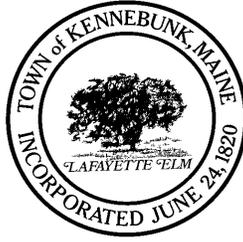


# Town of Kennebunk, Maine



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To: Select Board

From: Stephen Houdlette, Economic Vitality Director  
Heather Balsler, Town Manager

Subj: Cell Tower - Improve Communications in Downtown, Preferred Location on Town-Owned Property

Date: July 16, 2024

## Executive Summary

Kennebunk's operational record as a municipality has been one of balancing tradition with prudence in the face of emerging technological change. All the while, the Town has maintained a competitive economy and high levels of amenity. Most of all, Kennebunk has retained its rural village sensibilities and its iconic historical aesthetic.

The information age compels storefronts and households alike to embrace mobile cellular technology. This type of communication invites work, play and everything in between, but at a cost of infrastructure whose physical form is often in contrast to the existing norms of the built environment and natural canopy.

The result of a consolidated marketplace for commercial carriers often results in towers that reach well above 100 feet. Within the consideration of everyday phone calls and business transactions are the urgent needs of public health and personal safety.

The cellular service deficit in Kennebunk, and especially in the Downtown, is longstanding and well understood. The following sections provide further background for the proposed recommendation below. (1.0) relates the recent history of public and commercial telecommunication infrastructure in Kennebunk and the modern business and consumer behavior that drive the needs for this service. (2.0) gives a primer on the current U.S. market for wireless mobile technology, its infrastructure, and how municipalities can participate. (3.0) discusses site evaluation and project details. (4.0) discusses public benefit in more detail. Supplemental materials are included at the end. This includes existing work, visuals and supporting documentation and reference material.

### Summary of Recommendations:

- Town staff and the EDC with support from residents, businesses and local organizations recommend steps to address improved communications in the downtown
- The Town-owned land on Factory Pasture Lane is the preferred site for a communications tower



**Physical:** The total lot area of this parcel is 60,548 square feet (1.4 acres) and it includes a 20,000+ square foot area for locating the tower and maintenance buildings of a potential communications tower.

**Market:** Based on signal analysis and conversations with tower companies, this location is positioned to serve existing coverage areas and especially those with service deficits.

**Public Safety:** The parcel is owned by the Town providing site control and negotiating leverage for a land lease that will allow functional positioning for public safety equipment and leave adequate vertical positioning for commercial carrier equipment for multiple carriers.

**Land Use:** This property is located in the Industrial zone which is one of two zoning districts that includes communications towers as an allowable use. Additionally, this site is situated next to existing commercial, utility and industrial uses at the far end of a residential district and with the Mousam River as a near border.

- Direct staff to proceed with an RFP to negotiate a land lease to a qualified vendor for a transparent, competitive and viable process

## 1.0 Existing Conditions & Project History

A foundational element for achieving economic vitality in Kennebunk is having modern communication systems. This fact was identified in the Economic Development Plan for Kennebunk prepared by Crane Associates in 2009 and later in the 2013 Strategic Economic Development Action Plan (SEDAP). It is identified in the more recently approved 2022 Comprehensive Plan.

Today's world demands fast and reliable communications. Essential Public Safety services (police, fire, and EMS) require dependable radio communications in order to effectively perform their work, regardless of where they are in town. The same is true for Public Works. From a residential and business perspective, communication and information services are critical in today's world. The town also welcomes a large number of visitors throughout the year and having robust communications available to them is no longer just an amenity to their destination; it is taken for granted as part of a modern leisure experience.

In order to properly assess the existing infrastructure and provision of communication services, the EDC tasked a subcommittee on "Connectivity" to study this issue and worked with partners to produce a report delivered in April of 2022, "*Proposed Wireless Communications Master Plan*".

- The report evaluates key stakeholders within Kennebunk and differentiates their various use cases and technical needs
- It outlines existing communications assets in Town and their service areas and analyzes performance
- It offers scenarios for addressing current service deficits, modernizing infrastructure and planning for a future of increasing demands for communications provision

Key sections of the 'conclusions and recommendations' from this report focus on service provision along Route 1 and especially near the Downtown:

- **Constructing a new tower at one of two locations on Main Street**
- Potentially constructing a new tower near the existing Public Works Facility. This action would be necessary if a Main Street location cannot be constructed.

## Existing Communications Assets

The following wireless inventory was compiled through conversations with Town Departments and cellular carriers.

Police – 3 locations for wireless broadcast equipment

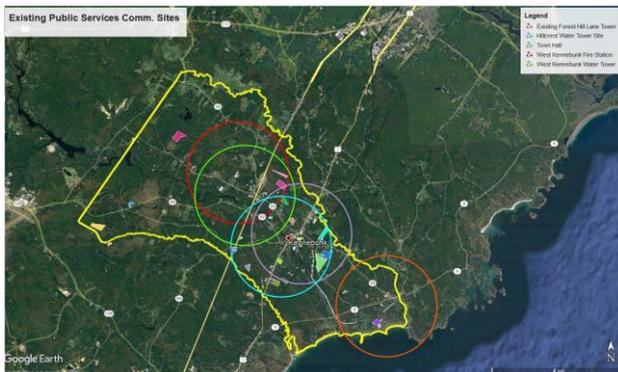
- West Kennebunk Water Tower
- Hillcrest Drive Water Tower
- Forest Hill Lane Tower in Lower Village

Fire and Public Works – 4 locations for wireless broadcast equipment

- Hillcrest Drive Water Tower
- West Kennebunk Water Tower
- West Kennebunk Fire Station
- Town Hall

Currently, there are 4 cellular broadcast locations for commercial carriers (3 conventional towers and a water tank) serving various cellular carriers in Kennebunk:

- A monopole tower in West Kennebunk off Webber Hill Road (Route 99) – T-Mobile
- A tower at the I-95 Exit 25 Interchange next to Cummings Market – All Major Carriers
- A monopole tower in Lower Village next to the Village Market Place – AT&T
- The Hillcrest Drive Water Tank off High Street – US Cellular and T-Mobile



## Public Safety and Public Works Communications Systems

Currently Public Safety (Police, Fire, and EMS) and Public Works use low frequency radio equipment for communications, but they don't operate on a single system. Each Department has its own equipment, which operates differently. In general, though, because they are using low frequency signals they enjoy a greater broadcast range than that used by the cellular industry. The Subcommittee worked with the Town Departments and their communications vendor, Southern Maine Communications, to understand how an "ideal" system for each of them should be created. Presently, they have a total of 5 broadcast locations throughout town as illustrated in Section 2. This network has evolved over the years and as technology has improved enhancements have been made, but the lack of site management at some broadcast locations have resulted in an actual degradation in service for some Departments. A fresh look at this overall situation has never been investigated, which this report is attempting to do.

The broadcast range of the equipment used by Public Safety and Public Works is roughly 5 miles under ideal conditions. The Town of Kennebunk is approximately 9 miles wide from its western limits in Sanford to the Beaches. Therefore, intuitively, a single broadcast location with proper site management in the middle of town (approximately Route 1) should be sufficient for these Departments. This is somewhat the case today with a primary broadcast location being the Hillcrest Drive Water Tank off Route 1 in combination with secondary repeater locations in West Kennebunk, on Main Street, and in Lower Village. In West Kennebunk repeater equipment is located at two sites - the West Kennebunk Water Tank and the West Kennebunk Fire Station. The latter was built because of the lack of space on the West Kennebunk Water Tank. In Lower Village, the repeater location is at the Forest Hill Lane Tower. There is also a fourth repeater on Town Hall for the Public Works radio system because of a lack of space at Hillcrest Drive Water Tank.

## Hillcrest Drive Water Tower

The communications tower that serves Route 1 / Downtown is at 33 York Street on a parcel owned by the Kennebunk, Kennebunkport and Wells Water District (KKWWD). This tower includes equipment for both Kennebunk Police and Fire communications systems as well as equipment for multiple commercial carriers.

From the EDC Report:

***Presently, this area of Town has variable coverage depending on the carrier. The Hillcrest Drive Water Tank provides a downtown location for US Cellular and T-Mobile equipment, but site management is a problem at this location. Verizon seems to have good coverage between 95 and Main Street, but not in downtown or along Route 1 south. AT&T has poor service throughout this corridor... The Subcommittee believes that first and foremost is the need to address Area 3 (Downtown) for cellular service and at the same time address the current signal interference among the Public Safety devices located on the Hillcrest Drive Water Tank. A new tower on this site would make significant improvements to all forms of wireless communications.***



## Service Needs

### Public Safety Radio Network

Not only is communication fundamental to economic vitality, but it is also essential in times of crisis. The ability to quickly and clearly send and receive information can be the difference between successful or sometimes fatal outcomes. Improved radio communications will be a building block towards a modern first-in-class regional public safety system.

Currently, Kennebunk Fire Rescue and Kennebunk Police Department are using aged infrastructure that is 30+ years old. These two organizations do not operate at the same frequency (UHF vs VHF), making communication laborious and often times impossible among agencies that work together daily. Both organizations are subjected to “dead spots” on both frequencies throughout their response area, which leaves first responders vulnerable and unaccounted for.

Kennebunk Fire Rescue and Kennebunk Police Department are part of a mutual aid agreement with other nearby cities and towns. The region of this State requires that they work collaboratively, especially given larger events that demand coordinated assistance. Although our municipalities may be separated by town lines, our services are shared, which makes our communities more of a regionalized system.

## Downtown Cellular Service

**Business Needs** - Kennebunk's downtown is home to over 100 businesses with a strong concentration of retail, food services and professional services. The consensus among commercial operators in this area is that poor cell service, especially for some carriers, is a longstanding competitive disadvantage.

Over the long term, the persistence of poor service can create a reputation about the quality of a business environment. Towns with strong wireless infrastructure are more attractive to businesses and investors. Reliable cell service is often seen as a critical component of modern infrastructure that supports economic growth and development. Areas that fail to secure this infrastructure are left behind.

**Personal Needs** - The most common and important personal use of cell service is communication. Making and receiving phone calls to stay connected with family, friends, and colleagues. Text Messaging for receiving SMS or multimedia messages for quick and convenient communication. Video Calls using services like FaceTime, Zoom, or WhatsApp for real-time video communication.

Residents and visitors experience many of the use cases outlined above for business needs: business location and operating information, product details and mobile payments are everyday occurrences for customers. While residents are able to use in-home broadband resources to connect their mobile devices, anyone who is in transit, in a public space downtown or at a business location will be relying on cell service to facilitate their activities.

The estimated service area for the proposed communications tower will cover a 1.5 Mile radius around the tower. This is expected to include over 2,500 homes (one out of every five in the Town) and over 1.5 million square feet of commercial uses. That translates to improving the communication for over 3,000 residents and over 5,000 jobs.

The project targets the most densely settled residential area in Town as well as some of the most valuable commercial locations in Kennebunk.

Kennebunk Downtown

### Service Area: Residential and Commercial Uses Within 1 mile of Site

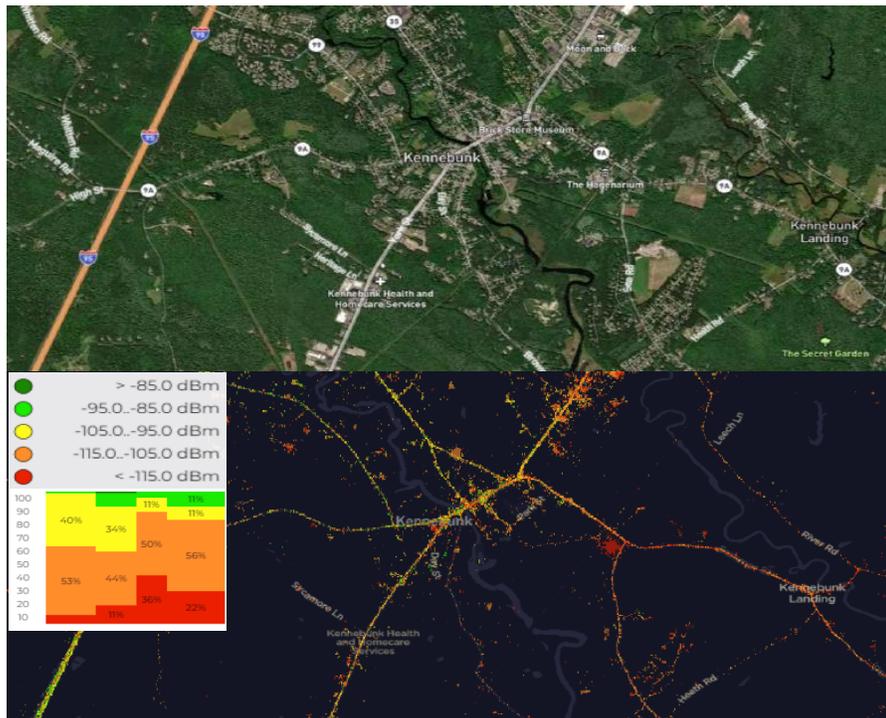


**EDC Analysis** - Kennebunk is not known for having great cellular service. In fact, there are some areas in town where it is difficult to even make a call – inside or out of doors. Not trusting the carriers' justification of service quality, the Subcommittee decided to conduct its own evaluation on this topic. The proper metrics to use for this testing was discussed and signal strength was chosen as the preferred indicator. Download speed and latency was also considered, and while important, these metrics are dependent on signal strength, therefore signal strength was determined to be the correct measure of quality of service.

The Subcommittee tested three carriers - AT&T, Verizon, and T-Mobile. The strength readings were recorded by two Subcommittee members in January of 2022. The AT&T and T-Mobile testing was done using an iPhone at 25 specific stationary locations throughout the town, whereas the Verizon test was done using an Android phone with a different software which recorded similar strength values while in a moving vehicle. Because these tests were performed in January with the leaves off, the Subcommittee believes that they represent optimal conditions.

This data collection effort confirmed what we had heard from various sources anecdotally. The immediate area on either side of the Maine Turnpike has the best coverage, and parts of Lower Village were good. Route 1 (and Main Street) was poor depending on the carrier. The area from Route 1 to the beaches was poor regardless of the carrier. Lower Village was okay, but the beaches were spotty. Far western Kennebunk was not good.

**Technical Analysis from Consultants** - As part of exploring service needs and site viability, Town staff and members of the EDC Connectivity subcommittee worked with industry consultants who performed frequency analysis and performance testing across locations in Kennebunk for multiple carriers. The results highlighted low levels of service at key areas around downtown and in residential areas between Route 1 and the beach. The visuals show the signal strength across commercial carriers (not specified here) for areas near Downtown. The instances of green (good) signal strength are few and are far outnumbered by orange (poor) and red (bad).



## 2.0 Tower Market Conditions & Technical Factors

There are approximately 150,000 towers for commercial cellular service in the U.S. ([in 2022](#)). These combine with a larger number of “micro cell” nodes across the country that provide infill capacity to smaller regions or increase the capacity in high-traffic areas of the network. Given that there are only

3,000 County Subdivisions and roughly 20,000 'places' (cities, towns and villages) in the U.S., it's clear that not only are these towers commonplace, in fact they are ubiquitous and densely settled features of our physical landscape.

In the early 2010s major commercial carriers (AT&T, Verizon, T-Mobile, US Cellular) shifted business operations in a way that caused them to sell physical capital assets like towers to third parties. These emerging "tower companies" have become the majority owners of this type of cellular infrastructure. They also play a primary role in constructing new facilities and delivering maintenance on existing assets. The market share is highly concentrated with three companies (American Tower, Crown Castle and SBA Communications) owning approximately two-thirds of the tower market. These companies rent space on tower systems to commercial cell carriers and other users as their primary business.

This new arrangement is driven by service providers, but it has consequences for mobile consumers and for municipal communications. Where in the past, Towns (or private land owners) could seek to negotiate directly with service providers to plan infrastructure needs, the current market for tower construction is triangulated between (i) commercial carriers, (ii) suppliers of land for tower sites and (iii) tower companies and their intermediaries. The successful coordination of these parties is necessary in order to deliver reliable cell service.

The economics of communications infrastructure is such that tower companies seek to execute projects where multiple carriers will be interested to co-locate equipment in order to meet the service area covered by the tower. However, each commercial carrier is interested in their own customer market which will vary geographically by carrier. While the commercial mobile market is concentrated, it is still competitive. Commercial carriers want to develop their network to serve existing customers and win new customers while preventing other carriers from doing the same. In order to mediate this competition and also develop an efficient system of communication infrastructure, the Federal Communications Commission, the State of Maine and even local ordinances of the Town of Kennebunk encourage co-location of equipment of multiple commercial carriers on the same tower. In practice, accomplishing co-location is in the interest of tower companies, in order to increase the rental revenues, and in the interest of municipalities, in order to increase the overall provision of services for businesses and residents.

The ability of tower companies to attract commercial carriers as tenants on communications towers is a function of (i) the size of the existing and prospective service market (based on density of residences, businesses and vehicular trips) and (ii) the ability for these carriers to deliver coverage to these markets (signal strength and lack of interfering elements).

## Technical Issues of Communications Infrastructure

**Height** - Wireless cellular signals propagate in a cone-shaped pattern from their signal source. This means that the higher the origination point of the signal, the greater the range of the coverage area. Real world environments provide a variety of factors influencing quality of signal propagation: weather, topography, competing frequency interference, building materials, tree cover as well as consumer-side factors like the model of phone they're using.

In general, signal efficacy relies on a 'line of site' to provide reliable mobile service. The most basic way of providing this is increasing height.

There are a number of considerations related to height. Ultimately, the provider is seeking to have the height of their equipment high enough so that the center of the radiating signal (RAD) is able to broadcast far enough to reach as many users as possible.

The RAD height of a given piece of equipment will have a specific distance above the ground level (AGL) and also a distance above sea level (ASL). These planned height metrics allow carriers to anticipate the effectiveness of their equipment (and therefore the value to their service).

**Equipment Location** - There are two functional types of equipment likely to occupy vertical space on a communications tower: (1) public safety radio equipment and (2) commercial cellular equipment.

The public safety radio equipment recommended by the Town's departments will require two tower locations for at least two or more pieces of equipment. The preference is for the top of the tower to be reserved for a public safety radio system that includes a receiver (multiple if more than one frequency is needed to be supported) and omni-directional antenna. This set of equipment at the top is coupled with a second set of transmitter equipment that can operate at a lower elevation and whose separation from the receiver (provided minimum functional height) is important to performance.

Commercial cell equipment is seeking the highest RAD location to reach users as well. The first commercial equipment location will be the second vertical position after the public safety radio receiver. Subsequent commercial locations will be available with proper separation. The number of viable commercial locations will be contingent on the height of the tower and performance factors limiting signal propagation (e.g., trees, ASL of the site).

**Vertical Separation** - Equipment locations are seeking the highest RAD to reach users, but they are also sensitive to proximity to other equipment. Space between different equipment reduces signal interference and improves performance. The expectations for commercial carriers is to have somewhere between ten and fifteen feet of vertical separation between RAD.

### Site Needs

**Access** - The party(s) responsible for maintaining the tower and equipment on it will require vehicular access to the property.

**Utilities** - The site will require access to electrical power. The selected party will need to relate the technical requirements to support their project.

**Maintenance Building(s)** - Communications towers and their equipment require outbuildings that contain support systems. These range in design, but can typically be contained on a 75 x 75 foot pad.

## 3.0 Site Evaluation & Project Details

### Publicly Owned Land

The expediciencies of the commercial carrier market make it clear that unlike other types of development initiatives where *'if you build it, they will come'*, instead to have a viable cell tower project, it requires careful consideration that combines site availability, matching multiple (relatively) unknown carrier markets, and engaging intermediaries that specialize in communications infrastructure.

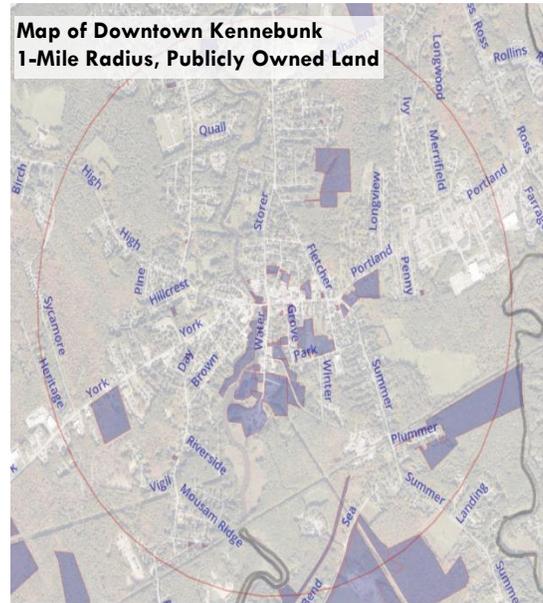
The EDC Connectivity Subcommittee, equipped with a network of industry contacts from its work on the *Proposed Wireless Communications Master Plan*, began to explore publicly owned property that would help attract other parties to the conversation to evaluate sites for project feasibility. Having the site be a publicly owned property provides site control. Private landowners were not excluded from consideration, but a key consideration was a preferred location for public safety equipment. Having public site control would ensure that this key benefit would be treated as a priority.

The parameters for site selection are interdependent, but the hierarchy is roughly:

- Physical viability, enough lot area, access and utilities for a tower and maintenance building
- Market viability, location that covers commercial carrier customer service areas
- Public Safety, site control ensures top position
- Land Use, consideration for abutters, zoning and permitting

Given the current equipment arrangement at the Hillcrest Drive water tower with KKWWD, early emphasis was to see if the existing structure could be enhanced (too costly) or if other KKWWD properties near Downtown were an option (not viable).

Other Town properties were considered and were excluded for different reasons: 36 Sea Road was not physically viable, 15 Portland Road was difficult for land use reasons. Many of the publicly owned parcels near the Downtown area are already developed or near existing sensitive land uses.



## Preferred Site

The site that best fulfills the criteria for project viability and public amenity ended up being an unaddressed lot owned by the Town of Kennebunk at MBL 052-044 on (0) Factory Pasture Lane.

**Physical:** The total lot area of this parcel is 60,548 square feet (1.4 acres) and it includes a 20,000+ square foot pad for locating the tower and maintenance buildings of a potential communications tower.

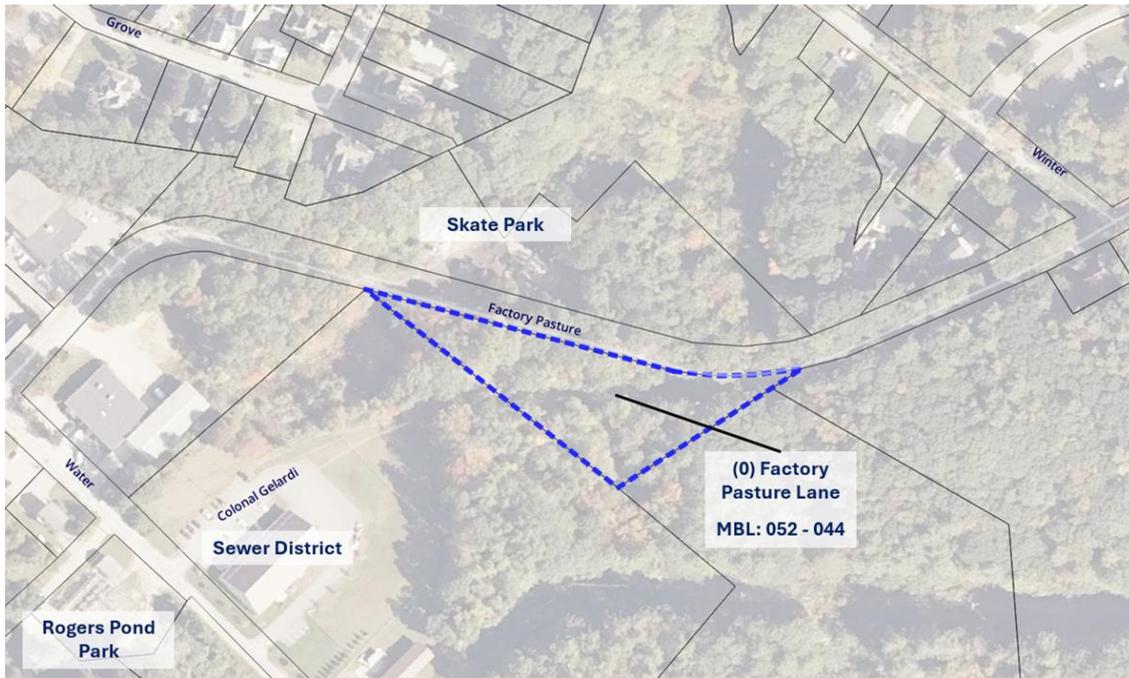
**Market:** Based on signal analysis and conversations with tower companies, this location is positioned to serve existing coverage areas and especially those with service deficits.

**Public Safety:** The parcel is owned by the Town giving site control and negotiating leverage for a land lease that will allow functional positioning of public safety equipment (and leave adequate vertical positioning for commercial carrier equipment for multiple carriers).

**Land Use:** this property is located in the Industrial zone which is one of two zoning districts that includes communications towers as an allowable use. Additionally, this site is situated next to existing commercial, utility and industrial uses at the far end of a residential district and with the Mousam River as a near border.

## Position of the Town

The Town of Kennebunk does not have staff with expertise to construct or maintain a communications tower. The clear trend in business operations for commercial carriers is towards focusing on its core competency and not building, owning or maintaining the tower structures. The Town prefers a similar position where it acts as landlord, but not property manager.



## Public Process

### Request for Proposals (RFP)

Should the preferred site move forward, the Town will solicit for proposals for a communications tower that allows control over timing and other crucial details of this project. This recommendation takes a measured approach to solving communications and public safety issues that are common to many Towns. This goal is pursued with a healthy consideration for the existing values of the community and a practical understanding of its partners.

### Public Approvals

**Compliance with State and Federal Telecommunications Statutes** - Applicants seeking to construct and operate communications infrastructure in Town will be required to meet State and Federal guidelines in addition to local regulations. <https://www.maine.gov/mpuc/regulated-utilities/telecom/laws-rules>

**Land Use** - State Law puts the land use approval process for cell towers under the responsibility of local planning boards. The Town's local ordinance relating to communications facilities is described in Zoning Ordinance, Article 7, Section 4.

*This section is designed and intended to balance the interests of the residents of the Town of Kennebunk, telecommunications providers, and telecommunications customers in the siting of telecommunications facilities within the Town... No person shall construct or expand a telecommunications facility without a permit from the Code Enforcement Office or a special exception permit from the Planning Board, as applicable.*

The preferred site is located in the Industrial zone and Communications Towers are an allowed use in this zone by special exception.

**Town Vote for Multi-Year Lease** - The selected party is expected to enter into a multi-year land lease with the Town of Kennebunk as part of this project. Multi-year lease arrangements involving the Town require a voter approval at a future Town Meeting.

## 4.0 Public Benefit

### Public Safety

The radio equipment located at the apex of the proposed communications tower will be a substantial upgrade to current public safety operations. The improved communication system will alleviate dead zones in Fire and Police service areas. The new equipment will improve interoperability across radio frequencies. It will be a substantive addition for Kennebunk as it builds a collaborative system to meet regional needs. It will improve public safety and the safety and effectiveness of first responders.

### Commercial Wireless Service

With the height of the current proposal, the tower will have vertical space for at least two commercial carriers in addition to adequate spacing for public safety needs. The impact of the new service provision will increase the number of device users able to have reliable service at the same time that it adds capacity during times of peak use.

The benefits of the improved service will be a boon to businesses, residents and visitors alike. The improved service will likely feature additional carriers that don't currently have equipment near downtown. This will likely increase users of these carriers from levels currently below -100 dBm into the range of -80 to -50 dBm.

### Land Lease

The location of the infrastructure on publicly owned land will allow the Town of Kennebunk to negotiate a land lease with the vendor where in addition to public safety improvements and the benefits of improved commercial cell coverage, the tower operators will pay a regular rent amount for the ability to use the land to host commercial carriers. These types of agreements are common between tower companies and public or private landowners. The regular revenue payments will provide a fiscal benefit to the Town and its stakeholders.

## 5.0 Supporting Material

Zoning Ordinance [Special Exceptions](#), see Section 4. Telecommunications Facilities  
The preferred site is located in the [Industrial District](#)

Economic Development Committee's [Proposed Wireless Communications Master Plan](#)