

# FACILITIES AND INFRASTRUCTURE CHAPTER

## INTRODUCTION

### Why Facilities and Infrastructure Matter

The Town of Barnstable protects, preserves, and improves a broad range of facilities and infrastructure that serves to meet and enhance the current and future social and economic needs of the community and contribute to a healthy, safe, and quality environment. The level at which these services are delivered is influenced by changes in population, development, environmental factors, regulatory changes, and economic conditions. Evaluating service capacity in combination with anticipated changes in community needs can help the Town determine strategic infrastructure and program investments for the near- and long-term.

*Please see Section 4: Built Systems of the Existing Conditions Report for more detailed information on water supply, wastewater management, stormwater management, transportation, and public services and utilities.*

## DATA SHEET

[Insert Data Sheet Graphics.]

### Facilities & Infrastructure Actions Since 2010

Since the Local Comprehensive Plan was last updated in 2010, the regional approach to infrastructure, especially as it relates to water resource management, changed dramatically. In 2015, Cape Cod's Area Wide Water Quality Management Plan, commonly known as the 208 Plan, was adopted by Governor Charlie Baker and provided the region with a framework to restore embayment water quality on Cape Cod. In the years since, the Town of Barnstable, responding to years of underinvestment in centralized wastewater infrastructure, actions from outside organizations such as the Conservation Law Foundation, and eventually 2023 changes to DEP Title V regulations, crafted, adopted and is implementing a Comprehensive Wastewater Management Plan.

The Town has also worked proactively to address the needs of its transportation system, looking not just to maintain the 250 miles of public roadways, but to evaluate how streets can be made safer for all users and make contributions to a community that has a healthier and improved quality of life.

All of the efforts above are done within the context of both planning for future climate resilience, and responding to the impacts of more frequent and intense storms experienced over the last decade.

### Policies, Priorities, and Plans

The 2010 LCP called for the creation and adoption of several new or updated plans, many of which have been addressed since then.

### *Comprehensive Wastewater Management Plan*

The CWMP is a town-wide, state approved, science-based plan to protect Barnstable’s coastal waters, ponds, and drinking water by managing nutrient pollution from wastewater. This 30-year plan will cost an estimated \$1.4 billion to implement.

### *Water Supply New Source Alternatives Report*

To address regulatory requirements for water supply redundancy and long-term planning, a study of potential future well sites was conducted for public property across the Town of Barnstable. Seven sites were determined for additional test well drilling, and nine wells were constructed across the seven sites in spring 2020, six of which were deemed hydro-geologically favorable. Sites were evaluated and ranked based on pump yield and water quality test results. The Bridge Creek Conservation Area in West Barnstable was deemed an advantageous site due to a potential yield almost 10-times greater than other sites.

### *Complete Streets*

The Town of Barnstable is seeking to improve the travel experience for all users of its streets – motorists, pedestrians, and bicyclists. In January of 2022, the Town of Barnstable was officially recognized as a Complete Streets community with an approved policy. A Complete Streets Prioritization Plan was developed with assistance from the Cape Cod Commission that includes a priority list of ranked multi-modal projects to improve safety for all users, including motorists, pedestrians, transit users and bicyclists for people of all ages and abilities, while making streets safer, sustainable, and more accessible to promote a more livable community. The project allows the Town to obtain up to \$500,000 in construction funding grants from MassDOT to implement complete streets projects included in the Plan.

### *Downtown Hyannis Great Streets*

The Downtown Hyannis Great Streets effort was focused on a study area including Hyannis Main Street and the surrounding roadway network and sought to address congestion, placing more of an emphasis on pedestrians, enhance the public realm through placemaking in support of economic development, employ traffic calming measures to enhance safety, and encourage multi-modal transportation. The Town of Barnstable’s Planning & Development and Public Works Departments partnered with walkability expert Jeff Speck and Stantec Consulting Services to complete this project. The end result of this process was buildable street designs concepts that convert the one-way network to two-way travel, address key intersections including ‘Six Points’, add proposed bicycle network, and create enhanced public spaces.

### *Parking Management Plan*

The 2017 Parking Management Plan for Downtown Hyannis developed a comprehensive approach for the entire downtown parking system, with the goal of providing convenient, accessible parking as part of a multi-modal transportation system. The plan sought to maximize value of the existing parking system, better connect the harbor to downtown, and develop a wayfinding and signage strategy for downtown.

### *Cape Cod Commission Low Lying Roads*

Cape Cod Commission worked with all 15 Cape towns to examine vulnerabilities in the roadway network and identify adaptation alternatives. The Commission conducted a vulnerability assessment of roadway segments, bridges, and culverts due to flooding from the combined effects of sea level rise and storm surge. The project employed state of the art modeling and community engagement to identify and prioritize low lying roads to target for coastal resiliency action. The Town received design solutions for two road segments: Bridge Street, Osterville and Ocean Street, Hyannis.

## ISSUES & OPPORTUNITIES

The facilities and infrastructure maintained by the Town of Barnstable face challenges including resilience to climate change (sea-level rise, intense storms, etc.), rising costs of construction and maintenance, and fluctuating seasonal demand. The Town has the opportunity, through anticipating needs and regulations, evaluating changing environmental and social conditions, and coordinating implementation, to protect, preserve, and improve facilities and infrastructure for the next generation.

*[Insert summary of subject expert presentations.]*

### Transportation

Barnstable seeks to invest in safe, accessible, and affordable transportation for all its residents. Transportation systems and connectivity across Barnstable are contributors to long-term economic vitality and the overall resiliency of the community. There is a lack of access across Barnstable, with limited fixed bus routes to connect individuals surrounding communities, to popular beaches and open space, or to connect villagers to the community at large. The Cape Cod Rail Trail stops at Barnstable's east and west border but does not yet traverse the town.

Challenges in the urban center of Hyannis include the upkeep of sidewalks and streetscapes, one-way roads unfamiliar to visitors, and an abundance of disparate parking lots.<sup>1</sup> Connections from downtown Hyannis to Hyannis Harbor include multiple intersections, one-way roads, and high stress pedestrian infrastructure. Residents and visitors would benefit from more connective infrastructure that helps pedestrians and cyclists navigate downtown with municipal parking opportunities on the periphery.

A lot of travel though Barnstable is auto-centric. Three main east-to-west roadways go through Barnstable: U.S. Route 6/Mid-Cape Highway, Route 6A/Old King's Highway, and Route 28/Falmouth Road. According to mobile count data from the Cape Cod Commission, Barnstable has some of the highest volume-to-capacity thresholds in Cape Cod throughout the year. Between 2012 and 2016, seven of the region's top ten crash locations were on Route 28 in Barnstable.<sup>2</sup> Furthermore, storm surge, culvert flooding, and sea level rise at times make many roads along the north and south bays impassable.

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<sup>1</sup> *Economic Development Analysis Interview –October 14, 2022.*

<sup>2</sup> Cape Cod Commission. 2020 Regional Transportation Plan. Technical Appendix G: Congestion Management Plan. July 15, 2019.

The Town allocates at least \$3.75 million annually to the public roads pavement management program, in addition to annual operating budgets dedicated to administration, engineering, highway maintenance, and snow and ice response. The Town currently maintains a modest budget to address private roads (\$93,000) and also provides snow and ice response. The Town is actively discussing and evaluating the fiscal and operating impacts of taking private roads, especially those impacted by implementation of the Comprehensive Wastewater Management Plan, those that are primary and collector roads, and those who have participated in the Temporary Repairs to Private Road program (23 roads) or have had recent sewer installation. To date, staff has evaluated private roads impacted by the CWMP and has begun to pursue easements to certify its right to utilities in said roads, as well as inventoried private roads that are eligible for maintenance under special legislation passed in 2014 (44 roads).

Major contributors to car reliance are certain public transportation limitations, such as limited bus service (particularly in West Barnstable, Barnstable, and Cotuit) and a dearth of protected, connected biking infrastructure. Fortunately, there are many services that address these limitations. The Cape Cod Regional Transit Authority (CCRTA) offers a door-to-door, appointment-based ride service called DART.<sup>3</sup> In collaboration with CCRTA, the Council on Aging offers a Silver Express service for elderly individuals, where the fares are suggested donations.<sup>4</sup> CCRTA provides additional transportation opportunities to help people get to appointments at major Boston-area hospitals.<sup>5</sup> Bus passengers can bring standard two-wheel bicycles on buses, helping to address limited connectivity between bike paths. Additional bus options include the Plymouth and Brockton bus line and the Peter Pan bus line, which bring residents to and from Boston's South Station and Logan Airport.<sup>6</sup>

Other public transportation options include the seasonal CapeFLYER rail service, which operates on weekends from Memorial Day through Labor Day, bringing people to and from Boston and Southeastern Massachusetts.<sup>7</sup> Steamship Authority ferries and Hy-line Cruises (a subsidiary of the Steamship Authority) take travelers to and from Barnstable and Nantucket and Martha's Vineyard.

## Capital Facilities

### Drinking Water

The Barnstable drinking water supply is provided by the Cape Cod sole source aquifer, an underground layer of porous soil through which groundwater can flow. Its sandy nature leaves the Cape Cod aquifer vulnerable to contamination since there is less time for natural filtration. All of Cape Cod is reliant on

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<sup>3</sup> Cape Cod Regional Transit Authority: "Overview, DART: Dial-A-Ride Transportation." Cape Cod Regional Transit Authority. Accessed October 2022

<sup>4</sup> "Transportation." Barnstable Council on Aging. Accessed October 2022.

<sup>5</sup> Cape Cod Regional Transit Authority: "Boston Hospital, The Cape to Boston Hospitals." Cape Cod Regional Transit Authority. Accessed October 2022

<sup>6</sup> "Plymouth and Brockton Daily Bus Routes." Plymouth & Brockton. Accessed October 2022.

<sup>7</sup> Cape Cod Regional Transit Authority: "CapeFLYER Schedules & Services." Cape Cod Regional Transit Authority. Accessed October 2022. <https://capecodrta.org/schedules-services/capeflyer/>

this aquifer for its drinking water (excluding, of course, any water transported to Cape Cod from elsewhere), making it an especially important resource to protect.

The Town of Barnstable Water Supply Division, an enterprise account-funded division under the Department of Public Works, was created by action of the Town Council following the Town's acquisition of the assets of the Barnstable Water Company in May 2005. This Division is responsible for management of the water distribution system primarily utilized by the residents and businesses in Hyannis. Outside of Hyannis, there are four independently governed water districts: Barnstable, West Barnstable, Centerville-Osterville-Marstons Mills, and Cotuit. West Barnstable has water commissioners, but they do not provide public water; all properties in West Barnstable are served by private wells.

Threats to water security and water resources generally are chemicals, including polyfluoroalkyl and perfluoroalkyl substances (PFAS), whose presence has been increasingly identified locally. The Town of Barnstable tests for PFAS and a variety of other pollutants and treats water to meet or exceed all public health standards.

### Wastewater Management

Protecting water quality is vital to the health and future of the Barnstable community and the region, and wastewater management plays a critical role. Infrastructure to handle and treat wastewater (household, commercial, and industrial wastes) can protect our embayments and groundwater for the health of the community and the natural environment. Barnstable's wastewater and sewer infrastructure include a secondary wastewater treatment plant, 30 sewage pump stations, and 55 miles of collection sewers, a pretreatment program for industrial wastewater, and a laboratory for process control/testing.

Septic systems are proportionally the biggest source of nitrogen contamination throughout Cape Cod, harming ecosystems and potentially affecting water resources. Fortunately, they are also the most addressable source of nitrogen contamination. Additional efforts by the Town of Barnstable to reduce nitrogen from point source contamination include a geographic information systems (GIS) tool that analyzes the water conditions on a lot-by-lot basis. The CWMP calls to expand the Town's sewer collection system by approximately 190 miles of sewer lines over 30 years. Climate change poses risks to Barnstable's wastewater systems since more frequent and intense storms and sea level rise could threaten infrastructure, including sewer pumping stations. Additionally, nonprofits, like the Barnstable Clean Water Coalition (BCWC), have worked with the Environmental Protection Agency to implement innovative/alternative wastewater solutions, such as alternative septic systems, bog restoration, and dredging.

### Stormwater Management

Stormwater includes all precipitation and snowmelt that runs off surfaces such as roofs, pavement, and even lawns instead of absorbing into soil and natural groundcover. The United States Environmental Protection Agency (EPA) has identified disturbance of land and polluted stormwater runoff as major sources of water pollution and has mandated local action to mitigate this pollutant through a Municipal

Separate Storm Sewer System (MS4) Permit requirement for each applicable municipality, including the Town of Barnstable. Managing runoff is necessary for the protection of the Town of Barnstable’s water bodies and groundwater resources and to safeguard the public health, safety, and welfare and the natural resources of the Town.

The Town is currently pursuing Municipal Separate Storm Sewer System (MS4) compliance through updated local standards and regulations. These regulations seek to achieve proper treatment and management of stormwater runoff to improve water quality and capture and treat runoff which can contain sediment, bacteria, fertilizers, oils, pesticides, and other harmful chemicals before it gets to our water bodies and groundwater resources.

In addition, the Town and other partners have been working to establish, maintain, and leverage green stormwater infrastructure (GSI). GSI methods reduce and treat runoff while also providing shade, habitat, and beautification and include approaches such as rain gardens, removing impervious cover, and constructed wetlands. In the Three Bays Watershed, the Town of Barnstable DPW has recently collaborated with APCC, the Horsley Witten Group (a consulting firm), and several environmental non-profit organizations to implement several GSI approaches.

## Energy

An effective energy policy and implementation program should include energy efficiency, distributed generation, renewable energy components, and a plan to measure, monitor, and reduce energy consumption town wide. The Town of Barnstable has inventoried greenhouse gas emissions at town-owned buildings and is working to reduce greenhouse gas emissions (GHGs) including through energy efficiency and renewable energy efforts. The town has efforts underway to increase the use of renewable energy at town facilities and pursue electrification of facilities and fleets. These efforts support the overall resilience of the town’s infrastructure and facilities, and can promote healthier indoor environments.

## Waste Management

The solid waste facility in Barnstable is managed by the Barnstable DPW through its Solid Waste Division. The solid waste facility, a transfer station, is located in Marstons Mills, which is operated strictly for solid waste generated within the Town of Barnstable. The facility accepts trash (municipal solid waste), in addition to recycling paper products, cans and bottles, plastics (where appropriate), leaves, scrap metal, white goods, motor oil, televisions, rechargeable batteries, computer monitors, tires, paint, mattresses, mercury products, fluorescent bulbs, cell phones, books and food waste. The recycling program also supports clothing and bottle redemption donations as well as a swap shop. Households in Barnstable can buy up to two Transfer Station Permits that they can use for household recycling and waste every week. Accommodation is made for residents facing financial hardship. There are opportunities throughout the year for hazardous waste collection for both households and local businesses through the County Extension’s Household Hazardous Waste program.

## GOALS & STRATEGIES

### Capital Facilities

When planning infrastructure improvements, seek opportunities to coordinate improvements across town departments and Barnstable agencies to increase cost-efficiency and minimize disruption to residents. This may include evaluating locations appropriate for sidewalk installation, streetscape and lighting improvements, or resiliency improvements together with the installation of public sewers and/or improvements to water infrastructure.

Research, develop, and continually evaluate policy and emerging technologies to improve infrastructure in locations vulnerable to climate change and evaluate options that may include hardening infrastructure, retrofitting with green infrastructure, or managed retreat.

Implement a comprehensive communications strategy related to infrastructure that: informs the public of upcoming capital projects; educates and advocates for residents to contribute to achieve water, waste management, energy, and safety goals; and enhances emergency response efforts.

### Transportation

The Town will improve safety and quality of traffic circulation and will coordinate an integrated transportation system that encourages use of alternate modes of transportation, including transit, walking, and biking.

- Strategy: Actively participate, submit projects, and seek priority on the Cape Cod Transportation Improvement Program to leverage State and Federal funding for local and/or regional priority transportation projects such as improvements to Route 132, the Cape Cod Rail Trail, Airport Rotary, etc.
- Strategy: Continue to pursue roadway easements for sewer installation on private roads impacted by the Comprehensive Wastewater Management Plan. Develop a policy for the town to take over ownership and responsibility of private roads, and a corresponding implementation plan that considers long-term financial and operational implications for the Town, and the needs of residents using private roads.
- Strategy: Expand routine seasonal and year-round transit options within and to essential destinations, commercial and employment centers, village centers, and areas of concentrated residential development. Explore options for increasing Barnstable’s connectivity with off-Cape destinations, including by rail.
- Strategy: Integrate Island ferry service facilities and operations with other multi-modal facilities and operations including, but not limited to, remote parking access, bicycle access, enhanced pedestrian access, and other transportation hubs such as the Cape Cod Regional Transit

Authority’s Hyannis Transportation Center and the Cape Cod Gateway Airport to reduce vehicle travel and land dedicated to parking in Downtown Hyannis.

- Strategy: Continue to build out the Town’s system of bike lanes, bike paths, bike routes, and related amenities, prioritizing safety and connections with other existing bikeways, the future Cape Cod Rail Trail, and linkages to public facilities, recreation and conservation areas, village centers, educational facilities, the CCRTA Hyannis Transportation Center, etc.
- Strategy: Continue to implement the Town’s Complete Streets policy and Prioritization Plan, pursuing transportation improvement alternatives that will reduce conflicts, improve traffic flow, and incorporate integrated multi-modal transportation options in Barnstable, while furthering the creation of vibrant, pedestrian- and bicycle-oriented mixed-use centers throughout the town.
- Strategy: Address accessibility deficiencies across Barnstable’s transportation system, making transportation options safe and accessible for people of all ages and abilities, languages, and cultures.
- Strategy: Use parking facilities to their full capacity, including looking at opportunities for: shared parking; potential for future housing development; addition of solar canopies; inclusion of green infrastructure and additional landscaping; and opportunities for flexible or seasonal uses.
- Strategy: Identify and prioritize improvements to low-lying roads to improve resilience to sea level rise, storm surge and flooding, focusing on evacuation routes and other key areas that represent a public safety concern during flood events and other hazardous conditions. Consider traditional “hard” infrastructure and green infrastructure solutions and evaluate the need for managed retreat.
- Strategy: Continue to plan for the end of the useful life of the town’s bridges, monitor their condition, and make repairs or replacements as needed.



## Wastewater Infrastructure

Provide wastewater treatment facilities to adequately treat wastewater discharges and address nitrogen and phosphorous, known contaminants of emerging concern, and other pollutants to protect the quality and quantity of our sole source aquifer.

- Strategy: Because water use equals sewage flows, effective wastewater management begins with water use conservation. To reduce impacts to Town wide wastewater infrastructure, the Town will partner with water districts to continue to implement water conservation programs, regulations, and incentives to incorporate new technologies into the system, as well as homes and businesses.
- Strategy: The current Comprehensive Wastewater Management Plan (CWMP) will be implemented and updated as required by such factors as growth, environmental impact or regulatory requirements to address the community's wastewater needs as prescribed by regional, state, and federal regulations.
- Strategy: Create a decentralized wastewater management plan that aims to eliminate aging wastewater solutions (cesspools), introduce innovative/alternative technologies in priority areas that will not be sewerred, and ensure appropriate management of septic systems.

## Water Supply Infrastructure

Plan for adequate drinking water supply, quality, flow, and pressure to meet current and future drinking water and fire protection demands.

- Strategy: Continue to update water treatment technology to address regulatory mandates and emerging and known contaminants.
- Strategy: Coordinate next steps on expanding water supply infrastructure to comply with redundancy requirements and plan for long-term resilience, including selecting one or more new public well sites and developing associated financial strategies.
- Strategy: Continue to encourage coordination between water system purveyors with joint meetings of drinking water suppliers, water committees/commissioners, and the Town.

## Stormwater Infrastructure

Have all stormwater discharge treated to appropriate levels through adaptive and best management practices. Protect saltwater estuaries, freshwater bodies, the aquifer, shellfish and other natural resources from stormwater impacts; better manage flooding from storms; and provide high quality stormwater recharge to water resources.

- Strategy: The community will comply with all Clean Water Act requirements (the MS4 permit) and implement and enforce regional, state, and federal regulations to eliminate pollutants or untreated water discharge into our waterways and maintain stormwater infrastructure to protect public and environmental health.
- Strategy: Incorporate green stormwater management techniques where appropriate to improve water quality and flood mitigation.
- Strategy: Continue to update aging and undersized culverts to improve coastal resiliency, emergency hazard response, and water quality, and restore wildlife habitat, where feasible.

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## Energy

Encourage energy conservation and improved energy efficiency and promote investment in distributed power generation and renewable energy systems on municipal property.

- Strategy: Develop and adopt design standards for development and redevelopment that promote efficient energy use such as orienting structures for solar gain; maintaining solar access for adjacent sites and using energy efficient landscape and building methods and materials.
- Strategy: Continue to increase use of alternative fuels for Barnstable's municipal vehicle fleet, as well as partner and support electrification of fleets at the CCRTA and Gateway Airport. Increase access to and public knowledge of charging stations.
- Strategy: Continue to update and monitor existing greenhouse gas emissions inventories and execute projects to reduce emissions, including pursuing grants and alternative funding for the expansion of solar and biomass energy systems at Town owned properties.

## Waste Management

The Town shall work towards a holistic system for waste management and disposal that increases source reduction, recycling, composting, and to dispose of hazardous waste in an environmentally sound manner.

- Strategy: Encourage a commitment to reduce consumption of materials and promote reuse of items in the workplace where practical.
- Strategy: A coordinated town-wide hazardous waste emergency response plan shall be maintained by the Town and the independent fire districts.
- Strategy: Continue and expand the Household Hazardous Waste Collection program.
- Strategy: Land uses that require treatment, generation, storage, and disposal of hazardous wastes or hazardous materials, with the exception household quantities, are prohibited and should continue to be excluded from drinking water protection districts. The Town will continue to refine hazardous materials ordinance and regulations to ensure maximum protection of drinking water supplies and public safety.

## Public Facilities

### Public Safety

Invest in infrastructure improvements that improve overall public safety, reduce/eliminate vehicle and pedestrian deaths, create a safe and welcoming public realm, public parking lots in village centers, beaches, and open spaces. Collaborate with public safety officials on roadway, intersection, and public space improvements.

- Strategy: Target improvements to roadways and intersections with the highest crash rate to reduce the number of vehicle and pedestrian crashes to improve the safety of all users; improvements should be designed to reflect the scale and character of the neighborhood. Consider major roadway/intersection reconstruction projects as well as smaller interventions such as crosswalk improvements and traffic calming methods.
- Strategy: Research and execute options for roadway improvements to improve safety for all users, for example daylighting at intersections and other low-cost, nimble efforts to improve the safety of our transportation network.
- Strategy: Develop a town-wide lighting survey to determine where additional street lighting is necessary to improve vehicular and pedestrian safety, focusing on frequently traveled roadway, bike and pedestrian corridors used for daily travel to work.
- Strategy: Design new roadways and incorporate into roadway projects interventions to calm traffic, reduce speeding, and incorporate public spaces where possible.

## MAPS

Mapping is an important tool for visualizing natural resources policies. The maps below can help the community see where important facilities and infrastructure exist today and where they are planned for the future.

*Please see the Existing Conditions Report for a fuller range of maps.*

**Map X: Existing Sewer System**

**Map X: Future Sewer System (Phases 1, 2 and 3)**