

Town of New Castle

MASTER PLAN

New Castle, New Hampshire

2024



Image courtesy of David J Murray, ClearEyePhoto

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Purpose of the Master Plan

The purpose of the Master Plan is to set down as clearly and practically as possible the best and most appropriate future development of the area under the jurisdiction of the planning board, to aid the board in designing ordinances that result in preserving and enhancing the unique quality of life and culture of New Castle, New Hampshire, and to guide the board in the performance of its other duties in a manner that achieves the principles of smart growth, sound planning, and wise resource protection.¹ A master plan is not a legal document; however, it is the legal basis for a zoning ordinance, site plan regulations, and subdivision regulations.



Image courtesy of David J Murray, ClearEyePhoto

¹ Section 674:2 Master Plan; Purpose and Description. (state.nh.us)

Executive Summary

Principles

Principles that guide the Town of New Castle in the design of its ordinances and other measures relating to development are as follows:

1. Town ordinances and other measures should maintain a just balance between the rights to the enjoyment of private property and the community's obligation to meet its existing and probable future needs to protect the general welfare of the community including, but not limited to, health, safety, order, convenience, and prosperity, and to protect the character of the town including, but not limited to, conservation and preservation of natural, historic, and other man made resources.
2. Ordinances should be simple to understand with clear, concise, objective standards.
3. Ordinances should be easily enforceable by town officials, imposing reasonable costs on applicants for approvals.
4. Where town authorities are exercising judgment, it should be clear that they are following objective rather than subjective considerations. Guidelines should be spelled out.

Conditions

The following conditions were noted throughout the development of the Master Plan of the Town of New Castle:

1. New Castle is New Hampshire's sole island seashore town, less than one square mile in size. Consequently, there are inherent limits on the amount of land within its borders, and on how that land can be used.
2. The town's scenic views, natural beauty, and diverse natural resources, including fragile wetlands and ecosystems, are home to many native flora and fauna. These natural features contribute significantly to the overall appeal and unique character of New Castle.
3. State and federal agencies own large amounts of land in New Castle and are increasing its use. The town has limited control over these activities, although they have substantial impact on the community.
4. The central part of New Castle is characterized by small lots, narrow streets, and limited setbacks, and there is a lack of developable land.
5. State-owned Route 1B is heavily used by multiple modes of transportation.
6. The town is experiencing increased threats from sea level rise, extreme precipitation, and other climate impacts.
7. Town infrastructure is aging.
8. Historic town facilities require ongoing maintenance.
9. New Castle has a valued historic district and natural features that contribute significantly to the overall appeal and unique character of New Castle.
10. The town is dependent on the City of Portsmouth for water and sewer service.

Methodology

The Master Plan was developed by citizens of New Castle and included the implementation of a survey to gauge priorities of the Town of New Castle, data collection to inform a greater understanding of the existing and potential future condition, and a public input session to solicit input to inform the direction of development in the community.



Image courtesy of David J Murray, ClearEyePhoto

Recommendations

The following summarizes the Master Plan's key recommendations:

1. Continue to balance the preservation of existing housing and streetscapes with demands for modern dwellings.
2. Evaluate other areas of New Castle to determine whether there is existing vulnerable architecture worthy of HDC oversight.
3. Consider an explicit town budget allocation to legally enforce both the spirit and letter of the existing Zoning Ordinance Building Code.
4. Include wetland buffers to respect sensitive fresh and tidal wetlands. Plan for future wetland migration and restore natural vegetation within buffer zones.
5. Advocate to the state about the importance of the New Castle/Rye Bridge repair project, the elevation of the Rt. 1B causeway, and the remediation of the Route 1B low spots in Rye in their identified priority projects.
6. Educate town residents about the location of Flood Hazard Zones and Storm Surge Inundation Zone.
7. Replace culvert on Pit Lane to allow for rapid water passage and retreat from Pit Lane A wetland to Pit Lane B wetland.
8. Collaborate with government agencies at the state and local levels to further evaluate the impacts of sea level rise and storm surge and review potential adaptation strategies to help mitigate those impacts. Devote special attention to island access and to the adverse impact on the sewer collection system.
9. Utilize the best available science and statewide guidance related to resilient communities in planning activities and stay current with regional and state capabilities to mitigate damage caused by climate impacts.
10. Strive for improved emergency vehicle access, particularly given the increased frequency and severity of weather events.
11. Continue to work cooperatively with NHDOT, New Castle Police Department, and residents to improve overall safety for non-motorized traffic.
12. Proactively work with existing utility providers to ensure that maintenance and upgrade of utility infrastructure is completed in a timely manner to support town resiliency, particularly during storm events.
13. Consider the feasibility and cost of burying power lines where possible for better protection against storm related disruptions and less visible equipment.
14. Diversify energy options, which could include the feasibility of natural gas supply to New Castle or renewable energy options.
15. Review town standards related to back-up electrical power sources, which could include generators, on-site solar, and battery combinations.
16. Provide more reliable and robust broadband services; the town should encourage further investment in wireless transmitting and receiving as well as fiber deployment where feasible.

17. Efforts should be made to reduce energy consumption for town buildings and vehicles, to lower operating costs.

18. New or modified community services should be considered to improve efficiency and accessibility, as well as respond to changing demographics.

19. Consider steps that will encourage all ages of citizens to be a part of a robust and lively school and student population in New Castle.

20. Review and revise the town's land use regulations to encourage installation and use of solar, wind, or other renewable energy systems on public and private buildings and homes.



Image courtesy of David J Murray, ClearEyePhoto

Introduction

This revision of the Master Plan of the Town of New Castle replaces all prior Master Plans adopted by the Town Planning Board. This Master Plan contains a statement of principles and conditions, as well as a vision statement. Additionally, there are chapters related to Community Services, Transportation, Public Utilities, Energy, Natural Resources, Historical Resources, and Housing and Land Use.



Image courtesy of David J Murray, ClearEyePhoto

About New Castle

New Castle contains 0.8 square miles of land area and 1.3 square miles of inland water area.²

The largest of several islands at the mouth of the Piscataqua River, this town was originally known as Great Island. Chartered in 1679 as a parish of Portsmouth, it was incorporated in 1693 during the reign of William and Mary. For a number of years, this was the seat of government, where meetings of the governor and council were held.

New Castle is unique in the state, being the only town made up entirely of islands, connected to the mainland by bridges. New Castle is home to the Wentworth-by-the-Sea Hotel, where delegates to the Russo-Japanese Peace Treaty of 1905 stayed during negotiations held at the nearby Portsmouth Naval Shipyard.

The treaty negotiation and signing, which elevated Japan to an international power at the conclusion of the Russo-Japanese War, was held in the Portsmouth area at the specific invitation of President Theodore Roosevelt.

According to 2020 data provided by Rockingham Planning Commission, there are 1,000 people in New Castle, an increase of 32 since 2010. The 2020 population of the town reflects a distribution skewed toward the older end with the median age 56.8 years. The town's older demographic, coupled with the third lowest tax rate among incorporated towns in New Castle at \$4.50/\$1,000 in 2022, make it an attractive community for aging and fixed income populations.⁴

Table 1: New Castle Demographics and Income³

| Metric | New Castle | RPC Region | State of NH |
|-----------------------------------|------------|------------|-------------|
| Total Population (2020) | 1,000 | 198,870 | 1,377,529 |
| change since 2010 | 32 | 10,349 | 61,059 |
| Average Age (2020) | 56.8 | 47 | 44.86 |
| change since 2015 | -0.4 | 1.4 | 1.17 |
| change since 2010 | 1.7 | 3.8 | 3.23 |
| Population Over 65 (2020) | 413 | 53,873 | 245,142 |
| change since 2015 | 55 | 22,183 | 43,178 |
| change since 2010 | 173 | 27,745 | 74,811 |
| Population Under 18 (2020) | 181 | 36,043 | 257,731 |
| change since 2015 | 74 | -2,373 | -13,949 |
| change since 2010 | 79 | -6,268 | -38,221 |

² <https://www.nhes.nh.gov/elmi/products/cp/profiles-htm/newcastle.htm>

³ Newcastle NH - Community Profile | Economic & Labor Market Information Bureau | NH Employment Security

⁴ <https://www.revenue.nh.gov/mun-prop/municipal/property-tax-rates.htm>

Community Services and Assets

EXISTING CONDITIONS

Over the past several decades, New Castle's population has ebbed and flowed around 1,000 residents. This, combined with limited buildable land, means that demand for town services is unlikely to grow in the foreseeable future.

Responses from the January 2023 community survey indicate an overall satisfaction with the town's services, including its parks and beaches, with 87 percent of respondents agreeing that recreational opportunities are an important or very important feature for New Castle. Additionally, more than three-quarters (76%) of survey respondents indicated that having a quality school is important for New Castle. The survey did indicate that one common concern is related to the cost and need for maintaining town-owned facilities. Below is a list of town, state, and federal buildings and assets within the New Castle boundaries.

FUTURE CONDITION/VISION

It is not anticipated that new community facilities will be built in the Town of New Castle in the foreseeable future, but we do expect increased and more intense use of existing facilities. As a result, the town should continue to commit to adequate funding for the maintenance of our existing community facilities. It is anticipated that some new or modified town services also may be developed, with improvements in technology and town processes.

Table 2: Community Services and Assets

| Facility | Description |
|---|--|
| Town Hall | The town hall built in approximately 1894 for the Knights of Pythias, continues to provide a range of in-person services and acts as a community space to conduct town business. |
| Public Works Building | The public works facilities include the town garage, salt shed and storage space known as the firing range. |
| Public Safety Building | The public safety building houses both the fire and police departments. |
| Recreation Center Building | The recreation building is an approximately 2,268 square foot building with indoor recreation facilities and a large meeting hall on one side and the town library on the other side. |
| The New Castle Historical Society Building | Originally the Free Will Baptist Church, and more recently the town’s former library, the building presently houses New Castle’s Historical Society. |
| Maude H. Trefethen Elementary School | Maude H. Trefethen Elementary School (MHT) is located at 142 Cranfield Street. This facility houses the town’s elementary school, serving kindergarten through fifth grade. |
| U.S. Post Office in New Castle | Located at 73 Main St, the post office supports the town of New Castle by providing delivery of mail and packages. A satellite facility in the “Yellow House” at the Wentworth By The Sea community provides additional post office boxes. |
| Town Cemeteries | The Town of New Castle owns and maintains five cemeteries. In addition, the New Castle Cemeteries’ Commission has identified 22 additional burial grounds with marked and unmarked graves. |
| The Great Island Commons | The Great Island Commons is a 32-acre parcel that is the town’s recreational centerpiece, granted from the federal government. |
| Town Landing | Town Landing consists of two adjoining parcels equaling 2.15 acres owned by the town. It is commonly known as the dog park. |
| Ocean Street Property | 0.91 acres acquired by the town from the U.S. Coast Guard in 2023. |
| Water Infrastructure | The New Castle Water Utility services the northside of the island; the City of Portsmouth the southside. The two are connected at the intersection of Main St. and Wentworth Rd. |
| Sewer Infrastructure | The collection system consists of underground pipes installed in 1975 and three pump stations located at Steamboat Ln., River Rd., and Quarterdeck Ln. Effluent is pumped from the River Rd. station to the Portsmouth Waste Water Treatment Facility on Peirce Island for processing. |
| Walking Paths | There are several walking paths throughout the town, notably in and around The Commons. |
| New Castle Congregational Church | Built in 1828, it is registered on both state and national historic records. With the post office, the meeting hall and parking lot provided on the church grounds, it is a great example of a private/public partnership. |
| State facilities located on New Castle Island include the following. | |
| Fort Stark | Fort Stark historic site is located on a peninsula once called Jerry’s Point at the end of Wild Rose Lane. It overlooks the Piscataqua River, Little Harbor and the Atlantic Ocean. |
| Fort Constituion | Fort Constitution State Historic Site, originally Fort William and Mary, is located adjacent to the US Coast Guard Station and is historically significant, preceding the American Revolution. |
| University of New Hampshire | The Marine Complex includes the Coastal Marine Laboratory, the Marine Research Pier, the Pier Operations Facility, and the Pavilion. |
| Federal facilities located on New Castle Island include the following. | |
| U.S. Coast Guard Station | The US Coast Guard operates out of New Castle where it protects state and federal waterways. |

Transportation

EXISTING CONDITIONS

State maintained Route 1B is the only access to New Castle. Route 1B enters New Castle from Portsmouth via two bridges and a causeway, goes through town and exits over another bridge into Rye. Route 1B's passage through New Castle is narrow, winding, has numerous sharp corners and ledge outcroppings, as well as houses near the pavement's edge in many places. The town falls within the Emergency Planning Zone for Seabrook Station Nuclear Power Plant, given its proximity. Route 1B is the sole evacuation route for all residents during emergencies both natural and radiological.

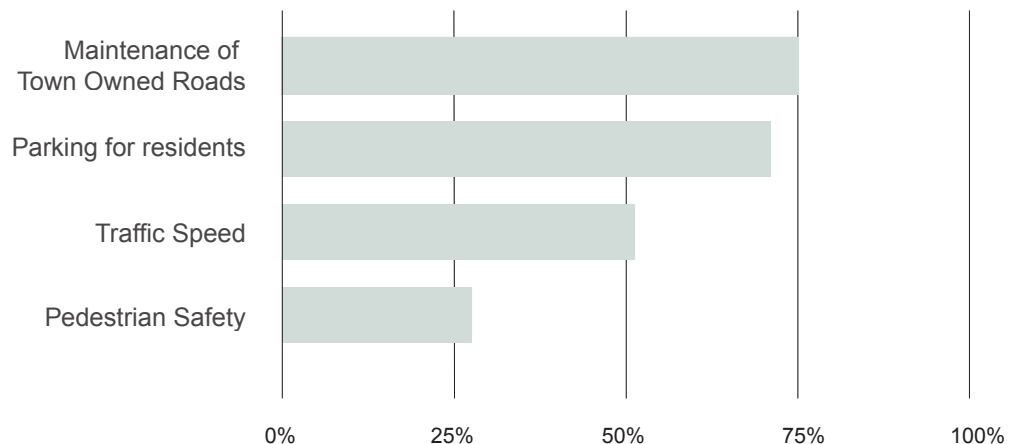
Over 50 percent of respondents in the Master Plan Survey expressed concern with emergency vehicle access to and evacuation routes off New Castle. Note that the evacuation route issue is addressed in the Natural Resources section of this Master Plan.

Parking along Route 1B is difficult, and parking in town is limited. There are several resident-only parking locations that have helped address this issue. The town maintains 27 public roads in town, and there are also many private roads in New Castle.

Respondents to the Master Plan Survey expressed their overall satisfaction with road maintenance, parking and traffic speed. The town and New Castle Police Department (NCPD) have taken measures to improve safety for all traveling in New Castle, including lowering the speed to 20 mph over the summer months and adding four speed feedback cameras.

Respondents to the Master Plan Survey expressed dissatisfaction with pedestrian safety. New Castle's narrow roadways, combined with its scenic views, means that there is often significant usage of our roads by vehicles, bikes, and pedestrians. New Castle roads are well traveled and categorized as "most popular" routes for recreation, including bicyclists and pedestrians by the New Hampshire Department of Transportation (NHDOT). Traffic data has remained steady at over 3,000 cars per day passing through town.⁵

Figure 2:
Percent of Respondents Satisfied or Very Satisfied With...



Source: Master Plan Survey

5 NHDOT Transportation Data Management System, <https://nhdot.public.ms2soft.com/tcds/tsearch.asp?loc=Nhdot&mod=>

State routes 1B and 1A are the most heavily traveled bicycle routes in New Hampshire according to Rockingham Planning Commission (RPC). These highways carry a designated state bicycle route, U.S. Bicycle Route 1 (the only United States Department of Transportation (USDOT) designated bicycle route in New Hampshire), the NH Coastal Byway and the on-road route for the East Coast Greenway. However, significant segments of both highways have less than one foot of shoulder. This means that people walking and bicycling frequently occupy the travel lanes, which has a history of causing user conflicts and safety problems.

There are currently sidewalks from the Wentworth Hotel to The New Castle Commons. These were funded by a public/private partnership between the town and Safepath, a local organization that has raised private funds to increase pedestrian safety. Additional sidewalks are planned to connect the commons to Pit Lane, funded by a Transportation Alternative Program (TAP) grant, town funds, and private donations, a unique partnership that can serve as a model for future pedestrian safety efforts.

Table 3:
Annualized Average Daily Traffic on Route 1B

| Year | Annualized Average Daily Traffic on 1B (rounded) |
|------|--|
| 2001 | 2,200 |
| 2010 | 4,200 |
| 2017 | 3,800 |
| 2019 | 3,200 |
| 2022 | 3,300 |

Source: NHDOT Transportation Data Management System

FUTURE CONDITION/TOWN VISION

NHDOT offers a vision for transportation through their Complete Streets approach, which is a philosophy that guides community, planning, and transportation agencies to consider and incorporate safe access to destinations for everyone, regardless of age or ability, or mode of transportation, when feasible.

For New Castle, this means focusing on improving safety for all travelers while working to maintain our historic streetscapes and managing a narrow, winding Route 1B. The town needs to work cooperatively with the NHDOT, NCPD, and town residents to improve overall safety for non-motorized traffic. Some examples of improvements include adding sidewalks, updating crosswalks with activated lights to alert motorists, or creating “sharrow” lanes to bring attention to drivers that they are sharing the road with cyclists and pedestrians.

New Castle should also address emergency vehicle access, particularly along the Route 1B Causeway. Increasing access to the island is important for resident safety as well as to ensure access to emergency services during storms. [See Natural Resources Section]. Residents and the Town of New Castle need to continue lobbying the state to prioritize the Causeway improvements in their planning efforts.



Image courtesy of Tony Coniglio

Public Utilities⁶

EXISTING CONDITIONS

In 2021, New Hampshire generated approximately 17.4 million MWhs of electricity. Nuclear power, specifically Seabrook Station, accounted for about 9.8 million MWhs of that generation, or just over 56 percent. Natural gas accounted for just under 26 percent of New Hampshire's generation, with renewables (i.e., solar, biomass, hydroelectric, and wind) representing about 17 percent. Coal and oil combined account for roughly two percent of New Hampshire's annual generation. In 2021, 16 percent of electricity generated in New Hampshire was from renewable resources. Hydroelectric generation was the largest renewable resource type at 6.6 percent, followed by biomass generation at 5.8 percent, wind at 2.9 percent, and solar at 1.1 percent.

New Hampshire customers receive electricity from three regulated investor-owned utilities (i.e., Eversource, Liberty, and Until), one electric cooperative (i.e., New Hampshire Electric Cooperative), and several municipally owned electric companies (i.e., Ashland, Littleton, Woodsville, New Hampton, and Wolfeboro). In 1996, New Hampshire's electric industry restructured to allow electric retail choice that allows customers to purchase electricity supply from an entity other than the electric utility.

ELECTRICITY

Eversource is the current and only supplier of electricity to New Castle. There are no power generation facilities located on the island, rendering the town reliant on several regional power generation facilities with whom Eversource maintains supply contracts. In 2022, there were approximately 540 active residential accounts with an average monthly usage of 899 Kwh. The national average for monthly household electrical consumption was 886 Kwh in 2021.

Portsmouth and Rye have joined the Community Power Coalition of New Hampshire (CPCNH), which allows them to have local control over electricity providers for the town residents who opt into the plan. While Eversource would remain the transmission and service supplier, Community Power plans offer a wider variety of electricity suppliers, including renewable energy options. Community Power is authorized under NH RSA 53-E and would need to be authorized by New Castle's governing body.

The majority of electrical power in New Castle is distributed through above ground utility poles and power lines. This arrangement carries elevated vulnerability to adverse weather events and materially degrades the streetscape. A number of residents have chosen to bury power lines where possible and usually during more extensive renovations. Larger scale power line burial may be limited in certain areas by geologic constraints, as well as uncertainty about funding mechanisms for this type of work.

6 Rockingham Planning Commission, Russ Bookholz (Building Inspector), Energy Information Authority (EIA), Eversource

NATURAL GAS (UNITIL)

Natural Gas is not available on the island. The costs of bringing natural gas to the island would be very high, given the required infrastructure (piping) through bridges and/or causeways as well as the relatively long distances from Portsmouth. It does not appear as though Unitil, who supplies natural gas to Portsmouth, has considered any realistic option to supply New Castle, given the combination of these physical constraints and moderate customer density.

HEATING

Oil and propane are the dominant forms of heating fuel on the island and are widely available from multiple independent vendors. Most of the new construction or major renovations in recent years have been installing propane furnaces instead of oil. A number of recent renovations and new builds have also included electric air source heat pumps for air conditioning and a secondary source of heating.

TELECOMMUNICATIONS

The Town of New Castle is currently served by Comcast (Xfinity) for landline telephone, Cable TV, and Broadband internet service. Consolidated Communications (Fidium) also serves the town for fiber optic broadband internet services. T-Mobile and Verizon have installed cell phone transmitting and receiving equipment located in the church steeple.

WATER AND SEWER INFRASTRUCTURE

The town is dependent on the City of Portsmouth for water and sewer service. As such, it must adhere to the regulations of the city; in particular the town is a “co-permittee” with the city of the Peirce Island Wastewater Treatment Facility. Because the town is effectively “built out,” there is no immediate concern in the town’s ability to absorb additional water and sewer capacity; however, any large-scale expansions would have to be coordinated with the City of Portsmouth.

The municipal water system on the northside was constructed in the late 1960’s and was improved in 2020 by the installation of a 12” main under Rte. 1B. However, many laterals (on side streets) date back to the original infrastructure, and in the absence of a project to replace them, the possibility of spot failures will increase. The southside of the town is serviced directly by the City of Portsmouth with some of its lines exceeding 75 years of age. An underwater supply line was abandoned because of frequent, costly-to-repair failures and the main water line under Wentworth Rd. from roughly Spring Hill Rd. to Main St. needs to be replaced. Portsmouth has had a longstanding capital project planned to replace this line as well as the abandoned supply line but has postponed any implementation until the Rye-New Castle bridge crossing is resolved.

The sewer system was installed in 1975. Its underground assets consist of 34,000 linear feet of pipe and over 100 manholes; the above-ground assets are the three pump stations at Steamboat Ln., Quarterdeck Ln., and River Rd. These pumps were replaced in 2018 and have an expected life of 15-25 years. A project to replace the three emergency diesel generators began in March 2023 with an expected completion date in 2025. Given the proximity of the pump stations to nearby bodies of water, this project was prefaced by an analysis of the elevation of the generator platforms. The platforms at Steamboat Ln. and River Rd. will be raised by two feet; the platform at Quarterdeck Ln. will remain unchanged. This should provide sufficient margin until 2050. Thereafter, should sea level rise not abate, a future project may require major relocation of virtually all components to above ground at all three stations, a costly and complex initiative. There are still numerous homes on the island serviced by private septic systems. Given the concern for groundwater rise accompanying sea level rise, the town may have to consider extension of the sewer collection system, especially to the southside Rte. 1B properties from Main St. to Wild Rose Ln.

FUTURE CONDITION/TOWN VISION

Given the concerns residents have about storm proofing our energy infrastructure, the town should examine the feasibility and cost of burying power lines where possible for better protection against storm related disruptions and less visible equipment. To maximize heating fuel options, the town should inquire about potential natural gas supplies in conjunction with any material causeway or bridge replacement or improvements. Efficient energy use and renewable energy options should be encouraged in New Castle.

Concerns about power outages could be alleviated with more lenient standards for back-up electrical power sources including both generators and on-site solar and battery combinations.

The town should encourage further investment in wireless transmitting and receiving equipment, as well as fiber deployment where feasible and effective for providing more reliable and robust broadband services.

Lastly, the town will have to pay close attention to the older components of the water and sewer infrastructures. Of particular concern will be the aging water laterals and the vulnerability of the pump stations to sea level rise.



Images courtesy of David J Murray, ClearEyePhoto

Energy

EXISTING CONDITIONS

While the town is committed to energy conservation, determining our current energy usage is limited due to data limitations. Despite this challenge, strong efforts have been made by the New Castle Energy Committee (NCEC) on various projects (see detail below). The role of the NCEC is to advise the Board of Selectmen on energy conservation and energy efficiency strategies. The primary goals of the NCEC are to:

- Coordinate Town energy conservation and energy efficiency activities with municipal officials, departments, zoning and planning boards, town committees, elementary school, businesses, residents, and other community groups or activities;
- Work with town officials to develop a capital improvement plan that includes energy cost saving strategies and emission reductions;
- Develop a comprehensive energy plan or strategies for the town;
- Evaluate municipal energy use and operations on an annual basis;
- Identify for the town the cost savings, Return on Investment (ROI), as well as a payment structure over the useful life of the equipment/ systems/ product;
- Evaluate reductions in energy use and emissions;
- Identify sources of funding including regional, state and federal grants, and organize fundraising activities;
- Recommend revisions and/or the development of regulatory and planning documents;
- Coordinate outreach and awareness activities in the community.



Image courtesy of Tony Coniglio

To date, the NCEC has helped facilitate and complete the following projects:

Table 4: NCEC Projects

| 2018 | 2020 | 2021 | 2023 |
|---|--|--|---|
| <p>Town Hall:</p> <p>Furnace change over to propane</p> <p>Basement water sealing</p> | <p>Town Hall:</p> <p>Installation of the Daikin Hyper Heat Pump System (3 ton) outside with four indoor units</p> | <p>Rec Center/Library:</p> <p>LED lighting in the Library, Macomber room and private area lights (PAL's)</p> <p>Installed a new ceiling fan motor for the furnace in the Rec area</p> | <p>New Castle Town Administrator and Selectboard members gave approval, and we were accepted into Eversource's Municipal Technical Assistance Program. This program can include energy audits, structural thermal imaging, and recommendations for engineering to improve energy cost savings. NCEC confirmed this work would be done at no cost to the town.</p> |
| <p>As part of the New Castle Lighting Plan:</p> <p>LED streetlights (68) retrofit projects were completed</p> | | | <p>The Rec Center building gym area lighting has been converted to LED.</p> |

FUTURE CONDITION/TOWN VISION

New Castle should systematically measure and monitor its energy consumption with the intention of lowering the energy requirements for our town buildings and vehicles and providing lower and more predictable operating costs. All electrical consumption and heating fuels in the town owned facilities, including the school, should be included as well as all vehicle fuel consumption. New Castle should also revise its planning, zoning, and related regulations to permit and encourage the installation and use of solar, wind, or other renewable energy systems on public and private buildings and homes.⁷



Image courtesy of Tony Coniglio



Image courtesy of David J Murray, ClearEyePhoto

⁷ Section 674:17 Purposes of Zoning Ordinances. -- I. Every zoning ordinance shall be adopted in accordance with the requirements of RSA 674:18. Zoning ordinances shall be designed:

j To encourage the installation and use of solar, wind, or other renewable energy systems and protect access to energy sources by the regulation of orientation of streets, lots, and buildings; establishment of maximum building height, minimum set back requirements, and limitations on type, height, and placement of vegetation; and encouragement of the use of solar skyspace easements under RSA 477. Zoning ordinances may establish buffer zones or additional districts which overlap existing districts and may further regulate the planting and trimming of vegetation on public and private property to protect access to renewable energy systems.

Natural Resources

EXISTING CONDITIONS

The impact of climate change is woven into every aspect of life on New Castle Island. As the Master Plan Survey showed, 97 percent of New Castle residents feel that the natural features and beauty of New Castle are very important. They also agree that sea level rise (SLR) is among the most significant future challenges New Castle faces. (The current and projected impact of this rise is a multi-decade problem not in the town’s control.) “By 2030, long term projections show-15 days per year of high-tide flooding for coastal communities nationally. By 2050, that rises to 25-75 days a year.”⁸

Building community resilience requires various approaches to address the many aspects of New Castle life impacted by coastal threats. The *New Hampshire Science and Technical Advisory Panel Part II: Guidance for Using Scientific Projections (2020)* lists adaptation strategies that build community resilience.⁹

1. Select and plan for relative sea-level rise (RSLR) estimates that range from
 - a. 1.3-2.3 feet by 2050
 - b. 2.9-6.2 feet by 2100
 - c. 4.6-11.7 feet by 2150

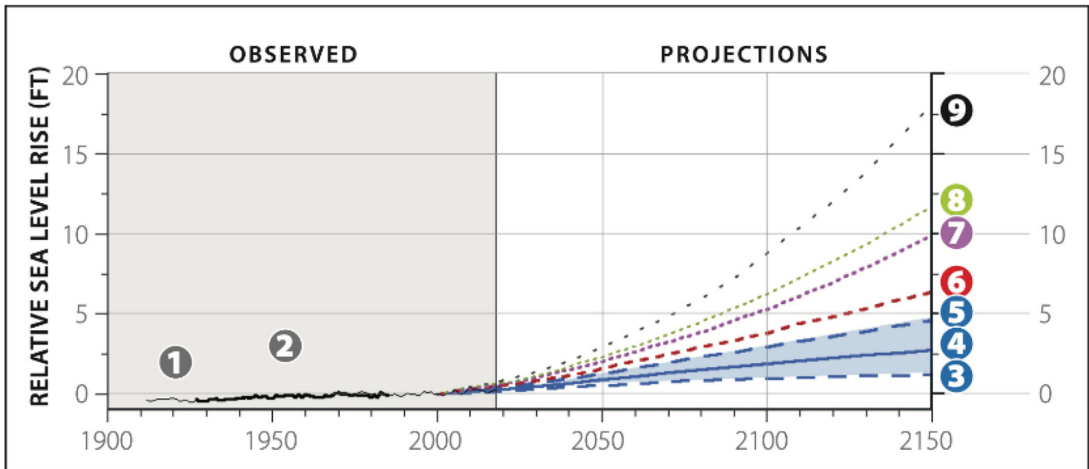


Figure 4.5. Observed and Projected Relative Sea-Level Rise for Seavey Island Tide Gauge K14 Projections | Stabilized Greenhouse Gas Concentrations (RCP 4.5).

- 1 Historical data for Portland, ME (1912-2018; thin black line)
- 2 Historical data for Seavey Island, ME (1927-1986; thick black line)
- 3 Lower end of “likely range”
- 4 Central estimate
- 5 Upper end of “likely range”
- 6 1-in-20 chance estimate
- 7 1-in-100 chance estimate
- 8 1-in-200 chance estimate
- 9 1-in-1000 chance estimate

2. Account for projected increases in extreme precipitation by multiplying present-day extreme precipitation rainfall estimates by at least 15%.
3. Identify and evaluate adaptation options to minimize coastal flood risks.

⁸ U.S. high-tide flooding continues to increase | National Oceanic and Atmospheric Administration (noaa.gov)
⁹ <https://scholars.unh.edu/cgi/viewcontent.cgi?article=1210&context=ersc>

Building a resilient community requires adaptations, each implemented as appropriate. Knowing which approach is right for a given project depends partly on the tolerance for flood risk at that site, as described in the *Part II: Guidance for Using Scientific Projections*. This document defines this risk tolerance as “the willingness of decision makers to accept a higher or lower probability of flood impacts.”

This section of the Master Plan describes the risks to the town and its shoreline from SLR and groundwater rise, providing an overview of the challenges facing New Castle from coastal hazards now and in the future. Coastal resilience is the ability of a coastal community to achieve community goals and social, economic, and environmental well-being over the long term in the face of a changing climate and coastal hazards.

PROJECTIONS

Over the coming decades, accelerating SLR and worsening storms threaten to degrade the town of New Castle’s beach, wetlands, roads, and strain its municipal services. The low-lying areas of the town are most directly at risk.

SEA LEVEL RISE

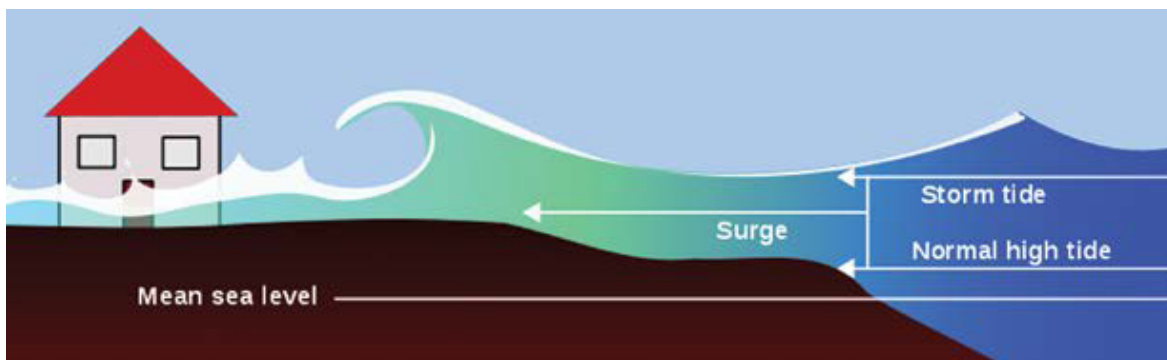
The New Hampshire Coastal Flood Risk Science and Technical Advisory Panel (STAP) produced a two-part document. *New Hampshire Coastal Flood Risk Summary Part I: Science*, published in 2019, provides projections of local sea level rise, coastal storms, groundwater rise, precipitation, and freshwater flooding in New Hampshire (Wake, et al., 2019). *Part II: Guidance for Using Scientific Projections*, published in 2020, lays out an approach for incorporating these projections into planning, regulatory, and site-specific projects based on a “Tolerance for Flood Risk” framework.¹⁰

The projected SLR estimates in *Part II: Guidance for Using Scientific Projections* for Coastal NH Tide Levels allow us to gauge how rising seas will affect our community.

COASTAL STORMS

The number of intense hurricanes passing near New Castle is projected to increase in the future, although the impact of climate change on coastal storms is uncertain. Even with this uncertainty, storms like Nor’easters are expected to be greater because of higher sea levels. Storm-caused erosion is also expected to increase. (New Hampshire Coastal Flood Risk Summary- Part 1: Science)

Storm surge depiction. Image Credit: NOAA/The Comet Program.



PRECIPITATION

Part I: Science reports that between 1901 and 2018 in nearby Durham, NH, annual precipitation increased by 14 percent, and the maximum daily precipitation increased by 16 percent. Extreme precipitation events are expected to increase in frequency in the future.¹¹

GROUNDWATER RISE

Part I: Science projects that groundwater levels will rise as local sea levels rise. The following maps show how New Castle's wetlands, both tidal and freshwater, will be affected in the upcoming years. Sea level rise with higher groundwater levels will alter our island.



Images courtesy of David J Murray, ClearEyePhoto

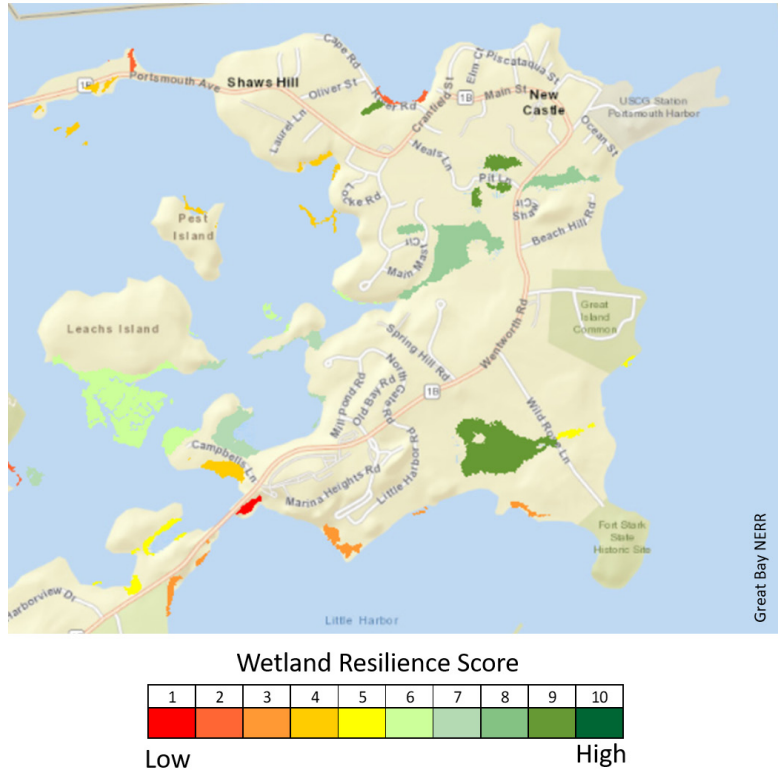
11 NH Coastal Flood Risk Summary Part 1: Science

Resilience of Current Wetland Areas in New Castle

Figure 3A

This map shows wetland areas in New Castle color coded based on their predicted overall resilience to climate change. The resilience scores and the metrics used to calculate the score can be used to identify appropriate management actions to help sustain these important wetland habitats.

Source:
NH Salt Marsh Plan, 2023, Great Bay National Estuarine Research Reserve

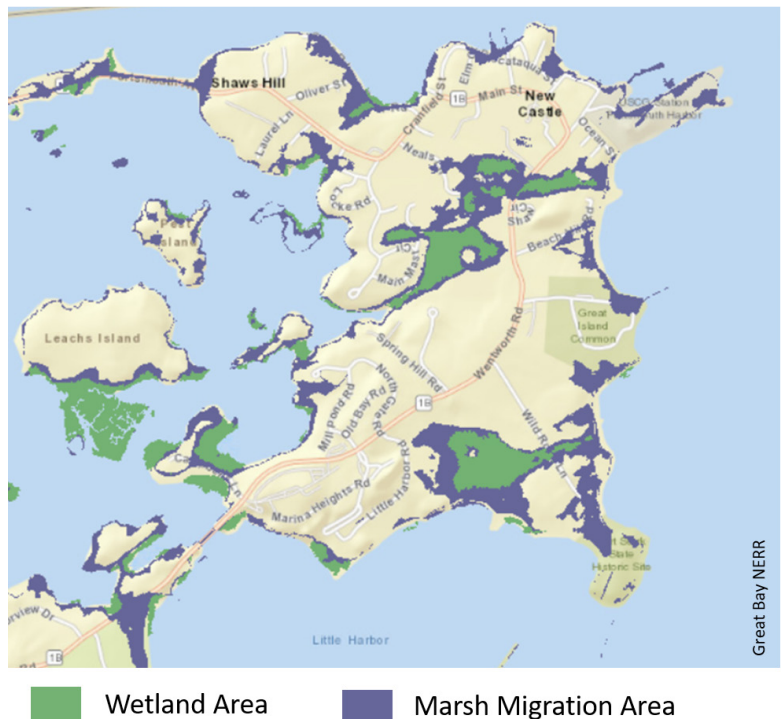


Projected Extent of Marsh Migration by 2100

Figure 3B

The purple areas on this map indicate where salt marshes are expected to migrate as seas rise. (This is based on a projection of 1.5m of sea level rise by 2100.) Preserving natural vegetation and limiting development in these potential marsh migration areas will protect critical habitat and reduce risks to people.

Source:
Sea Level Rise Affecting Marshes Model (SLAMM), 2022, NH Fish and Game.



Predicted High Tide Line with 2 feet of Sea Level Rise

Figure 3C

The predicted high tide line (MHHW, shown in dark blue, with two feet of sea level rise.

Source:
Sea Level Rise Projections,
2023, ESRC UNH, NH GRANIT
Clearinghouse



Predicted High Tide Line with 2 feet of Sea Level Rise + 1% Storm Surge

Figure 3D

The expected high water line (shown as a dark blue line) with two feet of sea level rise and a 1 percent storm surge event.

Source:
Sea Level Rise Projections,
2023, ESRC UNH, NH GRANIT
Clearinghouse



MUNICIPAL SERVICE

Damage to critical facilities, municipal equipment, and road flooding, hampers the town's ability to provide services and emergency response. At the same time, rising seas and worsening storms increase the need for those services over time.

On March 15, 2022, New Castle wrote its Hazard Mitigation plan.¹² The plan is to be used as a planning tool to reduce the effects of natural and manufactured hazards. It outlines specific hazards, their risk, and specific actions.

Clogging of stormwater drains



Flooding on 1B in Rye



Image courtesy of David J Murray, ClearEyePhoto

12 https://www.newcastlenh.org/sites/g/files/vyhlf956/f/uploads/newcastle_hmp_0.pdf

ROADWAYS

With higher sea level or storm surges, roadways may flood more frequently, drainage systems may become ineffective, and culverts may fail. The structural integrity of roads may also be undermined due to frequent inundation and elevated water tables. The Rockingham Planning Commission recently published a study of the impact of sea level rise on coastal roads, which included roadways in New Castle.¹³

The table below shows how various sites in New Hampshire score according to the state, in terms of their priority for investment.

Table 5: Initial Scoring Results - THE ORDER OF PRIORITY OF THESE RESULTS IS SUBJECT TO CHANGE

| Draft Priority | Community | Roadways |
|----------------|-----------------------------------|---|
| 1 | Hampton | US 1 through the Hampton-Seabrook Estuary |
| 2 | Seabrook | NH 286 over the Blackwater River in the Hampton-Seabrook Estuary |
| 3 | Hampton | Ashworth Ave in Hampton Beach |
| 4 | Hampton | NH 101 in Hampton Beach including Highland Ave, Church St and Brown Ave |
| 5 | Hampton | High St near the intersection with NH 1A |
| 6 | Portsmouth | State St near the Memorial Bridge |
| 7 | New Castle | NH 1B near Pit Lane |
| 8 | Rye | NH 1B near Portsmouth Marina |
| 9 | Portsmouth | Marcy St near Prescott Park |
| 10 | Rye | NH 1B near Sanders Point |
| 11 | Stratham | Squamscott Rd near NH 108 |
| 12 | Portsmouth/ New Castle | NH 1B (New Castle Ave/Portsmouth Ave) |

13 <https://www.therpc.org/STCVA>

DRAINAGE INFRASTRUCTURE

High sea-levels can prevent effective drainage of storm water when it rains. It is also possible for high tides to push seawater backwards through drains, thereby causing flooding in areas thought to be protected. Increasing precipitation and expanding impervious ground cover may also overwhelm aging drainage systems that were designed for historic rainfall patterns.

TIDAL WETLANDS + SHORELINE IMPACTS

Rapidly rising seas threaten to drown tidal wetlands that are unable to accumulate peat fast enough to stay above sea level. Under certain circumstances, salt marshes can increase their elevation and “keep up” with sea level rise. One way this can happen is for the marsh to migrate inland where possible. When seawalls, lawns, and structures are built at the existing edge of the marsh, however, landward movement is limited, and salt marshes become flooded.



Image courtesy of David J Murray, ClearEyePhoto

BEACHES

Beaches and dunes, which can mitigate some flood and wave impacts, are susceptible to erosion and scour during storms. Rising seas and worsening storms are expected to increase beach erosion. Like wetlands, beaches and dunes can migrate inland as sea levels rise; however, on New Castle there are few areas with space for such migration to occur.

OPEN SPACE AND CONSERVATION LAND

Open space vulnerabilities include interruptions to use, damage to facilities (such as at The Commons), and habitat alterations.

WILDLIFE

Care should be taken to preserve free mobility of wildlife around the island.

FUTURE CONDITION/TOWN

Moving forward, the Town of New Castle must incorporate strategies that will support town resiliency to coastal storms. In particular, the town should seriously consider the implementation of actions identified in the 2021 Hazard Mitigation Plan. In addition, advocating the importance and elevation of the New Castle/ Rye Bridge project and the Route 1B causeway should continue to be a priority for the town. A general education of town residents about the location of Flood Hazard Zones and Storm Surge Inundation Zone is also critical, as is continued coordination with RPC and the University of New Hampshire to further evaluate the impacts of SLR and storm surge. A review of potential adaptation strategies to mitigate these impacts is also recommended, with special attention made to getting on and off the island. To ensure the health of the Pit Lane marshes, existing culverts should be replaced to allow for rapid water passage.



Images courtesy of David J Murray, ClearEyePhoto

Historical Resources¹⁴

EXISTING CONDITIONS

The Historic District Commission (HDC) was created to manage change in the historic parts of town, specifically those areas identified in the 2021 New Castle Town-Wide Area Form Survey. The HDC's zoning ordinance guidance is to protect the unique streetscapes that have defined New Castle as a sense of place for four centuries. This area is under constant threat of change as owners seek new and larger homes. In addition, changes in climate cause greater concern for weather related impacts to historic structures.

Over the last few years, there have been several renovations outside of the Historic District that have raised concerns about preservation. In fact, 75 percent of Master Plan Survey respondents indicate they are concerned about over development in the island. The concerns over these changes have led to a renewed interest in strengthening and even expanding the District to preserve historically significant buildings and streetscapes, thus managing change beyond the current historic district. According to the survey, most respondents are satisfied with preservation of the Historic District.

The past decade has shown that construction activity in the Historic District is related to the economy. Hence, the last few years have experienced an increase in the number of Historic District Commission hearing applications. This time period has also seen a number of new homeowners who may not be familiar with HDC guidelines, procedures or building code requirements. Given this, the past decade has witnessed:

- Requests for demolition in the district.
- Requests for larger homes and additional requests for solar panels.
- Requests for the use of alternative (non-traditional) building materials.
- Changes in building codes that impact HDC considerations.
- Requests for public hearings when a work session would be a prudent and beneficial first step.
- Frequent questions about HDC procedures and what is approved and not approved in the District.

14 https://www.newcastlenh.org/sites/g/files/vyhlf956/f/uploads/new_castle_guide.pdf
<https://www.newcastlenh.org/historic-district-commission/pages/architectural-survey-new-castle-2021>
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FUTURE CONDITION/TOWN VISION

Given the existing conditions, the HDC with support and guidance from the survey, seeks to strengthen its ability to manage change in the District. The HDC also wants to look at other areas of the town to see if they contain vulnerable architecture worthy of HDC oversight. Lastly, the HDC seeks to broaden its understanding of the District in hopes of helping the community better understand the importance of the Historic District.



Images courtesy of Jim Cerney

Housing and Land Use¹⁵

Over the past 400 years, New Castle has transitioned from a fortified island protecting the mouth of Portsmouth Harbor with attendant commercial structures to a heavily residential community. In addition to Fort William and Mary, and later Fort Stark, the shores of New Castle teemed with wharves, ferry landings, taverns, and inns. The island also contained gristmills, an alms house, a quarry and a jail, along with the Knights of Pythias Hall and a life-saving station. In 1874, the Wentworth Hotel was constructed at the southwestern edge of the island, incorporating more docks, a pool, tennis courts and outbuildings for staff housing.

EXISTING CONDITIONS

Most of the commercial buildings and wharves have been converted into modest private homes on predominantly small lots, particularly within the Historic District. Only one restaurant and one Bed & Breakfast remain outside of the Wentworth Hotel, whose redevelopment in the 1990's created residential parcels accommodating an additional 107 homes on ¼ acre lots.

Housing units today total 568,¹⁶ including 64 multi-family houses, although the number of rooms per house in New Castle is below the average in the state. This reflects the small lot sizes and the age of many homes.

Based on the Master Plan Survey, 41 percent expressed concern about the level of building and development in town. Assuming a relatively consistent per-square-foot cost to build, their concerns are backed by the data. During the decade from 2009 to 2019, a total of 12 new houses were built with an average cost of \$628,000.¹⁷ In the past 2 years, nine new houses were constructed in New Castle with an average cost of \$1,355,000, more than double the average cost of the preceding decade.

To protect against over development, the zoning laws in New Castle strictly define lot coverage, setbacks, and other limiters in five districts with five overlay zones. Those districts are: Residential R-1, comprising the town center; Moderate Density Residential R-2, backing up on the town center; Low Density Residential R-3 in the central portion of the island; Planned Unit Development R-4 at the western end; and Mixed Use MU. The overlay districts are for Mobile Home Exclusion, Historic, Sensitive Areas, Telecommunications, Flood Plain, and Wetlands Protection Districts.

15 New Castle land use data
16 Rockingham Planning Commission
17 New Castle Building Inspector

The Sensitive Areas Overlay helps to protect precious open spaces in New Castle, such as the Great Island Commons and the Back Channel Islands. Access to areas of natural beauty and recreation such as beaches and parks, the playground and the islands must be preserved in perpetuity for the entire population to enjoy. As mentioned previously, 97 percent of survey respondents indicate that the natural features of New Castle are important or very important.

Zoning ordinances should take into account the needs of our residents to make their homes more resilient and more comfortable. Regulations on generators, propane tanks and air condensers need to be constructed in such a way as to allow for such equipment on tight lots in a safe and unobtrusive manner.

The high demand for housing, as well as the doubling of the median home sales price over the past ten years,¹⁸ impacts the ability of New Castle residents and the local workforce to be able to live in town. New Hampshire's statutory requirements regarding work force housing encourage development and further density that may be unachievable in New Castle. Current zoning laws have been instituted to allow for accessory dwelling units (ADUs) where possible, which may create more housing options that align with state requirements and provide additional flexibility for residential housing.

FUTURE CONDITION/TOWN VISION

The community survey emphasized residents' desires to retain the existing character of the town. The charming streetscapes, the historic architecture, and the quaint small town feel of New Castle were among the issues most frequently mentioned. Residents expect the scale of new homes to be compatible with the surrounding houses in their neighborhoods and avoid the appearance of "over-stuffed," small lots. They also want to retain the rural feel of the town with protected buffers. Balancing the preservation of existing housing and streetscapes with the demands for modern dwellings will be the primary challenge in writing new zoning ordinances or amending existing ones over the coming decades. New Castle should also consider an explicit budget allocation to legally enforce both the spirit and letter of the existing Zoning Ordinance Building Code.

18 Rockingham Planning Commission

Sources

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Images courtesy of David J Murray, ClearEyePhoto