CITY OF PALM COAST

WIRELESS MASTER PLAN

UPDATED MARCH 2025

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1 Executive Summary

1.1 Overview

The Wireless Master Plan is a City-wide strategy to facilitate the improvement of wireless communications infrastructure in an efficient and organized manner. Wireless communications are an essential technology for our communities. The ability to, wherever you are, connect with relatives, colleagues, friends, and services (including emergency services) is no longer a luxury, but depended upon by nearly everyone. High quality wireless service requires a robust carrier network with sufficient infrastructure to meet all users' needs. It's the City's desire to facilitate infrastructure that enables carriers to provide high quality wireless service to Palm Coast residents and businesses while maintaining control over the proliferation of cell sites throughout the City.

1.2 Objectives

The objectives of the Wireless Master Plan are to create a pathway to strong and reliable cellular service through improved wireless infrastructure, to preserve the City's control of new wireless infrastructure development, and to identify City properties that could house wireless infrastructure.

1.3 Importance of Wireless (Cellular) Infrastructure

The establishment and enhancement of wireless (cellular) infrastructure within a city are pivotal components for its overall development and prosperity. Our world is dominated by digital connectivity, and robust wireless infrastructure serves as the backbone for numerous vital aspects of modern life. Beyond offering residents and businesses high-speed internet access, reliable cellular service facilitates seamless communication, supports public safety initiatives, and fosters economic growth. Cities with dependable wireless infrastructure attract tech-savvy residents, entrepreneurs, and industries, contributing to a vibrant and competitive environment. Moreover, the integration of smart technologies and the Internet of Things (IoT) relies heavily on a resilient wireless network, enabling the implementation of efficient municipal services, such as smart traffic management, waste management, and energy conservation. The Wireless Master Plan also acknowledges the critical role of cellular infrastructure in positioning the City of Palm Coast at the forefront of technological innovation, ensuring its long-term sustainability and regional competitiveness.

2 Introduction

2.1 Background

In November 2015, the City of Palm Coast released a Request for Proposals (RFP) for wireless consultation services. The RFP sought qualified wireless infrastructure companies to assist the City in finding a solution for the marginal service experienced by many of its residents. The City

selected Diamond Communications in May of 2017 to assist with updating its ordinances related to Wireless Communications Facilities, draft the Wireless Master Plan and then market the Master Plan properties. Diamond Communications had the exclusive rights to build towers on City-owned parcels from May 2017 through May 2022.

After the expiration of Diamond's contract, City Council opted to leave the Wireless Master Plan open, giving any company the opportunity to construct a tower on Master Plan properties.

2.1.1 Purpose of the Master Plan

The purpose of the Wireless Master Plan is to promote robust and reliable cellular coverage within the City of Palm Coast, to provide a list of identified parcels to expedite carrier site selection and reduce the time for review and approval on preselected and approved parcels.

2.2 A Brief History and Overview of the Wireless Industry

From 2013 to 2023, adoption of cellular phones went from 35% to 97%, while traditional landline use dropped from 90% to 30%. Cell phones and tablets have evolved from an exclusive, niche product into a staple of our everyday lives and an essential piece of our personal, public, and professional communities. Additionally, first responders, connected cars, home management service providers and industrial companies are increasingly utilizing wireless communications technology as part of their core operations.

Consumption and demand for wireless services continues to increase as wireless technology and available content provides customers with a consistently improving user experience. The type of consumption of wireless services has evolved from the simple (texts and calls) to the highly complex data demands of today (GPS, video, social networking, applications, gaming, etc.). These services require significantly more bandwidth from provider networks and, compounded with the general increase in mobile use and increased availability of "unlimited" data plans, place heavy strain on network capacity – the ability of the carriers' existing network to provide wireless services to its customers at the quality level expected by those customers. Maintaining a robust network and keeping pace with the network requirements of evolving wireless technology is mission critical for wireless carriers.

A major component in network infrastructure investment is the acquiring of spectrum licenses from the federal government as additional spectrum creates more bandwidth for customers. To incorporate new spectrum into their networks, carriers require further investment in their existing sites (typically the addition or replacement of antennas and installation of tower mounted radio units) and the development of new sites.

In addition to personal consumption of wireless data, high quality wireless services are becoming essential in other applications, including emergency services and the Internet of Things ("IoT"). FirstNet, a national cellular network operated and managed by AT&T, required the deployment/upgrade of thousands of traditional macro sites across the U.S.

IoT is the rapidly emerging industry of connected objects – objects that can be monitored or controlled remotely or provide data to users/operators. The IoT market is expected to grow from

6 billion to 20 billion devices by 2020. Examples of IoT applications include smart city applications (street lights, traffic monitoring, etc.) and smart homes (smart thermostats, air conditioning units, lights, etc.). IoT networks are being actively deployed across the U.S. by both established wireless carriers and well-capitalized new entrants that use both licensed and unlicensed spectrum.

2.2.1 The Advanced Wireless Infrastructure Deployment Act

The Advanced Wireless Infrastructure Deployment Act, enacted in 2017 in Florida, streamlines the placement of small wireless facilities within public rights-of-way. It facilitates the installation of these facilities on "authority" utility poles, particularly for 5G networks. The Act imposes restrictions on height, separation distances, and permit processes, benefiting both wireless providers and infrastructure companies.

The Act defines an "authority" as a county or municipality with jurisdiction over public road rights-of-way. It allows wireless service providers (including both service providers and infrastructure companies) to collocate small wireless facilities on authority utility poles. These poles serve functions such as lighting, traffic control, and signage. Notably, the Act prohibits authorities from mandating specific utility poles or imposing minimum separation distances for these facilities.

These small wireless facilities cannot exceed 10 feet above the utility pole they're installed on. Additionally, new utility poles must not exceed the height of the tallest existing pole within 500 feet or 50 feet if no nearby pole exists. The Act also allows consolidated applications, enabling providers to submit a single application for up to 30 small wireless facilities within a single jurisdiction.

3 Current State of Connectivity

3.1 Existing Infrastructure

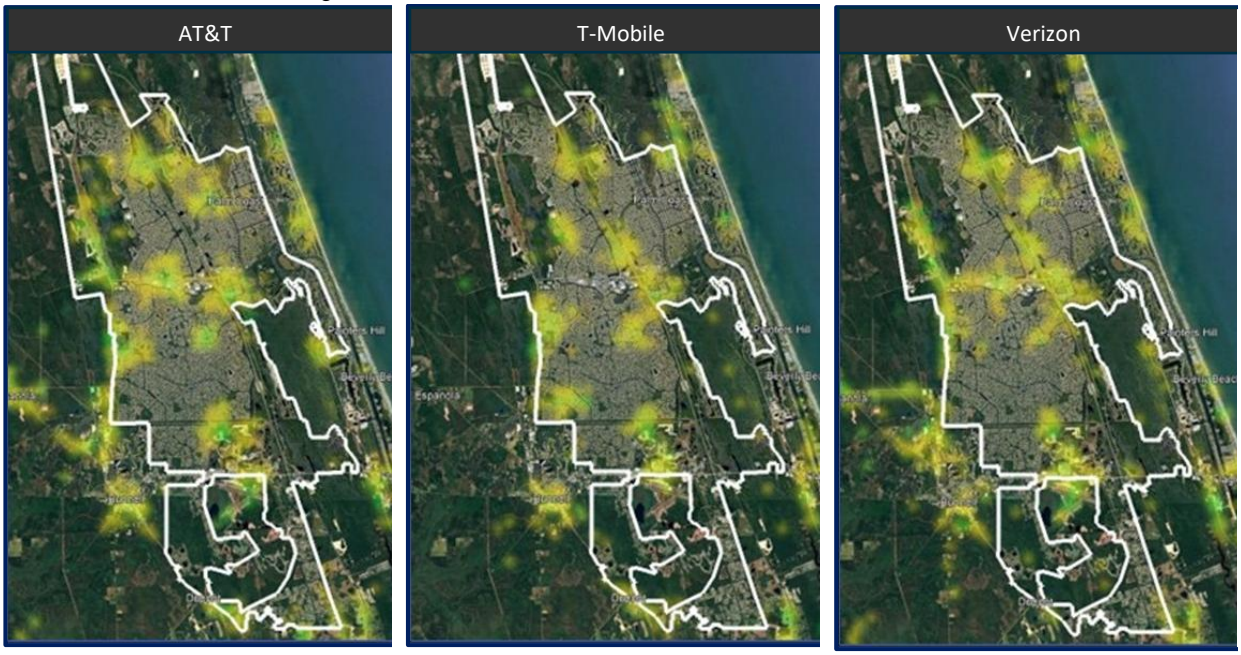
In 2007, the City of Palm Coast granted land leases at Belle Terre Park and Indian Trails Sports Complex for the construction of two concealed flagpole cell towers for T-Mobile. In 2008, the City contracted with Verizon to host their equipment on its A1A water tower. Then in 2008 and 2010 the City contracted with MetroPCS to build towers at the Palm Coast Tennis Center and Ralph Carter Park which remain the only City-owned cell towers. In 2017, with the adoption of the Wireless Master Plan, the City contracted with Diamond Communications to be the exclusive tower builder on City-owned property until 2022. During those 5 years, Diamond constructed towers at the Palm Coast Tennis Center, Heroes Park, and Fire Station 24.

3.2 Gaps and Challenges

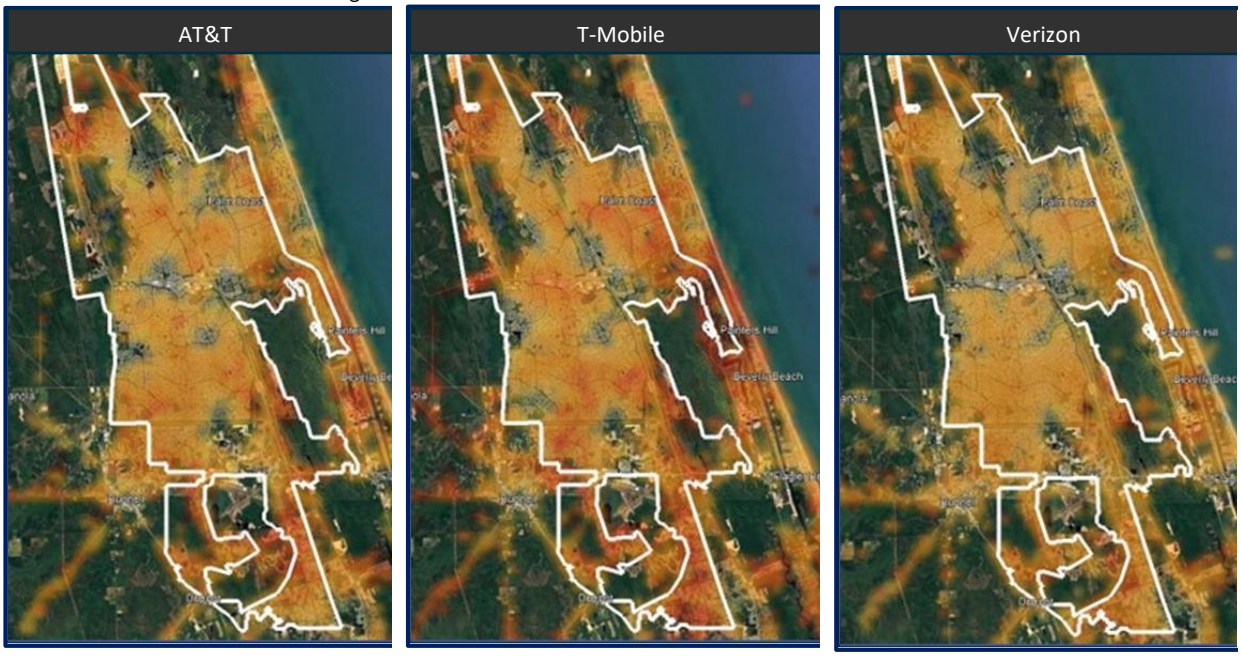
In 2024, the City of Palm Coast continues to face issues with adequate cellular coverage.

The maps below were provided to the City by Diamond Towers and are taken from the Ookla platform which maps signal strength based on crowd sourced data. The 2024 data depicts the reliable coverage (higher than -100dBm) and the unreliable coverage (under -100 dBm) throughout the City for the 3 major carriers.

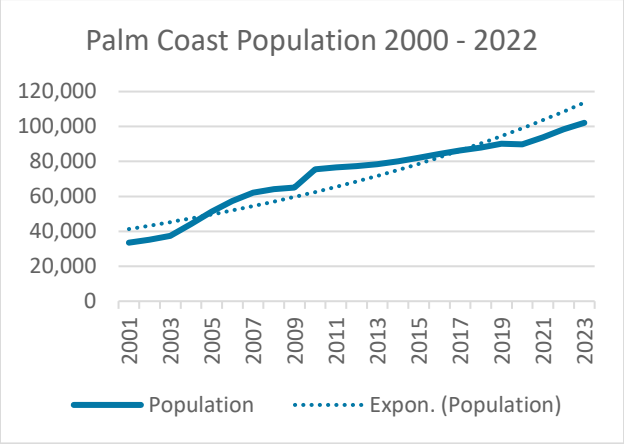
Palm Coast Reliable Coverage

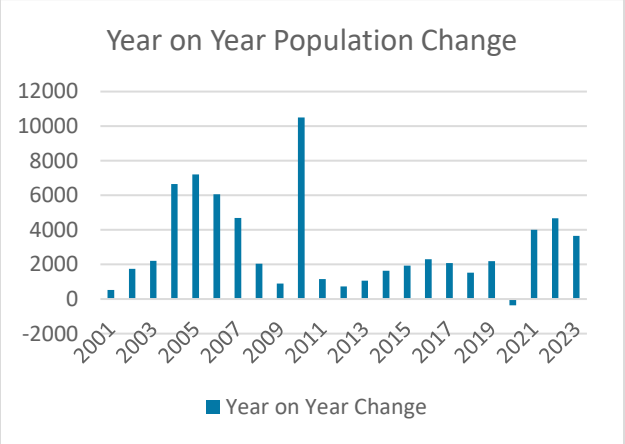


Palm Coast Unreliable Coverage



The City of Palm Coast also continues to experience steady population growth, averaging over 4% each year, going from 32,980 residents in 2000 to 98,411 in 2022. This growth causes challenges for cellular service as more people (and devices) are competing for the cellular bandwidth. Applications that are data-heavy, such as video and image sharing applications, add an additional strain on the network. A particular area may have good cellular coverage, but this increased demand for data can cause issues with capacity where there is not enough bandwidth to meet the demand. Carriers may need to install additional radios or equipment in an area to remediate the capacity issues they are facing.





4 Technology and Infrastructure

4.1 What is Wireless Infrastructure?

Wireless Infrastructure is a broad phrase describing the physical components of a wireless network - including antennas, radio base stations, cell towers and fiber routes – that support wireless communication between individuals, businesses, governments, and objects. Signals carrying information originate from individual sources and travel through the network to their intended recipient(s).

There are many types of wireless communications including personal communication (cell phones), Wi-Fi, AM and FM radio, machine to machine/IoT and a growing number of others. The primary goal of the Wireless Master Plan is to improve personal communications service in Palm Coast, although the plan may result in ancillary improvements in the provision of other wireless services.

Personal communications services in the U.S. are provided predominantly by three wireless carriers – Verizon, AT&T, and T-Mobile. The carriers hold licenses to spectrum (airwaves or frequencies) that give them the exclusive right in certain markets to broadcast their customers' phone calls, messages, information requests and data across those airwaves. To do this, each

carrier operates a national network comprised of tens of thousands of cell sites, with that number expected to approach a million (each), including small cells.

Carrier network engineers have two related primary goals: providing coverage and capacity. Coverage is the provision of wireless connectivity in a given area. Capacity is the network's ability to host simultaneous users and types of data use – e.g., texts vs. video messaging. Capacity constraints (many simultaneous users) can have the effect of "shrinking" a site's coverage area often meaning that carriers need more sites than their original network deployments provided.

There are three key types of cell sites typically deployed by the carriers to support their networks:

4.1.1 Macro Cells

Traditional antennas used for personal wireless communications. A macro cell can cover a radius anywhere from a quarter of a mile to five miles depending on numerous factors including user density, antenna height and topography. They remain the most effective coverage and capacity technology – a single macro cell can achieve the same coverage objective as up to 12 small cells (described below) – and are expected to remain the core of wireless networks. A macro cell deployment typically consists of six to twelve panel antennas (from three to six feet in length) mounted in a triangular pattern and a radio base station housed in a small shelter or shed at the base of the tower or roof. A key near-term area of macro cell growth is the deployment of FirstNet by AT&T, a national first responder network.

4.1.1.1 Typical Infrastructure

Macro cells are primarily deployed on cell towers and rooftops with first preference to cell towers as they are deliberately constructed to support the carriers' operational needs. There are numerous tower types which each present advantages and disadvantages. A key differentiator is non-concealed and concealed towers.

Non-Concealed – Traditional cell towers including monopoles, lattice and guyed towers that are not designed to blend in with natural surroundings. Non-concealed is the preferred solution for network deployment for numerous reasons including:

- High flexibility for collocating, upgrading, and modifying equipment –the ease of adding/modifying equipment is increasingly important as capacity constraints and technological changes necessitate more frequent upgrades. Flexible solutions better enable the carriers to meet their subscribers' changing needs.
- More cost effective – concealment of antennas often requires design specialists that increase the cost of deployment and may deter carriers from installing or upgrading equipment.
- Easier and safer for crews to work on – fewer components to work around (e.g., artificial branches, fiberglass pole coverings, flags, halyards, etc.).

Concealed – Cell towers designed to either blend in with surroundings or be aesthetically pleasing to the surrounding community. Designs include pine trees (monopines), flagpoles, silos and clock towers. While carriers and tower developers will develop and collocate on concealed structures when zoning authorities or landlords demand it, stealth is not a preferred solution because:

- Many designs constrain carriers' ability to collocate and upgrade their equipment
    - Certain designs (particularly flagpoles) restrict the carriers' current and future ability to add/modify the equipment necessary to meet their customers' connectivity demands.
    - This constraint deters carrier investment as the value of deploying its expensive equipment is significantly diminished by the increased risk of being unable to upgrade the equipment in the future.
- More costly – concealment of antennas and ongoing modifications often require specialists that come at a high price and may deter carriers from installing or upgrading equipment.
- More obstacles and safety issues for crews – Many concealment techniques have additional components that crews must either dismantle or work around, which can mean more time "in the air" performing more complex tasks.

4.1.2 Small Cells

Small cells provide more bandwidth and higher data speeds in targeted areas. Small cells are expected to comprise a significant role in the preparation of carrier networks for connectivity. Minimal spatial requirements mean small cells can be deployed on a large variety of existing structures. Importantly, small cells are generally not considered to be a substitute for macro cells but rather constitute complementary infrastructure that amplifies wireless service in areas of need.

Palm Coast's current infrastructure does not appear to be at a point where small cells could provide a holistic solution for wireless service. With further macro site development, small cells may become a suitable option to bolster service quality in high density areas of Palm Coast.

4.1.3 Distributed Antenna Systems (DAS) and Wi-Fi

DAS and Wi-Fi provide coverage and capacity in confined areas, primarily inside medium to large sized buildings, where outdoor networks have difficulty penetrating. DAS and Wi-Fi objectives can often also be accomplished with small cells. DAS is usually the best solution for high-capacity venues/locations such as stadiums, malls, airports, and college campuses.

4.2 FirstNet

FirstNet's initial roll out will predominantly be over AT&T's macro site network. AT&T will add antennas to its existing sites and deploy new sites that transmit FirstNet's exclusive spectrum band – 700 MHz – to as many citizens as it can reasonably accommodate. This means that AT&T

will not only require additional sites, but towers and infrastructure with the capacity for the upgrades/changes necessary to accommodate FirstNet.

The Wireless Master Plan will encourage monopoles as the optimal solution to improve Palm Coast's wireless service. The Wireless Master Plan is designed to optimize the development of new cellular infrastructure in the City and reliable, high-quality monopoles will best enable all carriers to meet Palm Coast's long-term wireless needs with the fewest number of new wireless sites.

5 Local Ordinances and Zoning

How will Master Plan properties be treated in the City Ordinance?

- City-Owned Master Plan properties will occupy the highest place in the siting hierarchy – If a carrier elects to develop on a Master Plan property, it will not have to prove the properties' suitability in comparison with other properties. This saves the carrier both time and resources required to build a case that another property, considered less viable by the City, is necessary. It will also save City resources as the properties have already had a preliminary review for suitability.
- Master Plan properties will be permitted to host monopole towers up to 150 feet. As described earlier, monopoles enable carriers to develop quality, lasting network infrastructure as a preferred alternative to a lattice tower. Using monopole towers best enables the City for future upgrades potentially limiting the need for significant future proliferation of cell towers to provide infrastructure to its growing population.

Any development on a City owned property will require the execution of a lease approved by City Council. This means that effectively, the City has final say and maximum control over all tower development including placement, design and footprint. While the Master Plan presents a streamlined approach to developing towers in the City, the City will retain significant control and input on the development and operation of wireless infrastructure.

Regulations related to Wireless Telecommunications can be found in Section 4.20 of the City of Palm Coast Land Development Code.

6 The Master Plan

6.1 Site Selection Process

In 2023, City Council set a Strategic Action Plan priority of having the City's land assets inventoried and analyzed. Administration created a multi-departmental team to perform this. As part of the analysis of each property, staff evaluated it for suitability to accommodate a

Wireless Communications Facility. As it pertains to suitability for a Wireless Communications Facility, staff considered several factors including:

- Area suitable to fit cell tower and associated equipment
- Distance from residential property (150' minimum)
- Access
- Wetlands/Flood Plain
- Stormwater/Drainage issues
- Existing easements
- Deed restrictions

6.1.1 How the Plan Stays Updated

City Council must approve adding a parcel to the Wireless Master Plan.

Upon acquisition of new property, or as planned uses for existing City-owned properties change, staff may evaluate parcels to determine if they would be able to accommodate a Wireless Communications Facility. If deemed appropriate, staff may present those parcels to City Council for inclusion in the Wireless Master Plan.

City Council has authorized the City Manager or designee to remove parcels from the Wireless Master Plan, should a review reveal that a parcel does not meet the requirements for a Wireless Communications Facility.

The appendix of this plan may be periodically updated as parcels are added or removed from the Master Plan.

6.2 Master Plan Parcels

The inclusion of a parcel in the Wireless Master Plan means that the City has identified that the parcel has been preliminarily identified to be able to accommodate a Wireless Communications Facility.

A parcel being included in the Wireless Master Plan does not guarantee that a tower can be constructed on the property, or that the site is shovel-ready for a tower. Neither does it mean that a tower can be located at any location within the parcel.

Identified parcels may require further work to determine their appropriateness for a facility. Further work may be needed to determine site access, deed restrictions, wetland mitigation or other issues not identified on the first look.

When a request is made for a particular parcel, the City will investigate further as to the fitness of the parcel for a tower, and will work with the requesting organization as to location within the parcel. Parcels deemed unfit for a wireless communication facility will be removed from the Wireless Master Plan after review.

Wireless Master Plan parcels will need to have a ground lease approved by City Council prior to submittal of a site plan.

6.3 Parcels Outside the Master Plan

A parcel being excluded from the Wireless Master Plan does not mean that a Wireless Communications Facility cannot be constructed on it.

If an organization requests a parcel outside of the Wireless Master Plan, the City may evaluate that parcel for its capability to accommodate a tower. If it is determined that the parcel is appropriate for a tower, then as part of the application process, the requesting organization would need to receive a special exception from the City's Planning and Land Development Regulation Board (PLDRB).

Alternatively, staff may choose to present the parcel to City Council for inclusion in the Wireless Master Plan.

6.4 Site Promotion

The City of Palm Coast will keep the most current version of this Master Plan available through its website at palmcoast.gov. The City will also strive to keep updated maps, information, and map services available on its website to aid carriers in the site selection process.

7 Conclusion

Through this Wireless Master Plan, the City works toward securing consistent and dependable cellular service throughout the City of Palm Coast, recognizing it as necessary and essential public service for communities.

Questions regarding the Wireless Master Plan should be directed to the City's Information Technology Department.

City of Palm Coast
Department of Information Technology
160 Lake Ave
Palm Coast, FL 32164
(386) 986-4732

8 Appendices

8.1 Existing Wireless Communications Facilities

Section Last Updated : March 18h, 2025

This section catalogs the existing Wireless Communications Facilities associated with the City of Palm Coast. This section will get updated periodically as new facilities are added. Sites with existing Wireless Communications Facilities are included in the Wireless Master Plan to facilitate future improvements to the facilities.

Site #	Parcel	Address	Facility Type	Tower Type	Tower Management
E1	07-11-31-7025-00RPA-0010	339 Parkview Dr (Belle Terre Park)	Land Lease	Flagpole	Crown Castle
E2	02-11-30-0000-01010-0031	5455 Belle Terre Pkwy (Indian Trails Sports Complex)	Land Lease	Flagpole	T-Mobile
E3	07-11-31-7031-RP11I-0000	1385 Rymfire Dr (Ralph Carter Park)	City Tower	Flagpole	Diamond Communications
E4	06-12-31-0000-000A0-0014	1290 Belle Terre Pkwy (Southern Rec Center)	Land Lease	Monopole	Diamond Communications
E5	07-11-31-7013-00000-0300	2860 Palm Coast Pkwy NW (Heroes Park)	Land Lease	Monopole	Diamond Communications
E6	06-12-31-5815-00000-0300	1255 Town Center Blvd	Land Lease	Not Constructed	Diamond Communications
E7	07-11-31-7009-RP0F0-0010	103 Farmsworth Dr (Fire Station 24)	Land Lease	Monopole	Diamond Communications
E8	40-10-31-3150-00000-0460	5636 N Ocean Shore Blvd	City Tower	Water Tank	City of Palm Coast
E9	28-10-30-4290-00000-0130	100 Park Square	Land Lease	Not Constructed	Diamond Communications

8.2 Master Plan Properties

Section Last Updated : March 18th, 2025

This section catalogs all parcels available in the Wireless Master Plan. Parcels that already have Wireless Communications Facilities on them which are listed above may be omitted from this list.

Site #	Parcel	Address
S1	19-12-31-0650-000C0-0020	50 Citation Blvd
S2	07-11-31-7059-RP0M5-0010	350 Sesame Blvd
S3	29-11-31-0000-01010-0010	2573 Old Kings Rd
S4	20-11-31-0000-01010-0010	2561 Old Kings Rd
S5	33-10-30-0000-01030-00B4	400 Peavy Grade
S6	07-11-31-7035-RP0L3-0010	
S7	07-11-31-7035-RPL03-0000	
S8	48-11-31-0000-01010-0130	
S9	07-11-31-7037-0RP0A-0100	
S10	33-10-30-0000-01030-00B6	
S11	17-12-31-0175-00000-0100	198 Airport Commerce Center Way
S12	06-12-31-5825-00000-0200	1580 Central Ave
S14	45-11-31-0000-01010-0000	350 Palm Coast Pkwy NE
S15	06-12-31-5815-00000-0300	1255 Town Center Blvd
S16	28-10-30-0000-01010-0020	
S17	27-10-30-0000-01010-0060	
S18	28-10-30-4290-00000-0130	100 Park Square