X	X	
Fee Schedules						
Unified fee for all permits, approvals		X	X	X		
Preapproved Fee schedule for SWF installations		X	X	X		
Total	*25*	*37*	*36*	*37*	*19*	*4*

ISP = Internet Service Provider

EMS = Emergency Management Services

X= Potentially enabled by this strategy

0 = Limited potential to be enabled by this strategy

** FCC regulations prohibit state or local governments or instrumentality thereof, from regulating "the placement, construction or modification of personal wireless service facilities on the basis of environmental effects or radio frequency emissions to the extent that such facilities comply" with the FCC health and safety regulations for radio frequency emissions. Despite this FCC regulation, factors that local governments may consider include design standards, viewshed considerations public safety factors affecting street corner visibility, noise, tree canopy impacts, height restrictions within the constraints imposed by the FCC, minimum spacing of wireless facilities provided they are reasonable and consistent with FCC regulations and placement of accessory equipment underground. These considerations, while not based on concerns for exposure to radio frequency emissions, do indeed, have the unintended effect of influencing radio frequency exposures.*

CHAPTER 3: SCOPE OF MUNICIPAL AUTHORITY OVER SMALL CELL WIRELESS FACILITIES

Introduction

Due to the complexity of the regulations governing the licensing, siting, design and installation requirements for small wireless facilities, many municipalities have assumed local governments play a limited role in guiding the development of fifth generation (5G) mobile broadband services. In order to shed light on these issues, this report is intended to identify the types of mobile broadband installations that fall within the purview of local governments in Connecticut. There are three elements to this analysis; 1) a review of statutory and case law authority prescribing municipal responsibilities for small wireless facilities; 2) a review of municipal right of way authorities and their impact upon the deployment of fifth generation mobile broadband services; and 3) a review of current mobile broadband installation locations in Connecticut – based on the Connecticut Siting Council's statewide database – as a proxy for the relative importance of municipal oversight over small cell wireless facilities.

It is important to recognize that 5G service is expected to result in the installation of over 800,000 small cell wireless facilities across the United States over the next ten years. Since the locations where these small cells will be installed is still unknown, the current locations identified in the Connecticut Siting Council's database only provides a crude estimate of the range of new locations where these facilities may be found in the future. Nevertheless, the range of locations, building types and other structures that are already being used for small cells gives a clear indication of what the future may hold. Small cell antennas are being installed in close proximity to high density living and working environments including on billboards, chimneys, silos, church steeples, the sides and roofs of commercial and residential buildings, gas station and hotel signs, signalized intersection guy wires, decorative poles, flag poles and the list goes on.

Who Regulates Mobile Broadband Services?

A number of chief elected official in Western Connecticut have recently expressed concern that municipal regulation of small wireless facilities would have little value due to the overarching controls of the Connecticut Siting Council (CSC) and the Connecticut Public Utilities Control Authority (PURA). This concern has stopped many local governments from adopting municipal or even zoning ordinances governing mobile broadband services, believing CSC has the final authority over all telecommunication tower installations including those on electric transmission lines. Similarly, since PURA has final authority over mobile broadband services installed on electric distribution lines, it is commonly believed that municipalities have no role in the regulation of small cell wireless facilities. To address these concerns, the Western Connecticut Council of Governments has worked with CSC and PURA to precisely delineate the full range of scenarios that determine who has primacy in the decision to install small wireless facilities. It should be kept in mind that with the increasing focus on enhancing mobile broadband capacities and coverage, Connecticut has experienced a shift away

from telecommunication towers as the sole means of ensuring effective and dependable cell phone service. The result is that the old paradigm – based on telecommunication towers as the sole means of providing wall to wall coverage at a municipal or regional level – has shifted to a more neighborhood centric model.

Under this new paradigm, public service companies like AT&T, Verizon and others, are now racing to install small wireless facilities at the neighborhood level to address the ever-growing consumer demand for more digital communication at increasing levels of gigabits of information per transaction. These 5G developments are changing the land use impacts of mobile broadband services. These changes, as presented in this paper, increase the need for municipal involvement in the siting of small cell facilities that fall exclusively within the authority of local governments above and beyond the important advisory role they already can play.

Connecticut municipalities have authority over the installation of small cell wireless facilities that fall outside the jurisdiction of CSC and PURA. The range of scenarios where municipal jurisdiction trumps the authority of the state regulatory agency is quite large and continues to expand as mobile broadband companies search for locations that can best meet the public's demand for increasing volumes of data (think; streaming videos on cell phones as the new paradigm). The issue is not merely adequate cell phone coverage within any given municipality in Connecticut but the data capacity of the wireless service providers in any given neighborhood.

The table identifies the scenarios where municipalities have the primary responsibility for regulating small cell installations. As can be seen, municipalities have authority over installations placed; 1) on the sides of buildings, 2) on top of buildings falling within zoning height restrictions (e.g., chimneys, cupolas, spires, steeples), 3) on structures such as billboards, hotel signs, gas station signs, water tanks, silos, smoke stacks, decorative poles, flagpoles, windmills, solar energy systems, traffic signalization systems, and other structures whose principal use is not as a telecommunications tower and 3) inside buildings for purposes of amplifying cellular coverage for conference halls, hotels and other large spaces serving the general public.

The emergence of 5G mobile broadband also reinforces the need for enhancing the advisory role that municipalities play in every Connecticut Siting Council decision concerning the location, design and visual impacts of telecommunication installations. CSC is required by law to consider municipal zoning standards as they apply to the installation of telecommunication towers, as well as to small cell wireless facilities. As long as a municipality's regulations do not prohibit the installation of these facilities and comply with Federal Communication Commission (FCC) requirements for reasonable design standards, CSC must consider municipal policies and regulations in its decision-making process. Without municipal design standards that comply with FCC standards, CSC has the authority to ignore local regulations. For this reason alone, it behooves Connecticut

municipalities to update municipal ordinances and zoning regulations for consistency with the 2018 FCC regulations.

PURA has authority over telecommunication systems installed on electric distribution lines. This authority is especially significant as public service companies attempt to expand the outdoor level of wireless cell phone coverage in high density areas of Connecticut where increased upload and download times are being experienced with ever greater reliance on streaming services. Yet PURA's authority is not absolute; municipalities retain authority over all activities that happen within municipally owned road right of way. Municipal authority can and should be used to ensure that future installations of small cell wireless facilities are not interfering with 1) public access requirements under the American Disabilities Act 2) highway safety requirements associated with intersections, road crossings and pole setback requirements and 3) the protection of existing sewer, stormwater, and water services and other buried public utilities and infrastructure. For example, when a small cell installation is proposed on a public utility pole and the ancillary equipment associated with that installation interferes with line of sight requirements at traffic intersections, a municipality can require the applicant to comply with its highway safety regulations. Similarly, if the ancillary equipment is proposed in a location that infringes upon pedestrian street crossing space or the effective width of sidewalks, a municipality must consider policies to maintain access and mobility for wheelchair bound persons. These are just a few examples of municipal responsibilities that have a direct bearing on small cell deployments.

Table 3-1: Jurisdiction over the Installation of Small Wireless Facilities and Distributed Antenna Systems (DAS) in Connecticut						
Scenarios of How Small Wireless Facilities (SWF) and Distributed Antenna Systems (DAS) are Regulated in the State of Connecticut **P=Primary Regulatory Authority(ies)** **A=Advisory Authority**	**FCC**	**CSC**	**PURA**	**Municipality**	**CT DOT**	**Regulatory References**
Licensing of Mobile Broadband Services	P					FCC Licensing
Radio Frequency (RF) Exposure Standards	P					FCC RF Standards & CGS Sect. 22a-162
Radio Frequency (RF) Certification for SWF	P					FCC RF Standards & CGS Sect. 22a-162
Radio Frequency Exposure Validation Assessment (CSC jurisdiction)		P				FCC RF Standards & CGS Sect. 22a-162
Radio Frequency Exposure Validation Assessment (Local jurisdiction)				P		FCC RF Standards & CGS Sect. 22a-162
Siting SWF on Towers		P		A		§16-50j-2a(30)
Siting SWF on Monopoles		P		A		§16-50j-2a(30)
Siting SWF on Towers above Bldgs. where antenna is high relative to its surroundings and owned by Public Service Company (PSC)		P		A		§16-50j-2a(30)
Siting SWF on Electric Transmission Lines		P		A		PURA DOCKET NO. 17-02-49
SWF on Bldgs. or other structures whose primary purpose is a tower		P		A		§16-50j-2a(30)
SWF on Electric Distribution Lines			P	A		PURA DOCKET NO. 17-02-49
SWF on support poles for Electric Distribution Lines			P	A		PURA DOCKET NO. 17-02-49
SWF on the sides of occupied buildings not owned by PSC				P		§16-50j-2a(30)
SWF on buildings where the antenna is not high relative to its surroundings not owned by PSC				P		§16-50j-2a(30)
SWF on structures whose principal purpose is not a tower (e.g., functioning water tanks) and not owned by PSC				P		§16-50j-2a(30)
SWF associated equipment in state road right of way on Utility Pole			P		P	47 CFR 253 (c)& CTDOT Title 13b-17
SWF associated equipment in state road right of way on Monopole		P			P	47 CFR 253 (c) & CTDOT Title 13b-17
SWF associated equipment in local road right of way on Utility Pole			P	P		47 CFR 253 (c) & CGS Sect. 7-148(c) (6)
SWF associated equipment in local road right of way on Monopole		P		P		47 CFR 253 (c) & CGS Sect. 7-148(c) (6)
FCC = Federal Communications Commission; CSC = Connecticut Siting Council; PURA = Public Utilities Regulatory Authority Source: Prepared by the Western Connecticut Council of Governments, April 21, 2020						

Municipal Right of Way Authority

Connecticut General Statutes Section 7-148 c (6) authorizes municipalities to regulate a wide range of activities that impact streets and sidewalks including the following:

> (i) Lay out, construct, reconstruct, alter, maintain, repair, control, operate, and assign numbers to streets, alleys, highways, boulevards, bridges, underpasses, sidewalks, curbs, gutters, public walks and parkways;
>
> (ii) Keep open and safe for public use and travel and free from encroachment or obstruction the streets, sidewalks and public places in the municipality;
>
> (iii) Control the excavation of highways and streets;
>
> (iv) Regulate and prohibit the excavation, altering or opening of sidewalks, public places and grounds for public and private purposes and the location of any work or things thereon, whether temporary or permanent, upon or under the surface thereof;
>
> (v) Require owners or occupants of land adjacent to any sidewalk or public work to remove snow, ice, sleet, debris or any other obstruction therefrom, provide penalties upon their failure to do so, and cause such snow, ice, sleet, debris or other obstruction to be removed and make the cost of such removal a lien on such property;
>
> (vi) Grant to abutting property owners a limited property or leasehold interest in abutting streets and sidewalks for the purpose of encouraging and supporting private commercial development;

The authorities granted to municipalities clearly cover the installation of small cell wireless facilities and ancillary equipment – whether that equipment is installed above or below grade. Because fifth generation mobile broadband services are still in a beta test phase across the nation, the full impacts that can be expected from the deployment of small cell wireless facilities is not fully known. However, we do know that 86% of the total miles of roadways in Western Connecticut fall within the authority of local governments. For this reason alone, it is clear that municipal road encroachment regulations, policies and permit procedures will play a critical role in future 5G deployments. For example, arguably a municipality has the authority to require all ancillary equipment associated with 5G small cell wireless facilities to be placed underground if such policies are applied in a non-discriminatory fashion and are based on sound public safety principles. Similarly, a municipality could require height restrictions for ancillary equipment installed on the ground to ensure unobstructed visibility for pedestrians along sidewalks or at street crossings. Under Section 148 c (6) municipal authority in the right of way includes the right to "… to regulate the location of any work or things thereon" which includes those "things" installed on utility poles. As of April 2020, none of the eighteen municipalities in Western Connecticut have modified their road encroachment regulations and policies to address the novel issues created by 5G mobile broadband deployment.

Mobile Broadband Installations in Connecticut

One of the best ways to understand the potential land use impacts of fifth generation

mobile broadband services is by a review of current installation locations. Because by its very nature, small cell wireless facilities are being deployed in close proximity to population centers, we can anticipate that the installation of extremely tall telecommunication towers will not be the primary means of improving Connecticut's cell phone service in the future. We anticipate small cell wireless facilities will be installed on public utility poles and other structures that are capable of providing cell phone coverage at the neighborhood level. Large towers, while remaining an essential component of the telecommunications system, will not be able to achieve the data density requirements associated with 5G. Fifth generation mobile broadband focuses on expanding current levels of service – ranging from 10 to 100 megabits per second – to much higher data transmission levels in the future reaching 1 to 5 gigabits. To achieve these revolutionary increases in service, mobile broadband providers need to install small cell wireless facilities in closer proximity to the intended users of these services. Higher capacity data transmission that is enabled by 5G mobile broadband also will have shorter radius of coverage – indicating that more of these facilities will be needed to achieve desired service standards. Buildings, trees, and other solid objects can interfere with 5G broadcasting and for this reason, the Federal Communications Commission anticipates a dramatically higher density of these facilities along public rights of way and other locations to achieve gigabits levels of service.

By law, the Connecticut Siting Council is required to maintain a database of all towers and small cell installations in the state. The database is the most comprehensive available in Connecticut but, because it relies on municipalities to submit data on its approved small cell installations, is not a complete portrait of all small cell wireless facility installations. Nevertheless, this database is an extremely valuable resource since it enables municipalities to identify the wide range of locations where small cell installations are occurring and thereby serves an important role in raising public awareness of the range of land use impacts that can occur if fifth generation broadband services remain unregulated at the municipal level. Our analysis of the database reveals that nearly 20% of all telecommunication towers and small cell wireless facilities installed in Connecticut may fall within the purview of local governments. The table below indicates that the Connecticut Siting Council has the most significant role in the location of new towers and small cell wireless facilities accounting for about 65% of all installations in Connecticut. Because CSC's database has limited detail on any given tower or small cell installation, it is not possible to definitively separate certain installations which fall within the CSC, PURA or municipal jurisdiction. This is an issue in the case of roof mounted small cell wireless facilities because CSC has not asserted authority over some building mounted small cells when the "antenna is not high relative to its surroundings." Site specific determinations concerning roof mounted antennas is not possible within the data provided by the Connecticut Siting Council. Nevertheless, even with municipal jurisdiction limited to about 20% of all past installations, the future of 5G mobile broadband will look far different than what is revealed in CSC's database. Perhaps, more importantly CSC

relies on municipalities to provide a detailed level of analysis and assessment of environmental, design and visual impacts from each proposed small cell installation even if that input is only advisory in nature. Similarly, decisions made by the Public Utilities Regulatory Authority routinely require, as a condition of approval, local zoning and road encroachment permit oversight to ensure consistency with municipal safety and zoning concerns.

Table 3-2: Location of Telecommunications Facilities in CT by Authority with Jurisdiction over Siting Decisions

Telecommunication Equipment Location	CT Siting Council	Municipalities	Municipalities / PURA	PURA	Unknown	Grand Total
Building Mounted	7	116				123
Ground Mounted		1				1
Inside Building		53				53
Other Structure		209			25	234
Roof of Building	505	46				551
Side of Building		3				3
Tower Mounted	985					985
Unknown					7	7
Utility Poles			10	335		345
Grand Total	**1,497**	**428**	**10**	**335**	**32**	**2,302**
Percent of Total	**65.0**	**18.6**	**0.4**	**14.6**	**1.4**	**100.0**

Source: WestCOG analysis of the CSC database, accessed April 2020
Note: The terms "Building Mounted" and "Roof of Building" are descriptions provided by Mobile Broadband companies and have limited value in defining the precise location of small cell antennas.

Conclusions

Connecticut's 169 municipalities will play an ever-increasing role in the regulation of small cell wireless facilities as mobile broadband providers begin to deploy these installations in areas that are currently experiencing limited data capacity transmission levels. The burgeoning growth of online streaming services such as YouTube, Netflix, Zoom conferencing and similar high definition video services have transformed past uses of the internet from simple text and document messaging services into a pipeline for telecommuting, remote entertainment, remote shopping and many other data intensive activities. The need for gigabits transmission capacity for mobile broadband services has become more salient since the COVID-19 pandemic. Our greater reliance on mobile communication services also underscores the need for a regional strategy that not only facilitates improved data capacity transmission but protects the region's community character.

Connecticut's legal structure has placed the Connecticut Siting Council as the primary arbiter of small cell wireless facility installations but because its authority was

never focused on small-scale neighborhood level installations of 5G services, the range of locations where 5G antennas and ancillary equipment will be placed in future years is expected to include many locations that are entirely within the regulatory authority of local governments. Installations on or inside buildings and other structures, whose primary purpose is not for telecommunications, generally fall within local authority provided that those buildings and other structures are not owned by a public service company and the antenna is not high relative to its surroundings. These caveats may make siting decisions "clear as mud" but these jurisdictional challenges are expected to become less confusing in time as municipalities exercise their statutory authorities to regulate the siting of small cell wireless facilities.

CHAPTER 4: THE CASE FOR SMALL CELL WIRELESS FACILITY ZONING REGULATIONS

Challenges & Opportunities Posed by SWFs

The emergence of fifth generation mobile broadband in Connecticut's most urbanized cities and transportation corridors will require significant reassessment of the current zoning regulations governing telecommunication facilities. Unlike telecommunication towers that have been deployed to provide cell phone coverage over large geographic areas, small cell wireless facilities are intended to provide higher capacity cell phone coverage – as measured in gigabits per second – over much shorter distances.[1] The signal range of small cell wireless facilities – absent obstruction such as tree canopies, buildings and torrential downpours – is anywhere from 300 to 1,500 feet and generally require line of sight connections between the transmitting/receiving antenna and the cell phone or other mobile device user. While line of sight connections are ideal, signals can be transmitted through reflection, diffraction, or refraction off buildings or other surfaces these conditions are not optimal for fifth generation mobile broadband.[2] To ensure uninterrupted coverage along transportation corridors small cell wireless facilities will need to be installed in series so signal strength can be maintained along travel corridors. Unlike telecommunication towers that represent standalone installations, small cell antennas are expected to be installed in batches of 30 to 90 units at a time to minimize the administrative burdens associated with obtaining zoning permits, electrical permits, construction permits, road encroachments permits, historic district determinations of appropriateness, Connecticut Siting Council (CSC) and Public Utilities Regulatory Authority (PURA) approvals. Large batches of applications are expected to place a strain on zoning commissions and zoning administrators.[3]

Not all small cell wireless facilities will fall within the sole jurisdiction of local zoning commissions. As discussed in Chapter 2, CSC and PURA have exclusive authority over small cell wireless facilities when these units are installed on towers or electric transmission systems (CSC) or electric distribution systems (PURA). Nevertheless, even in these latter two instances, these two state regulatory authorities are required to consider the policies of local governments.

Role of Zoning Regulations

Federal Communication Commission (FCC) laws and regulations, Connecticut General Statutes, case law and regulatory rulings of the Connecticut Siting Council establish the basis for zoning authority over telecommunications facilities in general and small wireless facilities in particular. Zoning commissions have authority over a range of issues that influence the siting of small cell wireless facilities including 1) establishing siting preferences for their locations, 2) regulation of installations not regulated by PURA, 3) regulation of the aesthetic impacts of small cell wireless facilities using reasonable design standards, 4) requiring applicants to provide alternative analyses of installations to ensure proposals

[1] Christian de Looper, What is 5G? The Next generation Network Explained, May 22, 2020.
[2] Federal Communications Commission, Millimeter Wave Propagation: Spectrum Management Implications, Bulletin Number 709, July 1997, pp. 4-16.
[3] Mark Del Bianco, Summary of Final FCC Small Cell Order, March 11, 2019.

represent the most feasible and least impacting approach among competing alternatives, 5) prohibiting installations within protected open space areas, 6) establishing explicit and objective approval criteria to ensure consistency with FCC requirements concerning local government decision making, 7) requiring proof of compliance with FCC radio frequency exposure standards for the general public and those responsible for maintenance of small cell antennas and 8) establishing zoning permit procedures that enable a more efficient processing of small cell wireless applications. While not all of these authorities are exclusive – the Connecticut Siting Council has exclusive jurisdiction over tower installations – the written policies set forth in a municipality's zoning regulations must be considered by the Connecticut Siting Council whenever it rules on the merits of any application within that municipality. These distinctions are discussed in more detail in a Chapter 2 but the larger point to be made is that zoning regulations are a key policy document that directly or indirectly influences the future development of small cell wireless facilities in Western Connecticut.

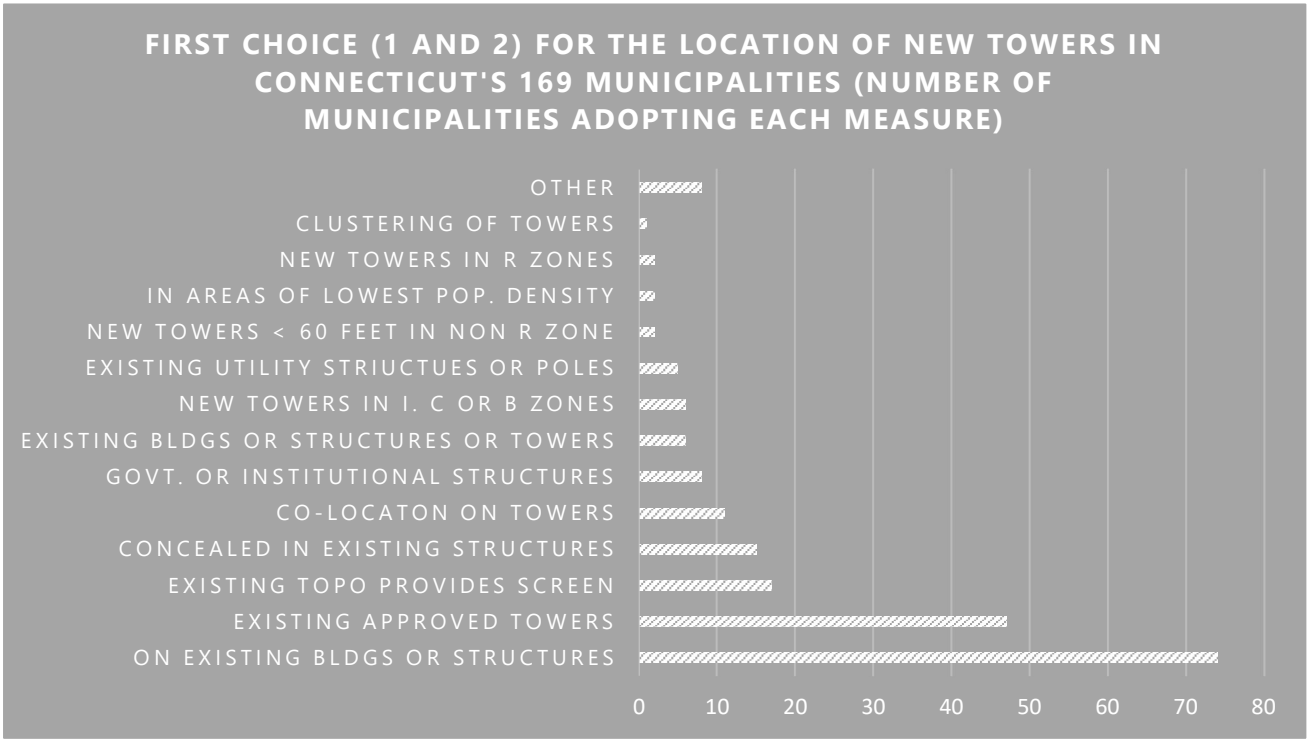
Establish and/or Revise Location Preferences

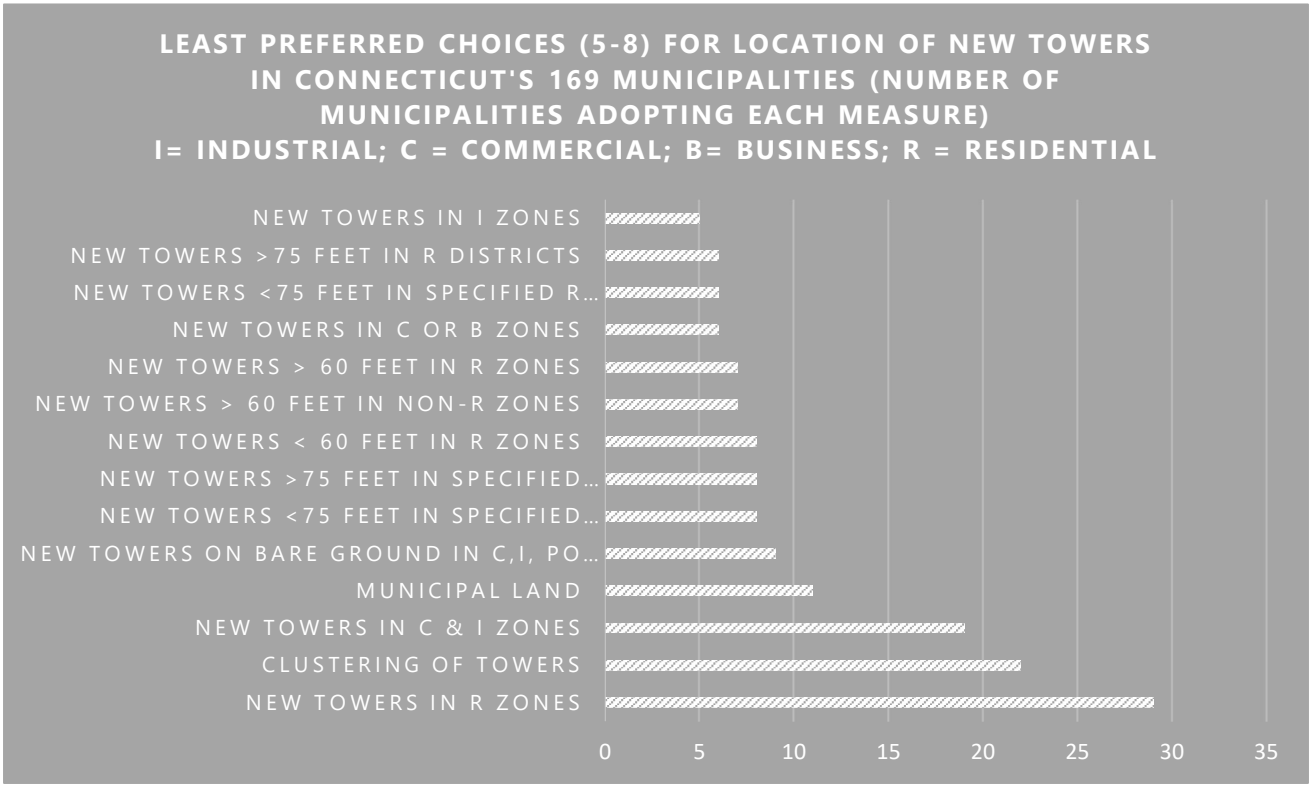
Connecticut municipalities, including their zoning commissions, have authority over the siting preferences for telecommunication facilities and small wireless facilities within their municipality.[4] This is an important tool for guiding the installation of telecommunication facilities yet only 102 (61%) of Connecticut's municipalities with zoning regulations have adopted siting preferences for telecommunication facilities. Municipal siting priorities vary widely across Connecticut depending upon the location of the municipality, its population density, community character, economic development interests and concern with aesthetic impacts to its residential neighborhoods. Based on the analysis of the 102 municipalities with siting preferences for telecommunication facilities, it is clear that zoning commissions prefer telecommunication towers placed on existing buildings or structures over any other option available.

These policies reflect a "pre-small cell wireless facility" era where highly visible telecommunication towers have dominated the rural landscape. Ironically, while these policies were meant to protect residential neighborhoods, village districts and other design protected areas within a municipality, these same preferences will now enable fifth generation mobile broadband deployments to be installed in general conformity with many of the zoning regulations in Connecticut. The siting preferences developed for tall tower installations are not suitable for guiding the development of small cell wireless facilities and this an immediate land use concern that should be remedied before fifth generation mobile broadband services transition from their beta test phase to full scale implementation.

[4] Connecticut General Statutes, Public Utility Environmental Standards Act, Chapter 277a, Sections 16-50x and 16-50gg. Municipalities that have not adopted siting preferences within their zoning regulations may respond to Connecticut Siting Council notices of a telecommunication tower application with their siting preferences as long as these preferences are submitted within 30 days of such notice.

At the other extreme, the least desirable location for telecommunication facilities in Connecticut's municipalities are new towers in residential zones. Again, while these policies reflect a pre-small wireless facilities era, it is expected that Connecticut's municipalities will likely continue to avoid the placement of these facilities in residential zones for many of





the same reasons that towers were least preferred in residential zones. Yet expectations are not enough – zoning commissions must establish explicit preference and non-preference standards for small cell wireless facilities.

The fact that 40% of the municipalities in Western Connecticut and a similar number statewide have failed to adopt siting preferences for telecommunication facilities, including small cell wireless facilities, leaves many municipalities vulnerable to the mobile broadband industry's strategic deployment plans. The initial deployments of small cell wireless facilities are expected to be aimed at the urbanized portions of Western Connecticut and similar locations statewide. Large cities without siting preferences within their zoning regulations include Bridgeport, Norwalk, Stamford and West Hartford.

Adopt Reasonable View Shed Regulations

The proliferation of towers and small cell wireless facilities has had a significant impact on the landscape of Western Connecticut and the state as a whole and for this reason, the FCC has recognized that view shed regulations, when established on a reasonable basis with clear standards for evaluation, are an acceptable state and municipal authority.[5] However, the U.S. Court of Appeals for the Ninth Circuit recently overturned the FCC's more onerous aesthetic standards that required objective and non-discriminatory standards, ruling that they were arbitrary and capricious.[6] As a result, the FCC must reconsider a new approach to what an objective aesthetic standard should be that meets the court's ruling. One key element of any reasonable aesthetic standard, according to the U.S. Court of Appeals for the Ninth Circuit, is that it must be "…'technically feasible and reasonably directed' at remedying aesthetic harms."[7]

While it is permissible for zoning commissions to address the aesthetic impacts of telecommunication towers and small cell wireless facilities, only 90 municipalities (53.9% of all municipalities) in Connecticut have adopted view shed regulations. Perhaps, more importantly, none of the state's municipalities have addressed the specific aesthetic ruling of the U.S. Court of Appeals for the Ninth Circuit with respect to how to apply reasonable aesthetic standards when reviewing small cell wireless facilities. With no explicit definition for small cell wireless facilities in any of the state's zoning regulations, it is not surprising that view shed standards for these facilities are conspicuous by their absence.

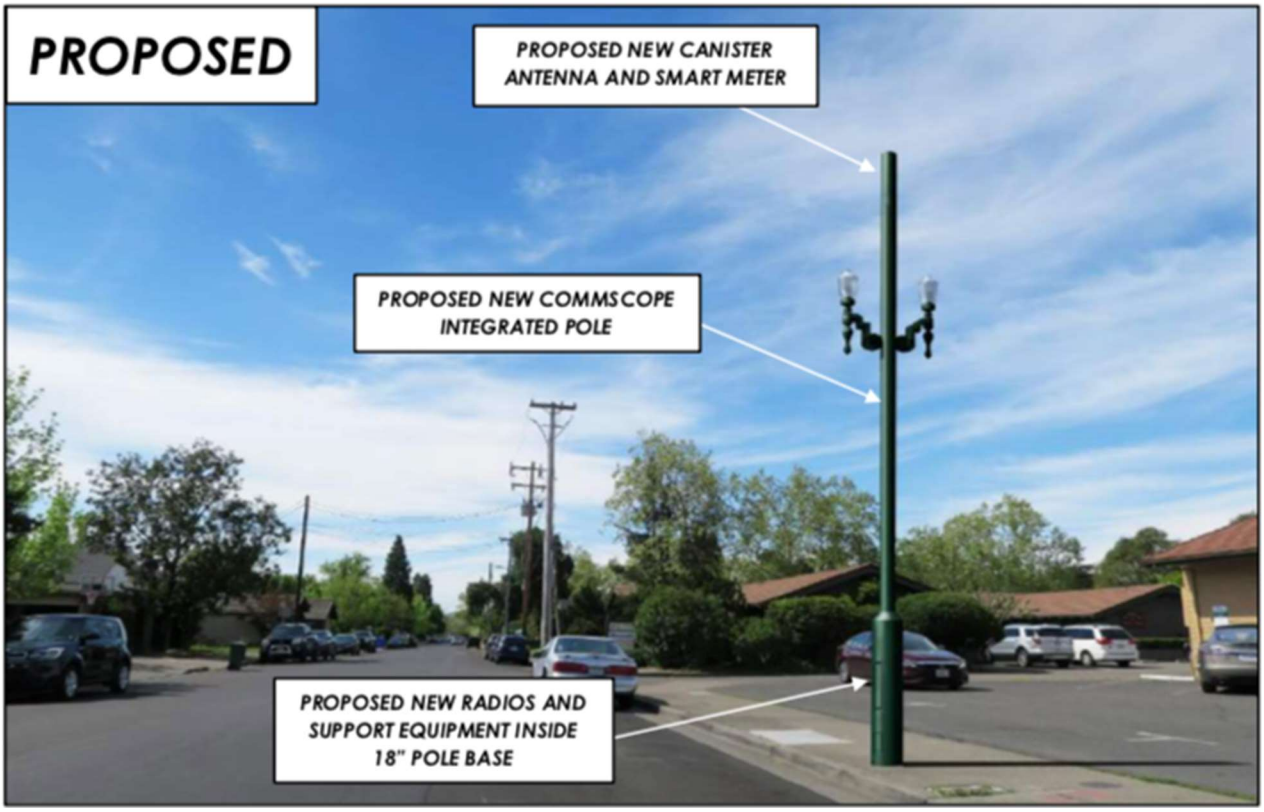
Establish Design Guidelines for Siting Small Cell Wireless Facilities

In contrast to the issues raised by view shed regulations, 129 municipalities (77.2%) in the

[5] While the FCC's regulations governing "objective" aesthetic standards have been overturned, it is likely the commission will respond to the directives of the U.S. Court of Appeals for the Ninth Circuit and remedy the identified flaws.

[6] "We conclude that the FCC's requirement that all aesthetic regulations be "objective" is arbitrary and capricious. At the very least, the agency must explain the harm that it is addressing, and the extent to which it intends to limit regulations meant to serve traditional zoning objectives of preventing deployments that are unsightly or out of neighborhood character." City of Portland v. U.S. Federal Communications Commission, No. 18-72689, (Ninth Circuit Court) Decided August 12, 2020, pp. 51-52.

[7] Ibid, p. 52.



Source 2: City of Sonoma

state require a consideration of visual compatibility – a term of art that overlaps with but is distinctly different than a view shed analysis. Within Western Connecticut, 11 of the region's 18 municipalities have established regulations for view sheds and 16 of the region's municipalities have regulations for visual compatibility. In order to comply with FCC regulations for reasonable standards for view shed analyses and evaluations of visual compatibility, planning and zoning commissions, working with municipal planners, should ensure that specific and reasonable approval criteria are set forth within the zoning regulations.

One approach is to establish design guidelines that apply specifically to the installation of small cell wireless facilities. This approach has been adopted by numerous municipalities across the nation to create procedures for approving these facilities. Design guidelines should include specific approaches used to conceal their visibility, minimize their impact on community character and establish design templates for acceptable and unacceptable installations. Excellent examples of small cell wireless facility design guidelines have been developed by 1) the National Capital Planning Commission for Washington DC, 2) the Denver Department of Public Works for the city of Denver, Colorado, 3) the city of San Jose

California and 4) the Planning Department of the city and county of San Francisco.[8]

Alternative Site Analysis

An important tool for guiding the development of fifth generation mobile broadband are municipal requirements for an alternative analysis to determine which of various installation scenarios best meets the service requirements of the community while minimizing land use conflicts including aesthetic, environmental, safety and historic preservation concerns. A total of 105 municipalities (62.9%) in Connecticut and eleven municipalities in Western Connecticut (61%) require applicants to perform an alternatives analysis to substantiate that the proposed location for a tower is the best option available. If municipalities wish to influence small cell wireless facility siting decisions, this is a tool that can be used to demonstrate the tradeoffs between service requirements and land use impacts. However, past applications of this analytical tool focused on tower siting and its impact on service coverage – not on high speed, high density data transmission associated with fifth generation mobile broadband. The result is that the principles underlying an alternative analysis for small cell wireless facilities are distinctly different than those for tall towers. Rather than being concerned with coverage issues associated with tall towers, the issues driving the location of small cell antennas focus on the geographic locations within a community that require high speed and high data density transmission to achieve specific public benefits such as 1) tele-medicine, 2) support for autonomous vehicles, 3) emergency preparedness, 4) increased public access to commercial and business services in downtown districts and 5) other governmental services that can be enhanced by high speed access to wireless telecommunication systems including the internet of things (IoT). Since the alternatives to be considered when small cell wireless facilities are proposed are distinctly different than those for towers, planning and zoning commissions will need to consider zoning amendments to reflect these changing mobile broadband priorities. One good example of alternative analyses pertinent to small cell wireless facilities has been developed by the Planning Department of the city of San Francisco. San Francisco's alternative analysis requires applicants to consider the relative impacts of noise, radio frequency exposure, and the least obtrusive design of antennas and related apparatus when determining the best locations for small cell wireless facilities.[9]

Placement on Government Buildings

The FCC has ruled that a government building can be used for the installation of small cell facilities if it is currently providing such services – even if it is NOT zoned for such use.[10] Municipalities should consider the

[8] Small Cell Infrastructure Design Guidelines, City of Denver, May 2019; Small Cell Infrastructure Guidelines, National Capital Planning Commission, December 6, 2018; City of San José Street Light Pole-Mounted Small Cell Permit and Design Guidelines, May 22, 2019; Wireless Telecommunication Services Facilities Siting Guidelines, San Francisco Planning Department, August 15, 1996.

[9] San Francisco Planning Department, Wireless Planning Advisory Bulletin#3: Best Practices for WTS Facilities, December 2015.

[10] In 2009 the FCC explained the priority given to collocation of small cell antennas that do not involve a "substantial increase in the size of a tower as defined in the Nationwide Programmatic Agreement (NPA) for the

consequences of the locations of their current telecommunication systems – especially on school buildings, senior centers and other locations where public concerns with radio frequency exposure have been raised. It is noteworthy that none of Connecticut's zoning regulations address this issue – a reflection of the relatively outdated telecommunication regulations that exist across the state. Zoning regulations should consider siting preferences that discourage small cell wireless facilities on schools and senior centers.[11] Alternatively, appropriate minimum setback requirements could be established to separate small cell wireless antennas from certain government buildings. This latter approach has been adopted by numerous municipalities in California.

Prohibiting Towers and Small Cell Wireless Facilities in Protected Open Space

Protected Open Space is intended for passive and active recreation and often contains deed restrictions or easements that prohibit development of any kind. Yet despite these restrictions, there have been instances where telecommunication facilities have been proposed in protected open space areas to provide coverage in rural areas of the state. While protected open space areas are not a priority location for small cell wireless facilities, depending on the specific terms of the deed restriction or easement, it might be possible for such installations to occur. Only fifteen municipalities in Connecticut and three municipalities in Western Connecticut prohibit towers in protected open space. While many municipalities may believe that such prohibitions are unacceptable, in 2001 the United States District Court for Connecticut ruled that such prohibitions are legal as long as they are based on rational standards and apply to land where strict limitations on development exist for protected open space areas.[12]

Protection of Historic Buildings

Currently, only 9 of the 18 municipalities in Western Connecticut explicitly require the protection of historic properties as part of the zoning approval process. In contrast, 54% of Connecticut's municipalities with telecommunication provisions in their zoning regulations have such standards. To achieve historic property protections from telecommunication towers, twenty-five zoning commissions in the state require them to be setback from historic properties with standards ranging from 200 to 2,000 feet. Such setback standards would not be appropriate for small cell wireless facilities since the FCC has rules that these facilities can be designed and installed to be compatible

Collocation of Wireless Antennas.'' The definition of [c]ollocation in the NPA provides for the 'mounting or installation of an antenna on an existing tower, *building or structure* for the purpose of transmitting and/or receiving radio frequency signals for communications purposes, *whether or not there is an existing antenna on the structure*" The NPA's definition of collocation explicitly encompasses collocations on structures and buildings
that have not yet been zoned for wireless use." Federal Register, Vol. 83, 199, p. 51876, October 15, 2018.

[11] It is important to recognize that schools and senior centers are not deprived of mobile telecommunication services when small cell wireless facilities are subjected to setback requirements for these facilities. Small cell antennas can provide mobile broadband services over distances ranging from 300 to 1,500 feet – absent obstructions from trees, buildings and other structures.

[12] Omnipoint Communications, Inc., v. Planning and Zoning Commission of the town of Guilford, 156 F.Supp.2d 212, No. Civ.A. 3-00-CV-2123 (JCH). United States District Court, D. Connecticut. August 2, 2001

with historic districts and properties. Design standards are needed to ensure small cell wireless facilities are installed consistent with municipal village district and historic district regulations in Western Connecticut. Several reasonable approaches to protecting historic properties have already been developed by municipalities in other parts of the United States.[13]

Approval Criteria

The FCC has responded to the wide range of state and municipal regulations of the telecommunication industry by imposing strict timetables for approval of applications and written approval criteria.[14] Only two of the region's municipalities (i.e., 11% of municipalities in the region) explicitly identify their approval criteria for telecommunication towers and small cell wireless facilities. In contrast, 45 municipalities (25.7%) in Connecticut have such standards. This is an issue that will become more important in light of the FCC's emphasis on reasonable and objective review standards. Similarly, only 117 of the state's municipalities (70.1%) and 14 of the region's municipalities (77.7%) have established explicit application requirements for towers. When zoning regulations lack objective and well-defined application and approval requirements it can result in the delay of mobile broadband applications. In these instances, the FCC has authorized applicants to seek relief through the federal court system.

Radio-Frequency Emission Reports

State and local governments are not authorized to replace the radio frequency exposure standards established by the Federal Communications Commission with those developed by state or local governments. However, zoning commissions can require that applicants provide proof of compliance with FCC radio frequency exposure standards as part of any application.[15] Concerns with radio frequency exposure fall into two categories; those pertinent to uncontrolled exposures of the public to radio frequencies and those pertinent to controlled exposures to telecommunications workers who must service this equipment or the structures upon which they are placed or by local/state government workers during emergency situations. The radio frequency exposure concerns posed by tall towers have created less public concern than those associated with the deployment of small cell wireless facilities. Their relative novelty and the lack of risk communication from credible governmental organizations such as the FCC, CDC and the State Department of Public Health has contributed to the proliferation of many unfounded fears. Local government can resolve some of these concerns by requiring radio frequency compliance reports. However, only 90

[13] See Interim Small Cell Design Guidelines, Madison, Wisconsin, February 11, 2020; Small Cell Wireless Facility Design Rules and Regulations, Arlington, Massachusetts, October 1, 2019.

[14] These so-called "shot clock" standards have recently been upheld by the U.S. Court of Appeals for the Ninth Circuit. City of Portland v. U.S. Federal Communications Commission, No. 18-72689, (Ninth Circuit Court) Decided August 12, 2020, pp. 53-56.

[15] Typically municipalities have required that applicants demonstrate compliance with the standards set forth in the FCC document, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*, OET Bulletin 65, Edition 01-01, June 2001. However, other exposure methodologies may be adopted – provided they comply with FCC standards for radio frequency exposure.

municipalities (53.9%) in the state and 12 municipalities in Western Connecticut (66.6%) require radio frequency compliance reports for applications made for towers or small cell wireless facilities. Since radio frequency exposures come from multiple sources within the environment, the most appropriate strategy to determine the real exposure risks is to require post installation measurements of radio frequencies. Only 21 municipalities (12.6%) statewide and 3 municipalities in Western Connecticut (6.6%) have adopted a requirement that annual measurements be taken to verify that towers or small cell wireless facilities remain in compliance with FCC standards. The advantage of this approach is that it addresses the complete exposure spectrum that may exist where multiple small cell installations are found on the same structure or within close enough range to become additive factors in human exposure scenarios. Without verified evidence of exposure measured against FCC exposure standards, public health and safety concerns will remain a lingering concern.

Establish Zoning Permit for Towers and Small Cells

The FCC has established a "shot clock" for the approval of complete applications for new towers of 90 days and 60 days for modification of existing towers, including small cell wireless facilities.[16] It is important to recognize that the shot clock requirements are not limited to zoning permits – they apply to all permit approval procedures required to complete a review of a small cell wireless facility including right of way, building permits, design or aesthetic permits, road closure permits, electric permits, lease negotiations, license agreements and other municipal provisions required prior to the approval of an application.[17] Special permit procedures make these timetables extremely challenging to achieve. Adopting a zoning permit process that requires compliance with highly specific standards, managed by the town planner for most routine applications, is one means to achieve compliance with FCC shot clock standards. The use of special permit procedures is currently the most common means of reviewing and approving telecommunication towers and small cell applications with 119 municipalities (71.3%) statewide and 16 of the region's municipalities (88.8%) taking this approach on some or all telecommunication applications. Because special permit procedures include public hearing requirements and require review of applications by the entire planning and zoning commission (or zoning commission when operating as a separate board from the planning commission), the chances of being able to review 30 to 60 batched applications

[16] The FCC has declared that it's "interpretation remains faithful to the purpose of Section 332(c)(7) to balance Congress's competing desires to preserve the traditional role of state and local governments in regulating land use and zoning, while encouraging the rapid development of new telecommunications technologies. Under the Commission's interpretation, states and localities retain their authority over personal wireless facilities deployment. At the same time, deployment will be kept on track by ensuring that the entire approval process necessary for deployment is completed within a reasonable period of time, as defined by the shot clocks addressed in this Third Report and Order." Federal Register, Vol. 83, 199, p. 51876, October 15, 2018. These regulations have been upheld by the U.S. Court of Appeals for the Ninth Circuit. See footnote 14.

[17] Federal Register, Vol. 83, 199, p. 51877, October 15, 2018.

for small cell wireless facilities will create administrative and logistical challenges that were not found with single tower applications. The easiest means to address this administrative hurdle is to delegate the decision making authority – under "tether" authority from the commission– to the town planner to administer the review and approval process under precisely circumscribed procedures that meet the standards required by the Federal Communications Commission. Taking this approach, each municipality that develops revised telecommunication regulations should ensure sufficient public input is received so that citizens feel comfortable with any zoning authorities delegated to the town planner. Conducting multiple public hearings and informational meetings with focus groups can play an important role in increasing public acceptance of whatever zoning regulations may be adopted. Absent such an approach, planning and zoning commissions will be hard pressed to review dozens of simultaneously submitted applications within the 60- and 90-day approval time frames established by the FCC's 2018 small cell wireless facility regulations.

Define the Range of Acceptable Non-Tower Installations

When small cell wireless facilities are installed on buildings (e.g., in a non-tower format), water towers, advertising signs, local traffic signalization structures, flag poles, decorative poles, faux chimneys, faux steeples, gas stations, billboards, municipal street lights, and similar structures, municipalities have exclusive jurisdiction over their installation. Despite municipal authority over these types of telecommunication facility installations, only 120 of the state's municipalities with zoning regulations (71.9%) have chosen to regulate towers (which legally includes small cell wireless facilities) on non-residential buildings within their community. Similarly, 91 municipalities (45.5%) have not established height limits for towers placed on buildings and 87 municipalities (52.1%) allow these towers on any building. Since the term tower technically includes small cell wireless facilities, the lack of regulation of their placement on buildings creates visual, radio-frequency exposure and design concerns that should be explicitly addressed by regulations that define small cell wireless facilities as a distinct land use category separate from the tall telecommunication towers.

Administrative Improvements to Wireless Telecommunication Regulations

Undoubtedly the technical and legal complexities of regulating wireless communication systems has resulted in many gaps in the review procedures adopted by local zoning commissions. Numerous municipalities are under the impression that the Connecticut Siting Council and the Public Utilities Regulatory Authority have exclusive authority over tower siting decisions.[18] Yet despite the considerable power of these two state agencies, there are a wide range of exclusive local authorities over wireless communication systems that have often gone unrecognized by some zoning commissions. This study has identified numerous deficiencies in the way zoning regulations

[18] Indeed, twenty seven municipalities have not adopted municipal zoning regulations for wireless telecommunication systems.

address wireless communication systems in general and small cell wireless facilities in particular. Indeed, because of the recent emergence of small cell wireless facilities within the American landscape, the phrase "small cell" was found in only one of Connecticut's zoning regulations.

Zoning commissions should consider 1) establishing a specific purpose statement for their wireless telecommunication regulations that address small cell wireless facilities; 2) expanding the definition of terms to address small cell wireless facilities and their ancillary equipment; 3) providing specific application requirements consistent with FCC regulations; 4) providing specific approval criteria used to evaluate the merits of small cell wireless facility applications; and 5) adopting standards for small cell wireless facility alternate site analysis reports required of applicants.

Table 4-1 includes a summary of the basic elements of the wireless telecommunication regulations adopted across the state broken out by Council of Government's regions– including standards for tower height, tower setbacks, siting considerations, radio frequency exposure reporting, design and view shed standards and policies concerning tower sharing and antenna co-location policies. Appendix A reveals a wide range of review procedures, and standards for evaluating wireless telecommunication facilities across the state of Connecticut. As small cell wireless facilities become a more prominent fixture of the urban and suburban landscape, it would behoove zoning commissions to consider developing specific standards applicable to this emerging technology.

Conclusion

The 2018 FCC regulations governing small cell wireless facilities pose a significant new challenge to planning and zoning commissions and this challenge is distinctly different than that posed by the tall towers designed to provide wide coverage across the American countryside. The years 2019 and 2020 are considered beta test years for the mobile broadband industry as it begins efforts to increase America's data capacities that will drive future economic, social, public health and environmental changes to the way Americans live. The FCC has asserted authority over land use decisions that do not comply with its 2018 regulations. In such instances the federal court system becomes the venue for arbitrating disputes and, absent reasonable zoning standards and timely commission review and approval of small cell wireless facility applications, it is expected that mobile broadband providers will seek redress through the court system.

The FCC's regulatory stance on small cell wireless facilities has largely been upheld by the U.S. Court of Appeals for the Ninth Circuit with the exception of vacating some elements of the agency's aesthetic standards declared to be arbitrary and capricious. It is likely the FCC will seek to revise its aesthetic standards to address the court's ruling with the goal of minimizing the administrative review of small cell wireless facilities. In the meantime, it would be prudent to consider some of the suggested revisions to zoning regulations to meet the changing telecommunications landscape that has emerged with fifth generation mobile broadband. See appendix D for ten things zoning commissions can do to comply with FCC regulations.

Table 4-1: Basic Elements of Telecommunication Regulations									
Region	**Municipalities in the Region**	**Municipalities with Telecom Regulations?**	**Is a Purpose Statement Included in the Regulations?**	**Do the Regulations Include Definitions for Telecom Terms?**	**Do the Regulations Include Specific Application Requirements?**	**Do the Regulations Have Explicit Approval Criteria?**	**Do the Regulations Authorize the Use of Independent Consultant Reviews?**	**Do the Regulations Require a Review of Impacts on Historic Properties?**	**Do the Regulations Require an Alternate Site Analysis?**
Capitol Region	38	35	23	28	26	10	7	21	21
Metropolitan	6	5	4	4	5	2	2	3	3
Lower CT River Valley	17	15	13	9	12	5	6	8	12
Naugatuck Valley	19	12	11	10	11	4	5	9	11
Northeastern	16	12	10	10	10	4	2	9	9
Northwest Hills	21	19	18	17	16	3	7	16	18
South Central	15	12	8	10	10	7	4	5	8
Southeastern	19	16	14	14	13	6	3	12	12
Western Connecticut	18	16	14	14	14	2	8	9	11
Grand Total	169	142	115	116	117	43	44	92	105
Percent of Total	100.0	84.0	68.0	68.6	69.2	25.4	26.0	54.4	62.1

Source: Western Connecticut Council of Governments staff work, August 10, 2020

Table 4-2: Height, Setback and Siting Considerations												
Region	**Do the Regulations Specify the Tower Heights When Placed on Bldgs?**	**Do the Regulations Specify Tower Height Limits?**	**Average of Specific Tower Height limits (feet)**	**Do the Regulations Require a Minimum Distance of Towers from Residences?**	**Average Required Distance of Towers from Residences (feet)**	**Do the Regulations Have Residential Setbacks for Tower?**	**Average of Required Residential setbacks for towers (feet)**	**Do the Regulations Require Tower Setbacks from Playground or Schools?**	**Do the Regulations Prohibit Towers in Protected Open Space?**	**Do the Regulations Prefer Antennas and Towers on Non-Residential Bldgs?**	**Do the Regulations allow towers on any Bldg?**
Capitol Region	20	26	176	13	282	17	273	5	4	11	22
Metropolitan	2	3	147	3	517	3	517	1	0	0	5
Lower CT River Valley	9	11	198	7	300	10	300	2	3	5	9
Naugatuck Valley	6	6	165	3	300	4	300	0	0	2	8
Northeastern	7	4	186	4	633	4	450	2	1	8	3
Northwest Hills	7	5	253	4	988	7	988	1	3	2	14
South Central	3	5	156	2	200	4	200	1	1	4	6
Southeastern	11	9	160	5	350	7	350	1	0	10	5
Western Connecticut	11	10	125	2	450	4	450	0	3	2	15
Grand Total	76	79	175	43	409	60	396	13	15	44	87
Percent of Total	45.0	46.7		25.4		35.5		7.7	8.9	26.0	51.5

Source: Western Connecticut Council of Governments staff work, August 10, 2020

Table 4-3: Radio Frequency Exposure, Design Considerations and Tower Sharing							
Region	**Is a Radio Frequency Emission Compliance/ Report Required?**	**Do the Regulations Require at Least Annual Monitoring of RF emissions?**	**Do the Regulations Provide for Periodic Testing of RF Emissions?**	**Do the Regulations Require a View Shed Review?**	**Do the Regulations Require Consideration of Visual Compatibility ?**	**Do the Regulations Encourage Sharing the Tower for Municipal Use?**	**Do the Regulations Encourage Co-Location of Antennas?**
Capitol Region	26	5	4	18	30	1	28
Metropolitan	4	0	1	2	5	0	4
Lower CT River Valley	8	1	1	9	13	3	13
Naugatuck Valley	7	1	2	7	11	2	9
Northeastern	9	1	1	9	12	3	12
Northwest Hills	15	10	4	18	18	3	18
South Central	2	0	1	6	10	2	9
Southeastern	9	0	0	10	14	3	15
Western Connecticut	10	3	1	11	16	5	13
Grand Total	90	21	15	90	129	22	121
Percent of Total	53.3	12.4	8.9	53.3	76.3	13.0	71.6

Source: Western Connecticut Council of Governments staff work, August 10, 2020

CHAPTER 5: THE CASE FOR A MUNICIPAL RIGHT OF WAY ORDINANCE

Introduction

The development of fifth generation mobile broadband services – often referred to as 5G services – will inevitably require access to federal, state and local road systems as a means to install fiber optic cables that are the necessary connection to small cell wireless facilities transmitting wireless communications. This chapter focuses on the importance of developing guidance for the use of road right of ways falling within local government authority. One means of ensuring municipal governments play an active role within their prescribed authority to regulate the public right of way is by revising local road encroachment ordinances to ensure they address the wide range of public safety and health issues associated with fifth generation mobile broadband services. The Western Connecticut Council of Governments has developed a model right of way ordinance that addresses traditional road encroachment concerns as well as those unique to mobile broadband services.

Revised local road encroachment ordinances are needed in Connecticut to address the wide range of potential impacts that small cell wireless facilities will have on roadways, sidewalks, intersections, traffic safety, traffic signalization systems, pedestrian crossings, roadway aesthetics, subterranean conflicts with other utilities and impacts to the integrity of street trees. Currently, none of the road encroachment ordinance in Western Connecticut explicitly address the issues associated with the installation of fiber optic cables or small cell wireless facilities that are being installed on utility poles, street light poles, decorative poles or monopoles. While the Public Utilities Regulatory Authority has authority over small cell wireless facilities installed on utility poles, its authority ends when these small cells, their ancillary equipment or related fiber optic cable encroach within the local road right of way. Depending upon where small cell facilities are installed responsibility for review and approval is determined by whether they are installed on state or local roads and whether they are installed on utility poles or those owned by the municipality for lighting, decorative or other purposes.

Fifth generation mobile broadband services are expected to be deployed in urban centers where there is the greatest concentration of users of cell phones and other wireless devices used for telemedicine, remote education, emergency preparedness, autonomous vehicles and entertainment. Rural municipalities are not the initial target market since it is not cost effective to deploy this technology in areas of low population density. However, town centers, village districts and more densely populated metropolitan areas within Western Connecticut will be attractive locations for enhanced small wireless facility infrastructure. Because 5G services rely on higher frequency wave lengths for transmission, the range of service will be dramatically less than that offered by telecommunication towers –with spacing of 300 to 1,500 feet depending upon the obstructions created by trees, buildings and other structures. These small cell wireless facilities require fiber optic cable to deliver high speed data transmission (i.e., at the gigabits per second level) and this is only possible when these units are installed at heights of 20 to a maximum of 50 feet above ground level.

Because of their limited range, the Federal Communications Commission (FCC) anticipates that mobile broadband service providers will be submitting batched applications for approval along state and local right of way corridors. Batched applications are expected to be the norm since the development of 5G services depends on continuous access to wireless service along transportation corridors.[19] The FCC has declared that local governments will only have 60 days to approve batched applications when small cells are co-located on existing structures (e.g., existing utility poles, monopoles, decorative poles, etc.). In contrast, batched applications for new construction scenarios (e.g., small cells on new utility poles, monopoles, decorative poles etc.) will be allowed a 90 day approval process.[20] Local governments faced with dozens of applications submitted at one time, will need to be prepared to address the wide range of public health, safety and environmental concerns that these small cell facilities may create.

The table at the end of this chapter provides an overview of the various regulatory approaches that support regulation of fifth generation mobile broadband services through a municipal ordinance, a zoning ordinance, a license agreement and a local right of way ordinance. These regulatory options are not mutually exclusive; they represent a portfolio of approaches that address specific concerns raised by the installation of small cell wireless facilities in Connecticut.

Why Regulate Small Cell Wireless Facilities in the Road Right of Way?

While previous chapters have addressed municipal authorities to regulate small cell wireless facilities, this chapter focuses on the unique importance of revising local road encroachment ordinances to address the issues that will be emerging with this new communication technology. The Federal Communications Commission has explicitly acknowledged the role of local governments in addressing public safety issues within local road rights of way.[21] The authorities granted to local governments over fifth generation mobile broadband cover a wide range of public health and safety issues. As can be seen in the second table below, there are a wide range of statutory authorities that enable local governments to regulate the local right of way to address 1) public safety issues associated with the use of local roads, 2) pedestrian accessibility issues required by the American Disabilities Act, 3) intersection safety issues that may emerge when small cell facilities interfere with sightlines or impede the use of traffic signalization systems, 4) the use of municipally owned lighting and decorative poles within the right of way, 5) the installation of fiber optic cables that are used

[19] Federal Communications Commission, Accelerating Wireless and Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, Final Rule, *Federal Register,* Vol. 83, No. 199, October 15, 2018, p. 51874

[20] Ibid, p. 51877

[21] 47 USC 253(c) "STATE AND LOCAL GOVERNMENT AUTHORITY.—Nothing in this section affects the authority of a State or local government to manage the public rights-of-way or to require fair and reasonable compensation from telecommunications providers, on a competitively neutral and nondiscriminatory basis, for use of public rights of-way on a nondiscriminatory basis, if the compensation required is publicly disclosed by such government."

for local government purposes or made available through lease for other profit making purposes, 6) excavation in streets, 7) installation and protection of underground utilities, 8) installation of wires that are not subject to Connecticut Siting Council or PURA regulations, 9) construction and alteration of streets, sidewalks and other public grounds and 10) the protection of street trees that fall within the public right of way.

It is anticipated that the Connecticut Department of Transportation will play an important role in managing the installation of small cell wireless facilities in Western Connecticut due to prominence of state highways as major transit corridors and in many cases, serving as the "main street" of many rural communities. Nevertheless, with that caveat, 86% of all road miles in Western Connecticut fall under the jurisdiction of local governments and for this reason, local road encroachment ordinances will need to be revised to address the public safety issues mentioned above. Those municipalities whose local roads provide access to town centers, village districts or other commercial centers will be a higher priority for the installation of 5G services than on rural roads in municipalities with low-density single-family development and limited commercial activities.

Key Elements of the Model Right of Way Ordinance

Specific safety and environmental concerns of fifth generation mobile broadband have been addressed in the model right of way ordinance to assist local governments without guidance on these matters. While the model ordinance addresses a wide range of road encroachment considerations, the items discussed below represent the unique elements that apply to small cell wireless facilities. Municipalities that already have an adopted local road encroachment permit merely need to evaluate the factors below as additional elements to be added to their current ordinance. For municipalities without a road encroachment permit process, the entire model ordinance will provide a comprehensive approach to regulating the wide range of activities that can impact the use of streets, sidewalks and other infrastructure in the street right of way. The elements of the ordinance discussed below represent those concerns that are uniquely tied to the installation of fifth generation mobile broadband.

Need for New Definitions: The model ordinance includes a definition section that adds new terms including "first gain", right of way, shot clock, and small cell wireless facilities to other more commonly used definitions found in local road encroachment ordinances. Since small cell wireless facilities are an emerging technology, it is important to distinguish them from telecommunication towers that were the original focus of Federal Communication Commission regulations issued in 1996.

Vertical and Horizontal Clearances: Buried utilities represent important public and private investments that must be protected when an applicant requests permission to install fiber optic or other cable to support fifth generation mobile broadband. The model ordinance establishes the need for vertical and horizontal clearances for any fiber optic or other cable installation to ensure it does not interfere with the use or maintenance of other buried utilities. The model ordinance also

requires at least three feet of horizontal clearance for cable or fiber optic from the face of the curb or from the edge of the pavement depending upon site conditions – unless right of way constraints require a lesser setback. Aboveground guy wires or tie down wires that cross sidewalks should not be less than 8 above ground level as set forth in the AASHTO publication, *Guide for the Planning, Design and Operation of Pedestrian Facilities*.[22] Additional safety setback standards for objects that obstruct the sidewalk passage way are set forth in this AASHTO guide and are relevant to the installation of ancillary equipment for small cell wireless facilities.

American Disabilities Act Issues: The installation of small wireless facilities have the potential to interfere with pedestrian street crossings and sidewalk access when ancillary equipment is installed at ground level or, within 8 feet of ground level, in such a way as to impede travel for disabled person or for wheelchair bound individuals. The obstruction of pedestrian travel has already occurred in urbanized areas where ancillary equipment is installed too close to pedestrian crossing points. U.S. Department of Justice ADA requirements applicable to municipalities establish the construction and accessibility standards pertinent to any obstructions that impede pedestrian access on municipal sidewalks and street crossings.[23]

Driveway Flare Setbacks: There should be a 3-foot separation between any above grade utility structure and existing driveway flare in accordance with standard design standards established by local governments. In addition, the model right of way ordinance also addresses the need to avoid obstructions placed within the line of sight for those exiting driveways. Landscaping near driveways is an important asset to the design of a highway as long as it does not interfere with line of sight requirements. Guidance on driveway design issues can be found in the *Guide for the Geometric Design of Driveways*.[24]

Intersection Line of Sight: Any above grade obstructions 3 feet or greater in height that is placed at intersections or driveways must evaluate sight line distance requirements as set forth in AASHTO standards as well as municipal ordinances and subdivision regulations.

Pole and Pedestal Setbacks: Local roads will also be impacted by the placement of new utility poles and large pedestals for these poles designed to conceal equipment used to support small cell installations. Because pole and pedestal placement can impact line of sight at intersections and driveway crossings and can encroach too near the edge of local roads and municipal sidewalks, these units need at least a 24-inch clearance between the pole and the face of the street curb.

Clearance Heights of Small Cells and Ancillary Equipment: Small cell antennas and ancillary equipment can interfere with line of

[22] American Association of State Highway and Transportation Officials, *Guide for the Planning, Design and Operation of Pedestrian Facilities,* Washington DC, July 2004, p. 65

[23] U.S. Department of Justice, 2010 Standards for State and Local Government Facilities: TITLE II. Accessed at: https://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#titleII

[24] National Academies of Sciences, Engineering, and Medicine*, Guide for the Geometric Design of Driveways*, 2010, p. 76. Accessed at: https://www.nap.edu/download/14399

sight for motorists at intersections and pedestrians at street crossings. Minimum heights for the installation of ancillary equipment above street and pedestrian walkways will be an important consideration that must be addressed by local right of way ordinances. Since the FCC allows ancillary equipment to be as large as 28 cubic feet, it is important to not only consider the aesthetics of where they are placed but their impact on pedestrian and traffic safety.[25]

Identify Improvements in Right of Way**:** The model ordinance calls for the identification of all existing public and private improvements within the area where excavation or aboveground work will occur including but not limited to driveways, utility boxes, fire hydrants, trees, curb ramps, street signs, etc. Once that information is provided as set forth in the model ordinance, it is then possible to determine if any adverse impacts might occur to other public infrastructure in the road right of way such as road signs, fire hydrants and other utility structures located aboveground.

Street Tree Protections: There is a great deal of concern that street trees will be adversely impacted by small cell wireless facilities. One concern is the potential for the pruning of street trees that may be interfering with the radio frequency propagation of gigahertz level wireless telecommunication systems. Since higher frequency radio transmissions are less able to penetrate buildings and trees, this is an area of significant concern – not only for tree protection but for the feasibility of fifth generation mobile broadband in areas with expansive tree canopies.[26] The second concern is with the underground health of the tree's root system which requires permeable soils to ensure precipitation and adequate oxygen is available to the root system.[27] A third consideration is providing sufficient underground space for tree roots to grow to maturity and one best practice is to maintain a minimum of 1.5 to 2 meters from a tree trunk to the edge of infrastructure.[28] A fourth consideration is ensuring that the installation of new street trees is compatible with maintaining sight lines for motorists and pedestrians and to avoid overhead obstructions within the pedestrian walkways and sidewalks. Tree branches, according to AASHTO guidelines should be at least seven feet above the sidewalk.[29] Without specific guidance on these concerns, the region's street trees may be endangered by the installation of fiber optic cables and by the

[25] Federal Communications Commission, Accelerating Wireless and Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, Final Rule, *Federal Register,* Vol. 83, No. 199, October 15, 2018, p. 51885.

[26] Anthony Ngozichukwuka Uwaechia and Nor Muzlifah Mahyuddin, "A Comprehensive Survey on Millimeter Wave Communications for Fifth-Generation Wireless Networks: Feasibility and Challenges," IEEE Access, March 2020, Vol. 8, p. 62377. Accessed at: https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9050553

[27] Gary Watson, et. al., (ed.), *The Landscape Below Ground IV, Proceedings of the Fourth International Workshop on Tree Root Development in Urban Soils*, International Society of Arboriculture, Atlanta, GA, 2020.

[28] Ibid p. 555.

[29] American Association of State Highway and Transportation Officials, *Guide for the Planning, Design and Operation of Pedestrian Facilities,* Washington DC, July 2004, p. 67

inappropriate pruning of trees along local rights of way.

Municipally Owned Traffic Signals: Local governments will need to decide if it will be acceptable to install small cell antennas and ancillary equipment on traffic signal support structures. At a minimum, the model regulation authorizes small cells on such structures if they comply with traffic safety standards. A recent study published by the Illinois Center for Transportation found traffic signal poles that do not hang over the road offer the optimal height for the installation of small cell antennas and can be designed to conceal the antenna in an aesthetically pleasing manner.[30]

Radio Frequency Electromagnetic Energy Compliance Report: While the FCC has sole authority over the exposure standards that govern radio frequency transmissions from towers and small cell wireless facilities, local governments can require proof of compliance as part of the local review process. The elements of an acceptable radio frequency compliance report should be established by each municipality. A good starting point is to reference the FCC guidelines for accepted methods for measuring radiofrequency fields.[31] A recent study sponsored by the Federal Highway Administration reviewed radiofrequency exposure concerns with small cell wireless facilities and indicated that, when proper installation, antenna setback and signage standards are adopted, maximum permissible exposure levels should not exceed FCC standards. However, concern for potential exposure exists for municipal or other contract workers who may attempt to repair a fallen utility, lighting or decorative pole with a small cell installation that has not been de-energized prior to work.[32] The model ordinance addresses this issue.

Kill Switch on Pole/Pedestal: As a public safety measure, it is recommended that a kill switch be installed on all poles and pedestals used for small cell wireless facilities in the event of a fire or other emergency. When two or more small cell wireless facilities are co-located on the same pole, there should be only one kill switch for all electrical power systems to ensure immediate de-energization of all systems.[33]

Antennas, Signs, Banners and Ancillary Equipment: The model ordinance requires the identification of all of the equipment, signs and other notices that are placed on utility

[30] Mohammad Imran Hossain, Mohammad Ammar Alzarrad, Kristy Wolfe, Suruz Miah, *Small-Cell Installation in Transportation Infrastructure— A Literature Review,* Research Report No. FHWA-ICT-20-003, Illinois Center for Transportation, Urbana, IL, January 2020, p. 15. Accessed at: https://apps.ict.illinois.edu/projects/getfile.asp?id=9079

[31] Federal Communications Commission, Office of Engineering & Technology, Evaluating Compliance with FCC *Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields,* OET Bulletin, 65, Edition 70-01, August 1997.

[32] Mohammad Imran Hossain, Mohammad Ammar Alzarrad, Kristy Wolfe, Suruz Miah, *Small-Cell Installation in Transportation Infrastructure— A Literature Review,* Research Report No. FHWA-ICT-20-003, Illinois Center for Transportation, Urbana, IL, January 2020, pp. 48-53.

[33] Belmont, Massachusetts, Public Works Department, *Public Works Department Administrative Policy – Small Cell Wireless Facilities in the Public Right-of-way*, April 15, 2019. This municipality provides for the Kill Switch concept as a public safety measure. Accessed at: https://www.belmont.gov/Home/ShowDocument?id=18352

poles or other poles including specific signage required by the FCC, PURA and/or the Connecticut Siting Council. Diagrams are to be submitted that locate the antenna location – whether top mount or side mount – ancillary equipment mounts and all signs.

Access to Municipal Electricity for Street Lights: Since there are various ways to provide electricity to small cell wireless facilities mounted on municipally owned street lights or decorative poles – including allowing the mobile broadband provider to use municipal electrical lines for a fee – the model ordinance requires the permittee to identify whether any given proposal will require access to existing municipal electric service.

Municipal Gain: Connecticut's general statutes and recent case law authorize local governments to install their own fiber optic cable under the rubric of "municipal gain" use of utility poles or underground fiber optic cable to create telecommunication systems to meet the needs of residents of the municipality. Connecticut case law also enables municipalities to make fiber optic cable available to the private sector under terms and conditions mutually agreeable to the affected parties.[34] The model ordinance includes a requirement that the permittee identify if any such agreements apply to any given application made for a local road encroachment permit.

As Built Plans: One of the critical elements of establishing oversight over small cell wireless facilities is maintaining as built plans for all such installations so that local governments can maintain a complete inventory of its telecommunications infrastructure and better manage the need for expansions of this infrastructure based on a solid understanding of where these small cells are located town-wide. The model ordinance requires submission of as built plans.

Measuring Visibility Area: The model ordinance also provides guidance on visibility areas for street intersections and driveway access points to provide technical guidance on the potential zones where small cell wireless facilities could adversely impact traffic safety (see page 140).

Required Submission Elements: The FCC requires local governments to have objective and clear standards for regulating small cell wireless facilities requiring local permits. To ensure objective and specific submission requirements are established, the model ordinance identifies requirements for a complete application (see page 142).

Conclusions

Local road encroachment ordinances can play an important role in protecting investments in aboveground and below ground public and private infrastructure, protecting pedestrian and motor vehicle safety, ensuring the unimpeded use of local thoroughfares and the proper installation of small cell wireless facilities that are installed in the public right of way. However, none of the region's road encroachment ordinances address the construction work that the mobile broadband industry anticipates installing over the next ten

[34] Connecticut Conference of Mayors v. Public Utilities Regulatory Authority, Superior Court of the Judicial District of New Britain, Decided November 12, 2019.

years. Without design and construction standards to guide the installation of small cell wireless facilities in the public right of way, municipalities will be unable to properly address vital public health and safety issues that are expected to arise as this technology assumes a greater role in serving America's wireless communication needs. While not all small cell wireless facilities will be installed on local roadways in Western Connecticut – state highway systems may indeed be the first area where they are installed – local road encroachment regulations need to be revised to address the inevitable extension of this technology onto town maintained roads. Since 86% of all road miles in the region are under the control of local governments, the model right of way ordinance should assist local governments with the technical guidance needed to address this emerging telecommunications technology.

Table 5-1: Overview of Federal and State Statutory Authorities Governing Regulation of Small Cell Wireless Facilities in the State of Connecticut

#	Potential Desired Outcomes	Pertinent Law/Regulation	Municipal Ordinance	Zoning Regulation	Right of Way Ordinance	License Agreement
Statutory Authorities Pertinent to Managing SWF through a Comprehensive Municipal Ordinance						
1	Effective involvement of the public	CGS § 16-234(f); CGS § 16-50l(b); CGS §7-148J	X			
2	Use of first gain for municipal telecom.	CGS § 16-233	X			X
3	Master plan to manage SWF deployment	CGS §7-163(c)	X			
4	Extension of fiber optic to digital dependent anchor tenants	CGS §16-247a	X			
5	Strategy to achieve FCC shot clocks	FR 83;199 Oct. 15, 2018	X			
6	Coordinated approach to co-location of multiple SWF vendors	47 CFR 1.6002(b)(2)	X			X
7	Municipal coordination of SWF applications	FR 83;199 Oct. 15, 2018	X			
8	Increased wireless upload/download capacities	Telecommunications Act of 1996 Sect 706	X			
9	Incentivize 5G expansion	CGS §16-247a	X			X
10	Standard municipal fees for SWF projects	FR 83;199 Oct. 15, 2018	X			
11	Long term SWF maintenance controls	CGS §7-148b	X			X
Statutory Authorities Pertinent to Managing SWF in the State and Local Rights of Way						
11	Control over decorative poles in local ROW	CGS § 7-148(c)6(B)iii			X	
12	Control over lighting poles in ROW	CGS § 7-148(c)6(B)iii			X	
13	Control over SWF on state highways	CGS §13a-80a			X	
14	Control over SWF on local highways	CGS 7-148(c)6(B)iii			X	
15	Protecting ADA sidewalk & crossing spaces	28 CFR 35.130			X	
16	Protection of intersection safety from SWF	CGS § 7-148(c) 6(C)ii			X	
17	Leasing local ROW to broadband providers	CGS §13a-80g			X	X
18	Emergency, police & fire wireless service	CGS §28-1a			X	
Statutory Authorities Pertinent to Managing SWF through Local Zoning						
19	Regulate placement of SWF through zoning	47 USC 332(c)(7); CGS §16-50x		X		
20	Influence CT Siting Council land use decisions	2014 OLR Research Report; CGS §16-50x		X		
21	Municipal siting preferences for telecommunication towers & SWF	CGS §16-50gg; CGS §16-50x		X		
22	Control over proximity of SWF to schools	CGS § 16-235		X		
23	Regulate rooftop SWF	CGS § 16-235		X		
24	Regulate wall mounted SWF	CGS § 16-235		X		

Table 5-2: Municipal Right of Way Authorities Established by the Connecticut General Statutes		
Right of Way Authorities	**Decision Makers**	**Source**
Authority to lease or enter into agreement for state highway right of way	Requires approval of OPM, CONNDOT and Chief Elected Official of affected municipality	CGS §13a-80a, Disposition of Interests on, above or below state highway right-of-way.
Authority to lease or transfer interests for local highway right of way	Requires Municipal Chief Elected Officials and consent of abutters	CGS §13a-80g, Disposition of interests in, above or below municipal highways
Authority to move utilities when necessary for local highway construction.	Municipal Chief Elected Officials	CGS §13a-98f, Regulation of Accommodation of utilities to federal surface transportation urban program roadways or facilities
Authority to lease real property or interest therein for public use for purpose of health, buildings or other structures	Municipal Chief Elected Officials	CGS 7-148 (c)3 Property
Authority to regulate laying, location and maintenance of poles, wires, conduits and other structures in the streets and public places	Municipal Chief Elected Officials	CGS 7-148(c)6(B)iii, Regulate the laying, location and maintenance of gas pipes, drains, sewers, poles, wires, conduits and other structures in the streets.
Authority to keep streets and sidewalks open and safe from encroachment or obstruction	Municipal Chief Elected Officials	CGS 7-148(c) 6(C)ii, Keep open and safe for public use and travel and free from encroachment streets and sidewalks and public places in the municipality.
Authority to control street excavation	Municipal Chief Elected Officials	CGS 7-148(c)6(C)iii, Control the excavation of highways and streets
Authority to regulate and prohibit the excavation, altering or opening of sidewalks, public places and grounds	Municipal Chief Elected Officials	CGS 7-148(c)6(C)iv, Regulate and prohibit the excavation, altering or opening of sidewalks, public places and grounds for public and private purposes.
Authority to regulate use of streets, sidewalks, public places and grounds	Municipal Chief Elected Officials	CGS 7-148 (c)7(H)xii, Regulate the use of streets, sidewalks, highways, public places and grounds for public and private purposes.
Authority to occupy and use for any purpose, without payment, one gain upon each utility pole or underground communications duct	Municipal Chief Elected Officials	CGS §16-233, Use of gain by town, city, borough, fire district or Department of Transportation.
Authority to regulate wires, fixtures, antennas, towers or earth station receivers not subject to CT Siting Council or PURA	Municipal Chief Elected Officials	CGS §16-235, Control by Local Authorities of wires, antennas, towers and other fixtures not under Connecticut Siting Council or the Public Utilities Regulatory Authority

CHAPTER 6: THE CASE FOR A MUNICIPAL ORDINANCE TO ADDRESS SMALL CELL WIRELESS FACILITIES

Introduction

There is an emerging municipal interest in the regulation of small cell wireless facilities across the nation, especially in urban centers on the east and west coasts where the demand for high speed wireless communication is greatest. The Western Connecticut Council of Governments staff have reviewed adopted municipal ordinances in numerous American cities to determine best practices and to make appropriate recommendations for enabling small cell wireless facilities in those municipalities expected to be high priority locations for the deployment of this telecommunications infrastructure.

As discussed in chapter 3, Connecticut municipalities have the authority to regulate numerous aspects of telecommunications systems that are installed within their jurisdiction. The authority to establish an ordinance to regulate certain aspects of telecommunication infrastructure – including small wireless facilities – is set forth in Section 7-148 (b)2 Connecticut General Statutes. Furthermore, Connecticut municipalities have the authority to execute contracts with respect to municipal property [CGS Sect. 7-148(c)1(B]; to lease municipal property for any purpose [CGS Sect. 7-148 (c)3] to regulate the laying, location and maintenance of gas pipes, water pipes, drains, sewers, poles, wires, conduits and other structures in the streets and public places of the municipality [CGS Sect. 7-148(c)6(B)iii] and to regulate the use of streets, sidewalks, highways, public places and grounds for public purposes and private purposes [CGS Sect. 7-148(c)7(H)xii]. Furthermore, municipalities that plan to lease municipal property to telecommunications providers must hold a public hearing prior to the final approval of such lease [CGS Sect. 7-163(e)]. While these laws enable municipal regulation of telecommunication providers that encroach on road rights of way, municipal infrastructure and municipal finance, their authorities over this industry are not exclusive; the Connecticut Siting Council and PURA remain the primary regulatory authorities over small cell wireless facilities in Connecticut.

The primary benefit of a municipal ordinance is that it offers a means to develop a comprehensive approach to the complete spectrum of fiscal, land use, design, real estate, public safety and telecommunication needs of the community. The five primary advantages of a municipal ordinance over piecemeal strategies addressing single issue concerns (e.g., zoning or road encroachment issues) are presented below.[35]

[35] An interim approach to adopting a municipal ordinance may be the adoption of a small cell wireless facility policy. For example, rather than enact a municipal ordinance, the city of Santa Clarita, California established a *Small Wireless Facilities Policy* document to serve as a stop gap means of organizing its response to the Federal Communications Commission mandate to accelerate the deployment of fifth generation mobile broadband services. This approach, providing policy guidance under the authority of the city manager, should be given serious consideration in those instances where municipal action is necessary to address imminent development proposals from the telecommunications industry since the enactment of a municipal ordinance requires a more lengthy development and approval process than a policy document. See: Kenneth Striplin, City Manager,

The Value Proposition for a Municipal Ordinance

There are five main reasons to consider adopting a municipal ordinance to guide the development of small cell wireless facilities. These reasons reflect a combination of value propositions including 1) administrative efficiency in addressing the wide range of municipal departments that will be impacted; 2) the need to coordinate municipal response times to meet FCC shot clock requirements; 3) the importance of creating a municipal ombudsman to establish a single point of contact for small cell wireless facility (SWF) proposals; 4) unified municipal fee schedules for SWF projects; and 5) simplified review and approval procedures that enable long term licensing agreements to be established with telecommunication providers. These five key elements are discussed in more detail below:

1. Administrative Efficiency

As discussed in previous chapters, SWF applications will require multiple municipal approvals when antennas and their ancillary equipment are located on municipal infrastructure or within municipal rights of way. To coordinate the multiplicity of issues associated with the use of municipal property, public safety considerations with the use of the municipal right of way, land use and siting concerns and design and environmental considerations, chief elected officials must consider the organizational response structure needed to create a unified review and approval process.

2. Meeting FCC Shot Clock Standards

Administrative efficiency is a necessary first element to justify a municipal ordinance, but prompt decision making must also comply with FCC "shot clock" requirements as discussed earlier in this report. The sixty-day review and approval period for SWF applications to place antennas on existing poles may very well preclude the timetables associated with holding public hearings, meetings and other consultations. To meet the shortened times set by FCC regulations, municipalities will need to establish clearly defined timetables to 1) decide when an application is complete; 2) determine that all affected departments have been consulted and have responded according to internal timetables aimed at having sufficient information to make a reasoned review of the application and 3) complete the review and approval process within FCC shot clock standards. To accomplish this second element supporting a municipal ordinance, the chief elected official and the town's governing body must establish municipal policies that guide the process.

3. Municipal Ombudsman

Major American cities that are managing SWF applications have established an ombudsman to coordinate the first two pillars supporting a municipal ordinance. A single point of contact can be created without a municipal ordinance but for long term program stability this role is best

---

Santa Clarita Policy, Small Wireless Facilities Policy/Procedure, Santa Clarita, CA, November 26, 2019. Policy document accessed at: https://www.santa-clarita.com/Home/ShowDocument?id=18085

assigned to one person or department. The Ombudsman plays a key role in establishing procedures including developing clear and well-defined application requirements to minimize possible delays caused by receipt of an incomplete application. Municipalities only have ten days to confirm an application is complete, so clear application instructions are an essential element of the ombudsman's role.

4. Unified Fee Schedules

The FCC has ruled, and the Ninth Circuit Court of Appeals has concurred, that municipal fees must be cost based. The costs for reviews, consultations and approvals required from each municipal department must reflect actual costs incurred. The municipal chief elected official is responsible for ensuring a cost based analysis has been accomplished so that zoning permits, building permits, road encroachment permits and other related costs reflect actual costs of completing municipal reviews, see Appendix E for guidance on accounting for all costs associated with telecommunications applications. Whether this is done through a municipal ordinance or through an alternate means, is less important than achieving compliance with FCC cost-based fee schedules.

5. Long Term Licensing of SWFs

Since any lease or licensing of municipal property or municipal right-of-way requires a bilateral long term relationship with a telecommunications provider – often for five or ten year intervals – continuity of leadership is an important element of any SWF deployment strategy and a municipal ordinance can ensure that such continuity is maintained regardless of which party is in office. A municipal licensing agreement creates long term relationships and responsibilities and such responsibilities require formal organizational structures, accountability systems and requirements that the public can rely on to determine the ongoing functioning of municipal telecommunication services. Establishing a municipal ordinance to consistently regulate municipal concerns with the telecommunications industry makes most sense in the region's urban centers where small cell wireless facilities are expected to be installed in the near term.

Model Municipal Ordinances

To understand the wide range of responsibilities that emerge once a municipal licensing agreement is established, the Western Connecticut Council of Governments staff reviewed thirteen different municipal ordinances including several model ordinances. Model regulations have been developed by the Federal Communications Commission (FCC), the National League of Cities, Verizon, AT&T, and Americans for Responsible Technology) representing the interests of the federal government, America's largest cities, broadband providers and public interest groups. In addition, adopted or pending municipal ordinances were reviewed from four different states (California, Michigan, New York and Massachusetts) with the focus placed on a review of recently adopted ordinances that address the latest FCC regulatory requirements. Several older municipal

ordinances were also reviewed as requested by members of the WestCOG task force.

Concerns with Small Cell Wireless Facilities Addressed by Municipal Ordinances

As can be seen in Appendix G, there are a wide range of issues that are being addressed by municipal ordinances. Perhaps the most sophisticated municipal ordinances adopted so far are those of San Jose and Fairfax California. It is clear from the review of some forty different municipal ordinances nationwide, including those in Appendix G, that municipalities in California and Cambridge, Massachusetts provide the most useful insights for chief elected officials in Western Connecticut. Many of the adopted municipal ordinances in California provide exacting design standards for small cell wireless facilities (SWF); force mobile broadband providers to adhere to location preference standards (i.e. locations that are preferred for SWF and those that are not); provide radio frequency compliance reports on a routine basis; require licensing agreements for the use of municipal property or municipal rights of way; require, where feasible, undergrounding of accessory equipment including special underground districts where all utilities must be underground; impose more restrictive limits on the height and volume of SWF equipment than noted in FCC regulations; impose minimum distances that SWF poles must be separated from residences and schools; require detailed right-of-way standards for the protection of existing water, sewer, fire hydrant and other buried utilities that might be adversely impacted by fiber optic cables; require tree canopy and tree root protections; and establish pole, antenna and accessory equipment design standards that minimizes aesthetic impacts to the community.

Variability in Adopted Standards

While many municipalities have addressed the same basic concerns raised by the installation of small cell wireless facilities, the standards applied are often quite different. For example, there are a range of minimum distances that have been established to separate SWF from residences and from schools. The separation distances reflect, in part, the varying densities of each municipality, the public opposition to the installation of SWFs in any given neighborhood and the counter-pressures from mobile broadband providers concerned with restrictions on the installation of 5th generation equipment. Similarly, many municipalities regulate municipally owned poles such as lighting poles, decorative poles and flag poles. However, some municipalities have chosen to license the use of these poles under specific design and licensing standards and others have chosen to prohibit their use for small cell wireless facilities. Inevitably, the choices made reflect the varying mix of economic development, municipal revenue opportunities, protection of community character and neighborhood concerns with aesthetics and public health issues.

Model Municipal Ordinance

Appendix A of this report contains the model municipal ordinance developed by this task force based on the ordinance developed for the city of Fairfax California. The model ordinance has been customized to the laws and regulations of the State of

Connecticut and incorporates the best municipal practices recommended by the National League of Cities, the Federal Communications Commission and telecommunication providers.

CHAPTER 7: THE CASE FOR MUNICIPAL LISCENSING FIBER OPTIC CABLE

Introduction

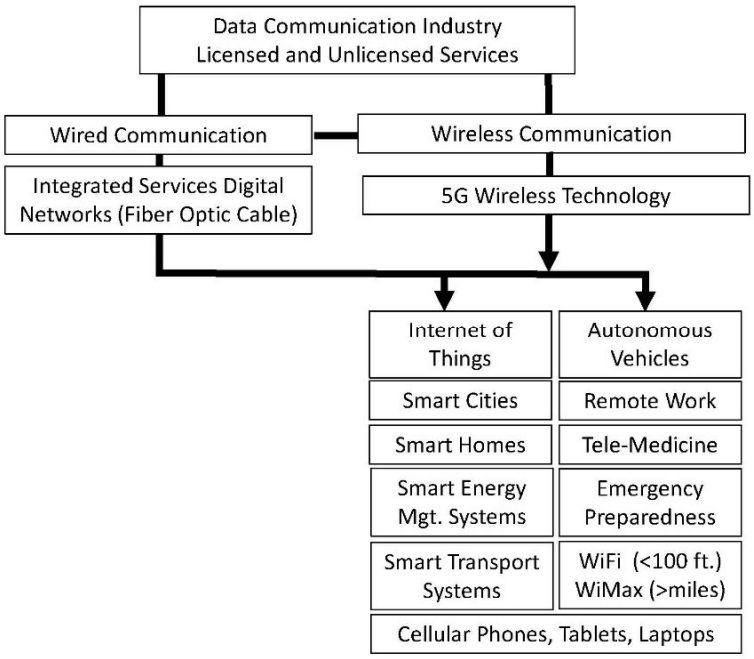
Municipalities have a wide range of business opportunities when it comes to the expansion of telecommunication services to meet their customer's needs – whether those be of residential, commercial, local government services or merely to resolve some of the challenges of the digital divide that adversely affect lower income, less educated and rural areas of western Connecticut. To understand the options available, it is important to understand the current range of telecommunication services that already exist – and those that are emerging – to determine what role municipal governments can play in the increasingly important field of telecommunications. The chart below provides a list of some of the wide range of telecommunication services that are enabled by wireless communication including service options available to local governments. Examples include remote education, telemedicine, emergency preparedness, the Internet of Things and many other governmental digital-based services.

With the anticipated deployment of fifth generation mobile broadband into western Connecticut, municipal governments have the opportunity to influence the types of telecommunication services that are offered to the public as well as to develop bilateral relationships with the telecommunication industry so that the use of government infrastructure – road rights of way, government buildings such as town halls, schools, fire and police stations, senior centers and libraries, as well as decorative lighting, traffic signal poles and water towers– is properly compensated through reasonable fees for services rendered.

Fifth generation mobile broadband promises to facilitate a wide range of telecommunication services but it also may impose financial burdens on municipal governments. Fortunately, federal law authorizes local governments to impose municipal fee schedules to account for these potentially uncompensated costs.[36] Moreover, state law authorizes municipalities to play an active role in the development of telecommunication services through its free access to the utility poles and underground conduit system. This chapter explores some of the licensing strategies that may be relevant to municipalities charged with managing the rapid deployment of small cell wireless facilities in western Connecticut.

[36] A list of the wide range of uncompensated fiscal burdens that are expected to emerge from deployment of fifth generation mobile broadband are presented in the appendix of this report.

Wired and Wireless Communication Services Relevant to Connecticut Municipalities



Telecommunication Licensing Options for Municipalities

There are two relevant licensing options that should be of considerable interest to Connecticut municipalities concerned with the expansion of mobile telecommunication services into fifth generation wireless technology that will dramatically expand data transmission capacities. One option relies on a municipality's authority to install fiber optic services on utility poles or road rights of way, including the ability to license such access to private sector mobile broadband providers. The second licensing option relies on the private sector mobile broadband industry to own, construct and operate small cell wireless facilities on government infrastructure and local road rights of way under bilateral agreements that ensure the financial burdens created by this emerging technology does not unfairly impact local governments. While these two approaches – one based on a municipal right to fiber optic cable services and the other based on a proactive strategy aimed at anticipating a private sector right to install small cell wireless facilities across America – are not mutually exclusive nor are they constrained in the "value packages" they might offer. For simplicity, the following discussion provides a high-level overview of these two main licensing options. It should be understood that licensing is only one of several contractual tools that could be used including lease agreements, contracts, and other binding legal agreements that enable a long-term reciprocal relationship between a municipal government and a private sector mobile broadband provider.

Municipal Gain Option

Municipalities have the authority to install fiber optic cable on public utility poles or underground under the "municipal gain" provisions of the Connecticut General Statutes.[37] A recent Connecticut Superior Court has upheld this authority and ruled that it encompasses a municipality's right to make this "municipal gain" privilege available to its residents as well as to commercial users for broadband internet services. This decision enables local governments to develop internet services whether that be under contract or licensing arrangements acceptable to both parties. One of the advantages of exercising "municipal gain" authority is that municipalities can provide improved wire based digital services to its residents as well as to enable the installation of small wireless facilities consistent with the economic development and land use concerns unique to each municipality. Because municipalities are provided with a "free gain" to the existing utility infrastructure they are also in a position to provide lower cost services when they undertake joint ventures with private sector internet providers since they are not subject to the utility pole lease charges imposed on private sector telecommunication firms.[38] Improved digital services are critical to a wide range of services that have traditionally been provided in person but which now can be achieved through remote access to customers. If a municipality should choose this approach, the first step will be to develop an economic analysis of the costs and benefits of developing a joint venture with a private firm specializing in communication infrastructure development. There are several major fortune 500 corporations that provide such services including the requisite business case studies to support municipally owned fiber optic and/or small cell wireless facility services appropriate for any given community.

What are the advantages of a municipal gain strategy when such services are already provided by various sectors of the communications industry (e.g., cable services and telecommunication services)? The primary advantage is to accelerate the extension of fiber optic cable for home use and enable a faster deployment of small cell wireless facilities to areas within Western Connecticut that currently have limited or non-existent data capacity – whether that be caused by limited mobile broadband or limited fiber optic connectivity. The telecommunications industry is focusing its business on the deployment of small cell wireless facilities in areas where there is the greatest demand – implying that suburban and rural areas are not likely to be the first locations to receive the benefits of quick

[37] **Sec. 16-233. Use of gain by town, city, borough, fire district or Department of Transportation.** Each town, city, borough, fire district or the Department of Transportation shall have the right to occupy and use for any purpose, without payment therefor, one gain upon each public utility pole or in each underground communications duct system installed by a public service company within the limits of any such town, city, borough or district. The location or relocation of any such gain shall be prescribed by the Public Utilities Regulatory Authority. Any such gain shall be reserved for use by the town, city, borough, fire district or the Department of Transportation.

[38] Interview with Jack, McCoy, Chief Information Officer, Town of Manchester, August 28, 2020.

upload and download times for data, video and voice transmissions. Improved wired and wireless communication does not necessarily require private sector installations by the telecommunications industry – municipally installed or licensed broadband internet services is now an option that may serve to meet many of the same communication needs as those offered by the telecommunications industry but with a focus on municipal priorities. Telecommunication service needs of local governments are not necessarily the business priorities for the telecommunications industry. The town of Manchester is an example of a municipal government that has chosen its own path forward. Manchester has developed its own telecommunication system to provide ten gigabit per second connectivity to forty-three of the town's municipal buildings. Its municipal telecommunication system is one of the best examples of how municipal investment in a high capacity telecommunication system can improve local government services working with telecommunication infrastructure providers.[39]

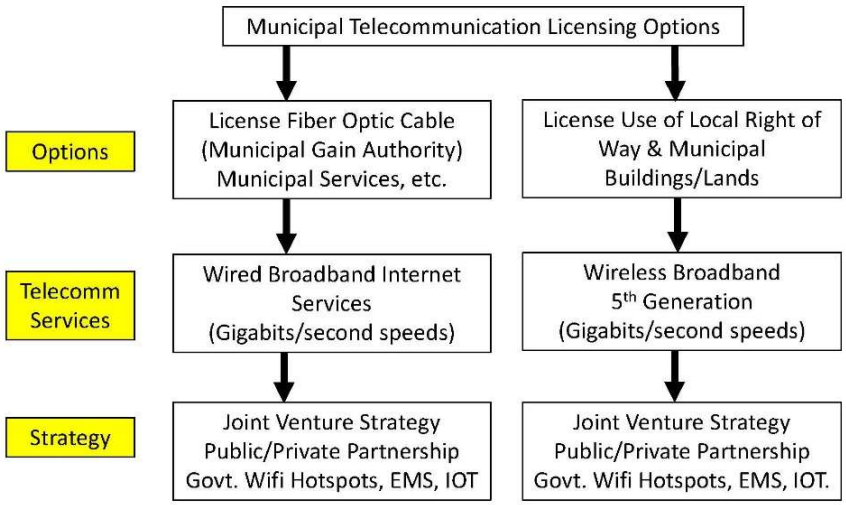
Licensing the Use of Government Infrastructure Option

A second opportunity for licensing telecommunication services relies on municipal ownership of government buildings, infrastructure, land and local road rights of way (see chart below). Mobile broadband providers are shifting their investment priorities from tower applications that provide wide coverage but low data density transmission to small cell wireless facilities along major transportation corridors and urban centers where line of sight communication systems can offer high speed and high data density upload and download capabilities. To the extent that these mobile broadband providers seek use of government properties and municipal rights of way, bilateral licensing agreements should be considered as business opportunities. License agreements ensure long term cooperation and mutually acceptable financial obligations for the use, maintenance, repair and alteration of government property and for ongoing reporting, repair and emergency notifications necessary to maintain jointly operated systems. For example, if a small cell wireless antenna is installed on a municipally owned traffic signal support pole both the local government and the mobile broadband company must develop mutually agreeable terms for the ongoing repair and maintenance of the signalized intersection and the small cell wireless facility. If an emergency condition exists – such as a truck knocking down the support pole – causing damage to the traffic signal or the antenna system installed on the pole, it is essential that the two parties have a long term contract to resolve the overlapping responsibilities, fiscal obligations and notification procedures binding upon each party.

One advantage of a licensing agreement is that a municipality has the contractual tools

[39] Manchester is not unique. Several other Connecticut municipalities have also taken advantage of the "municipal gain" option authorized by Connecticut General Statutes. Interview with Jack McCoy, Chief Information Officer, Town of Manchester, August 28, 2020.

to ensure mobile broadband services pay the costs incurred by the municipality responsible for small cell wireless facilities located on government property or within the municipal road right of way. The FCC has ruled that as long as these costs reflect the actual costs of providing services – and can be documented as such – they will be considered acceptable fees under the 2018 Small Cell Wireless Facilities regulations.[40]



EMS= Emergency Management Systems; IOT = Internet of Things

Telecommunication Services

Municipalities that wish to take advantage of their right to access public utility infrastructure in Western Connecticut need to consider the costs and benefits of undertaking such work based on 1) customer needs, 2) competing cable services, 3) anticipated public interest benefits, 4) potential public-private partnership opportunities and 5) federal funding targeted at eliminating the so-called "digital divide" that exists based on the availability of high speed fiber optic and mobile broadband services.[41]

Customer Needs

With increasing public demand for higher data capacities to meet business, residential and governmental telecommunication needs, municipalities need to find public or private means to meet a wide range of demands including remote work requirements, remote education, telemedicine, emergency management

[40] Federal Register, Vol. 83, 199, p. 51868, October 15, 2018. FCC has declared "…fees are only permitted to the extent that they represent a reasonable approximation of the local government's objectively reasonable costs and are non-discriminatory." See page 144 for examples.

[41] The Federal Communications Commission has established the Rural Digital Opportunities Fund to address the digital divide with $20.4 billion allocated for this initiative. See FCC Proposes $20.4 Billion Rural Digital Opportunity Fund accessed on August 26, 2020.

systems and public safety. The demand for telecommunication services has skyrocketed with the COVID-19 pandemic especially for remote education, telemedicine and software systems that enable remote working.[42] While some of this demand may be lost if and when the pandemic subsides, there are numerous chief executives of major American corporations that believe a fundamental shift is occurring in our reliance on internet and mobile broadband services.[43] In the future we can expect a far greater acceptance of the "remote office" as a substitute for the traditional five day a week commute to work paradigm that existed in the pre-COVID-19 era.

Competing Cable Services

To the extent that private sector cable systems provide internet access, municipal governments will have less pressure to develop municipally operated or leased telecommunication systems. However, cable services are not providing 100% coverage in many municipalities since it is not in their fiscal interests to extend services to remote areas where there is no return on investment. Moreover, cable services are not offering internet access speeds – as measured in gigabits per second upload and downloads – that meet the needs of customers requiring high density streaming services. Cable services are also expensive, and this is a major factor aggravating the digital divide between those who can afford such services and those that cannot. To compete with cable services, municipalities have two basic options; encourage lower cost internet services through the municipal gain option and create or promote wireless services that accomplish some of these same service objectives. For example, municipal strategies that focus on developing WiMax service is one option to overcome service deficiencies since this technology is capable of providing wireless internet coverage over longer distances than is feasible using WiFi hotspots.[44] Unfortunately, even WiMax networks do not offer the data capacities being developed by fifth generation mobile broadband but they do provide much wider service coverage than WiFi hotspots.

Anticipated Public Interest Benefits

Municipalities that choose to develop their own telecommunication system can achieve a wide range of public interest benefits by making broadband internet services available to all residents. Direct digital access to government services, emergency alert systems, mobile access to public health and medical services, and a wide array of commercial services and information systems creates a "public digital commons" that has spillover benefits for a wide array of digitally enabled businesses.

Communities with advanced digital capabilities become attractive locations for the millennial generation that relies on data and communication portals to meet their daily needs. Municipalities that focus on

[42] Sarah Krouse, Covid-19 Pandemic Drives Patients—and Deal Makers—to Telemedicine, *Wall Street Journal*, August 26, 2020.

[43] Mike Colias, Ford Rethinks the Office, Betting That Work Will Be Partly Remote Longer-Term, *Wall Street Journal*, August 26, 2020.

[44] How WiMax Works, Accessed online August 26, 2020

meeting these needs will play a pivotal role in creating the future of smart cities and smart homes in America. The result is that the younger generation will not necessarily choose a house based on the travel constraints of reaching their place of work but on the attractive features of the "digital commons" created by progressive local governments. Just as sewer and water services provide the infrastructure that support the urban lifestyle, the presence of fifth generation mobile broadband services and/or wired internet services using fiber optic cable direct to the home or business are expected to strengthen the locational advantages of those urban centers offering the most accessible and affordable internet and/or telecommunication services. It remains to be seen what impact these emerging technologies will have on the American workplace and where Americans choose to live in the future.

Public-Private Partnership Opportunities

There are numerous strategies for developing a municipal telecommunication system. Perhaps the most effective approach is through a public-private sector partnership where the expertise of telecommunication infrastructure providers can be linked to municipal strategies to meet a wide range of government and resident related communication needs (see below for more details). Smaller municipalities with less fiscal resources are likely to benefit from this approach more than major American cities that often have the in-house expertise and fiscal resources to play an independent role.

The Digital Divide

Not everyone has access to the internet or other online communication services.[45] Rural areas of Connecticut have less internet access and lower data density capacities for their wireless services than most cities. However, the digital divide is not merely a function of the rural-urban digital divide – neighborhoods in many urban centers may have less internet access or computer equipment by virtue of income constraints, or barriers created by lack of knowledge or interest in digital services. This can be a significant public health challenge for seniors who require greater access to medical services than the younger generation. Moreover, seniors represent a significant proportion of Connecticut's rural population and poor telecommunication services in these areas have the effect of exacerbating their public health needs due to the limited hospital and medical infrastructure in these areas of our state. Municipal governments can play a significant role in addressing these underserved populations through a variety of strategies ranging from municipally operated internet services, expanded WiFi or WiMax networks, laptop or smart phone loan programs and other techniques to connect them to digital services such as telemedicine, public safety notification systems, e-government services among many other digital support systems. Federal funding programs have been established to

[45] Paul Gorsky, Education Equity and the Digital Divide, Association for the Advancement of Computing In Education Journal, 2005, 13(1), 3-45.

address the digital divide – largely because the business strategies of private sector mobile broadband companies have prioritized services for major urban centers over the needs of rural America.

The Case for Municipal Gain

As previously mentioned, in 2019 the Connecticut Superior Court upheld a municipality's right to install fiber optic cable not just for its own use but also to expand commercial internet services under license agreements or other contractual arrangements.[46] The court ruled that "municipal gain" privileges offered to Connecticut municipalities do not authorize local governments to install telecommunications (e.g., licensed telephone services) or cable services but do authorize the deployment of broadband internet services.[47]

Judge Shortall's decision opens many business opportunities. As one reporter has noted:

> "Judge Shortall's decision opens the door for local communities who are interested in deploying publicly owned fiber optic network infrastructure and want to take advantage of the municipal gain space. With the increasing innovations tied to the use of fiber that go beyond Fiber-to-the-Home (FTTH), such as smart city applications, potential for 5G, and the ever-present need for better connectivity for municipal facilities, the decision has big implications."[48]

But creating future business opportunities for municipal governments touches only one aspect of the importance of Judge Shortall's landmark decision. Acting Consumer Counsel, Richard Sobolewski emphasized another critical aspect:

> "Many members of the public desperately need access to internet services at higher speeds and affordable prices in order to meet their daily needs for health care information, education, public safety warnings, and all the other aspects of modern society that run through the internet."[49]

Municipalities have the option to use their municipal gain privilege to improve local government communication systems as well as to provide services beyond local government's immediate communication needs. The town of Manchester has done an extensive fiscal analysis of the costs and benefits of its municipal gain opportunity and this work can serve as a model for other municipalities interested in pursuing one of Manchester's business models.[50]

---

[46] Connecticut Conference of Municipalities, et. al., v. Public Utilities Regulatory Authority, Connecticut Superior Court, Judicial District of New Britain, decided November 12, 2019.

[47] Ibid, p. 26.

[48] Lisa Gonzalez, *Connecticut Court Confirms Municipalities' Right to Reserved Space on Poles*, Community Networks; December 3, 2019.

[49] Edmund H. Mahony, Court gives Towns Internet Leeway, *Hartford Courant*, November 14, 2019, p. B-2.

[50] Manchester Strategic Plan website: http://infosys.townofmanchester.org/index.cfm/strategic-plan/

Business Models for Municipal Communication Systems

Because municipal governments are not in the telecommunications infrastructure development industry, one way they can develop improved fiber optic and mobile broadband services is through a partnership with private firms that specialize in providing such infrastructure. One study suggests that there are five business model variations municipalities may wish to consider when seeking to improve wired and wireless broadband internet services as follows:[51]

1. **Municipal Ownership of the Right of Way and Infrastructure**: A municipally owned fiber optic cable network could serve to connect households, businesses and government buildings and enable 5G small cell wireless facilities. Alternatively, a municipality could create a license agreement with a telecommunications provider who would be responsible for installing, owning or leasing the fiber optic cable. Would it be more advantageous for a municipality to own the fiber optic cable and related equipment or would it be more economical to lease it from the infrastructure provider? The answer is contingent on the range of costs and benefits associated with each approach which are inevitably project specific. Regardless of who takes the lead, if the applicant is a private sector firm it must be a registered public service company and obtain approval for the use of utility infrastructure from the Pole Administrator before any work commences.[52]

2. **Municipal Buildout and Ownership of Network**: This option involves an increased municipal involvement wherein the construction of the network is completed by the municipality – not private sector telecommunication firms. Alternatively, under a license agreement, a firm specializing in communications infrastructure development could be held responsible for the buildout of the fiber optic infrastructure – regardless of who actually owns the fiber optic cable.

3. **Municipal Buildout of Network and "Last Mile" Connections to End Users**: Like the previous option, this extends the municipal role to encompass the completion of the entire infrastructure project required to create high speed transmission achieving the goals for fifth generation mobile broadband as well as connecting fiber optic to businesses, industry and residential customers. Again, this "last mile" – connecting customers to the infrastructure – could be assigned to a firm specializing in communications infrastructure

[51] US Ignite and Altman Solon, *Broadband Models for Unserved and Underserved Communities*, Broadband Communities, July 2020. Accessed at Broadbandcommunities.com

[52] Getting the approval of the Pole Administrator is often the most challenging part of taking advantage of the municipal function, according to Jack McCoy. Interview August 28, 2020. For details on the role of the single pole administrator was established, see: Pole Attachments and the Public Rights of Way (PROW); Accessed September 3, 2020.

development under a license agreement.[53]

4. **Operation of the Fiber Optic Infrastructure**: Once the fiber optic network is created, municipalities must decide if ongoing operation and maintenance of the system should be a municipal service or whether it would be best managed under contract to a private provider.
5. **Providing Customer Service**: Once a fiber optic telecommunications network is developed, municipalities must also decide how customers are to be served and provide the requisite administrative structure to meet their ongoing needs. Will a communications company be a better customer service provider than a municipality? These decisions will depend upon the goals, objectives, and wired vs. wireless communication priorities of each municipality.

One way to understand the range of options available to municipalities and the telecommunications industry is by comparing these five business model variations against the ownership and licensing options that could be considered when fiber optic cable and small cell wireless facilities are planned in a coordinated fashion. After all, small cell wireless facilities depend upon the existence of fiber optic cable to achieve their high-speed transmission goals and for this reason fifth generation broadband can be viewed as just one more aspect of the five business models shown in the table below.

Ownership and Licensing Options for Expanding Wired and Wireless Telecommunication Services at the Municipal Level: A Business Model Template

Business Model	Municipal Ownership	Municipal Licensing/Lease	Telecommunications Co. Ownership
Right of Way & Infrastructure			
Buildout Fiber Optic Network			
"Last Mile" Service Connections including Deployment of Small Cell Wireless Facilities			
Operations & Maintenance of Infrastructure			
Providing Customer Services			

[53] The "Last Mile" is a metaphor for the final connection between the fiber optic network located underground or on the utility poles and the last several hundred feet required to connect to the home or business.

Each municipality must decide the degree to which each of the business models meets municipal needs for high speed data transmission to residents, businesses, government facilities and to the community of users that rely on high speed mobile broadband services. Several critical considerations affect the options chosen including 1) the cost of municipal investment in broadband internet infrastructure, 2) the degree to which timely improvements in high speed transmission is critical to economic development, educational and governmental services and 3) the administrative burdens imposed by assuming ownership or licensing responsibilities for wired and wireless broadband internet services. Based on the experiences of municipalities in Connecticut, it is unlikely that many will choose the municipal ownership strategy since such an approach saddles local governments with fiscal and administrative burdens that may not be outweighed by the benefits offered.[54] Taking advantage of the free "municipal gain" within rights of way or on utility poles is likely to be of interest to larger municipalities including Manchester, West Hartford and New Haven – all of which were appellants in the Connecticut Superior Court case that upheld "municipal gain" law. While there was concern this court's decision would be appealed, the appeal time limit expired and "municipal gain" rights remain intact.[55]

The degree of municipal involvement in the expansion of fiber optic services and the deployment of small cell wireless facilities will also depend on the importance each municipality places on improved data capacity for its wired and wireless broadband internet customers. Business decisions concerning the creation of municipally owned or managed wired and wireless broadband internet services within any given municipality will require a robust analysis of the economic, legal, educational and administrative costs and benefits of all the options considered.

It is important to recognize that the Connecticut Superior Court ruled that municipal gain privilege can be used for any purpose a municipality chooses to use it for but the services offered are limited to broadband internet services – not telecommunications and cable services.[56] This legal distinction between internet services and the telecommunications industry influences the services a municipality may offer to its residents but it does not restrict the business strategies that come into play when telecommunications companies request access to municipal rights of way to install their fiber optic and small cell wireless facilities. License agreements have been developed by numerous American cities to create bilateral

[54] Sharon E. Gillett, "Municipal Wireless Broadband: Hype or Harbinger," Southern California Law Review, Vol. 79, no. 3, March 2006, pp. 561-594. HeinOnline.
[55] Interview with Burt Cohen, Staff Attorney & Broadband Policy Coordinator, Office of Consumer Counsel, State of Connecticut, August 13, 2020.
[56] Connecticut Conference of Municipalities, et al., v. Public Utilities Regulatory Authority, Connecticut Superior Court, Judicial District of New Britain, decided November 12, 2019, pp. 18-20; 24-31.

responsibilities for telecommunication services installed in the public right of way – independent of Connecticut's municipal gain law. Such agreements are not based on the "municipal gain" privileges afforded to municipalities but reflect – as discussed above – their governmental authority in managing the public right of way in the interest of protecting the public health, safety and general welfare of the community.

The Western Connecticut Council of Governments has analyzed a wide range of license agreements adopted by America's largest cities. Based on this analysis, WestCOG has prepared a critique of the best approaches that identifies the critical elements required to make a licensing agreement work for partnerships between municipal governments and mobile broadband providers.[57] The structure of an effective licensing agreement will depend on the services to be provided and the degree of bilateral cooperation that a municipality wishes to develop with any fiber optic cable installer or mobile broadband service provider. Regardless of the approach taken, municipalities must consider the short- and long-term financial impacts that will be created to administer all aspects of fifth generation mobile broadband services and to establish the appropriate fee schedules applied to the services rendered to this emerging telecommunication infrastructure.

Near-Term Options for License Agreements

To the extent that mobile broadband providers are expected to request the use of municipal rights of way to establish high speed broadband services, it behooves municipal chief elected officials to consider the use of license agreements to guide the implementation of such services. License agreements have been used by America's largest cities and should be of interest to smaller cities where fifth generation mobile broadband services – and the attendant fiber optic cable backhaul systems – are expected to be deployed over the near term. License agreements are an appropriate means of providing a value structure for the use of municipal rights of way and the use of "municipal gain" for ensuring long term bilateral business relationships between local governments and telecommunication providers. Such agreements make the most sense for those municipalities where mobile broadband providers have determined there is a near term strategic business opportunity for establishing levels of service that raise data transmission standards from 25 to 125 megabits per second to 1 to 5 gigabits per second.

In summary, the business case for municipally owned fiber optic networks will depend upon the objectives that a municipality is attempting to achieve – whether that be improved internet service, remote education, business retention, attracting high tech industries and services

[57] A copy of this analysis is available upon request from the Western Connecticut Council of Governments.

or improving government services. There are a wide range of studies that have been conducted on municipally owned fiber optic networks across the nation and these studies must be understood based on the institutional or business perspectives of the authors.[58] There is no one "right way" to create a municipal license agreement to manage the deployment of mobile broadband services and fiber optic networks. Moreover, not all municipalities will be in a position to influence the early deployment strategies for this new technology unless they are of sufficient population density and/or with immediate access to major transportation corridors within their borders. Major cities in Connecticut are expected to be the first to address small cell wireless antennas and for this reason they are also the most likely to benefit from adopting a licensing agreement.

[58] Community Networks, Successes and Failures, Institute for Local Self-Reliance, Accessed August 20, 2020.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

The COVID-19 pandemic has aggravated the digital divide that exists between rural and urban centers in the region. It has also made it apparent that remote access to education and work have become necessities of daily life like never before. The Land Use Planning for Wireless Telecommunications Task Force has determined that a host of municipal strategies will be required to manage the anticipated deployment of fifth generation mobile broadband services. Since almost all of the region's municipalities have used zoning regulations as the primary means to influence the location, design and environmental impacts of telecommunications systems, the simplest first step in managing wireless small cell facilities will be through amendments to current zoning regulations. However, as discussed in this report, the Federal Communications Commission has made it clear that all local permitting processes, meeting and hearing requirements must comply with FCC shot clock requirements that set specific time frames in which all permits – not just zoning permits – must be approved.

The task force has determined that municipal right of way ordinances in the region have not yet addressed the anticipated impacts of small cell wireless facilities on public safety issues that fall within the purview of local governments. Since small cell wireless facilities require backhaul service, using fiber optic cable installed on utility poles or in underground conduits, municipal road encroachment ordinances will play an important role in guiding the growth of wireless mobile broadband services. By adopting the model right of way ordinance contained in the appendix to this report, municipalities can facilitate a standard approach to the regulation of small cell wireless facilities within the region that can, in turn, reduce the administrative burdens imposed upon the telecommunication industry forced to comply with a crazy quilt of different municipal requirements. Revising municipal road encroachment ordinances will not address all right of ways within the region since many of the region's village districts and downtown business areas are served by state highways under the jurisdiction of the Connecticut Department of Transportation. Nevertheless, 86% of all road miles in the region fall within the authority of the region's eighteen municipalities and for this reason, revisions to municipal right of way ordinances should be given serious consideration.

The most effective long-term strategy for managing the wide range of impacts and opportunities created by small cell wireless facilities is to adopt a municipal ordinance. A municipal ordinance can coordinate and assign responsibilities for a wide range of issues that impact public works, planning and zoning, building departments, public schools, engineering, architectural review boards, historic districts and information technology functions within local government. In addition, a municipal ordinance can establish uniform procedures and cost-based fee structures for review and approval of telecommunication applications received by each department. The model ordinance contained in the appendix reflects the best practices that exist across the

United States based on a review of dozens of adopted municipal ordinances for telecommunication systems. While a municipal ordinance offers many significant benefits to larger municipalities anticipating small cell wireless facilities in the near future, it may not be as useful for rural municipalities since the telecommunications industry has placed these locations as lower priorities within their strategic plans.

Regardless of the sequence of regulatory approaches adopted (e.g., zoning ordinance followed by road encroachment ordinance and then municipal ordinance), each municipality should give consideration to exercising its right to use "municipal gain" on utility poles or underground conduit to improve the telecommunication services for various markets within the community. Private-public partnerships to extend internet services at the municipal level have already been developed in other municipalities in Connecticut leading to vastly improved data transmission speeds for municipal facilities. The Connecticut General Statutes, and recent Connecticut case law, authorize local governments to use the municipal gain function for any purpose – not just to meet local government service needs.

Rather than waiting for the telecommunications industry to improve wireless services on their own timetable, the task force has determined that a public-private partnership is a viable option for expanding not just wireless services but wired connections to residences and businesses. Such an approach offers a strategy to address the need for improved internet services for the elderly, low income families and those living in rural areas of the region. It also offers a strategy to leverage municipal gain to create an economic development advantage for Western Connecticut to make it the "place to be" for those who want "lightning internet speeds within New England."

Investment in telecommunication systems by municipal governments will require thorough business studies that determine the market for improved internet services and the potential costs for providing such services. Connecticut municipalities are fortunate to have the right to free municipal gain since this privilege is not available in most of the rest of the United States. Having a free municipal gain provides leverage with the telecommunications industry interested in competing with the cable services that currently dominate internet services in western Connecticut. The pole rental costs imposed on telecommunication companies do not apply to municipalities and this municipal advantage – a point of negotiation with telecommunication providers – should be given greater attention by the economic development commissions within the region.

To achieve fiscally sound municipal gain strategies that rely on public-private sector partnerships to improve internet services, a license agreement is recommended to ensure bilateral responsibilities and fiscal obligations are properly addressed. A license agreement strategy, the task force believes, can also be used to manage the long-term deployment of small cell wireless facilities even if a municipality chooses not to take advantage of its right to municipal gain. In the latter instance, a license

agreement ensures that long term responsibilities for repair, maintenance, emergency management and decommissioning of equipment are managed with fiscal accounting of the bilateral responsibilities created by small cell wireless facilities installed by the private sector.

The Western Connecticut Regional Plan of Conservation and Development identified five key policies and goals to work towards in Communication Infrastructure in the next 10 years. The task force provides the resources and recommendations in this report to support municipalities efforts. The five goals and policies are presented below and include recommendations for municipalities to consider to further guide the development of telecommunications infrastructure:

1) **Establish view-shed regulations to guide the installation of towers consistent with the regulations of the Federal Communications Commission and the State of Connecticut Siting Council.**
   a) View-shed regulations for small cell wireless facilities must be reasonable – meaning that the regulations must be technically feasible – consistent with the 2020 ruling of the U.S. Court of Appeals for the Ninth Circuit.
   b) Existing structures and buildings are preferred locations for personal wireless service facilities.
   c) Establish height limits for small cell wireless facilities consistent with FCC regulations.
   d) Establish design guidelines for siting small cell wireless antennas and ancillary equipment.
   e) Require architectural review of small cell wireless facilities in village districts.
   f) Work with the Connecticut Department of Transportation to ensure municipal design considerations are addressed during CTDOT's review of small cell wireless facility applications for state road encroachment permits.
2) **Identify appropriate locations for towers consistent with communication requirements and the aesthetic and view-shed concerns of citizens of Western Connecticut.**
   a) Expand existing location preference criteria that address telecommunication towers to establish location preferences unique to small wireless facilities installations.
   b) Encourage applicants to identify alternative sites for small cell wireless facilities to enable municipalities to develop comparisons and explore tradeoffs.
   c) Consider the development of municipal telecommunications plans to address the economic, environmental and public safety considerations associated with the long-term expansion of fifth generation mobile broadband services.
3) **Encourage the co-location of communication towers to minimize the visual clutter of wireless communication systems in the region.**

a) To the extent feasible, small cell wireless facilities should be installed within the public right of way to enhance service coverage along key transportation corridors.
b) Expand municipal road encroachment ordinances to address the public safety, environmental and infrastructure impacts associated with the installation of fiber optic cables, small cell wireless facilities and ancillary equipment in local road rights of way.
c) Ensure camouflage techniques to minimize the visual impacts of all components of small cell wireless facilities.
d) Encourage co-location of small cell wireless facilities on municipal facilities currently hosting these services.
e) Facilitate access to reliable small cell wireless facilities along key transportation corridors, major urban centers and village districts within the region consistent with municipal plans of conservation and development, FCC regulations, Connecticut Siting Council, Public Utilities Regulatory Authority and Connecticut Department of Transportation regulations and policies.

4) Assess the consistency of local land use decision making timetables with the Federal Communication Commission's "shot clock" timetable that establishes strict deadlines for acceptance, review, and approval of telecommunication tower applications.

a) Consider adoption of a municipal ordinance to coordinate the review and approval of all municipal permits required for small cell wireless facilities including electric, plumbing, construction, road encroachment and zoning permits as well as timetables for public notices, public hearings, real estate approvals and licensing agreements.
b) Consider establishing a telecommunications ombudsman to coordinate local reviews and approval for small cell wireless facilities.
c) Strengthen the review process for small cell wireless facilities through education and training of staff, decision-makers and the general public.
d) Design and locate small cell wireless facilities to ensure public safety from radio frequency emissions and other physical hazards.

5) Assemble a Task Force of appointed municipal staff, industry leaders, and WestCOG staff to create a coordinated development strategy for fifth generation cellular network implementation.

a) Brief municipal chief elected officials, town planners and public works officials on the findings and recommendations of the WestCOG Land Use Planning for Wireless Telecommunications Task Force.
b) Share the task force findings and recommendations with Governor Lamont's 5G task force and other stakeholders around the state.

APPENDIX A: MODEL MUNICIPAL ORDINANCE

ORDINANCE NO. XXX

AN ORDINANCE OF THE [INSERT GOVERNING BODY OF CITY/TOWN] OF THE [CITY/TOWN] OF_____

OF THE [CITY/TOWN] MUNICIPAL CODE INTO A REVISED TITLE 10 WHICH ESTABLISHES UNIFORM AND COMPREHENSIVE REGULATIONS FOR WIRELESS TELECOMMUNICATION FACILITIES

WHEREAS, This Ordinance is adopted as follows:

(1) The purpose of this Ordinance is to update the [City/Town] Municipal Code to provide uniform and comprehensive standards, regulations and permit requirements for the installation of wireless telecommunications facilities in the [City/Town] including on private property and in the municipal public right-of-way.

(2) The wireless telecommunications industry has expressed interest in submitting applications for the installation of "small cell" wireless telecommunications facilities in the municipal public rights-of-way. Other Connecticut cities and towns have already received applications for small cells to be located within the public right-of-way.

(3) If not adequately regulated, installation of small cell and other wireless telecommunications facilities within the public right-of-way can pose a threat to the public health, safety and welfare, including disturbance to the public right-of-way through the installation and maintenance of wireless facilities; traffic and pedestrian safety hazards due to the unsafe location of wireless facilities; impacts to trees where proximity conflicts may require unnecessary trimming of branches or require removal of roots due to related undergrounding of equipment or connection lines; land use conflicts and incompatibilities including excessive height or poles and towers; creation of visual and aesthetic blights and potential safety concerns arising from excessive size, heights, noise or lack of camouflaging of wireless facilities including the associated pedestals, meters, equipment and power generators; and the creation of unnecessary visual and aesthetic blight by failing to utilize alternative technologies or capitalizing on collocation opportunities which may negatively impact the unique quality and character of the [City/Town].

(4) The [City/Town] currently regulates wireless telecommunications facilities – primarily telecommunication towers – through the zoning permit process. While this role is an advisory one, the Connecticut Siting Council gives consideration to municipal land use policies. The existing zoning standards have not been updated to reflect current telecommunications trends or necessary legal requirements. Further the primary focus of the zoning regulations is wireless telecommunications facilities located on private property, and the existing Code provisions were not specifically designed to address the unique legal and practical issues that arise in connection with wireless telecommunications facilities deployed in the public right-of-way or on private property outside of the purview of the Connecticut Siting Council.

(5) Chapter 98, Section 7-163(c) of the Connecticut General Statutes Code authorizes municipalities to establish telecommunication plans to identify areas where there may be deficiencies in coverage and to identify sensitive areas for restrictive use.

(6) Chapter 98, Section 7-148(c)6(C) authorizes municipalities to regulate telecommunications companies in so far as they impact its ability to (i) Lay out, construct, reconstruct, alter, maintain, repair, control, operate, and assign numbers to streets, alleys, highways, boulevards, bridges, underpasses, sidewalks, curbs, gutters, public walks and parkways; (ii) Keep open and safe for public use and travel and free from encroachment or obstruction the streets, sidewalks and public places in the municipality; (iii) Control the excavation of highways and streets; (iv) Regulate and prohibit the excavation, altering or opening of sidewalks, public places and grounds for public and private purposes and the location of any work or things thereon, whether temporary or permanent, upon or under the surface thereof.

(7) Chapter 283, Section 16-228 of the Connecticut General Statutes authorizes telephone and telegraph corporations to construct telephone or telegraph lines along and upon any public road or highway, along or across any of the waters or lands within this state, and to erect poles, posts, piers, or abatements for supporting the insulators, wires, and other necessary fixtures of their lines, in such manner and at such points as not to incommode the public use of the road or highway or interrupt the navigation of the waters.

(8) Chapter 283, Section 16-233 of the Connecticut General Statutes authorizes municipalities to make use of public utility poles and underground duct systems to establish municipal telecommunication systems for the general public in matters affecting the health, convenience, and safety of the general public, including matters such as the use and repair of public streets by any public utility and the location of the poles, wires, mains, or conduits of any public utility on, under, or above any public streets.

(9) State and federal law has changed substantially since the [City/Town] last adopted regulations for wireless telecommunications facilities in the [City/Town]. Such changes include establishing "shot clocks" whereby the [City/Town] must approve or deny installations within a certain period of time. Federal regulations require local governments to act on permit applications for wireless facilities within a prescribed time period and state and federal laws and regulations permit applicants to invoke a deemed granted remedy when a failure to timely act occurs. See 47 U.S.C. § 332(c)(7)(B)(iii); 47 C.F.R. §§ 1.6100 et seq., and Federal Register (83 FR 51867) *Accelerating Wireless and Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*. Under federal law, a decision on certain applications must be made in as few as 60 days.

(10) The public right-of-way in the [City/Town] is a uniquely valuable public resource, closely linked with its natural beauty, and a significant number of residential communities. The reasonably regulated and orderly deployment of wireless telecommunications facilities including in the public right-of-way is desirable, and unregulated or disorderly deployment represents an ever-increasing and true threat to the health, welfare and safety of the community.

(11) The regulations of wireless installations including in the public right-of-way are necessary to protect and preserve the aesthetics in the community, as well as the values of properties within the [City/Town], and to ensure that all wireless telecommunications facilities are installed using the least intrusive means possible.

(12) The [City/Town] finds that in light of more recent developments in federal and state law with respect to the regulation of small cell and other wireless telecommunications facilities, there is a need for the [City/Town] to update its ordinances based on current telecommunications trends, updates in laws, as well as aesthetic and location options for wireless facilities. The [City/Town] finds that overburdened utility

poles can present a hazard of collapsing and failing; that wireless facilities may present an electrical hazard and/or increase the risk of electrical fires if not properly regulated, installed and monitored.

(13) The [City/Town] finds that a personal residence is for most homeowners their single greatest financial asset, and that proximity of wireless facilities has been shown to adversely affect property values of personal residences. The [City/Town] further finds that aesthetic considerations in residential zones are especially important in close proximity to personal residences.

(14) The [City/Town] recognizes its responsibilities under the Federal Telecommunications Act of 1996 and state law, and believes that it is acting consistent with the current state of the law in ensuring that irreversible development activity does not occur that would harm the public health, safety, or welfare. The [City/Town] does not intend that this Ordinance prohibit or have the effect of prohibiting telecommunications service; rather, it includes appropriate regulations to ensure that the installation, augmentation and relocation of wireless telecommunications facilities including in the public right-of-way are conducted in such a manner as to lawfully balance the legal rights of applicants under the Federal Telecommunications Act, the Connecticut Public Utilities Regulatory Authority and the Connecticut Siting Council statutes while, at the same time, protect to the full extent feasible against the safety and land use concerns described herein.

(15) Accordingly, regulating the installation of Wireless Telecommunications Facilities in the [City/Town] is necessary to protect and preserve the aesthetics in the community, as well as the values of properties within the [City/Town], and to ensure that all Wireless Telecommunications Facilities are installed using the least intrusive means possible.

Based on the foregoing, the **[insert city/town governing board]** finds and determines that the preservation of the public health, safety and welfare requires that this Ordinance be enacted.

WHEREAS, adoption of this Ordinance is consistent with the [City/Town]'s Plan of Conservation and Development. The [City/Town]'s Plan of Conservation and Development provides goals and policies to preserve the high-quality design, community character, aesthetics and environmental characteristics while also maintaining a strong, healthy economy for its local business and assuring the health and safety of the predominantly residential character of the community. Adoption of this Ordinance will provide uniform and comprehensive regulations and standards for wireless telecommunications facilities in furtherance of these goals and objectives while reducing the potentially negative impacts.

NOW, THEREFORE, the [**insert city/town governing board]** of the Town of _____does ordain as follows:

Section 1. The [insert name of city/town] Municipal Code is hereby amended as follows: A new Chapter 10 of the [City/Town] Municipal Code is hereby enacted as set forth in Exhibit A to this Ordinance, which is hereby incorporated as though set forth in full herein.

Section 2. The [**insert city/town governing board]** hereby finds that Adoption of this Ordinance will enact only minor changes in land use regulations, and it can be seen with certainty that its adoption will not have a significant effect on the environment because it will not allow for the development of any new or expanded wireless telecommunication facilities anywhere other than where they were previously allowed under existing federal, state and local regulations. The wireless facilities themselves – specifically minor encroachment permits, and the installation of small equipment and facilities in a small structure –

are exempt from CEPA. The Ordinance does not constitute a "project" within the meaning of the Connecticut Environmental Policy Act of 1971.

Section 3. Severability. If any section, subsection, sentence, clause, phrase, or word of this Ordinance is, for any reason, deemed or held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, or preempted by legislative enactment, such decision or legislation shall not affect the validity of the remaining portions of this Ordinance. The [**insert city/town governing board]** of the [City/Town] of _____ hereby declares that it would have adopted this Ordinance and each section, subsection, sentence, clause, phrase, or word thereof, regardless of the fact that any one or more sections, subsections, clauses, phrases, or word might subsequently be declared invalid or unconstitutional or preempted by subsequent legislation.

Section 4. Effective Date. This Ordinance shall be effective 30 days following its adoption by the [**insert city/town governing board]**. Copies of this Ordinance shall, within fifteen days after its passage and adoption, be posted in public places in the [City/Town] of_____, as required by public notice requirements.

The foregoing ordinance was introduced at a regular meeting of the [**insert city/town governing board]** of the [City/Town] of _____ held in said [City/Town] on the ___th day of (month) 2020, and duly adopted at the next regular meeting of the [**insert city/town governing board]** on the __th day of (month) 2020 by the following vote, to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:
ATTEST:

Exhibit A

ORDINANCE

Title (No 10): Telecommunications

WIRELESS TELECOMMUNICATIONS FACILITIES

10.04.010 Purpose

A. The purpose and intent of this chapter is to provide a uniform and comprehensive set of regulations and standards for the permitting, development, siting, installation, design, operation and maintenance of wireless telecommunications facilities in the [City/Town] of _____ to avoid visual impacts to the downtown, scenic corridors, residential and visually distinctive areas; to avoid impact to listed and candidate endangered species including habitats; and to provide a uniform and comprehensive set of standards for the orderly development of telecommunications facilities and installation of antennas. These regulations are intended to prescribe clear and reasonable criteria to assess and process applications in a consistent and expeditious manner, while reducing the impacts associated with wireless telecommunications facilities. This chapter provides standards necessary to: (1) preserve and promote harmonious land uses and the public right-of-way in the [City/Town]; (2) promote and protect public health and safety, community welfare, visual resources, and the aesthetic quality of the [City/Town] consistent with the goals, objectives, and policies of the Plan of Conservation and Development; (3) provide for the orderly, managed, and efficient development of wireless telecommunications facilities in accordance with the state and federal laws, rules, and regulations; and (4) encourage new technology in the provision of wireless telecommunications facilities.

B. This chapter is not intended to, nor shall it be interpreted or applied to: (1) prohibit or effectively prohibit any personal wireless service provider's ability to provide personal wireless services; (2) prohibit or effectively prohibit any entity's ability to provide any interstate or intrastate telecommunications service, subject to any competitively neutral and nondiscriminatory rules or regulation for rights-of-way management; (3) unreasonably discriminate among providers of functionally-equivalent services; (4) deny any request for authorization to place, construct or modify personal wireless service facilities on the basis of environmental effects of radio frequency emissions to the extent that such wireless facilities comply with the FCC's regulations concerning such emissions; or (5) prohibit any collocation or modification that the [City/Town] may not deny under federal or state law.

10.04.020 Definitions. For the purposes of this chapter, the following defined terms shall have the meaning set forth in this section, unless otherwise defined or the context clearly indicates or requires a different meaning.

A. **"Accessory Equipment"** means any equipment associated with the installation of a wireless telecommunications facility, including, but not limited to, cabling, generators, air conditioning units, electrical panels, equipment shelters, equipment cabinets, equipment buildings, pedestals, meters, vaults, splice boxes, and surface location markers.

B. **"Antenna"** means that part of a wireless telecommunications facility designed to radiate or receive radio frequency signals or electromagnetic waves for the provision of services, including, but not limited to, cellular, paging, personal communications services (PCS) and microwave communications. Such

devices include, but are not limited to, directional antennas, such as panel antenna, microwave dishes, and satellite dishes; omnidirectional antennas; wireless access points (Wi-Fi); and strand-mounted wireless access points. This definition does not apply to broadcast antennas, antennas designed for amateur radio use, or satellite dishes designed for residential or household purposes.

C. **"Base Station"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(1), as may be amended, which currently defines that term as a structure or equipment at a fixed location that enables FCC-licensed or authorized wireless communications between user equipment and a communications network. The term does not encompass a tower as defined in 47 C.F.R. § 1.6100(b)(9) or any equipment associated with a tower. The term includes, but is not limited to, equipment associated with wireless communications services such as private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul. The term includes, but is not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies, and comparable equipment, regardless of technological configuration (including distributed antenna systems and small-cell networks). The term includes any structure other than a tower that, at the time the relevant application is filed with the State or local government under this chapter, supports or houses equipment described in 47 C.F.R. § 1.6100(b)(1)(i)-(ii) that has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process, even if the structure was not built for the sole or primary purpose of providing such support. The term does not include any structure that, at the time the relevant application is filed with the State or local government under this chapter, does not support or house equipment described in 47 C.F.R. § 1.6100(b)(1)(i)-(ii).

D. **"Building-mounted"** means mounted to the side or facade, but not the roof, of a building or another structure such as a water tank, pump station, church steeple, freestanding sign, or similar structure.

E. **"Collocation"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(2), as may be amended, which currently defines that term as the mounting or installation of transmission equipment on an eligible support structure for the purpose of transmitting or receiving radio frequency signals for communications purposes.

F. **"Eligible Facilities Request"** means the same as defined by the FCC in 47 C.F.R. §1.6100(b)(3), as may be amended, which currently defines that term as any request for modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station, involving: (i) collocation of new transmission equipment; (ii) removal of transmission equipment; or (iii) replacement of transmission equipment.

G. **"Eligible Support Structure"** means the same as defined by the FCC in 47 C.F.R. §1.6100(b)(4), as may be amended, which currently defines that term as any tower or base station as defined in this section; provided that it is existing at the time the relevant application is filed with the State or local government under this chapter.

H. **"Existing"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(4), as may be amended, which currently provides that a constructed tower or base station is existing for purposes of the FCC's Section 6409(a) regulations if it has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process; provided that, a tower that has not been reviewed and approved because it was not in a zoned area when it was built, but was lawfully constructed, is existing for purposes of this definition.

I. **"FCC"** means the Federal Communications Commission or its duly appointed successor agency.

J. **"Listed Species"** means any species, endangered, threatened or rare species as listed by the Department of Fish and Wildlife (CT Department of Energy and Environmental Protection), or the United States Fish and Wildlife Service (Endangered Species Act, 16 U.S.C. §§ 1531 et seq.).

K. **"Modification"** means any change to an existing wireless telecommunications facility that involves any of the following: collocation, expansion, modification, alteration, enlargement, intensification, reduction, or augmentation, including, but not limited to, a change in size, shape, color, visual design, or exterior material. Modification does not include repair, replacement, or maintenance if those actions do not involve a change to the existing facility involving any of the following: collocation, expansion, modification, alteration, enlargement, intensification, reduction, or augmentation.

L. **"Monopole"** means a wireless communication facility support structure which consists of a self-supported monopolar structure, usually rounded, erected on the ground to support antennas and connecting appurtenances.

M. **"Non-Ionizing Electromagnetic Radiation"** means electromagnetic radiation primarily in the visible, infrared and radio frequency portions of the electromagnetic spectrum).

N. **"Personal Wireless Services"** means the same as defined in 47 U.S.C. § 332(c)(7)(C)(i), as may be amended, which defines the term as commercial mobile services, unlicensed wireless services and common carrier wireless exchange access services.

0. **"Personal Wireless Service Facilities"** means the same as defined in 47 U.S.C. § 332(c)(7)(C)(i), as may be amended, which defines the term as facilities for the provision of personal wireless services.

P. **"Pole"** means a single shaft of wood, steel, concrete, or other material capable of supporting the equipment mounted thereon in a safe and adequate manner and as required by provisions of the [City/Town] Municipal Code.

Q. **"Public Right-of-Way or "Right-of-Way"** means any public street, public way, public alley or public place, laid out or dedicated, and the space on, above or below it, and all extensions thereof, and additions thereto, under the jurisdiction of the [City/Town].

R. **"Reviewing Authority"** means the person or body who has the authority to review and either grant or deny a wireless telecommunications facility permit pursuant to this chapter.

S. **"RF"** means radio frequency or electromagnetic waves.

T. **"Roof-mounted"** means mounted directly on the roof of any building or structure, above the eave line of such building or structure.

U. **"Section 6409(a)"** means Section 6409(a) of the Middle-Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, codified as 47 U.S.C. § 1455(a), as such law may be amended from time to time.

V. **"Section 6409(a) Approval"** means the approval required by Section 6409(a).

W. **"Shared-Location"** means more than one wireless communications facility comprised of multiple structures used to support antennas operated by one or more carriers where the structures are located within proximity to each other.

X. **"Site"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(6), as may be amended, which provides that for towers other than towers in the public rights-of-way, the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site, and, for other eligible support structures, further restricted to that area in proximity to the structure and to other transmission equipment already deployed on the ground.

Y. **"Substantial Change"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(7), as may be amended, which currently defines that term differently based on the particular wireless facility type (tower or base station) and location (in or outside the public right-of-way). For clarity, this definition organizes the FCC's criteria and thresholds for a substantial change according to the wireless facility type and location.

1. For towers outside the public rights-of-way, a substantial change occurs when: a) the proposed collocation or modification increases the overall height more than 10% or the height of one additional antenna array not to exceed 20 feet (whichever is greater); or b) the proposed collocation or modification increases the width more than 20 feet from the edge of the wireless tower or the width of the wireless tower at the level of the appurtenance (whichever is greater); or c) the proposed collocation or modification involves the installation of more than the standard number of equipment cabinets for the technology involved, not to exceed four; or d) the proposed collocation or modification involves excavation outside the current boundaries of the leased or owned property surrounding the wireless tower, including any access or utility easements currently related to the site.

2. For towers in the public rights-of-way and for all base stations, a substantial change occurs when: a) the proposed collocation or modification increases the overall height more than 10% or 10 feet (whichever is greater); or b) the proposed collocation or modification increases the width more than 6 feet from the edge of the wireless tower or base station; or c) the proposed collocation or modification involves the installation of any new equipment cabinets on the round when there are no existing ground-mounted equipment cabinets; or d) the proposed collocation or modification involves the installation of any new ground-mounted equipment cabinets that are ten percent (10%) larger in height or volume than any existing ground-mounted equipment cabinets; or e) the proposed collocation or modification involves excavation outside the area in proximity to the structure and other transmission equipment already deployed on the ground.

3. In addition, for all towers and base stations wherever located, a substantial change occurs when: a) the proposed collocation or modification would defeat the existing concealment elements of the support structure as determined by the zoning administrator; or b) the proposed collocation or modification violates a prior condition of approval, provided however that the collocation need not comply with any prior condition of approval related to height, width, equipment cabinets or excavation that is inconsistent with the thresholds for a substantial change described in this section.

The thresholds for a substantial change outlined above are disjunctive. The failure to meet any one or more of the applicable thresholds means that a substantial change would occur. The thresholds for height increases are cumulative limits. For sites with horizontally separated deployments, the cumulative limit is

measured from the originally permitted support structure without regard to any increases in size due to wireless equipment not included in the original design. For sites with vertically separated deployments, the cumulative limit is measured from the permitted site dimensions as they existed on February 22, 2012- the date that Congress passed Section 6409(a).

Z. **"Telecommunications Tower" or "Tower"** means a freestanding mast, pole, guyed tower, lattice tower, free standing tower or other structure designed and primarily used to support wireless telecommunications facility antennas. For the purposes of "Eligible Facilities Requests", the term "Tower" means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(9), as may be amended, which currently defines that as any structure built for the sole or primary purpose of supporting any FCC-licensed or authorized antennas and their associated facilities, including structures that are constructed for wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul, and the associated site.

AA. **"Transmission Equipment"** means the same as defined by the FCC in 47 C.F.R. § 1.6100(b)(8), as may be amended, which currently defines that term as equipment that facilitates transmission for any FCC-licensed or authorized wireless communication service, including, but not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, and regular and backup power supply. The term includes equipment associated with wireless communications services, including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

BB. **"Utility Pole"** means a pole or tower owned by any utility company that is primarily used to support wires or cables necessary to the provision of electrical or other utility services regulated by the Connecticut Public Utilities Regulatory Authority.

CC. **"Wireless Services"** means any FCC-licensed or authorized wireless communication service transmitted over frequencies in the electromagnetic spectrum.

DD. **"Wireless Telecommunications Facility"** means any facility constructed, installed, or operated for wireless service. "Wireless telecommunications facility" includes, but is not limited to, antennas or other types of equipment for the transmission or receipt of such signals, telecommunications towers or similar structures supporting such equipment, related accessory equipment, equipment buildings, parking areas, and other accessory development.

"Wireless telecommunications facility" does not mean any of the following:

1. A ground-, building- or tower-mounted antenna facility operated by a federally licensed amateur radio operator as part of the Amateur Radio Service that qualifies as an amateur station as defined by the FCC, 47 C.F.R. Part 97, of the Commission's Rules, or its successor regulation, provided that the antenna does not exceed [30 feet above grade] and is subject to the allowable setbacks pursuant to the [City/Town] zoning regulations.

2. A single ground- or building-mounted receive-only radio or television antenna facility, for the sole use of the owner or tenant occupying a parcel on which the antenna is located, that is subject to the FCC Over-The-Air-Reception Devices rule, 47 C.F.R. Section § 1.4000, or any successor regulation, including, but not limited to, TV antennas used to receive television broadcast signals and wireless cable antennas.

The antenna is not to exceed [30 feet above grade] and must be subject to the allowable setbacks pursuant to the [City/Town] zoning regulations.

3. A single ground-, pole- or building- mounted receive-only radio or television satellite dish antenna, not to exceed 48 inches in diameter, for the sole use of the owner or tenant occupying a parcel on which the antenna is located; satellite dish antenna height not to exceed the height of the roof ridge of the host structure; (All such applications shall be subject to regulations pursuant [City/Town] zoning regulations).

4. Portable radios and devices including, but not limited to, hand-held, vehicular, or other portable receivers, transmitters or transceivers, cellular phones, CB radios, emergency services radio, and other similar portable devices as determined by the zoning administrator.

5. Wireless telecommunications facilities owned and operated by any government agency.

6. Wireless telecommunications facilities owned and operated by any emergency medical care provider.

7. Mobile services providing public information coverage of news events of a temporary nature.

8. Any wireless telecommunications facilities exempted from the _____Municipal Code by federal law or state law.

EE. "Zoning administrator" means the [City/Town]'s Planning Director or his/her designee.

10.04.030 Applicability

A. This chapter applies to all wireless telecommunications facilities as follows:

1. All facilities for which applications were pending prior to the effective date of this chapter shall be subject to and comply with all provisions of this chapter; All facilities, notwithstanding the date approved, shall be subject immediately to the provisions of this chapter governing the operation and maintenance, cessation of use and abandonment, removal and restoration of wireless telecommunications facilities and wireless telecommunications collocation facilities and the prohibition of dangerous conditions or obstructions by such facilities; provided, however, that in the event a condition of approval conflicts with a provision of this chapter, the condition of approval shall control unless and until the permit is amended or revoked.

B. Notwithstanding any provision of the [City/Town] Municipal Code to the contrary, provisions governing the installation of a public utility structure or facility shall not apply to wireless telecommunications facilities. This chapter shall govern all applications for wireless telecommunications facilities.

10.04.040 Wireless Telecommunications Facility Permit Required

Permit required. No wireless telecommunications facility shall be located or modified within the [City/Town] on any property, including the public right-of-way, without compliance with this chapter.

Excluding Eligible Facilities Request applications, applications for wireless facilities shall require a use permit subject to the requirements of this chapter, to be acted upon by the Planning and Zoning Commission pursuant to its Zoning regulations, and other permits as set forth in the table below, in

addition to any other permit required pursuant to the [City/Town]Municipal Code. Eligible Facilities Request applications shall be processed according to the requirements of Section 10.04.140.

Notwithstanding any other provision of this chapter, a conditional use permit shall be required for a facility when an exception is requested. Subject to any applicable limitations in federal or state law, nothing in this Chapter is intended to limit the approval authority's ability to conditionally approve or deny without prejudice any application for a use permit as may be necessary or appropriate to protect and promote the public health, safety and welfare, and to advance the goals or policies in the _____ Municipal Code or the Plan of Conservation and Development. See Table for Small Wireless Facility Installation Rules.

Description of Small Wireless Facility Installation Rules	**Private Property**			**Public Right of Way******
	Residential Zones where restrictions exist	**Other Protected Zones (Floodplain, Wetlands, Municipal Park or Protected Open Space**	**All Other Zoning District**	**Non-Residential Zones**
Roof or Bldg. Mounted SWF & not subject to CSC**	Not Permitted	Not Permitted	Conditional Use Permit	Not Applicable
Mounted on Light Pole & not subject to CSC or PURA**	Not Permitted	Not Permitted	Conditional Use Permit	Conditional Use Permit
Mounted on a Decorative Pole & Not subject to CSC**	Not Permitted	Not Permitted	Conditional Use Permit	Conditional Use Permit
Applications on electric distribution pole pursuant to PURA	Permitted	Not Permitted***	Permitted	Permitted
Applications on an electric transmission pole or other free-standing structure pursuant to CSC regulations*	Permitted	Not Permitted***	Permitted	Permitted
Note 1:* According to the Connecticut Siting Council (CSC), "Tower means structure, whether free standing or attached to a building or another structure that has a height greater than its diameter and that is high relative to its surroundings, or that is used to support antennas for sending or receiving radio frequency signals or for sending or receiving signals to or from satellites, or any of these which is to be: (A) used principally to support one or more antennas for receiving or sending radio frequency signals, or for sending or receiving signals to or from satellites, or any of these; and (B) is owned or operated by the state, a public service company as defined in Section 16-1 of the Connecticut General Statutes, or a certified telecommunications provider, or used in a cellular system, as defined in Section 16-50i(a) of the Connecticut General Statutes."			
Note 2:** Small wireless facilities that fall under municipal regulation include those installed on municipal street light poles, municipal decorative poles and on private buildings where the antenna is located on the side of the building, on the top of the building but not higher than its relative surroundings (i.e., other buildings and obstructions) or where the tower's height is smaller than its diameter and not high relative to its surroundings.				
Note 3:*** Connecticut Siting Council has the final decision on telecommunication towers including those located in floodplains and wetlands but not for municipally owned parkland or protected open space. In the case of installations in floodplains or wetlands, the CT Siting Council must consider municipal policies, ordinances and regulations when making siting decisions for telecommunication towers. The Public Utilities Regulatory Authority also requires public utilities to obtain local permits before construction work is initiated.				
Note 4:**** For any public right-of-way on the boundary between zoning districts, the zone applicable to the location of a Wireless Telecommunication Facility shall be determined based upon the closest district adjacent to the facility's location. The centerline of the public right-of-way will be used as the boundary between districts.				

B. Non-exclusive grant; No warranty. No approval granted under this chapter shall confer any exclusive right, privilege, license, or franchise to occupy or use the public right-of-way of the [City/Town] for delivery of telecommunications services or any other purposes. Further, no approval shall be construed as any warranty of title.

10.04.050 Application for Permit

A. Application content. All applications for a permit required by this chapter must be made in writing on such form as the zoning administrator prescribes. The zoning administrator may waive the requirements for submittal of any information described herein only when determined that it is inapplicable based on project-specific factors, and documentation is provided to that effect. For permit applications other than Eligible Facilities Requests (which are addressed in Section 1004.140), the form shall include the following information, in addition to all other information determined necessary by the zoning administrator or the [City/Town] as part of an application for a conditional use permit, variance, and design review:

1. Full name and contact information for the facility owner, facility operator, agent (if any}, and property owner, and related letter(s) of authorization.

2. The type of facility, including a full written description of the proposed facility, its purpose, technical specifications, and an assessment of any fire hazard a proposed installation presents to surrounding vegetation and structures. The applicant must provide proof for why expanded service is required for the proposed location(s) based on a) service deficiencies, b) capacity limitations of current towers, c) obsolete or malfunctioning equipment or d) other technical, legal or environmental constraints;

3. A detailed site and engineering plan of the proposed facility containing the exact proposed location of the facility, created by a qualified licensed engineer and in accordance with requirements set by the zoning administrator. The site and engineering plan shall display the dimensions of each proposed facility, including its height from the ground level. Applicants must demonstrate that facilities have been designed to attain the minimum height required from a technological standpoint for the proposed site. The site and engineering plans shall show the proposed facility from each cardinal direction. The site and engineering plan shall also include technical information, including, but not limited to visual analysis, alternative sites analysis, landscape plans, lighting plans, and architectural and engineering plans. Technical information, including, but not limited to radio frequency and power density reports, visual analysis, alternative sites analysis, landscape plans, lighting plans, and architectural and engineering plans shall be prepared by an appropriate qualified professional acceptable to the zoning administrator;

4. The visual analysis shall include, but not necessarily be limited to, a photo montage or photo simulation and story poles erected at the proposed site (and surrounded by temporary construction fencing) or other similar technique. The visual analysis shall address visually distinctive areas and scenic corridors as depicted and described in the Plan of Conservation and Development, views from public vantage points and private residences if determined appropriate by the [City/Town]. The visual analysis shall also depict cumulative conditions by including information pertaining to existing, approved and proposed telecommunications facilities that will or may eventually be constructed at the site by all carriers based upon permit applications which have been filed with or approved by the [City/Town]. The visual analysis may be expanded to include alternative locations within the proposed service area.

5. Photographs of facility equipment and an accurate visual impact analysis with photo simulations.

6. Proof of all applicable licenses or other approvals required by the FCC.

7. A technically sufficient written report certified by a qualified radio frequency emissions engineer, certifying that the facility, operating by itself and in combination with other existing or approved facilities which can be measured at the proposed facility site, is in compliance with such FCC standards. Measurements for radio frequency emissions shall be based on all proposed, approved and existing facilities operating at maximum power densities at all relevant frequencies being used. Posting of a financial security may be required as a condition of approval to pay the cost for preparation of radio frequency reports evaluating the conformance of approved and operative facilities with applicable health standards adopted by the FCC. The carrier may post a single financial security in an amount not to exceed $25,000 and indexed to the annual construction index hereafter, to satisfy radio frequency performance reports for buildout of the carrier's network facilities plan.

8. A technically sufficient written report by a qualified radio frequency engineer, certifying the location type, capacity, field strength or power density, and calculated geographic service of the proposed wireless communication facility.

9. If the application is for a facility that will be located within the public right-of-way, the applicant shall certify that it is a telecommunications facility or telephone corporation or state the basis for its claimed right to enter the right-of-way, and provide a copy of its certificate of public convenience and necessity (CPCN), if a CPCN has been issued by the Connecticut Public Utilities Regulatory Authority under (CGS) §§16-247(f) and (CGS) §§16-247(g).

10. A written description identifying the geographic service area for the subject installation, accompanied by a plan and maps showing anticipated future installations and modifications for the following two years.

11.A written report that analyzes acoustic levels for the proposed wireless telecommunications facility and all associated equipment, including, without limitation, all environmental control units, sump pumps, temporary backup power generators, and permanent backup power generators in order to demonstrate compliance with Noise Control. The acoustic analysis must be prepared and certified by a qualified engineer and include an analysis of the manufacturer specifications for all noise-emitting equipment and a depiction of the proposed equipment relative to all adjacent property lines. In lieu of a written report, the applicant may submit evidence from the equipment manufacturer that the ambient noise emitted from all the proposed equipment will not, both individually and cumulatively, exceed the applicable limits.

12. If the applicant claims it requires an exception to the requirements of this chapter, all information and studies necessary for the [City/Town] to evaluate that claim should be provided.

13. An application and processing fee and a deposit for a consultant review as set forth in paragraph (B) of this section.

14. A copy of any land use easement or restriction (access, open space, public utility and the like) which encumbers the proposed facility site, as well as a copy of the proposed site's title report.

15. A detailed lighting plan including the location and type of all exterior lighting fixtures.

16. When batch applications are submitted for multiple small wireless facilities on the same street or within the same neighborhood, that is when one proposed location falls within 500 feet of another

proposed location, the applicant shall provide a detailed analysis of the reasons for the proposed locations why they are needed to achieve mobile broadband service needs.

17. Public Notification. Proof that the applicant has provided public notification, at its own cost, via mail to all property owners and occupants within a radius of 300 feet from its proposed facilities. Information regarding the application shall be displayed on the outside of the envelope.

18. Public Participation: When a proposed batch application for small wireless facilities will impact more than five residences within 300 feet of the proposed batch locations, the applicant will convene a public meeting, organized by the zoning administrator to ensure the public can comment on the proposal.

19. A written report that explains the proposal's consistency with the [City/Town] **Telecommunications Plan** and the Connecticut Siting Council's latest State-wide Telecommunications Coverage Plan for Small Wireless Facilities.

20. Any other studies or information determined necessary by the zoning administrator.

B. Independent expert. The zoning administrator is authorized to retain on behalf of the [City/Town] an independent, qualified consultant to review any application for a permit for a wireless telecommunications facility. The cost of this review shall be paid by the applicant through a deposit pursuant to an adopted fee schedule resolution. Such fee resolution may include the contract price of a third-party consultant and the [City/Town] overhead costs for staff time expended on administration of the consultant contract. The independent consultant shall have maximum latitude as to how and when monitoring is done. The consultant may review the technical aspects of the application, including, but not limited to, the following matters:

The accuracy, adequacy, and completeness of submissions;

Compliance with applicable radio frequency emission standards and applicable electrical codes and fire codes and best practices for fire and electrical safety;

Whether any requested exception is justified;

An engineering assessment of the proposed installation to ensure that the proposed location is structurally adequate to support the proposed installation, and that it is adequately engineered to withstand the maximum wind loads that could be reasonably anticipated for the location. For installations on utility poles, the assessment would be based on conformance to PURA standards;

An assessment of any fire hazard a proposed installation presents to surrounding vegetation and structures;

An assessment of any impact on trees or flora;

A technical evaluation of alternative sites, facility designs or configurations, and coverage analysis; and

The validity of conclusions reached, or claims made by applicant.

Procedures for a Duly Filed Applications

1. *Voluntary Pre-Submittal Conference.* Before application submittal, applicants are encouraged (but not required) to schedule and attend a pre-application meeting with the zoning administrator. A pre-

submittal conference is intended to streamline the review process through informal discussion that includes, without limitation, the appropriate project classification, including whether the project qualifies for Section 6409(a); potential concealment issues (if applicable); coordination with other [City/Town] departments responsible for application review; and application completeness issues. To mitigate unnecessary delays due to application incompleteness, applicants are encouraged (but not required) to bring any draft applications or other materials so that [City/Town] staff may provide informal feedback about whether such applications or other materials may be incomplete or unacceptable.

2. *Submittal Appointment.* All applications must be filed with the [City/Town] at a pre-scheduled appointment with the zoning administrator or his/her designee. Applicants may generally submit one (1) application per appointment but may schedule successive appointments for multiple applications whenever feasible. Any application received without an appointment, whether delivered in-person or through any other means, will not be considered duly filed, unless the applicant received a written exemption from the zoning administrator at a pre-submittal conference.

3. *Appointment Scheduling Procedures.* For any event in the submittal process that requires an appointment, applicants must submit a written request to the zoning administrator.

Applications Deemed Denied. To promote efficient review and timely decisions, the [City/Town] may deem an application denied without prejudice to the applicant to re-file as a new application when the applicant fails to tender a substantive response within ninety (90) calendar days after the [City/Town] deems the application incomplete in a written notice to the applicant.

10.04.060 Location and Configuration Preferences

A. Purpose. The purpose of this section is to provide guidelines to applicants and the reviewing authority regarding the preferred locations and configurations for wireless Telecommunication Facilities in the [City/Town], provided that nothing in this section shall be construed to permit a wireless Telecommunication Facility in any location or configuration that is otherwise prohibited by this chapter.

B. Review of Location and Configuration. The reviewing authority shall consider the extent to which a proposed wireless Telecommunication Facility complies with these preferences and whether there are feasible alternative locations or configurations to the proposed facility that are more preferred under this section.

C. Order of Preference - Configurations. The order of preference for the configuration for wireless Telecommunication Facilities from most preferred to least preferred is:

1. Collocation with existing facilities outside the public rights-of-way;

2. Roof-mounted;

3. Building-mounted;

4. Mounted on an existing pole or utility pole;

5. Mounted on a new pole or utility pole that will replace an existing pole or utility pole; and

6. Mounted on a new telecommunication tower or pole.

D. Order of Preference - Location. The order of preference for the location of wireless telecommunications facilities from most preferred to least preferred is: (**insert priority zones**)

1. In the Commercial zoning districts;

2. In the Downtown zoning district;

3. In the Industrial zoning district;

5. In the Professional Office zoning district; and

6. In the public right-of-way with the closest adjacent district being a commercial district.

E. Applications for new wireless communications facilities shall only be for placement a minimum of 50 feet from all residences and a minimum 300 feet from child day care centers, schools, playgrounds, parks, ballfields, and medical facilities unless the applications include information sufficient to demonstrate:

(1) The location and type of preferred sites which exist within the proposed or technically feasible coverage area is mapped;

(2) The preferred location site was not available as shown by the good faith efforts and measures taken by the carrier to secure the preferred location sites;

(3) Specific reasons why such efforts and measures were unsuccessful;

(4) Specific reasons why the location of the proposed facility site is essential to meet the service demands of the carrier; and

(5) Thorough reports required pursuant to § 10.04.050 demonstrating compliance with current federal health standards.

F. Wireless communications facilities shall be attached or sited adjacent to existing structures unless the carrier demonstrates to the satisfaction of the [City/Town] that no other technically feasible site exists or that construction of a freestanding facility on or at a distant location from an existing structure will mitigate adverse effects related to land use compatibility, visual resources, public safety and other environmental factors. Appropriate types of existing structures may include, but not be limited to: buildings, water tanks and some telephone/utility poles.

G. Monopoles for wireless communications facilities should not be located in residential or open space areas unless technical evidence demonstrates to the satisfaction of the [City/Town] that no other alternative facility site or type of antenna support structure is feasible and/or if the use of a Monopole for the proposed facility by itself or in combination with other existing, approved and proposed facilities will avoid or mitigate adverse effects related to land use compatibility, visual resources and public safety.

H. Accessory equipment. In order of preference from most preferred to least preferred, accessory equipment for wireless telecommunication facilities and wireless telecommunications collocation facilities (excluding antennas and electric meters) shall be located underground where possible, within a building or structure, on a screened roof top area or structure, or in a rear yard if not readily visible from surrounding properties and the roadway, unless the reviewing authority finds that another location is

preferable under the circumstances of the application. The applicant shall bear the burden of demonstrating that accessory equipment cannot be placed in the most preferred location.

I. Collocation and Shared-Location of wireless telecommunications facilities should be required when it is feasible and mitigates adverse effects related to land use compatibility, visual resources, public safety and other environmental factors. Collocation and Shared-Location sites should not be required when it creates or significantly increases such adverse effects and/or technical evidence demonstrates to the satisfaction of the [City/Town] that it is not feasible due to service impairment or operational failures. To ensure adequate and complete consideration of Collocation and Shared-Location siting of proposed wireless communications facilities, the carrier may be required to submit a graphic and written analysis which identifies all technically feasible sites within the coverage area that would accommodate the proposed service. The analysis shall include:

1. Enough information to provide adequate consideration of technically feasible alternative sites and/or facility designs that would avoid or minimize adverse effects related to land use compatibility, visual resources, public safety and other environmental factors;

2. In writing, the specific factors for selection of the proposed facility site over alternative sites;

3. Facilities which are not proposed to be sited on a Collocation or Shared-Location site shall provide information substantiating the unfeasibility of the sites; and

4. The [City/Town] may require independent peer review of the analysis prior to making a decision on the permit applications. The analysis should, to the extent practical, be incorporated with the coverage area map.

J. Non-Exclusive Use. The [City/Town] should, to the extent practicable and legal, discourage leases which convey exclusive (i.e., single user) rights for new wireless communications facilities to the extent that the leases may preclude development of a suitable Collocation facilities site.

K. Shared Use. The design of Collocation sites should promote shared use among different carriers. To the extent feasible, antenna support and equipment structures should be designed to consolidate future planned facilities to eliminate or minimize the visual clutter resulting from multiple telecommunications structures. Where appropriate, as demonstrated by the carrier and determined by the [City/Town], multiple antenna support structures may be approved (Shared-Location) rather than a single larger/higher structure. Facilities should make available unutilized space for Collocation of other antennas and equipment, including space for competing service carriers.

10.04.070 Design and Development Standards for All Facilities

A. Basic requirements. The design and development standards set forth in this section apply to all wireless telecommunications facilities no matter where they are located. Wireless telecommunications facilities shall be designed and maintained so as to minimize visual, noise, and other impacts on the surrounding community and shall be planned, designed, located, and erected in accordance with the design and development standards in this section.

B. Build-out Period. Approvals will automatically expire six (6) months from the issuance date, unless the permittee obtains all other permits and approvals required to install, construct and operate the approved wireless facility, which includes, without limitation, permits required pursuant to Building Code, and any

other permits or approvals required by any federal, state, or local public agencies with jurisdiction over the subject property, the wireless facility, or its use and constructs the approved facility. The zoning administrator may grant one (1) written extension to a date certain when the permittee shows good cause to extend the limitations period in a written request for an extension submitted at least 30 days prior to the automatic expiration date in this subparagraph. No further extensions may be granted but the permittee may resubmit a complete application, including all application fees for the same or substantially similar project.

C. General guidelines.

1. The applicant shall employ screening and camouflage design techniques in the design and placement of wireless telecommunications facilities in order to ensure that the facility is as visually inconspicuous as possible, to prevent the facility from dominating and disrupting the surrounding area, and to hide the facility from predominant views from surrounding properties, all in a manner that achieves compatibility with the community.

2. For open space or hillside locations that would be generally viewed from a distance, innovative design solutions may be appropriate where the screening potential of a site is low (i.e., disguise facility as a landscape element, public art and the like).

3. Facilities should not be located on historically or architecturally significant structures unless the Secretary of Interior's guidelines determine that facilities can be visually and architecturally integrated with the structure; historical landscapes shall be avoided.

4. Facilities should be sited to avoid adverse impacts to existing views from surrounding residences.

D. Traffic safety; Roads. All facilities shall be designed and located in such a manner as to avoid adverse impacts on traffic safety. Whenever feasible, existing roads and parking areas should be used to access, build and service new telecommunications facilities. Any new access roads or parking areas constructed shall be shared with subsequent telecommunications facilities and/or other permitted uses to the extent feasible. New access roads constructed in open space areas shall have the minimum width and surfacing necessary to meet fire safety and access requirements and shall be graded and drained consistent with [City/Town] stormwater pollution prevention requirements. The size of new parking areas shall be limited to the minimum necessary to accommodate vehicles associated with periodic maintenance of the facility.

E. Antennas. The applicant shall use the least visible antennas possible to accomplish the coverage objectives. Antenna elements shall be flush mounted, to the extent reasonably feasible. All antenna mounts shall be designed so as not to preclude possible future collocation by the same or other operators or carriers. Antennas shall be situated as to reduce visual impact without materially compromising their function. Whip antennas need not be screened.

F. Landscaping; Vegetation.

1. Where appropriate, facilities shall be installed so as to maintain, protect, and enhance existing landscaping on the site, including trees, foliage, and shrubs, whether or not utilized for screening. Additional landscaping shall be planted, irrigated, and maintained where such vegetation is deemed necessary by the [City/Town] to provide screening or to block the line of sight between facilities and adjacent uses.

2. Applications for Wireless Facilities shall be accompanied by a landscape plan that shows existing vegetation, indicates any vegetation proposed for removal or trimming, and identifies proposed planting by type, size and location. The emphasis of the landscape plan should be to visually screen the proposed facility and stabilize soils on sloping sites. Introduced vegetation shall be native, drought tolerant species compatible with the predominant natural setting of the project area.

3. Existing trees and other screening vegetation in the vicinity of the proposed facility and associated access ways shall be protected from damage both during and after construction. Submission of a tree protection plan may be required to ensure compliance with this requirement.

4. All vegetation disturbed during project construction shall be replanted with compatible vegetation and soils disturbed by development shall be reseeded to control erosion.

5. No vegetation shall be removed subsequent to project completion, except to comply with local and state fire safety regulations, to prevent the spread of disease as required by the state's Department of Agriculture, or to prevent safety hazards to people and property.

6. The carrier shall enter into a landscape performance and maintenance agreement with the [City/Town] to ensure the installation and establishment of required landscaping. This agreement shall be secured by financial securities in an amount equal to 150 percent of estimates to cover the cost of materials and labor for required improvements. The duration of the landscape maintenance agreement shall be for a minimum period of no less than one year and may be extended for an additional period of up to two additional years upon renewal of the permit applications.

7. Antennas and associated structures and equipment shall be painted to blend with the structures, vegetation, sky or landscape against which they will be primarily viewed.

8. Wireless telecommunications facilities are not permitted on ridgelines

G. Signage. Wireless telecommunications facilities and wireless telecommunications collocation facilities shall not bear any signs or advertising devices other than certification, warning, or other signage required by law or permitted by the [City/Town].

H. Lighting. No wireless telecommunications facility may be illuminated, unless either specifically required by the Federal Aviation Administration or other government agency or in association with the illumination of an athletic field on [City/Town] or school property. Lightning arresters and beacon lights are not permitted, unless required by the Federal Aviation Administration, FCC or other applicable regulations for health and safety. Legally required lightning arresters and beacons shall be included when calculating the height of facilities. If lighting is permitted, the following requirements apply to such lighting:

1. Mechanically operated, low wattage, hooded and downward directed exterior lighting shall be permitted for safety purposes only and shall be kept off, except when maintenance or safety personnel are present at night.

2. Tower lighting required under FAA regulations should, to the greatest extent feasible, be shielded or directed to minimize light and glare impacts visible from publicly accessible areas.

3. Nighttime lighting of warning signs required near publicly accessible facilities must consist of low wattage fixtures, and must be directed downward and hooded to mitigate impacts visible from publicly accessible areas.

I. Noise.

1. Each wireless telecommunications facility and wireless telecommunications collocation facility shall be operated in such a manner so as to minimize any possible disruption caused by noise.

2. Normal testing and maintenance activities shall not take place weekends, holidays or between the hours of 5:00 p.m. and 7:00 a.m., excluding emergency repairs. Normal testing and maintenance activities, which do not involve the use or operation of telecommunications and maintenance equipment that is audible from residences and other nearby sensitive receptors, may occur at all other times.

3. Backup generators shall only be operated during periods of power outages or emergency occurrences, and shall not be tested on weekends, holidays, or between the hours of 5:00 p.m. and 7:00 a.m.

4. At no time shall equipment noise from any facility exceed an exterior noise level of 50 dBA at the facility's property line if the facility is located in a business or commercial zone that permits those uses; provided, however, that for any such facility located within 500 feet of any property zoned residential or improved with a residential use, such equipment noise shall not exceed an exterior noise level of 40 dBA at the property line of any such residential property. For any facility located within a residential zone, such equipment noise shall at no time be audible at the property line of any residentially improved or residential zoned property.

5. Any equipment, including, but not limited to, air conditioning units, that may emit noise that would be audible from either beyond three feet from the facility in the case of a facility located in the right-of-way, or the facility's property line in the case of other facilities, shall be enclosed or equipped with noise attenuation devices to the extent necessary to ensure compliance with applicable noise limitations under the _____Municipal Code.

J. Security. Each wireless telecommunications facility shall be designed to be resistant to, and minimize opportunities for, unauthorized access, climbing, vandalism, graffiti, and other conditions that would result in hazardous situations, visual blight, or attractive nuisances. The reviewing authority may require the provision of warning signs, fencing, anti-climbing devices, or other techniques to prevent unauthorized access.

K. Radio Frequency Radiation and Field Strength. Each wireless telecommunications facility shall be designed to address the following:

1. Demonstrating that the *wireless communication facility* complies with federal standards for radio frequency radiation in accordance with the Telecommunication Act of 1996 and subsequent amendments and any other requirements imposed by state or federal regulatory agencies.

2. Identifying the location type, capacity, field strength or power density, and calculated geographic service of the *wireless communication facility*.

L. Modification. At the time of modification of a wireless telecommunications facility, existing equipment shall, to the extent feasible, be replaced with equipment that reduces visual, noise, and other impacts,

including but not limited to undergrounding the equipment and replacing larger, more visually-intrusive facilities with smaller, less visually-intrusive facilities.

10.04.080 Additional Design and Development Standards for Facilities Outside the Public Right-of-Way

A. Basic Requirements. Facilities located outside the public right-of-way are subject to the design and development standards set forth in this section in addition to all design and development standards that apply to all facilities.

B. No parking interference. In no event shall the installation of facilities replace or interfere with parking spaces in such a way as to reduce the total number of parking spaces below the number that is required.

C. Roof-mounted facilities. Roof-mounted facilities shall be designed and constructed to be fully concealed or screened in a manner compatible with the existing architecture of the building the facility is mounted to in color, texture, and type of material. Screening shall not increase the bulk of the structure nor alter the character of the structure. Roof-mounted antennas and associated equipment shall be located as far back from the edge of the roof as possible to minimize visibility from street level locations. Where appropriate, construction of a roof-top parapet wall to hide the facility may be required. To avoid or mitigate the appearance of visual clutter on rooftops, proposed facilities should, to the extent feasible, be located adjacent to existing rooftop antennas or equipment, incorporated into rooftop antenna or equipment enclosures, or otherwise screened from view. In addition, existing rooftop antennas and equipment should be consolidated where practical and shall be removed if abandoned.

D. Antenna Design. Wall-mounted antennas shall be integrated architecturally with the style and character of the structure or otherwise made as unobtrusive as possible. If possible, antennas should be located entirely within an existing or newly created architectural feature so as to be completely screened from view. To the extent feasible, wall-mounted antennas should not be located on the front, or most prominent facade of a structure, and should be located above the pedestrian line-of-sight.

E. Facilities mounted to a telecommunications tower.

1. Facilities mounted to a telecommunications tower shall be located in close proximity to existing above-ground utilities, such as electrical towers or utility poles (which are not scheduled for removal or under grounding for at least 18 months after the date of application), light poles, trees of comparable heights, and in areas where they will not detract from the appearance of the [City/Town].

2. Facilities mounted to a telecommunications tower, including, but not limited to, the attached antennas, shall be designed to be the minimum functional height and width required to adequately support the proposed facility and meet FCC requirements. The applicant shall provide documentation satisfactory to the zoning administrator establishing compliance with this paragraph. **In any event, facilities mounted to a telecommunications tower shall not exceed the applicable height limit for structures in the applicable zoning district.**

3. Aside from the antenna itself, no additional equipment may be visible. All cables, including, but not limited to, electrical and utility cables, shall be laid within the interior of the telecommunications tower

and camouflaged or hidden to the fullest extent feasible without jeopardizing the physical integrity of the tower.

4. Pole installations shall be situated so as to utilize existing natural or man-made features including topography, vegetation, buildings, or other structures to provide the greatest amount of visual screening.

5. All antenna components and accessory wireless equipment shall be treated with exterior coatings of a color and texture to match the predominant visual background or existing architectural elements so as to visually blend in with the surrounding development. Subdued colors and non-reflective materials that blend with surrounding materials and colors shall be used.

6. Poles shall be no greater in diameter or other cross-sectional dimensions than is necessary for the proper functioning of the facility.

7. If a faux tree is proposed for the pole installation, it shall be of a type of tree compatible with those existing in the immediate areas of the installation. If no trees exist within the immediate areas, the applicant shall create a landscape setting that integrates the faux tree with added species of a similar height and type. Additional camouflage of the faux tree may be required depending on the type and design of faux tree proposed.

F. Accessory equipment. All accessory equipment associated with the operation of any wireless telecommunications facility shall be fully screened or camouflaged and located so as to minimize their visibility to the greatest extent possible, utilizing the following methods for the type of installation:

1. Accessory equipment for roof-mounted facilities shall be installed inside the building to which it is mounted or underground, if feasible. If not feasible, such accessory equipment may be located on the roof of the building that the facility is mounted on, provided that both the equipment and screening materials are painted the color of the building, roof, or surroundings. All screening materials for roof-mounted facilities shall be of a quality and design that is architecturally integrated with the design of the building or structure.

2. Accessory equipment for facilities mounted to a telecommunications tower shall be visually screened by locating the equipment either within a nearby building, in an underground vault (with the exception of required electrical panels), or in another type of enclosed structure, which shall comply with the development and design standards of the zoning district in which the accessory equipment is located. Such enclosed structure shall be architecturally treated and adequately screened from view by landscape plantings, decorative walls, fencing or other appropriate means, selected so that the resulting screening will be visually integrated with the architecture and landscaping of the surroundings.

3. Whenever possible, base stations, equipment cabinets, back-up generators and other equipment associated with building-mounted antennas should be installed within the existing building envelope or underground. If this is not feasible, the equipment shall be painted, screened, fenced, landscaped or otherwise treated architecturally to minimize its appearance from off-site locations and to visually blend with the surrounding natural and built environments. Equipment buildings should be designed in an architectural style and constructed of exterior building materials that are consistent with surrounding development and/or land use setting.

10.04.090 Additional Design and Development Standards for Facilities in the Public Right-of-Way

A Basic Requirements. Facilities located in the public right-of-way are subject to the design and development standards set forth in this section in addition to all design and development standards that apply to all facilities.

B. Right-of-way authority. An encroachment permit must be obtained for any work in the public right of way. Only applicants authorized to enter the public right-of-way pursuant to state or federal law or a franchise or other agreement with the [City/Town] shall be eligible for a permit to install or modify a wireless telecommunications facility in the public right-of-way.

C. Antennas.

1. *Utility poles.* The maximum height of any antenna mounted to an existing utility pole shall not exceed two (2) feet above the height of the existing utility pole, nor shall any portion of the antenna or equipment mounted on a pole be less than eighteen (18) feet above any drivable road surface. Notwithstanding the foregoing, all installations on utility poles shall fully comply with the Connecticut Public Utilities Regulatory Authority general orders, as revised.

2. *Street light poles.* The maximum height of any antenna mounted to a street light pole shall not exceed seven (7) feet above the existing height of the street light pole in a location with its closest adjacent district being a commercial zoning district, and shall not exceed three (3) feet above the existing height of the street light pole in any other zoning district. Any portion of the antenna or equipment mounted on a streetlight pole shall be no less than eighteen (18) feet above any drivable road surface.

D. Poles.

1. Only pole-mounted antennas shall be permitted in the public right-of-way. All other types of telecommunications towers are prohibited, and no new poles are permitted that are not replacing an existing pole unless an exception is granted pursuant to Section 10.04.130.

2. Pole height and width limitations:

a) All replacement poles shall be designed to be the minimum functional height and width required to support the proposed antenna installation and meet FCC and Connecticut PURA requirements. Replacement poles and antennas and similar structures shall be no greater in diameter or other cross-sectional dimensions than is necessary for the proper functioning of the facility. Replacement poles must match existing poles, as determined by the zoning administrator.

b) Notwithstanding (a) above, no facility shall be located on a pole that is less than twenty (20) feet in height, and no facility shall exceed thirty-five (35) feet in height as measured from the ground, including, but not limited to, the pole or replacement pole and any antenna that protrudes above the pole or replacement pole.

3. Pole-mounted equipment shall not exceed six (6) cubic feet in dimension per pole.

4. If an applicant proposes to replace a pole in order to accommodate the facility, the pole shall match the appearance of the original pole to the extent feasible, unless another design better accomplishes the

objectives of this chapter. Such replacement pole shall not exceed the height of the pole it is replacing by more than seven (7) feet, and no facility shall exceed thirty-five (35) feet in height as measured from where the base of the pole meets the ground.

5. Mounting any and all hardware or antennas on decorative light poles is prohibited except as a replacement pole that matches the existing decorative light poles in the vicinity.

6. If an exception is granted for placement of new poles in the public right-of-way, new poles shall be designed to resemble existing poles in the public right-of-way, including size, height, color, materials and style, with the exception of any existing pole designs that are scheduled to be removed and not replaced, unless another design better accomplishes the objectives of this section. Such new poles that are not replacement poles shall be located no closer than one hundred forty (140) feet to an existing pole.

7. All new wires needed to service the wireless telecommunications facility must be installed within the width of the existing utility pole so as to not exceed the diameter and height of the existing utility pole. For streetlights, any replacement pole must allow for an integrated design with wires inside the pole.

E. Space occupied. Facilities shall be designed to occupy the least amount of space in the public right-of-way that is technically feasible.

F. Location.

1. Each component part of a facility shall be located so as not to cause any physical or visual obstruction to pedestrian or vehicular traffic, inconvenience to the public's use of the right-of-way, or safety hazards to pedestrians and motorists.

2. A facility shall not be located within any portion of the public right-of-way that would interfere with access to fire hydrants, fire stations, fire escapes, water valves, underground vaults, valve housing structures, or any other vital public health and safety facility.

3. Each pole mounted wireless telecommunications facility must be separated by at least one thousand five hundred (1,500) feet unless field strength or power density analysis determines that a lesser or greater distance is required to meet the telecommunication service needs of the public service company.

4. All cables, including, but not limited to, electrical and utility cables, between the pole and any accessory equipment shall be placed underground, if feasible.

5. For all applications in undergrounding districts, all undergrounding district regulations apply.

G. Americans with Disabilities Act Compliance. All facilities shall be built in compliance with the Americans with Disabilities Act (ADA).

H. Accessory equipment. The wireless facility shall be powered using unmetered service, whenever available. If not available, the electric meter shall be pole-mounted to the extent feasible, and all accessory equipment shall be located underground within three (3) feet of the pole and ground flush mounted to the extent feasible. When above-ground is the only feasible location for a particular type of accessory equipment and when such accessory equipment cannot be pole-mounted, such accessory equipment shall be enclosed within a structure, and shall not exceed a height of five (5) feet and a total footprint of fifteen (15) square feet, and shall be screened and camouflaged to the fullest extent possible, including

the use of landscaping or alternate screening. Required electrical meter cabinets shall be adequately screened and camouflaged.

l. Documentation. The applicant shall provide documentation satisfactory to the zoning administrator establishing compliance with this section.

10.04.100 Conditions of Approval for All Facilities

A. In addition to compliance with the requirements of this chapter, upon approval all facilities shall be subject to each of the following conditions of approval, as well as any modification of these conditions or additional conditions of approval deemed necessary by the reviewing authority throughout the duration of the permit:

1. Before the permittee submits any application for a permit or other permits required by the [City/Town] Municipal Code, the permittee must incorporate the wireless telecommunication facility permit granted under this chapter, all conditions associated with the wireless telecommunications facility permit and engineering and electrical plans, schematics and specifications and the approved plans and any photo simulations into the project plans (the "Approved Plans"). The permittee must construct, install and operate the wireless telecommunications facility in strict compliance with the Approved Plans. The permittee shall submit an as built drawing within ninety (90) days after installation of the facility.

2. Where feasible, as new technology becomes available, the permittee shall: a) place above-ground wireless telecommunications facilities below ground, including, but not limited to, accessory equipment that has been mounted to a telecommunications tower or mounted on the ground; and b) replace larger, more visually-intrusive facilities with smaller, less visually- intrusive facilities, after receiving all necessary permits and approvals required pursuant to the [City/Town] Municipal Code.

3. The permittee shall submit and maintain current at all times basic contact and site information, in a form as may be required by the [City/Town]. The permittee shall notify the [City/Town] of any changes to the information submitted within seven (7) days of any change, including change of the name or legal status of the owner or operator. This information shall include, but is not limited to, the following: a) Identity, including the name, address and 24-hour local or toll free contact phone number of the permittee, the owner, the operator, and the agent or person responsible for the maintenance of the facility; b) The legal status of the owner of the wireless telecommunications facility, including official identification numbers and FCC certification; and c) The name, address, and telephone number of the property owner if different than the permittee.

4. The permittee shall not place any facilities that will deny access to, or otherwise interfere with, any public utility, easement, or right-of-way located on the site. The permittee shall allow the [City/Town] reasonable access to, and maintenance of, all utilities and existing public improvements within or adjacent to the site, including, but not limited to, pavement, trees, public utilities, lighting, and public signage.

5. At all times, all required notices and signs shall be posted on the site as required by the FCC, Connecticut Siting Council or Connecticut Public Utilities Authority, as applicable, and as approved by the [City/Town]. The location and dimensions of a sign bearing the emergency contact name and telephone number shall be posted pursuant to the approved plans.

6. At all times, the permittee shall ensure that the facility complies with the most current regulatory and operational standards including, but not limited to, radio frequency emissions standards adopted by the

FCC, antenna height standards adopted by the Federal Aviation Administration, and all electrical code requirements for the equipment, wiring the equipment and providing power to the equipment. At the sole expense of the permittee and using a consultant approved by the [City/Town], testing shall be performed demonstrating compliance with current regulatory and operational standards, and to ensure the equipment is operating within proper specifications and does not pose an undue fire risk or electrical risk. Tests shall occur upon commencement of operations and annually thereafter, and results provided in a written report to the [City/Town].

7. If, upon inspection, the [City/Town] Building Official determines there is good cause to believe that the facility (including, without limitation, its Accessory Equipment, Antenna and/or Base Station) may present a fire risk or electrical hazard, the Building Official may order the facility to be shut down and powered off until such time as the facility is repaired and restored to its correct operating specifications, at the sole expense of the permittee.

8. Permittee shall pay for and provide a performance bond, which shall be in effect until the facilities are fully and completely removed and the site reasonably returned to its original condition, to cover permittee's obligations under these conditions of approval and the [City/Town] Municipal Code. The bond coverage shall include, but not be limited to, removal of the facility, maintenance obligations and landscaping obligations. The amount of the performance bond shall be set by the zoning administrator in an amount rationally related to the obligations covered by the bond and shall be specified in the conditions of approval.

9. Permittee shall defend, indemnify, protect, and hold harmless the [City/Town], its elected and appointed (insert governing board name), boards, commissions, officers, officials, agents, consultants, employees, and volunteers from and against any and all claims, actions, or proceeding against the [City/Town] and its elected and appointed members, boards, commissions, officers, officials, agents, consultants, employees, and volunteers to attack, set aside, void or annul, an approval of the [City/Town], Planning and Zoning Commission or (insert governing board name)concerning the permit, the project, and any and all claims, actions, or proceedings arising from, or related to, the installation, operation, or inspection of any facility. Such indemnification shall include damages, judgments, settlements, penalties, fines, defensive costs or expenses, including, but not limited to, interest, attorneys' fees, and expert witness fees, or liability of any kind related to or arising from such claim, action, or proceeding. The [City/Town] shall promptly notify the permittee of any claim, action, or proceeding that this indemnification obligation may cover. Nothing contained herein shall prohibit [City/Town] from participating in a defense of any claim, action or proceeding. The [City/Town] shall have the option of coordinating the defense, including, but not limited to, choosing counsel for the defense at permittee's expense. The [City/Town] shall retain the right to participate in any claim, action or proceeding if the [City/Town] bears its own attorney's fees and costs, and the [City/Town] defends the action in good faith.

10. Permittee shall obtain and maintain insurance for the coverages and in the amounts reasonably specified by the zoning administrator.

11. All conditions of approval shall be binding as to the applicant and all successors in interest to permittee.

12. The proposed facility complies with all applicable provisions of this chapter, including the technical review by the [City/Town] Independent Expert set forth in Section 10.04.050(8).

13. The proposed facility has been designed and located to achieve compatibility with the community to the maximum extent reasonably feasible.

14. Noise generated by equipment will not be excessive, annoying nor be detrimental to the public health, safety, and welfare and will not exceed the standards set forth in this chapter.

15. A condition setting forth the permit expiration date in accordance with section 10.04.200 shall be included in the conditions of approval.

16. *Record Retention*. The permittee must maintain complete and accurate copies of all permits and other regulatory approvals issued in connection with the wireless facility, including, without limitation, any approval, the approved plans and photo simulations incorporated into the approval, all conditions associated with the approval, and any other ministerial permits or approvals issued in connection with the approval. In the event that the permittee does not maintain such records as required in this condition, any ambiguities or uncertainties that would be resolved through an inspection of the missing records will be construed against the permittee.

17. *Compliance Obligations.* An applicant or permittee will not be relieved of its obligation to comply with every applicable provision in the [City/Town] Municipal Code, any permit, any permit condition, or any applicable law or regulation by reason of any failure by the [City/Town] to timely notice, prompt or enforce compliance by the applicant or permittee.

10.04.110 Additional Conditions of Approval for Facilities in the Public Right-of-Way

A. In addition to compliance with the requirements of this chapter, upon approval all facilities in the public right-of-way shall be subject to each of the conditions of approval set forth in section 10.04.100, each of the following conditions of approval, and any modification of these conditions or additional conditions of approval deemed necessary by the reviewing authority throughout the duration of the permit:

1. The wireless telecommunications facility shall be subject to such conditions, changes or limitations as are from time to time deemed necessary by the (insert Chief Elected Official) or his/her designee for the purpose of: (a) protecting the public health, safety, and welfare, (b) preventing interference with pedestrian and vehicular traffic, and (c) preventing damage to the public right-of-way or any property adjacent to it. The [City/Town] may modify the permit to reflect such conditions, changes or limitations by following the same notice and public hearing procedures as are applicable to the grant of a wireless telecommunications facility permit for similarly located facilities, except the permittee shall be given notice by personal service or by registered or certified mail at the last address provided to the [City/Town] by the permittee.

2. The permittee shall not move, alter, temporarily relocate, change, or interfere with any existing structure, improvement, or property without the prior consent of the owner of that structure, improvement, or property. No structure, improvement or property owned by the [City/Town] shall be moved to accommodate a wireless telecommunications facility, unless the [City/Town] determines that such movement will not adversely affect the [City/Town] or any surrounding businesses or residents, and the permittee pays all costs and expenses related to the relocation of the [City/Town]'s structure, improvement, or property. Prior to commencement of any work pursuant to an encroachment permit issued for any facility within the public right-of-way, the permittee shall provide documentation establishing to the [City/Town] satisfaction that the permittee has the legal right to use or interfere with

any other structure, improvement, or property within the public right-of-way to be affected by applicant's facilities.

3. The permittee shall assume full liability for damage or injury caused to any property or person by the facility.

4. The permittee shall repair, at its sole cost and expense, any damage including, but not limited to, subsidence, cracking, erosion, collapse, weakening, or loss of lateral support to [City/Town] streets, sidewalks, walks, curbs, gutters, trees, parkways, street lights, traffic signals, improvements of any kind or nature, utility lines and systems, underground utility lines and systems, or sewer systems and sewer lines that result from any activities performed in connection with the installation or maintenance of a wireless telecommunications facility in the public right-of-way. The permittee shall restore such areas, structures and systems to the condition in which they existed prior to the installation or maintenance that necessitated the repairs. In the event the permittee fails to complete such repair within the number of days stated on a written notice by the zoning administrator, the zoning administrator shall cause such repair to be completed at permittee's sole cost and expense.

5. Prior to issuance of a building permit, the applicant shall obtain the zoning administrator's approval of a tree protection plan prepared by a certified arborist if the installation of the wireless Telecommunication Facility will be located within the canopy of a street tree, or a protected tree on private property, or within a ten (10)-foot radius of the base of such a tree. Depending on site specific criteria (e.g., location of tree, size, and type of tree, etc.), a radius greater than ten (10) feet may be required by the zoning administrator.

6. If a meter cabinet has been approved for the facility and subsequently any utility company offers electrical service that does not require the use of a meter cabinet, the permittee shall seek approval of the utility company to switch to the unmetered service and, at its sole cost and expense, remove the meter cabinet and any related foundation within thirty (30) days of such service being obtained and reasonably restore the area to its prior condition.

7. The permittee shall modify, remove, or relocate its facility, or portion thereof, without cost or expense to [City/Town], if and when made necessary by: a) Any public improvement project, including, but not limited to, the construction, maintenance, or operation of any underground or aboveground facilities, including, but not limited to, sewers, storm drains, conduits, gas, water, electric or other utility systems, or pipes owned by [City/Town] or any other public agency; b) Any abandonment of any street, sidewalk, or other public facility; c) Any change of grade, alignment or width of any street, sidewalk, or other public facility; or d) A determination by the zoning administrator that the wireless telecommunications facility has become incompatible with public health, safety, or welfare or the public's use of the public right-of-way.

8. Any modification, removal, or relocation of the facility shall be completed within ninety (90) days of written notification by [City/Town], unless exigencies dictate a shorter period for removal or relocation. Modification or relocation of the facility shall require submittal, review, and approval of a permit amendment pursuant to the [City/Town] Municipal Code. The permittee shall be entitled, on permittee's election, to either a pro-rata refund of fees paid for the original permit or to a new permit, without additional fee, at a location as close to the original location as the standards set forth in the [City/Town] Municipal Code allow. In the event the facility is not modified, removed, or relocated within said period of

time, the [City/Town] may cause the same to be done at the sole cost and expense of permittee. Further, due to exigent circumstances as provided in the [City/Town] Municipal Code, the [City/Town] may modify, remove, or relocate wireless telecommunications facilities without prior notice to permittee, provided permittee is notified within a reasonable period thereafter.

9. The applicant has the right to enter the public right-of-way pursuant to state or federal law, or by virtue of a franchise or other agreement with the [City/Town] permitting them to use the public right-of-way.

10. The facility will not interfere with the use of the public right-of-way, existing subterranean infrastructure, or the [City/Town] plans for modification or use of such location and infrastructure.

10.04.120 Findings

A. Where a wireless telecommunication facility requires a conditional use permit under this chapter, the reviewing authority shall not approve any application unless, in addition to the findings generally applicable to all conditional use permits, all of the following additional findings are made:

1. The proposed facility complies with all applicable provisions of this chapter.

2. The proposed facility has been designed and located to achieve compatibility with the community to the maximum extent reasonably feasible.

3. The applicant has submitted a statement of its willingness to allow other carriers to collocate on the proposed wireless telecommunications facility wherever technically and economically feasible and where collocation would not harm community compatibility.

4. Noise generated by equipment will not be excessive, annoying nor be detrimental to the public health, safety, and welfare and will not exceed the standards set forth in this chapter.

B. In addition to the findings in paragraph (A) above, approval of a wireless telecommunications facility permit for a facility that will be located in the public right-of-way may be granted only if the following findings are made by the reviewing authority:

1. The applicant has provided substantial written evidence supporting the applicant's claim that it has the right to enter the public right-of-way pursuant to state or federal law, or the applicant has entered into a franchise or other agreement with the [City/Town] permitting them to use the public right-of-way.

2. The applicant has demonstrated that the facility will not interfere with the use of the public right-of-way, existing subterranean infrastructure, or the [City/Town] plans for modification or use of such location and infrastructure.

10.04.130 Exceptions

A. Exceptions pertaining to any provision of this chapter, including, but not limited to, exceptions from findings that would otherwise justify denial, may be granted by the reviewing authority if the reviewing authority makes the finding that a refusal to grant the exception would violate federal law, state law, or both. Such exceptions may be granted if the reviewing authority finds, without limitation, that:

1. A provision of this chapter, as applied to applicant, would deprive applicant of its rights under federal law, state law, or both; and

2. The proposed wireless facility qualifies as a "personal wireless service facility" as defined in 10.04.020(N), as may be amended or superseded; and

3. The applicant has provided the reviewing authority with a reasonable and clearly defined technical service objective to be achieved by the proposed wireless facility; and

4. The applicant has provided the reviewing authority with a written statement that contains a detailed and fact-specific explanation as to why the proposed wireless facility cannot be deployed in compliance with the applicable provisions in this Chapter, the [City/Town] Municipal Code, the Plan of Conservation and Development and/or any specific plan; and

5. The applicant has provided the reviewing authority with a meaningful comparative analysis with the factual reasons why all alternative locations and/or designs identified in the administrative record (whether suggested by the applicant, the [City/Town], public comments or any other source) are not technically feasible or potentially available to reasonably achieve the applicant's reasonable and clearly defined technical service objective to be achieved by the proposed wireless facility; and

6. The applicant has demonstrated to the reviewing authority that the proposed location and design is the least non-compliant configuration that will reasonably achieve the applicant's reasonable and clearly defined technical service objective to be achieved by the proposed wireless facility, which includes without limitation a meaningful comparative analysis into multiple smaller or less intrusive wireless facilities dispersed throughout the intended service area; and

7. The applicant has demonstrated that its proposed wireless facility will be in compliance with all applicable health, safety, and environmental regulations, which include without limitation the Americans with Disabilities Act, the Endangered Species Act, and all FCC rules and regulations for human exposure to RF emissions.

B. An applicant may only request an exception at the time of applying for a wireless telecommunications facility permit. The request must include both the specific provision(s) of this chapter from which the exception is sought and the basis of the request. Any request for an exception after the [City/Town] has deemed an application complete shall be treated as a new application.

C. The applicant shall have the burden of proving that the exception should be granted.

10.04.140 Eligible Facilities Requests

A. Applicability. This Section applies to all Eligible Facilities Requests pursuant to Section 6409(a).

B. Approval Required. **A**pplicants for Eligible Facilities Requests must submit a written request for a 6409(a) approval consistent with this section, which will be reviewed by the Zoning administrator who will determine whether the request should be approved, conditionally approved, or denied without prejudice pursuant to the standards and procedures contained in this section.

C. Other Regulatory Approvals. Any Eligible Facilities Request approved under this chapter shall be subject to any and all lawful conditions or requirements associated with such other permits or regulatory approvals from the [City/Town] and state or federal agencies.

D. Eligible Facilities Request Application Requirement. An application must include the following information:

1. Full name and contact information for the facility owner, facility operator, agent (if any), and property owner, and related letter(s) of authorization. If the applicant does not own the subject property, the application must include a written authorization signed by the property owner that empowers the applicant to file the application and perform all wireless facility construction, installation, operation, and maintenance to the extent described in the application.

2. The type of facility, including a full, written description of the proposed facility, its purpose, and technical specifications.

3. A detailed site and engineering plan of the proposed facility containing the exact proposed location of the facility, created by a qualified, licensed engineer and in accordance with requirements set by the zoning administrator. The site and engineering plan shall display the dimensions of each proposed facility, including, but not limited to, its height from the ground level. The site and engineering plans shall show the proposed facility from each cardinal direction.

4. Photographs of facility equipment and an accurate visual impact analysis with photo simulations.

5. A written statement that explains why the applicant believes Section 6409(a) and the related FCC regulations require approval. A complete written narrative analysis will state the applicable standard and all the facts that allow the [City/Town] to conclude the standard has been met. Bare conclusions not factually supported do not constitute a complete written analysis. As part of this written statement the applicant must also include (a) whether and why the support structure qualifies as an existing tower or existing base station; and (b) whether and why the proposed Eligible Facilities Request does not cause a substantial change in height, width, excavation, equipment cabinets, concealment, or permit compliance. The analysis provided under (b) shall include a copy of all prior conditions of approval and an explanation as to why the prior conditions of approval are met by the proposed wireless facility application.

6. A technically sufficient written report by a qualified radio frequency emissions engineer, certifying that the facility is in compliance with such FCC standards.

7. Public Notification. Proof that the applicant has provided public notification, at its own cost, via mail to all property owners and occupants within a radius of 300 feet from its proposed facilities. Information regarding the application shall be displayed on the outside of the envelope.

E. Administrative Review; Decision Notices. The zoning administrator shall administratively review an application for an Eligible Facilities Request and act on such an application without prior notice or a public hearing. Within five (5) working days after the zoning administrator approves, conditionally approves, or denies an Eligible Facilities Request application, the zoning administrator shall send a written notice to the applicant.

In the event that the zoning administrator determines that an application submitted for approval pursuant to Section 6409(a) does not qualify for approval, the zoning administrator will send written notice to the applicant that includes the reasons to support the review authority's decision and states that the application will be denied without prejudice.

F. Required Findings for 6409(a) Approval. The zoning administrator may approve or conditionally approve an application submitted for Section 6409(a) approval when the zoning administrator finds that the proposed project:

1. Qualifies as an Eligible Facilities Request; and

2. Complies with (or is conditioned to comply with) all generally applicable health and safety rules.

G. Criteria for Denial Without Prejudice. The zoning administrator may deny without prejudice an application submitted for approval pursuant to Section 6409(a) when it finds that the proposed project does not meet the criteria under subsection (D) above.

H. Conditional 6409(a) Approvals. Subject to any applicable limitations in federal or state law, nothing in this chapter is intended to limit the [City/Town] authority to conditionally approve an application for a section 6409(a) approval to protect and promote the public health, safety, and welfare.

I. Standard Conditions of Approval. In addition to all other conditions adopted by the zoning administrator, all Section 6409(a) approvals, whether approved by the zoning administrator or deemed approved by the operation of law, shall be automatically subject to the following conditions in this section; provided, however, that the zoning administrator shall have discretion to modify or amend these conditions on a case-by-case basis as may be necessary or appropriate under the circumstances:

1. *Approved Plans.* Before the permittee submits any application for a building permit or other permits required by the [City/Town] Municipal Code, the permittee must incorporate the wireless telecommunications facility permit granted under this section, all conditions associated with the wireless telecommunications facility permit and the approved plans and any photo simulations into the project plans (the "Approved Plans"). The permittee must construct, install and operate the wireless telecommunications facility in strict compliance with the Approved Plans. The permittee shall submit an as built drawing within ninety (90) days after installation of the facility.

2. *Permit Term.* The [City/Town] grant or grant by operation of law of a Section 6409(a) approval will not extend the permit term, if any, for any conditional use permit, or other underlying prior regulatory authorization. Accordingly, the term for a Section 6409(a) approval shall be coterminous with the underlying permit or other prior regulatory authorization for the subject tower or base station.

3. *Accelerated Permit Terms Due to Invalidation.* In the event that any court of competent jurisdiction invalidates any portion of Section 6409(a) or any FCC rule that interprets Section 6409(a) such that federal law would not mandate approval for any Section 6409(a) approval, such 6409(a) approvals shall automatically expire one year from the effective date of the judicial order, unless the decision would not authorize accelerated termination of previously-approved Section 6409(a) approvals or the zoning administrator grants an extension upon written request from the permittee that shows good cause for the extension, which includes, without limitation, extreme financial hardship. Notwithstanding anything in the previous sentence to the contrary, the zoning administrator may not grant a permanent exemption or indefinite extension. A permittee shall not be required to remove its improvements approved under the invalidated Section 6409(a) approval when it has submitted an application for a conditional use permit for those improvements before the one-year period ends.

4. *No Waiver of Standing.* The [City/Town] grant or grant by operation of law of a Section 6409(a) approval does not waive, and shall not be construed to waive, any standing by or right of the [City/Town] to challenge Section 6409(a), any FCC rules that interpret Section 6409(a), or any Section 6409(a) approval.

5. *Build-out Period.* The Section 6409(a) approval will automatically expire one (1) year from the issuance date, unless the permittee obtains all other permits and approvals required to install, construct and operate the approved wireless facility, which includes, without limitation, any permits or approvals required by the any federal, state, or local public agencies with jurisdiction over the subject property, the wireless facility, or its use. The zoning administrator may grant one (1) written extension to a date certain when the permittee shows good cause to extend the limitations period in a written request for an extension submitted at least 30 days prior to the automatic expiration date in this subparagraph. Any further extensions may be granted by the Planning and Zoning Commission, in its sole discretion, pursuant to the same procedures to request an extension from the zoning administrator.

6. *Maintenance Obligations; Vandalism.* The permittee shall keep the site, which includes, without limitation, any and all improvements, equipment, structures, access routes, fences and landscape features, in a neat, clean, and safe condition in accordance with the Approved Plans and all conditions in the Section 6409(a) approval. The permittee shall keep the site area free from all litter and debris at all times. The permittee, at its sole cost, shall remove and remediate any graffiti or other vandalism at the site within two (2) days after the permittee receives notice or otherwise becomes aware that such graffiti or other vandalism occurred.

7. *Compliance with Laws.* The permittee shall maintain compliance at all times with all federal, state, and local laws applicable to the permittee, the subject property, the wireless facility, or any use or activities in connection with the use authorized in this section 6409(a) approval, including, but not limited to, compliance with the Americans with Disability Act. The permittee expressly acknowledges and agrees that this obligation is intended to be broadly construed and that no other specific requirements in these conditions are intended to reduce, relieve, or otherwise lessen the permittee's obligations to maintain compliance with all applicable laws.

8. *Adverse Impacts on Other Properties.* The permittee shall use all reasonable efforts to avoid any and all undue or unnecessary adverse impacts on nearby properties that may arise from the permittee's construction, installation, operation, modification, maintenance, repair, removal, or other activities at the site. The permittee shall not perform or cause others to perform any construction, installation, operation, modification, maintenance, repair, removal, or other work that involves heavy equipment or machines on any day and at any time prohibited under the [City/Town] Municipal Code. The restricted work hours in this condition will not prohibit any work required to prevent an actual, immediate harm to property or persons, or any work during an emergency declared by the [City/Town]. The zoning administrator may issue a stop work order for any work that violates this condition.

9. *Noise Complaints.* The permittee shall conduct all activities on the site in compliance with the noise standards in the [City/Town] Municipal Code. In the event that any person files a noise complaint and the [City/Town] verifies that such complaint is valid, the permittee must remedy the violation within ten (10) days after notice from the [City/Town], which may include a demonstration that the permittee has amended its operational guidelines in situations where the violation arises from the permittee's personnel rather than the permittee's equipment.

10. *Inspections; Emergencies.* The permittee expressly acknowledges and agrees that the [City/Town] or its designee may enter onto the site and inspect the improvements and equipment upon reasonable prior notice to the permittee; provided, however, that the [City/Town] or its designee may, but is not obligated to, enter onto the site area without prior notice to support, repair, disable, or remove any improvements

or equipment in emergencies or when such improvements or equipment threatens actual, imminent harm to property or persons. The permittee will be permitted to supervise the [City/Town] or its designee while such inspection or emergency access occurs.

11. *Contact Information.* The permittee shall furnish the [City/Town] with accurate and up-to- date contact information for a person responsible for the wireless facility, which includes, without limitation, such person's full name, title, direct telephone number, facsimile number, mailing address, and email address. The permittee shall keep such contact information up-to-date at all times.

12. *Performance Bond.* Before the [City/Town] issues any construction permit in connection with the wireless facility, if, in the [City/Town] sole discretion, the existing performance bond for the facility is inadequate or the facility is not associated with any existing performance bond, the permittee shall post a performance bond from a surety and in a form acceptable to the [insert chief elected official] in an amount equal to or greater than a written estimate from a qualified contractor with experience in wireless facilities removal. The written estimate must include the cost to remove all equipment and other improvements, which includes, without limitation, all antennas, radios, batteries, generators, utilities, cabinets, mounts, brackets, hardware, cables, wires, conduits, structures, shelters, towers, poles, footings and foundations, whether above ground or below ground, constructed or installed in connection with the wireless facility. In establishing or adjusting the bond amount required under this condition, the [insert chief elected official] shall take into consideration information provided by the permittee regarding the cost to remove the wireless facility.

13. Conditions of approval shall specify a maximum number of trips on a case-by-case basis based upon the carrier's maintenance and testing schedule.

10.04.160 Business License

A permit issued pursuant to this chapter shall not be a substitute for any business license otherwise required under the [City/Town] Municipal Code.

10.04.170 Emergency Deployment

In the event of a declared federal, state, or local emergency, or when otherwise warranted by conditions that the zoning administrator deems to constitute an emergency, the zoning administrator may approve the installation and operation of a temporary wireless telecommunications facility (e.g., a cell on wheels or "COW"), which is subject to such reasonable conditions that the zoning administrator deems necessary.

10.04.180 Operation and Maintenance Standards

A. All wireless telecommunications facilities must comply at all times with the following operation and maintenance standards. All necessary repairs and restoration shall be completed by the permittee, owner, or operator within 48 hours:

1. After discovery of the need by the permittee, owner, operator or any designated maintenance agent; or

2. After permittee, owner, operator, or any designated maintenance agent receives notification from a resident or the zoning administrator.

B. All facilities, including, but not limited to, telecommunication towers, poles, accessory equipment, lighting, fences, walls, shields, cabinets, artificial foliage or camouflage, and the facility site shall be maintained in good condition, including ensuring the facilities are reasonably free of:

1. General dirt and grease;

2. Chipped, faded, peeling, and cracked paint;

3. Rust and corrosion;

4. Cracks, dents, and discoloration;

5. Missing, discolored, or damaged artificial foliage or other camouflage;

6. Graffiti, bills, stickers, advertisements, litter and debris;

7. Broken and misshapen structural parts; and

8. Any damage from any cause.

C. All trees, foliage, and other landscaping elements approved as part of the facility shall be maintained in good condition at all times, and the permittee, owner, and operator of the facility shall be responsible for replacing any damaged, dead, or decayed landscaping. No amendment to any approved landscaping plan may be made until it is submitted to and approved by the zoning administrator.

D. The permittee shall replace its facilities, after obtaining all required permits, if maintenance or repair is not sufficient to return the facility to the condition it was in at the time of installation.

E. Each facility, operating alone and in conjunction with other telecommunications facilities, shall be operated and maintained at all times in compliance with applicable federal regulations, including FCC radio frequency emissions standards. Within one month post-construction and **annually thereafter,** permittee must provide a radio frequency report as a condition of project approval to verify that actual levels of radio frequency emitted by the approved facilities, operating alone and in combination with other approved facilities, substantially conform to the pre-approved radio frequency report and do not exceed current standards for permissible human exposure to radio frequency as adopted by the FCC. In the event of an increase over accepted levels is detected, the permittee shall be responsible for immediately making the necessary adjustments to comply with FCC standards.

F. Each facility shall be operated and maintained to comply at all times with the noise regulations of this chapter and shall be operated and maintained in a manner that will minimize noise impacts to surrounding residents. Except for emergency repairs, any testing and maintenance activities that will be audible beyond the property line shall only occur between the hours of 7:00 a.m. and 5:00 p.m. on Monday through Friday, excluding holidays, unless alternative hours are approved by the zoning administrator. Backup generators, if permitted, shall only be operated during periods of power outages or for testing.

G. If a flagpole is used for camouflaging a wireless telecommunications facility, flags shall be flown and shall be properly maintained at all times.

H. Each owner or operator of a facility shall routinely inspect each site to ensure compliance with the standards set forth in this section and the conditions of approval.

I. Annual Certification. Each year on July 1, the permittee shall submit an affidavit which shall list, by location, all facilities it owns within the [City/Town] by location, and shall certify (1) each such installation remains in use; (2) that such in use facility remains covered by insurance; and (3) each such installation which is no longer in use, and pay applicable recertification fees established by the [City/Town]. Any facility which is no longer in use shall be removed by permittee within 60 days of delivery of the affidavit or be subject to a fine of $100 per day until removal. Where such annual re-certification has not timely submitted, or equipment no longer in use has not been removed within the required 60-day period, no further application for that small cell wireless installation will be accepted by the [City/Town] until such time as the annual re-certification has been submitted and fee and fines paid.

10.04.190 No Dangerous Conditions or Obstructions Allowed

No person shall install, use, or maintain any wireless telecommunications facility which in whole or in part rests upon, in or over any public sidewalk or parkway, when such installation, use, or maintenance endangers or is reasonably likely to endanger the safety of persons or property, or when such site or location is used for public utility purposes, public transportation purposes, or other governmental use, or when such facility unreasonably interferes with or impedes the flow of pedestrian or vehicular traffic including any legally parked or stopped vehicle, the ingress into or egress from any residence or place of business, the use of poles, posts, traffic signs or signals, hydrants, mailboxes; permitted sidewalk dining, permitted street furniture, or other objects permitted at or near said location.

1004.200 Permit Expiration

A. A permit for any wireless telecommunications facility shall be valid for a period of ten (10) years, unless the Planning and Zoning Commission authorizes a different period, or pursuant to another provision of the [City/Town] Municipal Code the permit lapses sooner or is revoked. At the end of such period, the permit shall expire.

B. A permittee may apply for renewals of its permit in increments of no more than ten (10) years and no sooner than twelve (12) months prior to expiration of the permit.

C. An application for renewal shall be evaluated based on federal, state, and local law as it exists at the time applicant seeks renewal. The following may also be required for an application to renew a wireless permit:

1. At the zoning administrator's discretion, additional studies and information may be required of the applicant.

2. If the zoning administrator determines that the facility is nonconforming or that additional conditions of approval are necessary to bring the facility into compliance with the provisions of the[City/Town]Municipal Code that are then in effect, the zoning administrator shall refer the renewal request to the Planning and Zoning Commission.

D. The request for a renewal shall be decided by the Planning and Zoning Commission if the permit expired before the application is made for a renewal or if the zoning administrator refers the matter to the Planning and Zoning commission. After notice and a public hearing, the Planning and Zoning Commission may approve, conditionally approve, or deny the renewal. A permit application may not be renewed if the facility is not upgraded to mitigate its impacts, including land use compatibility, visual resources, public

safety or other environmental factors, to the greatest extent permitted by technology which exists at the time of renewal and is consistent with the provisions of adequate service at affordable rates.

1004.210 Cessation of Use or Abandonment

A. A wireless telecommunications facility is considered abandoned and shall be promptly removed as provided herein if it ceases to provide wireless telecommunications services for ninety (90) or more consecutive days. If there are two or more users of a single facility, then this provision shall not become effective until all users cease using the facility.

B. The operator of a facility shall notify the [City/Town] in writing of its intent to abandon or cease use of a permitted site or a nonconforming site (including unpermitted sites) within ten (10) days of ceasing or abandoning use. Notwithstanding any other provision herein, the operator of the facility shall provide written notice to the zoning administrator of any discontinuation of operations of thirty (30) days or more.

C. Failure to inform the zoning administrator of cessation or discontinuation of operations of any existing facility as required by this section shall constitute a violation of any approvals and be grounds for:

1. Prosecution;

2. Revocation or modification of the permit;

3. Calling of any bond or other assurance required by this chapter or conditions of approval of the permit;

4. Removal of the facilities by the [City/Town] in accordance with the procedures established under the [City/Town] Municipal Code for abatement of a public nuisance at the owner's expense; and

5. Any other remedies permitted under [City/Town] Municipal Code or applicable law.

10.04.220 Removal and Restoration, Permit Expiration, Revocation or Abandonment

A. Permittee's removal obligation. Upon the expiration date of the permit, earlier termination or revocation of the permit or abandonment of the facility, the permittee, owner or operator shall remove its wireless telecommunications facility and restore the site to its natural condition, except for retaining the landscaping improvements and any other improvements at the sole discretion of the zoning administrator. Removal shall be in accordance with proper health and safety requirements and all ordinances, rules, and regulations of the [City/Town]. The facility shall be removed from the property within thirty (30) days of the permit's expiration, at no cost or expense to the [City/Town]. If the facility is located on private property, the private property owner shall also be jointly and severally responsible for the expense of timely removal and restoration.

B. Failure to remove. Failure of the permittee, owner, or operator to promptly remove its facility and restore the property within thirty (30) days after expiration, earlier termination, or revocation of the permit, or abandonment of the facility, shall be a violation of the[City/Town] Municipal Code, and be grounds for:

1. Prosecution;

2. Calling of any bond or other assurance required by this chapter or conditions of approval of permit;

3. Removal of the facilities by the [City/Town] in accordance with the procedures established under the [City/Town] Municipal Code for abatement of a public nuisance at the owner's expense; or

4. Any other remedies permitted under the [City/Town] Municipal Code.

C. Summary removal. In the event the zoning administrator determines that the condition or placement of a wireless telecommunications facility located in the public right-of-way constitutes a dangerous condition, obstruction of the public right-of-way, or an imminent threat to public safety, or determines other exigent circumstances require immediate corrective action (collectively, "exigent circumstances"), the zoning administrator may cause the facility to be removed summarily and immediately without advance notice or a hearing. If the circumstances allow for it and, to the extent feasible, the zoning administrator will notify the permittee to remove the facility and allow for the reinstallation of the facility, subject to the permittee demonstrating to the satisfaction of the [City/Town] Building Official and zoning administrator that the work can be done in safe manner compliant with the original Approved Plans and Section 10.04.100. Written notice of the removal shall be served upon the person who owns the facility within five (5) business days of removal and all property removed shall be preserved for the owner's pick-up, as is reasonably feasible. If the owner cannot be identified following reasonable effort or if the owner fails to pick-up the property within sixty (60) days, the facility shall be treated as abandoned property.

D. Removal of facilities by [City/Town]. In the event the [City/Town] removes a facility in accordance with this chapter, any such removal shall be without any liability to the [City/Town] for any damage to such facility that may result from reasonable efforts of removal. In addition to the procedures for recovering costs of nuisance abatement, the [City/Town] may collect such costs from the performance bond posted and to the extent such costs exceed the amount of the performance bond, collect those excess costs in accordance with the [City/Town] Municipal Code. Unless otherwise provided herein, the [City/Town] has no obligation to store such facility. Neither the permittee, the owner, nor the operator shall have any claim if the [City/Town] damages or destroys any such facility not timely removed by the permittee, owner, or operator after notice, or removed by the [City/Town] due to exigent circumstances.

10.04.230 Authorization for Departmental Forms, Rules, and Other Regulations.

The [insert governing body of the City/Town] authorizes the zoning administrator to develop and publish permit application forms, checklists, informational handouts and other related materials that the zoning administrator finds necessary, appropriate or useful for processing requests, applications, permits, or any other matter under this chapter. Without further authorization from the [insert governing body of the City/Town], the zoning administrator may from time-to-time update and alter any such permit application forms, checklists, informational handouts and other related materials as the zoning administrator deems necessary, appropriate or useful to respond to regulatory, technological or other changes related to this chapter. The [insert governing body of the City/Town]authorizes the zoning administrator to establish other reasonable rules and regulations, which may include, without limitation, regular hours for appointments with applicants, as the zoning administrator deems necessary or appropriate to organize, document, and manage the application intake and permitting process.

10.04.240 Appeals.

A. Appeals by Applicants. Notwithstanding any provision of the [City/Town] Municipal Code to the contrary, including, but not limited to, the zoning regulation, any applicant may appeal a decision by the

zoning administrator under this Chapter. The appeal must be filed within two (2) days from the zoning administrator's decision. The appeal must state in plain terms the grounds for reversal and the facts that support those grounds. The [insert governing body of the City/Town] shall serve as the appellate authority for all appeals of all actions of the zoning administrator taken pursuant to this section. The [City/Town] shall provide notice for an administrative hearing by the [insert governing body of the City/Town].

The **(insert governing body of the Town)** shall limit its review to whether the project should be approved or denied in accordance with the provisions in this Chapter.

B. Appeals by the General Public. Any interested person or entity may appeal any decision by the approval authority in accordance with the standards and procedures in the Zoning regulations, except as modified in this Section. On the next available meeting date after the appeal period lapses, or as soon as reasonably feasible thereafter, the appellate body shall hold a public hearing to consider and act on the application in accordance with the applicable provisions in the Plan of Conservation and Development, any applicable specific plan and all applicable provisions in the [City/Town] Municipal Code. Appeals from an approval will not be permitted to the extent that the appeal is based on environmental effects from RF emissions that comply with all applicable FCC regulations.

10.04.250 Effect on Other Ordinances

Compliance with the provisions of this chapter shall not relieve a person from complying with any other applicable provision of the [City/Town] Municipal Code, including, but not limited to, obtaining any necessary encroachment or building permits. In the event of a conflict between any provision of this chapter and other provisions of the [City/Town] Municipal Code, this chapter shall control.

APPENDIX B: MUNICIPAL ORDINANCE RESOURCES

1. Fairfax, CA Municipal Ordinance

   https://storage.googleapis.com/proudcity/fairfaxca/uploads/2019/08/Ord-833-5G-titles-19-and-20.pdf

2. San Diego, CA Municipal Ordinance

   https://www.sandiego.gov/development-services/codes-regulations/wireless-communication-facilities

3. National League of Cities Model Ordinance

   https://www.nlc.org/sites/default/files/2018-08/NATOA%20NLC%20Alternative%20Model%20Code%20for%20Municipalities%20FINAL_0.pdf

4. FCC Model Ordinance

   https://www.fcc.gov/sites/default/files/bdac-07-2627-2018-harmonization-wg-model-code-muni.pdf

5. Massachusetts Model Ordinance prepared by Verizon

   https://mdsafetech.files.wordpress.com/2018/11/verizon-ordinanace-small-cell-ma-model-small-cell-ordinance-2810-31-1829.pdf

6. Los Gatos, CA Municipal Ordinance

   https://www.losgatosca.gov/2527/Small-Cell-Wireless

7. Cambridge, MA Municipal Ordinance governing Electrical Code

   https://library.municode.com/ma/cambridge/codes/code_of_ordinances?nodeId=TIT15BUCO_CH15.16ELPOWI

8. Americans for Responsible Technology Model Ordinance

   https://mdsafetech.files.wordpress.com/2019/07/model-ordinance-americans-for-responsible-technology-2019.pdf

9. Schenectady, NY Municipal Ordinance – Wireless Telecommunication Facilities

   https://ecode360.com/8691167

10. Santa Clarita, CA Municipal Ordinance on Cell Towers and Pending Ordinance on Small Cells

    https://www.codepublishing.com/CA/SantaClarita/html/SantaClarita17/SantaClarita1769.html

Website guidelines:

https://www.santa-clarita.com/residents/small-cell-and-5g-wireless-telecommunication-facilities/small-cell-and-5g-wireless-telecommunication-facilities-faq

Draft Municipal Ordinance presented at November 2019 meeting (see page 76 onward)

https://scvhistory.com/scvhistory/ccagenda20191126.pdf

11. Palo Alto, CA Pending Municipal Ordinance

    https://www.cityofpaloalto.org/civicax/filebank/documents/70193

12. Berkeley, MI Municipal Ordinance and website

    Website: http://www.berkleymich.org/hot_topics/5g_small_cell.php

    Municipal Ordinance:
    http://cms6.revize.com/revize/berkley/departments/city_clerk/docs/City%20Codes/New%20Article%20V%20to%20Chapter%20118%20(New)%20(2019.11.08).pdf

13. Newark, CA Municipal Ordinance and Master License Agreement (starts on page 57)

    https://scvhistory.com/scvhistory/ccagenda20191126.pdf

APPENDIX C: MODEL RIGHT OF WAY ORDINANCE

ORDINANCE NO. 1

AN ORDINANCE OF THE [insert governing body of city/town] OF THE [CITY/TOWN] OF_____

OF THE [CITY/TOWN] MUNICIPAL CODE INTO A REVISED TITLE 1 WHICH ESTABLISHES PUBLIC RIGHT OF WAY REGULATIONS FOR UTILITIES AND WIRELESS TELECOMMUNICATION FACILITIES IN THE LOCAL RIGHT OF WAY

WHEREAS, This Ordinance is adopted as follows:

(1) The purpose of this Ordinance is to update the [City/Town] Municipal Code to provide uniform and comprehensive standards, regulations and permit requirements for the installation of wireless telecommunications facilities in the municipal public right-of-way.

(2) The wireless telecommunications industry has expressed interest in submitting applications for the installation of "small cell" wireless telecommunications facilities in the municipal public rights-of-way. Other Connecticut cities and towns have already received applications for small cells to be located within the public right-of-way.

(3) If not adequately regulated, installation of small cell and other wireless telecommunications facilities within the public right-of-way can pose a threat to the public health, safety and welfare, including disturbance to the public right-of-way through the installation and maintenance of wireless facilities; traffic and pedestrian safety hazards due to the unsafe location of wireless facilities; impacts to trees where proximity conflicts may require unnecessary trimming of branches or require removal of roots due to related undergrounding of equipment or connection lines; land use conflicts and incompatibilities including excessive height of poles and towers; creation of visual and aesthetic blights and potential safety concerns arising from excessive size, heights, noise or lack of camouflaging of wireless facilities including the associated pedestals, meters, equipment and power generators; and the creation of unnecessary visual and aesthetic blight by failing to utilize alternative technologies or capitalizing on collocation opportunities which may negatively impact the unique quality and character of the [City/Town].

(4) The [City/Town] currently regulates wireless telecommunications facilities – primarily telecommunication towers – through the zoning permit process. While this role is an advisory one, the Connecticut Siting Council gives consideration to municipal land use policies. However, the primary focus of the zoning regulations is wireless telecommunications facilities located on private property, and the existing Code provisions were not specifically designed to address the unique legal and practical issues that arise in connection with wireless telecommunications facilities deployed in the public right-of-way.

(5) Chapter 98, Section 7-163(c) of the Connecticut General Statutes Code authorizes municipalities to establish telecommunication plans to identify areas where there may be deficiencies in coverage and to identify sensitive areas for restrictive use.

(6) Chapter 98, Section 7-148(c)6(C) authorizes municipalities to regulate telecommunications companies in so far as they impact its ability to (i) lay out, construct, reconstruct, alter, maintain, repair, control, operate, and assign numbers to streets, alleys, highways, boulevards, bridges, underpasses, sidewalks, curbs, gutters, public walks and parkways; (ii) keep open and safe for public use and travel and free from encroachment or obstruction the streets, sidewalks and public places in the municipality; (iii) control the excavation of highways and streets; (iv) regulate and prohibit the excavation, altering or opening of sidewalks, public places and grounds for public and private purposes and the location of any work or things thereon, whether temporary or permanent, upon or under the surface thereof.

(7) Chapter 283, Section 16-228 of the Connecticut General Statutes authorizes telephone and telegraph corporations to construct telephone or telegraph lines along and upon any public road or highway, along or across any of the waters or lands within this state, and to erect poles, posts, piers, or abatements for supporting the insulators, wires, and other necessary fixtures of their lines, in such manner and at such points as not to incommode the public use of the road or highway or interrupt the navigation of the waters.

(8) Chapter 283, Section 16-233 of the Connecticut General Statutes authorizes municipalities to make use of public utility poles and underground duct systems to establish municipal telecommunication systems for the general public in matters affecting the health, convenience, and safety of the general public, including matters such as the use and repair of public streets by any public utility and the location of the poles, wires, mains, or conduits of any public utility on, under, or above any public streets.

(9) Chapter 238, Section 80g of the Connecticut General Statutes authorizes any municipality to sell, lease or otherwise transfer easements or other interests in, above or below any street, highway or other public right-of-way to the centerline thereof, other than the right-of-way of a state highway as defined in section 13a-1, in the same manner that it may dispose of any other interest in real property owned by such municipality; provided adequate provision is made for the safe and convenient public use of the street, highway or other public right-of-way and for the protection of adjacent land users and that the transferee of said interest restores the street, highway or right-of-way to its condition existing prior to the transfer of said interest and provided further that any sale, lease or transfer of easements or other interests above any street, highway or other public right-of-way is made with the consent of the owner of the real property abutting the portion of the street, highway or other public right-of-way above which such easement or other interest is sold, leased or transferred.

(10) Chapter 238, Section 80a of the Connecticut General Statutes even enables municipalities to make use of the state highway right of way with the appropriate approvals from the

Commissioner of Transportation, with the advice and consent of the Secretary of the Office of Policy and Management. Such use includes the sale, lease and conveyance, or otherwise disposal of, or entering into agreements concerning, any interest the state may have on, above or below any state highway right-of-way. The Commissioner of Transportation may place such restrictions, conditions and qualifications on the use of any area as he determines to be necessary to provide for the safety and adequacy of highway facilities, and for the protection of abutting or adjacent land users. A committee composed of the Commissioner of Transportation, the Secretary of the Office of Policy and Management and the chief executive officer of the municipality may also place such restrictions, conditions and qualifications on the use of any area which they determine to be necessary to provide for the efficient, economical and socially beneficial use of the area.

(11) State and federal law has changed substantially since the [City/Town] last adopted regulations for wireless telecommunications facilities in the [City/Town]. Such changes include establishing "shot clocks" whereby the [City/Town] must approve or deny installations within a certain period of time. Federal regulations require local governments to act on permit applications for wireless facilities within a prescribed time period and state and federal laws and regulations permit applicants to invoke a deemed granted remedy when a failure to timely act occurs. See 47 U.S.C. § 332(c)(7)(B)(iii); 47 C.F.R. §§ 1.6100 et seq., and Federal Register (83 FR 51867) *Accelerating Wireless and Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*. Under federal law, a decision on certain applications must be made in as few as 60 days.

(12) The public right-of-way in the [City/Town] is a uniquely valuable public resource, closely linked with its natural beauty, and a significant number of residential communities. The reasonably regulated and orderly deployment of wireless telecommunications facilities including in the public right-of-way is desirable, and unregulated or disorderly deployment represents an ever-increasing and true threat to the health, welfare and safety of the community.

(13) The regulations of wireless installations including in the public right-of-way are necessary to protect and preserve the aesthetics in the community, as well as the values of properties within the [City/Town], and to ensure that all wireless telecommunications facilities are installed using the least intrusive means possible.

(14) The [City/Town] finds that in light of more recent developments in federal and state law with respect to the regulation of small cell and other wireless telecommunications facilities, there is a need for the [City/Town] to update its ordinances based on current telecommunications trends, updates in laws, as well as aesthetic and location options for wireless facilities. The [City/Town] finds that overburdened utility poles can present a hazard of collapsing and failing; that wireless facilities may present an electrical hazard and/or increase the risk of electrical fires if not properly regulated, installed and monitored.

(15) The [City/Town] finds that a personal residence is for most homeowners their single greatest financial asset, and that proximity of wireless facilities has been shown to adversely affect property values of personal residences. The [City/Town] further finds that aesthetic considerations in residential zones are especially important in close proximity to personal residences.

(16) The [City/Town] recognizes its responsibilities under the Federal Telecommunications Act of 1996 and state law and believes that it is acting consistent with the current state of the law in ensuring that irreversible development activity does not occur that would harm the public health, safety, or welfare. The [City/Town] does not intend that this Ordinance prohibit or have the effect of prohibiting telecommunications service; rather, it includes appropriate regulations to ensure that the installation, augmentation and relocation of wireless telecommunications facilities including in the public right-of-way are conducted in such a manner as to lawfully balance the legal rights of applicants under the Federal Telecommunications Act, the Connecticut Public Utilities Regulatory Authority and the Connecticut Siting Council statutes while, at the same time, protect to the full extent feasible against the safety and land use concerns described herein.

(17) Accordingly, regulating the installation of Wireless Telecommunications Facilities in the [City/Town] is necessary to protect and preserve the aesthetics in the community, as well as the values of properties within the [City/Town], and to ensure that all Wireless Telecommunications Facilities are installed using the least intrusive means possible.

Based on the foregoing, the [insert city/town governing board] finds and determines that the preservation of the public health, safety and welfare requires that this Ordinance be enacted.

WHEREAS, adoption of this Ordinance is consistent with the [City/Town]'s Plan of Conservation and Development. The [City/Town]'s Plan of Conservation and Development provides goals and policies to preserve the high-quality design, community character, aesthetics and environmental characteristics while also maintaining a strong, healthy economy for its local business and assuring the health and safety of the predominantly residential character of the community. Adoption of this Ordinance will provide uniform and comprehensive regulations and standards for wireless telecommunications facilities in the municipally regulated right of way in furtherance of these goals and objectives while reducing the potentially negative impacts.

NOW, THEREFORE, the [insert city/town governing board] of the Town of _____does ordain as follows:

Section 1. The [insert name of city/town] Municipal Code is hereby amended as follows: A new Chapter 9 of the [city/town] Municipal Code is hereby enacted as set forth in Exhibit A to this Ordinance, which is hereby incorporated as though set forth in full herein.

Section 2. The [insert city/town governing board] hereby finds that Adoption of this Ordinance will enact only minor changes in right of way regulations, and it can be seen with certainty that

its adoption will not have a significant effect on the environment The wireless facilities themselves – specifically requiring right of way permits, and the installation of small ancillary equipment and facilities – are exempt from CEPA. The Ordinance does not constitute a "project" within the meaning of the Connecticut Environmental Policy Act of 1971.

Section 3. Severability. If any section, subsection, sentence, clause, phrase, or word of this Ordinance is, for any reason, deemed or held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, or preempted by legislative enactment, such decision or legislation shall not affect the validity of the remaining portions of this Ordinance. The [insert city/town governing board] of the [City/Town] of _____ hereby declares that it would have adopted this Ordinance and each section, subsection, sentence, clause, phrase, or word thereof, regardless of the fact that any one or more sections, subsections, clauses, phrases, or word might subsequently be declared invalid or unconstitutional or preempted by subsequent legislation.

Section 4. Effective Date. This Ordinance shall be effective 30 days following its adoption by the [insert city/town governing board]. Copies of this Ordinance shall, within fifteen days after its passage and adoption, be posted in public places in the [City/Town] of_____, as required by public notice requirements.

The foregoing ordinance was introduced at a regular meeting of the [insert city/town governing board] of the [City/Town] of _____ held in said [City/Town] on the ___th day of (month) 2020, and duly adopted at the next regular meeting of the [insert city/town governing board] on the __th day of (month) 2020 by the following vote, to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

Exhibit A

Ordinance

Title No. 9: Street Public Right of Way Ordinance

§1-1. Title.

This ordinance shall be known and may be cited as the "Street Public Right of Way Ordinance of the City/Town of _____."

§ 1-2. Definitions.

A. For the purpose of this ordinance, the following terms, phrases, words and their derivations shall have the meanings given herein:

ABOVEGROUND WORK – Any work connected with excavation or above ground surface required to install, remove or modify utilities that falls within the right of way.

APPLICANT — Any person making written application to the Director of Public Works for a permit hereunder.

DIRECTOR OF PUBLIC WORKS — The Director of Public Works of the City/Town of _____ or his agent.

EMERGENCY – means a condition that poses a clear and immediate danger to life, health, or safety of a person, or of significant damage or loss of real or personal property.

EXCAVATION WORK — The excavation and other work permitted under a permit and required to be performed under this ordinance.

FIRST GAIN – Each town, city, borough, fire district or the Department of Transportation shall have the right to occupy and use for any purpose, without payment therefor, one gain upon each public utility pole or in each underground communications duct system installed by a public service company within the limits of any such town, city, borough or district. The location or relocation of any such gain shall be prescribed by the Public Utilities Regulatory Authority. Any such gain shall be reserved for use by the town, city, borough, fire district or the Department of Transportation.

FACILITY – means any tangible thing, including but not limited to pipes, mains, conduits, cables, wires, poles, towers, traffic and other signals, and other equipment, appurtenances, appliances and future technology of any Utility in, on, along, over, or under any part of the Rights of Way within the city/town.

PERMIT – means an authorization which grants permission to conduct specific regulated activities on, in, over, under or within any public right-of-way, and which may be subject to

conditions specified in a written agreement with the city/town or in a related provision of this ordinance.

PERMITTEE — Any person who has been granted and has in full force and effect an excavation permit issued.

PERSON — Any person, firm, partnership, association, corporation, company or organization of any kind.

PUBLIC UTILITIES REGULATORY AUTHORITY– A state agency responsible for, among many other things, regulating electric distribution systems, telecommunications and for prescribing regulations for first gain use of public utilities poles or underground conduit for municipal use.

RIGHT OF WAY – The public way – both above and below ground – required to provide unimpeded travel within local road systems of the city/town and provide access to overhead or below ground public services required for the public health safety and general welfare. Right(s) of Way means the surface and space in, on, above, within, over, below, under or through any real property in which the city/town has an interest in law or equity, whether held in fee, or other estate or interest, or as a trustee for the public, including, but not limited to any public street, boulevard, road, highway, freeway, lane, alley, court, sidewalk, parkway, or any other place, area, or real property owned by or under the legal or equitable control of the city/town, now or hereafter, that consistent with the purposes for which it was dedicated, may be used for the purposes of constructing, operating, repairing or replacing Facilities.

SHOT CLOCK – The Federal Communications Commission has established timetables for the approval of permits for small wireless facilities depending on whether they involve new installations or modifications to exiting installations as set forth in FR 83;199 Oct. 15, 2018.

SMALL CELL WIRELESS FACILITIES (SWF) – A cellular mobile broadband network facility capable of delivering high transmission speeds over relatively short distances. The licensing for SWF facilities falls within the jurisdiction of the Federal Communications Commission.

STREET — Any street, highway, sidewalk, alley, avenue or other public way or public grounds in the city/town. Street or Streets means the surface of, as well as the spaces above and below, any and all the streets, alleys, avenues, roads, bridges, tunnels and public places within the corporate limits of the city/town, as the same now exist or may be hereafter extended or altered, and any location thereon, thereover or thereunder, and any portion thereof.

UTILITY – All privately, publicly, or cooperatively owned systems for producing, transmitting, or distributing communication, data, information, telecommunication, cable television, video services, power, electricity, light, heat, gas, oil, crude products, water/sewer, steam, fire and police signals, traffic control devices, and street lighting systems, and housing or conduit for any of the foregoing, which directly or indirectly serve the public or any part thereof. The term "utility" may also be used to refer to the owner, operator, Utility, service, contractor or subcontractor, or any agent thereof, of any above-described utility or utility facility.

CITY/TOWN — The City/Town of _____.

B. When not inconsistent with the context, words used in the present tense include the future; words in the plural number include the singular number; and words in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.

§ 1-3. Permit required.

It shall be unlawful for any person, except a duly authorized officer, agent or employee of the city/town, to dig up, excavate, tunnel, undermine or in any manner break up any street or to make or cause to be made any excavation in or under the surface of any street for any purpose or to place, deposit or leave upon any street any earth or other excavated material unless such person shall first have obtained an excavation permit therefor from the Director of Public Works as herein provided.

§ 1-4. Application.

No permit shall be issued unless a written application for the issuance is submitted to the Director of Public Works. The written application shall state the name and address of the applicant, the nature, location and purpose of the work (e.g., excavation, utility installations or modifications – either above or below ground), the date of commencement and date of completion of the work and other data as may reasonably be required by the Director of Public Works. The application shall be accompanied by plans or sketches showing the extent of the proposed work, and in the case of excavation work, the dimensions and elevations of both the existing ground prior to said excavation and of the proposed excavated surfaces, the location of the excavation work. In the case of aboveground work, the application shall include the nature of utility work to be performed, the impact of this work on sidewalks, intersection clear zones, and driveway visibility and such other information as may be prescribed by the Director, and shall be signed by the applicant. The application cannot be accepted unless it provides the required elements listed in Appendix B and in Section 1-10.23.

§ 1-5. Permit fees.

A permit fee shall be charged by the Director of Public Works for the issuance of a permit which shall be in addition to all other fees for permits or charges relative to any proposed construction work. The permit fee shall be in an amount established by the [insert governing body of the city/town].

§ 1-6. Surety bond.

Before a permit is issued, the applicant shall deposit with the Director of Public Works a surety bond payable to the city/town in the amount of 100% of the estimated cost, as prescribed by the Director of Public Works, of restoring the street opening, and in no event shall such bond be in an amount of less than $10,000.

A. The required surety bond must be:

(1) With good and sufficient surety.

(2) Issued by a surety company which is authorized to transact business in this state.

(3) Satisfactory to the city/town Attorney in form and substance.

(4) Conditioned upon the permittee's compliance with this ordinance to secure and hold the city/town and its officers harmless against any and all claims, judgments or other costs arising from the excavation and other work covered by the permit or for which the city/town or any city/town officer may be made liable by reason of any accident or injury to persons or property through the fault of the permittee, either in not properly guarding the excavation or for any other injury resulting from the negligence of the permittee, and to fill up and restore in good and safe condition as near as may be to its original condition and to the satisfaction of the Director of Public Works all openings and excavations made in streets, and to maintain any street where an excavation is made in as good condition for the period of 24 months after said work shall have been done, usual wear and tear excepted, as existed before said work was undertaken. Any settlement of the surface within said two-year period shall be deemed conclusive evidence of defective backfilling by the permittee. Nothing herein contained shall be construed to require the permittee to maintain any repairs to pavement made by the city/town if such repairs should prove defective.

B. Recovery on such bond for any injury or accident shall not exhaust the bond, but it shall in its entirety cover any or all future accidents or injuries during the work for which it was given. In the event of any suit or claim against the city/town by reason of the negligence or default of the permittee, upon the city/town giving written notice to the permittee of such suit or claim, any final judgment against the city/town requiring it to pay for such damage shall be conclusive upon the permittee and his surety.

C. An annual bond may be given under this provision which shall remain in force for one year, conditioned as above, in the amount as above prescribed and in other respects as specified above and applicable as to all work in streets by the principal in such bond during the term of two years from the completion of the work.

§ 1-7. Issuance of permit; expiration.

Upon the filing of the application accompanied by the bond and certificate of insurance, as provided in the preceding section, and payment to the Director of Public Works, for the use of the city/town, of the application fee as required, the Director of Public Works may issue a permit to the applicant to make the opening, excavation or aboveground work in or on the street designated in the application. Prior to the issuing of the permit, the Director of Public Works or his designee shall forward the application to the Police Department for notification and approval.

The Chief of Police or his designee will, within one business day, return the application to the Director of Public Works with recommendations on whether traffic control is required. The earliest date of the opening of the street shall be set at seven business days from the date the Police Department returns the application to the Director of Public Works. In the case of any work which disrupts public roadways but does not require a permit (e.g., routine maintenance) the Police Department shall notify the Director of Public Works of such work and any traffic disruptions that it may cause. In addition to the fee, the Director of Public Works may, in lieu of the bond under § 1-6, require of the applicant the deposit of an amount of cash or collateral sufficient to cover the reasonable costs of resurfacing the highway upon completion of the opening or excavation or aboveground alteration of land within the right of way, which deposit may be used as provided in § 1-6 of this ordinance. Unless work shall commence under the permit within 30 days from the date of issuance, such permit shall expire, unless the same is renewed by the Director of Public Works for a like term upon the payment of a like fee.

§ 1-8. Routing and control of traffic.

In order to protect the public from accidents and to minimize the impediment of vehicular and/or pedestrian traffic within the limits of any city/town or state roadway within the limits of the city/town of _____, the Chief of Police or his/her designee may require that traffic control services and/or devices be employed by the person or entity conducting such work or responsible for such activity, consistent with such rules and regulations as the traffic authority of the city/town may enact. Traffic control services may be required for excavation and aboveground utility work, for which a permit has been approved. They may also be required for any contractors' and/or utilities' operations which are engaged in work that disrupts normal traffic or pedestrian movement. The permittee or contractor shall take appropriate measures to assure that, during the performance of the excavation or other aboveground work, traffic conditions shall be maintained as nearly normal as practicable at all times so as to cause as little inconvenience as possible to the occupants of the abutting properties and to the general public. In addition, the Director of Public Works may require the closing of streets to all traffic for a period of time if, in his opinion, it is necessary. The permittee or contractor shall route and control traffic, including its own vehicles, as directed by the city/town Police Department. The following steps shall be taken before any highway may be closed or restricted to traffic:

§ 1-9. Clearance for fire equipment.

The excavation or aboveground work shall be performed and conducted so as not to interfere with access to fire stations and fire hydrants. Materials or obstructions shall not be placed within 15 feet of fire plugs. Passageways leading to fire escapes or fire-fighting equipment shall be kept free of piles of material or other obstructions.

A. The permittee or contractor must receive the approval of the Director of Public Works and/or the Police Department, as appropriate.

B. The cost and expense of such traffic control measures shall be borne by the person or entity conducting or responsible for such work or activity. In the event that traffic direction services are required, such services shall be obtained from the _____ Police Department, provided that, if the Police Department is unable within a reasonable time to furnish the officer or officers that may be required, a qualified traffic flag person or persons may alternatively be employed until a police officer is available to be assigned.

C. The permittee or contractor will ensure that notifications are made to all emergency services and the Director of Public Works regarding any approved street closure, the duration of the closure, and the resumption of normal traffic flow following removal of the closure. These notifications may be conveyed by the Police Department if department personnel have been hired to regulate such closure.

D. Through traffic shall be maintained without detours, if possible. In instances where prolonged detours are required, they shall be designated by the Director of Public Works. Temporary detours may be designated by the Police Department. The city/town shall maintain the surfaces of existing highways designated as detours without expense to the permittee or contractor; however, in the event that there are no existing highways, the permittee or contractor shall construct all detours at his expense and in conformity with the specifications of the Director of Public Works.

E. The permittee or contractor will be responsible for any unnecessary damage caused to any highways by the operation of his equipment.

§ 1-10.1 Barricades; protection of traffic.

The permittee shall erect and maintain suitable timber barriers to confine earth from trenches or other excavations in order to encroach upon highways as little as possible. The permittee shall construct and maintain adequate and safe crossings over excavations and across highways under improvement to accommodate vehicular and pedestrian traffic at all street intersections. Vehicular crossings, decking and pedestrian crossings shall be provided as required by the Director of Public Works.

§ 1-10.2 Removal and protection of utilities.

A. The permittee shall not interfere with any existing utility without the written consent of the Director of Public Works and the utility company or person owning the utility. If it becomes necessary to remove an existing utility, this shall be done by its owner.

B. No utility owned by the city/town shall be moved to accommodate the permittee unless the cost of such work is borne by the permittee. The cost of moving privately owned utilities shall be similarly borne by the permittee unless it makes other arrangements with the person owning the utility. The permittee shall support and protect by timbers or otherwise all pipes, conduits, poles, wires or other apparatus which may be in any way affected by any excavation work and do everything necessary to support, sustain and protect them under, over, along or across said

work. In case any of said pipes, conduits, poles, wires, fiber optic cable, or apparatus should be damaged, they shall be repaired by the agency or person owning them, and the expense of such repairs shall be charged to the permittee and his or its bond shall be liable therefor. The permittee shall be responsible for any damage done to any public or private property by reason of the breaking of any water pipes, sewer, gas pipe, electric conduit, fiber optic cable, or other utility and the bond shall cover such damage.

C. The permittee shall be responsible for determining the existence and location of all underground utilities and shall protect the same against damage.

§ 1-10.3. Protection of adjoining property.

A. The permittee shall at all times and at his or its own expense preserve and protect from injury any adjoining property by providing proper foundations and taking other measures suitable for the purpose.

B. Where, in the protection of such property, it is necessary to enter upon private property for the purpose of taking appropriate protective measures, the permittee shall obtain a license from the owner of such private property for such purpose, and, if he cannot obtain a license from such owner, the Director of Public Works may authorize him to enter the private premises solely for the purpose of making the property safe.

C. The permittee shall, at his expense, shore up and protect all buildings, walls, fences or other property likely to be damaged during the progress of the excavation or aboveground work and shall be responsible for all damage to public or private property or highways resulting from his failure to protect and carry out properly said work.

D. Whenever it may be necessary for the permittee to trench through any lawn area, the sod shall be carefully cut and rolled and replaced after ditches have been backfilled as required in this ordinance. All construction and maintenance work shall be done in a manner calculated to leave the lawn area clean of earth and debris and in a condition as nearly as possible to that which existed before such work began. The permittee shall not remove, even temporarily, any trees or shrubs which exist in parking strip areas or easements across private property without first having notified and obtained the consent of the property owner or, in the case of public property, the appropriate city/town department or official having control of such property.

§ 1-10.4. Sidewalk excavations.

Any excavation or alteration made in any sidewalk or under a sidewalk shall be provided with a substantial and adequate footbridge over said excavation on the line of the sidewalk, which bridge shall be at least three feet wide and securely railed on each side so that foot passengers can pass over safely at all times.

§ 1-10.5. Protective measures.

The permittee shall erect such fence, railing or barriers about the site of the excavation work as shall prevent danger to persons using the city/town street or sidewalks, and such protective barriers shall be maintained until the work is completed or the danger removed. At twilight there shall be placed upon such place of excavation and upon any excavated materials or structures or other obstructions to streets suitable and sufficient lights which shall be kept burning throughout the night during the maintenance of such obstructions. It shall be unlawful for anyone to remove or tear down the fence or railing or other protective barriers or any lights provided there for the protection of the public.

§ 1-10.6. Attractive nuisances.

It shall be unlawful for the permittee to suffer or permit to remain unguarded at the place of excavation or opening or to leave unguarded any hazardous live electrical lines or any machinery, equipment or other device constituting an attractive nuisance.

§ 1-10.7. Care of excavated material.

All material excavated from trenches and piled adjacent to the trench or in any street shall be piled and maintained in such manner as not to endanger those working in the trench, pedestrians or users of the streets and so that as little inconvenience as possible is caused to those using streets and adjoining property. Where the confines of the area being excavated are too narrow to permit the piling of excavated material beside the trench, such as might be the case in a narrow alley, the Director of Public Works shall have the authority to require that the permittee haul the excavated material to a storage site and then re-haul it to the trench site at the time of backfilling. It shall be the permittee's responsibility to secure the necessary permission and make all necessary arrangements for all required storage and disposal sites.

§ 1-10.8. Damage to existing improvements.

All damage done to existing improvements during the progress of the excavation or aboveground work shall be repaired by the permittee. Materials for such repair shall conform to the requirements of any applicable code or ordinance. If, upon being ordered, the permittee fails to furnish the necessary labor and materials for such repairs, the Director of Public Works shall have the authority to cause said necessary labor and materials to be furnished by the city/town, and the cost shall be charged against the permittee, and the permittee shall also be liable on his or its bond therefor.

§ 1-10.9. Property lines and easements.

Property lines and limits of easements shall be indicated on the plan of excavation or aboveground work submitted with the application for the permit, and it shall be the permittee's responsibility to confine excavation and aboveground work within these limits.

§ 1-10.10. Cleanup.

As the work progresses, all streets and private properties shall be thoroughly cleaned of all rubbish, excess earth, rock and other debris resulting from such work. All cleanup operations at the location of such excavation or aboveground work shall be accomplished at the expense of the permittee and shall be completed to the satisfaction of the Director of Public Works. From time to time, as may be ordered by the Director of Public Works and in any event immediately after completion of said work, the permittee shall, at his or its own expense, clean up and remove all refuse and unused materials of any kind resulting from said work, and, upon failure to do so within 24 hours after having been notified to do so by the Director of Public Works, said work may be done by the Director of Public Works and the cost thereof charged to the permittee, and the permittee shall also be liable for the cost thereof under the surety bond provided hereunder.

§ 1-10.11. Provisions for watercourses and Stormwater runoff.

The permittee shall provide for the flow of all watercourses, sewers or drains intercepted during any excavation work and shall replace the same in as good condition as existed before undertaking such work or shall make such provisions for them as the Director of Public Works may direct. The permittee shall not obstruct the gutter of any street, but shall use all proper measures to provide for the free passage of surface water. The permittee shall make provision to take care of all surplus water, muck, silt, slickings or other runoff pumped from excavations or resulting from sluicing or other operations and shall be responsible for any damage resulting from its failure to so provide. If the permittee will disturb one acre or more of land inside or abutting the right of way during the term of the permit, he must provide proof of compliance with Connecticut Department of Energy and Environmental Protection General Permit for Discharge of Stormwater and Dewatering and Wastewaters from Construction Activities.

§ 1-10.12. Breaking through pavement.

Whenever it is necessary to break through existing pavement for excavation purposes and where trenches are to be four feet or over in depth, the pavement in the base shall be removed to at least six inches beyond the outer limits of the subgrade that is to be disturbed, in order to prevent settlement, and a six-inch shoulder of undisturbed material shall be provided in each side of the excavated trench. The face of the remaining pavement shall be approximately vertical. A power-driven concrete saw shall be used so as to permit complete breakage of concrete pavement or base without ragged edges. Asphalt paving shall be scored or otherwise cut in a straight line.

§ 1-10.13. Tunnels.

Tunnels under pavement shall not be permitted except by permission of the Director of Public Works and, if permitted, shall be adequately supported by timbering and backfilling under the direction of the Director of Public Works.

§ 1-10.14. Backfilling.

Backfilling in any street opened or excavated pursuant to a permit issued hereunder shall be compacted to a degree equivalent to that of the undisturbed ground in which the trench was dug. Compacting shall be done by mechanical tappers or vibrators, by rolling in layers or by water settling, as required by the soil in question and sound engineering practices generally recognized in the construction industry. The decision as to whether a trench shall be backfilled by water settling shall be based upon such engineering practices and shall be made by the Director of Public Works.

A. **Backfilling by water settling**. When backfilling is done by water settling, excavated materials above utility installations shall be deposited uniformly in layers of not more than five feet in thickness and shall be thoroughly flooded. During the flooding, the water shall be allowed to flow slowly to the trench from high points and shall be worked down to the full depth of the layer of backfill with bars. All bars used shall be long enough to extend entirely through the layer being filled and shall be forced down through the loose backfill material. As the bars are withdrawn, the water shall be allowed to flow downward around the bar. The channel or hole formed by the bar shall be kept open and the water kept running into it until the fill has settled. All work shall be done in such manner as to obtain a relative compaction through the entire depth of the backfill of not less than that existing adjacent to the excavation.

B. **Dry backfilling**. Backfilling up to the first 18 inches above the top of the utility pipes or similar installations shall be done with thin layers. Each layer is to be tamped by manual or mechanical means. Layers that are hand tamped shall not exceed four inches in thickness. Layers that are power tamped shall not exceed six inches in thickness. The same requirements shall apply to the remainder of the backfilling if tamping is the method used for backfilling. Backfilling of all pipes of over 24 inches in diameter shall be carried up to the spring line of the pipe in three-inch layers, with each layer moistened and thoroughly tamped with suitable mechanical equipment. The backfill around all pipes 24 inches or less in diameter shall be flooded or tamped as specified above to a depth of 18 inches above the top of the pipe before any additional backfilling is placed thereon.

C. **Backfill material**. Whenever any excavation for the laying of pipe is made through rock, the pipe shall be laid six inches above the rock bottom of the trench and space under, around and six inches above the pipe shall be backfilled with clean river sand, noncorrosive soil or one-fourth (1/4) inch minus gravel. Broken pavement, large stones and debris shall not be used in the backfill.

D. **Backfilling at the surface**. Backfilling shall be completed by placing the backfill material well over the top of the trench. For dry backfilling, the material shall be compacted with a roller of an approved type or with the rear of a truck carrying at least five tons until the surface is unyielding. The surface shall then be graded as required.

§ 1-10.15. Restoration of surface.

The permitted shall restore the surface of all streets broken into or damaged as a result of the excavation or aboveground work to its original condition in accordance with the specifications of the Director of Public Works.

A. **Temporary restoration.**

(1) The permittee may be required to place a temporary surface over openings made in paved traffic lanes. Except when the pavement is to be replaced before the opening of the cut to traffic, the fill above the bottom of the paving slab shall be made with suitable material well tamped into place, and this fill shall be topped with a minimum of at least one inch of bituminous mixture which is suitable to maintain the opening in good condition until permanent restoration can be made. The crown of the temporary restoration shall not exceed one inch above the adjoining pavement. The permittee shall exercise special care in making such temporary restorations and must maintain such restorations in safe traveling condition until such time as permanent restorations are made. The asphalt which is used shall be in accordance with the specifications of the Director of Public Works.

(2) If, in the judgment of the Director of Public Works, it is not expedient to replace the pavement over any cut or excavation made in the street upon completion of the work allowed under such permit by reason of the looseness of the earth or weather conditions, he may direct the permittee to lay a temporary pavement of wood or other suitable material designated by him over such cut or excavation to remain until such time as the repair of the original pavement may be properly made.

B. **Permanent Restoration**. The street shall be permanently restored by the permittee in strict accordance with the specifications prescribed by the Director of Public Works to restore the street to its original and proper condition or as near as may be.

C. **Surety Bond.** Acceptance or approval of any excavation or aboveground work by the Director of Public Works shall not prevent the city/town from asserting a claim against the permittee and his or its surety under the surety bond required hereunder for incomplete or defective work if discovered within 24 months from the completion of the work. The Director of Public Works' presence during the performance of any work shall not relieve the permittee of its responsibilities hereunder.

D. **City/Town right to restore surface**. If the permittee shall have failed to restore the surface of the street to its original and proper condition upon the expiration of the time fixed by such permit or shall otherwise have failed to complete the excavation or aboveground work covered by such permit, the Director of Public Works, if he deems it advisable, shall have the right to complete all work necessary to restore the street and to complete such work. The permittee shall be liable for the actual cost thereof and 25% of such cost in addition for general overhead and administrative expenses. The City/Town shall have a cause of action for all fees, expenses and amounts paid out and due for such work and shall apply in payment of the amount due any

funds of the permittee deposited as herein provided and the city/town shall also enforce its rights under the permittee's surety bond provided pursuant to this ordinance.

E. **Maintain Site Conditions.** It shall be the duty of the permittee to guarantee and maintain the site of the excavation or aboveground work in the same condition as existed prior to the commencement of work, for two years after restoring such site to its original condition.

§ 1-10.16. Trenches for pipe laying.

Except by special permission from the Director of Public Works, no trench shall be excavated more than 250 feet where pipe has been laid. The length of the trench that may be opened at any one time shall not be greater than the length of pipe and the necessary accessories which are available at the site ready to be put in place. Trenches shall be braced and sheathed according to generally accepted safety standards for construction work as prescribed by the Director of Public Works. No timber bracing, lagging, sheathing or other lumber shall be left in any trench.

§ 1-10.17. Prompt completion of work.

The permittee shall prosecute with diligence and expedience all excavation and aboveground work covered by the permit and shall promptly complete such work and restore the street to its original condition, or as near as may be, as soon as practicable and in any event not later than the date specified in the permit therefor.

§ 1-10.18. Urgent work.

If, in his judgment, traffic conditions, the safety or convenience of the traveling public or the public interest require that the work be performed as emergency work, the Director of Public Works shall have full power to order, at the time the permit is granted, that a crew be employed by the permittee 24 hours a day, to the end that such excavation or aboveground work may be completed as soon as possible.

§ 1-10.19. Emergency action.

In the event of any emergency in which a sewer, main, conduit or utility above, in or under any street breaks, bursts or otherwise is in such condition as to immediately endanger the property, life, health or safety of any individual, the person owning or controlling such sewer, main, conduit or utility, without first applying for and obtaining a permit hereunder, shall immediately take proper emergency measures to cure or remedy the dangerous conditions for the protection of property, life, health and safety of individuals. However, such person owning or controlling such facility shall apply for a permit not later than the end of the next succeeding day during which the Director of Public Works office is open for business and shall not proceed with permanent repairs without first obtaining an excavation permit hereunder.

§ 1-10.20. Noise, dust and debris.

Each permittee shall conduct and carry out the excavation or aboveground work in such manner as to avoid unnecessary inconvenience and annoyance to the general public and occupants of neighboring property. The permittee shall take appropriate measures to reduce to the fullest extent practicable, in the performance of the excavation or aboveground work, noise, dust and unsightly debris and, during the hours of 10:00 p.m. and 7:00 a.m., shall not use, except with the written permission of the Director of Public Works or in case of an emergency as herein otherwise provided, any tool, appliance or equipment producing noise of sufficient volume to disturb the sleep or repose of occupants of the neighboring properties.

§ 1-10.21. Preservation of monuments.

The permittee shall not disturb any surface monuments or hubs found in the line of excavation work until ordered to do so by the Director of Public Works.

§ 1-10.22. Inspections.

The Director of Public Works shall make such inspections as are reasonably necessary in the enforcement of this ordinance. The Director of Public Works shall have the authority to promulgate and cause to be enforced such rules and regulations as may be reasonably necessary to enforce and carry out the intent of this ordinance.

§ 1-10.23. Drawings, Maps and Certifications

Users of surface and subsurface street space shall maintain accurate drawings, plans, certifications and profiles showing the location and character of all aboveground and underground structures, including abandoned installations and comply with Section 1-10.23N. When small wireless facility installations require trenching, new or repair work on existing aboveground utility, decorative and other structures in the right of way, they shall comply with Sections 1-10.23A through 1.10.23N.

§ 1-10.23.A Vertical and Horizontal Clearance. The permittee shall identify the vertical clearance of the fiber optic cable, utility, or other buried piping system from existing utilities. Horizontal clearances for installed fiber optic shall comply with guidelines established by the Public Works Department. Fiber Optic cable shall be installed at least three feet from the face of the curb – or where no curb exists from the edge of the pavement unless right of way constraints require a lesser setback.

§ 1-10.23.B Identify ADA Path of Travel. The permittee shall identify the minimum 4-foot-wide American Disabilities Act Path of Travel between above ground utility structure(s) and the edge of Path of Travel/sidewalk. Manholes and hand holes shall not be in the Path of Travel.

§ 1-10.23.C Driveway Flare Setbacks. Identify the minimum required 3-foot separation between any above grade utility structure(s) and existing driveway flare in accordance with standard drawing available from the city/town Director of Public Works.

§ 1-10.23.D Intersection Line of Sight. Any above grade obstruction 3 feet or greater in height that are placed at intersections or driveway shall evaluate sight distance requirements per AASHTO Standards, the city/town Zoning and Subdivision Regulations and the line of sight guidelines in Appendix A.

§ 1-10.23.E Pole/Pedestal Setback. Identify the minimum required 24-inch clearance between the replacement/new Pole/pedestal and face of curb in accordance with Standard drawings available from the city/town Director of Public Works.

§ 1-10.23.F Pole/Pedestal Ancillary Equipment. Identify the minimum required height clearance above ground level for ancillary equipment installed on the replacement/new Pole/pedestal in accordance with Standard drawings available from the city/town Director of Public Works.

§ 1-10.23.G Identify Improvements in Right of Way. Identify all existing public and private improvements within the area where excavation or aboveground work is proposed, such as driveways, utility boxes, fire hydrants, trees, curb ramps, street signs, etc. In the case of trees, identify procedures to protect tree root systems with minimum setbacks from tree roots in accordance with Standard drawings available from the city/town Director of Public Works.

§ 1-10.23.H Municipally Owned Traffic Signals. Only one Small wireless facility may be allowed on traffic signal armature if it complies with traffic safety standards. Permittee shall identify if traffic signals in the area of the proposed construction have a small wireless facility installed.

§ 1-10.23.I Radio Frequency-Electromagnetic Energy (RF-EME) Compliance Report. Provide a radio frequency-electromagnetic energy compliance report for each small cell wireless facility to be installed within the road right of way. The elements of an acceptable compliance report are available from the city/town Director of Public Works.

§ 1-10.23.J Kill Switch on Pole/Pedestal. Identify the location of the Kill Switch on the Utility, decorative or other structure used for the installation of small cell wireless facilities.

§ 1-10.23.K Antennas, Signs, Banners & Ancillary Equipment. The following components of each small cell wireless facility proposed to be installed in the right way shall be identified on individual diagrams specific to each pole. Items to be identified on pole specific diagrams are Top Antenna Mount, Side Antenna Mount, Ancillary Equipment Mount, Signs required by the Federal Communications Commission, the Connecticut Siting Council, the Connecticut Public Utilities Regulatory Authority and/or the city/town of _____Planning and Zoning Commission.

§ 1-10.23.L Access to Municipal Electricity Street Lights. The permittee shall identify whether the proposed small cell wireless facilities will require access to an existing electric service line established on a street light pole and the amount of power required for each installation as

measured in amps, the existing power consumption of the street light and who will be paying for the power consumed.

§ 1-10.23.M First Gain Commitments. The permittee shall identify any commitments to "first gain" provisions for fiber optic cable installed above or below ground including the number of fiber optic strands dedicated to municipal use as part of the proposed application and as governed by a license agreement between the permittee and city/town. The permittee will comply with the Public Utilities Regulatory Authority's regulations that prescribe the use of "first gain" in street right of ways.

§ 1-10.23.N As-Built Maps. Corrected maps shall be filed with the city/town Director of Public Works within 60 days after new installations, changes or replacements are made.

§ 1-10.24. Application to City/Town work.

The provisions of this ordinance shall not be applicable to any excavation or aboveground work under the direction of city/town authorities by employees of the city/town or by any contractor of the city/town performing work for and in behalf of the city/town in connection with openings or excavations or aboveground work on or in streets.

§ 1-10.25. Application to public utilities.

Any person operating any such public utility shall comply with the bonding requirements of this ordinance, unless exempted by § 16-230 of the Connecticut General Statutes.

§ 1-10.26. Insurance.

A permittee, prior to the commencement of excavation or aboveground work hereunder, shall furnish the Director of Public Works satisfactory evidence, in writing, that the permittee has in force and will maintain in force during the performance of the excavation or aboveground work, and the period of the permit, public liability insurance of not less than $500,000 for any one person and $500,000 for any one accident and property damage insurance of not less than $100,000 duly issued by an insurance company authorized to do business in this state.

§ 1-10.27. Liability of City/Town.

This ordinance shall not be construed as imposing upon the city/town or any official or employee any liability or responsibility for damages to person injured by the performance of any excavation or aboveground work for which a permit is issued hereunder; nor shall the city/town or any official or employee thereof be deemed to have assumed any such liability or responsibility by reason of inspections authorized hereunder or the issuance of any permit or the approval of any excavation or aboveground work.

Appendix A: Measuring Visibility Area

The visibility area is a triangular portion of a premises formed by drawing one line perpendicular to and one line parallel to the property line or public right -of-way for a specified length and one line diagonally joining the other two lines, as shown in Diagram 1.

(a) The City/Town Engineer shall determine whether proposed development provides adequate sight distance based on the context of the development and the typical distance guidelines set forth in Section (b) and shall require visibility areas accordingly. No structures may be located within a visibility area unless otherwise provided by the city/town of _____ Zoning Regulations.

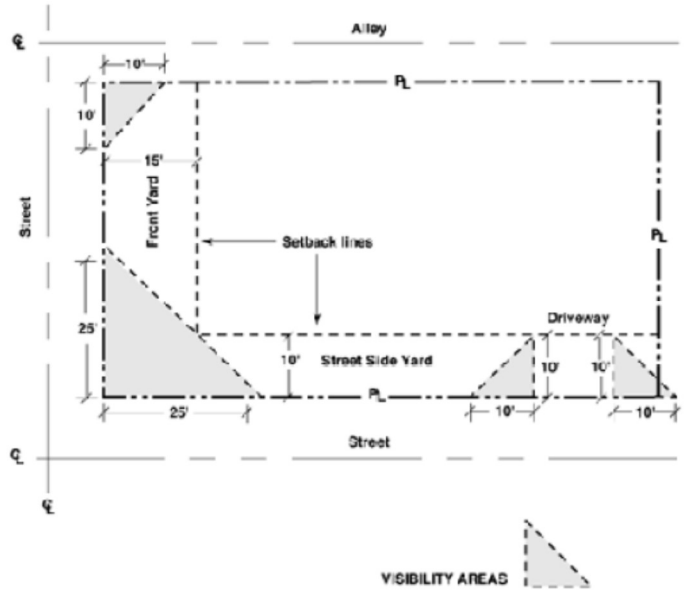
(b) Typical Distances Used to Measure Visibility Areas

(1) For visibility areas at the intersection of streets, two sides of the triangle extend along the intersecting property lines for 25 feet and the third side is a diagonal line that connects the two.
(2) For visibility areas at the intersection of a street and alley, two sides of the triangle extend along the intersecting property lines for 10 feet and the third side is a diagonal line that connects the two.

(3) For visibility areas at the intersection of a street and driveway, one side of the triangle extends from the intersection of the street and the driveway for 10 feet along the property line. The second side extends from the intersection of the street and driveway for 10 feet inward from the property line along the driveway edge and the third side of the triangle connects the two.

(4) Where the required front and street side yards measure less than 25 feet when combined, that measurement or 15 feet, whichever is greater, establishes the visibility area at the street intersection.

Diagram 1: Visibility Area



(c) The City/Town Engineer may modify the typical distance used to measure visibility areas in Section a) and (b) under the following conditions.

(1) The distance specified in Section (b) may be increased if the City/Town Engineer determines that a greater distance is required to maintain public health and safety.

(2) The distance specified in Section (b) may be reduced if the City/Town Engineer determines that the reduced distance would not create a public health and safety hazard.

Appendix B- Required Submission Elements

Applicant Information: Name, Address, email and Telephone of Applicant

Nature and Purpose of the Work: In narrative format, explain the type of work to be conducted and whether it involves any of the following types of work.

Excavation

Utility Installation

Utility Modification

Aboveground work

Installation of Small Wireless Facilities

Other (please explain)

Date Work Commences: Indicate the anticipated date work will commence

Anticipated Length of Work: Indicate how long the work will take approval (in days)

Plans and Sketches of the proposed Work showing;

Dimensions and elevations of existing ground

Dimensions and elevations of proposed excavated or altered surface conditions

Utility Work: Explain the nature of the utility work to be performed

Intersection Impacts: Describe the impacts to intersection clear zones

Sidewalk Impacts: Describe the impacts to sidewalks.

ADA Requirements: If work will impact sidewalks or street crossings, identify the minimum 4-foot-wide American Disabilities Act Path of Travel between above ground utility structure(s) and the edge of Path of Travel/sidewalk. Manholes and hand holes shall not be in the Path of Travel.

Driveway Impacts: Describe impacts on driveway visibility, driveway access and setbacks from driveways

Additional Requirements for **Small Wireless Facilities** in municipal rights of way:

Curb Setbacks: Identify minimum required 24-inch clearance between replacement/new pole/pedestal and face of curb in accordance with standard drawings available from the city/town Director of Public Works.

Traffic Signal Structure Use: If use of municipally owned traffic signals is requested for small wireless facilities, provide details how it will comply with traffic safety standards. Permittee shall

identify if traffic signals in the area of the proposed construction already have a small wireless facility installed.

Street Lights: If access to municipal electricity street lights is required, identify whether the proposed small cell wireless facilities require access to an existing electric service line established on a street light pole and the amount of power required for each installation as measured in amps, the existing power consumption of the street light and who will be paying for the power consumed. Identify if the street pole will be compatible with municipal designs.

Pole Diagrams: Identify on individual diagrams specific to each pole, each small cell wireless facility proposed to be installed in the local right way. Items to be identified on "pole specific diagrams" are top antenna mount, side antenna mount, ancillary equipment mount, and signs required by the Federal Communications Commission, the Connecticut Siting Council, and/or the Connecticut Public Utilities Regulatory Authority. The height of each antenna off the ground shall be indicated including the height of any ancillary equipment attached to the pole.

Pole Locations: Identify the location of poles used for small wireless facilities including pedestals, ancillary equipment that supports these facilities and their required curb setback. Indicate the nearest pole where a small wireless facility is already installed.

Concealment: Identify any concealment techniques to be used for ancillary equipment and antennas for the small wireless facilities.

Separation from Residences: Identify how far each small wireless facility will be located from residential dwelling units.

Radio frequency-electromagnetic energy compliance report: For each small cell wireless facility to be installed within the road right of way provide a report that indicates the small cell wireless facilities comply with FCC safety standards.

First Gain Options: Identify any commitments to "first gain" provisions for fiber optic cable installed above or below ground including the number of fiber optic strands dedicated to municipal use that may be part of the proposed application and whether a license agreement has been consummated between the applicant and city/town.

Compliance with PURA and CSC: Identify if the proposed work will also require approvals from the Public Utilities Regulatory Authority and/or the Connecticut Siting Council.

Authorized Signature: The applicant must attest to the accuracy of the information supplied by signing the application form and indicate if he is the owner or a representative of the owner for whom the work is being done.

APPENDIX D: TEN THINGS LOCAL ZONING COMMISSIONS CAN DO TO COMPLY WITH 2018 FEDERAL COMMUNICATIONS COMMISSION REGULATIONS AND PUBLIC CONCERNS

1. **Establish and/or Revise Location Preferences**: The Connecticut General Statutes authorize municipalities to establish siting and location preferences for towers (including small cell wireless facilities) yet less than 40% of WestCOG municipalities have done so. This is a key issue that needs to be remedied.
2. **Adopt Reasonable View Shed Regulations**: The Federal Communication Commission has ruled that local zoning regulations must provide reasonable view shed regulations.
3. **Establish Design Guidelines for Siting Small Cells**: Concealment of small cells on buildings and other structures should be considered as a key means to minimize their visual impacts as long as these strategies do not compromise radio frequency signal strength.
4. **Alternative Analysis**: Only 11 of the 18 municipalities in the region require an alternative site analysis before making a decision on the appropriate location for a tower or small cell wireless facility. Adopting a requirement that an alternative analysis must be provided for any proposal for a tower or small cell enables the zoning commission to make better decisions on the costs and benefits of any given proposal.
5. **Placement on Government Buildings**: The FCC has ruled that a government building can be used for the installation of small cell facilities if it is currently providing such services. Municipalities should consider the consequences of their current use of buildings for telecommunication systems – especially on school buildings, senior centers and other locations where public concerns with radio frequency exposure have been raised.
6. **Prohibiting Towers and Small Cell in Protected Open Space**: Only 3 municipalities in Western Connecticut prohibit towers in protected open space. While many municipalities may believe that such prohibitions are unacceptable, in 2001 the United States District Court for Connecticut ruled that such prohibitions are legal as long as they are based on rational standards and apply to land where strict limitations on development exist for protected open space areas (see Omnipoint Communications, Inc., v. Planning and Zoning Commission of the town of Guilford, 156 F.Supp.2d 212, No. Civ.A. 3-00-CV-2123 (JCH). United States District Court, D. Connecticut. August 2, 2001).
7. **Protection of Historic Buildings**: Currently, only 9 of the 18 municipalities in Western Connecticut explicitly require the protection of historic properties as part of the zoning approval process. In contrast, 54% of Connecticut's municipalities with telecommunication regulations have such standards.
8. **Approval Criteria**: Only 2 of the region's municipalities (i.e., 11% of municipalities in the region) explicitly identify their approval criteria for telecommunication towers and small cell wireless facilities. In contrast, 43 municipalities (25.7%) in Connecticut have such standards. This is an issue that will become more important in light of the FCC's emphasis on reasonable and objective review standards.

9. **Radio Frequency Emission Reports**: Only 10 of the 18 municipalities in Western Connecticut require the submission of a radio frequency emission report. While the FCC has declared that local governments have no authority in setting exposure standards, local governments can require documentation that any given installation complies with FCC's maximum permissible exposure limits.

10. **Establish Zoning Permit for Towers and Small Cells**: The FCC has established a shot clock for the approval of complete applications for new towers of 90 days and 60 days for modification of existing towers, including small cell wireless facilities. Special permit procedures make these timetables extremely challenging to achieve. Adopting a zoning permit process that requires compliance with highly specific standards, managed by the town planner for most routine applications, is one means to achieve compliance with FCC shot clock standards.

APPENDIX E: WHAT ARE THE COSTS OF MANAGING 5G IN YOUR MUNICIPALITY?

What Are the Costs to Manage 5G Deployment in Your Municipality?

To do so, determine the staff time assigned to each activity for each individual involved in managing the administration of small cell wireless facilities. Determine the labor rates and overhead costs for each staff person for each listed task. This analysis should also include the costs for consultative services for town counsel, outside experts and costs for public involvement issues attributable to 5G Deployment.

Anticipated Municipal Services Provided	Est. Hours (to Manage Typical Activity)	Est. Labor Rates (Staff Performing Work)	Est. Total Cost of Service
Review Zoning applications for completeness.			
Review, evaluate and make decisions on complete zoning applications.			
Review, evaluate and make decisions on construction, electrical, plumbing, engineering, and public health issues associated with small cell wireless facilities.			
Review requests for municipal road encroachment permits.			
Review small cell wireless facilities impacting Historic Districts, Village Districts and government properties.			
Review the design of small cell wireless facilities.			
Notify the public, hold meetings and hearing on small cell wireless facilities.			
Legal review of applications by city or town counsel.			
Coordinate reviews and evaluations with CT Siting Council, PURA, Council of Governments and adjoining affected municipalities.			
Retain outside consultants with expertise in radio frequency emissions, power density characteristics and telecommunication systems to review technical submissions submitted by applicants.			
Development and maintenance of municipal GIS, tax assessment systems, and other telecommunication related databases.			
Development and maintenance of websites to provide digital access on			

telecommunication projects to ensure effective public input.			
Support power deactivation and traffic control measures when fiber optic and/or small cells must be turned off during emergencies or to accomplish normal repair and maintenance.			
Coordination of alterations to small cells wireless facilities requiring municipal approval.			
Coordination with utility pole and ROW stakeholders when alterations are made.			

APPENDIX F: LISCENCE AGREEMENT RESOURCES

1. San Antonio, Texas License Agreement:

   https://sanantonio.legistar.com/LegislationDetail.aspx?ID=2356430&GUID=7C14D0C0-8C7A-48BB-87B9-D7BFC1DEA59B

2. Spokane, Washington License Agreement (see page 30):

   https://static.spokanecity.org/documents/citycouncil/advance-agendas/2016/08/city-council-advance-agenda-2016-08-29.pdf

3. Rancho Cucamonga Pending License Agreement (see page 364)

   https://rcdocs.cityofrc.us/WebLink/DocView.aspx?id=543487&page=7&searchid=43f21730-0b19-4d9b-879c-47d2f1706d32

4. Boston License Agreement with Crown Castle:

   https://www.boston.gov/sites/default/files/document-file-09-2017/083117_-_crown_castle_small_cell_license_agreement_signed.pdf

5. Verizon Master Licensing Agreement Template in New York State:

   https://www.verizon.com/wholesale/business/poleconduit/ctny/Poles-Conduits-ctny.html

6. Washington DC Master Licensing Agreement with Verizon and Permit Fees:

   https://octo.dc.gov/sites/default/files/dc/sites/octo/page_content/attachments/Verizon%20Master%20License%20Agreement.pdf

   https://dcregs.dc.gov/Common/DCMR/SectionList.aspx?SectionNumber=24-225

7. New York City License Agreement with Verizon (the city has over a dozen agreements):

   https://breitbart.files.wordpress.com/2008/05/verizon-new-york-proposed-citywide-cable-franchise-agreement.pdf

8. Bellevue Washington License Agreement:

   http://mrsc.org/getmedia/4b335f2f-2c4b-4e50-bfe8-3b3781114dba/b44smallcellmaster.pdf.aspx

9. Elk Grove, California License Agreement (see page 30):

   http://cityofelkgrove.hosted.civiclive.com/UserFiles/Servers/Server_109585/File/Commissions-Committees/planning/agendas/2019/Attachments/07-18-19_ITEM%205.2_Cingluar%20Code%20Amendment%20(EG-18-006)_Staff%20Report.pdf

10. Portland Maine Small Cell Wireless Agreement with Mobilite:

    https://www.portlandmaine.gov/DocumentCenter/View/18173/Order--98-1718

11. Modesto California Small Wireless License Agreement:

    https://tellusventure.com/downloads/bank/mla/modesto_template_mla_1jun2017.pdf

12. Lincoln Nebraska Small Cell Wireless Agreement with Verizon:

    https://muninetworks.org/sites/www.muninetworks.org/files/2017-01-Lincoln-Verizon-Small-Cell-Final.pdf

13. San Diego California Master Occupancy Agreement Template:

    https://www.sandiego.gov/sites/default/files/muoa_small_cell_2-22-2019.pdf

14. South Francisco California Master License Agreement Template and Draft License:

    https://tellusventure.com/downloads/bank/mla/south_san_francisco_template_mla_11apr2018.pdf

    https://ci-ssf-ca.legistar.com/LegislationDetail.aspx?ID=4199554&GUID=66A52707-02A1-4250-8BA8-4F58B8CC8C2B&Options=ID|Text|&Search=license+agreement

    https://ci-ssf-ca.legistar.com/LegislationDetail.aspx?ID=3880563&GUID=AAA80374-1CEE-4926-9486-11CD9BB27029

15. San Jose California Master Property Use Agreement, Mobilitie Agreement & City Website:

    https://tellusventure.com/downloads/bank/mla/san_jose_template_property_use_agreement_amendment_26jun2018.pdf

    https://moti.sanjosemayor.org/wp-content/uploads/2018/10/mobilitie-amendment.pdf

    https://www.sanjoseca.gov/your-government/department-directory/office-of-the-city-manager/civic-innovation/broadband-strategy-and-small-cell-deployment-5147

16. West Sacramento California approved License Agreement with AT&T:

    https://tellusventure.com/downloads/bank/mla/west_sacramento_att_mla_17jan2018.pdf

17. New Rochelle Illinois Master Attachment Agreement:

    https://www.cityofrochelle.net/government-documents/city-council-agendas-and-minutes/agendas/2018-city-council-meeting-documents/2018-08-13-agenda/5892-15-rochelle-7-16-18-rochelle-mobilitie-agreement/file.html

18. Newport Beach License Agreement:

    http://ecms.newportbeachca.gov/Web/DocView.aspx?dbid=0&id=1263341&page=1&cr=1

19. Lake Zurich, Illinois Master License Agreement with Verizon:

    https://lakezurich.org/DocumentCenter/View/10052/Verizon-Master-License-Agreement-5G-wireless-cells-November-2019

20. AT&T Model License Agreement:

    https://www.yorkcity.org/wp-content/uploads/2018/10/ATT-Wireless-Agreement.pdf

APPENDIX G: REQUIREMENTS FOR SMALL CELL WIRELESS FACILITIES IN MUNICIPAL ORDINANCES IN THE UNITED STATES: MARCH 2020

Elements of Municipal Ordinances Regulating Wireless Telecommunication Systems	FCC Model Ordinance	National League of Cities Model Ord.	Massachusetts Model Ordinance (Verizon issued)	Model by Americans for Responsible Technology	Los Gatos, CA	Schenectady, NY	Cambridge, MA	Berkley, MI	Newark CA	Fairfax, CA	San Jose, CA	Santa Clarita, CA	Palo Alto, CA	**Summary**
Date Released/Adopted	**2018**	**2018**	**2018**	**2020**	**2003**	**2006**	**2018**	**2019**	**2019**	**2019**	**2019**	**Draft**	**Draft**	
Purpose and Intent			X	X	X	X		X	X	X	X	X	X	10
Definitions	X		X	X	X	X		X	X	X	X	X	X	11
Governance of Deployment in the Public Right of Way	X	X		X	X			X			X		X	7
Applicability		X	X	X				X		X	X	X	X	8
Permitted Communication Facility Uses/Administrative Review	X	X	X	X					X	X	X	X	X	9
Action on Administrative Review Applications	X	X	X		X	X	X	X		X	X			9
Pole Licensing Agreement		X					X		X		X	X	X	6
Voluntary Pre-submittal Conference						X				X		X		3
Radio Frequency Compliance Report				X				X		X	X	X	X	6
Radio Frequency Emissions Monitoring on an Ongoing basis				X	X					X				3
Radio Frequency Field Strength, Power Density Report				X							X			
Historic District Requirements											X			
Small Wireless Facility (SWF) height requirements	X	X	X	X	X	X	X	X	X	X	X	X	X	13
Undergrounding Provisions	X	X		X		X	X	X		X	X	X	X	10
Undergrounding Accessory Equip. (if required)		X		X			X			X	X	X	X	7
Special regulations within Undergrounding Districts										X	X			2
Removal/Relocation, Modification or abandonment of Communication Facility in ROW	X	X	X	X		X				X	X		X	8
Attachment to Authority Poles in Public ROW	X	X								X	X		X	5
Applications Requiring Discretionary Review	X										X		X	3
Required Findings for Approval		X						X		X	X	X	X	6
Standard Conditions of Approval										X				1
Build out Approval (time constrained approvals)			X		X					X		X		4
Administrative Land Use Permit Requirements		X			X						X			3
Required Accommodation of Future Tower/Pole Users		X				X								2
Limit of one Provider per Pole											X			1
Other Public ROW Installation Requirements	X	X								X			X	4

Elements of Municipal Ordinances Regulating Wireless Telecommunication Systems	FCC Model Ordinance	National League of Cities Model Ord.	Massachusetts Model Ordinance (Verizon issued)	Model by Americans for Responsible Technology	Los Gatos, CA	Schenectady, NY	Cambridge, MA	Berkley, MI	Newark CA	Fairfax, CA	San Jose, CA	Santa Clarita, CA	Palo Alto, CA	**Summary**
Control over requests in congested ROW issues	X	X								X			X	4
Required assessment of impacts to Fire Hydrants, Water valves and other underground structures										X	X			2
Safety and compliance requirements	X	X		X		X	X			X			X	7
Non-interference requirements with existing facilities	X												X	2
Relocation/replacement of existing SWF	X									X	X		X	4
Emergency considerations	X	X								X			X	4
Abandonment of facilities	X							X		X	X	X	X	6
Location preference Standards				X	X		X			X	X	X	X	7
Alternative Site Analysis		X								X			X	3
Non-Exclusivity of Pole Access			X							X				2
Accessory Equipment Location Preference Requirements				X						X	X		X	4
Preferred Concealment Techniques					X	X	X			X	X	X	X	7
Prohibited Support structures							X			X		X		3
Design Standards	X	X		X	X		X	X		X	X	X	X	10
Antenna Design Standards							X			X	X		X	4
Limit on Number of Antennas per Utility Pole											X			1
Pole Design Standards		X		X						X	X		X	5
Limit on pole mounted equipment cubic footage										X	X			2
Limit on Pole space utilization within the Public ROW										X	X			2
Concealment of Cables and Wires				X							X			2
Tree Protection/Tree Canopy Protection Considerations				X						X	X		X	4
Tree Root Protection Considerations				X						X				2
Landscape Plan (Vegetation and slope stabilization)										X				1
Visual Impact Assessment		X		X		X	X			X				5
Attachment to and replacement of decorative poles	X	X					X				X		X	5
Design issues for Electric service/meters		X								X		X		3
Additional Design Stds. - Wireless Facility outside of Public ROW										X				1

Elements of Municipal Ordinances Regulating Wireless Telecommunication Systems	FCC Model Ordinance	National League of Cities Model Ord.	Massachusetts Model Ordinance (Verizon issued)	Model by Americans for Responsible Technology	Los Gatos, CA	Schenectady, NY	Cambridge, MA	Berkley, MI	Newark CA	Fairfax, CA	San Jose, CA	Santa Clarita, CA	Palo Alto, CA	**Summary**
Additional Design Standards - Wireless Facility IN Public ROW										X				1
Prohibition of New Pole Installations										X				1
Roof or Wall mounted Wireless Facilities design considerations										X	X			2
Batch Applications	X							X						2
Applications and Fees	X	X	X	X					X	X	X			7
Proprietary or Confidential Information	X	X	X											3
Administrative Review Requirements	X									X	X		X	4
Ordinary Maintenance, Repair and Replacement	X	X		X	X	X	X			X	X		X	9
Review Timetables for Administrative Action	X	X								X	X			4
Build Out Period for Work Completion										X				1
Distinction between SWF actions Requiring Administrative Review and Those That do not	X	X								X	X		X	5
Adverse Impacts on other Properties										X	X	X	X	4
Minimum Setbacks from Habitable and School Spaces				X						X	X		X	4
Temporary and Emergency Installations	X											X		2
Lighting including Noise Requirements	?	X								X	X		X	4
Impacts to Pedestrian Safety and ADA concerns										X	X			2
Performance Bond		X		X		X	X	X		X		X		7
Applications requiring discretionary Review and review criteria	X	X								X			X	4
Electricity Costs								X						1
Dig Safe Requirements	X	X												2
Violation of this Ordinance	X	X		X										3
Appendix (Utility Permit requirements)	X													1
Description of SWF equipment permitted	X									X			X	3
Sample Underground Construction Provisions	X													1
Preapproved Designs												X		1
Indemnification		X	X	X						X			X	5
Insurance			X	X						X				3

Elements of Municipal Ordinances Regulating Wireless Telecommunication Systems	FCC Model Ordinance	National League of Cities Model Ord.	Massachusetts Model Ordinance (Verizon issued)	Model by Americans for Responsible Technology	Los Gatos, CA	Schenectady, NY	Cambridge, MA	Berkley, MI	Newark CA	Fairfax, CA	San Jose, CA	Santa Clarita, CA	Palo Alto, CA	**Summary**
Annual Recertification and fee				X					X					2
Emergency Report on Network Service Improvements							X							1
Signage Standards for Equipment				X			X			X			X	4
Use of an Independent Expert										X			X	2
Applicant Pays for Independent Expert				X									X	2
Abutter/Public Notice requirement				X						X	X		X	4
Separation Distances for Small wireless facilities				X						X			X	3
Annual Report: location and status of all Small Wireless Facilities											X			1
Engineering and Seismic Assessment										X				1
Replacement of old Larger equipment as technology improves				X										1
Total Criteria Used to Regulate Small Wireless Facilities	32	34	13	33	12	13	17	14	7	63	46	22	44	349

APPENDIX H: TASK FORCE MISSION STATEMENT

Mission Statement

The Land Use Planning for Wireless Telecommunications Task Force will create a coordinated development strategy to best serve the citizens and businesses of Western Connecticut. It will work within the authority of municipalities** towards making Western Connecticut a digital leader while preserving the unique character of its communities by undertaking the following tasks:

1. Make recommendations for revisions to the municipal permitting procedures that complies with FCC requirements
2. Create model ordinances and explore other management strategies for wireless telecommunication facilities
3. Identify priority zones for wireless telecommunication facilities

The Task Force is made up of appointed municipal staff.

** Municipalities cannot deny applications for wireless telecommunication facilities, including new 5G installments, based on health concerns. Under federal law, states and municipalities "shall not prohibit or have the effect of prohibiting the provision of personal wireless services" (47 U.S.C. § 332(c)(7)(B)(i)). Furthermore, "no State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions." (47 U.S.C. § 332(c)(7)(B)(iv)).

APPENDIX I: BIBLIOGRAPHY

Fifth Generation Mobile Broadband Challenges and Opportunities

Martin Cave and Gabriel Solomon, Optimizing Spectrum Assignments to Deliver Expansive 5G Connectivity, Ericsson, 20019, Ericsson.com.

Columbia Telecommunications Corporation, A Brief Overview of Broadband Deficiencies in Connecticut, Connecticut Office of Consumer Counsel, 2016.

Mike Colias, Ford Rethinks the Office, Betting That Work Will Be Partly Remote Longer-Term, *Wall Street Journal*, August 26, 2020.

Community Networks, Successes and Failures, Institute for Local Self-Reliance, Accessed August 20, 2020.

Mark Del Bianco, Summary of Final FCC Small Cell Order, March 11, 2019.

Christian de Looper, What is 5G? The Next generation Network Explained, May 22, 2020.

Sharon E. Gillett, "Municipal Wireless Broadband: Hype or Harbinger," Southern California Law Review, Vol. 79, no. 3, March 2006, pp. 561-594. HeinOnline.

Lisa Gonzalez, *Connecticut Court Confirms Municipalities' Right to Reserved Space on Poles*, Community Networks; December 3, 2019.

Paul Gorsky, Education Equity and the Digital Divide, Association for the Advancement of Computing In Education Journal, 2005, 13(1), 3-45.

Robert G. Hollands, Will the Real Smart City Please Stand Up? *City*, 2008, 12.3.303.

Kehua Su, Jie Li, Hongbo Fu, Smart City and the Applications, *IEEE*, 2011.

Mohammad Imran Hossain, Mohammad Ammar Alzarrad, Kristy Wolfe, Suruz Miah, *Small-Cell Installation in Transportation Infrastructure— A Literature Review,* Research Report No. FHWA-ICT-20-003, Illinois Center for Transportation, Urbana, IL, January 2020.

Sarah Krouse, Covid-19 Pandemic Drives Patients—and Deal Makers—to Telemedicine, *Wall Street Journal*, August 26, 2020.

Edmund H. Mahony, Court gives Towns Internet Leeway, *Hartford Courant*, November 14, 2019, p. B-2.

Kevin E. McCarthy, Federal Law Regarding Siting Telecommunications Towers You asked, Connecticut Office of Legislative Research, January 16, 1998.

Michael E. Porter, Clusters of Innovative Initiative: San Diego, Council on Competitiveness, 2001.

Sriganesh K. Rao, Ramjee Prasad, Impact of 5G Technologies on Smart City Implementation, *Wireless Personal Communications*, 2018, 100: 161.

Rohde and Schwarz, The Internet of Things, 2020, www.rohde-shwarz-usa.com

Anthony Ngozichukwuka Uwaechia and Nor Muzlifah Mahyuddin, "A Comprehensive Survey on Millimeter Wave Communications for Fifth-Generation Wireless Networks: Feasibility and Challenges," IEEE Access, March 2020, Vol. 8.

Municipal Guidance on Small Cell Wireless Facilities

Arlington, Massachusetts, Small Cell Wireless Facility Design Rules and Regulations, October 1, 2019.

Belmont, Massachusetts, 5G in Belmont, Public Works Department, Belmont Information Technology Advisory Committee, November 25, 2019

City of San Jose, City of San José Street Light Pole-Mounted Small Cell Permit and Design Guidelines, May 22, 2019.

City of Dan Diego, City of San Diego Land Development Manual: Wireless Communication Facility (WCF) Guidelines, September 2019.

National Capital Planning Commission, Small Cell Infrastructure Guidelines, December 6, 2018.

National Capital Planning Commission, et al, Small Cell Design Guidelines, Third Version, March 21, 2019.

National Capital Planning Commission, Executive Director's Recommendation: Small Cell Infrastructure Guidelines, November 1, 2018.

San Francisco Planning Department, Wireless Telecommunication Services Facilities Siting Guidelines, August 15, 1996.

Southampton, New York, Wireless Communication Master Plan, December 11, 2007.

Federal Communication Commission Regulations and Rulings

Federal Communications Commission, Millimeter Wave Propagation: Spectrum Management Implications, Bulletin Number 709, July 1997.

Federal Communications Commission, Accelerating Wireless and Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, Final Rule, *Federal Register,* Vol. 83, No. 199, October 15, 2018.

Federal Communications Commission, *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*, OET Bulletin 65, Edition 01-01, June 2001.

Federal Communications Commission, Model Code for Municipalities, Federal Communications Commission Broadband Deployment Advisory Committee Model Code for Municipalities Working Group, July 19, 2018.

Federal Communication Commission, 2019 Broadband Deployment Report: Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, GN Docket No. 18-238, May 29, 2019.

Federal Communications Commission, Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment, Federal Register, Vol. 84, no 214, November 5, 2019.

Federal Communication Commission, Human Exposure to Radiofrequency Electromagnetic Fields and Reassessment of FCC Radiofrequency Exposure Limits and Policies: Final Rule, Federal Register, Vol. 85, no. 63. April 1, 2020.

Radio Wave Propagation Challenges

Bart Chudas, The Effect of the Built and Natural Environment on Millimetric Radio Waves, Department of Digital, Culture, Media and Sport, Ordinance Survey, United Kingdom, February 2018.

Mir Ghoraishi, Jun-ichi Takada and Tetsuro Imai, Radio Wave Propagation through Vegetation, Intech Commons, 2013.

International Telecommunications Union, Attenuation in Vegetation: Radio Wave Propagation, ITU-R P.833-9, September 2016.

International Telecommunications Union, Effects of Building Materials and Structures on Radio Wave Propagation Above About 100 MHz: Radio Wave Propagation, ITU-R P.2040-1, July 2015.

Nick Savage and David Ndzi, Radio Wave Propagation through Vegetation: Factors Influencing Signal Attenuation, *Radio Science*, 2003, Vol. 38, No. 5, 1088

James B. Speta, Competitive Neutrality in Right of Way Regulation: A Case Study in the Consequences of Convergence, *Connecticut Law Review,* 2003, 35:763.

Technical References Governing Municipal Rights of Way

American Association of State Highway and Transportation Officials, *Guide for the Planning, Design and Operation of Pedestrian Facilities,* Washington DC, July 2004.

National Academies of Sciences, Engineering, and Medicine*, Guide for the Geometric Design of Driveways*, 2010.

Gary Watson, et al., (ed.), *The Landscape Below Ground IV, Proceedings of the Fourth International Workshop on Tree Root Development in Urban Soils*, International Society of Arboriculture, Atlanta, GA, 2020.