Groton

PLAN OF CONSERVATION & DEVELOPMENT

2016





GROTON 2016
PLAN OF CONSERVATION AND DEVELOPMENT

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Developed for:
The residents of the Town of Groton

Developed by:
Town of Groton Planning Commission

Technical Assistance Provided by:
Milone & MacBroom, Inc.

MILONE & MACBROOM

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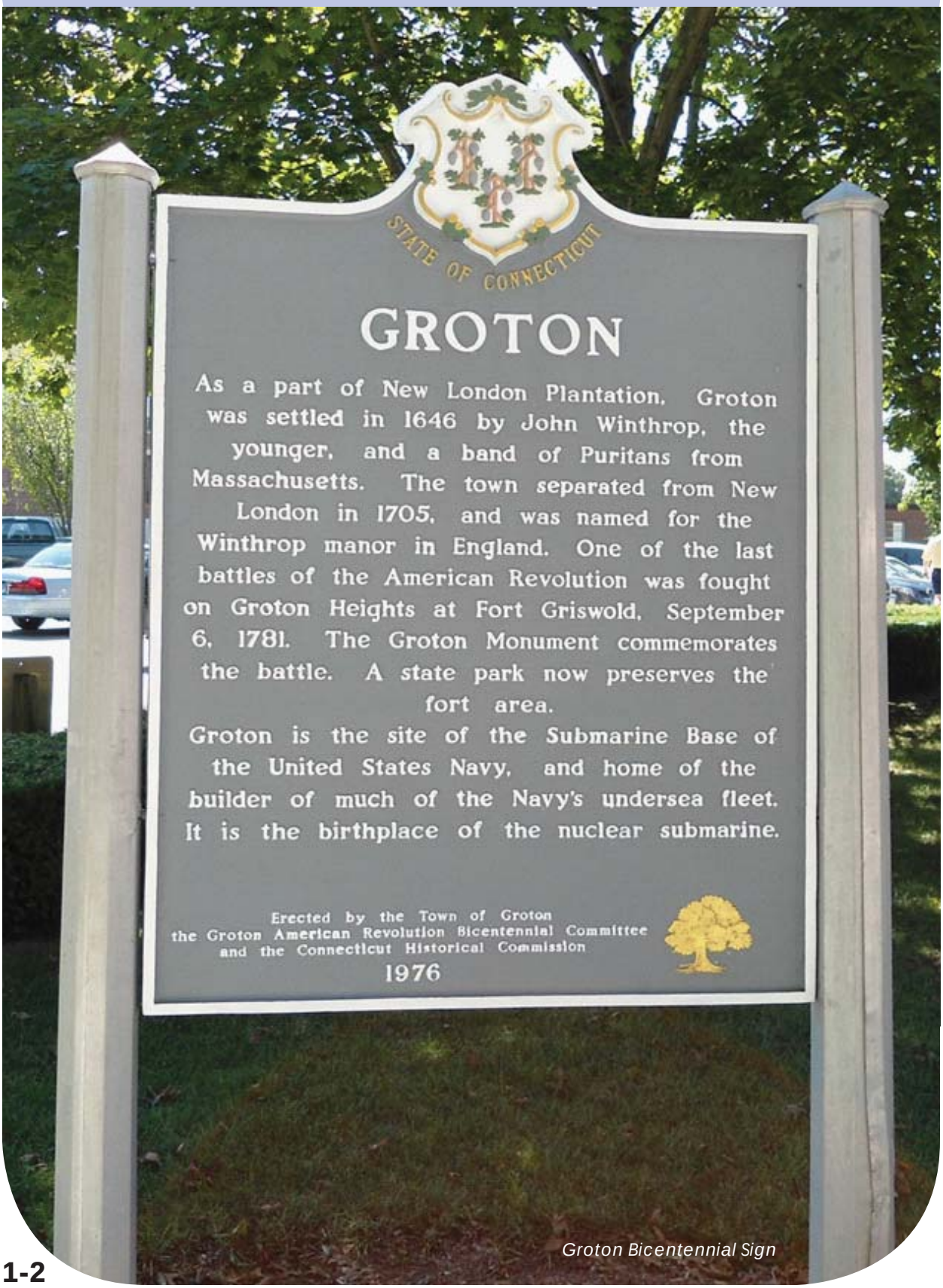
INTRODUCTION



Groton Bicentennial Sign

INTRODUCTION

Groton is located on Fisher's Island Sound in southeastern Connecticut, about 10 miles west of the Rhode Island border. The town is bounded on the west by the Thames River and the City of New London, on the north by the Town of Ledyard, and on the east by the Mystic River and the Town of Stonington. The 2010 Census indicated that Groton has 40,115 residents and a land area of about 31.8 square miles.

Groton historically has had a strong naval presence. The USS Nautilus Museum showcases the world's first nuclear submarine, which was built and based in Groton. Today, Groton is still home to a U.S. Navy Submarine Base and the submarine shipyards of the Electric Boat Corporation, a division of General Dynamics Corporation. Pfizer Pharmaceuticals also contributes to Groton being a manufacturing and employment center for the region, although the company's reoganization has resulted in major economic changes in the area. Groton also has many cultural and natural resources. The historic maritime villages of Mystic and Noank, Bluff Point and Haley Farm State Parks, the Groton Long Point area with residences on Fisher's Island Sound, and other community and commercial facilities serve local and regional needs.

The Town of Groton also encompasses numerous political subdivisions, some of which have their own jurisdictional powers. For example, while the Navy Base is located within the Town of Groton, it is largely self-governing as federal land although children living on the base do attend Groton Public Schools. The City of Groton, Groton Long Point, and Noank all have independent zoning authority and their local authority supersedes the town on zoning matters. While the City of Groton and Groton Long Point have their own POCDs, Noank does not and is included in the Town POCD. The City of Groton and Groton Long Point have their own charters and provide police, fire, recreation, and other services to their residents. They also exercise planning and zoning authority within the cities' limits. While town services are available to city residents (since the city is part of the town), city services are only available to residents that live in the city and pay taxes to the city. There are nine fire districts in Groton, each with their own power of taxation. In addition, the Mystic and Old Mystic fire districts span the Mystic River and are in both the Town of Groton and the Town of Stonington.

Public Service Responsibilities

	Fire Districts								
	Poquonnock Bridge	Center Groton	Mystic	Old Mystic	West Pleasant Valley	Noank	Groton Long Point	City of Groton	Navy Base
Overall Government	Town of Groton					Town & Noank	Town & GLP	Town & City	Navy
Education	Town of Groton								
Public Works	Town of Groton						GLP	City of Groton	Navy
Police	Town of Groton						GLP	City of Groton	Navy
Wetlands	Town of Groton						GLP	City of Groton	Navy
Land Use Planning	***Town of Groton***						GLP	City of Groton	Navy
Zoning	***Town of Groton***					Noank	GLP	City of Groton	Exempt
Recreation	Town of Groton					Town & Noank	Town & GLP	Town & City	Town & Navy
Ambulance, Rescue & Paramedic	Groton Ambulance Association (GAA)		Mystic River Ambulance Association		GAA	Mystic River Ambulance Association		GAA	Navy & GAA

WHAT IS A POCD?

Chapter 126, Section 8-23, of the Connecticut General Statutes requires that a planning commission, "prepare, adopt, and amend a plan of conservation and development for the municipality." POCDs are guidance documents that set policy priorities for the physical, economic, and social future of a community. POCDs contain goals and visions along with recommended action steps to help work toward achieving those goals. The planning process involves assessing current conditions and trends in order to develop reasonable goals and strategies and engage the community in a dialogue on its future.

Put very simply, a POCD considers the questions:

- Where are we?
- Where do we want to go?
- How will we get there?
- How do we implement our chosen strategies?

As an advisory document, the POCD is intended to provide a long-term vision for the town and guide short-term decision making relating to growth and development. This plan does not have the authority of a law or regulation but is instead a set of broad recommendations for future development and improvement of Groton over the next 10 years.

WHAT IS A MUNICIPAL COASTAL PROGRAM?

Coastal municipalities may adopt a Municipal Coastal Program (MCP) for the area within the coastal boundary. An MCP shall include, but is not limited to, the following:

- Revisions to the POCD
- Identification and description of the major coastal-related issues and problems such as erosion, flooding, recreational facilities, and utilization of port facilities and to include a description of the municipal boards, commissions and officials responsible for implementing and enforcing the coastal program, a description of enforcement procedures, and a description of continuing methods of involving the public in the implementation of the MCP

The MCP was concurrently updated with this POCD, and will be adopted in the near future as a stand-alone document.

WHAT IS A HAZARD MITIGATION PLAN?

The Town of Groton is included in the Hazard Mitigation Plan Update (2012) for the Southeastern Connecticut Council of Governments. The Hazard Mitigation Plan's primary goal is to identify vulnerability to natural hazards and potential mitigation measures in order to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources. This includes the reduction of public and private damage costs. Limiting losses of and damage to life and property also reduces the social, emotional, and economic disruption associated with a natural disaster. The 2012 Hazard Mitigation Plan is considered to be incorporated into this MCP by reference.

GOALS

The major goals of this revision are to update both the POCD and the MCP and to introduce a new *Energy and Sustainability* element to the POCD. Rather than be an independent section, *Energy and Sustainability* is treated as an integral element within each planning task and is interwoven throughout the document.

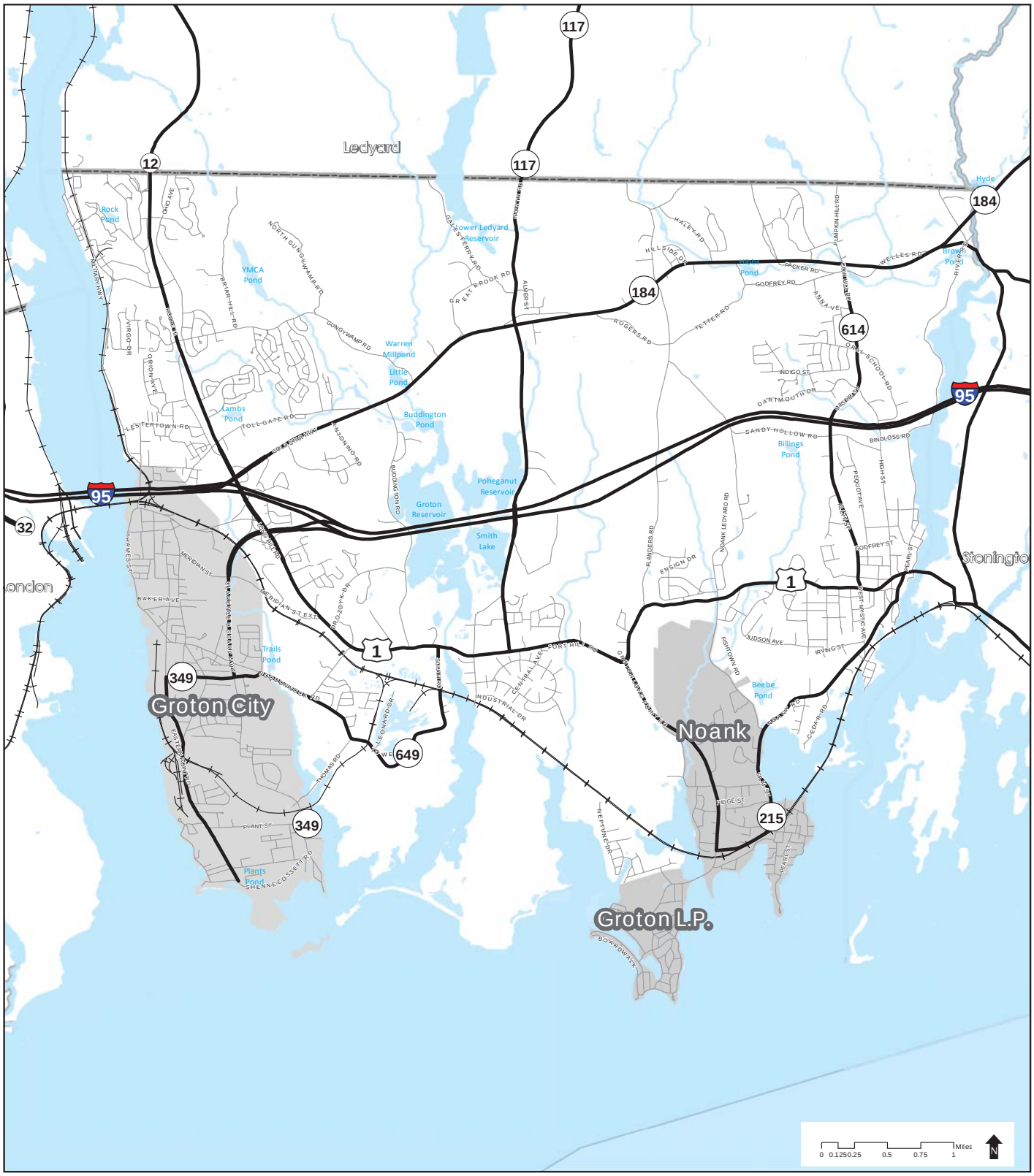
HOW THIS PLAN WAS DEVELOPED

In early 2012, the town began the process of reviewing and updating the 2002 POCD. It has been guided by staff from the Town of Groton Office of Planning and Development, the consultant firm of Milone & MacBroom, Inc., and community members through input, comments, and a survey. In July 2012, a POCD Steering Committee was formed with representatives of the Town Council, Planning Commission, Zoning Commission, Representative Town Meeting, Conservation Commission, Economic Development Commission, Inland Wetlands Agency, and Water Pollution Control Authority.

The POCD Steering Committee reviewed plan element memoranda that covered specific topics, including background information, conditions maps, and analyses of trends and conditions since the completion of the 2002 POCD. These documents were shared with the public via the town's website. The Steering Committee met from July 2012 until May 2014. Two public community meetings were held in May and November 2013. The materials from these meetings were then made available in the library for those who could not attend. An online public survey was run from September to December 2013.

The key components of this POCD are the Goals and Objectives, the Generalized Future Land Use Plan, and the Action Agenda, which detail steps towards implementation.

Map Introduction-1: Town Boundary



Groton PLAN OF CONSERVATION + DEVELOPMENT

Interstate, US, and State Highways

Local Roads

Sources:
* Street Centerlines: Town of Groton Information Technology.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

Town Boundary

April 2014

MILONE & MACBROOM

GROTON'S PLANNING HISTORY

1950

1956: First Subdivision Regulations
1957: First Zoning Regulations
1960 1960s: First Director of Planning Hired
1961: First Town Plan (POCD)

1970

1973: Update to the POCD

1979: Update to the POCD
1980

1990 1990: Update to the POCD

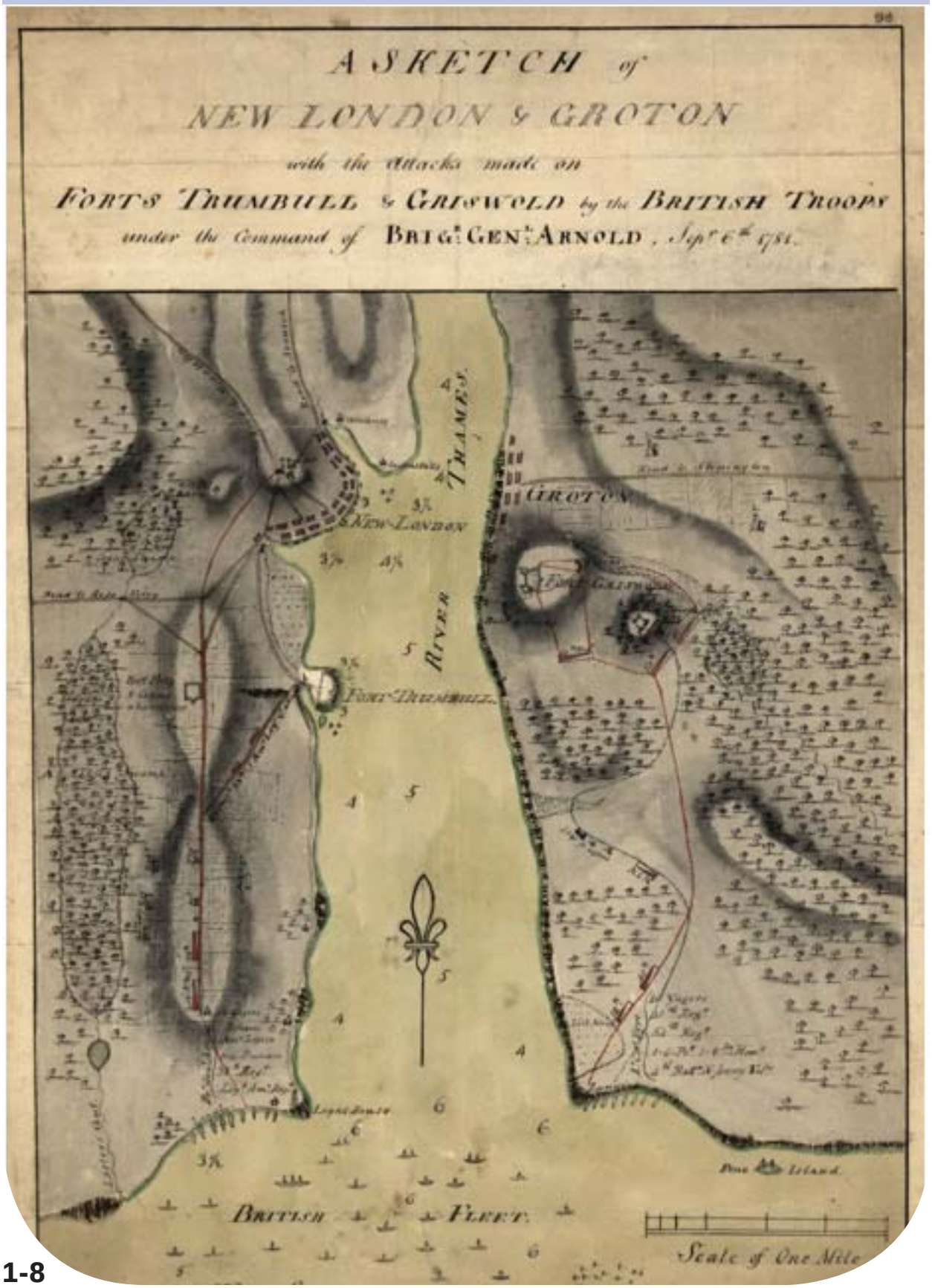
2000

2002: Update to the POCD

2010

2016: Update to the POCD
2020

HISTORY AND TRENDS

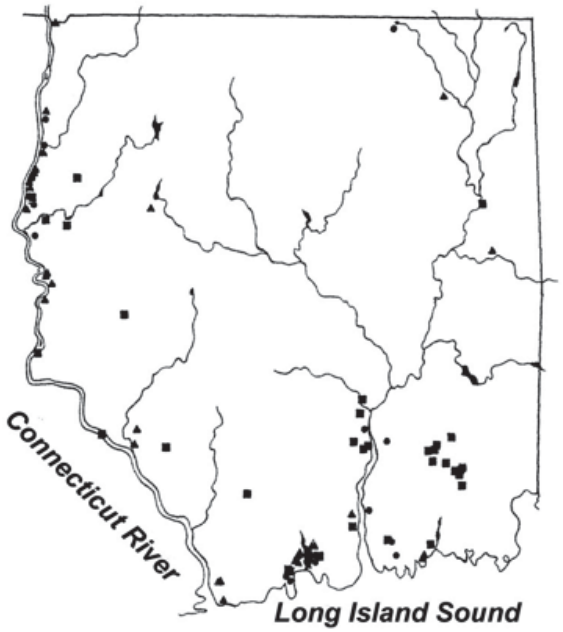


GEOMORPHOLOGY

Groton, and southern Connecticut in general, has been heavily culturally influenced by geological history and the resultant geomorphology. The hills and valleys and underlying granite bedrock have shaped the patterns of human development, such as the location of Groton's early village centers, and early industry. All of the current Town of Groton sits on relatively hard granite gneiss bedrock which still influences development today, as shallow depth to bedrock can be a development constraint.

PRECOLONIAL

There is substantial archeological evidence of early Native American settlement in eastern Connecticut. The cultural resource management firm ACS has surveyed Native American burial grounds and cemeteries in the area, and their analysis of the sites and archeological evidence from the Susquehanna Tradition of the late Archaic period (ca. 5,900 to 3,200 years ago) shows evidence of a large settlement along Gungywamp Road, dating from 2,000-770 BC; however, some archeologists attribute the structural elements to later colonial development and see the Native American arrowheads, stone flakes, and pottery fragments as inconclusive evidence of a large or permanent settlement.



Distribution of Documented Native American Burial Sites and Historic Cemeteries in Eastern Connecticut, *ACS*

At the establishment of colonial settlements in Connecticut and Massachusetts, the Pequots-Mohegans were a tribe inhabiting much of the eastern portion of both states. Pequots-Mohegans's are eastern Algonquin people and are today members of the Mashantucket (Western) Pequot Tribe, the Mohegan Tribe of Connecticut, or the Eastern Pequot Tribe, and the term Pequot-Mohegan has historically been used to describe those who were part of the Pequot, Niantic (also known as Nehantic), and Mohegan tribes.

Some historians believe that the Pequots migrated east from New York State as late as the 1500s although much current archeological data and research seems to suggest that Pequots inhabited the area along the Connecticut River from 8,000 BC.[1] The tribe local to the shore of Long Island Sound, in the area of the Connecticut and Niantic Rivers, is the Nehantic (Niantic) tribe. Sometime after 1850, they were fully absorbed by the Pequot-Mohegan tribe. Although the Mohegans, Niantics, and Pequots split sometime before the turn of the 16th century and took opposite sides during the Pequot Wars, they were, for much of their history, one sociopolitical entity. In 1633, an epidemic is reported to have

[1] *ACS, Native American Burials and Cemeteries of Eastern Connecticut, http://acsarchaeology.com/projects/native_american_burials.htm>.*

devastated all of the region's Native population (of whose numbers were estimated to be reduced 90% by a smallpox epidemic in 1616-19). Historians estimate that the Pequot suffered the loss of 80% of their population, and at the outbreak of the Pequot War four years later, survivors may have numbered only about 3,000.

Pequot War

Between 1634 and 1638, the drastic reduction in the Native populations left a substantial power vacuum in the region. This escalated to the Pequot War, with the Colonists aligning with the Mohegans and Narragansetts against the Pequots. In May 1637, Captain John Mason engaged in fighting with a group of Pequots along the Mystic River. The war largely accounted for the elimination of the Pequot people and the possibility for unthreatened development of Southern Connecticut. The Treaty of Hartford officially ended the war in 1638 and divided the remaining Pequot under the control of other tribes. Those under the control of the Mohegans were given a reservation at Noank in 1651 and then transferred to land in Mashantucket in 1666.

COLONIAL PERIOD

In 1644, development began on a compact village on the west side of the Pequot (now Thames) River originally called Pequot and renamed New London in 1658. By 1649, development had expanded on the east side of the river. In 1702, the need for church services on the east side of the river led the New London Congregational Church to approve a separate church, which was constructed in Center Groton in 1703. In 1705, the General Assembly approved the petition to create the Town of Groton, named after the English home of John Winthrop. The same year, a group of Baptists was allowed to build a church near Burnett's Corner, making Groton the first Connecticut town to tolerate a non-Congregational church.

This tolerance of non-Congregational parishioners had important impacts on the land use development of Groton. The lack of a town green is assumed to be modeled after the Rhode Island town that specifically prohibited town greens, "based on the theory that location of any church theron implied public endorsement."[2] This also led Groton to develop several self-contained clusters rather than one central village. Absent of one central village, the development pattern of Groton instead followed major transportation routes. These began as pathways that connected bodies of water, including what are now Routes 184 and 1. Village nodes developed where crossroads intersected these routes, especially in Center Groton, Burnett's Corner, West Mystic, and Old Mystic. Village residents farmed the area, leaving stone walls to demarcate their properties which are still present today in areas of town, such as in Bluff Point State Park.[3]

AMERICAN REVOLUTION

Like many colonial towns, Groton supplied men and supplies to support the American Revolution. Groton was also well known for being home to privateers who raided British warships. In response, in September 1781, General Benedict Arnold commanded a British fleet to attack the port of New London. After taking Fort Trumbull on the New London side and burning much of the town of New London, 800 British soldiers crossed the Thames

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[2] *Kevin Allen Mcbride, "Prehistory of The Lower Connecticut River Valley" (January 1, 1984). Dissertations Collection for University of Connecticut. Paper AAI8509510.*

[3] *Andrews and Will, Preservation Plan for Groton, 1996.*

and marched on Fort Griswold, held by Colonel William Ledyard, who responded to the British call for surrender by stating, "we shall not surrender, let the consequences be what they may." After a forty-minute fight, Leydard and 80 American soldiers were killed, and the British gained control of the Fort and the Thames River.[4]

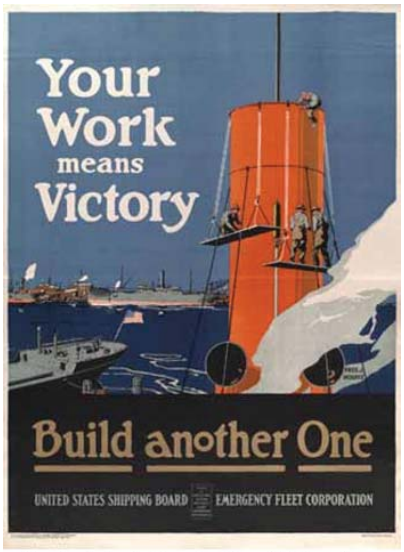

Groton Monument

MARITIME HISTORY

The connection to shipbuilding and the water has always been strong in Groton. Throughout its history, whaling, sealing, fishing, Caribbean and coastal trade, and privateering and defense have been major components of economic and physical growth.

Mystic became a center of the whaling industry in the mid-19th century, and profits from shipbuilding and merchant marines built many of the stately homes still standing in Mystic, Groton Bank, and Noank. During the Civil War, Groton shipbuilders built the Union's ironclads. The USS *Galena* was designed by naval architect Samuel H. Pook and was built at the Mystic shipyard of Maxson, Fish & Company. The Palmer Shipyard in Noank was considered the largest builder of wooden vessels on the Atlantic Coast and built over 600 ships in the late 1800s.

Following 1882, the U.S. Navy considered many of its ship designs outdated and began to redesign and build naval ships in earnest. Its New London base along the Thames was transformed in the early 20th century to the Naval Submarine Base in Groton. The first diesel powered submarine, the USS *E-1 (SS-24)*, was commissioned in Groton in 1912. In 1919, Groton Iron Works launched the steel-hulled freighter Worcester for the Emergency Fleet Corporation of the U.S. Shipping Boards. During World War II, the Electric Boat division of General Dynamics produced 74 submarines in Groton, more than any other American yard. On January 21, 1954, the first nuclear powered submarine, the USS *Nautilus*, was launched in Groton by Electric Boat. At its peak in the early 1980s, Electric Boat employed 27,000 people. Electric Boat continues to build and maintain submarines for the Navy.



Frederick J. Hoertz, The Wolfsonian–Florida International University, Miami Beach, Florida, The Mitchell Wolfson, Jr. Collection

COASTAL TOURISM

In the late 19th century and early 20th centuries, development grew to support summer coastal tourism. In 1904, the Shoreline Railroad opened, bringing access for summer tourists. Especially popular were the village of Noank, the Griswold Hotel in Eastern Point at Shennecossett, and later Groton Long Point. Morton Plant arrived in Groton during this

[4] *Connecticut DEP, History of The Battle of Groton Heights and The Burning of New London, <http://www.ct.gov/dep/lib/dep/stateparks/general_info/the_battle_of_groton_heights_and_the_burning_of_new_london.pdf>*

period, developing the Branford House on Avery Point. He would build the new Town Hall in 1908, and in 1911, he developed the New London Ship and Engine Company (Nelseco). To support the tourists, golf and yachting infrastructure was developed.

20TH CENTURY DEVELOPMENT

The 20th century also saw the creation of new political boundaries within Groton. In 1903, the Borough of Groton was created, and in 1964, it was renamed the City of Groton. Noank Fire District was established in 1929, and Groton Long Point was established in 1921, largely to provide fire protection and road maintenance to the beach community.

Following World War II and the beginning of the Cold War, the Navy increased production of submarines, and local industrial and military facilities grew to support that need. The construction of I-95 through Groton relieved traffic pressure on Route 1 and allowed for large-scale commercial development along Routes 1, 184, and 12. It has decentralized much of the residential development as well, as new housing could be automobile oriented and located near Route 1, rather than within walking distance to village centers.

In 1946, Charles Pfizer & Co., Inc. first purchased land in Groton. Pfizer's first Research & Development (R&D) facilities opened in Groton.

GROTON IN THE 21ST CENTURY

Today, employment in Groton is dominated by the "Big Three": the U.S. Navy Submarine Base, Electric Boat, and Pfizer, Inc. However, the development of two casinos in New London County (Foxwoods Resort Casino in Mashantucket and Mohegan Sun in Montville) has also created a regional draw for employment and tourism. Tourism attractions in Groton itself are also important economic drivers, such as Fort Griswold, the historic Submarine Nautilus and Submarine Force Museum, Mystic Aquarium and Institute for Exploration, Mystic Seaport, Mystic River Historical Society, Downtown Mystic, and Project Oceanology.

FUTURE SEA LEVEL RISE AND CLIMATE CONCERNS

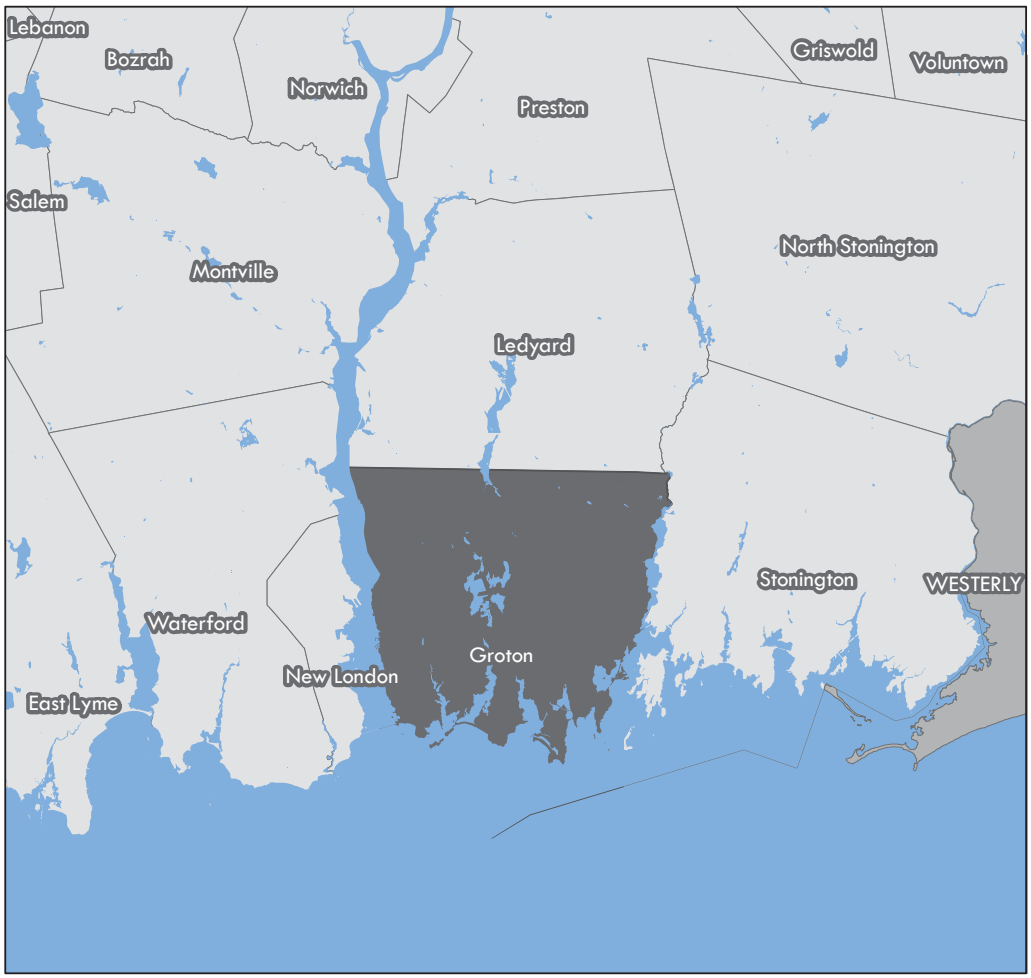
Groton's coastal location makes it vulnerable to rising sea levels and storm events, including recent hurricanes and nor'easters. A joint effort between Groton, UConn at Avery Point, and DEEP brought a NOAA Coastal Management Fellow to study the static sea-level rise likely to happen in Groton. Projected rising sea levels and increasingly common large storm events will likely have considerable impacts on Groton's developed shoreline, and should be a consideration in future development plans.

The Town of Groton has been forward-thinking in commissioning a Climate Change Sustainable Community Report to address how impacts from climate change will affect the community. The report lists protecting the coastline as well as forests and wetlands as a key strategy to mitigate climate change impacts, as they are powerful absorbers of CO_2. A series of Climate Change workshops in 2010 also focused on adaptation planning, identification of vulnerabilities to projected change in regional climate (such as transportation corridors, infrastructure, residential areas, commercial areas, ecological resources, and emergency services which will be subject to increased flooding), and identification of potential actions to increase resilience.

GROTON'S REGIONAL ROLE

Groton has a strong position in the regional economy, acting as a major employment center. Employment in Groton has been in a declining trend for the past decade as major employers adjust their operations to recessionary pressures and changing markets. However, Groton remains a significant state employment center even as the economy continues to slowly transition from a goods-producing to a service-based economy.

At the beginning of 2014, announcements by Electric Boat and Pfizer pointed to a return to relative employment stability for the near term. Electric Boat plans a $100 million upgrade to its facilities in Groton to accommodate construction or refitting four types of submarines over the next decade, after earlier moving design and engineering activities to facilities in New London. Virginia-class submarines will have new modules installed, two Los Angeles-class submarines will be converted to training platforms, and work on a new class of ballistic-missile submarine is underway. Pfizer announced that it anticipated maintaining its workforce of 3,400 employees and 3,100 contract employees at its research and development campus in Groton for the foreseeable future. It is also working with the state and CURE (Connecticut United for Research Excellence) to make available unused research buildings for bioscience start-ups. Previously, Pfizer had laid off 1,100 employees after a merger in 2009 and demolished unused buildings.



Groton's Place in the Region

Groton's Immediate Market Area
Employment by Town - 2012

	Groton	Ledyard	Montville	New Londc	Norwich	Stonington	Waterford
Total Non-Farm Employment	**25,754**	**12,195**	**13,901**	**14,128**	**16,702**	**7,131**	**11,010**
Goods Producing	**10,646**	**190**	**681**	**583**	**954**	**1,083**	**147**
Mining	0	*	*	0	0	0	*
Construction	192	84	267	176	410	268	*
Manufacturing	*10,454	106	414	407	544	815	147
Service Producing	**15,107**	**11,809**	**12,990**	**13,425**	**15,595**	**6,017**	**9,344**
Utilities	*	0	*	*	0	0	*
Retail Trade	2,052	143	905	1,384	1,947	871	3,432
Wholesale Trade	477	38	102	277	694	176	191
Trans. & Warehousing	908	*	121	273	851	84	475
Information	66	*	*	418	191	106	141
FIRE	657	69	98	408	672	159	201
Professional and Technical	2,259	92	77	724	687	396	476
Mgmt. Of Companies	*	*	*	50	39	*	73
Admin. & Waste Management	248	73	54	502	337	158	262
Education	81	16	*	1,139	413	97	77
Health Care/Social Assistance	1,830	300	492	4,481	4,949	825	1,554
Arts, Entertainment & Rec.	182	49	10	135	*	834	138
Accommodation & Food Service	2,175	1,038	1,300	1,185	1,290	1,340	1,117
Other Services	576	131	238	510	680	259	238
Government	3,594	9,861	9,593	1,939	2,845	713	968
Nonclassified	*****	**0**	*****	**0**	*****	**0**	*****
Farm Employment	*****	51	0	*	*	17	0

*Disclosure provisions of Connecticut's Unemployment Insurance Law prohibit the release of figures which tend to reveal data reported by

For 2012 data, Manufacturing information was withheld. The figure reported on the table is an estimate based on the difference between the

Source: *CT Dept. of Labor* , QCEW Program Data, 2011.

PEOPLE OF GROTON

Groton's 2010 U.S. Census population was 40,115, a slight increase of 0.5% from 2000. While Census numbers indicate that Groton gained and then lost approximately 5,000 people between 1990 and 2000, as shown in *Groton Historic and Projected Population 1960-2025,* town officials have indicated that the 1990 Census inaccurately counted Naval Base residents and that the community did not actually experience a small population boom and bust. Aside from that possible error, the town's total population has been remarkably stable since 1970, between 38,000 and 41,000 residents.

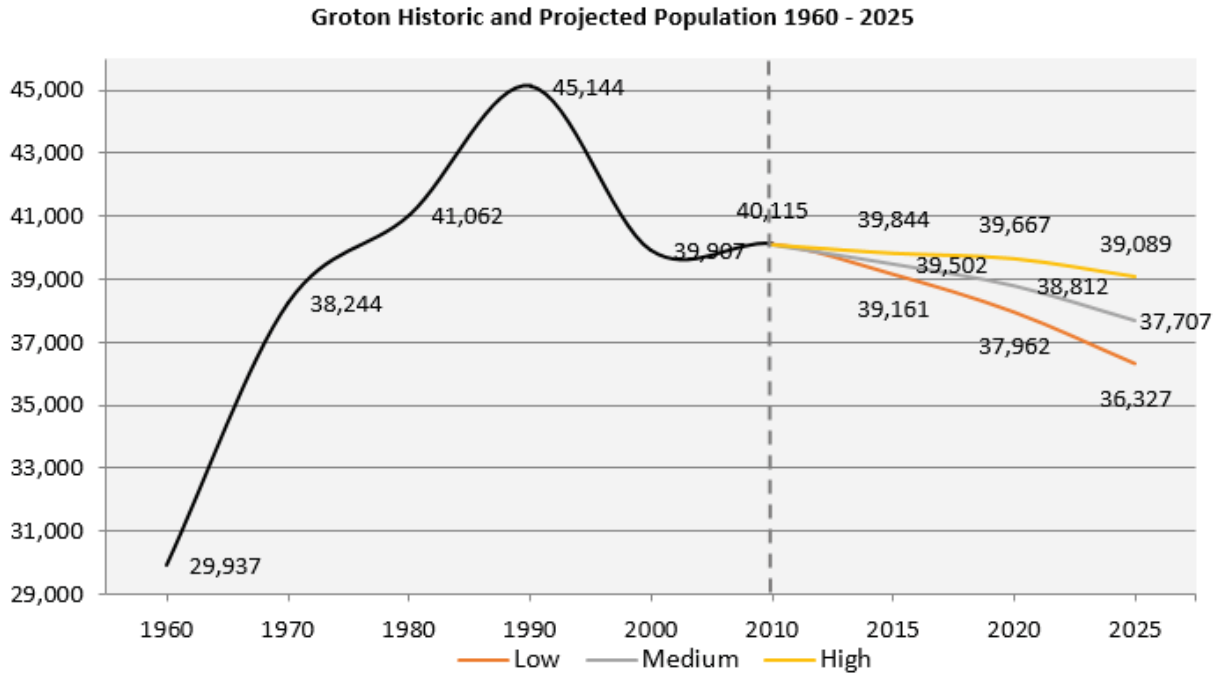
Groton's population stability is in contrast to a largely growing region. As shown in *Population Change in New London County 1960-2010*, Groton experienced among the lowest growth in New London County from 2000 to 2010. While there are many rural communities in New London County, both Norwich and New London, communities more similar to Groton in terms of size and character experienced significantly stronger growth than Groton from 2000 to 2010. Norwich gained 12.1% and New London 7.6% in that time period. However, recent growth in Norwich and New London contrasts with population decreases in those cities from 1970 to 2000 when Groton's population was continuously growing slowly.

Population Change in New London County 1960-2010

	1960	1970	1980	1990	2000	2010	1960-2010 Change	2000-2010 Change
Lyme	1,183	1,484	1,822	1,949	2,016	2,406	103.4%	19.3%
Norwich	38,506	41,739	38,074	37,391	36,117	40,493	5.2%	12.1%
Bozrah	1,590	2,036	2,135	2,297	2,357	2,627	65.2%	11.5%
Griswold	6,472	7,763	8,967	10,384	10,807	11,951	84.7%	10.6%
Colchester	4,648	6,603	7,761	10,980	14,551	16,068	245.7%	10.4%
Salem	925	1,453	2,335	3,310	3,858	4,151	348.8%	7.6%
New London	34,182	31,630	28,842	28,540	25,671	27,620	-19.2%	7.6%
Lisbon	2,019	2,808	3,279	3,790	4,069	4,338	114.9%	6.6%
North Stonington	1,982	3,748	4,219	4,884	4,991	5,297	167.3%	6.1%
Lebanon	2,434	3,804	4,762	6,041	6,907	7,308	200.2%	5.8%
East Lyme	6,782	11,399	13,870	15,340	18,118	19,159	182.5%	5.7%
Montville	7,759	15,662	16,455	16,673	18,546	19,571	152.2%	5.5%
Franklin	974	1,356	1,592	1,810	1,835	1,922	97.3%	4.7%
Stonington	13,969	15,940	16,220	16,919	17,906	18,545	32.8%	3.6%
Voluntown	1,028	1,452	1,637	2,113	2,528	2,603	153.2%	3.0%
Old Lyme	3,068	4,964	6,159	6,535	7,406	7,603	147.8%	2.7%
Ledyard	5,395	14,837	13,735	14,913	14,687	15,051	179.0%	2.5%
Waterford	15,391	17,227	17,843	17,930	19,152	19,517	26.8%	1.9%
Preston	4,992	3,593	4,644	5,006	4,688	4,726	-5.3%	0.8%
Groton	**29,937**	**38,244**	**41,062**	**45,144**	**39,907**	**40,115**	**34.0%**	**0.5%**
Sprague	2,509	2,912	2,996	3,008	2,971	2,984	18.9%	0.4%
County Total	**185,745**	**230,654**	**238,409**	**254,957**	**259,088**	**274,055**	**47.5%**	**5.8%**

Source: *U.S. Census 1960, 1970, 1980, 1990, 2000 and 2010*

The Connecticut State Data Center at the University of Connecticut has projected populations for Groton based on high, medium, and low levels of fertility. The projections are shown in *Groton Historic and Projected Population 1960-2025*. The projections show overall continued stability in the population over the next 10 years. The low-fertility level projection, which represents a worst-case scenario, projects a decline of only by about 5%. The high-fertility level projections are for only a 1% decrease by the year 2020.



Source: *U.S. Census,* Projections from *CT State Data Center and UCONN, June 2012*

Population changes result from natural increase (births - deaths) and net migration. Overall, annual births in Groton have declined during the last decade, as shown in *Groton Natural Increase, 2000-2010*. However, other communities and the state have experienced a more significant decline in annual births than the Town of Groton. Indeed, national fertility and birth rates have declined precipitously since 2007 according to the National Center for Health Statistics.

Groton Natural Increase, 2000-2010

Year	Births	Deaths	Natural Increase
2000	660	323	337
2001	631	293	338
2002	619	304	315
2003	682	332	350
2004	643	281	362
2005	653	259	394
2006	639	309	330
2007	627	291	336
2008	642	292	350
2009	592	290	302
2010	589	297*	292
TOTAL	**6,977**	**3,271**	**3,706**

* Data not available, estimated using long-term average

Source: *CT Dept. of Public Health*

The number of deaths each year has remained relatively stable. The town's natural increase from 2000 to 2010 was approximately 3,700 people. Given that the 2010 Census indicated a gain of only 208 residents between 2000 and 2010, one can assume the community experienced an out-migration of approximately 3,500 people over the last decade.

In contrast to state and regional trends, Groton's population did not significantly age between 2000 and 2010. The median age in Groton was only 33 in 2010, up just 1.5% from 2000 figures. These numbers reflect the influence of Navy personnel and their families on the demographics of Groton. As *Change in Median Age in New London County 2000-2010*

Change in Median Age in New London County 2000-2010

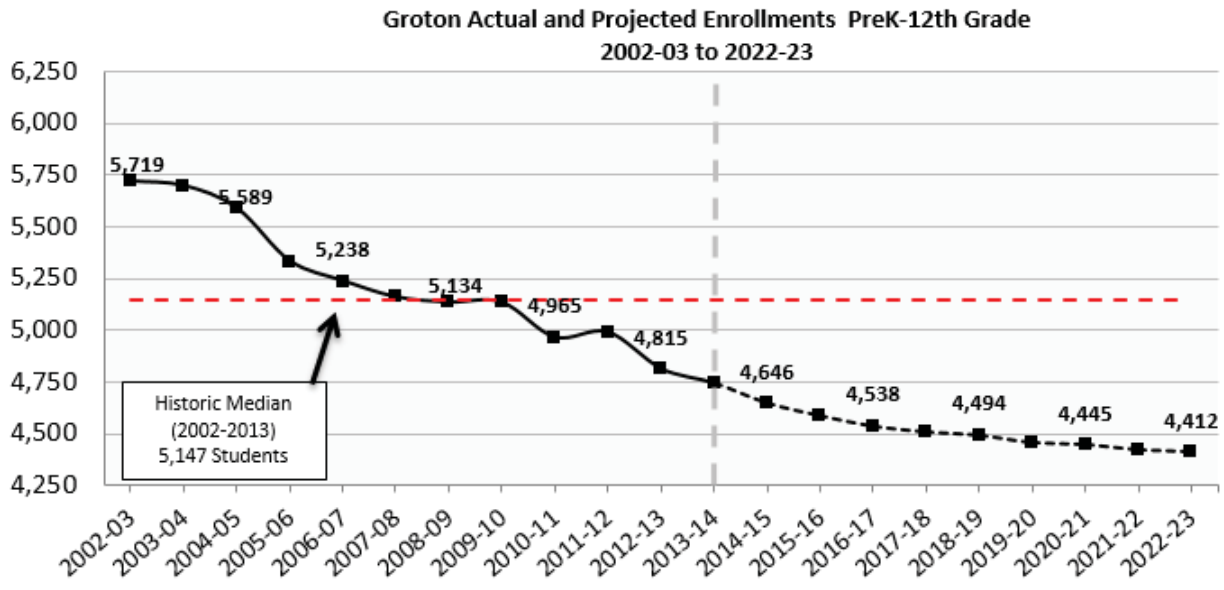
	2000 Median Age	2010 Median Age	Change
New London	31.2	30.3	-2.9%
Groton	**32.5**	**33**	**1.5%**
Norwich	36.9	38	3.0%
Sprague	37.1	38.5	3.8%
Griswold	36.7	39.6	7.9%
Ledyard	37.1	40.6	9.4%
Bozrah	40.1	43.9	9.5%
Lyme	47.1	51.6	9.6%
Franklin	39.9	44.1	10.5%
Waterford	41.7	46.1	10.6%
Montville	36.5	40.7	11.5%
Lebanon	38.2	42.7	11.8%
Preston	41	45.9	12.0%
Stonington	41.7	46.8	12.2%
Salem	37.1	41.8	12.7%
Lisbon	39	44	12.8%
East Lyme	39	44.3	13.6%
Old Lyme	42.9	48.8	13.8%
Colchester	35.3	40.6	15.0%
North Stonington	39.6	45.9	15.9%
Voluntown	36.3	42.8	17.9%

Source: *U.S. Census 2000 and 2010*

shows, the New London County region experienced significant aging between 2000 and 2010. Only New London experienced a decline in median age. The median age for the state in 2010 was 40, up 7% from 2000.

Looking more specifically at changes in population by age cohorts within Groton, it is evident that Groton has experienced a reduction in children and young working age population despite its relatively stable median age. *Groton Change in Population by Age Group, 2000-2010* shows changes by age groups from 2000 to 2010. The increase in 18- to 24-year-old population and the sizeable 25- to 34-year-old population maintain a relatively young median age. The loss of children and increase in older age groups has implications on facilities and service planning for the town.

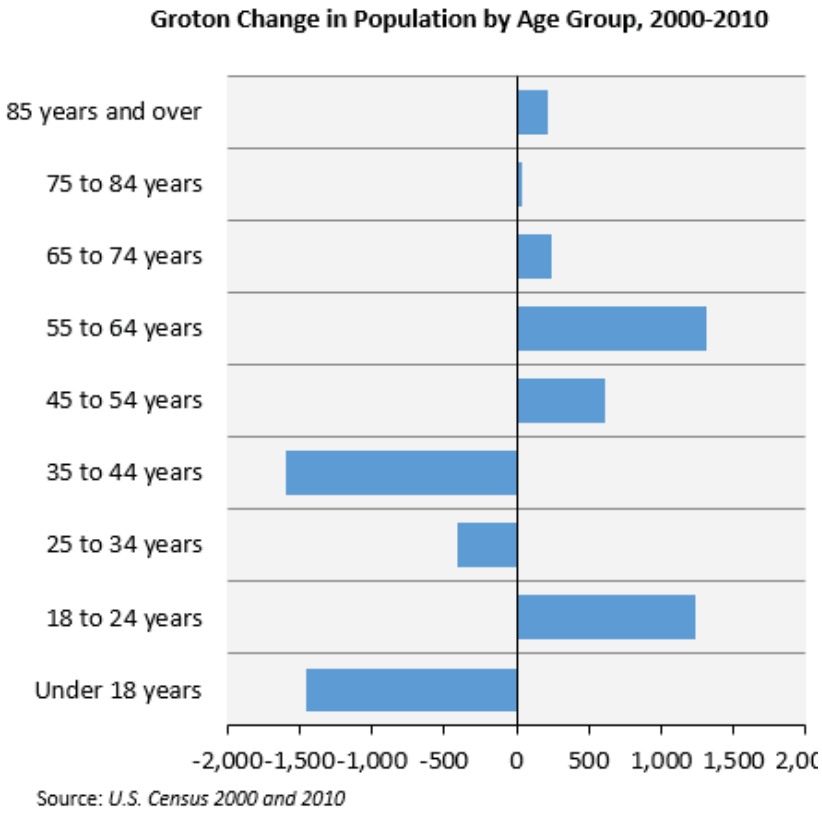
A significant decline in the population under 18 can have an impact on a community's school system. As part of the school redistricting process, the Groton Public Schools system recently had enrollment projections for the district prepared by Milone & MacBroom, Inc. The study showed that the overall school system has experienced a decline of about 18% since 2002 and is projected to further decline over the next five years, albeit at a much slower rate, as shown in *Groton Actual and Projected Enrollments PreK-12th Grade, 2002-03 to 2022-23*.



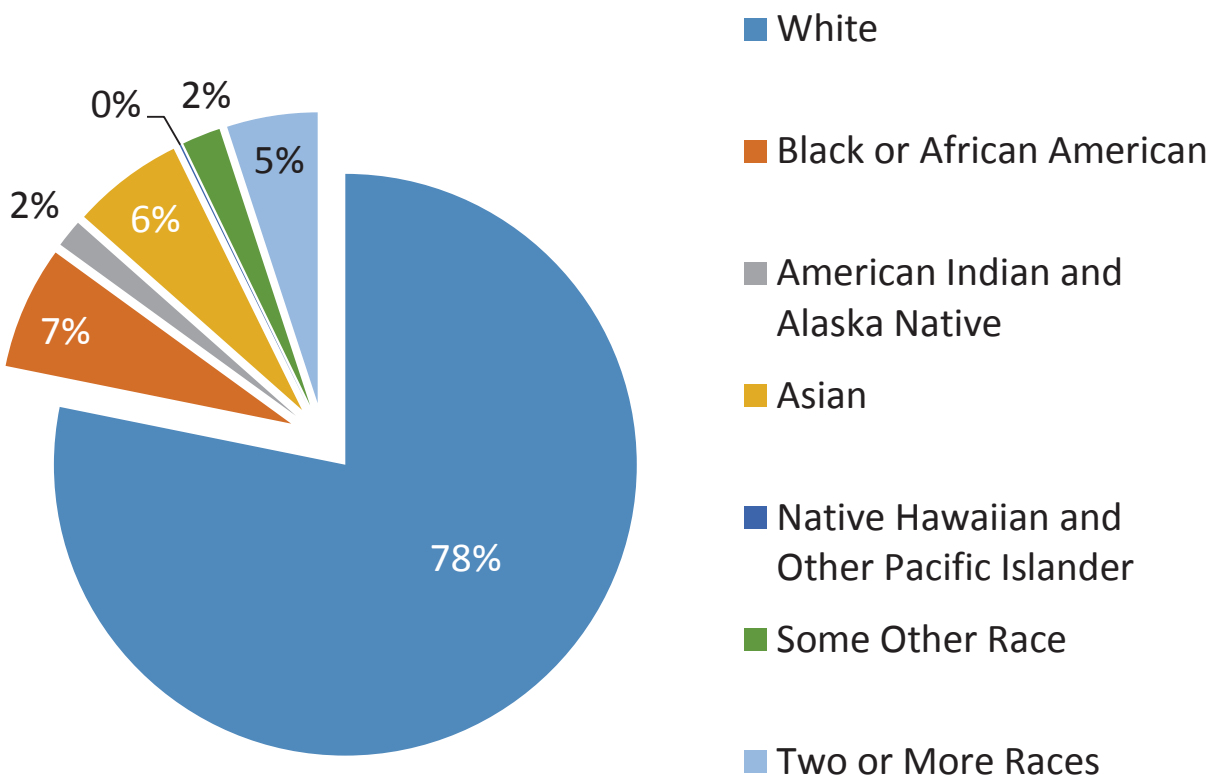
Prepared for the Board of Education by Milone & MacBroom, Inc. 2014.

Groton's racial composition is similar to the composition of New London County. Groton 2010 Racial Composition shows the breakdown of Groton's 2010 population by race. The majority, or 78%, is white. This is less than, but comparable to, New London County where the 2010 population was 84% white. As shown in Table 9, Groton has seen an increase in reported American Indian and Native Alaskans, Asians, Other Races, and Multi-Racial population. Some of these increases may be the result of self-reporting differences.

The Hispanic population, of any race, in Groton grew by 78% from about 2,000 people in 2000 to 3,575 in 2010. That is in line with growth in the Hispanic population throughout New London County, which was about 75% from 2000 to 2010.



Groton 2010 Racial Composition



LAND USE

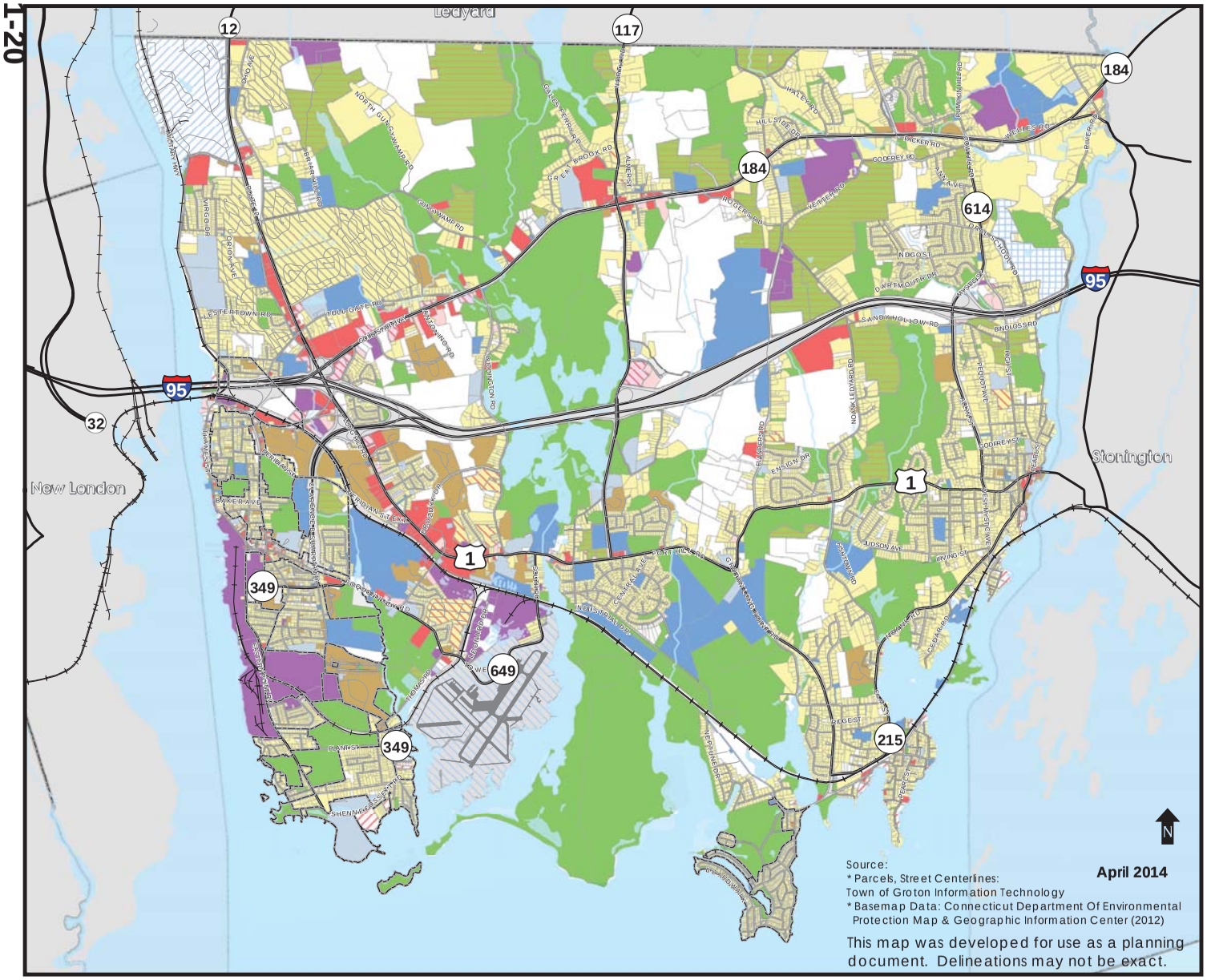
The Town of Groton has a total area of approximately 20,612 acres or 32 square miles. Groton contains a variety of land uses including industrial, commercial, residential, institutional, and open space.

As part of the study of existing land use and development potential, an analysis was prepared based on the town's digital parcel base map. Groton's land records are incorporated into this parcel base map so that information such as land use, zoning, and property assessment value can be displayed and analyzed on a townwide, parcel-by-parcel basis. While utilizing detailed information of this type for quantifying land use patterns and estimating development potential is more accurate a method then used in the past, it is important to recognize that the purpose of this study is only to provide a generalized assessment of land use characteristics and indicate growth trends and potential for the future.

The joining of the digital base map and corresponding property records from the assessor's database resulted in a detailed *Existing Land Use* map and inventory for all parcels in the town. The *Existing Land Use* map was field verified during August and September 2012 using the following land use categories.

LAND USE CATEGORIES

RESIDENTIAL	**1-2 Family:** Includes single-family and/or two-family houses, along with mobile and manufactured homes on individual parcels
	Multi-Family: Three or more units on a parcel
	Mobile Homes: Park sites of mobile homes
	Residential Navy Housing: Includes single-family and multi-family housing supporting the naval base, owned or operated by the federal government
COMMERCIAL	**Commercial Retail:** Includes retail sales and services operations; animal services; eating and drinking establishments; automotive sales/ services; driving ranges; and other commercial recreation.
	Offices: Includes commercial professional and medical office uses
	Lodging: Includes commercial hotel, motel, inn, bed & breakfast, and other lodging uses
	Marine Business: Includes commercial and industrial uses dependent on water access or proximity, such as marinas, boatyards, commercial fishing operations, etc.
INDUSTRIAL	Includes manufacturing, research and development, warehousing, storage, and earth processing
PUBLIC/ INSTITUTIONAL	**Community Facilities:** Includes local-government owned buildings and facilities such as schools and their associated grounds and facilities; transfer stations; lands dedicated to flood control; water company lands with structures or buildings; and public service facilities such as senior centers, fire stations, police stations, etc.
	Naval Base: Include federally owned naval property (as distinguished from naval housing)
	Other State Facilities: Includes state lands and facilities otherwise not classified
	Institutional: Includes private institutional uses such as places of religious worship, private schools, state or private universities, museums, daycare, and other non-profit facilities
OPEN SPACE AND PARKS	Includes parks and recreation that are maintained for active recreation, open space and parks in a natural state that are not maintained for active recreation, public & private parks, playgrounds, camping areas, golf courses, beaches, cemeteries, and water company holdings with no structures
TRANSPORTATION	**Airport:** FAA air traffic control tower and instrument landing system (ILS), runways, and hangars
	Parking: Includes standalone surface and structured parking
	ROW: Public rights-of-way including those for roads, train corridors, and "paper" streets
VACANT	Includes undeveloped parcels
AGRICULTURE	Includes Agriculture, Aquaculture, and Silviculture. Also includes parcels with a Connecticut Public Act 490 Agriculture tax adjustment



Groton PLAN OF CONSERVATION + DEVELOPMENT

Existing Land Use

Residential
- 1-2 FAMILY
- MULTI-FAMILY
- MOBILE HOMES
- RESIDENTIAL NAVY BASE

Commercial
- COMMERCIAL RETAIL
- OFFICES
- LODGING
- MARINE BUSINESS
- INDUSTRIAL

Open Space and Institutional
- COMMUNITY FACILITIES
- AIRPORT
- NAVAL BASE
- OTHER STATE FACILITIES
- INSTITUTIONAL

- AGRICULTURE
- OPEN SPACE
- PARKING
- VACANT

0 0.5 Miles

MILONE & MACBROOM

Map Introduction-2:Existing Land Use

The *2012 Land Use Distribution Summary* below is a summary of the major land use categories and a calculation of percent change since the 1998 land use inventory.

2012 Land Use Distribution Summary*

Land Use Category	Area (Acres)	Percent of Committed Land	Percent of City's Land Area	Percent Change 1998-2012 (1)
Residential	5,908	36%	29.0%	22.7%
Commercial	697	4%	3.4%	5.6%
Industrial	627	4%	3.1%	19.7%
Public Institutional (2)	1,859	11%	9.1%	7.0%
Parks & Open Space	4,694	29%	23.0%	7.0%
Transportation/ Roads (3)	2,562	16%	12.6%	30.1%
Developed/ Committed	**16,347**	**100%**	**80.2%**	**16%**
Vacant/ Under-Developed (4)	**4,030**		**19.8%**	**-35%**
Total Land Area	**20,377**		**100%**	

Source: Tax Assessor 2012

**Land Use does not include Town Parcels classified as Water*

(1) *Based on 2002 POCD, 1998 Land Use Inventory*

(2) *Includes Private Institutions*

(3) *Includes all Infrastructure*

(4) *Includes Agricultural Lands*

While some differences in inventory methodology and categorization of land uses between 1998 and 2012 exist, it is helpful to compare land use characteristics between decades in order to identify general trends in land development. Because of differences in source data and methodology, direct comparisons of individual land use categories from 2002 and 2012 are not completely accurate indicators of growth.

Groton has continued to develop and mature as a community in all respects particularly in the industrial, residential, commercial, and parks and open spaces categories, which experienced growth of 17%, 15%, 24%, and 10% respectively. Approximately 80% of the land in Groton is committed to a land use, including Water Company land.

RESIDENTIAL DEVELOPMENT POTENTIAL

The results of the residential development potential analysis indicate that, based on existing zoning, approximately 4,530 additional dwelling units could be built within the town's residential zones at full build-out. This represents an approximate 25% increase over the 17,978 existing dwelling units enumerated during the 2010 Census. Ninety percent of these potential units are in single-family zones, with fewer than 500 potential units in multi-family zones.

In 2010, the town had an average household size of 2.31; therefore, these units have the potential to increase the population by 10,464 people at full build-out, yielding a potential for a total population of 50,579 person in the town.

Following the last POCD, zoning changes were made in 2002, based on recommendations from the plan, which removed two-family homes as-of-right in the RU-40 and RU-80 zones. This resulted in a decrease in the potential yield of dwelling units by an estimated 800 dwelling units in RU-40 and RU-80 zones.

Since 2007, there has been an average of 48 annual housing permits. If this trend continues for the next 10 years, there would be an estimated additional 480 units of housing built by 2023. In 2010, the town had an average household size of 2.31; therefore, these units would have the potential to increase the population by 1,109 people.

FISCAL

Due to the variety of governmental organizations in Groton, it is very difficult to compare local revenues and expenditures with other jurisdictions. For example, fire protection expenditures (which may be included in other town's municipal expenditures) are levied separately in Groton and are not included in local expenditures. The nine fire districts and the Groton Sewer District all levy a separate additional mill rate, ranging from 0.25 to 6.05 mills.

Groton has the largest tax base in the immediate region based on the Equalized Net Grand List (ENGL), a measure of the market value of all property in a community. However, the ENGL per capita is near the regional average.

FY 2016 Mill Rates in Groton, CT

Jurisdiction	Mill Rate
Town of Groton	20.95
Groton Sewer District	0.25
City of Groton	5.868
Poquonock Bridge Fire District	6.05
Mystic Fire District	2.29
Noank Fire District	1.39
Old Mystic Fire District	2.90
Center Groton Fire District	3.50
W. Pleasant Valley Fire District	3.76
Mumford Cove	0.309
Long Point Assoc., Inc.	2.995

Source: *CT Office of Policy & Management*

Tax Base Comparison

Community Type	Town	Population (2013 estimate)	2013 Equalized Net Grand List	Equalized Net Grand List/capita
Urban	**Groton**	**40,126**	**$5,435,454,547**	**$135,460**
Urban	New London	27,588	$1,826,592,880	$66,210
Urban	Norwich	40,424	$2,574,691,786	$63,692
Suburban	Stonington	18,527	$3,653,849,292	$197,218
Suburban	Ledyard	15,051	$1,562,200,147	$103,794
Suburban	Waterford	19,508	$4,602,445,285	$235,926
Suburban	East Lyme	19,119	$2,948,988,218	$154,244
Suburban	Montville	19,621	$1,824,269,016	$92,975
Rural	North Stonington	5,291	$752,502,500	$142,223
Rural	Preston	4,751	$550,138,881	$115,794
	Area Average		**$2,573,113,255**	**$130,754**
	Area Median		**$2,200,642,333**	**$125,627**

Source: *Connecticut Office of Policy & Management*

Equalized Net Grand List is an estimate of all taxable property in a municipality by OPM

TOWN OF GROTON, CONNECTICUT
PRINCIPAL TAXPAYERS
CURRENT YEAR AND NINE YEARS AGO
(In Thousands)

		2015			2006		
Taxpayer	Nature of Business	Taxable Assessed Value	Rank	Percentage of Gross Taxable Assessed Grand List	Taxable Assessed Value	Rank	Percentage of Gross Taxable Assessed Grand List
Pfizer, Inc.	Pharmaceutical	$ 511,942	1	13.1%	$ 418,634	1	16.2%
Electric Boat Corp.	Submarine Mfg./R&D	255,281	2	6.6%	172,933	2	6.7%
LCOR Groton Apartments LLC	Ledges Apartments	21,400	3	0.6%	12,236	4	0.5%
Exit 88 Hotel LLC	Mystic Marriott Hotel	18,710	4	0.5%	18,772	3	0.7%
Groton Devel Assoc Ltd	Country Glen Apartments	17,533	5	0.5%	10,701	6	0.4%
ELK La Triumphe LLC	LaTriumphe Apartments	14,732	6	0.4%	10,391	8	0.4%
CW Groton Square LLC	Groton Square Shopping Center	14,518	7	0.4%	10,485	7	0.4%
Groton Estates LLC	Colonial Manor Apartments	12,186	8	0.3%	8,516	9	0.3%
Branford Manor Assoc	Apartment Complex	10,932	9	0.3%	7,430	10	0.3%
Groton Shoppers Mart LLP	Groton Shopping Center	10,743	10	0.3%			
CSC Outsourcing	Leased Equipment at Electric Boat				11,274	5	0.4%
		$ 887,977		23.0%	$ 629,192		26.3%

Source: Town Assessor's office

Table 13 from the 2015 Comprehensive Annual Financial Report

FISCAL PARAMETERS OF DIFFERENT USES

A fiscal analysis determines whether the general fund tax revenues generated to the Town of Groton by a particular land use are greater than the town expenditures associated with that land use. Fiscal parameters are not the only criteria on which municipal policy, especially conservation and development decisions, should be made. Such findings need to be balanced with environmental, physical, social, and economic implications.

Residential uses: Due to education expenses, several residential uses in Groton generally receive more in services than they pay in taxes. Single family homes and apartments or condos with multiple bedrooms that are geared toward families generally fall into this category. Conversely, if a dwelling unit contains no schoolchildren, it likely pays more in taxes than it receives in services. Studio or efficiency apartments or one bedroom apartments or condos that are geared toward single individuals, couples, or room mates typically fall into this category.

Commercial/Industrial/Public Utility Uses: Nonresidential uses typically pay more in taxes than they receive in services because they receive no direct benefit from local education expenses.

Private Open Space: Land that is privately owned but assessed as farm, forest, or open space land under the Public Act 490 program (codified as CGS Section 12-107e) has a positive fiscal impact on the town since it pays more in taxes than it receives in services.

Tax Exempt Uses: Since tax-exempt uses pay no taxes yet receive some services from the town, they typically have a negative fiscal impact.

State properties in Groton include open-space land (such as Bluff Point and Haley Farm) and facilities (such as Avery Point, Groton/New London Airport, CT DOT facilities, etc.). Groton received about $1.2 million from the state for payments in lieu of taxes (PILOT) for state properties in 2012. Connecticut is unique in the nation for having municipalities

reimbursed by the state for tax-exempt properties. There is currently a proposal in the legislature to enact a Reverse PILOT program where colleges and other traditionally tax-exempt uses would start paying taxes in their municipalities with partial reimbursement by the state. Any changes to the PILOT program could have impacts on Groton's fiscal parameters.

Municipal facilities in Groton include all town-owned land and facilities such as schools, Town Hall, public works, police, recreation, libraries, senior center, and other sites. While these uses require local expenditures but pay no taxes, they are the facilities that are used to provide municipal services, and the costs are incorporated elsewhere in the municipal budget.

Other tax-exempt uses include educational, historical, charitable, and religious land and facilities. Again, while these uses require local expenditures but pay no taxes, they are facilities that typically enhance community character and quality of life.

COMMUNITY INPUT

The preparation of this POCD update included public input throughout the plan drafting process. This input included a communitywide internet-based survey containing questions regarding all facets of the plan's topical chapters, which garnered 280 responses, and two public workshops lasting two hours were held in May and November 2013.

COMMUNITY WORKSHOPS

The first community workshop, held in mid May 2013, provided Groton residents with the opportunity to review and comment on topical memoranda prepared to date and to actively engage in the development of goals and objectives for the town's future. After an initial presentation of pertinent data gathered and conclusions drawn for topics such as demographics, housing, economic development, and natural resources, "break out" sessions were held where members of the public could go to multiple plan topic "stations," discuss with one another the findings and implications for each topic area, and use large scale maps to design and compose their own appropriate goals and objectives for consideration.

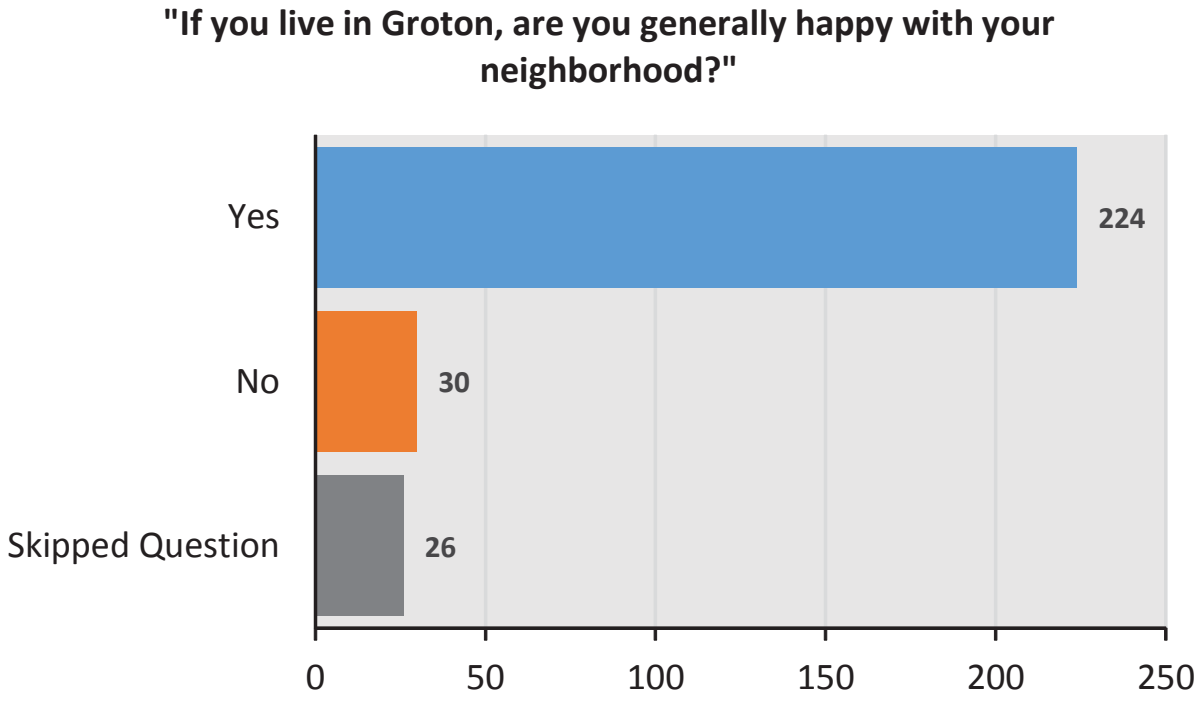
The second public workshop, held in late November 2013, provided an opportunity to present to the public the initial goals and strategies developed for the POCD. These goals and strategies were presented and discussed with the public. Feedback was gathered from the attendees to help refine and improve the initial goals and strategies presented.


Community Input at the Public Open House

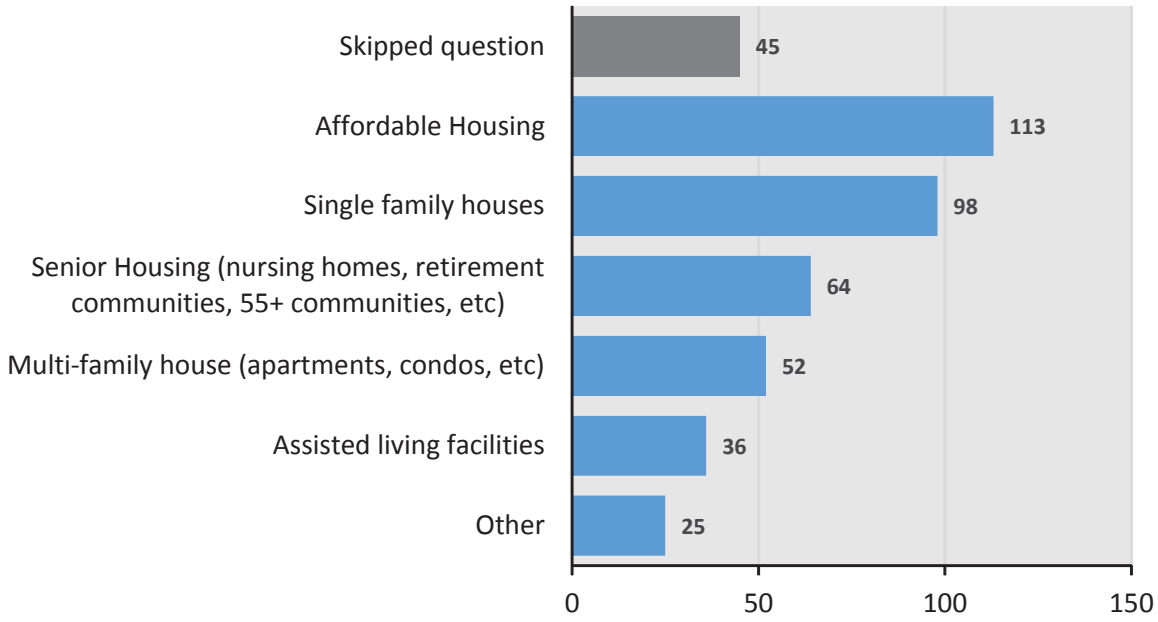
GROTON POCD COMMUNITY SURVEY

The Groton POCD Community Survey was intended to gather information from residents to inform the POCD update. The

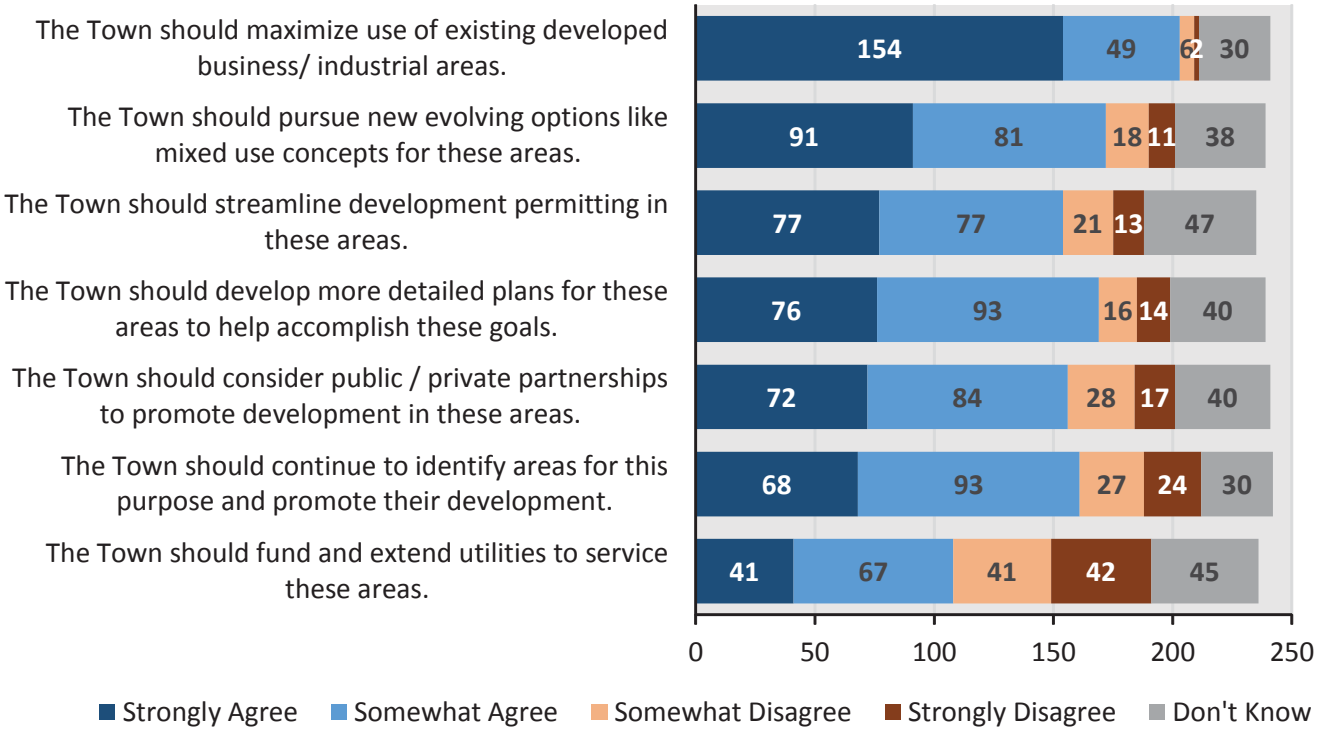
questions were about quality of life, recreation, land use, economic development, and other topics in Groton. The survey was available online from the end of July to December 18, 2013 and advertised in local newspapers as well as on the town website. Two hundred and eighty Groton residents submitted responses. People taking the survey were able to skip questions, so the total pool of respondents for each question did not always equal the full 280 respondents. Residents self-selected to particpate in the survey, which means that the survey does not represent a random sample that can be said to provide an accurate view of Groton as a whole. Roughly 60 of the respondents were high school students involved in a civics class that participated in the survey. Results from several survey questions are highlighted in the graphs below.



"What housing types should Groton plan for MORE of in the future?"



"Groton has very limited suitably located underdeveloped land available for large scale business/ industrial expansion and development. Current plans identify areas of the Town for this purpose. Do you agree or disagree with the following?"



Chapter 2: Conservation

Chapter 2: Map Index

PROTECT NATURAL RESOURCES

Natural resources are as vital to the community as any part of the built environment. Their continued conservation provides benefits to current residents and ensures the vitality of the town for future generations. Protecting natural resources is an important issue in the Plan since such efforts:

Provide economic benefits

- Increase property values
- Support emerging markets in outdoor industries
- Create assets that attract businesses

Provide ecological benefits

- Balance development with the natural environment
- Preserve vital natural functions and ecological services
- Protect public drinking water quality
- Protect inland and coastal resources

Provide social benefits

- Improve the quality of life for existing and future generations
- Improve air and water quality
- Create active and passive recreation opportunities

Protection of natural resources requires taking positive steps to identify and safeguard vulnerable environmental assets.

Beebe Pond

PROTECT WATER QUALITY AND WATER RESOURCES

PUBLIC DRINKING WATER SYSTEM

Protection of water quality is one of Groton's most important natural resource preservation priorities. In addition to the need to protect the drinking water supply for Groton residents, it is also significant in terms of protecting the overall health of Groton's ecosystem.

Four water companies operate in the Town of Groton: Aquarion, Groton Utilities, Groton Long Point Water and Noank Water Company. Groton Utilities directly services the majority of the town and is operated by the City of Groton. In addition, Groton Utilities also supplies water to Groton Long Point and Noank and recently established an interconnection with Aquarion Water Company to supply their Mystic Division. Many private wells and community systems in the town also provide water to users. See Map C-1.

Groton Utilities relies on five interconnected reservoirs and eight community wells with a combined capacity of 2.5 billion gallons located in a watershed of 15.6 square miles within the Town of Groton and neighboring Ledyard to supply its system.

WATER RESOURCE PROTECTION DISTRICT (WRPD)

The Water Resource Protection District (WRPD) was specifically encoded into the town's zoning in order to protect water supply sources by exercising "reasonable controls over land use, waste disposal, and material storage." The WRPD is designed to protect extensive stratified drift aquifers, which recharge wells; surface water reservoirs, such as the Smith Lake Reservoir and Poheganut Reservoir owned by Groton Utilities; and other areas in which groundwater is the sole source for water supply.

The WRPD is an overlay zone that provides more protections in addition to the underlying zoning. Even when the underlying zoning is more permissive, the WRPD disallows uses that may have a greater chance of ground contamination, such as sanitary landfills and septage lagoons, road salt storage, engine repair and machine shops, dry cleaners, etc.

Currently, about 7,700 acres of land in Groton fall under the WRPD overlay district. WRPD land generally encompasses the majority of land north of I-95; this area is mostly low-density residential but does include some commercial and industrially zoned parcels. As this district spans such a wide area, it is prudent to periodically review and update the district's requirements to reflect best available technology and protection measures. Regulations should reflect current practices in order to not be overly restrictive or constraining for development while also preserving watershed water quality.

DRINKING WATER MANAGEMENT PLAN

In 2008, Groton participated in developing a regional Drinking Water Quality Management Plan (DWQMP). The DWQMP was designed as a tool to manage drinking water in a coordinated effort among the supplier, watershed communities, and end users to integrate planning at every level. Implementation of the DWQMP may provide a framework for coordinating land use and resource protection issues that span multiple jurisdictional layers between municipal boundaries and planning and regulatory bodies.

The major recommendations from the DWQMP include seeking broad participation from stakeholders and leadership to implement drinking water quality improvements. The plan recommended that municipalities seek multiple and concurrent approaches to stormwater management, such as requiring new development to utilize modern methods of stormwater management, or to implement new best management practices. Amending local regulations to accommodate the application of low impact development by developers and striving for consistency in local stormwater regulations in the watershed areas would also provide long-term benefits for drinking water quality.

As part of this process, Groton Utilities has identified future potential public water supply watersheds, which include the Haley Brook watershed in Ledyard and northern Groton. If or when this watershed is included in the public water supply watershed, there may be additional impacts on land use in this area.

STORMWATER MANAGEMENT PLAN

Groton's Stormwater Management Plan addresses public education and outreach, public involvement and participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention and good housekeeping for municipal operations. Stormwater and erosion control requirements are also codified into the zoning regulations.

LOW IMPACT DEVELOPMENT

According to the United States Environmental Protection Agency (EPA), Low Impact Design (LID) is an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as:

- Preserving and recreating natural landscape features
- Minimizing effective imperviousness to create functional and appealing site drainage
- Treating stormwater as a resource rather than a waste product

There are many practices that follow these principles, such as bioretention facilities, rain gardens, green roofs, rain barrels, and permeable pavements. These practices, especially reducing impervious paving with a surface that allows water to infiltrate into the ground, also has positive effects on water quality and the quality of habitat for shellfish and other species. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions. LID practices can also reduce stormwater management costs, as the stormwater is infiltrated on site. Groton has emphasized the incorporation of LID principles into development design, but there are currently no requirements in the zoning or subdivision regulations.

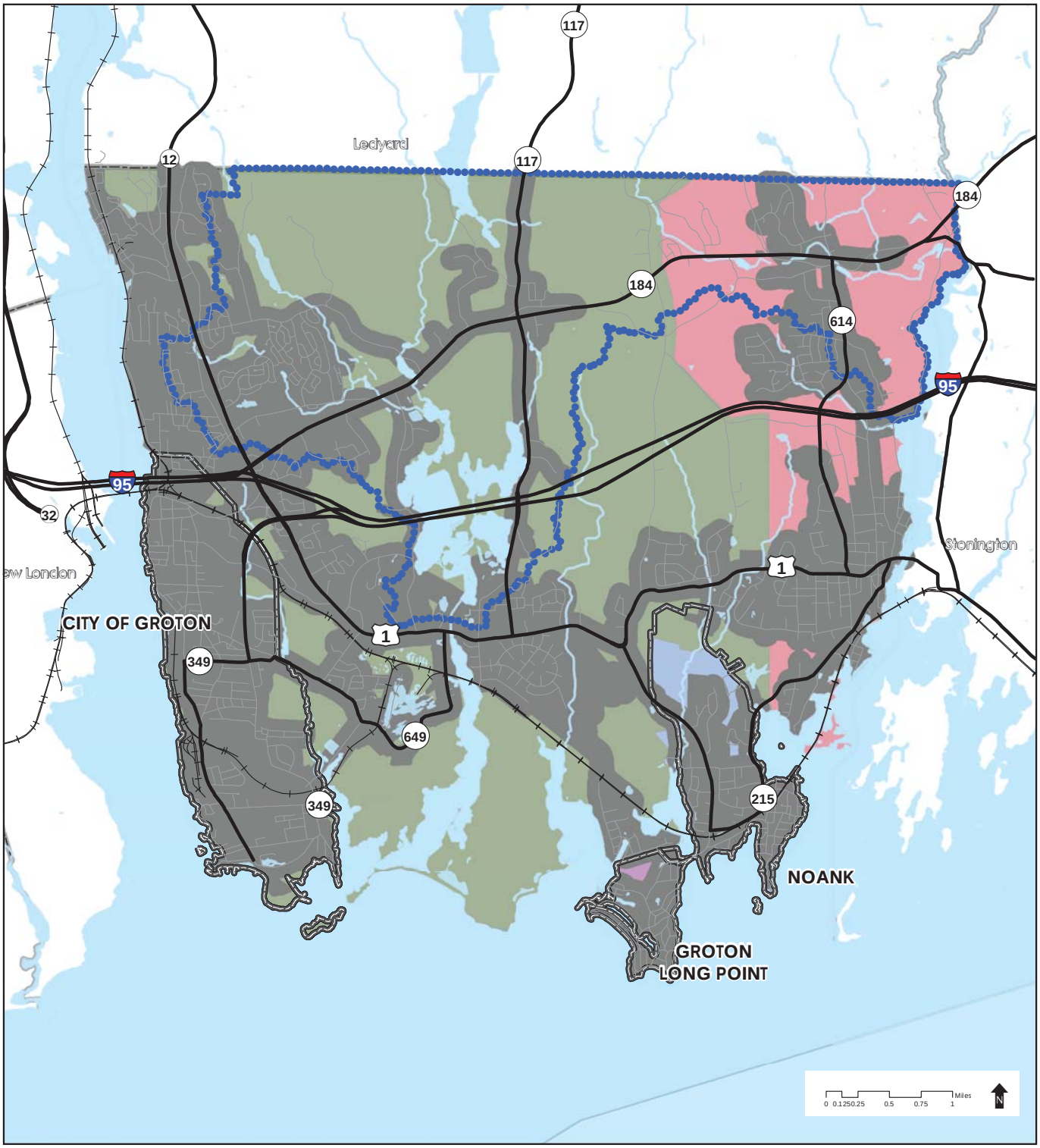
Recommendations

2-1 Update the Water Resource Protection District regulations, including prohibited uses and impervious surface standards, material handling methods, and consider a tiered system based on proximity to the reservoir or tributary streams.

2-2 Develop Low Impact Development regulations.

2-3 Prepare a plan to retrofit town-owned stormwater basins and drainage structures to improve water quality.

Map C-1: Water District and Service Areas



Groton PLAN OF CONSERVATION + DEVELOPMENT

Water District & Service Areas

- Public Water Service Areas
- Water Resource Protection District (WRPD)
- AQUARION WATER COMPANY
- CITY OF GROTON UTILITIES
- GROTON LONG POINT WATER
- NOANK WATER COMPANY

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

October 2016

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PROTECT OTHER IMPORTANT NATURAL RESOURCES

Some resources are so significant for preserving environmental quality or community character that efforts must continue to ensure that these resources are preserved. Preservation generally means to avoid altering these areas to the extent feasible and prudent. Resources for preservation can include: watercourses, inland and tidal wetlands, floodplains (100-year, 1.0% probability), and Coastal "V" flood hazard areas (within the 100-year, 1.0% probability floodplains, with storm-induced waves). Resources for conservation can include slopes exceeding 25%, floodplains, Coastal "A" flood hazard areas, and areas of unique habitat.

Some important functions of natural resources can be maintained while compatible activities take place nearby. While development in these areas is possible, it must be undertaken in a way that is sensitive to the conservation of important resources.

Methods of Resource Protection: Preserve vs. Conserve

Preservation means:
- To protect from harm
- To maintain intact or unchanged

Conservation means:
- To save from loss or depletion
- To avoid wasting

UNIQUE HABITATS

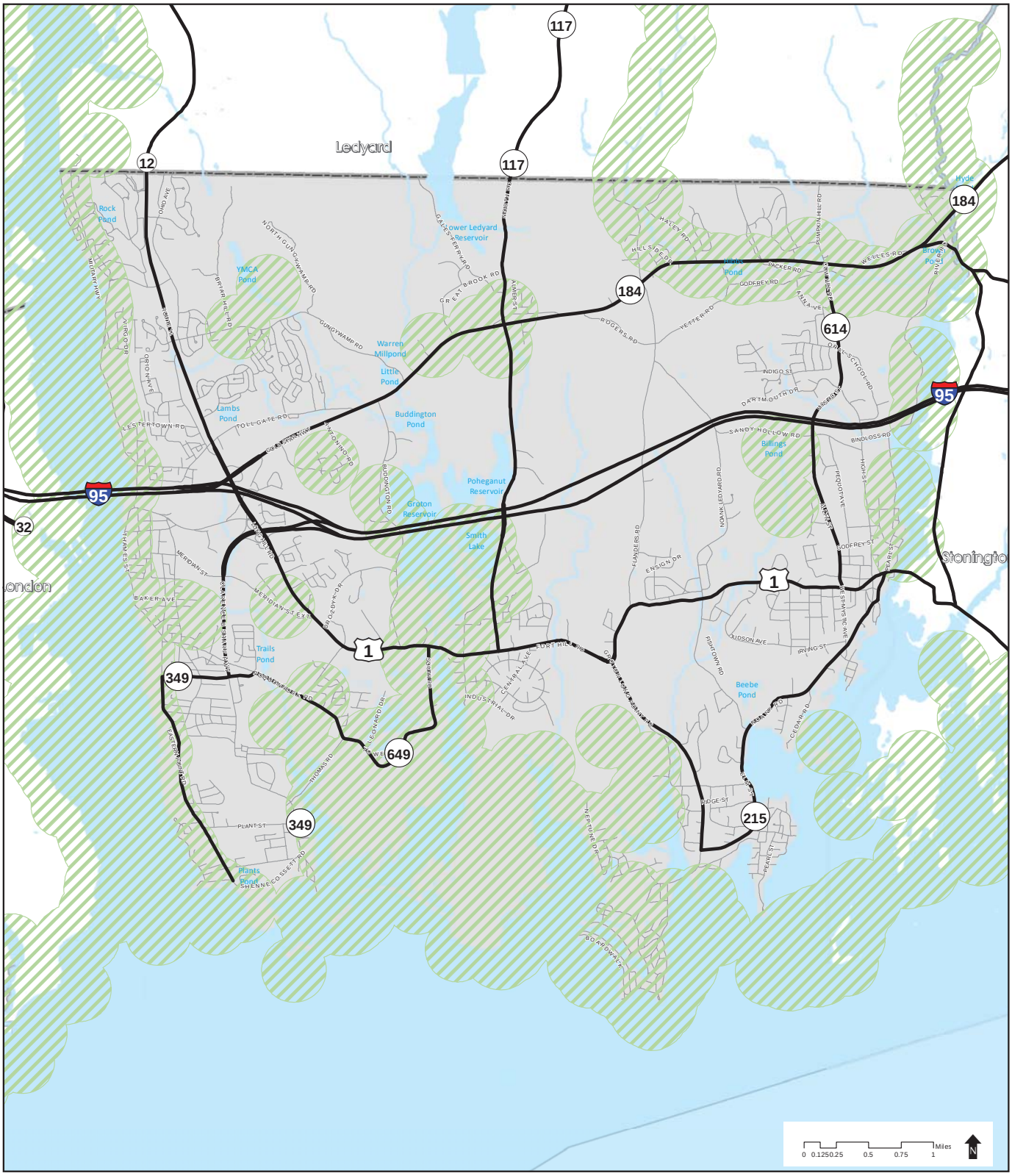
Despite its dense population and increased development, Groton is host to abundant diverse plant and animal life as well as equally varied habitats. The variety of topography, forested lands, and coastal resources provide exceptional habitats for a variety of plants and animals. The Connecticut Department of Energy & Environmental Protection (DEEP) has inventoried sites across the state that contain habitats of endangered, threatened, and special concern species in the Connecticut Natural Diversity Data Base. The database represents years of biological surveys and identifies areas that are unique and receive special protection status. The Significant Habitat map highlights these areas. As is demonstrated in Map C-2, Groton's high quality marine resources provide unique habitats.

STEEP SLOPES AND SHALLOW SOILS

Steep slopes are important to identify primarily due to the way they affect development. While the stability of a slope depends on a variety of factors from underlying geology to vegetation cover, as a general rule slopes greater than 25% pose challenges to development due to difficulties involved with building foundations and siting septic systems. These areas also pose additional hazards of increased erosion and surface runoff. Areas of steep slopes are prevalent in the hills of northern Groton.

Bedrock depth varies throughout Groton depending on elevation and slope. Understanding what areas have shallow soil depths is important for planning future development, especially for on-site septic system capabilities. Shallow soils (soils with less than 60 inches above bedrock) account for approximately 3,489 acres or about 17% of Groton's land area. See Map C-3.

Map C-2: Significant Habitat



Groton PLAN OF CONSERVATION + DEVELOPMENT

Significant Habitat

Natural Diversity Data Base Area

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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June 2014

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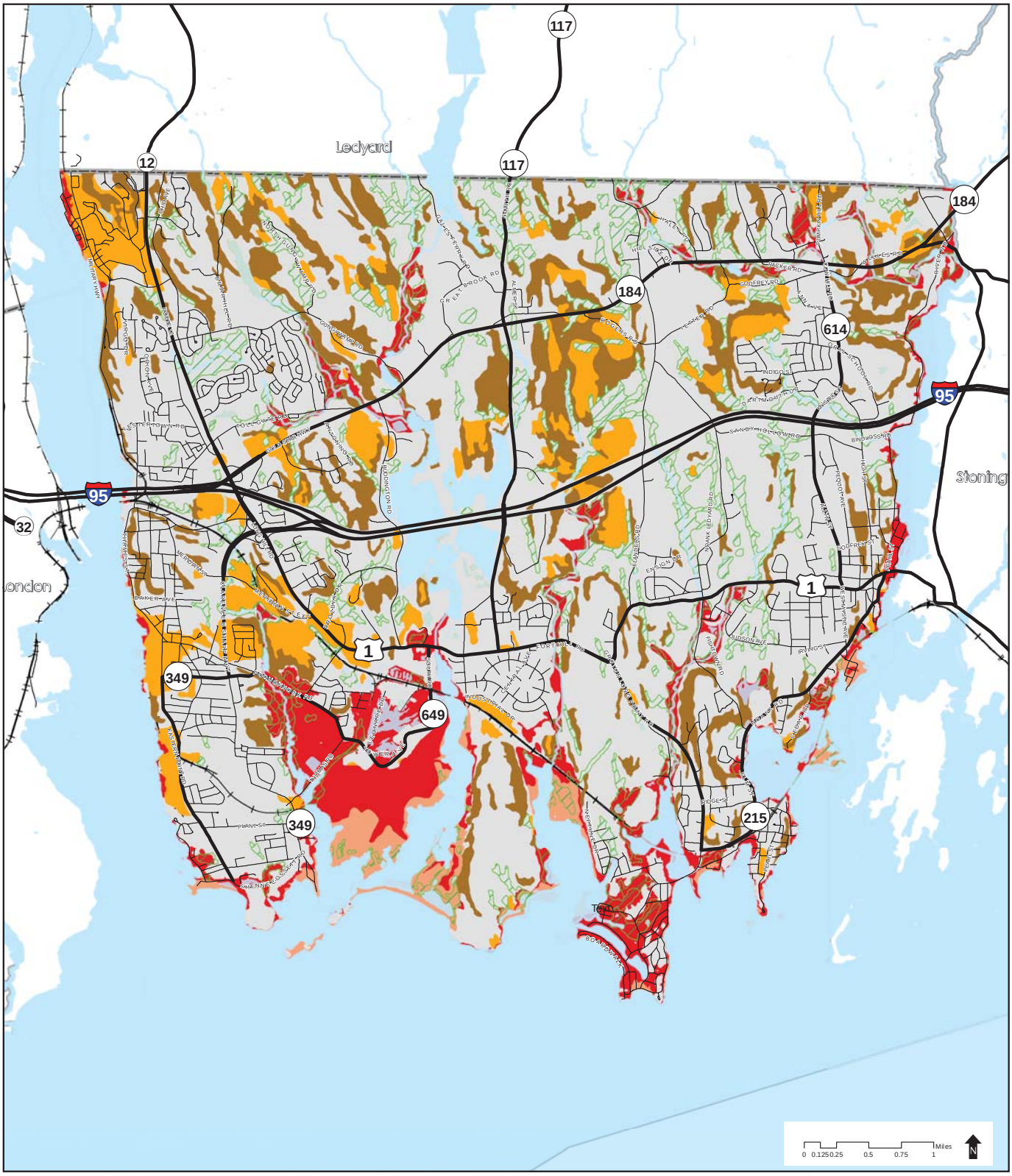
Map C-3: Areas Physically Sensitive to Development



Groton PLAN OF CONSERVATION + DEVELOPMENT

Areas Physically Sensitive to Development

- Wetland Soils
- Steep Sloped Soils*
- 100-Year Flood Zone
- Coastal Flood Zone**
- Shallow Soils (Max. Depth <60")

Sources:
* Street Centerlines: Town of Groton GIS Dept.
* State Roads: Streetmaps USA (2011)
* Wetlands and FEMA Data: Connecticut DEEP Map & Geographic Information Center (2012)

*NRCS soils with a lower limit of slopes >15% and an upper limit of slopes >25%
**As identified by FEMA

This map was developed for use as a planning document. Delineations may not be exact.

April 2014

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FLOODPLAINS/INLAND AND COASTAL

There have been recent changes to the Federal Emergency Management Agency (FEMA) mapping that determines areas of 100-year and 500-year flood risks. A 2013 update to the coastal Digital Flood Insurance Rate Map (DFIRM) has resulted in some changes in coastal base flood elevations. An additional 228 acres became part of the 100-year floodplain, and 804 acres were added to the 500-year floodplain. These changes are not due to sea level rise, but only incorporate changes from improved modeling and analysis of coastal hazards such as storm surges. Sea level rise will eventually cause the FEMA base flood elevations (BFEs) to rise, putting currently unaffected elevations into 100-year and 500-year flood categories.

Groton has flood protection regulations in the zoning regulations that are based on FEMA Flood Zone classifications.

- A Zones are areas within the 100-year floodplain where no hydraulic analyses have been performed.
- AE Zones are areas within the 100-year floodplain that have documented BFEs.
- V Zones are coastal areas within the 100-year floodplain, which have additional hazards associated with storm-induced velocity wave action.
- VE Zones are V Zones that have documented BFEs.

One recommendation from the Municipal Coastal Program is to hold coastal A Zones to the higher standards of the V Zones to create development that is more appropriate to floodprone coastal areas. Groton's position as a coastal town means that it will continually have to evaluate development patterns and resource protection along its coast.

Groton also has extensive areas of inland wetlands and tidal wetlands totalling about 11% of Groton's land area, or approximately 2,190 acres of wetland-designated soils. Wetlands have many defining characteristics: periods of standing water, saturated soil conditions, and specific organisms and vegetation that are adapted to or tolerant of saturated soils. In Connecticut, inland wetlands are defined by soil types, specifically soils that are classified as Poorly Drained, Very Poorly Drained, and/or Alluvial/Floodplain by the Natural Resources Conservation Service (NRCS) of the U.S. Geological Survey.

Wetlands provide highly productive natural ecosystems; habitat for a variety of plant and animal species, including threatened and endangered species; flood protection in their ability to store and slowly release flood waters (which will become increasingly important due to projected sea level rise and climate change increasing the frequency of storm events and flooding); and serve to improve water quality through sediment and nutrient removal processes. See Map C-3.

METHODS OF PROTECTION

Many methods of protection of important natural resources such as steep slopes, habitats, and floodplains involve developing in a sensitive manner. Conservation goals can be built into regulatory tools such as zoning and subdivision ordinances. For example, an objective of the Groton zoning regulations already states that any site development will preserve sensitive environmental land features, such as steep slopes, wetlands, and large rock outcroppings, as well as scenic views or historically significant features. Updating these regulations to provide specific regulations to conserve other important natural resources during the subdivision or development review process can strengthen these protections.

Groton also protects floodplains through additional review of special flood hazard areas. Land identified as being prone to flooding by FEMA receive additional regulatory protection in order to permit the Town of Groton to participate in the National Flood Insurance Program (NFIP). These special regulations are designed to: a) prevent or minimize loss of life, injuries, property damage, and other losses, both private and public; b) promote the health, public safety, and general welfare of the people; and c) help control and minimize the extent of floods and reduce the depth and violence of flooding. These provisions apply in any zoning district which is located within a flood hazard area, floodway, or coastal high hazard zone.

Recommendations

2-4 Update regulations to conserve important natural resources.

PRESERVE AND STRATEGICALLY EXPAND RECREATION AREAS AND OPEN SPACE

The quality, quantity, variety, and location of parks and open spaces are important characteristics of any community. Neighborhood parks such as Farqunar Park and larger community recreational facilities such as Poquonnock Plains Park and Sutton Park lend strength to Groton's residential neighborhoods, while open spaces add to the overall character of the town. The benefits of parks and open space are many: they provide spaces for healthy activities and opportunities for social interaction, help preserve natural resources, enhance community character, positively affect property values, and act as community focal points and economic engines.

Haley Farm State Park

CONTINUE TO FUND AND IMPROVE OPEN SPACE

BENEFITS OF OPEN SPACE

Open spaces are lands preserved primarily for conservation purposes but can also support recreation uses. Recreation on open space can be passive in nature, such as hiking or bird watching, requiring little to no developed facilities, or it can be more active, involving recreational uses such as playgrounds, parks, and athletic fields. Preserving open space provides many local benefits for Groton.

Economic benefits:

- People are willing to pay more money for a home in close proximity to parks and open space, increasing the tax base

Ecological benefits:

- Providing habitat for different bird and wildlife species
- Protecting water quality

Social benefits:

- Can help provide access to the natural environment for all residents
- Can encourage residents to play and do physical activity outside, leading to community health benefits

TYPES OF OPEN SPACE

The 2002 Groton Plan of Conservation and Development (POCD) defines open space as land that is permanently preserved for or dedicated to open space uses. For the 2014 POCD Open Space Inventory, lands were placed into three categories: dedicated open space, managed open space, and facilities.

- Dedicated Open Space includes all land that is permanently preserved as open space. This includes land owned by the state, municipal organizations, and land trusts. It can also include land that is privately owned but set aside for open space as part of a development.
- Managed Open Space includes land that is used or preserved for some purpose other than open space but that provides open space characteristics. In Groton, this includes land owned by the City of Groton Department of Utilities, cemeteries, golf courses, the YMCA, and beaches.
- Facilities includes some land at public facilities, such as schools, that is used for open space or recreation.

The State of Connecticut has a stated goal of preserving 21% of Connecticut's land as open space by the year 2023. This open space goal is broken down by 10% to be state-owned additions and 11% owned by municipalities, private nonprofit land conservation organizations, water companies, and the federal government. The Connecticut Department of Energy & Environmental Protection's website indicates that the state has achieved 73% of this goal as of October 2010.

In the Town of Groton, roughly 14% of its total of 20,377 acres is currently preserved as dedicated open space. State-owned dedicated open space (such as Bluff Point State Park) totals 1,195 acres, or 6% of the total land area of Groton. Municipal and Private Land Trust dedicated open space totals 1,700 acres, or about 8% of the total land area in Groton.

Open Space Inventory, Acres of Open Space

Parks and Open Space Categories	2015 POCD				2002 POCD			Change
	Total Area in Acres	Facilities (est.)	Open Space***	Percentage of Total Open Space	Total Area in Acres	Facilities (est.)	Open Space	in Open Space
Dedicated Open Space	**2,895**	**0**	**2,895**	**51%**	**2,311**	**0**	**2,311**	**584**
Municipal Dedicated Open Space	1,347		1,347	24%	1,198			
State Dedicated Open Space	1,195		1,195	21%	1,020			
Private Land Trust Dedicated Open Space	354		354	6%	93			
Managed Open Space	**2,310**	**234**	**2,076**	**37%**	**2,075**	**197**	**1,878**	**198**
Public Managed Open Space	392		392	7%	302			
Private Managed Open Space	282		282	5%	258			
Groton Utilities Land	1,401		1,401	25%	1,318			
Class 1 Utility Land	817		817	14%				
Class 2 Utility Land	449		449	8%				
Class 3 Utility Land	135		135	2%				
Cemeteries	63	63			63	63		
Golf Courses	171	171			134	134		
Facilities*	**835**	**127**	**708**	**12%**	**578**	**237**	**341**	**367**
Municipal Facilities	594				336	164		
Schools/ Parks, Open Space at Schools	391	65	327	6%				
*State Facilities***	241	62	179	3%	242	73		
Total Parks and Open Space	**6,041**	**362**	**5,679**		**4,964**	**434**	**4,530**	**1,149**

2002 POCD info from 2002 Groton POCD Workbook, Booklet #11 p.1 and 2

**Other Facilities included in this section are the Senior Center, Town Hall Annex, Police and Fire services, libraries, and Dept. of Public Works.*

*** UConn Avery Point, Ella T. Grasso Technical HS, and Mystic Oral School*

**** Excluding buildings, parking, etc*

If Groton Utility lands are included (1,400 acres), the open space total becomes 21% of total land area.

Recreation uses within the town are defined as passive or active. In this POCD, passive recreational facilities are areas that provide low impact recreation such as hiking or picnicking with minimal development or improvements. If improvements have been made they typically include little more than park benches or picnic areas.
Some passive recreation areas function as natural conservation areas and are generally left as natural, undeveloped open space. Active recreational facilities are defined as areas that accommodate organized sporting activities such as baseball, basketball, soccer, or tennis, or playscapes for children. Active recreational facilities have been further categorized by ownership as well as those associated with school facilities. The two largest active recreational facilities in Groton are:

- Poquonnock Plains Park – This 15.8-acre park contains well-used recreation facilities. Located on Fort Hill Road adjacent to Claude Chester School, and across from Sutton Park, this park lies near the geographic center of the community. The park contains three multiuse fields, a stone dust walking trail/track, a picnic area, a concession stand/restroom facilities, and a large, fully inclusive playground.
- Sutton Park – This 17.8-acre park is located across Fort Hill Road from Poquonnock Plains Park and is adjacent to the Fort Hill neighborhood and Ella T. Grasso Technical High School. This park has the town's skate park, basketball courts, two baseball fields with concession stand, a playground and shelter, and horseshoe pits.

OPEN SPACE ACREAGE AND KEY PARCELS IN 2002

Bluff Point State Park is one of the last remaining large, undeveloped coastal properties in Connecticut. This 789-acre property is located in south central Groton between the Groton-New London Airport and Noank. Bluff Point was designated as a coastal reserve in 1975.

The property consists of saltwater marsh, beach, bluffs, and an upland ridge that rises 125 feet to Bluff Point. The park contains an extensive trail system and is heavily used by pedestrians and bicyclists.

Haley Farm State Park, located northeast of Bluff Point State Park, consists of 257 acres. The former farmland contains forests, tidal wetlands, open fields, ponds, bike paths, and a series of hiking trails. A trail connects Haley Farm State Park to adjacent Bluff Point State Park. This property is also heavily used by pedestrians and bicyclists and includes wheelchair-accessible trails.

Four properties owned by the town make up 427.7 acres, about 25% of the community's existing passive open space: Beebe Pond, Pequot Woods, River Road Park, and the Mortimer Wright Preserve. An additional property, Copp Family Park, also contains a large amount of passive recreation area. This 227-acre former farm parcel contains a network of trails through former farm fields and woods although it also has a portion of more developed park land currently used as a dog park.

Finally, parcels owned by private non-profits dedicated to preserving open space and natural resources contribute an additional 321 acres to Groton's passive recreation open space inventory. The Avalonia Land Conservancy and Groton Open Space Association own several parcels throughout the community, many of which contain trail systems. See Map C-4.

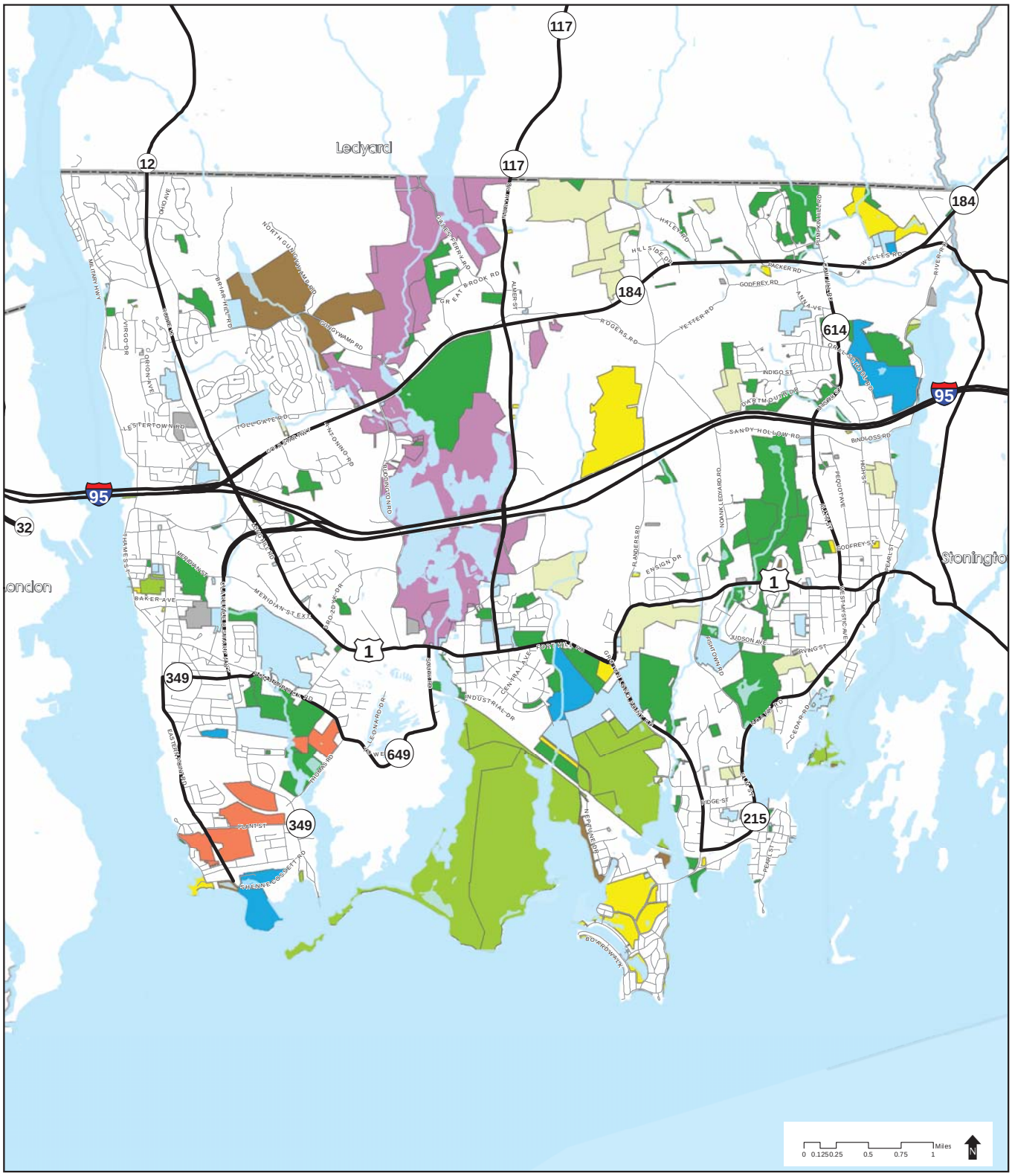
KEY ADDITIONS SINCE 2002

The 2002 POCD created a Possible Future Open Space Plan that highlighted parcels and linkages that contribute to expanding open space in Groton. These included desirable parcels to be acquired by public entities as well as parcels to target for preservation through land trusts, conservation easements, and conservation developments. While some parcels suggested for acquisition have become open space (as well as many parcels not originally suggested), some of the parcels have been developed. Some have not changed from the 2002 land use and may still be future open space investments. See Map C-5.

The Town of Groton recently made a notable purchase of 30 acres of open space land known as the Sparkle Lake Conservation Area for open space preservation. In total, the amount of dedicated open space in Groton increased by about 580 acres since 2002.

In some municipalities, private, non-profit organizations that acquire land for recreation or conservation may work cooperatively with the town by sharing costs and maintenance of the property. Land trusts often enter the real estate market more quickly and easily than government agencies. The most prominent land trust groups in Groton are the Groton Open Space Association, Inc. (GOSA) and Avalonia Land Conservancy. GOSA was founded in 1967 and has worked to preserve many open space areas, including the

Map C-4: Existing Parks, Recreation, and Open Space



Groton PLAN OF CONSERVATION + DEVELOPMENT

Existing Parks, Recreation, and Open Space

Facilities

- Municipal Facilities
- State Facilities

Dedicated Open Space

- Municipal Dedicated OS
- State Dedicated OS
- Private Land Trust Dedicated OS

Managed Open Space

- Public Managed OS
- Private Managed OS
- Groton Utilities Land
- Cemetery
- Golf Course

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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April 2014

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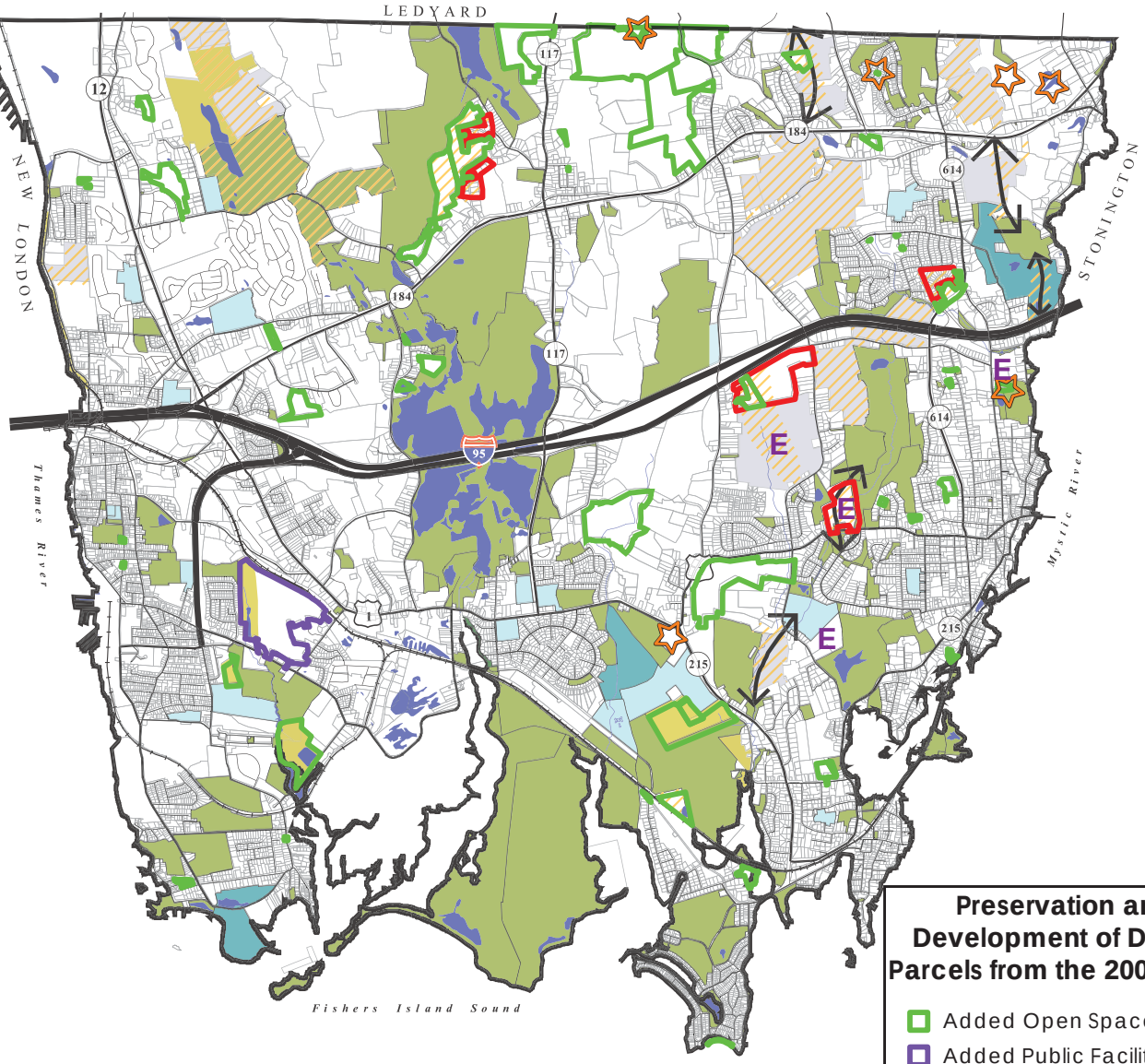
What Has Changed:

Preservation and Development of Desired Parcels from the 2002 POCD

Possible Future Open Space Plan *(2002 POCD)*

Town of Groton, CT



2002 POCD

Existing Open Space

- Existing dedicated and managed open space
- Municipal facilities
- State facilities

Possible Future Open Space

- Desirable acquisition by public entity
- Connections
- Preservation through land trusts, conservation easements open space development

Other

- Water

Preservation and Development of Desired Parcels from the 2002 POCD

- Added Open Space
- Added Public Facility
- Parcel Developed Since 2002
- No Change in Land Use
- Existing Open Space Missed in 2002 Future Open Space Plan
- E Conservation Easements

*Note: Conservation Easements may have existed during the 2002 POCD, but were not mapped. It should be noted that easements may exist that are not shown on map.

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Planimetrics

Merritt Family Forest and the Sheep Farm, and as of June 11, 2013 acquired the 91-acre Candlewood Ridge site for preservation and the 152 acre Avery Farms site. The Avalonia Land Conservancy, founded in 1968, also oversees two preserves in Groton: Moore Woodlands off Judson Avenue and Town's End along the edge of Beebe Cove.

METHODS OF ACQUISITION AND FUNDING

Methods to fund and acquire open space lands include:

- Fee-in-lieu: Developers may pay a fee instead of setting aside a portion of their proposed subdivision for open space. This is advantageous in cases where the subdivision does not offer valuable open space connections, and the fee may instead be used to acquire land that is of more targeted importance.
- Easements: A property owner may wish to conserve a property but retain ownership. An easement would grant the town or another entity the right to use a portion of the property for conservation purposes, such as a public trail.
- Grants: Governmental funds may be available in the form of grant money for the acquisition of lands with valuable natural resources that the town wishes to conserve.
- Purchase: The outright purchase ("fee simple") of natural resource lands.
- Donation: Property owners may donate or will properties to the town for conservation purposes.
- Open Space Fund: A dedicated fund for the purpose of purchasing parcels or easements for open space. An Open Space Fund can be funded through fee-in-lieu payments, the Capital Improvement Program, grants, and donations.
- Open Space Banking: Open space or land banking involves the acquisition of land for open space preservation. Land banking can also be used to acquire and preserve agricultural land, which is often then leased back to a farmer.

METHODS OF PROTECTION

The Town of Groton should create a comprehensive open space acquisition and management plan. A vision of future land acquisition of valuable natural areas would allow the town to be selective in furthering overall management goals, such as connecting currently non-contiguous parcels of open space to create greenbelts. An open space management plan will also provide the framework for how the town will prioritize and identify desirable acquisitions and manage its open space resources into the future.

Following a comprehensive open space acquisition and management plan, regulatory methods to fund and protect open space can be refined. For example, the zoning map and zoning regulations can be more targeted in requiring parcels that lie within desired open space corridors, especially those identified as "Desirable Open Space, Parks, and Connections" in the Future Land Use Plan, to provide useful open space easements. Development on parcels not identified as being high priority acquisitions for open space or recreation parcels could be encouraged to provide a fee-in-lieu of open space to instead go to the funding of acquisition of more valuable natural resource and open space or recreation parcels.

To further strengthen regulatory protections, an Open Space/Recreation District could be incorporated into the zoning map and regulations. Within the Open Space/Recreation District, development could be controlled and limited to give preference for open space and recreational uses. This zoning district could work in tandem with residential Open

Space Subdivisions. As of 2015, Open Space Subdivisions are an optional development pattern in the zoning regulations that is intended to promote imaginative, well-designed subdivisions which preserve open space, respect the physical qualities of the land, and reduce the overall development costs of a subdivision. Open Space Subdivisions currently require 20% of the gross area of the residential subdivision to be designated as common open space.

A Property Review Team, consisting of town staff from the Planning and Development, Public Works, Finance, and Town Manager's departments periodically review land the town has acquired through foreclosure. This group should continue to consider whether parcels are suitable to retain for open space.

OPEN SPACE IMPROVEMENTS

Once open space is acquired, the town should develop an open space management plan in order to determine which, if any, improvements should be made on the property. Depending on the best use of the property, it may be appropriate to create walking, hiking, or biking trails; to provide active recreational facilities such as ball fields or playgrounds; or to provide parking. Such improvements should be considered carefully, as they will require routine upkeep and maintenance. The Parks & Forestry Division in Groton maintains all parks, athletic fields, school grounds, open space, public properties, 13 cemeteries, and the public trails.

Steps to protect wildlife habitat and diversity should also be included in parks management plans throughout Groton. Birds including buffleheads, mute swans, snowy egrets, great blue herons, mallards, songbirds, ospreys, and others can be seen at Bluff Point State Park and Coastal Reserve, and tourism from wildlife and bird watching contribute to the economy of Groton. Parks management plans could include considerations such as where to mow grass and clear brush vs. where to let park areas grow wild in order to provide more habitat opportunities for wildlife and encourage biodiversity. Educational signage may be one way to inform the public why some areas of select parks may look more 'unkempt.' These actions may also reduce the total amount of active upkeep and maintenance needed for wildlife habitat areas in parks, and should be considered as part of a comprehensive parks management plan.

Recommendations

2-5 Fund open space acquisition annually in the Capital Improvement Program.

2-6 Amend the zoning map and regulations to include a new Open Space/Recreation district.

2-7 Develop an open space management plan for existing town-owned open to include inventory/monitoring of conservation easements, and to provide standards for improvements.

2-8 Develop criteria with which to evaluate proposed open space parcels and develop a map of desirable open space.

2-9 Revise the zoning and subdivision regulations to increase open space and recreation requirements and to provide standards for improvements.

PRESERVE ACTIVE AGRICULTURAL USES

FARMS IN GROTON

Groton has an active and diverse base of agriculture in town, with about 1,084 acres (5.3% of land area) actively farmed.

- Groton's coastal location allows for aquaculture, such as shellfish cultivation. The Town of Groton leases about 40 shellfish beds for shellfish seeding and production from Avery Point to Mystic.
- Yetter Road Tree Farm in Mystic grows and sells Christmas trees for the holidays.
- The Groton Family Farm sells free range, pasture-raised eggs; fruits and vegetables; and wool from Shetland sheep. Produce is available from their on-site farm stand.
- Red Fence Farm is a small family farm on Daboll Road that raises "antique" breeds of animals such as cattle, goats, turkeys, and chickens. Fresh meat and eggs are available for pick up at the farm.
- Whittle's Willow Spring Farm is located in Mystic. Willow Spring Farm produces fruits and vegetables, including pick-your-own apples in the fall.
- Current trends in the farm-to-table and grow your own/organic movement may create opportunities for expansion of existing farms and establishment of new farms.
- The Groton Community Garden currently has 41 rented garden plots and several communal garden plots that give residents a chance to grow their own produce, as well as donating over 650 pounds of vegetables to the Groton Food Bank.
- Noank School Public Gardens is a 6-acre property that was formerly the site of the Noank Elementary School. Currently, 2 acres of land will be developed as vegetable plots for rent to residents of Groton, with other areas planned to become an apple orchard, berry patch, memorial garden, and other uses.

METHODS OF PRESERVATION AND PROTECTION

To assist municipalities in the preservation of farmland, the Connecticut Department of Agriculture has established a joint State-Town Farmland Preservation Program as a means to limit the conversion of prime farmland to non-agricultural uses. Due to the development suitability of farmland soils, there is increasing pressure to develop farmlands.

The preservation of active farmland differs from other types of Open Space preservation because the goal is preserving the activity associated with the farm in order to stave off development pressures rather than simply purchasing rights to develop the land or the land itself. The goal should be to ensure that the farm stays owned by a farmer and that the economic viability of farming can resist the pressures of new development interest on that land. In this sense, farmland preservation requires as much economic development as it does traditional open space preservation.

The town should actively work to promote the viability of farming as a sustainable livelihood.

- Community Supported Agriculture (CSA) allows farmers to sell weekly "shares" directly to customers over the course of the growing season. The shares for the season are bought in a lump sum at the beginning of spring, which gives farmers an early cash

flow at the beginning of the season. CSAs also help foster a direct connection between the farmer and the people that eat their food. Currently, CSA options are available in nearby Ledyard, Waterford, and Stonington, but not in Groton. Encouraging Groton farms to consider CSA subscriptions could be another avenue for promoting fresh, local food.

- The town should continue to incentivize the keeping of land in production through continued reduced tax assessments such as the PA 490 program. PA 490 lands are taxed based on actual use, which results in lower property taxes than the "highest and best use."
- The town should consider the adoption of a Right-to-Farm law in certain areas of the town to reduce nuisance complaints associated with production agriculture. The town should formally acknowledge that working farms in various stages of production may appear messy, and should work to educate neighbors that the preservation of these critical farmland assets may not always appear picturesque.
- Farms have become popular venues for weddings, food festivals, and other large events. Promoting and supporting farms as event venues highlight Groton's agricultural amenities and bring agritourism to the region. Towns are starting to issue permits to regulate events on farms in terms of frequency, character, and intensity of use, and allow these events as an accessory use.
- Marketing efforts can promote locally grown products, food festivals, and event venues to support family farms.

In today's economy, creative strategies and flexibility are necessary to support the farmers' abilities to sustain their businesses, and therefore preserve their land.

BENEFITS OF FARMLAND PRESERVATION

Preserving active agriculture provides many local benefits for Groton.

Economic benefits:

- Supports small family businesses
- Contributes agritourism dollars to local economy
- Farms generally pay more in taxes in relation to the amount of public services that they use

Ecological benefits:

- Keeps open space lands undeveloped, which can provide water quality and habitat benefits
- Preserves productive farmland soils, which are a finite natural resource

Social benefits:

- Provides a source of fresh, local food
- Preserves access to local farms and continues a cultural heritage

Recommendations

2-10 Develop regulations to address various farming practices and to allow accessory uses for farms associated with on-farm agri-tourism activities, especially those that promote local food production, such as local food festivals, or other on-site events that capitalize on Groton's agricultural amenities.

CONTINUE TO DEVELOP AND MAINTAIN GREENBELT

LOCAL GREENBELTS

Greenbelts refer to open space linkages that join open spaces into a cohesive whole greater than the equivalent amount of land separated into many small parcels. Greenbelts create connections that allow for corridors for trails and wildlife migration. When properly planned, greenways can link existing parks and open space areas with neighborhoods and community facilities, including schools, and provide an interconnected network serving town residents. Greenbelts can also provide a visual and auditory buffer along I-95 and other major noise sources, providing aesthetic benefits to neighboring businesses and residents.

GROTON'S GREENBELT HISTORY

The establishment and preservation of greenbelts and greenways in particular has been a longstanding high-priority objective for Groton. Groton has been a leader in recognizing the importance of greenbelts in planning, first identifying and focusing on streambelts in 1961 and expanding this focus to "greenbreaks" in the community.

GAPS IN GREENBELTS

As discussed in the 2002 POCD, there are many greenbelt opportunities in Groton. For example, the large amount of open space that already exists in the Poquonnock River Watershed still presents an opportunity to create a greenbelt that could lead from the Bluff Point Coastal Reserve on Long Island Sound to the Ledyard town line.

This opportunity is particularly apparent because much of the land in this greenbelt is already in public or utility company ownership and there are only a few remaining linkages to be obtained. Many other opportunities also exist to create greenbelts that will maintain wildlife corridors and enhance community character and the quality of life for Groton residents.

Since the 2002 POCD, various parcels have been added as open space, in many cases expanding the greenbelt connections recommended in the 2002 Plan. Parcels and potential easements that are desired for open space and open space connections are also shown on the Future Land Use Map, and may be used to target acquisitions over the 10-year planning period. In cases where direct acquisition is not possible, the town could also discuss open space easements with land owners to receive limited access to the property for the purpose of creating greenbelt connections.

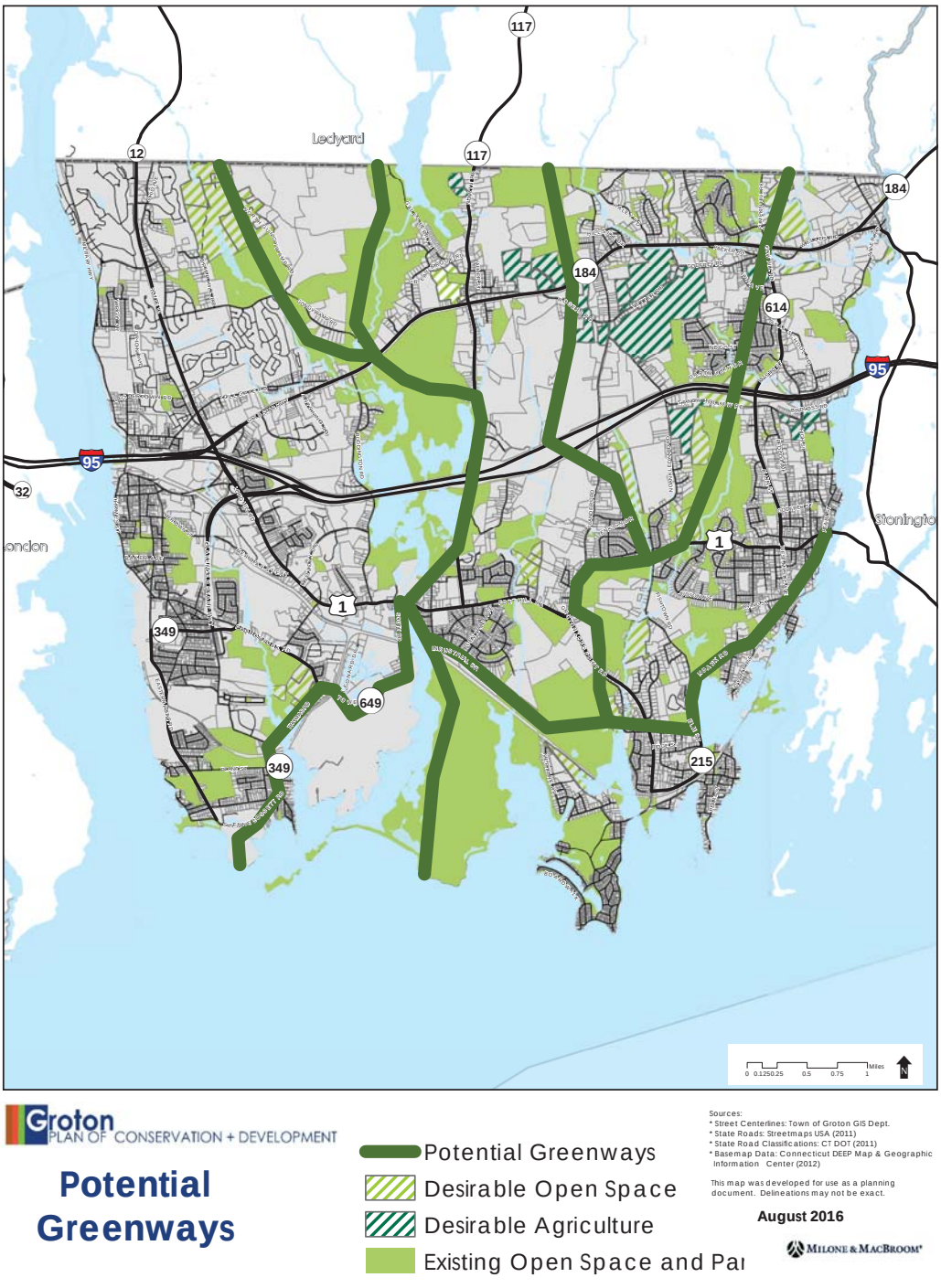
STATE GREENWAYS

According to the Department of Energy & Environmental Protection, a "greenway" means a corridor of open space that:

1. May protect natural resources, preserve scenic landscapes and historical resources, or offer opportunities for recreation or non-motorized transportation
2. May connect existing protected areas and provide access to the outdoors
3. May be located along a defining natural feature, such as a waterway, along a man-made corridor, including an unused right-of-way, traditional trail routes or historic barge canals
4. May be a greenspace along a highway or around a village (CGS section 23-100)

Groton currently has no state greenways with the closest state Blue-Blazed trail to the north in Ledyard and closest existing state greenways in Norwich and Old Lyme. Groton should reach out to neighboring jurisdictions to coordinate open space acquisitions near shared borders in order to establish and expand greenbelt and greenway connections. Connections with Ledyard to the north of Groton present the most logical path, as Groton is bounded by rivers to the east and west and the Long Island Sound to the south.

Map C-6: Potential Greenways



Recommendations

2-11 Develop an action plan to establish, expand, and connect greenbelts and state greenways.

CONTINUE TO BUILD A TRAIL SYSTEM

TYPES OF TRAILS

Non-motorized modes of transportation provide alternatives for those who cannot or choose not to drive for some or all trips. Walking and biking are the most common and practical modes of non-motorized transportation. Sidewalks, multiuse trails for transportation and recreation, equestrian paths, mountain bike routes, hiking trails, handicap-accessible trails and walkways, and greenways form the foundation of the non-motorized transportation network and can attract and retain users.

EXISTING TRAIL SYSTEM

The Town of Groton's often steep topography and limited rights-of-way can limit many on-street bike trail options - see Map C-6. Area parks such as Bluff Point State Park and Haley Farm State Park contain some limited (in that they do not connect with commuting paths) hiking and bike trails. A bikeway reaches from Thomas Road in the City of Groton, east along Route 649, to Industrial Drive, through Haley Farm Park, and joining with Groton Long Point Road and Elm Street to connect to Stonington through Mystic.

Groton's Cross-Town Trail is a 6-mile hiking trail that winds through many of Groton's parks and open spaces from Bluff Point State Park, the G&S Trolley Trail, Haley Farm State Park, the Mortimer Wright Preserve, the Merritt Family Forest, Beebe Pond Park, and Town's End.

Public coastal access can also be considered a trail head to the water. While coastal public access is addressed further in its own section, expansion of public coastal access should also be included in efforts to build the trail system in Groton.

GAPS IN TRAIL SYSTEM

The Town of Groton has long supported improvements to pedestrian and bicycling facilities: the Groton Bikeway Proposal was completed in the 1970s, and several other pedestrian and bike plans have been completed in recent years.

The Groton Bicycle, Pedestrian & Trails Master Plan, completed in 2005, established the following goals for all forms of non-motorized transportation in Groton:

- interconnect neighborhoods
- develop commuter routes
- develop recreational trails that provide access to open space
- build facilities that are safe and attractive

These goals are still valid, and should continue to be incorporated into the current Plan of Conservation and Development.

The 2002 Plan of Conservation and Development recommended creating an overall pedestrian network, including improving and extending the sidewalk network, developing and improving the trail network, and establishing a bikeway network. In addition to the recommended routes outlined in the 2002 Plan of Conservation and Development, the Southeastern Connecticut Council of Governments (SCCOG) Long Range Transportation

Plan, 2015-2040 recommends two additional pedestrian/bike routes through Groton, as follows:

> "15. Pleasant Valley Road to Lestertown Road to Military Highway to Fairview Avenue #2 to Bridge Street #1 to Mitchell Street to Benham to Eastern Point Road to Shennecossett Road around Avery Point to Plant Street to Shennecossett Road to Thomas Road to Tower to South Road to Route 1 to Route 215 either to Mystic Village, or West Mystic Avenue to Allyn Street to Mystic Street to Cow Hill Road to Route 184 (east) to Route 27 to River Road to Mystic Village.
>
> 16. Gungywamp Road to Route 184 to Stonington." *(SCCOG Long Range Transportation Plan, 2015)*

The Tri-Town Trail Committee completed a plan in 2009 that recommended implementation of the region's first multiuse recreational trail extending from Bluff Point in Groton north through Center Groton and Ledyard to Preston Community Park. The preferred route for the 14-mile trail traverses land owned by the City of Groton for the Groton Utilities (GU) Reservoir system. However, public access to these lands is not allowed without a guide. The town and the Tri-Town Trail Committee should continue to work with Groton Utilities to come to a mutual agreement that allows public access to GU properties for hiking trails.

The Tri-Town Trail Committee and local officials have continued to work on implementing the plan. The town has also hired a consultant to plan an East/West Bikeway, beginning at Depot Road running to South Road, Tower Avenue, and Thomas Road.

Clear, visible, appropriate signage can be very important to the successful implementation of a new trail system, including posting public coastal access. Signs can be used to create a safer environment for people on foot or bike as well as provide directional assistance. Signs such as "Bike Route" or "Share the Road" alert drivers to be on the lookout for pedestrians and bikers and to give them a safe amount of space while passing and are important at crosswalks and other road crossings. Hiking trails or other non-street trails can also have signs marking the entrance to the trail head. The Trails Coordinating Task Force has designed a sign that is posted at public trail heads regardless of ownership. Interpretive signs along the trail can also convey environmental or cultural information about the area, which serves to educate and raise awareness among trail users. The Groton Bicycle, Pedestrian & Trails Master Plan has many specific recommendations for road safety improvements that should be followed in the expansion of the trail system.

Connections between destinations in Groton as well as connections to other towns, can also contribute to the usefulness of new trails. While the bike and hiking trails in Bluff Point State Park provide valuable recreational opportunities, the trails do not connect residents to shopping or employment destinations and, thus, do not meaningfully reduce auto-dependence. Encouraging such connectivity to allow greater choice and freedom available to residents wishing to use non-motorized transportation for daily commuting or errands should be a trail priority. Creating meaningful linkages among existing trails, as well as creating new trails, will increase pedestrian and bicycle use and ridership as non-motorized travel becomes more convenient.

In seeking these connections, it will be important to reach out to private landowners and private open space organizations. Private landowners may grant access easements through portions of their land to allow the town to fill in gaps in the overall trail network. During land use applications, the town should review the proximity of the property to existing trails in order to determine if trail linkages are feasible. For example, the Blue-Blazed trail system in Connecticut passes through both public and private lands. Private open space organizations may also assist in coordinating trail network connections and posting the appropriate signage.

A water trail is defined as, "a stretch of water along a river or shoreline that has been mapped out with the intent of creating an educational, scenic, and enjoyable experience for recreational canoers and kayakers." At appropriate public coastal access points, having improvements that allow for canoe and kayak launches helps further create connections along the coast.

Maintenance issues should also be considered as trails are planned, as upkeep needs will vary depending on the type of trail and the materials used in construction. For example, an asphalt trail may need to be plowed to be usable in winter, as well as patched in spring to remedy pot holes. The Parks and Recreation Department is funded through the General Fund Budget; the Parks and Recreation Revolving Fund which allows the Department to offer programs that generate sufficient revenues to cover direct costs and consolidate donations without impacting the General Fund Budget; state and federal grants; and the town's Capital Reserve Fund for major physical improvements. In the past, Capital Improvement funds have been used for the Trail Improvement Program.

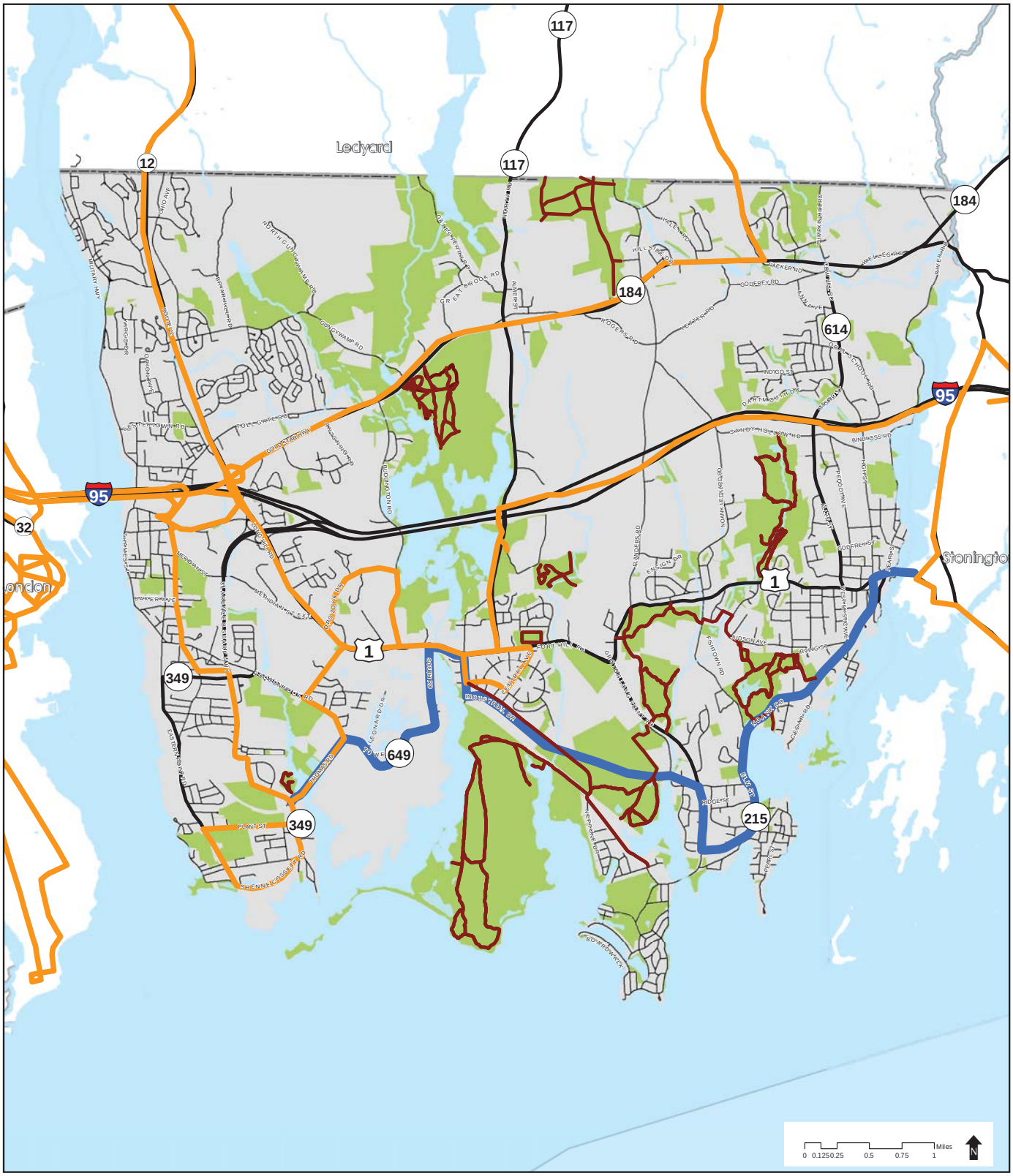
GROTON TRAILS

The Groton Trails Logo identifies those trails open to the public on property managed by Town of Groton, Avalonia Land Trust and Groton Open Space Association. Signs are posted on trail heads and at key intersections along trails.

Recommendations

2-12 Update the Groton Bicycle, Pedestrian and Trails Master Plan.

Map C-7: Existing Bus Routes, Trails, and Bikeways



Groton
PLAN OF CONSERVATION + DEVELOPMENT

Existing Bus Routes, Trails, and Bikeways

Recreation Trails
SEAT Bus Routes
Established Bikeway

Sources:
* Street Centerlines: Town of Groton GIS Dept.
* State Roads: Streetmaps USA (2011)
* State Road Classifications: CT DOT (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

January 2016

MILONE & MACBROOM®

IMPLEMENT THE PARKS AND RECREATION MASTER PLAN

OVERVIEW OF THE PLAN

In recognition of the changing needs of Groton, a comprehensive Parks and Recreation Master Plan for the Town of Groton was completed in 2009, and components are incorporated into this Plan of Conservation and Development update. The Parks and Recreation Master Plan included an extensive community survey and outreach process to gauge existing facilities and programming strengths, weaknesses, opportunities, and threats; establish goals for the department and community; and identify gaps in service. In addition, the Plan included an extensive action agenda designed to move the Groton Parks and Recreation Department closer to its goals.

The Groton parks and recreation system is composed of a wide variety of sites and facilities. There are 15 separate neighborhood parks, 14 school parks, four community parks, and five special use facilities, including Esker Point Beach. The Town of Groton is fortunate to have an existing park and open space system that is in relatively good condition, well distributed geographically, and diverse in the types of uses accommodated. Recreation programs offered include community boating, community gardens, beach and indoor volleyball leagues, summer day camps, and various sports leagues.

The Parks and Recreation Master Plan also identified several underserved areas, such as the northeast, northwest, and southwest corners of town that have fewer nearby facilities available to residents as many park facilities are clustered in the center of town in the Poquonnock Bridge area. The Plan also found a lack of specific facilities, such as an indoor aquatic center, a multipurpose recreation center, and athletic fields that the Master Plan identified as high priority community needs.

KEY GOALS OF THE PLAN

The overarching Master Plan Goals are as follows:

- Evaluate the resource needs of the Department. Identify the tools, funding, and staffing levels necessary for employees to do their jobs effectively and provide a high level of customer service to the community.
- Address current facility challenges and impacts on services. The Department is highly dependent on athletic fields and indoor facilities that are not under town ownership, which leaves the Department vulnerable to uncontrollable circumstances that can greatly impact the provision of core services and the associated revenue.
- Identify the prioritized community needs for facility improvements and development. These needs should provide details on the town's gaps in services, the types of facilities and amenities needed, as well as the resources needed to operate and maintain these facilities.
- Create a plan that is realistic, identifies priorities, and provides an action plan to implement it.

Recommendations

2-13 Implement the recommendations of the Parks and Recreation Master Plan and continue to set implementation policies for open space and parks based on funding.

SUPPORT THE ESTABLISHMENT OF THE THAMES RIVER HERITAGE PARK PLAN

OVERVIEW OF THE PLAN

To celebrate the area's historic relationship with the Thames River and the sea, a Thames River Heritage Park has been proposed to connect various parks and historical sites on the Thames River. To celebrate the connections between Groton, New London, and the Thames River, the vision of the Thames River Heritage Park is to bring in regional tourism to appreciate the history and geography of this area as well as bring patronage to local businesses. Since enabling legislation for heritage parks was enacted in 1987, $2.5 million in state funding has been allocated and expended on infrastructure, such as a boat dock on the Groton side of the Thames River.

The National Coast Guard Museum, the Submarine Force Museum, Fort Trumbull State Park, and Fort Griswold Battlefield State Park would be part of the park system and would provide self-guided tours. Ferry connections between the sites on the New London and Groton sides of the Thames River are proposed to create a cohesive heritage park, as well as meet cross-river business and institutional needs for Electric Boat, UConn Avery Point, and Mitchell College. One proposed connection would be to the future site of the *USS Groton* submarine sail and memorial park. A demonstration of the water taxi component was tested in September of 2014 and was found to have a number of positive impacts.

Other plan recommendations include multiuse trails for walkers and bicyclists to tie together the historic and cultural sites to improve circulation and transportation options.

Thames River Heritage Plan, Yale Urban Design Workshop

Recommendations

2-14 Support the implementation of the Thames River Heritage Park and plan for connections between a water taxi, a trail network, and existing town infrastructure.

PROTECT COASTAL RESOURCES

Groton is a coastal town abutting Fisher's Island Sound. Due to the importance of the coastal area to Groton's character and quality of life, as well as the tax base and economy, Groton has an important obligation to carefully manage coastal areas. To be a good steward of its coastal areas, the Town of Groton must protect and restore its coastal resources; resolve use conflicts for waterfront sites, particularly promoting water-dependent uses; and balance economic growth and resource protection. The Connecticut Department of Energy & Environmental Protection – Office of Long Island Sound Programs (Department of Energy & Environmental Protection-OLISP) oversees activities within coastal communities. The Town of Groton is also responsible for managing areas seaward of the coastal boundary through coastal site plan reviews and harbor management.

Bluff Point State Park

PROTECT WATER QUALITY AND COASTAL RESOURCES

WATER QUALITY

Due to advances in wastewater treatment implementation among many communities along major tributaries to Long Island Sound, Connecticut's coastal water quality has improved in recent years overall. Numerous state and municipal programs have also been implemented to address coastal nonpoint source pollution in Connecticut.

However, coastal water quality remains a concern in Groton. Coasts with poor water quality become unsuitable for certain recreational and commercial activities, and impair aquatic ecosystems. The Connecticut Department of Energy & Environmental Protection conducts water quality sampling in Long Island Sound to assess long-term trends in water quality, including segments of coastal Groton. In the most recent 2012 Connecticut Integrated Water Quality Report available from the Connecticut Department of Energy & Environmental Protection website, coastal waters in seven areas were deemed impaired for safe shellfish harvesting due to fecal coliform concentrations (Beebe Cove, Palmer Cove, Mumford Cove, Inner Poquonnock River, Inner Baker Cove, West Cove, and Bluff Point). The report identified nearly all of the testing sites in Long Island Sound as impaired, and lays out action plans for the state for improving water quality. The Thames River adjacent to the Town of Groton is also impaired for commercial shellfishing and aquatic habitats because of contamination by harmful bacteria as well as low levels of dissolved oxygen due to industrial point discharges, municipal discharges, illicit discharges, remediation sites, and/or other groundwater contamination.

METHODS TO PROTECT WATER QUALITY

The Town of Groton has taken steps to address the impacts of stormwater runoff through the development and implementation of a Stormwater Management Plan (SWMP), which has the long-term goal of improving the overall quality of Groton's stormwater runoff. The SWMP addresses measures such as public education, outreach, and involvement; detecting and eliminating illicit discharges; and stormwater management on construction sites as well as postconstruction.

Under the Connecticut Coastal Management Act (CCMA), coastal municipalities are required to implement Connecticut's Coastal Management Program through their existing planning and zoning authorities. Most activities within the coastal boundary require a municipal Coastal Site Plan Review (CSPR) process. In this review process, the applicant must describe the proposed project and identify coastal resources in the project area and potential impacts to those resources. Local planning and zoning authorities must decide whether potential adverse impacts to water quality or other coastal resources are acceptable. The Municipal Coastal Program (MCP) recommends that vegetated buffers along shorelines be considered during the CSPR process where appropriate.

The MCP details areas of town where stormwater from town roads (carrying roadway pollutants and sediments) discharges directly into coastal waters. The MCP also identifies sewer pumping stations and a sewer treatment plant that are currently located in potential floodplains and could discharge into surrounding waters in the event of flooding or storm surge. Groton should strive to look for opportunities to retrofit stormwater systems to avoid direct discharges to coastal waters as well as floodproofing sewer facilities in potentially hazardous areas.

Low Impact Development (LID) also incorporates best management practices to protect water quality. By encouraging direct infiltration on site by decreasing the amount of impervious surfaces, stormwater does not run off the site to contribute to erosion, sedimentation, and pollution.

COASTAL RESOURCES

As defined by Connecticut General Statutes (CGS) Section 22a-93, "Coastal Resources" include the coastal waters of the state, their natural resources, related marine and wildlife habitat, and adjacent shorelands both developed and undeveloped that together form an integrated terrestrial and estuarine ecosystem. The MCP lists the following coastal resources found in Groton: coastal bluffs and escarpments, rocky shorefronts, beaches and dunes, intertidal flats, tidal wetlands, estuarine embayments, coastal hazard areas, islands, nearshore waters, offshore waters, shorelands, shellfish concentration areas, and developed shorefronts.

The Town of Groton participated in an EPA-funded climate change planning process in 2010 and 2011. This process resulted in the report "Preparing for Climate Change in Groton, Connecticut: A Model Process for Communities in the Northeast" (April 2011). Workshop participants identified the following climate-related impacts likely to affect Groton's coastal resources:

- More frequent river and coastal flooding
- Increased coastal erosion
- Increased precipitation, flooding, drought, and erosion
- Access to state parks such as Bluff Point and Haley Farm could be hampered by flooding.

The same group developed adaptation strategies in response to these risks, such as: conversion of land upriver to wetlands to accommodate sea level rise; creation of incentives for retreat zoning; zoning and redevelopment restrictions as well as building code changes or enforcement to prevent building in the most vulnerable locations; purchase of vulnerable land or land that will act as a buffer; beach nourishment; installation of flood/tide gates; and others.

MUNICIPAL COASTAL PROGRAM

A Municipal Coastal Program was adopted for the Town of Groton in 1982, and served as the coastal portion of previous Plans of Conservation and Development. As part of the update to the POCD, an update to the MCP was also completed as a standalone document. The recommendations from the MCP addressed coastal management issues townwide as well as area-specific recommendations for the Navy Submarine Base and West Pleasant Valley, the airport, Poquonnock Bridge and Bluff Point, Mumford Cove and Groton Long Point, Noank, Mystic, and Old Mystic.

The MCP notes that the 1992 Noank Harbor Management Plan is the only such plan for any area in Groton. Whereas the MCP focuses mainly on land use in the coastal management area, the Harbor Management Plan focuses on management of the navigable waters offshore from Noank. However, the two plans are closely related because the coastal

program addresses public access for activities such as boating as well as water-dependent land uses such as marinas.

The goals and objectives of the Harbor Management Plan are organized into four categories:

- Harbor Administration, which addresses funding and staffing.
- Water Access and Use, which establishes a comprehensive water use and access plan that addresses competing demands while maintaining open access for use and navigation.
- Land Use and Development, which has the goal of interfacing with other land use commissions for promoting economic vitality of waterfront-related businesses and options for increased public use.
- Natural Resources, which has the goal of preserving and protecting the significant natural resources and features of the coastal zone within a framework that allows for the orderly and equitable use of waterfront areas.

The Noank Harbor Management Plan can serve as an example to other parts of Groton for future harbor management planning, either for the town as a whole or for other area Harbor Management Plans, such as Mystic.

The MCP also focuses heavily on the importance of protecting tidal marshes and providing for marsh advancement. Tidal marshes are a type of coastal wetland bordering tidal waters that are flooded twice a day and support a diverse ecosystem of vegetation and wildlife. Tidal marshes are important because they preserve many functions, including buffering storm surge, slowing shoreline erosion, and absorbing excess nutrients, such as nitrogen, before they reach the ocean. Many of Connecticut's tidal wetlands are undergoing a transformation as sea level rise, erosion, altered tidal flushing, invasive species, and "sudden marsh dieback" collectively work toward degrading marshes.

Groton is home to extensive tidal marshes, which should be preserved as valuable natural resources. Tidal marshes are a type of coastal wetland including low marsh that is subject to daily tidal flooding; high marsh, which is floodd only a few times a month; and an upper border marking the transition zone to upland that is only occasionally flooded during the hiest tides of the year. Saltwater tidal marshes support a distinct assemblage of salt tolderant vegetation dominated by a few species adapted to alternating periods of dry and standing salt or brackish water providing food, cover, and breeding habitat for fish and wildlife species which are marsh specialists. One recommendation is to create living shorelines in appropriate coastal areas. Living shorelines use non-structural shoreline stabilization to provide erosion control and enhance natural habitat. These are often created through strategic placement of plants, stone, sand fill, and other structural and organic materials. The MCP outlines specific locations where creating living shorelines may be appropriate.

Recommendations

2-15 Complete a Harbor Management Plan for Groton.

2-16 Develop a program to prioritize and implement the selected strategies outlined in the Municipal Coastal Program, including development of plans to restore eroded tidal marshes, to acquire land for marsh advancement, and to reduce the direct discharge of stormwater to coastal waters.

PROVIDE FOR WATER-DEPENDENT USES

WATER-DEPENDENT USES

Promoting water-dependent uses of waterfront sites is another goal of Connecticut's coastal management program. "Water-dependent uses" are defined as land uses that require direct access to coastal waters in order to function, such as marinas, commercial fishing operations, waterborne transportation facilities, and uses which provide general public access to marine or tidal waters.

CONFLICTS BETWEEN USES

Due to the high value of waterfront property, conflict can arise between competing uses. As waterfront property is bought for high-end residential development, water-dependent industries may be driven out. Conflicts may also arise between recreational boaters and commercial boaters or between private property owners and public access to the water. Private residential development along the coast may also contribute to the loss of the area's cultural maritime heritage, and overcrowding on the coast can also lead to adverse environmental impacts.

GOALS OF CONNECTICUT COASTAL MANAGEMENT ACT

The Connecticut Coastal Management Act requires that municipal land use authorities give highest priority and preference to water-dependent uses at waterfront sites. Groton currently has many water-dependent uses, including commercial boat yards and commercial marinas, as well as public boat launches that accommodate car-top boats and trailer-mounted boats. As noted in the MCP, while it may be difficult to develop new water-dependent commercial uses in Groton, there are opportunities to return some properties in Mystic to water-dependent uses. Some waterfront properties currently house office space that could be returned to water-dependent uses over time. Water-dependent uses are also typically more resilient to coastal hazards than general office buildings. In the face of increasing coastal hazards, the Town of Groton may need to team with its water-dependent businesses to encourage adaptation and help build resilience, as well as streamline the approval process, as appropriate.

Recommendations

2-17 Create incentives such as a streamlined approval process to encourage water-dependent uses at waterfront sites.

MANAGE COASTAL DEVELOPMENT

IMPACTS OF COASTAL DEVELOPMENT

Waterfront properties have long been desirable for a variety of uses, which has led to extensive coastal development. Coastal development can adversely impact the ecology, hydrology, and biological productivity of sensitive coastal resources. Extensive coastal development can also become vulnerable to the increasing number and severity of coastal storms, resulting in potential loss of life or injury, property damage, and loss of tax base to the town.

Public Acts 12-101 and 13-179 now require that POCDs consider: (1.) the potential impact of sea-level rise (SLR), as published by the National Oceanic and Atmospheric Administration (NOAA) in Technical Report OAR CPO-1; (2.) coastal flooding and erosion patterns on coastal development so as to minimize damage to and destruction of life and property and the necessity of public expenditure and shoreline armoring to protect future new development from such hazards. It should be noted that the range of SLR scenarios offered in the NOAA Technical Report are based on global estimates and should not be used in isolation but rather should factor in locally and regionally specific avaliable information. One source for this kind of information is through the CT Institute for Resilience and and Climate Adaptation (CIRCA).

COASTAL DEVELOPMENT IN GROTON

The main areas of coastal development in Groton are the military use at the Navy Submarine Base; the industrial uses at Electric Boat and Pfizer; the institutional uses at the University of Connecticut Avery Point campus; the Groton-New London airport; and mostly residential and small commercial uses in Groton Long Point, Noank, and Mystic.

A significant coastal management issue is the airport's vulnerability to coastal flooding and sea level rise. It must become more resilient to coastal hazards to remain positioned as an important regional asset. The entire airport and most of the airport industrial park are located within the FEMA Special Flood Hazard Area with a coastal base flood elevation of 11 to 13 feet. This conflicts with plans to further develop the airport as an economic development area. As Groton plans for the future, the town should use the most up-to-date SLR planning tools available to address threats to infrastructure and resources.

POTENTIAL EFFECTS OF CLIMATE CHANGE

Throughout 2010, the Town of Groton partnered with federal, state, and local government as well as academic, non-profit, and community partners to develop a model for coastal community adaptation to climate change. The findings from these workshops were compiled into the report, "Preparing for Climate Change in Groton, Connecticut: A Model Process for Communities in the Northeast." Both computer modeling based on recent scientific information as well as resident knowledge about impacts of frequent flooding yielded a list of specific climate-related impacts likely to affect Groton:

- More frequent river and coastal flooding
- Increased occurrence of sewer overflows
- Loss of coastal habitats and resources (wetlands)
- Increased coastal erosion

- Reduced drinking water quality and supply caused by saltwater intrusion as well as increased precipitation, flooding, drought, and erosion
- More frequent flooding that could prevent access to and reduce function of Groton-New London Airport
- Potential hampered access to state parks such as Bluff Point and Haley Farm by flooding
- Possible impaired access to UCONN-Avery Point campus during storm events
- Damaging of docks and marina facilities by flooding and sea level rise
- Increased economic impacts related to infrastructure replacements, loss of employment hours, additional emergency service personnel, and others arising from no action scenarios
- Sections of Amtrak railroad could flood under certain sea level rise and storm flooding scenarios.
- Mystic River bridge may experience additional openings for smaller boats as bridge clearance diminishes with sea level rise.
- Shellfishing and fish spawning could be drastically reduced and/or collapse.
- Overall quality of life, aesthetics, and enjoyment of citizens may be reduced.

Workshop participants also identified the residential areas of Mumford Cove, Groton Long Point, Noank, Eastern Point, and Mystic; as well as the commercial locations of Downtown Mystic, Poquonnock Bridge, the Airport Industrial Park, and Electric Boat and Pfizer; as potentially vulnerable to climate change. Town or city infrastructure that may be vulnerable included the reservoir and water treatment plant, wastewater treatment plant and pump stations (30% of pump stations are along the coastline), Claude Chester Elementary School, and Cutler Middle School. Flood mitigation measures should be pursued at sewer pumping stations to protect public health during storm and flood events.

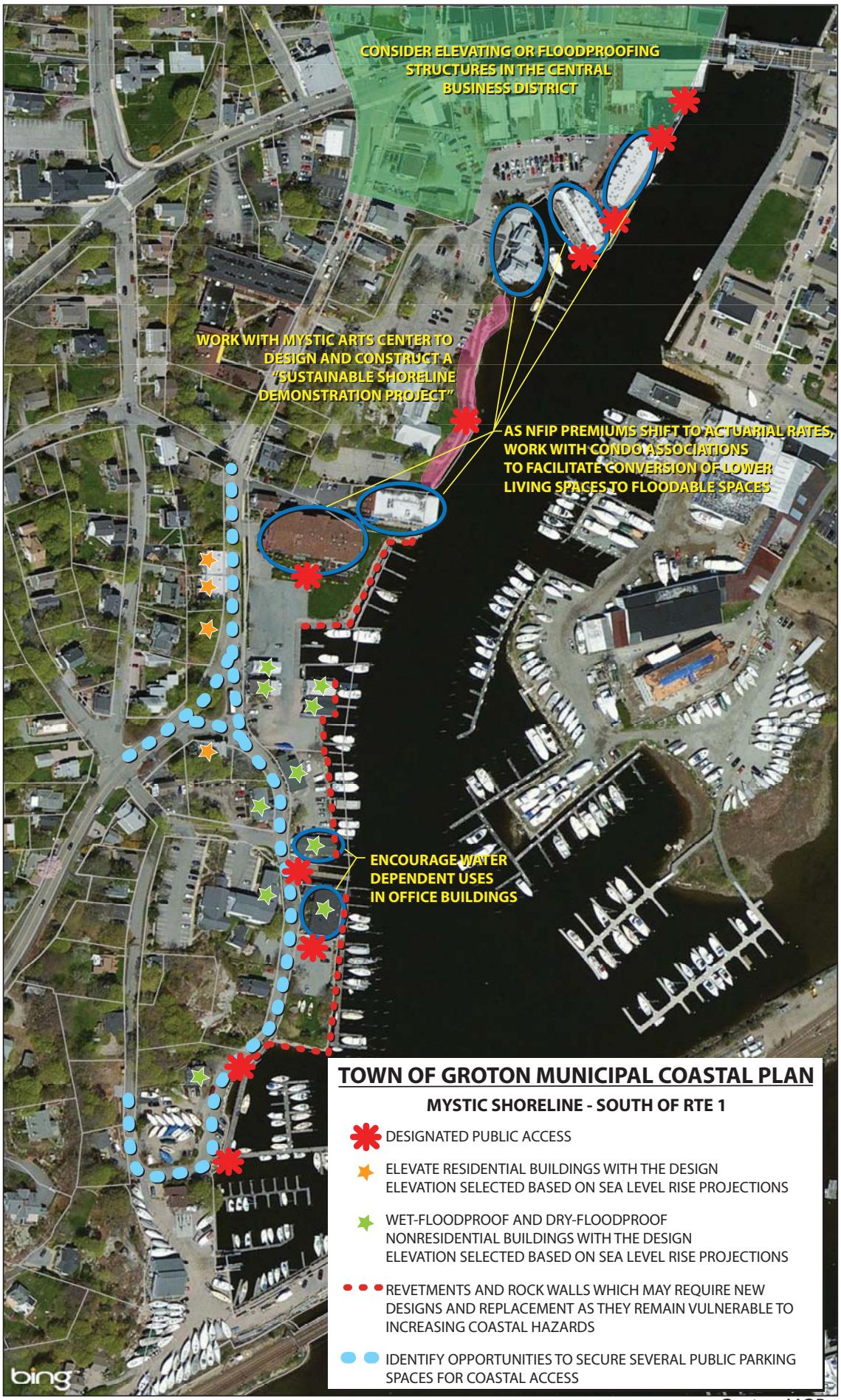
Transportation infrastructure was also identified as being vulnerable, including roads, drainage, bridges, airport, and railroads. A 500-year storm event on in March 2010 highlighted this issue by causing extensive road and bridge flooding and destruction. Flooding on many roads can block the access of emergency or support vehicles and prevent residents from evacuating flooded areas.

Continuing the work from the Climate Change report, Groton should inventory town-owned shoreline structures and infrastructure, and develop a plan to adapt to, mitigate, or retreat from the effects of sea level rise. Transportation routes that provide key access or egress in floodprone areas should also be inventoried and included in future hazard mitigation and evacuation planning.

The Coastal Site Plan Review (CSPR) can also be used to protect the future of coastal development in Groton. Since most activities within the coastal boundary require a municipal CSPR process, it affords an opportunity for the town to provide extra review of coastal properties. The MCP has several recommendations concerning the CSPR process, such as protecting public views, increasing coastal resilience, and describing coastal benefits.

Recommendations

2-18 Create a coastal overlay zone to manage coastal development.


CONSIDER ELEVATING OR FLOODPROOFING STRUCTURES IN THE CENTRAL BUSINESS DISTRICT
WORK WITH MYSTIC ARTS CENTER TO DESIGN AND CONSTRUCT A "SUSTAINABLE SHORELINE DEMONSTRATION PROJECT"
AS NFIP PREMIUMS SHIFT TO ACTUARIAL RATES, WORK WITH CONDO ASSOCIATIONS TO FACILITATE CONVERSION OF LOWER LIVING SPACES TO FLOODABLE SPACES
ENCOURAGE WATER DEPENDENT USES IN OFFICE BUILDINGS
bing
TOWN OF GROTON MUNICIPAL COASTAL PLAN
MYSTIC SHORELINE - SOUTH OF RTE 1
DESIGNATED PUBLIC ACCESS
ELEVATE RESIDENTIAL BUILDINGS WITH THE DESIGN ELEVATION SELECTED BASED ON SEA LEVEL RISE PROJECTIONS
WET-FLOODPROOF AND DRY-FLOODPROOF NONRESIDENTIAL BUILDINGS WITH THE DESIGN ELEVATION SELECTED BASED ON SEA LEVEL RISE PROJECTIONS
REVETMENTS AND ROCK WALLS WHICH MAY REQUIRE NEW DESIGNS AND REPLACEMENT AS THEY REMAIN VULNERABLE TO INCREASING COASTAL HAZARDS
IDENTIFY OPPORTUNITIES TO SECURE SEVERAL PUBLIC PARKING SPACES FOR COASTAL ACCESS

IMPROVE COASTAL PUBLIC ACCESS

CURRENT PUBLIC ACCESS POINTS

In Connecticut, the shore belongs to the public based on the common law public trust doctrine. Submerged lands and waters waterward of the mean high water line, as well as all navigable waters, are considered public trust areas where the general public can fish, boat, hunt, bathe, take shellfish or seaweed, and pass and repass without trespassing. The Town of Groton is generally considered to have abundant opportunities for coastal public access, as reported in the 2002 POCD and the Groton Parks and Recreation Master Plan (2009), and shown on the Map C-7. Coastal access points include state and town parks, road ends, easements, boat launches, and public docks.

POTENTIAL IMPROVEMENTS

Nevertheless, the 2013 Community Survey for the POCD update suggests that the public perceives a lack of public coastal access. 58% of responders felt that there are "too few" public beaches available in Groton. Roughly one-third of responders believed that Groton should acquire new open space to access the shoreline.

Physically handicapped users are also underserved by the town's open space areas, with the only handicap accessible trails into natural resource areas in Bluff Point State Park and Haley Farm State Park. The town must continue striving for provision of diverse and spatially distributed public access to the shoreline and water, possibly securing land through conservation easements or other methods for marsh advancement and public access.

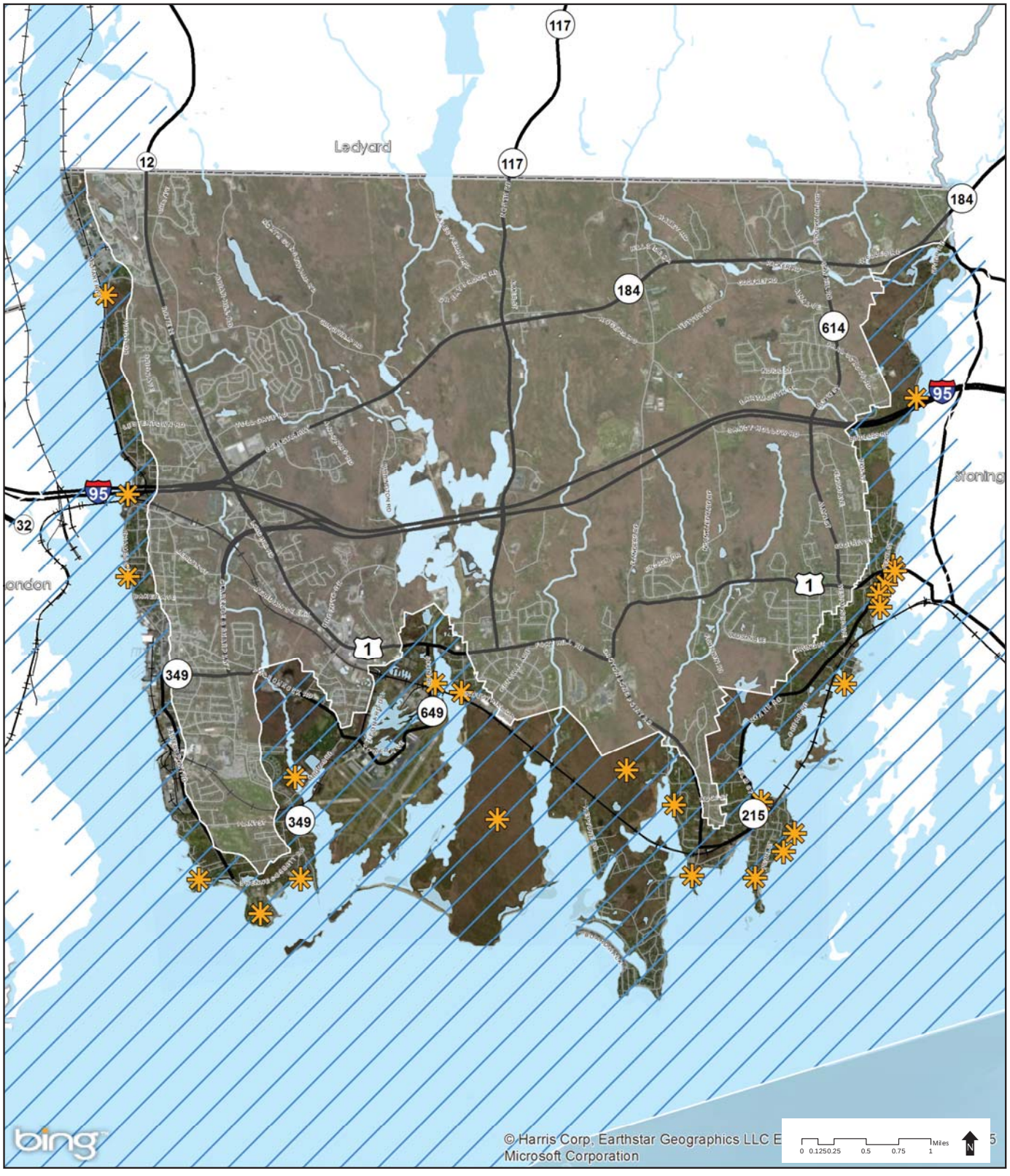
As opportunities for providing new public access points may be limited, the town must maximize the promotion and usage of existing sites and provide parking when possible. Improvements to existing sites can include additional parking, new or improved facilities (such as boat launches and trails, etc.), and improved signage. Two areas in particular that should be targeted for coastal access planning are Esker Point Beach and Park and Mystic.

Recommendations

2-19 Create a plan to connect, expand, and improve public access locations and to secure additional public parking for these public access points.

2-20 Develop a master plan for Esker Point Beach and Park.

Map C-8: Coastal Public Access



Groton PLAN OF CONSERVATION + DEVELOPMENT

Coastal Public Access

Public Access

Coastal Management Area Boundaries

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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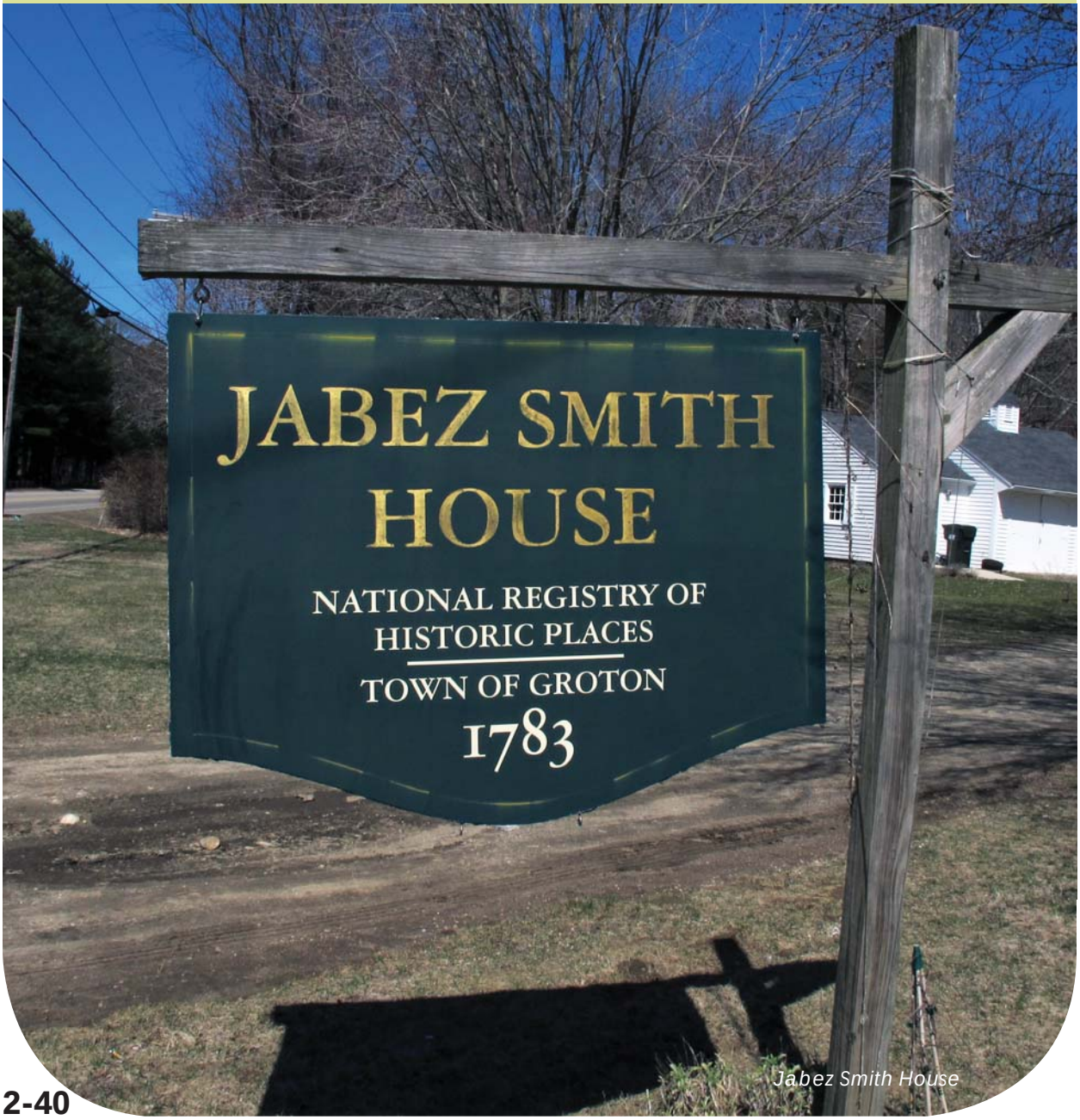
PROTECT CULTURAL AND HISTORIC RESOURCES

The character of a community is strongly shaped by its history. Groton has a strong heritage that includes Native American settlements, later European settlements, and a strong tradition of maritime endeavors. Groton's long history contributes to its sense of place, or feeling that a place is special or unique.

The Plan of Conservation and Development can be used to help preserve and enhance Groton's cultural and historic resources. Protections can include local ordinances and historic districts, state and national registers, and broad education, which aims to help community members become active stewards of history and culture throughout Groton.



Jabez Smith House

CONTINUE TO IDENTIFY HISTORIC AND CULTURAL RESOURCES

EXISTING HISTORIC DISTRICTS

Groton has a long and diverse history and prides itself on its continued preservation of that history. Within the Town of Groton there are five Historic Districts and eight historic sites listed on the National Register of Historic Places - see Map C-8. The National Register of Historic Places (NRHP) is the U.S. federal government's official list of districts, sites, buildings, structures, and objects deemed worthy of preservation. The State Register of Historic Places is Connecticut's official listing of structures and sites that characterize the historical development of the state. Areas on the state and national registers are not necessarily protected from alteration or demolition; however, the listing is honorific and does qualify properties for Historic Tax Credits for rehabilitation.

Two NRHP districts, Burnett's Corner and Mystic River, are in the Town of Groton. Three other NRHP districts (Groton Bank, Eastern Point, and Noank) are in the City of Groton and the Village of Noank, respectively. Additionally, there are eight NRHP sites within the town with the Avery Point Lighthouse added since the 2002 POCD was adopted. The 1996 Historic Preservation Plan suggested 11 potential new NRHP districts or expansions, and four potential new sites. These sites and districts are all deemed significant to American history, architecture, archaeology, engineering, or culture. The Plan also suggested that Fort Griswold be nominated as a National Historic Landmark. Landmark properties are nationally recognized as having "exceptional value or quality in illustrating or interpreting the heritage of the United States," and there are less than 2,500 in the nation.

Periods of Historical Significance in Groton

- Native American Settlement (PreHistory-1666), until the establishment of the Mashantucket reservation
- Early European Settlement (1637-1781), including the Pequot War and Battle of Groton Heights
- Maritime Orientation (Late 17th c. through 20th c.), including shipbuilding, privateering, whaling and fishing, and Naval/ Submarine histories
- Waterfront and Seasonal Growth (Late 19th c. through Mid 20th c.), including Grand Hotels/ Shennecossett Golf Course, and Groton Long Point.
- Transportation-motivated growth (Mid-20th c.- today), including the construction of I-95, reorientation along Route 1, and construction of mid-century residential developments.

Groton should recognize the extensive archaeological work that has taken place in the last 15 years to identify sites important to Native American and pre-settlement history. In coordination with the work of the Mashantucket Pequot Museum and Research Center, critical sites should be recognized in a manner that best ensures their continued protection. Significant recent work has been undertaken to survey the Gungywamp area, including colonial house foundations, root cellars, a bark mill, stone walls, an old cranberry bog, pond, and a rock shelter site that was utilized by Native Americans at least 2,000 years ago. According to the State

Archaeologist, the entire complex remains eligible for the NRHP. Additionally, recent archaeological work has uncovered new information regarding the final battle of the Pequot War, the "Massacre at Mystic," that took place in 1637 between a force of Englishmen with Narragansett and Mohegan allies against the Pequot at Mistick Fort. Researchers hope to preserve the battle sites of the Pequot War by having them listed on the National Register of Historic Places. A Townwide Historic Survey may uncover additional historic finds, and should begin along the edges of the current National Register districts.

Groton is also designated as a Certified Local Government by the National Park Service. The program creates a local, state, and federal partnership that promotes historic preservation at the local level by developing programs to encode historic preservation into zoning and permitting decisions. The Certified Local Government designation makes Groton eligible for Historic Preservation Enhancement Grants and Supplemental Certified Local Government Grants.

OTHER CULTURAL RESOURCES

Groton has a wealth of cultural resources. Libraries, museums, galleries, theater groups, and cemeteries all contribute to the cultural landscape of Groton. These resources provide cultural enrichment and learning opportunities for Groton residents as well as for visitors from neighboring towns. For example, the Submarine Force Library and Museum is the only submarine museum managed exclusively by the U.S. Navy, making it a national draw for visitors interested in Navy history, as well as highlighting Groton's maritime and naval history.

EXISTING NATIONAL REGISTER HISTORIC SITES

1. Fort Griswold
2. Yeoman House (Cove Neck Farm)
3. USS Nautilus
4. Jabez Smith House
5. Branford House
6. Pequot Fort
7. New London Ledge Lighthouse
8. Avery Point Lighthouse

EXISTING NATIONAL REGISTER HISTORIC DISTRICTS

Mystic River Historic District
Noank Historic District
Eastern Point Historic District
Groton Bank Historic District
Burnett's Corner Historic District

POTENTIAL NATIONAL REGISTER HISTORIC DISTRICTS

Eastern Point expansion (Avery Point)
Groton Bank expansion
Mystic expansion
Noank expansion
US Submarine Base
Electric Boat Shipyard
Devil's Foot Hill
Groton Long Point Boardwalk
Prospect Hill
Poquonnnock Bridge
Old Mystic

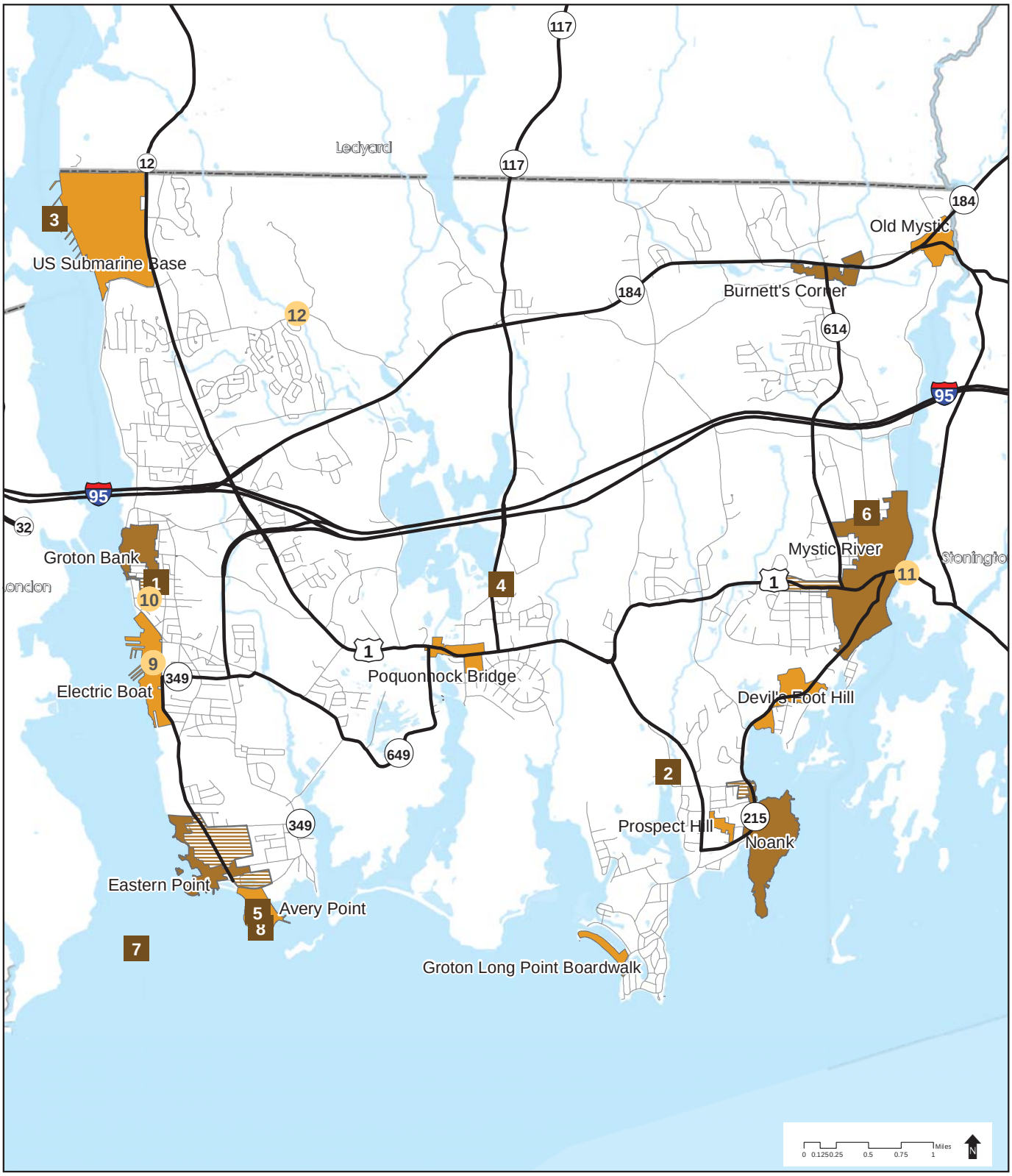
POTENTIAL NATIONAL REGISTER HISTORIC SITES/ NATIONAL HISTORIC LANDMARKS

9. Electric Boat Shipyard – site status
10. Fort Griswold – landmark status
11. Mystic Bascule Bridge – site status
12. Gungywamp area – site status

Recommendations

2-21 Maintain and enhance the historic character of various areas of town by continuing to participate in the Certified Local Government program, continuing to support the local historian, and conducting updated surveys of the local historic districts when funds are available.

Map C-9: National Register of Historic Places



Groton PLAN OF CONSERVATION + DEVELOPMENT

National Register of Historic Places

- NRHP Sites
- Potential NRHP Sites
- NRHP District
- Potential NRHP District Expansion
- Potential NRHP District

Sources:
*NRHP: US Dept of Interiro NRHP (2012)
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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METHODS OF PROTECTION

The Historic Preservation Plan from 1996 can continue to serve as a comprehensive review and analysis of Groton's cultural and historic resources. It provides a clear framework for the future of preservation in the town, although it is in need of some minor updates. However, simply acknowledging the presence of historic and cultural resources does little to protect. For example, the surveying and documentation of additional archaeological sites throughout Groton should be pursued in coordination with regional institutional bodies.

The town has four designated historic districts: Center Groton Historic District, Mystic River Historic District, Eastern Point Historic District (City of Groton), and Burnett's Corner Historic District - see Map C-9. The local Historic District Commission regulates activity that is visible from public view, including construction and demolition of buildings and alteration of external architectural features. Municipal historic districts offer some of the best protection for areas with a high concentration of historic structures by creating an additional level of municipal oversight of changes that will affect buildings' influence on the integrity of the district. Private land owners must apply for a certificate of appropriateness for changes to their property that is visible from the public view. This approval is in addition to any zoning, building, or other municipal permissions. Additional notification to the town historian before the demolition of historic buildings, known as a Demolition Delay ordinance, can allow the historic building or site to be thoroughly documented for posterity before demolition (Groton does not currently have a Demolition Delay ordinance).

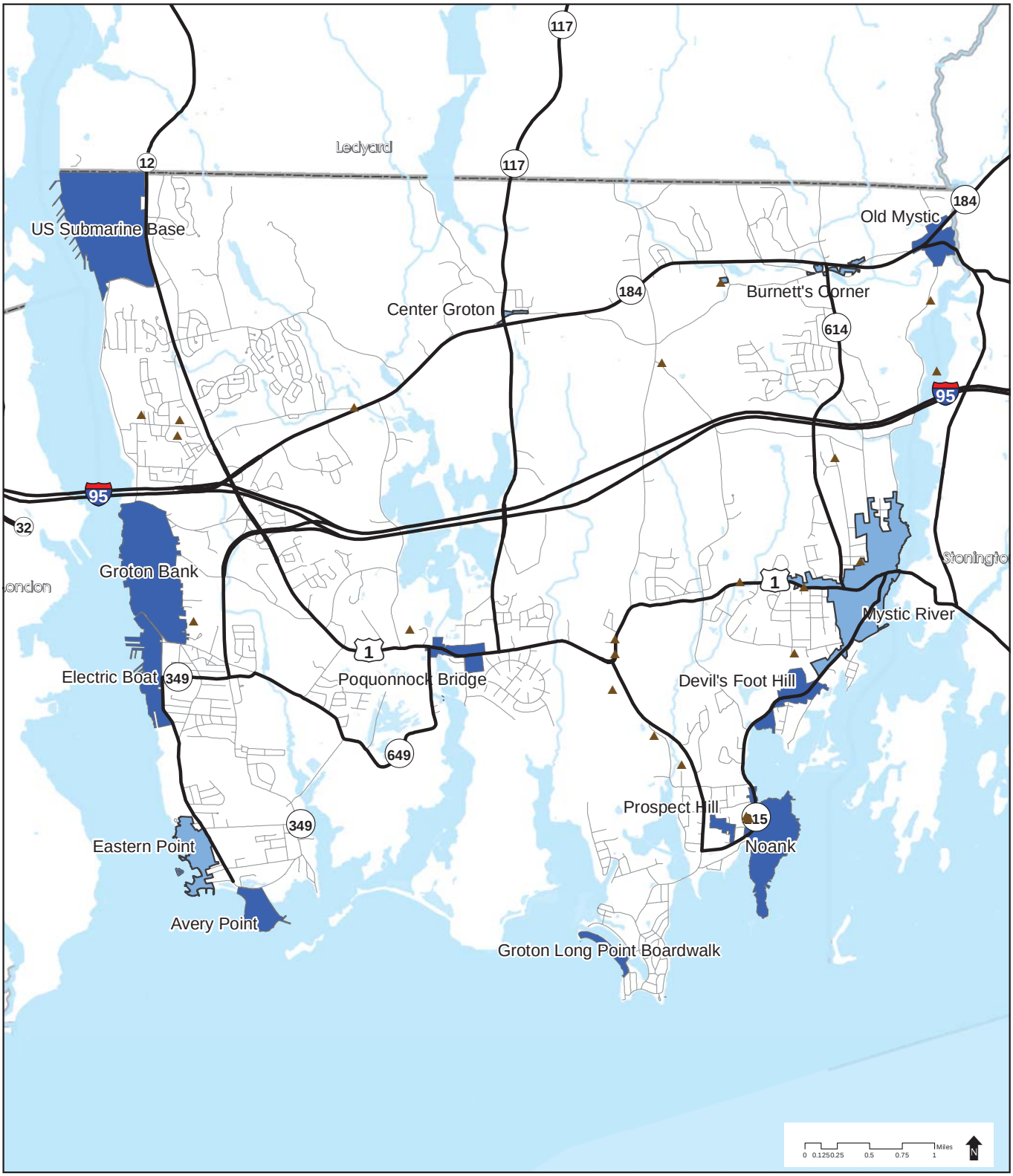
Coastal historic sites may be especially vulnerable to sea level rise and coastal erosion. Preservation of historic sites should be considered in Hazard Mitigation Plans, and appropriate steps should be taken to ensure their protection. Historic sites may also be vulnerable to redevelopment and economic development efforts. Groton should support and encourage redevelopment efforts of historic properties to maintain historic characteristics.

The State of Connecticut also allows for the establishment, by the Zoning Commission, of protected village areas through Historic Resources Overlay Zoning, which do not require the endorsement of property owners. These districts are often best used in places where the overall character is more important than any set of specific properties.

Zoning and subdivision regulations could also be strengthened to allow the Planning and Zoning Commissions to require archaeological surveys prior to approval. The municipal historian will continue to be essential in this role and should be maintained to preserve historic information. The municipal historian may also establish a central repository of archaeological and historic artifacts in the town to eventually be housed in a town museum or cultural visitor's center.

NRHP listing provides a guarantee of consideration in planning for federal, federally licensed, and federally assisted projects under Section 106 of the National Historic Preservation Act of 1966; eligibility for certain tax provisions; and qualification for federal

Map C-10: Local Historic District



Groton PLAN OF CONSERVATION + DEVELOPMENT

Local Historic District

- Historic District
- Potential Local District
- ▲ Cemetery

Sources:
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* State Roads: Streetmaps USA (2011)
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grants for historic preservation. However, their national or state designation does not offer significant protection from destruction or substantial alteration by private owners when no federal monies are involved. Protection is best served by ownership through a preservation organization or society or designation in a local historic district.

In 2013, the state authorized municipalities to "protect the historic or architectural character of properties or districts that are listed on or under consideration for, the National Register of Historic Places…" [PA 13-181]. This allows municipalities to legally designate districts and sites already on the NRHP as locally protected without the individual permission of the landowners. Groton has considerable historic assets that are on the NHRP and not locally protected and should consider adding legal protection for the properties through local ordinances.

Noank has incorporated language into the Zoning Ordinance for the Noank Fire District to include greater architectural design review in order to preserve historical integrity and architectural character in village areas. For example, the distinguishing original qualities or character of a building can not be destroyed during renovations. These regulations were strengthened to deter tear-downs of historic buildings in favor of larger construction that is out of scale to the surrounding community.

AREAS TO BE REVIEWED FOR PROTECTION

Areas that may be considered potential local historic districts have local historic significance and should be considered for preservation, such as acquisition or easements on significant properties:

- The U.S. Submarine Base
- Groton Bank
- Electric Boat
- Avery Point
- Poquonnock Bridge
- Groton Long Point Boardwalk
- Prospect Hill
- Noank
- Devil's Foot Hill
- Old Mystic

Recommendations

2-22 Amend zoning and subdivision regulations to allow the land use commissions to require archaeological and historic surveys prior to approval.

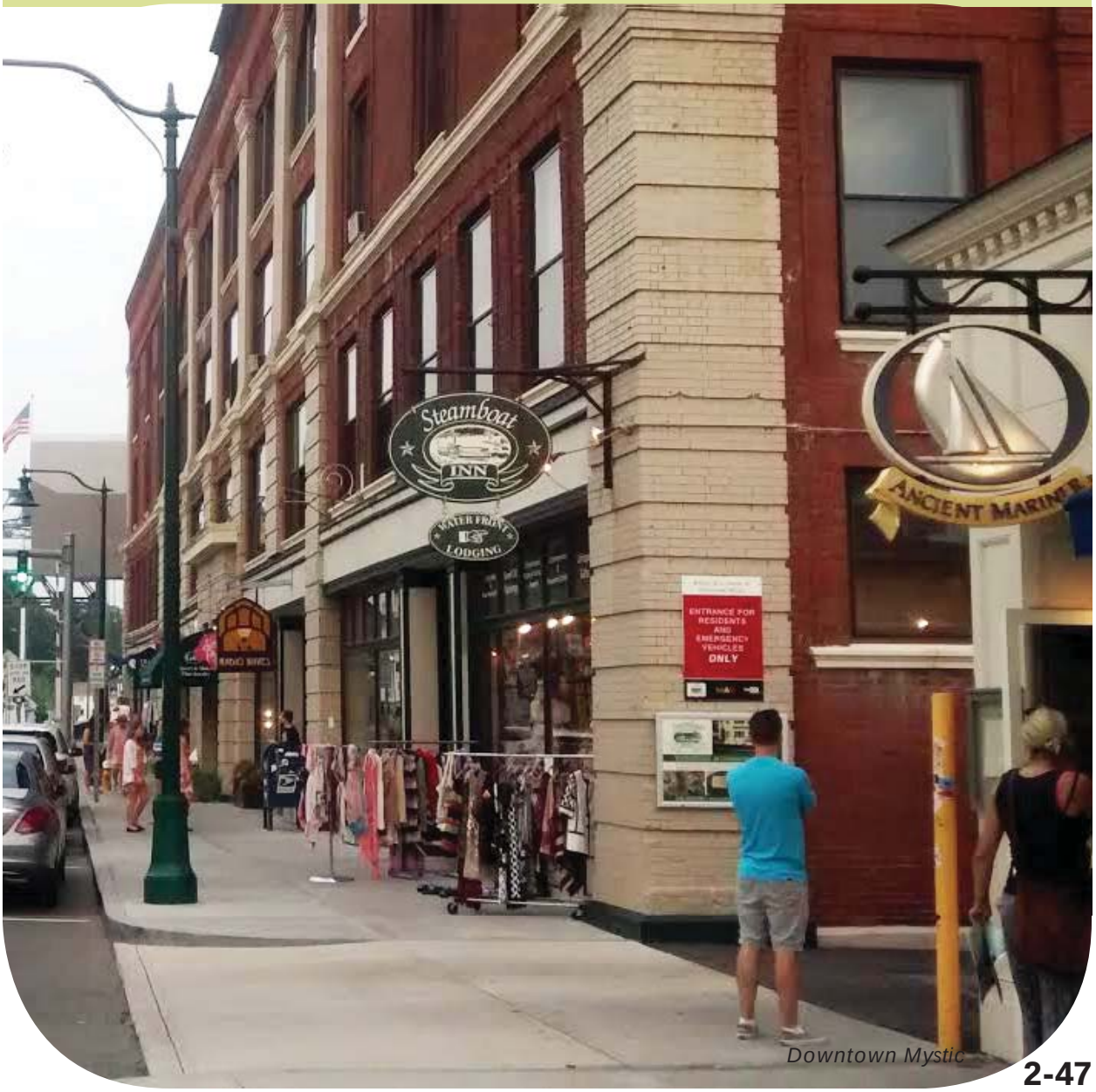
2-23 Include historic assets and historic districts as critical features that merit protection and/or planning when considering Disaster Mitigation Plans, especially with regard to flooding, storm surge, sea level rise, and coastal erosion.

2-24 Amend zoning regulations to support redevelopment and creative reuse of historic properties while maintaining historic characteristics.

PROMOTE COMMUNITY CHARACTER

Community character is the essence or identity of a city or town, and results from the relationships of many factors, such as the built form, landscape, history, people, and their activities. Groton's character as a maritime community, shipbuilding center, and a strong coastal tourism destination still informs development patterns today.

The utilization of the Plan of Conservation and Development to preserve and enhance desired aspects of Groton's community character should begin with a collective perception of the elements that contribute to the formation of the town's community character. As Groton continues to develop, these characteristics can be preserved through careful planning.



Downtown Mystic

ENHANCE "SENSE OF PLACE" AND PROMOTE SYMPATHETIC DESIGN

SENSE OF PLACE

Groton has a strong, defined community character. It is a maritime community, with historic connections to the Navy and the sea; shipbuilding, both historic and modern industrial; and a vibrant coastal tourism season. Groton has developed to support these industries and connections. The development patterns help to define the community character of Groton. Generally, these development patterns include villages of mixed commercial and residential use, residential areas, industrial areas, commercial corridors, transportation corridors, coastline, and rural areas.

The village areas of Groton are a dense mix of commercial uses including offices, retail, and residential uses. These villages vary, but they all share certain qualities including older housing stock, increased density, and strong transportation connections either to the water or a central road. They are also the historic villages of Groton, and prior to the 1930s were the most developed parts of the town. These villages include Poquonnock Bridge, Mystic, Old Mystic, Noank, Center Groton, and the City of Groton.

Groton has rural lands, residential neighborhoods, commercial corridors, industrial clusters, and coastal areas that each have a sense of place that contribute to the overall environment of Groton. Many of these areas are mapped as nodes and special focus areas in the Future Land Use Plan, and Groton should continue to identify and recognize the uniqueness of each as well as their contribution to the feel of Groton as a whole.

METHODS TO ENHANCE SENSE OF PLACE

Villages and special focus areas are only useful if their role in defining historic development patterns is carried forward into future development goals. By maintaining the form, function, and design aesthetics traditionally present, Groton can continue to grow and develop without losing the identifying characteristics that make each area so unique and valued. This plan has identified several nodal areas. Development in these areas should be carefully tailored to enhance the specific identity and historic and cultural resource present in those places. Development standards such as pattern books or design review guidelines can be used to make new development sympathetic to these character areas. A design review process that focuses on building form can also be implemented when design review is required.

Areas such as Mystic, Burnett's Corner, and Center Groton are protected and defined by Historic Districts, which in part help to preserve the character of the areas. Therefore, special attention should be paid to the areas of Poquonnock Bridge and Old Mystic where districts have not been created, and their identity is being threatened by loss of historic fabric or unsympathetic development. In these development nodes, new development should seek to create connectivity through sidewalks and streetscape improvements as well as continuity of design. Massing and bulk standards can reinforce the established development pattern, complement existing structures, and enhance neighborhood character.

The special focus areas in the Downtown District, Old Mystic Village, and Poquonnock Bridge Village also have provisions to encourage their sense of place through patterns of development intensity, protective and enhancing historic development patterns, and retaining mixed uses and pedestrian-friendly environments.

Poquonnock Bridge is also facing serious danger from climate change that threatens its increased role as the civic and governmental center of Groton. Groton and the region have experienced an increase in the frequency of coastal and inland flooding, and Poquonnock Bridge has been particularly affected by flooding along the Poquonnock River and Route 1. The impact of these events is magnified by the siting of critical facilities in this area. Currently, FEMA prevents the siting of new critical facilities in 500-year flood zones. While the level and speed of climate change actions are unclear, Groton needs to be aware of the vulnerability of this area when developing or improving institutional uses here. Its role as an institutional center has been bolstered by the town's takeover of the former Fitch Middle School and the construction of the new senior center and library complex.

Additionally, the town may consider targeting land conservation towards rural and coastal areas and targeting residential development in those areas where it is already a significant identifying feature of the landscape. Development in rural and coastal areas should seek to maintain viewsheds and cultural landscapes through mitigation techniques such as height restrictions, ridgeline protection, and cluster development.

The town should continue to address abandoned and blighted buildings as promptly as possible to preserve character. The town should look to use the Blight Ordinance, where appropriate, to prevent deterioration of properties before they are deemed too structurally unsound to preserve.

METHODS TO PROMOTE SYMPATHETIC DESIGN

The town should continue to identify scenic roads and scenic viewsheds, especially those that enhance their character areas. The recognition of these areas allows the town to suggest sympathetic mitigations to new development proposals, which allow growth but still target that growth to align with general cultural conservation goals.

The town should consider design review guidelines for areas where Historic Districts or Village Districts are not applicable. Design guidelines and design review can limit the impact of development on scenic vistas and viewsheds. Clear design guidelines and design review gives communities a chance to decide how development will affect their neighborhoods and help a development blend with its surroundings.

Recommendations

2-25 Align and adjust zoning development standards in older neighborhood areas to reinforce the established development pattern, complement existing structures, and enhance neighborhood character.

2-26 Identify and recognize the uniqueness of each Node and Special Focus Area as a component of the entire community. Create development standards, pattern books, and/or design guidelines to enhance a sense of place and sympathetic design in the Special Focus Areas.

PROTECT SCENIC ROADS

SCENIC ROADS DEFINITION

For a local road to be designated as a scenic road, it must not have intensive commercial development or high volumes of traffic. Traditional scenic roads emphasize aesthetic and cultural resources. Efforts to make roads in Groton more scenic attempt to balance traffic efficiency with community character. Scenic road elements include narrow road width, tree canopies, stone walls, scenic vistas, agricultural lands, historic buildings, and notable natural features. Scenic roads, in rural or historic areas, are one element that significantly contribute to Groton's character. As development of the community continues, scenic roads may be increasingly threatened by adjacent development or increasing traffic volumes. Currently, Sandy Hollow Road and River Road are recognized with an official scenic road designation. The 2002 POCD also identified other roads of scenic value, such as Pleasant Valley Road North, Military Highway, and others.

SCENIC ROAD PROTECTION

Groton has a scenic road ordinance for town roads that was adopted in 1989. Future roads and redevelopment/repaving of existing roads should be made as scenic and safe for pedestrians as possible while providing for safe and efficient circulation. The best way to do this is through modifying the road construction standards, primarily design speed and paved width.

Sign marking the scenic River Road

The design speed of a road is the speed that the road is designed to be capable of handling.
It is typically higher than the posted speed limit. A higher design speed results in roads that are wider, flatter, and straighter. As a result of the road design speed, motorists often feel that it is safe to exceed the posted speed limit. Existing scenic roads show that minimum design standards for traffic safety can be used in conjunction with scenic road criteria to create roads that are scenic and safe.

OTHER SCENIC RESOURCES

Other roads and resources that may have scenic qualities in Groton include stone walls, curbing, old right-of-way monuments, and hitching posts. These resources provide Groton with a connection to its history as well as providing aesthetic benefits. Tree canopies also have scenic qualities but must be balanced with the maintenance needs of utility company power lines. These scenic resources may be protected by landowners voluntarily, through incentives such as tax breaks for property owners who donate land or easements, by land purchase, or through regulatory measures such as design guidelines.

Recommendations

2-27 Develop guidelines to preserve scenic resources (such as stone walls, hitching posts, public views, etc.) that are visible from public rights-of-way.

Chapter 3: Sustainable Land Use Development

Chapter 3: Map Index

ENCOURAGE SUSTAINABLE LAND USE DEVELOPMENT

Sustainable communities incorporate consideration for the environment, for social equity, and for the economy in land use and other policy decisions. Becoming a sustainable community has tangible positive impacts for people today. Many sustainability measures conserve energy, saving money as well as reducing pollution. Having the appropriate development pattern for residents to safely walk and bike to destinations reduces fossil fuel consumption and pollution as well as promoting exercise and encouraging residents to be engaged in their communities by seeing their neighbors outside.

A sustainable community reinforces development patterns that contribute to meaningful community character and quality of life by encouraging appropriate economic growth, mixed-use developments, and walkable communities while protecting sensitive natural and cultural resources.

Mystic Node

PROMOTE APPROPRIATE SUSTAINABLE DEVELOPMENT PATTERNS

DESIRED DEVELOPMENT PATTERNS

In Groton, residents and visitors identify most strongly with the mixed-use village pattern that exists in Mystic and Noank and, to some extent, in the City of Groton. These centers have more intense activity that serve as a focal point for the surrounding areas, with a development pattern that is appropriately scaled to the location. These centers act as clear "Nodes" of development. The Town of Groton never had a traditional New England town green, and has developed in self-contained villages along major transportation routes (such as Center Groton and Old Mystic) since its founding in 1705.

In contrast, most recent residential development in Groton largely occurs through large-lot subdivisions that contribute to a more sprawling, automobile-oriented development pattern. Most business development in Groton is likewise occurring in strips along major roads with separate curb cuts and limited architectural character. While these areas meet the acute need for single-family residential development and retail commercial shopping, they do not contribute to meaningful community character or add to the quality of life in Groton.

Sustainable Development

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

-World Commission on Environment and Development, *Our Common Future* (1987)

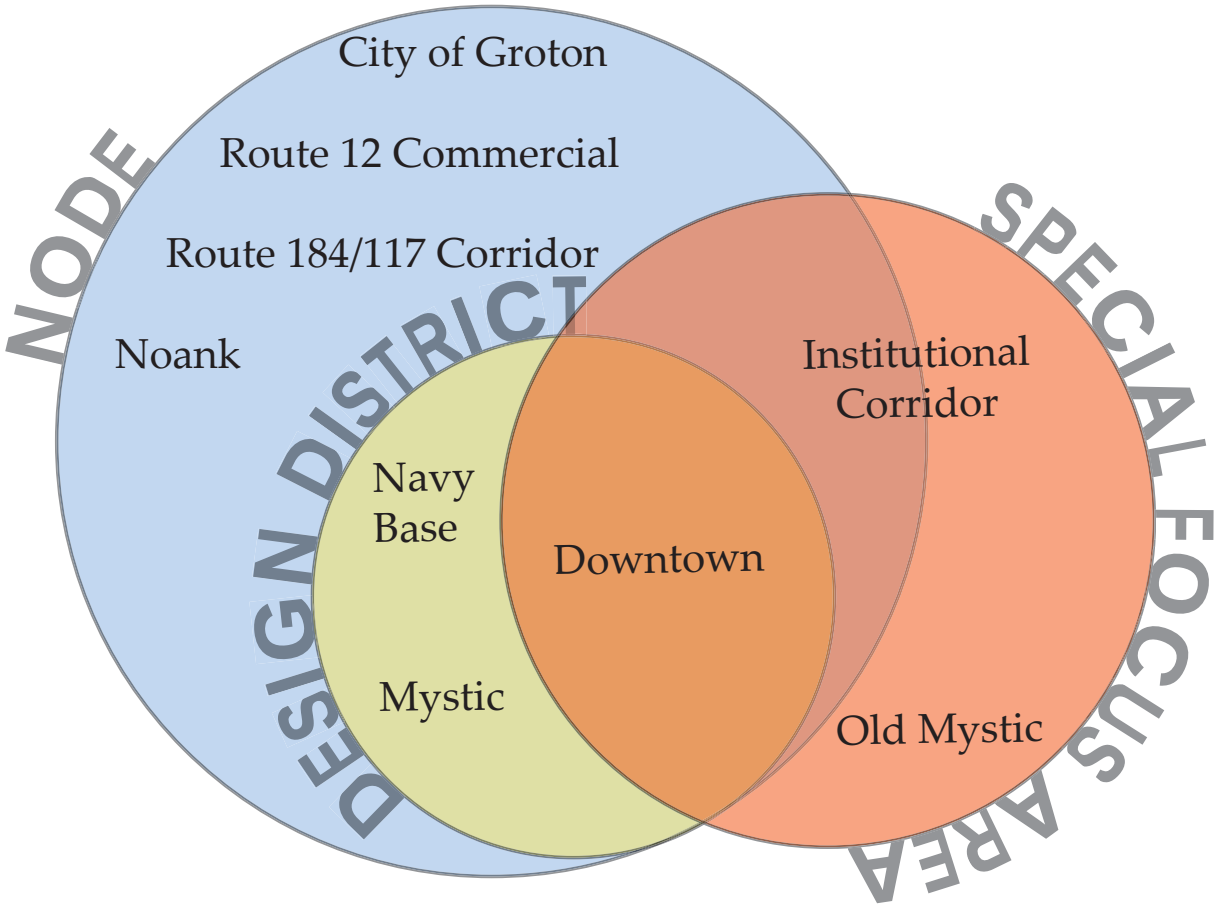
As well as improving a community's sense of place, mixed-use, village-type development patterns with minimal setbacks create walkable neighborhood centers. Development patterns that encourage residents and visitors to walk or bike to clustered destinations instead of driving have many added benefits, such as reducing vehicle emissions and traffic congestion, extending the life of infrastructure, reducing the number of traffic accidents, enabling increased physical activity levels, and providing a greater sense of social connection and interaction.

The goal of the "Node designation," as established in the 2002 POCD, is to target new development toward specific areas to achieve the community character, land use, infrastructure, environmental, and smart growth policy objectives related to a given Node. However, it is also important to note that the development of disparate Nodes dissipates any overall feeling of cohesive community identity, as noted in the 2002 POCD and the 2015 draft Market Analysis by consultant Vanasse Hangen Brustlin, Inc. (VHB). The 2002 POCD recommended that Groton create thematic connections between Nodes through signage, bike paths and sidewalks, design consistency, and other components.

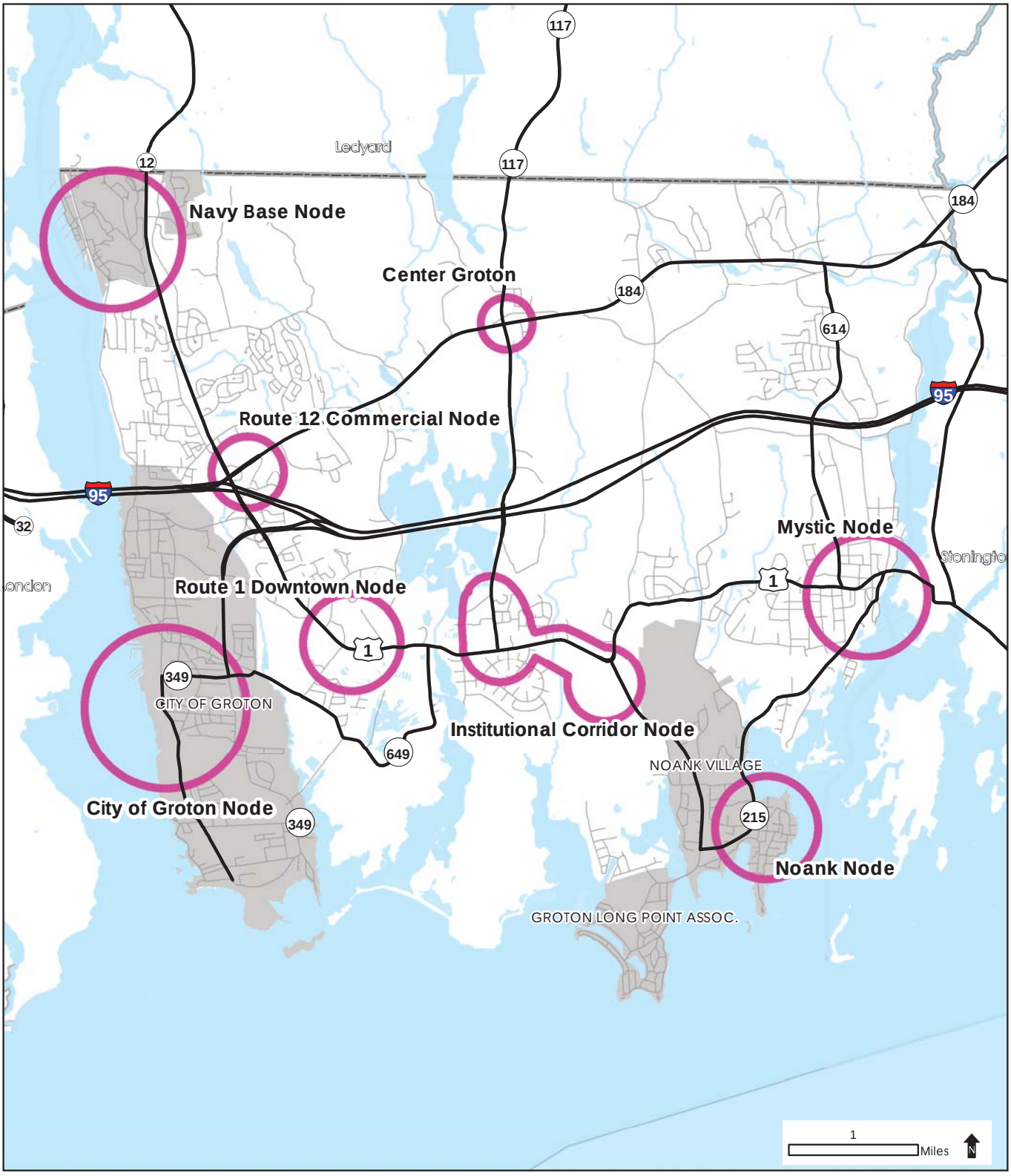
"Design Districts" are codified in the zoning regulations specifically to encourage the development of certain Nodes. Design districts are areas that have developed or are intended to develop with significant guidance of use, intensity, and design characteristics.

The "Special Focus Areas" designation is new in this POCD update. These areas have historic village settlement patterns and were selected for increased attention in the next 10-year planning period and beyond. As a new designation, Groton should create an appropriate mechanism in the zoning regulations to implement sustainable development patterns in these areas.

As illustrated below, there is overlap among the areas of Groton that are considered Nodes, have codified Design District status, and have been chosen as Special Focus Areas for the next 10 years. The following sections describe each of these areas in more detail and describe areas that have multiple designations.



Map D-1: Nodes



Groton PLAN OF CONSERVATION + DEVELOPMENT

Nodes

Nodes

Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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NAVAL SUBMARINE BASE NODE

Groton is known as the Submarine Capital of the World because of the location of the Naval Submarine Base, established in 1868, and Electric Boat (see next section). The Naval Base is owned by the federal government, and as such the U.S. Navy has political jurisdiction over general government, public works, police, land use planning, recreation, fire, ambulance, rescue, and paramedic needs on the base itself and adjacent housing. The base employs nearly 10,000 people. It has a reported Navy family housing inventory of 1,476 units, while many Navy staff without family on site live in barracks and dormitories on the base. The majority of Navy personnel are young submariners, and many are starting families and sending their children to Groton Public Schools. As a result, the demographics of this area are very young compared to other areas of Groton, and also tend to be somewhat transient as military staff may be relocated to different bases.

The area is a federal institutional Node due to the concentration of uses at the base itself. The Nautilus Memorial Design District (NMDD) was established directly off the base to preserve and enhance the entryway to the Nautilus Memorial (the first nuclear-powered submarine in the world) and the Submarine Force Library and Museum. The NMDD's purpose is to serve tourism needs for visitors to the Nautilus Memorial while also buffering adjacent residential neighborhoods from the higher-intensity uses of Navy operations. However, development activity in this area has been minimal, and the purpose and requirements of the NMDD need to be reevaluated.

Naval Base Node

Purpose	An institutional Node first adopted in the 2002 POCD, which includes federally owned naval property and some adjacent property. Naval base has control over land use and development on federal land.
Proposed Development Type	Off base, tourism, uses to service the Navy base and/or their personnel, and residential uses or mixed uses. Residential multifamily uses are to be used as a transition/buffer area between tourist commercial and lower-density residential.
Changes Since 2002	A major housing redevelopment program in the mid-2000s replaced or rehabilitated many of the family Navy-controlled housing units.
Possible Boundary Changes	Change boundary to include all of NMDD is recommended at this time.

Nautilus Memorial Design District (NMDD)

Description	Commercial, multifamily, and single family area off base along Crystal Lake Road and Route 12 in the vicinity of the Navy Base, in need of upgrades and redevelopment.
Purpose	Protect and enhance the primary entryway to the Nautilus Memorial, serve tourist-related and Navy needs, and protect adjacent residential neighborhood.
Changes	This district was created in the early 1980s in anticipation of the USS Nautilus/Submarine Library and Museum. Since development activity has been minimal, the purpose and requirements of the district should be reevaluated.

DOWNTOWN GROTON

Historically, Groton developed without the traditional New England village green that has typically evolved into the central downtown of other New England towns and cities. Because Groton was historically oriented toward its coast, it never developed a strong central focal point. The area identified as "downtown" Groton is along Route 1, and is characterized by strip-style development that is atypical of a New England downtown. Strengthening a Downtown Node is a high priority for Groton. Downtown is the only area to have three designations (Node, Design District, and Special Focus Area), although the three different designations have different, overlapping boundaries.

Route 1 Downtown Groton Node

Purpose	A commercial mixed-use Node first adopted in the 2002 POCD.
Proposed Development Type	Mixed used, pedestrian friendly
Changes Since 2002	While some stores were upgraded or renovated in this Node since 2002 (Big Y, CVS, and others), there have been no major changes. The proposed entranceway to the Downtown Development District has not been completed.
Boundary Changes	Boundary of Node may change based on future study of downtown Special Focus Area.

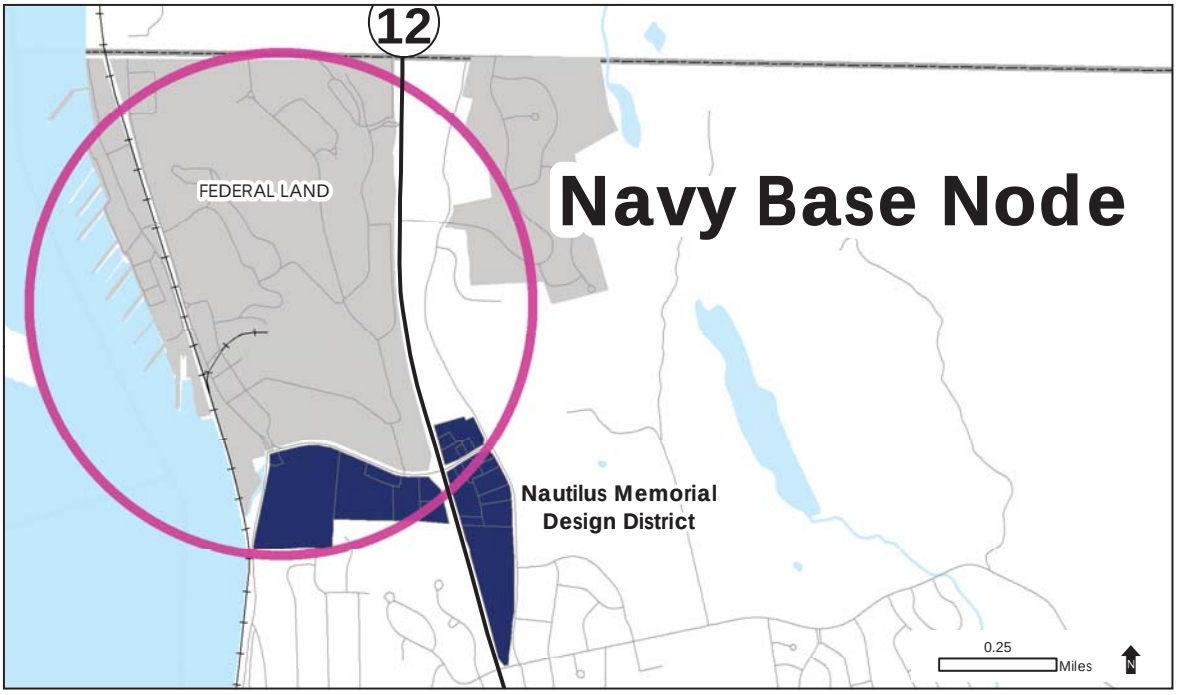
Downtown Design District (DDD)

Description	Older strip malls with large parking lots, fast food restaurants, and former single-family homes converted to commercial uses.
Purpose	Town's retail, office, institutional, and cultural center with pedestrian connections and enhanced landscaping.
Changes	Reevaluate and revise purpose to update and possibly change boundary of DDD based on outcome of downtown Special Focus Area study.

Downtown District Special Focus Area

Purpose	Encourage a concentration of commercial development with special attention paid to public amenities. This district is seen as the town center. Development within the district should be of a quality and character appropriate for the business and cultural focus of the town and build on the recommendations in the 2006 Groton Strategic Economic Development Plan.
Proposed Development Type	Pattern of development intensity should follow a dense mixed-use form based development within the center Node to a less-intense use and form adjacent to residential areas while creating a pedestrian-friendly environment with logical connections to the surrounding neighborhoods.

Map D-2: Navy Node



Groton PLAN OF CONSERVATION + DEVELOPMENT

Navy Node

Nodes
Nautilus Memorial Design District
Other Jurisdictions

Sources:
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* State Roads: Streetmaps USA (2011)
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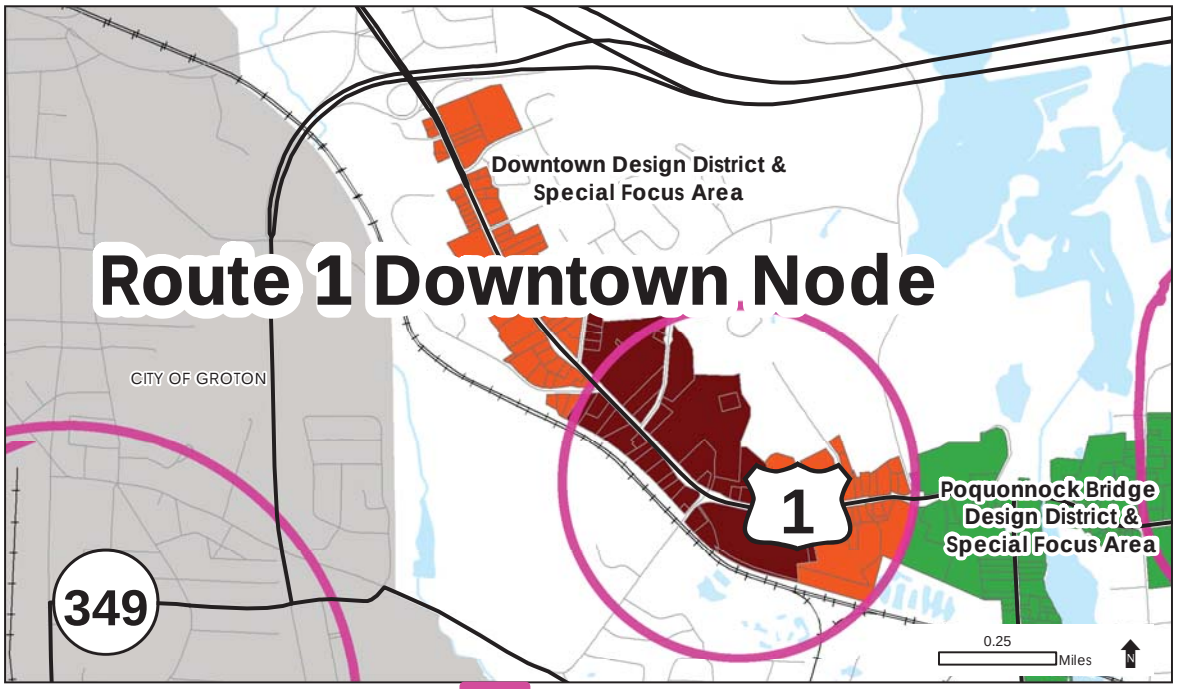
Map D-3: Groton Downtown: Node, Design District, Special Focus Area



Groton PLAN OF CONSERVATION + DEVELOPMENT

Groton Downtown: Node, Design District, Special Focus Area

Nodes
Current Downtown Design District
Downtown Special Focus Area
Poquonnock Bridge Special Focus Area
Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

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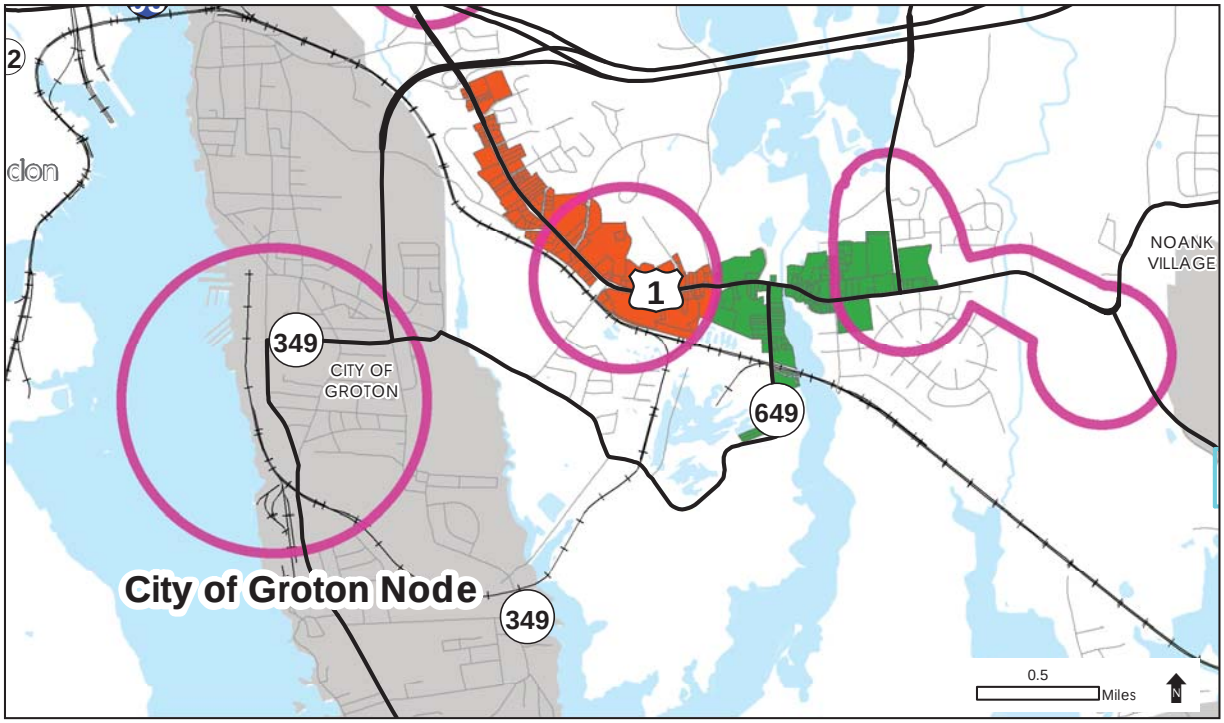
CITY OF GROTON NODE

The City of Groton is a semiautonomous political entity within the town that has its own charter and provides police, fire, recreation, and other services to city residents. It also exercises planning and zoning authority within the city limits. While town services are available to city residents (since the city is part of the town), city services are only available to residents that live in the city and pay taxes to the city. The city lies on the bank of the Thames River, where the waterfront is dominated by the Node composed of Electric Boat and Pfizer, the second- and third-largest employers in Groton (behind the Navy Base). Like the Navy Base, this area also tends to have a younger, more transient demographic. This Node is advisory, as the town has no direct land use control over this area.

City of Groton Node

Purpose	An industrial, mixed-use Node first adopted in the 2002 POCD.
Proposed Development Type	Large industrial uses and adjacent mixed uses.
Changes Since 2002	There have been no major changes to the City of Groton Node since 2002.
Possible Boundary Changes	No boundary changes are recommended at this time.

Map D-4: City of Groton Node



Groton PLAN OF CONSERVATION + DEVELOPMENT

City of Groton Node

Nodes
Downtown Special Focus Area
Poquonnock Bridge Special Focus Area
Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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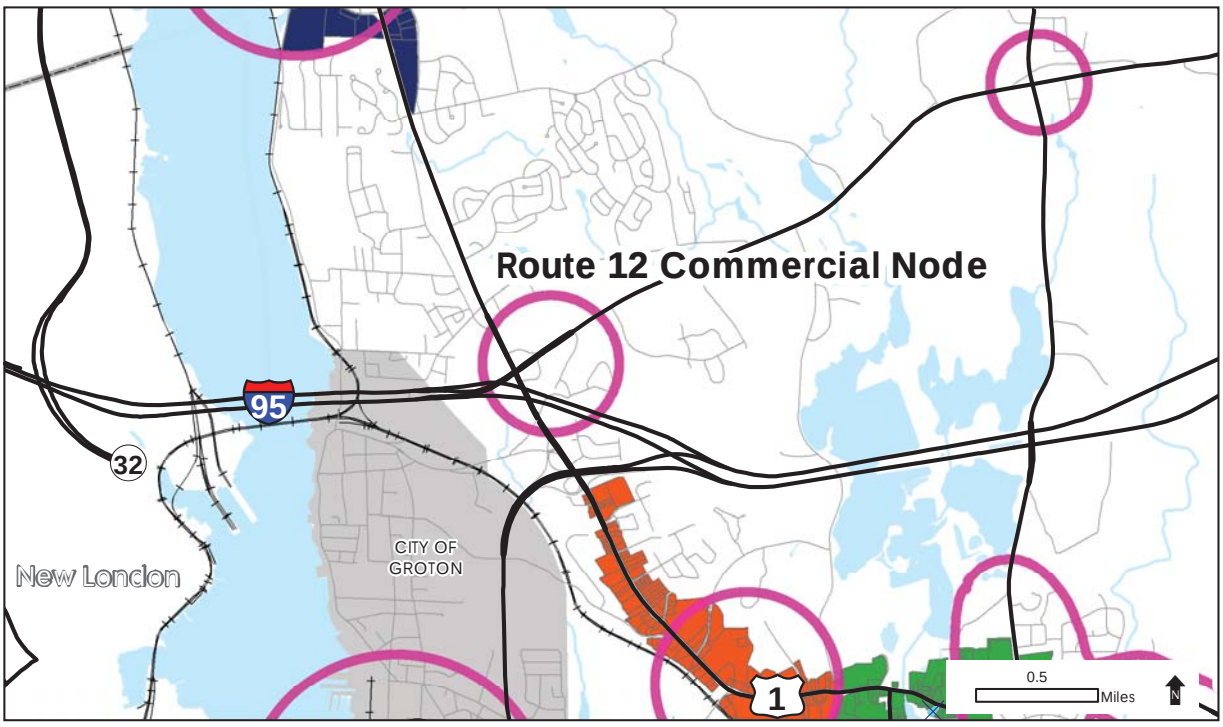
ROUTE 12 COMMERCIAL AREA

The area of the intersection of Route 12, Route 184, and I-95 has developed into a regional commercial development Node due to its transportation accessibility. This area has largely developed into big-box retail (Walmart, Kohl's, and Super Stop & Shop), large hotels (Hilton Garden Inn), and some strip development north of Route 184. South of Route 184 has seen the development of hotels, small-scale retail and restaurants, and smaller-lot single-family residential developments (Bonnie Circle and Pamela Avenue). Current redevelopment potential exists with the closing of the William Seely Elementary School and the surrounding vacant properties.

Purpose	A commercial use Node first adopted in the 2002 POCD.
Proposed Development Type	Retail and Service Commercial
Changes Since 2002	This Node has seen some redevelopment and renovations since 2002. An expansion of the Walmart was approved, and a hotel was built.
Boundary Changes	Expand boundaries of the Node to the west in order to incorporate existing commercial developments west of Route 12.

Map D-5: Route 12 Commercial Node



Groton PLAN OF CONSERVATION + DEVELOPMENT

Route 12 Commercial Node

Nodes
Downtown Special Focus Area
Poquonnock Bridge Special Focus Area
Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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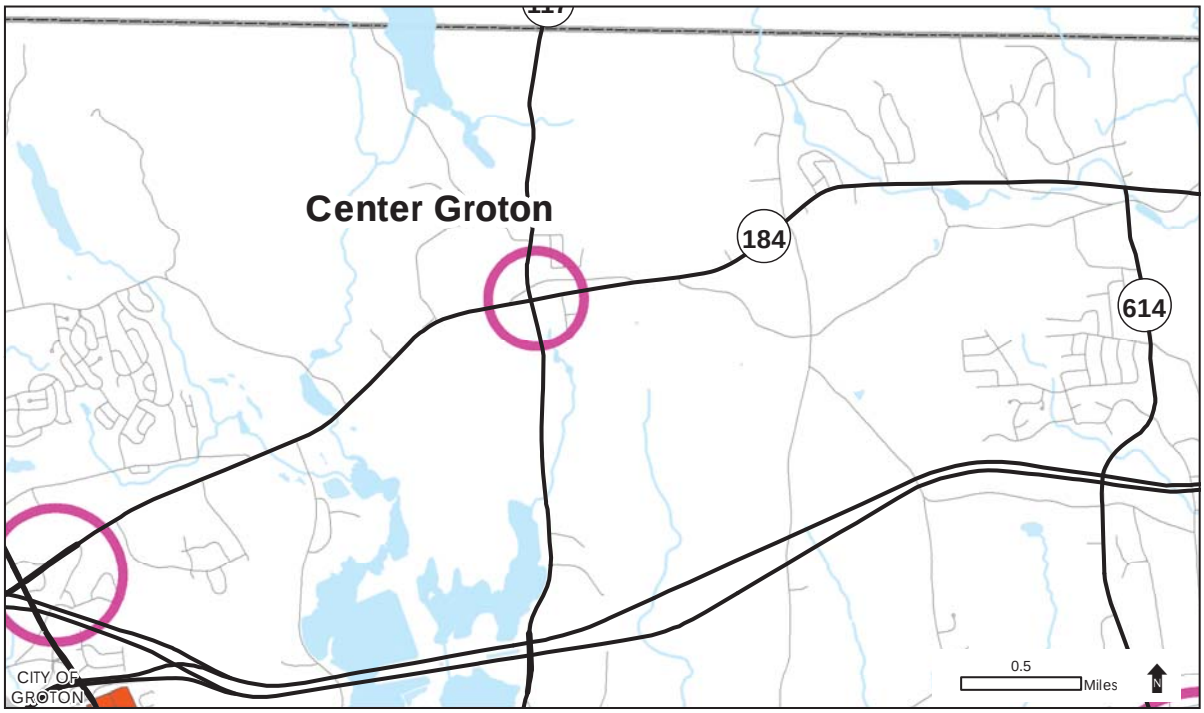
CENTER GROTON

The area known as Center Groton, at the intersection of Routes 184 and 117, has a long history in Groton as an important crossroad. In 1703, it became the site of the town's first Congregational Church as Groton began to become independent from New London. Center Groton is still considered a small village area with a mix of uses, primarily commercial and residential. However, Center Groton is now isolated from the population centers of Groton and is no longer suitable as a town center or downtown. Center Groton would benefit from an analysis to further define the character and desired future uses of the area.

Center Groton Node

Purpose	A commercial use Node first adopted in the 2002 POCD.
Proposed Development Type	Mixed use, walkable
Changes Since 2002	There have been no major changes to the Route 184/117 Corridor since 2002.
Boundary Changes	No proposed boundary changes.

Map D-6: Center Groton Node



Groton PLAN OF CONSERVATION + DEVELOPMENT

Nodes

Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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Center Groton Node

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INSTITUTIONAL CORRIDOR/POQUONNOCK BRIDGE

The Institutional Corridor Node encompasses the Town Hall, the Town Hall Annex, Fitch High School, Grasso Technical High School, the Police Station, the Animal Control Facility, the Centennial playground, Poquonnock Plains Park, Sutton Park, the Senior Center, and the Public Library. The eastern section of Fort Hill Road and Groton Long Point Road mostly contains institutional uses and protected park lands, while the western portion in the Poquonnock Bridge area has a more diverse mix of institutional, recreational, residential, and commercial uses.

While the Poquonnock Bridge Special Focus Area has the benefit of a historic village development pattern, it also faces environmental challenges. Groton and the region have experienced an increase in the frequency of coastal and inland flooding, and the Poquonnock Bridge area has been impacted by flooding along the Poquonnock River and Route 1. These events are magnified by the siting of critical facilities in this area. Currently, FEMA prevents the siting of new critical facilities in 500-year flood zones. While the intensity and speed of potential climate change actions remain unclear, Groton needs to be aware of the vulnerability of this area when focusing future institutional uses here.

Institutional Corridor Node

Purpose	An institutional Node first adopted in the 2002 POCD, this corridor generally spans the area from the Town Hall to the Town Hall Annex, along Fort Hill Road and Groton Long Point Road.
Proposed Development Type	Civic uses and appropriately scaled retail, office, and service.
Changes Since 2002	Since 2002 there have been many changes to institutions in this area: Fitch High School was renovated; Fitch Middle School was closed; the Senior Center, Centennial playground, and the new Animal Control Facility were built, and St. Mary's Church built an addition.
Boundary Changes	The boundary has been extended slightly north along Route 117 (North Road) in order to include the institutional uses at the Senior Center and Public Library and to the east along Route 1 to also include Grasso Technical High School and Sutton Park.

Poquonnock Bridge Village District Special Focus Area

Purpose	Permit and control development within the designated Special Focus Area, which will protect and enhance historic village development patterns while building on the recommendations in the 1996 Historic Preservation Survey and protect the resources of the Poquonnock River.
Proposed Development Type	Village development pattern with historical architectural styles and massing, mixed uses, in a pedestrian-friendly environment.

MYSTIC VILLAGE

The Village of Mystic spans the Mystic River within the Towns of Groton and Stonington. The Village has long been tied to maritime activity. Mystic is famed for its traditional coastal New England character and is one of the biggest tourist destinations in the state. It is an important retail district in Groton with small, locally owned shops along a main street. The town has invested heavily in streetscape improvements in Mystic in order to improve the pedestrian experience.

The Mystic Waterfront Design District (WDD) is an example of how town zoning can codify nodal goals by establishing specific guidelines to ensure a mix of uses, concentrated development, pedestrian friendly circulation, shared parking and public spaces, and the continuation of historic styles. The smaller Waterfront (WF) District falls within the same Node, but encompasses marina uses south of downtown Mystic on Willow Point peninsula.

Mystic Node

Purpose	A mixed-use Node first adopted in the 2002 POCD.
Development Type	Traditional coastal New England small village mixed use.
Changes Since 2002	Mystic has had streetscape improvements and new restaurants come to the area since 2002. For possible future developments, there is a proposed parking lot expansion at the Mystic Arts Center and a large mixed-use development on West Main Street that has been approved but not built. The Mystic area has developed as a strong tourist attraction.
Boundary	No proposed boundary changes.

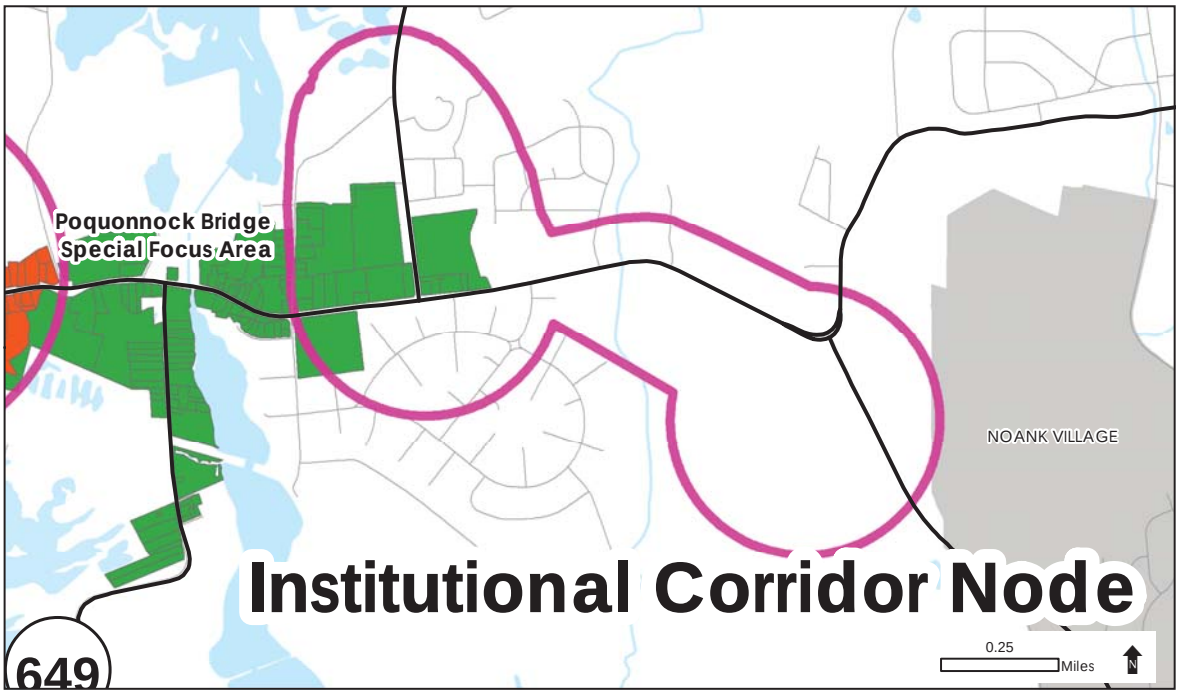
Waterfront (WF) District

Description	Area on the Willow Point peninsula with boatyards and marinas.
Purpose	To permit water-dependent uses and businesses that are reliant on water access, such as marinas, boatyards, and commercial fishing operations.
Changes	No changes proposed.

Waterfront Design District (WDD)

Description	Commercial, mixed use, tourist, and marine-related business in downtown Mystic.
Purpose	To allow development that will protect and enhance the unique qualities of the Mystic area while protecting coastal resources, providing public access to the Mystic River, and providing a mixture of residential, commercial, and office uses that serve the needs of area residents and visitors.
Changes	Possible revised purpose and expansion of area and allowed uses compatible with the neighborhood.

Map D-7: Institutional Corridor/Poquonnock Bridge



Groton PLAN OF CONSERVATION + DEVELOPMENT

Institutional Node and Poquonnock Bridge Special Focus Area

- Nodes
- Downtown Special Focus Area
- Poquonnock Bridge Special Focus Area
- Other Jurisdictions

Sources:
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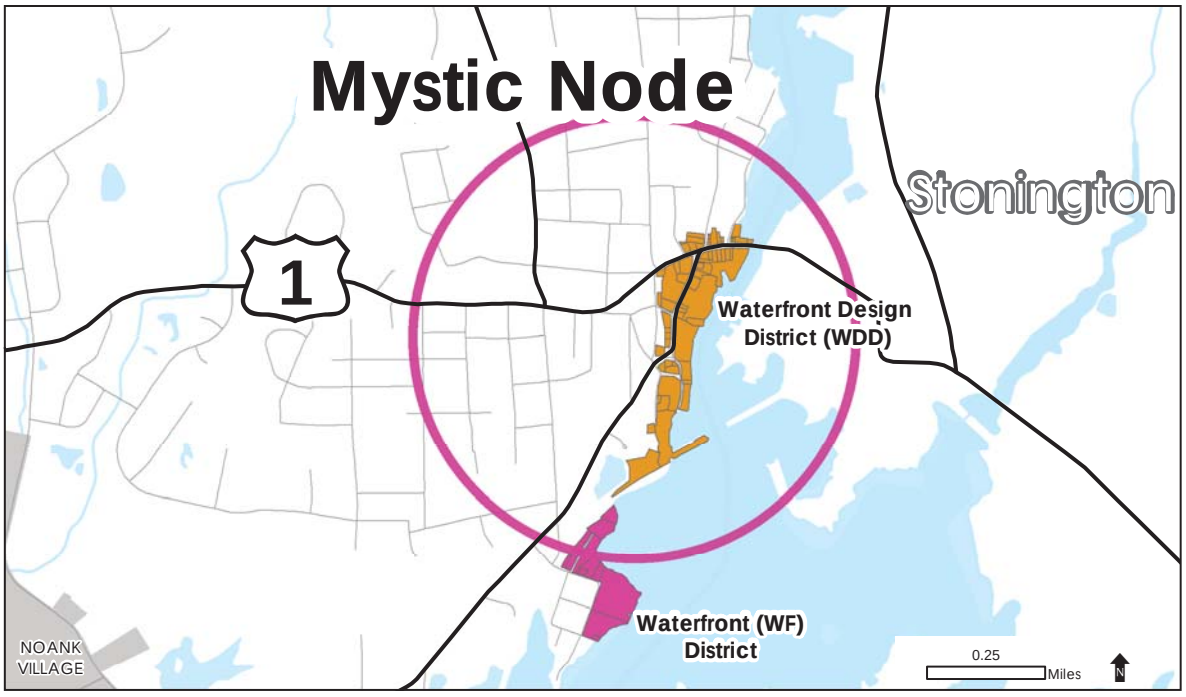
Map D-8: Mystic: Node and Design Districts



Groton PLAN OF CONSERVATION + DEVELOPMENT

Mystic: Node and Design Districts

- Nodes
- WDD
- WF
- Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
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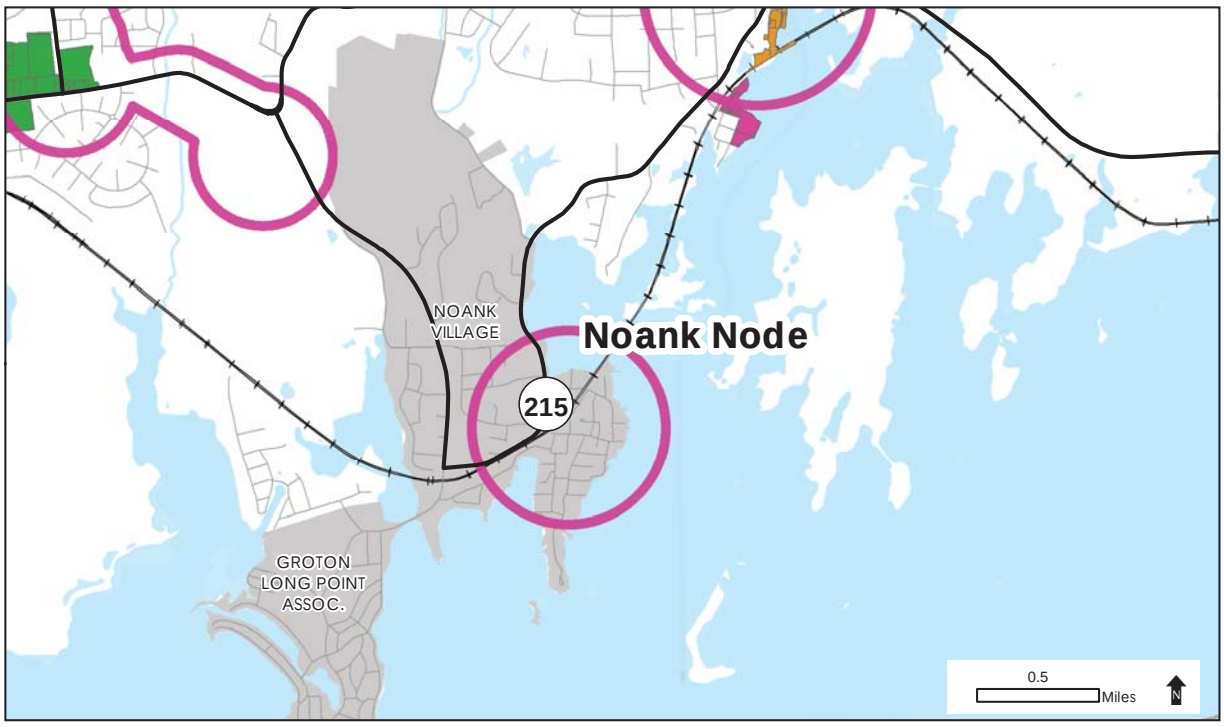
NOANK VILLAGE

The Village of Noank is a political subdivision of the Town of Groton with independent zoning authority. Noank is a popular destination for coastal tourism with a traditional New England feel, and is also a National Register Historic District. The mixed-use coastal village pattern that exists here should continue to be encouraged.

Noank Node

Purpose	A residential mixed-use Node first adopted in the 2002 POCD.
Proposed Development Type	Traditional coastal New England small village mixed-use.
Changes Since 2002	Other than the closure and demolition of Noank School, there have been no major changes to the Noank Node since 2002.
Boundary Changes	No proposed boundary changes.

Map D-9: Noank Node



Groton PLAN OF CONSERVATION + DEVELOPMENT

Nodes

Other Jurisdictions

Sources:
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* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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Noank Node

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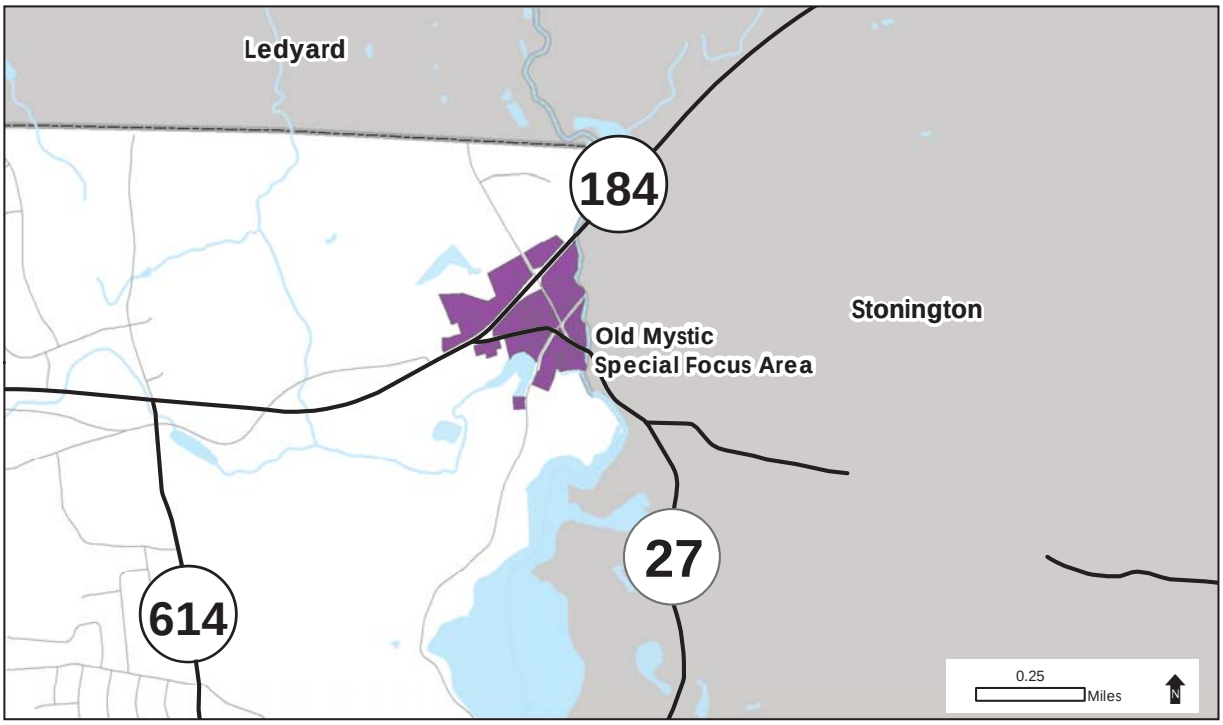
OLD MYSTIC

The Old Mystic area is a newly recommended Special Focus Area where Route 184 intersects with Route 27. Old Mystic has a rural village character.

Old Mystic District Special Focus Area

Purpose	Permit and control development within the designated Special Focus Area that is consistent with village-scaled uses that will continue to protect and enhance historic development patterns.
Proposed Development Type	Historic architectural styles and massing, mixed uses and a pedestrian friendly environment, while building on the recommendations in the 1996 Historic Preservation Survey and protecting the resources of Haley Brook and the Mystic River.

Map D-10: Old Mystic Special Focus Area



Groton PLAN OF CONSERVATION + DEVELOPMENT

Old Mystic Special Focus Area

Nodes

Old Mystic Special Focus Area

Other Jurisdictions

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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DOWNTOWN AS A PRIORITY REDEVELOPMENT AREA

Numerous planning documents, such as the 2006 Strategic Economic Development Plan, have recommended redevelopment of the the downtown/Route 1 corridor. More recently, the VHB Draft Zoning and Subdivision Regulation Audit for Groton recommended a comprehensive study of the Route 1 corridor to quantify current conditions in order to determine a long-term plan. In addition, the Audit report recommends a more immediate "guide plan" that targets areas that can lead to quality mixed-use development within the Downtown Design District.

The Economic and Market Trends Analysis report prepared by Camoin Associates characterizes the Route 1 corridor as "dated" strip-style retail that is isolated from other land uses in Groton. This report also recommends redeveloping the existing strip malls into mixed-use developments, as Groton is losing market share to newer retail developments.

Future plans for this area should include not only the desired design and uses of redevelopment projects, but also implementation strategies. Tools such as incentives, grants, public/private partnerships, marketing, Tax Increment Financing (TIF), infrastructure improvements, and others should be considered as ways to encourage desirable redevelopment.

Plans for the downtown area should also consider elements of creative placemaking. According to the Connecticut Department of Economic and Community Development's (CT DECD) Office of Culture and Tourism, creative placemaking is defined as "creating cities, towns and villages where people want to come to live, to work, to play and to learn." Cultural reinvestment can be instrumental in creating desirable places where people want to spend time and reinvest in the community. The CT DECD has published "Ten Policies to Increase the Impact of the Arts on Placemaking" (Feb. 2013 - full text available online) that suggest the following:

- Foster partnerships between creatives and visionary mayors, as all placemaking is local in nature.
- Balance funding between institutional and entrepreneurial/market approaches, as there is frequently too much emphasis on institutionalized approaches such as arts districts and not enough of storefront and pop up type approaches that are more quickly transformative.
- Focus the measurement of arts outcomes on the role of the arts in creating distinctive places that are magnets for talent. While placemaking can definitely have a direct impact as a jobs creator and driver for spending, the greater potential jobs impact is through creating distinctive places where people want to spend time and live.
- Tailor placemaking strategies to the neighborhood context, as a low-income neighborhood will have different needs and require different strategies than higher-income neighborhoods.
- Use housing and historic preservation policy to promote and maintain diversity.
- Promote the reintegration of art and science. Groton in particular has a strong resident base of engineers and researchers that can be a resource for integrating science and creative placemaking.
- Encourage churn among arts organizations and foster the rapid cycling of failed arts entrepreneurs, and view failure as an experience in order to encourage risk-taking.

- Link creative placemaking initiatives to form regional learning communities. Groton is already a member of The Southeastern Connecticut Cultural Coalition, and should continue to build capacity and relationships through this regional arts and economic development organization.
- Use art to help make urban schools the best places to develop pattern recognition skills.
- Use public art to radically enhance the public realm and "create conditions for serendipity". Good public spaces encourage civic engagement, and public art plays a key role in enlivening the public realm.

MX ZONE - NOT DESIGNATED TO DATE

To address recommendations concerning nodal development in the 2002 POCD and the 2006 Strategic Economic Development Plan (SEDP), and to offer greater development flexibility, the town added a Mixed Use (MX) floating zone to the zoning code in 2007. The MX zone is a floating zoning classification that can be applied to projects within the identified Naval Base Node, Center Groton Node, Groton Downtown Node, and Route 1/Route 12/ Route 184 Node. The zoning regulations state:

> *The MX Zone is a special zone tailored to the unique characteristics of its area or its neighborhood and is intended to encourage design innovation and a mix of residential, commercial, and office uses appropriate for the site. The intent of the MX zone is to achieve the community character, land use, infrastructure, environmental, and other policy objectives related to a given "Node" depicted in the CSP [Community Structure Plan in the 2002 POCD]. Depending upon the specific Node, projects will vary in scale, uses, and other attributes. In general, however, the MX zone is intended to create compact mixed-use environments, which are pedestrian in scale and well-integrated with surrounding uses. These projects could generally be considered an "infill" form of development or redevelopment.*

The MX zone application includes a Preapplication Review with Preliminary Node Site Plan, Zoning Map Change, an MX Project Master Plan Application, and a Site Plan Application. All MX applications would automatically be considered a "Complex Application" and require a consultant fee/escrow as well as a Grant of Application Review Extension. In addition to the Master Plan, traffic impact studies, a Design Manual, a Market Analysis, and a Fiscal Impact Analysis are also required. To date, no development project has received an MX zoning designation.

While the purpose and goals of the MX zone are laudable and speak to the recommendations in the 2002 POCD and 2006 SEDP, the fact that no developer applied for or has successfully completed an MX application for a project in one of the Nodes can partially be attributed to the recession beginning in 2007, but also may be an indication that the process for the MX zone may warrant review. As a point of comparison, both the Waterfront Design District and the Nautilus Museum Design District have some similarities in purpose and design objectives, and require far fewer applications. The MX zone is, however, designed for projects of a much larger scale and scope. A study should be conducted to review potential barriers preventing successful implementation of the MX zone, and suggest recommendations for changes or incentives to encourage adoption and implementation.

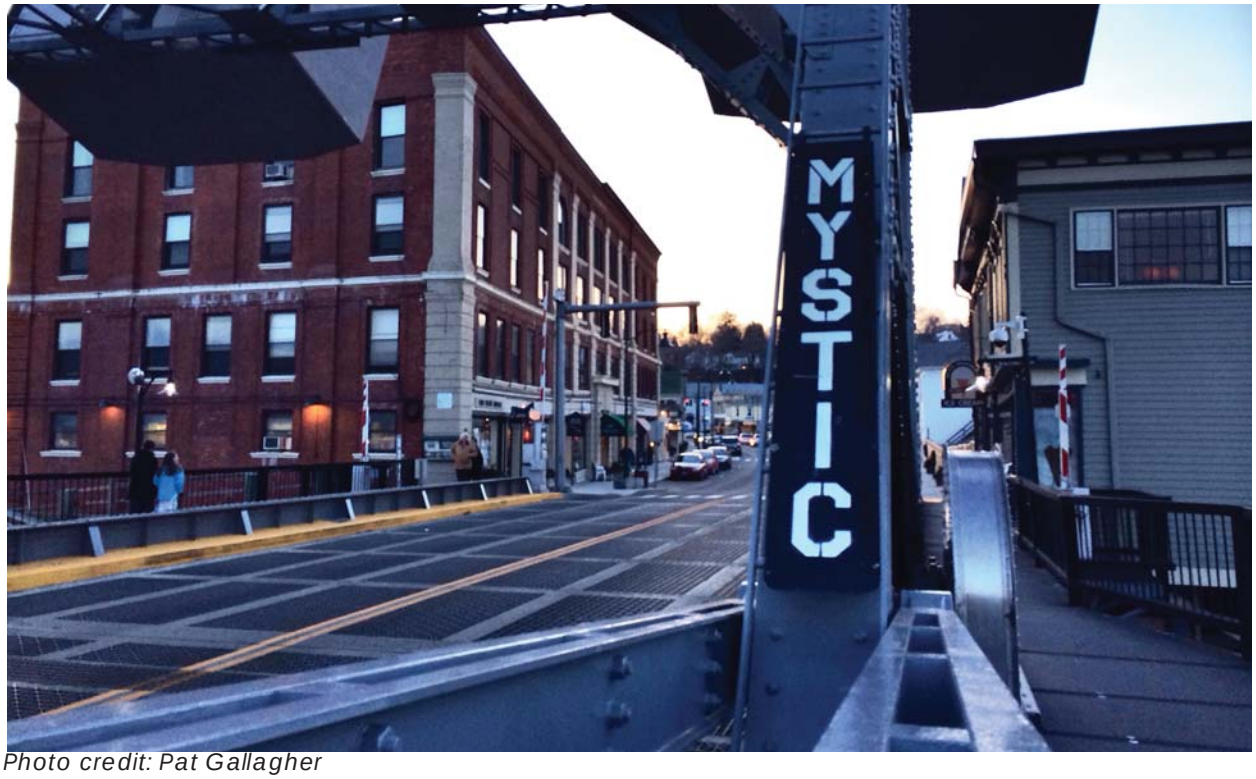


Photo credit: Pat Gallagher

Recommendations

3-1 Encourage development appropriate for each Node and discourage strip type commercial development patterns.

3-2 Focus infrastructure improvements in the Nodes to encourage development.

3-3 Modify the MX and other zoning regulations to clarify and simplify the approval process and provide incentives to encourage development in the Nodes.

3-4 Inventory existing development in the Special Focus Areas.

3-5 Create appropriate mechanisms in the zoning regulations to allow the implementation of sustainable development patterns in Special Focus Areas.

3-6 Encourage the development of neighborhood- and community-based services and business in Special Focus Areas and Nodes.

3-7 Locate important new civic and institutional facilities in the central Route 1 Node area to reinforce community structure.

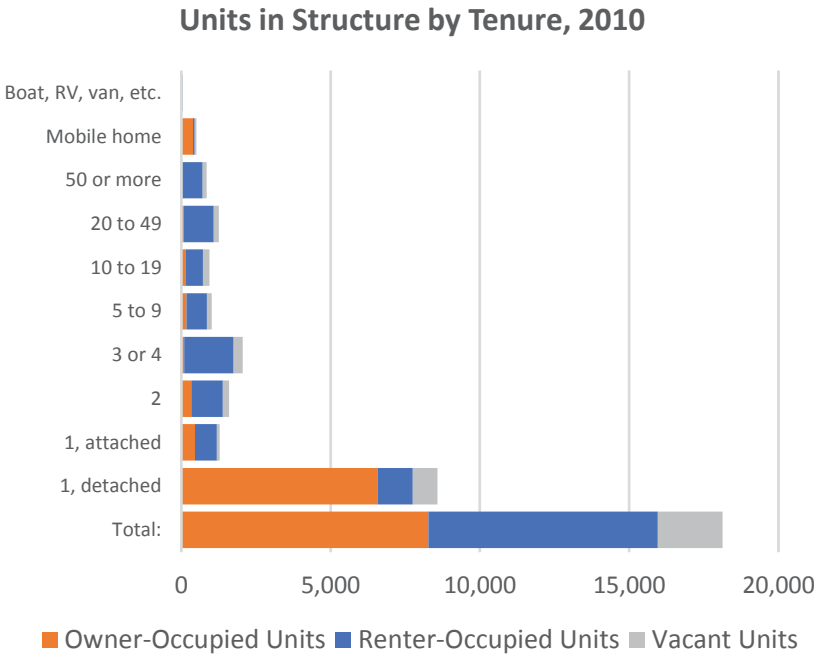
3-8 Develop a plan for the downtown Groton Special Focus Area that provides an orderly transition of land uses and development patterns from a dense mixed-use pattern to a less intensive pattern adjacent to existing residential neighborhoods. Create a pedestrian-friendly, walkable downtown plan with logical connections to adjacent neighborhoods.

3-9 Use Creative Placemaking as a tool for creating a viable Downtown Development District (DDD) and enhancing the Village Special Focus Areas.

ADDRESS GROTON'S CHANGING HOUSING NEEDS

EXISTING HOUSING STOCK

As one of the principal land uses within a community, housing and housing-related issues affect all residents. The form, layout, condition, and cost of housing available within a community are key to its residents' quality of life.



Single family detached houses are the most common housing type, at 47% of all housing units and 79% of owner-occupied units. Other single family housing types include attached housing, such as townhouses. Groton also has a diverse supply of multifamily housing, including two-family units (duplexes), small multifamily units, and larger apartment complexes.

AFFORDABILITY

The State of Connecticut requires that the issue of affordable housing be addressed in each municipality's Plan of Conservation and Development. The State legislature has established an Affordable Housing Appeals Procedure, commonly referred to as Section 8-30g, to provide assistance with development of affordable housing throughout the State. The procedure does not apply where at least 10% of the dwelling units in the municipality meet one or more of the following criteria:

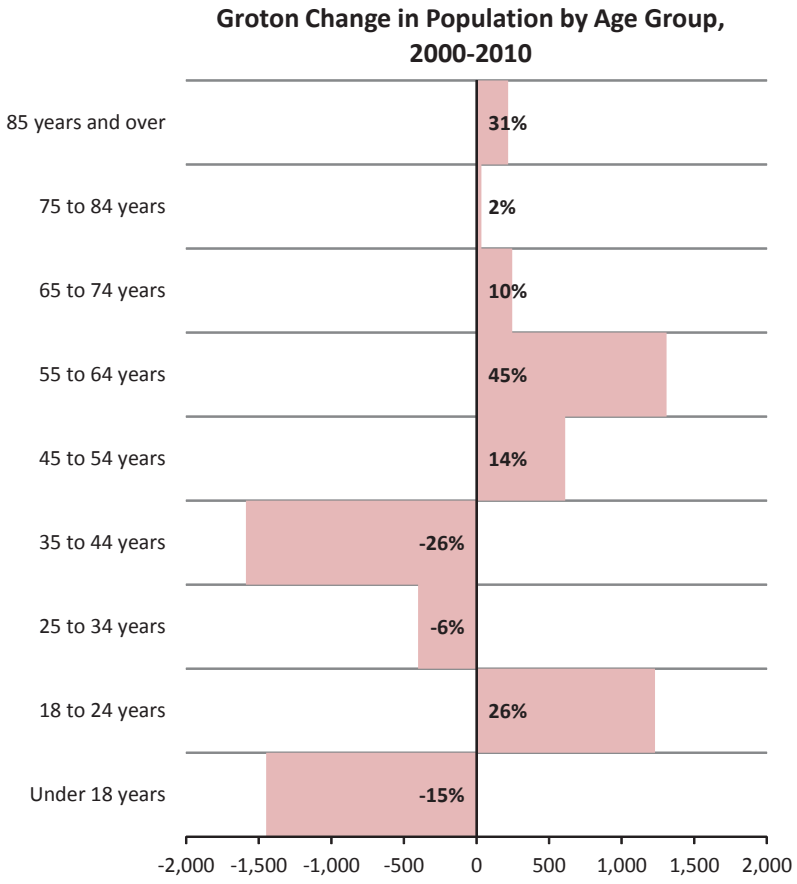
- governmentally assisted housing, units receiving either RAP (Rental Assistance Program) or Section 8 rental assistance;
- currently financed by Connecticut Housing Finance Authority (CHFA) or Farmer's Home Administration (FHA) mortgages;
- subject to deeds containing covenants or restrictions that require sale or rental at affordable levels.

In 2012, Groton was exempt from 8-30g appeals, with 20.41% of housing units meeting the CT DECD definition of affordable.

CT DECD does not include affordable unrestricted market rate units in its count of affordable units. There are many units in Groton, both single and multifamily, that serve as affordable homes for the town's population. For example, the average home sale price in Groton in 2012 was $237,500, which is affordable to a household with an annual income of $50,800 (based on Department of Housing and Urban Development (HUD) calculations of affordability).This is 12% lower than Groton's 2012 median household income ($57,731). Multifamily housing is also largely affordable in Groton. HUD issues an annual schedule of Fair Market Rents for counties and metropolitan areas across the United States. For 2013, the Fair Market Rent for the Norwich-New London area (of which Groton is a part) was $1,088 for a two-bedroom apartment. According to 2010 Census data, Groton's median rent was $1,099.

DEMOGRAPHIC CHANGES

Due to changing demographic and economic trends, a housing needs and market analysis may be useful to determine if Groton's housing stock is meeting the needs of the community. Groton has a relatively young population of a relatively stable size. The town experienced a 2% increase in households between 2000 and 2010, and had a median age of 33 in 2010, reflecting the influence of young Navy personnel and their families on the demographics of Groton. However, over the past 10 years, Groton has seen a decrease in its numbers of children, and an increase in older age groups.



Source: *U.S. Census 2000 and 2010*

On a household rather than individual level, the number of households headed by a person age 65 or older grew by 14%, from 3,044 in 2000 to 3,481 in 2010. This aging of householders has implications for the future of housing units in the community. Many older residents, facing fixed incomes and increasing mobility and health issues, may not be able to independently remain in their large single-family homes. Households in

Groton are also becoming smaller, with an 11.5% increase in householders living alone, from 4,512 in 2000 to 5,030 in 2010.

The majority of Groton's new housing development during the last decade was in the form of single family detached housing and single-family attached condominium units, as well as the development of the Ledges apartment buildings in 2003 and 2004. No multi-family development has occurred since 2006. There have been a number of demolitions and new permits since 2000.

As in many aging communities, elderly residents could be better served by housing choices that provide a variety of alternatives to large single-family detached housing or assisted living complexes. Existing land use regulations give a preference to traditional single-family houses and provides few options for elderly residents who wish to age in place.

FLEXIBILITY AND ALIGNMENT WITH FUTURE NEEDS

With shifting demographics come corresponding changes to housing needs. Land use regulations should accommodate future housing needs through changes in both the density and types of permitted housing units.

The Conservation chapter of this plan establishes Groton's goals of protecting natural resources, preserving and strategically expanding open space, protecting coastal resources, protecting cultural and historic resources, and promoting community character. To those ends, future housing developments should be encouraged in suitable areas that already have utilities and infrastructure, rather than greenfield development. Increasing density in already-developed areas allows for the production of more housing opportunities without sacrificing conservation goals. Density can be increased while also respecting historic development patterns and community character by utilizing well-designed, well-regulated infill development or redevelopment.

Building small multifamily buildings such as triplexes and quads, rather than large apartment complexes, could be one means of increasing density at a more human scale. This kind of building type has already been used in the City of Groton and in Mystic, where large (generally Victorian style) single-family houses have been converted to three or four units. Although this would be one method of reusing existing building stock and adapting it to current needs, these historic buildings help define community character, and care must be taken to preserve their defining features during alterations. With increased unit density, the provision of adequate parking on narrow streets must be addressed. Land use regulations should be revised to include standards for triplex and quad development types to address these issues.

In addition to smaller-scale multifamily developments or conversions, land use regulations should also be modified to permit greater diversity among single family housing products. Accessory apartments, which are already permitted in Groton, can be created from a finished basement or attic, or a finished unit above a garage. A small, free-standing structure built alongside a traditional single-family house on a large single family lot could serve this same purpose. Accessory apartments serve two primary functions in a community: making homeownership more affordable and accessible for moderate income households, and encouraging the provision of housing units for small households or individuals who are unable or unwilling to live independently. Although accessory

apartments are already permitted, the current zoning regulations should be revised to provide more flexibility; for example, the maximum floor area for an accessory apartment is currently 600 feet.

Example: Single family home in Mystic converted to multi-family.

Groton could also utilize a variety of other housing product types intended to make it affordable and convenient for elderly residents to live independently. Small "elder cottages" or "granny pods" allow elderly residents to live in a separate accessory apartment, but still close to the residents in the main residential property (such as adult children, other relatives, or friends). These may also be classified as temporary structures that could be removed on the sale or transfer of the lot.

"Cottage design" is another type of infill development. Instead of individual accessory units or "elder cottages" in the backyards of existing traditional single-family housing, multiple compact cottages are built as single-family homes around a common courtyard or other open space on the same lot in a small "pocket neighborhood".

Co-housing is another housing model that is organized as an intentional community. Co-housing developments are generally designed as small attached or single-family homes along a pedestrian street or around a shared central courtyard, similar to pocket neighborhoods, and typically include a larger common house that serves as the social hub of the community and provides other amenities. Co-housing communities are organized to include all residents in a participatory design and decision-making process, with residents managing their own communities and performing their own maintenance work. Such a model could be organized as an active older adult community, or also work well for single people or small families of any age.

Encouraging more mixed-use, multifamily developments could also expand the selection of housing options for elderly residents. As opposed to large, isolated apartment complexes, apartments or condos above retail or professional offices allow residents to live close to goods and services. This can be especially important for residents who do not drive or have limited mobility. In Groton, the population cohort between 24 and 35 is another large and growing group drawn to job opportunities in Groton that almost exclusively rents. These younger adults are another important driver of new housing and market opportunities.

Existing bulk standards should also be reviewed in terms of providing housing type flexibility and density. Zoning regulates the minimum lot area, width, area per dwelling unit, minimum yard setbacks, maximum building coverage, and height of different building types, which may not always be conducive to alternative building types.

Additionally, incorporating universal design principles, which encourage building designs that are fully accessible to older and/or disabled individuals, will also help Groton's housing stock adapt to residents who wish to age in place. For example, single-story buildings with access ramps and wide doorways allow people in wheelchairs to access and move through the building.

Example of an accessory apartment over a garage.
Photo credit: radworld (creative commons)

The City of Seattle's document "A Guide to Building a Backyard Cottage" (2010) provides design guidelines as well as setback and other massing requirements for detached accessory units.
Photo credit: City of Seattle

The 31-acre Troy Gardens project in Madison, WI includes an affordable co-housing community, with the open space used as community gardens, CSA farms, and native prairie/woodland. The gardens were planted in 1995, with the housing completed in 2007.
Photo credit: Madison Area Community Land Trust

Recommendations

3-10 Perform a multi-family (alternatives to single-family dwellings) housing analysis including a needs and market analysis.

3-11 Modify land use regulations to allow new product types including, but not limited to, additional accessory units, temporary structures, or cottage design in appropriate locations that will meet the needs of Groton's changing household profile.

3-12 Revise the regulations regarding the size, standards, and number of accessory units to provide more flexibility for the creation of new or the conversion of existing housing units.

3-13 Expand universal design (visit-ability) components of the regulations to allow aging in place and adaptive housing needs of all populations.

RESIDENTIAL BUILD-OUT MAP

About 14% of the town is classified as Vacant Land and 6% is classified as Agricultural Land, which could conceivably be developed for residential or other uses under current land use regulations. Understanding where the developable land is located within Groton and how much development can be accommodated based on existing regulatory controls and physical constraints on the landscape is the first step in establishing a development plan for the future.

In order to understand the development capacity of residentially zoned land in the town, each parcel's capacity to accommodate new development was assessed based on the presence of development constraints and existing zoning. For the purpose of this study, development constraints were defined and deductions taken according to the following assumptions:

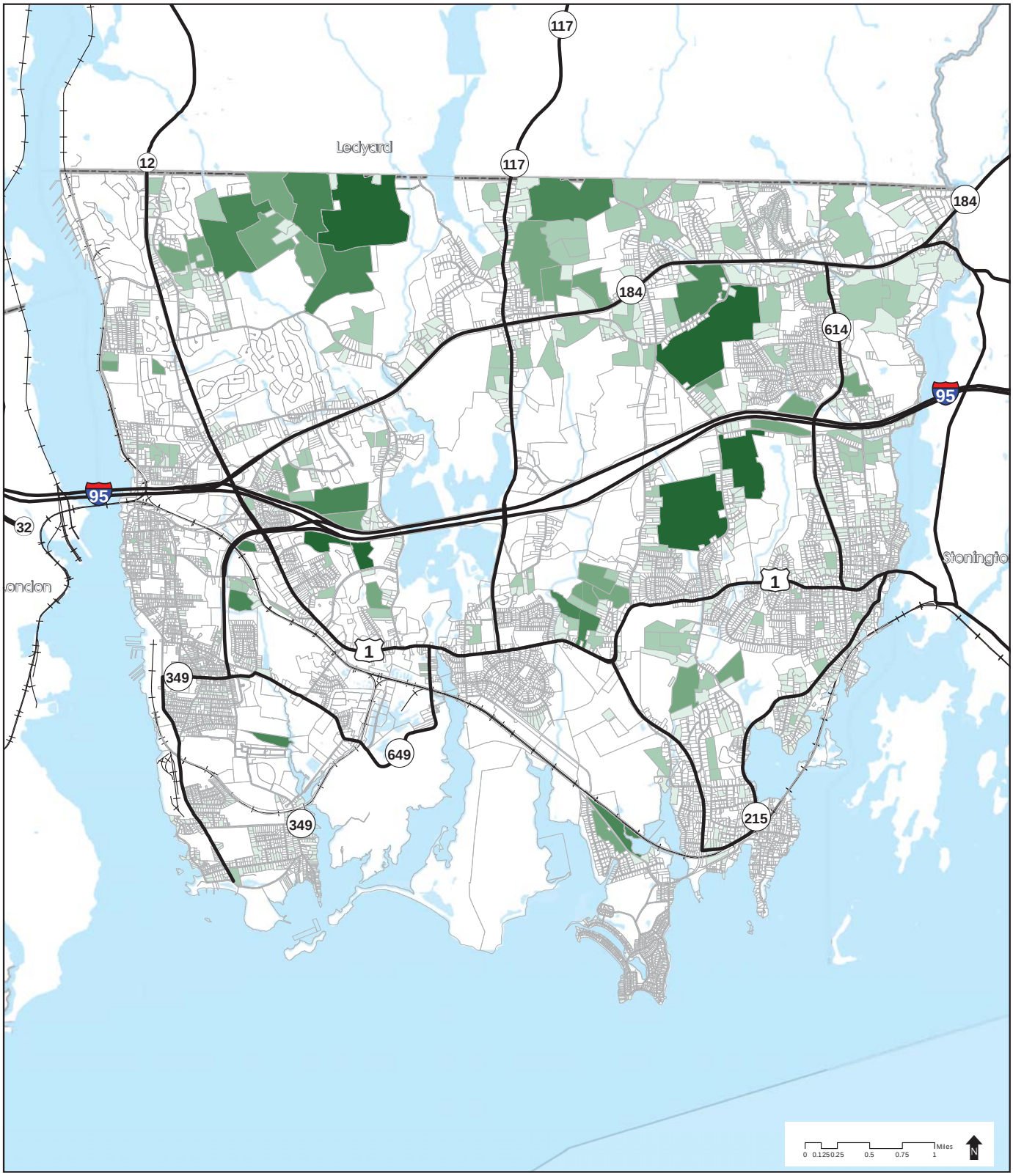
- 100% deduction of FEMA 100-year flood zones, water courses and bodies, and inland wetlands and tidal wetlands
- 80% deduction of steep slopes >25%
- 35% deduction of moderate slopes (15% to 24%)

These development constraints were deducted from the gross land area for each parcel, yielding a per parcel buildable land area (unconstrained land). From the buildable land area, 20% was factored out to account for the required internal roadways, stormwater retention, or open space offsets to result in a Total Net Buildable Land calculation. This analysis was done for both Vacant and Agricultural parcels and residentially zoned parcels with an existing residential structure that are large enough to be subdivided (greater than three times the minimum lot size as defined by zoning), and are referred to as "underdeveloped". From the Net Buildable Land area, the minimum lot size of the underlying residential zones was applied to yield an approximation of potential residential dwelling units for each parcel.

This analysis found that Groton at full build-out under current zoning designations has the potential to add 3,258 dwellings on raw vacant or agricultural land and 1,272 dwellings from the subdivision of underdeveloped existing single-family residential lots. 90% of the potential units would be single-family houses, as there is limited potential for new units in multifamily developments (468 units).

Much of the vacant, underdeveloped, or agricultural land in the town is north of I-95 or along the Ledyard border on large residentially zoned parcels. This area is largely rural in character, with limited road access, utilities, or public infrastructure. Large portions of this area also fall within planned sewer avoidance areas and the Water Resource Protection District, which could further limit actual residential build-out capacity. Full development of these areas would not align with conservation goals to preserve Groton's agricultural land and natural open space. Zoning and land use regulations for northern Groton should be carefully reviewed and revised in order to promote appropriate development patterns that consider natural resources, the presence or absence of infrastructure, transportation access, and sewer avoidance areas.

Map D-11: Potential New Dwelling Units Under Full Build-Out



Groton
PLAN OF CONSERVATION + DEVELOPMENT

Potential New Dwelling Units Under Full

Potential New Dwelling Units per Parcel

- 0 - 5
- 5 - 20
- 20 - 50
- 50 - 100

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

April 2014

MILONE & MACBROOM

CURRENT RESIDENTIAL DEVELOPMENT

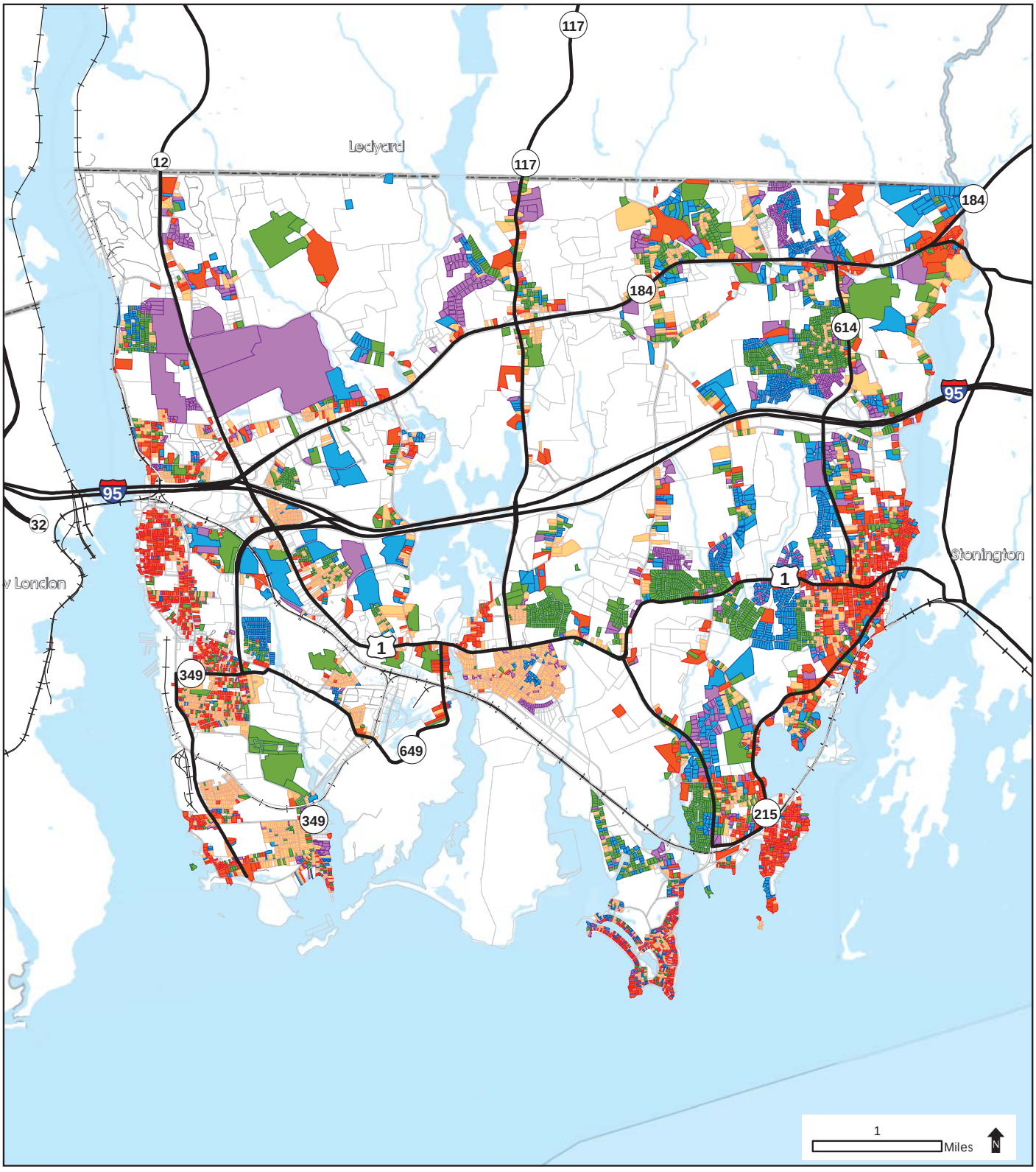
Map D-12, titled *Housing Stock by Year Built*, shows residential properties in Groton color-coded by the age of their associated housing structures in order to show how the community has matured in terms of its residential development. The oldest segment of the housing stock, built prior to 1939, can primarily be found clustered in Mystic, Noank, and the city's Thames Street neighborhood. From 1941-1959, housing developed along transportation corridors such as the Poquonnock neighborhood along Route 1, and the Eastern Point neighborhood in the city. The greatest growth in housing occurred from 1960-1979, from subdivisions expanding outward along transportation corridors, from infill in the established neighborhoods, and from multifamily complexes such as Branford Manor. The period from 1980-1999 saw growth in single-family housing in West Mystic, Old Mystic, infill in established neighborhoods, and the development of several multi-family complexes in the Route 1 downtown area. The latest examples of new housing stock, built since 2000, can be found in subdivisions north of Interstate 95, continued infill throughout town, and the redevelopment of naval housing along Route 12.

REGULATORY TOOLS

The town must balance conservation goals against providing an adequate housing supply for residents. A large proportion of new development is occurring in formerly agricultural areas in the north part of Groton as opposed to the town's traditional population centers south of I-95. These patterns contribute to "suburban sprawl" and the loss of open space in Groton while increasing the potential for destabilization of existing neighborhoods that are already served by utilities and infrastructure. To combat this trend, Groton should encourage more compact development in traditionally developed areas, such as the Nodes, which largely have support services, infrastructure, and transit. Increasing density in already developed, serviced areas is more sustainable than developing raw vacant land; however, incentives and/or changes to current land use regulations may be required to facilitate a reversal of this trend.

Multi-family housing in Mystic

Map D-12: Housing Stock by Year Built



Groton PLAN OF CONSERVATION + DEVELOPMENT

Housing Stock by Year Built

Housing Stock by Year Built

- 2000-2012
- 1940-1959
- 1980-1999
- <1939
- 1960-1979

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

October 2015

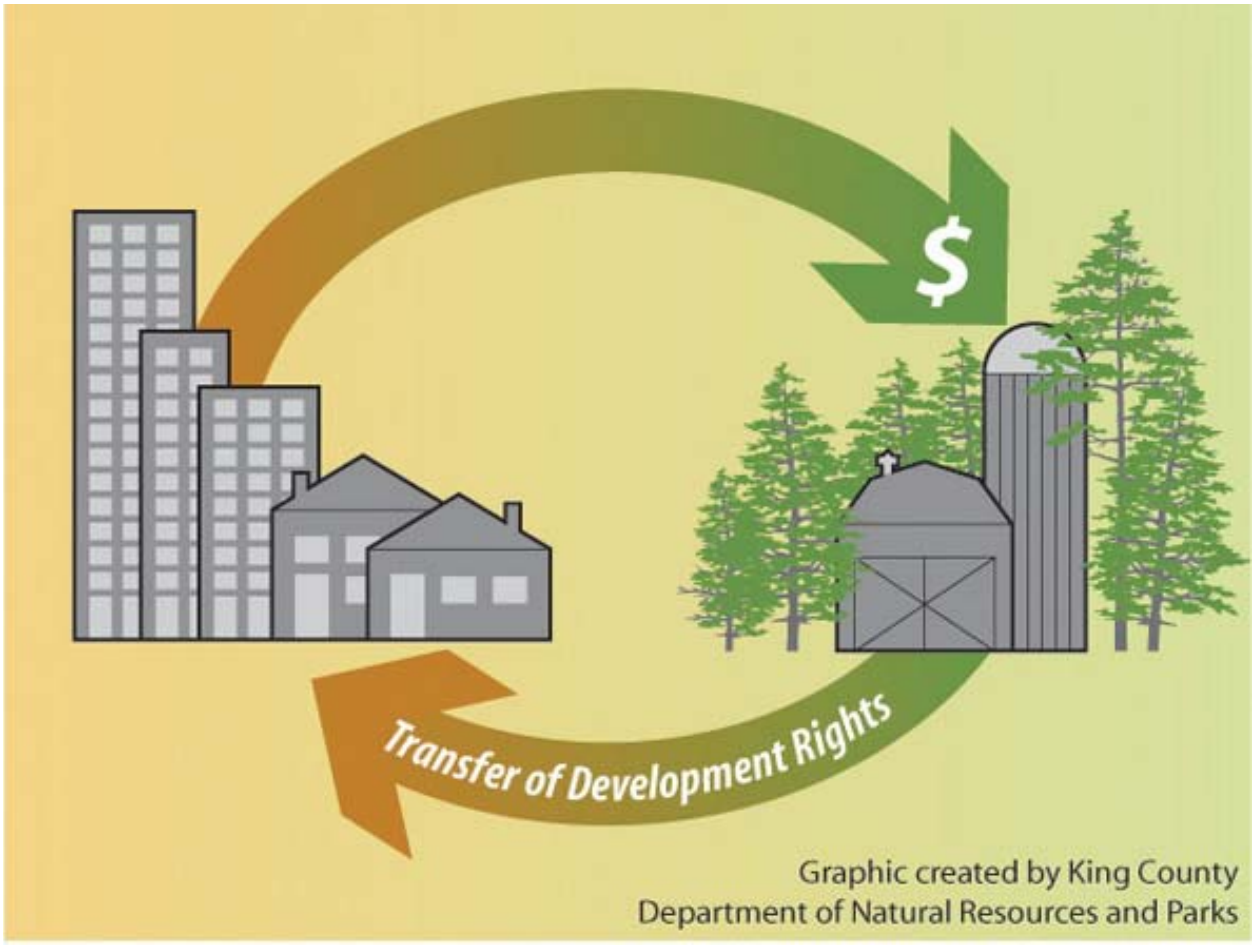
MILONE & MACBROOM

The following existing regulatory tools can be reviewed for their ability to influence sustainable residential development:

- Mixed Use (MX) Zones: The MX zone is intended to create compact, mixed-use environments, which are pedestrian in scale and well-integrated with surrounding uses. These projects could generally be considered an "infill" form of development or redevelopment. Implementation of the MX zone could provide valuable infill residential development at higher densities in appropriate areas .
- Nodes: Nodes are areas of more intense activity that serve as a focal point for the surrounding areas. Mixing residential units with commercial, retail, and other uses helps to increase density in appropriate areas.
- Design District: Design districts are areas that have developed or are intended to develop with significant guidance regarding use, intensity, and design characteristics, to protect and enhance their unique qualities while providing a mixture of residential, commercial, and office uses that serve the needs of area residents.
- Special Focus Areas: The downtown Special Focus Area is specifically intended to promote a denser pattern of development in the town center that encourages mixed uses. The village Special Focus Areas in Old Mystic and Poquonnock Bridge are focused on protecting and enhancing historic village development patterns, mixed use, and a pedestrian-friendly environment.
- Open Space Subdivision Regulations: By allowing individual lots within a subdivision to be smaller and clustering houses closer together, Open Space Subdivisions can preserve larger contiguous tracts of open space while maintaining the same overall housing density as a traditional subdivision. Current regulations should be reviewed and modified as needed to ensure that there is flexibility in development types and lot configurations to protect sensitive land.

As a supporting regulatory tool, Groton should also develop design guidelines or pattern books to guide development. Design guidelines or pattern books provide guidance to developers and help translate the goals of the POCD into desired outcomes for the design of streets, parks, open spaces, and buildings. Specific design guidelines can be developed for certain Nodes and each Special Focus Area to encourage mixed-use, pedestrian friendly, neighborhood-scale development that is appropriate for each area.

A Transfer of Development Rights (TDR) program is another tool for consideration to further incentivize preservation of open spaces and natural resources in the northern part of town while increasing residential density in appropriate areas, such as Nodes and fully serviced areas of town. Traditionally, when a parcel is bought it is assumed to have a "bundle" of different rights, including the right to develop. The development right for a parcel may be separated from the bundle of rights and sold separately from the land, offering an economic incentive for preserving land rather than developing it. In a TDR program, a parcel that is targeted for preservation may become a Sending Site, meaning its owners could sell their development rights to the property, receiving an economic return for preserving the property in perpetuity. The sale of the development rights acts as a conservation easement that stays with the land. These development rights could then be purchased by the owners of Receiving Sites. The newly purchased development rights would stack on top of their existing development rights, allowing the parcel to be developed at a greater density than originally allowed. Once in place, Sending Sites can sell their development rights on the free market to Receiving Sites, providing an additional incentive for both preservation and higher densities.



Graphic illustrating TDR concept. Image credit: King County Department of Natural Resources and Parks

Recommendations

3-14 Revise the residential zoning north of I-95 to promote appropriate development patterns, taking into account natural resources, infrastructure (or lack thereof), transportation, and sewer avoidance areas.

3-15 Revise the open space subdivision regulations to provide more flexibility, development types, and lot configurations to protect sensitive land.

3-16 Provide incentives to encourage mixed-use developments and higher housing densities in the Nodes and Special Focus Areas where support services, infrastructure, or transit are located.

3-17 Develop design guidelines or pattern books to encourage mixed-use, pedestrian-friendly, neighborhood scale development in the Nodes and the village and downtown Special Focus Areas.

ENCOURAGE SUSTAINABLE ECONOMIC DEVELOPMENT

A sustainable local economy is one that responds to the needs and desires of residents, provides diverse and robust economic opportunities for individuals and groups at every stage of growth, and successfully insulates the overall system against upheaval caused by major events or outside market forces, ensuring long-term, continually evolving economic resiliency.

A historic house on Route 1 that has become a Massage Therapy school, incorporating several elements of sustainable economic development, such as adaptation of a historic structure, supporting small businesses, and Low Impact Development.

ADDRESS GROTON'S CHANGING EMPLOYMENT TRENDS AND COMMERCIAL AND INDUSTRIAL NEEDS

GROTON'S TRADITIONAL ECONOMY

Throughout the 20th century, Groton was a community that derived much of its economic viability from a few key employers – the Naval Submarine Base, Electric Boat, and Pfizer. After World War II, Groton's economic development was largely driven by these national corporations and the military, tying the town's fortunes to production decisions that lay well outside of local influence. The size and strength of these few employers provided Groton more economic stability than that which many neighboring communities experienced; however, their prominence left the town vulnerable to serious economic disruption if those entities laid off or relocated significant numbers of employees. This reality continues to impact large-scale economic development decisions in the town today.

ECONOMIC ACTIVITY SINCE 2002

Since the last POCD was adopted in 2002, Groton's population and labor force figures have been largely static. The total population grew by 229 people (0.6%) between 2005 and 2010, and the resident labor force declined by 199 (-1.0%). The top five employers have remained the same from 2002 to 2012, led by Groton's big three – the Submarine Base, Electric Boat, and Pfizer. However, employment at these businesses declined by over 4,000 employees and their share of total top ten employees declined by 1.4% over the decade. Businesses new to the 2012 list of top employers were from the hospitality and medical sectors. This transition is consistent with nationwide trends regarding the rise of the service sector. During this time, the town has become less dependent upon its top ten employers as employment in those businesses declined from 91.3% of all jobs to 80.6% over the past decade.

Groton's Major Employers

		2015		
Name	Nature of Business	Employees	Rank	Percentage of Total Town Employment
U.S. Navy Submarine Base	Military Base	9,445	1	33.4%
Pfizer, Inc.	Pharmaceutical	6,500	2	23.0%
Electric Boat Corporation	Submarine Mfg/R&D	5,577	3	19.7%
Town of Groton	Municipality	1,283	4	4.5%
Theater Aviation Sustainment Maintenance Group	Helicopter repair	709	5	2.5%
Mystic Marriott	Hotel/Conference Center	243	6	0.9%
Fairview Retirement Community	Senior Living	214	7	0.8%
PCC Structurals (1)	Manufacturer	206	8	0.7%
City of Groton	Municipality	194	9	0.7%
DealerTrack	Automated Motor Vehicle Registration	175	10	0.6%
Lawrence & Memorial Facilities	Hospital			
Doncasters Precision Castings	Manufacturer			
Proto-Power Corporation	Engineering/Design			
		24,546		86.8%

(1) Formerly known as Wyman Gordon Company

Source: 2015 Groton Comprehensive Annual Financial Report, Table 13

The Submarine Base in Groton remains the town's largest employer with 9,710 Navy personnel in 2012, or 35% of total town employment. The base has housing and support facilities for more than 21,000 civilian workers, active-duty service members, and their families.

In 2011, Pfizer downsized its Groton operations and laid off approximately 1,100 employees. Although Pfizer announced in 2014 that it anticipated maintaining its workforce at its research and development campus in Groton for the foreseeable future, the pharmaceutical giant has in recent years vacated several of its buildings, including its 26,000-square-foot glass visitor center (Building 114), the 24,000-square-foot Building 286, and its 47,000-square-foot Building 230. Pfizer also chose to demolish its 750,000-square-foot laboratory and R&D space, Building 118, in 2013. Many of these vacated buildings have been acquired and reused by other major facilities.

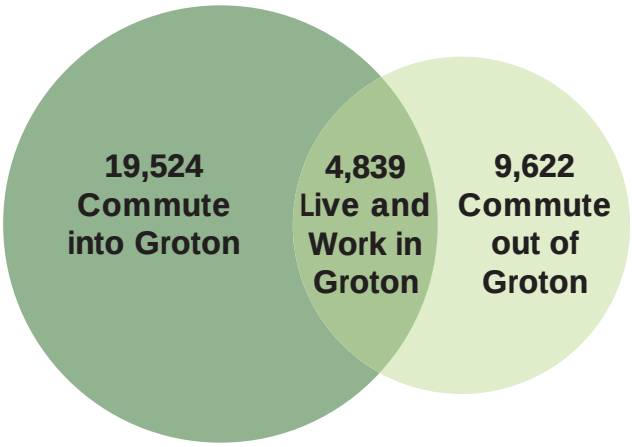
In 2014, Electric Boat announced plans to expand their Groton facilities, embarking on a $31.5 million expansion that will purchase and renovate a Pfizer building and substantially improve its facilities. Electric Boat has planned a $100 million upgrade to its facilities in Groton to accommodate the construction and refitting of submarines over the next decade. Electric Boat has also announced plans to add 200 jobs over the next two years.

Additional investments that have impacted the economy of the town include:

- Development in the Route 184 and Route 117 Commercial Corridor focused on healthcare, manufacturing, and hospitality uses, such as the L&M Pequot Health Center expansion, Hilton Gardens, and the proposed Walmart Superstore expansion.
- The trend in the Route 1 Downtown Commercial Corridor has been reinvestment in existing retail commercial centers and multifamily housing, such as Big Y, Connecticut Center for Massage Therapy, and the Ledges multifamily development.
- The Route 12 Commercial Corridor development included modification and expansion of retail uses, restaurants, hotels, and auto dealerships. Prominent among these are Advanced Auto Parts, Best Western Olympic, and Dunkin' Donuts.
- The trend in the northern area of Mystic/Old Mystic includes combinations of various commercial and recreational uses such as the Haley Brook Plaza, Fields of Fire outdoor paintball arena and aerial adventure park, and Mystic indoor sports facility.
- In the downtown Mystic area, significant public investment was incorporated into the downtown Mystic streetscape project. Several new restaurants were opened and outdoor dining was explored.
- Improvements in the City of Groton have focused on infrastructure improvements of city and state facilities, such as the Connecticut Department of Energy & Environmental Protection dock, streetscape reconstruction on Thames Street, and the Marine Sciences Building on the UCONN Avery Point campus. A new marine science magnet high school was also constructed on the site of a previous elementary school.
- In the Groton-New London Airport, a Master Plan revision for the airport was completed, and the Airport Business Park for industrial development and construction of flex space was greatly expanded.
- While Foxwoods Resort Casino (in Mashantucket, Connecticut) and Mohegan Sun (in Uncasville, Connecticut) are not located in Groton, the casinos provide employment opportunities to residents and draw in tourism to the region as a whole. However, both casinos are still recovering from the economic impact of the recent recession.

COMMUTING PATTERNS

Groton is a net importer of workers. According to 2013 data available on the U.S. Census OnTheMap website, there are 24,363 primary jobs in Groton, and 14,461 workers living in Groton. Only about 20% of the people who work in Groton also live in Groton, with 80% of workers commuting in for employment.



There are many reasons why a household may choose to live in one town and commute to work in another, especially with the rise of two-income households where couples may have to compromise on location, or other personal, family, and consumer demands. However, there is a widespread belief in Groton that a large number of people make a conscious decision to work in Groton and live somewhere else, especially higher-income workers with greater freedom of mobility. The top 10 most common towns of residence are shown in the chart Groton Workers and Town of Residence; after Groton, the most common towns are nearby Stonington, Ledyard, New London, and Waterford.

Groton Workers and Town of Residence

Town of Residence	Number	%
Groton	4,839	19.9%
Stonington	1,641	6.7%
Ledyard	1,593	6.5%
New London	1,298	5.3%
Waterford	1,259	5.2%
Norwich	1,204	4.9%
Montville	1,086	4.5%
East Lyme	1,048	4.3%
Westerly, RI	928	3.8%
North Stonington	501	2.1%
All Other Locations	8,966	36.8%
Total Groton Workers	**24,363**	**100.0%**

U.S. Census Bureau. 2015. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/

Interviews conducted through the recent Economic and Market Trends Analysis by the consulting group Camoin Associates suggest that a major reason that more workers do not choose to live and invest in Groton is that other communities offer more to potential residents. The report especially pointed to a lack of "sense of place" that challenges Groton and makes it an undesirable place to live. Findings from this report include a need for future improvements to provide more amenities, mixed-use developments, and infrastructure improvements to draw some of these professional workers to live and invest in Groton. See also the creative placemaking strategies discussed under "Downtown as a Priority Redevelopment Area."

SUSTAINABILITY THROUGH DIVERSITY

Traditionally, the presence of Groton's large employers and the lucrative tax revenues they provide presented little incentive toward the town pursuing more diverse and smaller-scale economic development strategies. However, a diverse economy is more sustainable than one that is dominated by a handful of large entities, and is less easily disrupted by internal or external events or crises.

Groton should encourage sustainable economic development using incentive programs and its regulatory powers. Existing land use regulations could be modified in a variety of ways to encourage development in locations where it could be most advantageous, and at densities that most closely adhere to the community's long-term needs. The town could also enact a demolition delay ordinance, similar to what was recently adopted in the City of Groton, to provide some measure of protection against the sudden demolition of privately owned structures that have high historic or economic value for the community.

Economic development activities in Groton should be focused on startup, small, and medium-sized businesses that are likely to experience ongoing growth. Fostering these smaller businesses to a greater degree would help ensure a more sustainable economy for Groton – one that is nimble, has developed from the grassroots level, and is responsive to the needs of local residents. These home-grown businesses provide economic diversity, are frequently rooted in local knowledge and needs, and enhance the overall quality of life in Groton.

Groton Employers by Number of Employees and Industry Category

		# of Employees					
Category	**Total**	**1 to 4**	**5 to 9**	**10 to 19**	**20 to 49**	**50 to 99**	**100+**
Forestry, fishing, hunting and agriculture support	1	1	0	0	0	0	0
Construction	50	40	5	1	4	0	0
Manufacturing	24	11	5	3	2	0	3
Wholesale Trade	35	18	7	8	1	1	0
Retail Trade	233	118	64	25	17	5	4
Transportation and warehousing	14	7	1	1	4	1	0
Information	13	6	1	4	1	0	1
Finance and insurance	65	30	21	8	3	3	0
Real estate and rental and leasing	46	35	6	3	2	0	0
Professional, scientific and technical services	121	81	15	11	5	5	4
Management of companies and enterprises	2	1	0	1	0	0	0
Administrative and support, waste management and remediation	37	28	2	4	1	1	1
Educational services	9	4	1	3	0	1	0
Health care and social assistance	134	44	31	37	10	6	6
Arts, entertainment and recreation	35	14	8	9	2	0	2
Accommodation and food services	158	46	30	37	33	11	1
Other services	119	65	31	17	5	1	0
Industries not classified	2	2	0	0	0	0	0
TOTAL	**1,098**	**551**	**228**	**172**	**90**	**35**	**22**

Source: 2010 ZIP Code Business Patterns, U.S. Census Bureau. Zip codes 06340, 06349 and 06355 which includes a portion of the Town of Stonington.

LOCAL MARKET OPPORTUNITIES

The portion of Groton's economy called local population dependent economic activity is driven by the routine household expenses of local residents. Total Groton household budget expenditures exceed $1.1 billion for all categories of goods and services. Housing expenditures, consisting of shelter and utility costs, make up the greatest share of these expenses at 31.8%, followed by transportation at 13.9%, and food at 12.1%. Smaller shares of household expenditures are made up by clothing, consumer goods, personal care, entertainment, and other goods and services.

According to 2010 Census Data (ZIP Code Business Patterns), Groton has 233 employers in the Retail Trade Industry. These are generally smaller stores, with 118 establishments employing 1 – 4 people.

Additional data show that Groton residents buy many of their goods outside of Groton. Data from 2012 (Esri and Dun & Broadstreet) calculate what residents spend on different industries, and the amount of sales that the town actually supplies to produce a 'surplus' (non-residents are coming and spending money) or 'leakage' (residents are going out of town to spend money) factor. For example, total retail trade and food and drink demand (retail potential) was calculated to be $475,392,395 for Groton in 2012. The supply (retail sales) was calculated to be $474,039,649, with a retail gap of $1,352,746 more demand than supply overall and a leakage factor of 0.1.

However, a more detailed look at specific industries can be used to develop plans for economic development. For example, Groton has 12 grocery stores with $54,388,428 in retail sales, but residents spend $74,523,417 at grocery stores, representing more than $20 million of sales outside of Groton.

To determine if Groton is truly underserved by grocery stores, and if a new grocery store (or any other types of retail or office businesses) in Groton would be successful, a more in-depth market analysis should be conducted. The Town of Groton has initiated such a market study with the consulting firm VHB and Camoin Associates. The scope of work for this market study includes:

- Land use and regulatory review of Groton's zoning regulations to outline areas of concern, suggest changes, and provide a road map to implement recommendations.
- A market analysis and review that will include demographic and socioeconomic trends, economic trends analysis, workforce analysis, leading industry analysis, residential market analysis, retail and restaurant market analysis, and real estate interviews.
- Analysis of opportunity areas, including Route 184, Route 117/I-95/Exit 88, U.S. Naval Submarine Base area, City of Groton, Long Hill Road Area, Route 12 and I-95/Exit 86, and Mystic. The analysis will identify up to three priority development sites that offer the greatest potential for economic development.

The results of this market study can provide valuable information for determining appropriate retail and office uses in Groton based on future needs for the town. In particular, Groton should use the findings of these reports to streamline the regulatory approval process in an effective manner. The findings from the Market Analysis can also provide information on where Groton's current market is not supporting local demand, resulting in "leakage" as residents of Groton and nearby communities drive elsewhere

to fulfill consumer needs in different niches. Groton should aim to emphasize support to business growth that fills these market demands.

SMALL AND GROWING BUSINESSES

Most of the businesses (70.9%) in Groton have fewer than 10 employees and only 22 businesses employ more than 100 people. The town's economy has a diverse mix of small businesses combined with several key large-scale industrial enterprises. Groton can further diversify its economy by fostering these small businesses, affording them opportunities to grow in town.

Regional and state economic development groups and the local Chambers of Commerce will be key partners in helping Groton to advance the agendas and growth of smaller businesses. Groton is supported by the Southeastern Connecticut Enterprise Region (seCTer), a public-private regional economic development agency whose purpose is promoting the region's attractiveness, encouraging new businesses, and assisting existing and expanding local enterprises. Groton also contains an Enterprise Zone, a DECD program created to encourage the reuse of the state's established industrial areas. Businesses located in these zones can take advantage of a package of state and local incentives, including corporate tax credits, property tax abatements, exemption from certain state sales and use taxes, state grants for the creation of new full-time jobs, job training and placement assistance, as well as other local incentives such as deferrals of taxes on business plant and equipment (personal property). These incentives generally provide financial relief or increase the capital/leverage available to businesses, thus reducing the overall cost burden of the business.

Assistance to different businesses could be tailored to their specific needs and current stages of growth, with new businesses benefitting most from assistance in incorporation and feasibility analyses, and developing businesses benefitting from customer research or mentoring. This "grow from within" strategy is sometimes called "economic gardening," an entrepreneurial approach that helps existing companies within a community develop new markets, refine their business models, and gain access to competitive knowledge.

NEW AND STARTUP BUSINESSES

In addition to supporting existing businesses, Groton should continue working to create an economic climate that is attractive to new businesses, particularly startups. Most commonly used to refer to technology firms, "startup" describes any newly created business that incorporates plans for active, scalable growth from its outset. Entrepreneurship should be a key component of Groton's economic development program. Groton has a wealth of engineering and scientific intellectual capital within its borders that has the potential to create a strong entrepreneurial environment. While traditional economic development offices are often focused on business attraction, Groton should target direct services to entrepreneurs, to capitalize on their potential to incubate businesses that best fit Groton's existing resources. Working in conjunction with other surrounding communities, Groton could help start a regional business accelerator program or a startup "competition," where entrepreneurs with ideas for new businesses could be assisted.

HOME OCCUPATIONS (HOME-BASED BUSINESSES)

Home-based businesses, called Home Occupations in Groton's zoning regulations, are often entrepreneurial in nature and should be considered strong assets to the economic

viability of the town. Groton's zoning regulations permit residents to conduct business activities in their residentially zoned homes with approval of an administrative site plan, provided certain conditions are met and the businesses are registered with the town. Under current zoning regulations, Home Occupations may not occupy more than 25% of the gross floor area or 500 square feet, whichever is less, and may not alter the exterior residential appearance of the dwelling. The regulations require that employees of the Home Occupation be confined largely to family members residing in the dwelling, and restrict advertisements, signage, patronage, outdoor storage, parking, and environmental impacts associated with the business.

The Home Occupation regulations have remained unchanged since their adoption in 1991 and do not account for changes that have occurred in home-based business activities as a result of technological innovations, such as broadband internet, smart phones, low-cost print/fax/scan systems, digital credit card readers, 3D printing, etc. These technologies have had a profound impact on the wider business community, and have made work-from-home opportunities much more broadly available, from entrepreneurs to remotely working employees of large corporations. Tech startups in particular have established a reputation for incubating in residential environments, and some of the largest firms in the world, including Google, Amazon, and Apple, all initially operated out of their founders' residential properties.

In an economic climate in which startup businesses can be the foundation of new industries, and advantageously diversify local economies, Home Occupation uses should be encouraged. Groton's current regulations on Home Occupations should be reviewed where needed, such as enacting zoning changes to promote in-home occupations in all zones if they do not create significant parking or traffic impacts. Additionally, home occupations that are located in areas that are appropriate for higher density, such as Nodes and Special Focus Areas, may consider more intensive home occupations (such as allowing more customers to visit, etc.).

INCUBATOR AND CO-WORKING SPACES

In addition to Home Occupations, newly created businesses also gain footholds in their markets by locating in inexpensive incubator spaces. The availability of flexible business space is important to the town's small business promotion efforts. Typically operated by private companies, municipalities, or public institutions, business incubators offer more than just below-market-rate office or manufacturing spaces, they may also include business support resources, services, equipment, networking opportunities, and professional business expertise to aid fledgling companies. Incubators are invested in the success of the businesses that they partner with and require interested new businesses to apply for membership with a promising business plan.

Groton could encourage entrepreneurship in targeted industries by participating in the development of incubator spaces reserved for those industries. The recent announcement of the Connecticut United for Research Excellence (CURE) Innovation Commons reuse of vacant Pfizer lab space for incubator space is an excellent example of this technique. CURE is a nonprofit network of bioscience companies that aims to help spur job growth through supporting bioscience startups. Groton should continue to encourage business incubator spaces, and should consider regulatory standards and incentives to site incubators in appropriate locations.

Entrepreneurs seeking spaces where placement is less competitive or has fewer restrictions may instead seek out a co-working space. Co-working spaces provide a shared working environment for individuals and small groups that are not employed by the same organization or in the same industry. Co-working provides an alternative to professionals who might otherwise be working in their homes, offering socialization, opportunities for collaboration and networking, and shared resources and amenities such as conference rooms. Some co-working spaces focus on the services that they offer member entrepreneurs, while others focus on opportunities for community and collaboration.

Example of office space that can be rented on an hourly or yearly basis, at 500 Bridge St., Groton.
Source: Coldwell Banker

Recommendations

3-18 Modify home occupation standards with respect to current technology trends and the ability to operate businesses in numerous locations, and to allow additional uses or more intense uses within the Nodes and Special Focus Areas.

3-19 Increase focus of economic development efforts on small businesses, resource sharing, incubator space development, and redevelopment of key areas.

3-20 Update the Water Resource Protection District regulations to protect the town's drinking water supply resources and to use creative tools to manage land use in light of current construction and water quality treatment practices.

3-21 Use the 2015 Market Analysis to establish a program to support the future retail and commercial needs for the town.

PROMOTE SUSTAINABLE COMMERCIAL, INDUSTRIAL, AND MIXED-USE PRACTICES AND DEVELOPMENT

COMMERCIAL AND INDUSTRIAL LAND USES

Groton has well-established and significant commercial and manufacturing sectors. The town must effectively plan for the future land use needs of these sectors, and ensure that lands that are currently zoned for commercial or industrial use remain suitable for those uses. To that end, Groton should analyze existing data regarding the number, location, and concentration of existing commercial and industrial sites, and compare those values to the areas that are currently zoned commercial or industrial. The Planning Commission and Zoning Commission should work in conjunction with the Economic Development Commission to determine whether properties that are currently commercially or industrially zoned are zoned appropriately based on the sites' existing utilities, topography, and natural resources and the uses that are permitted on the land. Within these areas, vacant properties would be particularly well suited for rezoning in situations where the parcel is not compatible with the uses permitted under the current zoning.

Vacant industrial or commercial land poses an interesting set of opportunities and concerns. These properties are particularly attractive as development sites, but development can pose a potential threat to sensitive environmental and cultural resources on some sites. The developable acreage of key vacant industrial and commercial parcels should be identified, and future development should be steered toward these parcels and away from sensitive resources. Groton is currently undertaking a market study that examines where Groton fits into the regional market and identifies areas to target for future investment, representing a proactive approach to economic development that is based on data analysis and comprehensive knowledge. This approach could be expanded to incorporate a Market Analysis for Groton's commercial and industrial needs, including the sectors' future land area requirements.

In recent years, Groton has faced several instances of large-scale industrial buildings becoming vacant, and has witnessed a variety of outcomes to these vacancies. On the positive end of the scale, in 2014, Pfizer donated its 24,000-square-foot Building 286 to Connecticut United for Research Excellence (CURE), a bioscience association of more than 90 life science companies and entities. With a $4.2 million state grant, CURE is opening a tech incubator called CURE Innovation Commons in the building. On the negative side of the scale, Pfizer's former research headquarters, known as Building 118, was demolished in 2013 after a lengthy effort by the town and state to find a new tenant for the facility. Ultimately, Pfizer determined that demolishing the 750,000-foot-structure, at an estimated cost of $2.193 million, was preferable to selling or leasing the building.

Needless to say, the loss of valuable and functional sites such as Building 118 undermines Groton's tax base and industrial strength. The demolition of the building also represented a tremendous loss of economic potential and physical resources. Retaining and reusing economically viable buildings is a key component of smart growth and sustainable development principles. Losses as a result of unnecessary demolition are typically

calculated from environmental metrics, but they also have a significant economic impact. Unnecessary demolition results in the loss of embodied energy and an increase in landfill waste. Embodied energy is the sum of the energy consumed by extracting raw materials, processing those materials into a finished product, transporting them to the building site, and installing the building components into a structure. Fifteen to 30 times as much energy is used in the construction of a building than in its annual operation. The environmental and economic benefits of retaining structures such as Building 118 are overwhelming and comprise a vital component of Groton's sustainability goals.

NODAL DEVELOPMENT

Groton's Nodes are intended to be areas of concentrated, contextually appropriate development that promote walkability and integrate a variety of uses within an authentic local place. To attain these density goals, new commercial and mixed-use development should be located within the Nodes whenever possible. Property owners and developers should also be encouraged to reuse; repurpose; and, where necessary, redevelop existing built properties in Nodes. Ongoing investment in these built environments is consistent with Groton's prioritization of sustainability in its economic development goals and helps to ensure the area's long-term success.

Other municipalities have incentivized the adaptive reuse of existing buildings, facilitating the conversion of historic and non-historic structures into new uses and modified forms. In Los Angeles, dozens of underutilized structures have been converted into several thousand new housing units since the adoption of its Adaptive Reuse Ordinance in 1999. Also focused on densely developed portions of the municipality, the ordinance provides for an expedited approval process and ensures that older structures that are noncompliant with current zoning and code requirements are not held to the same compliance standards as new construction. Instead, adaptive reuse projects are subject to special guidelines. In Connecticut, many communities provide density bonuses for adaptive reuse of historic and significant structures.

CONCENTRATED DEVELOPMENT WITH SHARED AMENITIES

The economic potential and sustainability of some commercial areas, particularly Nodes and Special Focus Areas, could be strengthened through more concentrated development patterns that utilize a diverse mix of uses and apply systemic plans for access, parking, and circulation. When strategically employed, shared parking, access, and circulation allow sites to be used more intensively and efficiently, increasing the site's economic return, permitting a higher yield of goods and services for the community, utilizing existing utilities and infrastructure, and creating a cohesive design.

The contribution that parking lots and driveways make to the character of a community is minimal, so finding opportunities to share these resources among neighboring properties reduces the need to dedicate large expanses of valuable commercial or industrial land to these auto-oriented uses.

Additionally, shared parking promotes a more vibrant pedestrian street presence as shoppers and visitors park once then navigate the area on foot, visiting multiple establishments during each visit. Shared parking strategies could be employed either through:

- Contractual agreements between adjacent property owners; or
- Parking management districts, where multiple property owners throughout the district share all provided parking spaces.

Shared parking arrangements are most successfully employed in mixed-use environments where adjoining land uses are dissimilar and consequently experience different peak hours of use, but can also be effective where adjoining land uses are complementary, encouraging patrons to go from store to store, (e.g. retain shopping and dining). Generally, the preferred parking-space-to-front-door distance that a person is willing to walk for shopping or work is 400 to 800 feet, and the maximum is generally 1,200 feet. In addition, walkways, crosswalks, decorative paving, stop signs for cars, and landscaping are needed to allow pedestrian flow through the parking areas, such that the shared parking area is well-integrated into the development.

One of the purposes of Groton's MX zone is to facilitate the sharing of parking in Nodes. Groton could make shared parking more attractive to developers by providing zoning incentives, such as an increase in floor area ratio (FAR) and increased flexibility in certain bulk regulations, such as building coverage or height. As development density in Nodes increases, offering incentives for shared parking will become less necessary because a scarcity of land will provide an intrinsic economic incentive for sharing parking facilities.

RETROFITTING WALKABILITY

Currently, much of Groton's older commercial developments conform to the styles and forms typical of mid-twentieth-century strip development, which is car-oriented and typically has limited architectural character. New business development is also occurring in strips along major roads with separate curb cuts. While these areas meet the acute need for commercial shopping, they do not make a significant contribution to meaningful community character or add to the quality of life in Groton. Conversely, residents and visitors to Groton identify most strongly with the mixed-use village patterns that exist in Mystic and Noank. These centers have more intense activity that serves as a focal point for the surrounding areas with a development pattern that is appropriately scaled to the location.

While regulatory measures can be put in place to encourage the wholesale redevelopment of strip commerce, increasing the walkability and visual appeal of existing strips can be a challenge. State ownership of the roads on which many of these strips are located places potential improvements to their sidewalks and streetscape under the purview of the State of Connecticut, further limiting local options. However, remedies of varying intensity do exist, ranging from incentive programs to design strategies.

Many communities have sought to improve the visual character of their commercial districts using façade improvement or commercial rehabilitation programs, typically funded through municipal grants or loans. Administered by the CT DECD, Small Town Economic Assistance Program (STEAP) funding has been used for commercial revitalization programs in Berlin ($400,000 in 2007) and Hebron (more than $850,000 between 2006 and 2008). Façade programs have been funded nationally utilizing CDBG grants from the Department of Housing and Urban Development and the Community Development Administration under the provision of Title I of the Housing and Community Development Act of 1974.

Groton's MX zone, intended to encourage the development and redevelopment of auto-oriented areas into denser, mixed-use, and more pedestrian-friendly developments, has not been utilized since its creation in 2007. The MX zone regulation should be assessed to determine what hurdles it has posed, and how the regulation could be revised to encourage utilization by developers.

The City of Austin, Texas uses a combination of financial and regulatory incentives for mixed-use development. The Smart Growth Matrix system used by Austin allows the city to reduce or waive development fees for projects that are located in a designated center and meet specified land use and design criteria. Regulatory incentives include streamlined administrative review for projects that meet the code's standards for mixed-use and pedestrian orientation, the provision of density, and building height or floor area bonuses when a specified mix of uses is proposed and a high level of pedestrian orientation is provided. Other communities have incentivized mixed-use development and redevelopment by implementing tax abatements for mixed-use projects, permit fee reductions in targeted areas, or system development fee reductions or waivers in targeted areas.

The Mashpee Commons site before the streetfront was lined with buildings. The pictured strip construction was extensively renovated and remains to the rear of the "liner" buildings. © bettercities.net

Increased density and walkability, hallmarks of modern smart growth principles, can be difficult to incorporate into existing commercial strips without completely reconfiguring the buildings and layout of the area. The ubiquity of strip commerce has caught the attention of planners and urban designers seeking to rethink how existing strips could be reformulated, part of a concept referred to as "sprawl repair." In 2012, the University of Alberta sponsored an architecture and design competition called "Strip/Appeal, Reinventing the Strip Mall" that generated large numbers of design concepts rethinking and reconfiguring existing strip malls in highly creative, pedestrian-centered ways. One of the earliest and most successful strip mall retrofits was performed at Mashpee Commons on Cape Cod, where a single-story retail complex with expanses of front parking was converted into a walkable community using infill development and building renovations. At Mashpee, narrow infill buildings with both a front and back entrance, called "liners," were constructed on the street frontage, while the existing strip mall at the rear of the parcel was extensively renovated, creating a parking area and pedestrian concourse between the two sets of structures. On-street parallel parking was then instituted in front of the liner buildings.

The frontage of 20' deep "liner" buildings in Mashpee. © bettercities.net

DESIGN GUIDELINES AS A DEVELOPMENT TOOL

Groton currently uses zoning development regulations to shape development patterns and architectural forms in three Design Districts: the Mystic Waterfront Design District (WDD), the Groton Downtown Design District (DDD), and the Nautilus Memorial Design District (NMDD). The establishment of specific design guidelines for these districts would function to instill the character of the built environment within these districts, clearly communicating how their best features should be retained and incorporated into their ongoing development. The guidelines would establish a common understanding and common reference point for developers, architects, and planners mutually involved in the design and review processes.

Two additional areas would benefit from inclusion within a Design District: the Poquonnock Bridge area (already part of one of Groton's Nodes and designated as a Special Focus Area), and Old Mystic (already designated as a Special Focus Area). Both of these areas were surveyed as a part of Groton's 1996 Preservation Plan, which identified both areas as historic villages with valuable physical and community characteristics worth retaining. Preserving these characteristics and employing design guidelines to lead future development towards incorporating contemporary adaptations of these characteristics would positively impact the visual character and cohesion of these areas. Design guidelines for these areas should encourage mixed-use, pedestrian friendly, neighborhood-scale development. Increased regulatory oversight may be particularly appropriate in the Poquonnock Bridge area, where the town has made significant land acquisitions and institutional investments in recent years.

Recommendations

3-22 Analyze the zoning and allowed uses on currently vacant industrially and commercially zoned land with respect to the availability of utilities, transportation, and constraints imposed by sensitive natural resources and revise the zoning and allowed uses as appropriate.

3-23 Catalogue key industrial and commercial vacant parcels to determine developable acreage and to guide development away from sensitive resources.

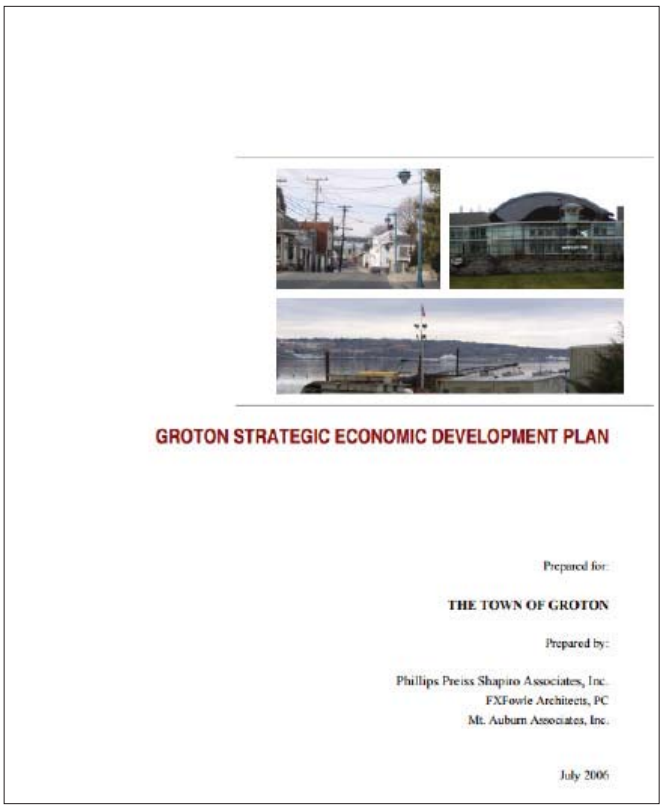
3-24 Develop strategies to encourage investments within the Nodes for new construction and for reuse, redevelopment, or repurposing existing properties and existing strip commercial developments to walkable, pedestrian-friendly, and mixed-use development.

REVIEW AND UPDATE THE STRATEGIC ECONOMIC DEVELOPMENT PLAN (SEDP)

THE STRATEGIC ECONOMIC DEVELOPMENT PLAN

In 2006, Groton completed a Strategic Economic Development Plan (SEDP), a comprehensive analysis of economic development conditions and a detailed economic strategy for the future. The SEDP was conducted to focus on economic diversification to decrease reliance on the Navy Submarine Base, Electric Boat, and Pfizer.

As a result of the SEDP process, the following economic development policies were proposed:



- Diversify the local economy by attracting new business, retaining and growing existing businesses, and assisting with the startup of new business
- Take a proactive approach to creating sites for economic development
- Enhance economic development capacity at the town level and through regional partnerships
- Zone with economic development in mind
- Improve the aesthetics and image of Groton's highway business corridors, including downtown Groton
- Improve circulations and access in downtown Groton and throughout the town
- Work with property owners to spur the redevelopment of downtown Groton
- Preserve and enhance the town's historic, scenic, and open space resources to create both local and tourist amenities
- Improve the packaging and marketing of existing tourist attractions
- Undertake projects and plans which bolster community pride and image

Improving the aesthetics, circulation, and redevelopment of downtown Groton was a major recommendation of the SEDP, which characterized the downtown as having "an aging stock of buildings no longer suitable for modern retail tenants, and an out of date image and appearance. Significant investments, beyond landscaping, will be necessary to improve the performance of the area."

IMPLEMENTATION

As part of the proposed policies, specific projects were also proposed to further the goals of the SEDP, such as:

- **Business park utilities infrastructure improvement project:** Over a period from 2004 to 2013, a number of engineering cost/benefit studies were done to determine the feasibility and location of a water main extension and sewer extension north of I-95 in the Flanders Road area. A referendum for an ordinance to appropriate $9.9 million in bonds and notes for the design and construction of the utilities failed in 2013.
- **Military Highway Linear Park**: The Military Highway Linear Park is still recommended as part of the larger Thames River Heritage Park project (see below).
- **Thames River Heritage Park:** After a two-weekend pilot launch in the fall of 2014, the Thames River Heritage Park is moving forward with a plan to have water taxis connect tourists to historical and cultural sites on both sides of the Thames River. Currently, a non-profit organization is being founded to oversee the operations of the park. Park signage and a mobile app for visitors to find information about park sites are also in development for an expected opening in 2016.
- **Business Incubator:** The Connecticut United for Research Excellence (CURE) Innovation Commons is reusing vacant Pfizer lab space as business incubator space. CURE is a nonprofit network of bioscience companies that aims to help spur job growth through supporting bioscience startups.

UPDATES TO THE SEDP

Many of the original recommendations in the 2006 SEDP are still valid and Groton should continue to implement the policies and strategies as appropriate. However, due to the rapid pace of change in the economy, Groton should also focus on reviewing and completing a comprehensive update of the SEDP every five years. As economic realities change, specific recommendations from 2006 may cease to be relevant or valid and need to be replaced by other opportunities.

In particular, the Downtown Groton Plan should be revisited and brought to stakeholders for public input and engagement. This area has been designated as a Node and a downtown Special Focus Area in this POCD, and will warrant review to ensure that any future plans for this area are consistent with the goals of the Future Land Use Plan.

Recommendations

3-25 Update the Groton Strategic Economic Development Plan, including actively reviewing the Policies and Strategies Implementation tables.

3-26 Update the Downtown Groton Plan and engage with stakeholders to adjust or expand the plan for current and future investment opportunities and to create a viable mixed-use downtown.

REVIEW COMMERCIAL ZONE LOCATIONS, USES, AND STANDARDS

COMMERCIAL ZONES

Commercial A (CA) and Commercial B (CB):

- Allowed Uses: Both general commercial zones allow residential, hotel, retail, personal services, general offices, and institutional uses. The CA zone also allows multifamily uses, and the CB zone also allows wholesale, medical product assembly, warehousing, and screen printing.
- Current Uses: Current uses include agriculture, commercial office, commercial automotive sales and service, commercial retail and services, industrial, mixed use, parks and open space, private institutions, public services, and residential uses (condominium, mobile home park, single family, 2 to 3 family), and state property.
- Vacant Land Acreage: Out of roughly 700 total acres, about 110 acres (16%) are currently vacant.

Nautilus Memorial Design District (NMDD): The Nautilus Memorial Design District is intended "to create a viable tourist commercial, service, and residential area which serves the needs of visitors to the Nautilus Memorial, personnel associated with the Submarine Base, and adjacent residential areas." The objectives for this district are to create a high-quality tourist area, while also ensuring that the high intensity and bulk of these uses do not encroach onto surrounding residential districts.

- Allowed Uses: Examples of uses that are allowed include hotels/motels, restaurants, convention/meeting facilities, banking/credit services, daycare facilities, and other tourist commercial or residential service uses. High-density residential uses consistent with the RMF-12 zone should be positioned to buffer tourist commercial and service uses from adjacent residential zones.
- Current Uses: Current uses include commercial office, commercial automotive sales and service, commercial retail and services, military, and residential uses (apartment/multi-family, single family, and 2 to 3 family).
- Vacant Land Acreage: Out of roughly 80 acres, about 25 (31%) are currently vacant. Much of this land is accessory to commercial or industrial uses.

Downtown Development District (DDD): The Downtown Development District is the central business district of Groton. The DDD is intended to "encourage a concentration of commercial development with special attention paid to public amenities… in order to continue to develop the downtown area as the town's retail, office, governmental, and cultural center."

- Allowed Uses: Allowed uses include most commercial retail, office, and public service uses.
- Current Uses: Current uses include commercial office, commercial automotive sales and service, commercial retail and services, industrial manufacturing, parks and open space, private institution, public service, and residential uses (single family and 2 to 3 family).

- Vacant Land Acreage: Out of roughly 86 acres, about 3 acres (3%) are vacant. These parcels are either undevelopable, currently used as parking lots, or accessory to commercial uses.

Office-Multifamily Districts (OMF): The Office-Multifamily District is intended to provide an orderly transition between lower-density single-family residential areas and more intensive commercial development along arterial roads.

- Allowed Uses: Residential (one- and two-family dwellings conforming to R-12 district), small-scale personal retail uses, and office and similar uses.
- Current Uses: Current uses include agriculture, commercial office, commercial automotive sales and service, commercial retail and services, mixed use, private institution, public service, and residential uses (apartment/multifamily, mobile home parks, single family, and 2 to 3 family (duplex and triplex)).
- Vacant Land Acreage: Out of roughly 77 acres, about 5 acres (6%) are vacant. This land is either undevelopable or is accessory to commercial use.

Waterfront Design District (WDD) and Waterfront District (WF): The Waterfront Design District is an example of how town zoning can codify nodal goals by establishing specific guidelines to ensure a mix of uses, concentrated development, detailed, human-scale design , pedestrian friendly circulation, shared parking and public spaces, and the continuation of historic styles that create the signature location that Mystic has come to be. In Historic Districts, like Mystic, these standards can be further specified by the application of Design Review Standards through the Historic District Commission.

- Allowed Uses: Any residential, office, or commercial use or mix of same which is consistent with the purpose and objectives of the WDD and which is not detrimental to the unique character of the area is permitted in the WDD.
- Current Uses: Current uses include commercial office, commercial automotive sales and service, commercial retail and services, marine commercial, mixed use, parks and open space, private institution, public infrastructure, and residential uses (condominium, single family, and 2 to 3 family).
- Vacant Land Acreage: Out of roughly 34 acres, about 1 acre (3%) is vacant.

IMPACT OF WRPD OVERLAY ZONE

The purpose of the Water Resource Protection District (WRPD) is to protect the quality of the water supply by restricting uses that may lead to contamination, such as sanitary landfills or storage of hazardous materials. The WRPD acts as an overlay district that can supersede the requirements of the underlying zoning. While having high-quality drinking water has economic benefits, the stricter provisions of the WRPD, including lot coverages and stormwater management facilities, can also constrain development options. At 7,700 acres, the WRPD covers much of the northern half of Groton.

COMMERCIAL USES

The Town of Groton is currently performing a land use and regulatory review of the Town of Groton zoning regulations. The review will identify any inconsistencies, confusing and vague language, barriers to efficient permitting, and other issues. As part of this process, commercial uses will be considered. The review should address questions such as:

- Should number of zones be condensed?
- Should allowed uses in OMF be expanded?
- Is the NMDD viable or should boundaries be changed?

The DDD/Groton downtown area will continue to be a focus of commercial development in Groton. The regulatory review and the study of the Special Focus Area should outline how to simplify the commercial permitting process for this area in order to continue to build the concentration of uses in this Node. Over the long term as development projects are proposed, the town should also strive for implementation of the recommendations within the SEDP and Special Focus Area Plan.

COMMERCIAL LOCATIONS

The Town of Groton is also drafting an analysis of opportunity areas as part of the larger market study for Groton. This analysis will focus on the Nodes, and will provide a more focused approach for geographic-based opportunity areas to better target these areas. The boundaries of several Nodes or Special Focus Areas may expand or contract based on recommendations coming out of this study.

Recommendations

3-27 Evaluate current zones and development standards to determine if districts, uses, setbacks, and other requirements are appropriate.

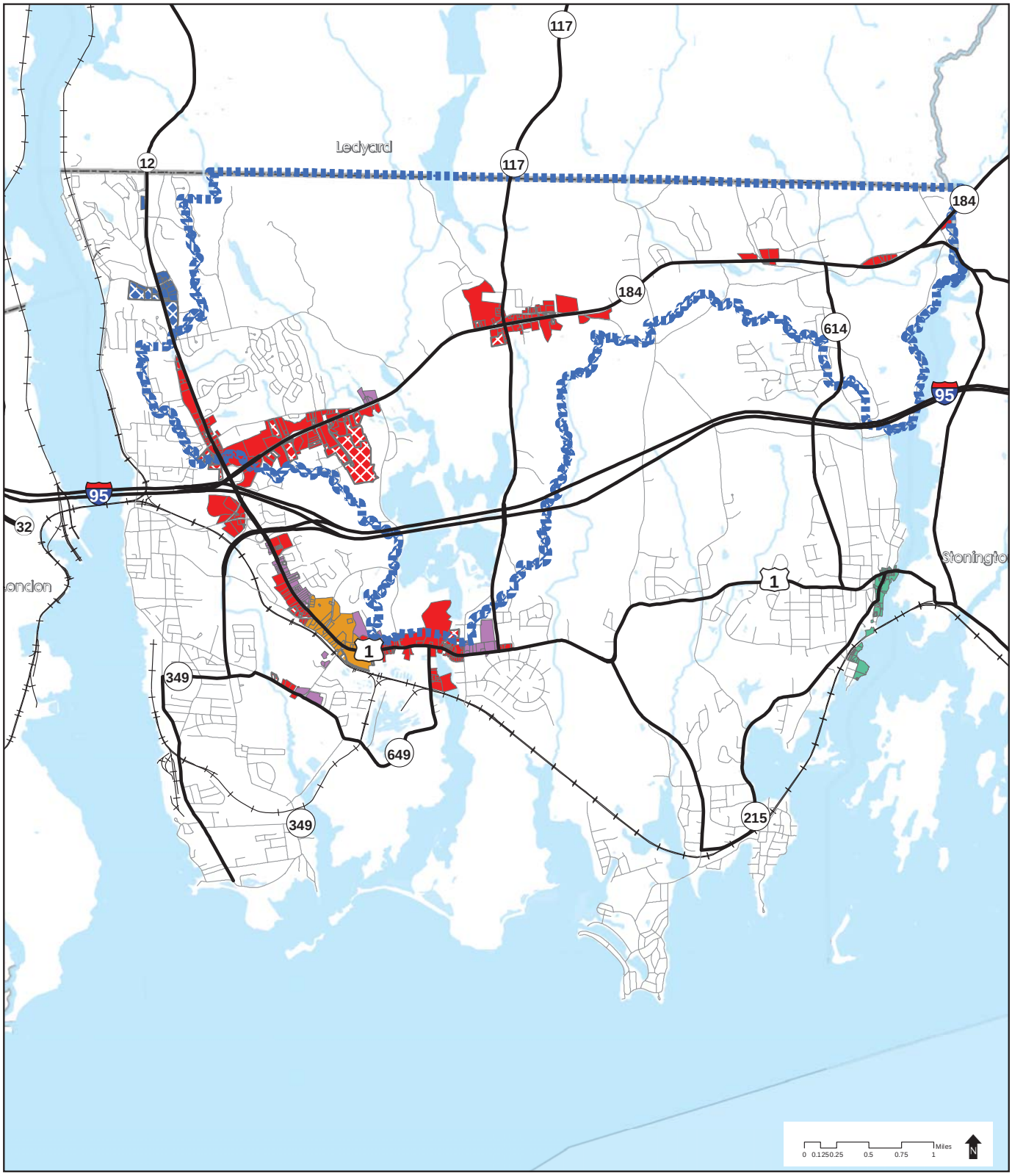
3-28 Modify zoning regulations to create incentives for consolidated development and redevelopment of commercial areas and for enhanced architectural design as part of new business development rather than prototypical architecture.

3-29 DDD/Groton Downtown: Implement the policies for design and development of the SEDP and the Special Focus Area Plan recommendations for the downtown Groton area.

3-30 NMDD: Revise standards to promote appropriate development and to better address purpose and objectives of the district.

3-31 WDD: Consider expanding the WDD and revising the regulations to make permit processing easier while preserving the cultural assets of the area, reusing existing historic structures, serving both tourists and the residents, and balancing the needs of the residential and commercial entities.

Map D-13: Existing Commercially Zoned Land



Groton PLAN OF CONSERVATION + DEVELOPMENT

Existing Commercially Zoned Land

Commercially-Zoned Parcels

- Vacant Land
- CA & CB
- DDD
- WRPD
- NMDD
- OMF
- WDD & WF

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

September 2015

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REVIEW INDUSTRIAL ZONE LOCATIONS, USES, AND STANDARDS

INDUSTRIAL ZONES AND LOCATIONS

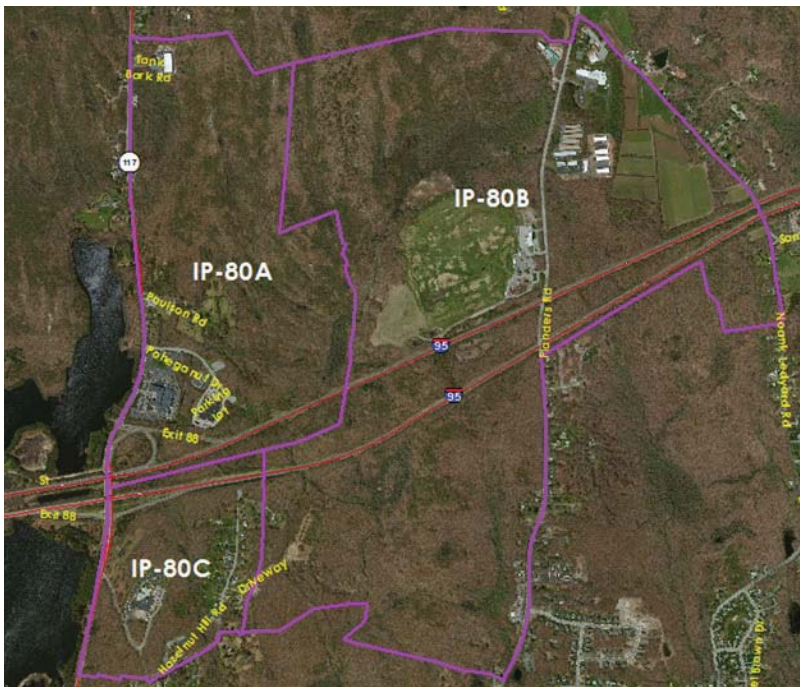
IA-40: Airport Industrial

The IA-40 Airport Industrial Zone is over 1,000 acres of land centered on the Groton-New London Airport. This area is well served by both sewer and water utilities. However, this area is mostly developed or in open space, and the majority of what is not developed may be constrained by FEMA flood zones. Existing uses include the Airport Business Park, as well as a golf course and a sand/gravel operation that may have redevelopment potential. A large portion is also part of the airport and is out of direct control by the town.

Map D-14: Airport Industrial Zone

IP-80A, 80B, 80C: Industrial Park

In the center of Groton there is a large area zoned for industrial parks (IP-80A, IP-80B, and IP-80C). This land is currently largely vacant or in agricultural use (663 acres out of 1,197, or 55%), which would lend the area to future development. However, this area is currently poorly served by public utilities, and there are some constraints due to topography and natural resources.



Map D-15: Industrial Park Zone

SITES AND ENVIRONMENTAL CONSTRAINTS

As discussed, future industrial development in Groton is constrained by some environmental factors. While there are substantial portions of industrially zoned parcels that are currently vacant or being used for agriculture, much of this land is also environmentally constrained by wetlands, flood zones, watercourses, and steep slopes.

Industrially Zoned Land in Groton

	Total Land	Vacant and Agriculture Land					
		Total Vacant and Ag Land		Constrained Land		Net Buildable Land	
Zone	Acres	Acres	Percent	Acres	Percent	Acres	Percent
IA-40	1,008	32	3.2%	28	2.8%	5	0.5%
Total Industrial Park	1,197	663	55.4%	166	13.9%	490	40.9%
IP-80A	*309*	*208*	*67.3%*	*52*	*16.8%*	*156*	*50.5%*
IP-80B	*767*	*378*	*49.3%*	*78*	*10.2%*	*293*	*38.2%*
IP-80C	*121*	*77*	*63.6%*	*36*	*29.8%*	*41*	*33.9%*
Total Industrial Zones	**3,402**	**1,358**	**39.9%**	**360**	**10.6%**	**985**	**29.0%**

In addition, almost the entirety of the IP-80A and IP-80C zones lie within the Water Resource Protection District (WRPD). This overlay, designed to protect the water supply, disallows uses that could contaminate Groton's reservoirs such as the manufacture, use, storage, transport, process, or disposal of hazardous materials or waste. The WRPD zone also has additional lot coverage and setback restrictions, buffers, and requirements for stormwater management facilities. The restrictions of the WRPD zone should be reviewed as part of the comprehensive zoning audit to determine if the WRPD zone should be updated to incorporate new technology and a tiered protection system to reflect current best management practices.

Flood zones also greatly constrain development in Groton's industrially zoned areas. Almost all of the IA-40 zone near the airport is within the 100-year flood zone. This low area is identified as being prone to flooding by the updated Federal Emergency Management Agency (FEMA) flood zone designations. By town ordinance, areas with this designation require more stringent application and development standards to protect the health and safety of the community in the event of a flood. As the airport uses and stores hazardous materials (fuel, etc.), the Municipal Coastal Plan (MCP) update has suggested that steps be taken to ensure that fueling areas are flood damage resistant. The town may also take further steps, such as developing standards for a coastal overlay zone that addresses the use and storage of hazardous materials for the IA-40 zone.

As part of the comprehensive regulatory review, industrial uses should be simplified and made clearer. For example, under the table of permitted uses for Industrial – Textile Mill Products, "felt goods" and "knit goods" are separate categories; all Textile Mill Products are permitted by right in IA and IPB zones and prohibited in IPA and IPC zones. Beyond the table of permitted uses, there is no narrative in the zoning regulations describing the purpose for, nor the difference between, the Airport Industrial zone and the three different Industrial Park zones.

Other updates to the industrial uses should consider the evolution of small-scale, mixed-use manufacturing that is becoming popular across the country. For example, one microbrewery may request an industrial use (brewery) as well as on-site retail (sales of alcohol) and restaurant/bar uses. The current zoning regulations do allow any permitted wholesale or industrial use to use 20% or less of the building floor area for display/sales to the general public, but liquor stores are currently prohibited in all industrial zones, and restaurants are a conditional use in the IPA zone only.

Other small-scale manufacturers and artisans may focus on using clean technologies (such as laser cutters or 3D printers) to make local products and not need a large amount of space in an office park. As access to new manufacturing technologies becomes increasingly affordable and widespread, locally produced consumer goods can become an avenue for startup business and job growth in Groton, provided that there is regulatory support and appropriate buildings for investment.

Recommendations

3-32 Address recommendations of the 2015 Market Analysis for future small industrial development.

3-33 Acknowledge the impact of updated flood zone designations on current and future industrial development near the airport and develop standards for a coastal overlay zone and the use and storage of hazardous materials.

ENCOURAGE DEVELOPMENT AND REDEVELOPMENT OF FULLY SERVICED SITES

Concentrating development on sites with existing infrastructure, including transportation, sewers, and water lines, is a keystone of "smart growth" development and generally represents the most efficient, cost-effective, and sustainable pattern of development for communities. "Smart growth" takes advantage of past investments, reinvests in older developed areas, and operates within existing hydrological systems, helping to safeguard the water supply against depletion and degradation. Established development areas that receive reinvestment build upon existing strengths and help to establish a community's firm sense of place.

Most of the developed areas of Groton are served by its 136 linear miles of sanitary sewers, particularly around the outermost edges of the town, and along the southern portion of the Route 117 corridor (see Infrastructure section). Four water companies operate in the town, providing service to the majority of Groton's residences and businesses (see map C-1, Water District and Service Areas). GIS data for existing sewer lines and water service lines throughout Groton are not current, however, and should be updated. Once updated, this data can aid the town and developers in identifying fully and partially serviced sites that would be most appropriate for development or redevelopment.

In the past, Groton has witnessed firsthand the financial and political challenges associated with developing areas without a clear plan for extending sewer and water services, as has been the case with Flanders Road. The extension of sewer and water lines further into Flanders Road to facilitate the expansion of an existing industrial park was a long-standing town priority; however, the electorate voted the measure down in 2013. Currently, this area of Flanders Road is not one of the locations recommended for the future extension of water and sewer services.

To make the issues and considerations surrounding utility upgrades more transparent, to educate the public on the role that regular utility upgrades play in the town's ongoing development and infrastructure maintenance, and to aid the Town Council in planning for these upgrades and extensions, Groton should develop a set of guidelines evaluating potential infrastructure improvements based on the town's ongoing development priorities. When evaluated based on these guidelines, the potential improvements could then be prioritized, planned, and clearly communicated in advance, increasing the likelihood that they may secure public support.

Recommendations

3-34 Map fully and partially serviced sites to identify appropriate locations for economic development in order to guide businesses and developers to serviced sites with appropriate infrastructure.

3-35 Develop a priority list and guidelines to assist the Town Council in considering when to fund infrastructure improvements.

PURSUE ECONOMIC DEVELOPMENT OPPORTUNITIES

ECONOMIC DEVELOPMENT INITIATIVES

Utilities

While the town has ample public water and sanitary sewer capacity, connecting this capacity to areas of undeveloped industrial lands would require an extension of services. This lack of infrastructure will need to be resolved to move forward with any large-scale development in the industrially zoned areas in the center of Groton.

Streetscape Improvements

Groton has already gone through two phases of streetscape improvements in Mystic, including relocating utilities underground; milling and paving; and adding landscaping, bike racks, and benches. The goal of these streetscape improvements was to create a pedestrian-friendly streetscape appropriate for this historic downtown area that is the number one tourist destination in Connecticut. A third round of streetscape improvements is being discussed, with projects dependent on the level of funding still available.

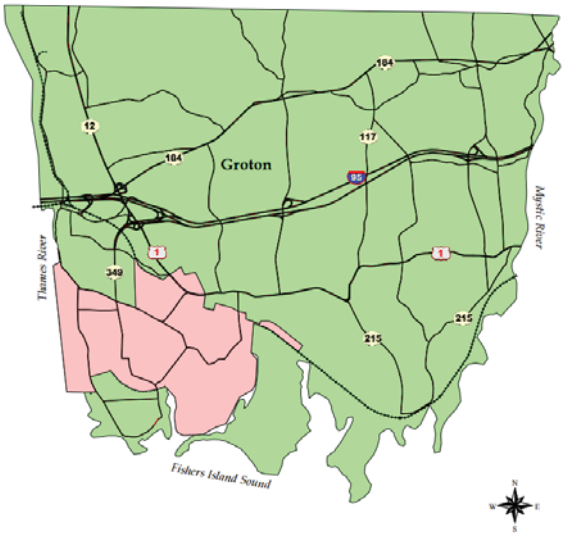
Airport Development Zone (ADZ)

The Connecticut Airport Authority (CAA) and the Department of Economic and Community Development (DECD) developed the Airport Development Zone (ADZ) Program in order to ensure the economic development potential of Connecticut's general aviation airports. As of 2015, administration of the program has been transferred from the CAA to the DECD. The ADZ is meant to spur job creation, attract new capital, and increase tax revenue to the state and municipalities. The Town of Groton is seeking approval for an ADZ within a 2-mile radius of the Groton-New London Airport to extend property tax incentives and tax credits to eligible businesses to locate and develop in the area. The town will also work with the Groton-New London Airport to complete necessary infrastructure improvements such as utilities on South Road and changes to railroad underpasses to create more shovel-ready sites within the ADZ.

Enterprise Zone

Groton is currently home to an Enterprise Zone. This is a designation given by the state to areas within Targeted Investment Communities. Incentive benefits are provided for eligible business relocation/expansion within the Enterprise Zone, including: corporate tax credits, property tax abatements, exemption from certain state sales and use taxes, state grants for the creation of new full-time jobs, job training and placement assistance, as well as other local incentives such as deferrals of taxes on business plant and equipment (personal property). These incentives generally provide financial relief or increase the capital/leverage available to businesses, thus reducing the overall cost of business.

Groton, Connecticut Enterprise Zone



Economic Assistance Fund
The town's Economic Assistance (EA) and Development Assistance (DA) Funds provide construction of necessary public infrastructure improvements associated with new job creating development opportunities in the town. To date, the EA program has funded four projects: property acquisition associated with the Midway Industrial area, Shore Avenue relocation associated with the Pfizer/Groton land exchange project, Mystic public restrooms, and new sidewalk on Route 1 east of Buddington Road. The Capital Improvement Program has budgeted $100,000 to be added to the EA fund for fiscal year 2015.

Economic Incentive Policy
The Strategic Economic Development Plan (SEDP) notes that Groton's suite of local incentive programs goes beyond what many comparable municipalities currently offer. However, the SEDP also notes that the town's incentive agreements have been developed on a case-by-case basis. While this approach is flexible, it means that each deal is negotiated from scratch and does not give developers appropriate guidance. The process related to the local Financial Incentives Policy and Economic Assistance Fund should be streamlined and made clear to provide the development community with a consistent model.

Other Community Development Initiatives

- **Brownfields:** The town received a $200,000 brownfield assessment grant in 2014 from CT DECD's Office of Brownfields to complete Phase I and II assessments for the former Groton Heights Elementary School and a site formerly occupied by a gas station that the town acquired through a tax auction.
- **Façade Improvements:** The town is currently in discussions concerning façade renovations and redevelopment along the Route 1 corridor in downtown Groton.

Market Analysis
The town is preparing a Market Analysis which will include: economic analysis, workforce analysis, leading industry analysis, residential market analysis, and retail and restaurant market analysis. The recommendations that result will inform the framework for developing final focused strategies and action items for future economic development programs in Groton.

REGIONAL INITIATIVES

Groton should not view its economy as a standalone system. Rather, the town needs to look at itself as part of a larger regional economic system. Focusing economic analysis to all of New London County or to the greater Groton-New London area would provide a more complete region for general economic analysis. A regional view could provide important sector linkages for expanding or creating new industries.

Groton needs to consider its place within the region and the town's competitive advantages. Groton should look for ways in which it can collaborate with the state and surrounding communities to develop economic development networks. Several initiatives are highlighted below.

Expansion of Services and Utilities
The Town of Groton and the Town of Ledyard are considering the possibility of applying for a federal Economic Development Agency (EDA) grant to explore the expansion of utilities. The focus area would be the installation of sewer and gas lines up Route 117 from the area near the Mystic Marriott to the interchange with Route 184, continuing up Route 117 to Ledyard Center. An initial grant request will be made in order to complete construction drawings and associated studies. A future grant request may be made for the project construction.

Railways
Several regional railways are in or near Groton. Shore Line East is a passenger line that currently has local commuter service from New Haven to New London. Amtrak also provides service with stops in New London and Mystic on the Stonington side. There are currently no station stops in Groton. Groton should explore with Shore Line East the feasibility of expanding station stops in Mystic and/or downtown Groton, as well as expanding service to TF Green Airport in Providence, RI. These station stops would serve both tourists coming to Mystic as well as local residents who wish to travel along the shoreline without contributing to traffic on I-95.

The Central Corridor Line and the Providence/Worcester Line are both freight lines in or near Groton. The Central Corridor Line is currently a freight line on the New London side of the Thames River that services New London's deepwater port. The line was recently awarded an $8.2 million Transportation Investment Generating Economic Recovery (TIGER) grant to upgrade 55 miles of track, in part to upgrade the line to passenger service. The Central Corridor Line is proposing passenger service from New London up to Brattleboro, VT to serve as a rail link between 13 colleges and universities.

The Providence & Worcester Railroad is a regional freight line on the Groton side of the Thames River with a branch line that connects Worcester, Massachusetts to Groton. The Town of Groton should continue to work with Providence & Worcester Railroad to determine upgrades, needs, and growth plans for the freight line.

Southeastern Connecticut Cultural Coalition
The Southeastern Connecticut Cultural Coalition is a 501(c)(3) nonprofit organization headquartered in New London governed by a board of directors comprising cultural, community, and business leadership. The mission of the Coalition is to foster "region-wide economic growth in New London County by optimizing existing and new arts and cultural activities to assure that cultural sector and creative business assets are central to the vitality of the region." Groton is an active partner in the coalition, and in 2014 the Groton Public Library was one of the sites chosen to host *The Way We Worked*, an exhibition created by the Smithsonian Institution.

The Southeastern Connecticut Enterprise Region (seCTer)
The Southeastern Connecticut Enterprise Region (seCTer) is a public-private regional economic development agency serving the towns of New London County. seCTer's mission is to promote and preserve the region's attractiveness, to encourage new businesses, and to assist and nurture existing and expanding local enterprises. In Groton, seCTer was involved in the sale of the Connecticut United for Research Excellence, Inc. (CURE)/Pfizer buildings to be used as a regional incubator space for biotech entrepreneurs, as well as

with the Thames Maritime Heritage Park to plan the proposed water taxi connection between Groton and New London.

ZONING INITIATIVES

Home Occupations
There has been a continued interest in home occupations in Groton. These are often entrepreneurial in nature and should be considered strong assets to the economic viability of the town. Regulations should be adjusted where needed, including streamlining of a registration process to assure that the town receives applicable tax revenue and zoning changes to promote in-home occupations in all zones if they do not create significant parking or other neighborhood impacts.

Streamline Permitting Process
The town's zoning regulations should continue to be reviewed to determine what elements of the regulations are providing positive incentives for economic development and what regulations could be hindering creativeness and dynamic economic development. Groton is currently performing a *Regulations Audit*. Based on the recommendations of the Audit, the zoning regulations should be revised to assure a clear, concise, and expeditious pathway for appropriate projects while still protecting and enhancing the town's unique features and character.

Sustainable Practices
While the zoning regulations are being evaluated, it would also be an appropriate time to evaluate zoning codes, ordinances, and land use plans in regards to how well they advance sustainability initiatives. Zoning regulations and the permitting process can be audited to determine if they support or incentivize building types and systems such as passive solar heating, geothermal heating, natural ventilation, green roofs, water conservation systems, and energy efficient building systems.

Transit-Oriented Development (TOD)
Transit-Oriented Development (TOD) is development that provides a concentration of uses (residential, commercial, office, and/or mixed use) near transit stations. Currently, the only public transit serving Groton is the Southeast Area Transit (SEAT) bus line. TOD may become more appropriate in the future if transit access is expanded, especially in the downtown Groton area. Groton should continue to study the feasibility of commuter rail, multiuse transportation hub, and TOD for downtown Groton.

EXISTING BUSINESSES
One of the critical components for the successful economic development strategy is an effective business retention and expansion strategy. Emphasis should be placed on assisting existing businesses and creating a friendly environment for local entrepreneurs. Working in concert with regional and state economic development groups, keeping in close contact with the area Chambers of Commerce, and helping them become even more robust will be a critical task.

The town may also be helpful to existing businesses by assisting them in assessing what "stage" they are in in their growth and evolution and tailoring the type of assistance available depending upon this assessment. For example, the town could help connect new local businesses and entrepreneurs with support programs for small businesses,

organizations that perform feasibility analyses for businesses or potential business ideas, and assistance in becoming incorporated. More mature, growth-oriented businesses could be assisted through services such as mentoring, access to a property database of appropriate sites for expansion, help with improving their business model, or researching customer base expansion.

APPROPRIATE REDEVELOPMENT OF PUBLIC PROPERTIES

The town has several former school properties under its control including Groton Heights, Noank School, and the recently closed Fitch Middle School. Funds have been budgeted to remove underground storage tanks at Groton Heights. The ultimate disposition of these closed schools/properties remains an unresolved issue. The state is also in the process of divesting itself of the Mystic Education Center, which formerly housed the Parks and Recreation Department aquatics program. As appropriate, redevelopment of these sites could be a valuable economic development opportunity.

SUPPORT AND PROMOTE MYSTIC

The portion of Mystic that is on the west side of the Mystic River and falls under the jurisdiction of the Town of Groton is an important tourism destination for Groton and the region. In contrast to downtown Groton, Mystic is characterized by small, locally owned shops arranged along a traditional main street. This area is geared toward visitors who frequent the Mystic tourist attractions and does not generally cater to Groton residents.

Mystic has been a small seaside village with a traditional downtown and mixed uses since the 1700s. Tourists are drawn to the character of the area, which can often result in transportation and parking issues for the influx of visitors. Many options are being explored, including vans and shuttle buses from large attractions with ample parking to the downtown; an increase in mass transit, including the SEAT bus system and rail; and additional parking spaces. The Town of Groton will continue to work with the Mystic Cooperative Task Group and Stonington to study parking requirements and needs in downtown Mystic and consider revising regulations to reflect best practices.

TOURISM BEYOND MYSTIC

Groton's coastal, historic, and scenic assets provide opportunities for a variety of tourism-related business opportunities to flourish. Tourist destinations or activities in Groton include:

- An extensive park system, including Bluff Point and Haley Farm State Parks
- The Nautilus Memorial Submarine Force Library and Museum
- The Maritime Heritage Park, with a water taxi linking sites on both sides of the Thames River (operational as of Summer 2016)
- The Fort Griswold Battlefield State Park
- University of Connecticut's seaside Avery Point campus
- A developing recreational sector, including a paintball course, aerial adventure park, tennis club, Shennecosset Golf Course, Mystic Schooners baseball, and numerous marinas

SUPPORT MARITIME ASSETS

A component of the tourism sector is recreational boating. Groton has over 2,000 slips and moorings within its jurisdiction contained in 16 marinas. They attract a continual

stream of nonresidents during the boating season that support a variety of service jobs and businesses in the town. This concentration of marine businesses is among the largest in Connecticut and provides the potential to create linkages among marine businesses and promote new ventures. Boating activity also creates the maritime atmosphere that non-boating visitors expect to find when visiting coastal communities. Therefore, supporting and encouraging this component of the tourism sector can provide multiple benefits to the town's economy.

Outreach to the local maritime business community could be a first step to learn if local regulations impede investment or if some type of municipal assistance could stimulate new private investment in this business sector. The town can consider ways to expand support services to the recreational boating community, including promoting recreational uses such as sport fishing and shell fishing.

Groton also has a long tradition of oyster farming, a form of aquaculture, with some oyster beds farmed for 100 years or more. Groton should continue to ensure that local farmers have the support and resources that they need to continue to be successful.

Recommendations

3-36 Pursue designation of an Airport Development Zone with CT DECD.

3-37 Work with Mystic Cooperative Task Group and Stonington on transportation and parking options in Mystic and pursue funding to implement.

3-38 Work to align regional and local tourism with economic development opportunities through physical improvements such as the Thames River Heritage Park along with local services.

3-39 Develop a plan to support the economic viability of the local marine industries, including sport fishing, recreational boating, shell fishing, aquaculture, and the corresponding land based commercial, industrial, and educational facilities.

3-40 Study parking requirements and needs in downtown Mystic and revise regulations to reflect best practices.

3-41 Implement a simplified process to access Financial Incentives and Economic Assistance Funds.

3-42 Work with Groton-New London Airport and local utility suppliers to complete necessary infrastructure improvements such as utilities on South Road and changes to railroad underpasses.

3-43 Study feasibility of commuter rail, multi-use transportation hub and TOD for downtown Groton.

3-44 Work with Providence & Worcester Railroad to determine upgrades, needs, and growth plans for the freight line.

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Chapter 4: Infrastructure

Chapter 4: Map Index

ENHANCE TRANSPORTATION OPTIONS

Groton's transportation systems include the following:

- 170 miles of public roads
- The general aviation Groton-New London Airport
- The Amtrak rail corridor and rail freight service
- Various off-road and multiuse trails, bike paths, and sidewalks
- Extensive water access on the Mystic and Thames Rivers and Fisher's Island Sound

The following Transportation section will highlight changes in transportation systems and options in Groton since 2002 as well as the relationship between transportation and issues of sustainability and resiliency.

Bicyclist on Gravel St.

EXISTING ROADS AND MAINTENANCE

Groton's internal roadway system has been influenced by Route 1, Interstate 95, the location of historic coastal villages such as Noank and Mystic, and the town's two bordering rivers – the Mystic and the Thames. The roadway network in Groton is comprised of a series of interconnected corridors with varying levels of functional classification. According to the Connecticut Department of Transportation (CT DOT), as of December 31, 2010, Groton was served by 169.72 miles of public roads, 76% of which were town roads (128.77 miles) and 40.95 miles of which were state roads.

Groton has a well-established hierarchy of roads to meet the needs of residents and businesses. Historical development patterns have resulted in a greater number of north-south roads versus east-west roads. East-west traffic is restricted to Routes 1 and 184 and Interstate 95. The 2002 Plan of Conservation and Development's (POCD) Transportation Plan identified three east-west connections between Route 117 and Flanders Road/ Lambtown Road. Lambtown Road, Great Brook Road, and Ledgeland Drive are newly constructed local roads that create connections identified in the 2002 POCD.

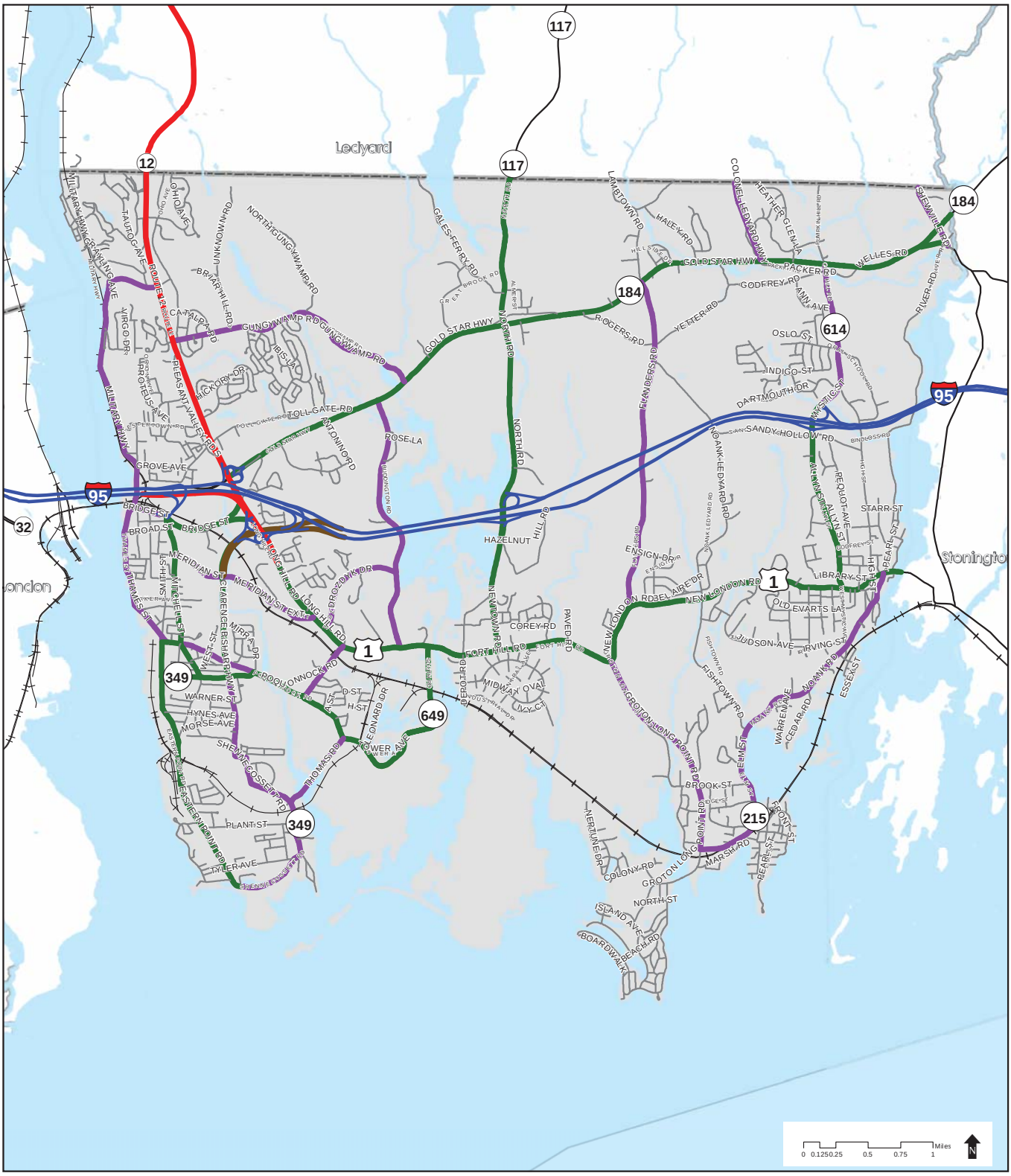
Transportation officials classify roadways based on traffic volumes, accessibility, and function. CT DOT has identified six different levels of roadway classifications in Groton: Principal Arterial – Interstate, Principal Arterial – Expressway, Principal Arterial – Other, Minor Arterial, Collector, and Local Road. In some cases, the actual classification of a road may change along its length or may operate differently than its assigned functional classification (see Map I-1). Federal, state, and regional transportation planning organizations use regional road classifications to identify and prioritize road projects for funding under the Transportation Improvement Program.

The highest functional roadway classification in Groton is Principal Arterial – Interstate. Roads in this class provide limited-access, multilane, high-volume, and high-capacity facilities intended to provide for and accommodate high-speed travel over long distances with relatively few points of access to the local street system. Within Groton, Interstate 95 is classified as Principal Arterial – Interstate.

Groton's second highest functional roadway classification is Principal Arterial – Expressway. This classification of roadway is similar to interstate arterials, without the interstate designation. The Clarence B. Sharp Highway (Route 349) from its junction with Interstate 95 to Meridian Street is a Principal Arterial – Expressway in Groton.

The next order of roadway classification is Principal Arterial – Other. This roadway type connects major development and activity centers within Groton to each other as well as to activity centers in other towns and to accessible expressways. The design of this type of road typically accommodates higher speeds and greater traffic carrying capacity. To maintain the road's through-traffic carrying capacity and higher design speeds, this road type would ideally provide a more restrictive level of access control to adjacent land uses than other roads. The only Principal Arterial – Other roadways within Groton are a portion of Route 1, from its intersection with the Clarence B. Sharp Highway to Route 184, and Route 12.

Map I-1: State Functional Road Classifications



Minor Arterials are ranked next within the hierarchy of roadway classifications. This type of roadway connects principal arterials and augments the traffic carrying capabilities of the entire roadway system. Minor Arterials provide for a greater degree of access to abutting land uses and typically do not provide the same level of through mobility as the higher classifications.

Town of Groton Minor Arterial Streets

Allyn Street	High Rock Road	North Road
Benham Road	John Street	North Street
Bridge Street	Kings Highway	Poquonnock Road
Chester Street	Long Hill Road	Rainville Avenue
Clarence B. Sharp Highway	Mitchell Street	Route 27
Eastern Point Road	Mystic Street	South Road
Fort Hill Road	New London Road	Tower Avenue
Gold Star Highway	Newtown Road	West Main Street

The next classification of roadways, Collector Streets, provides a higher degree of access to abutting land uses and a somewhat diminished level of through mobility than the higher classifications. Groton's Collector Streets, or portions thereof, include the following:

Town of Groton Collector Streets

Brandegee Avenue	Fairview Avenue	Noank Road
Bridge Street	Flanders Road	Poquonoock Road
Buddington Road	Groton Long Point Road	Shennecossett Road
Colonel Ledyard Highway	Gungywamp Road	Shewville Road
Cow Hill Road	Meridian Street	Thames Street
Crystal Lake Road	Meridian Street Extension	Thomas Road
Drozdyk Drive	Military Highway	Water Street
Elm Street	Mystic Street	

In addition to the state's classification, the Town has established a local roadway classification.

Town of Groton Local Roadways

Antonino Road	Grove Avenue (Mystic)	Ohio Avenue
Bridge Street	Gungywamp Road	Pearl Street (Mystic)
Brook Street (portion)	High Street (portion)	Pleasant Valley Road N
Buddington Road	Irving Street (portion)	Pleasant Valley Road S
Central Avenue (portion)	Judson Avenue	Poquonnock Road(portion)
Colonel Ledyard Highway	Kings Highway	Pumpkin Hill Road
Cow Hill Road (portion)	Lambtown Road	River Road
Crystal Lake Road	Main Street (portion)	Sandy Hollow Road
Depot Road (portion)	Marsh Road	Shewville Road
Drozdyk Drive	Meridian Street	Terrace Avenue (portion)
Fishtown Road	Midway Oval	Thomas Road
Fitch Avenue	Military Highway	Toll Gate Road
Flanders Road	Mosher Avenue	Walker Hill Road (portion)
Gales Ferry Road	Noank-Ledyard Road	West Mystic Avenue
Groton Long Point Road	Ocean View Avenue	Winding Hollow Road

Local Roadways, the final classification of roadways, includes all remaining streets. This classification contains a high percentage of street mileage, with roads that provide the highest level of access to abutting land uses and the lowest level of through mobility.

MAINTENANCE

Regular roadway maintenance minimizes the total amount and cost of work required while deferred maintenance means that significant efforts and expenditures are required to restore the original integrity. Groton should continue to make regular road improvements on local roads such as periodic resurfacing. Incremental maintenance (as and where needed) helps to maintain road conditions efficiently and cost-effectively and helps to avoid expensive road reconstruction projects that can result from deferred maintenance. In addition to routine maintenance, when significant work is proposed, Groton should also consider adding bicycle and pedestrian facilities to existing roadways as appropriate.

A 2012 referendum approved $11,200,000 to fund pavement management activities such as milling and replacing asphalt in the Town of Groton, City of Groton, and Groton Long Point for the next five years. For Fiscal Year 2017, the Capital Improvement Program has recommended $46,000 in funds for planning and engineering work to update road inventories as part of a pavement management program. If approved, there will be another bond referendum in Fiscal Year 2018 to continue the systematic road maintenance work, estimated at $7,000,000.

Groton should continue to work closely with state and regional agencies, such as the Southeastern Connecticut Council of Governments (SCCOG) and CT DOT, regarding transportation issues and improvements in town. Continued spot improvements on state highways should be encouraged in terms of general maintenance. This includes the work currently budgeted in the Capital Improvement Program to upgrade the Main Gates of the submarine base. This work is in conjunction with SCCOG and is scheduled to receive state and federal funding.

COMPLETE STREETS AND SCENIC ROADS

Transportation engineering has typically focused on removing road hazards and moving cars as efficiently as possible. This can result in roads that are wide, flat, and straight – characteristics that may encourage speeding and detract from community character by emphasizing automobile traffic flow over pedestrian safety or aesthetic concerns.

Complete Streets design approaches emphasize the safety and comfort of people of all ages and abilities engaging in different modes of transportation – walking, biking, and transit as well as cars. Complete Streets elements include sidewalks and American with Disabilities Act (ADA) compliant facilities (such as curb cuts for wheelchairs), traffic calming measures such as center medians and narrower roads, bicycle accommodations such as protected bike lanes and bike parking, and transit accommodations such as bus shelters. Complete Streets design often has many benefits: health and safety benefits for pedestrians and bikers, who are more easily able to exercise and better protected from potential traffic collisions; environmental benefits from reduced car use and reduction in emissions; aesthetic benefits from the addition of more street trees, plantings, benches, and other streetscaping; and economic benefits from increased foot traffic.

Traditional scenic roads emphasize aesthetic and cultural resources. Efforts to make roads in Groton more scenic attempt to balance traffic efficiency with community character. Scenic road elements include narrow road width, tree canopies, stone walls, scenic vistas, agricultural lands, historic buildings, and notable natural features. Scenic roads, in rural or historic areas, are one element that significantly contributes to Groton's character. As development of the community continues, scenic roads may be increasingly threatened by adjacent development or increasing traffic volumes. Groton adopted a scenic road ordinance in 1989, and River Road and Sandy Hollow Road have since been designated by the Town Council as scenic roads.

Scenic roads and Complete Streets are not mutually exclusive (for example, both suggest narrowing traffic lanes to reduce speed), and both include design recommendations that value aesthetic improvements that would benefit the community character of Groton. Both design approaches should be incorporated into road standards in Groton where appropriate and feasible. However, one design approach may be more appropriate than the other in the specific context of each individual road. For example, adding an extra bike lane and a sidewalk may not be appropriate for a rural scenic highway where a separate multiuse trail may be a better approach.

Future roads and redevelopment/repaving of existing lower classification roads should be made as scenic and safe for pedestrians and bicyclists as possible while providing for safe and efficient circulation. The best way to do this is through modifying the road construction standards, primarily design speed and paved width.

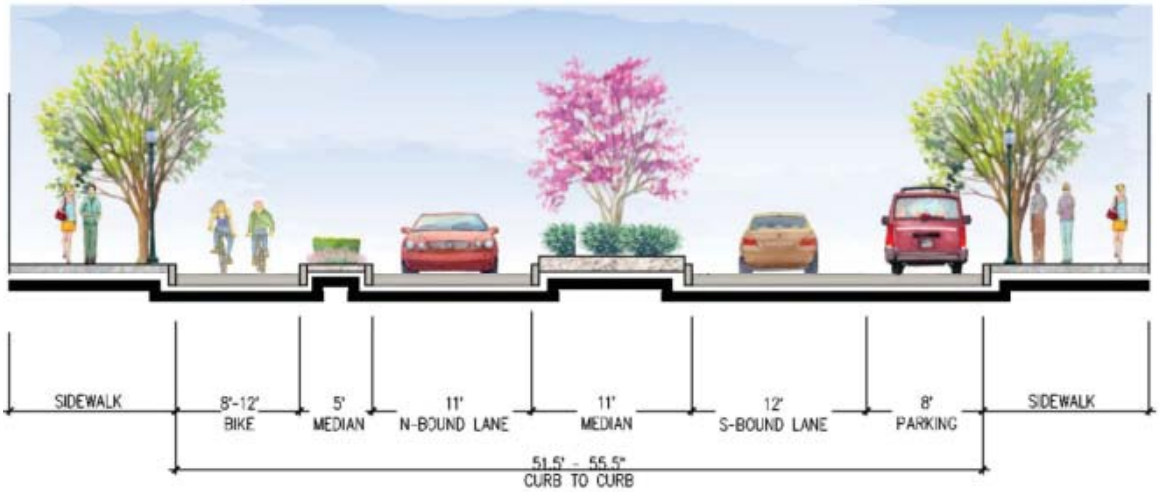
ROAD STANDARDS FOR NEW ROADS

The design speed of a road is the speed that the road is designed to be capable of handling. It is typically higher than the posted speed limit. A higher design speed results in roads that are wider, flatter, and straighter. As a result of the road design speed, motorists often feel that it is safe to exceed the posted speed limit. Existing scenic roads show that minimum design standards for traffic safety can be used in conjunction with scenic road criteria to create roads that are scenic and safe. The Scenic Road Standard Recommendations table shows recommendations from the 2002 POCD. While these recommendations conform generally to American Association of State Highway and Transportation Officials (AASHTO) safety design guidelines, individual roads will still need to be assessed for appropriateness according to their traffic volume and terrain.

Scenic Road Standard Recommendations

	Current Design Speed	Current Right-of-Way Width	Current Pavement Width	Proposed Recommendations
Arterial (Thoroughfare)	50 MPH	60-100'	40-44'	None
Collector	45 MPH	60'	34-40'	Reduce design speed to 35 MPH and allow paved width of 30'
Access	30 MPH	50'	30'	Reduce design speed to 25 MPH and allow paved width of 24'
Village Road	25 MPH	50'	26'	Reduce design speed to 20 MPH and allow paved width of 22'
Sub-Village Road	25 MPH	40'	20'	Reduce design speed to 20 MPH and allow paved width of 18'

Future Capital Improvement Program projects including any street reconstruction should also include provisions for a Complete Streets design review. The design review should gauge suitability of the street for improvements that will make the street safer, easier, and more pleasant for residents to walk and bike instead of drive. Improvements such as sidewalk widening, adding sidewalk buffers, adding bike lanes, and adding sidewalk furniture such as benches and clearly marked and lighted crosswalks should be considered. One mechanism



that the town can use to implement these principles for new streets is to revise the current subdivision regulations regarding design and classification of proposed roads. In addition to incorporating Complete Streets design principles, these regulations can also be written to further other sustainability goals such as reducing impervious surfaces and increasing the use of low-impact development practices (see Conservation section).

ROADWAY MANAGEMENT CONCERNS

Flooding

Various sections of roads in Groton were identified as being vulnerable to climate change impacts in the Municipal Coastal Program (MCP) update. Impacts such as sea level rise, increased storm frequency, and increased storm intensity can have major consequences for transportation in Groton. Strategies to adapt Groton's roadways to become more resilient may also require coordination with CT DOT and other agencies. As outlined in detail in the MCP, alterations may include the following:

- *Elevation of Roadways* – Roads may be elevated to remain viable while flood elevations increase. This has been done in many coastal communities along the east coast of the United States over the last century to counter sea level rise. The drawback to elevating roads is that private properties often remain at lower elevations and, therefore, remain flood prone. A higher road surface can then impede drainage of floodwaters off properties.
- *Abandonment of Roads* – Some communities may find it acceptable to abandon roads as the cost of elevating or maintaining a road becomes excessive. In some cases, complete abandonment may not be necessary, but Groton may allow a lesser level of maintenance.
- *Evaluation of Emergency Access and Routes* – Groton may abandon designated emergency accessways (without actually abandoning the associated road) while selecting a different route for emergency access or evacuations.
- *Developing Alternative Egress* – If pursued, developing alternate egress would likely be used in connection with abandonment of roads and/or reassignment of emergency access.

Of particular concern is the South Road underpass, an important accessway to and from the airport. It is flood prone and must be closed several times each year. The town eventually would like to make the airport's access more resilient. The town should develop a comprehensive approach to prioritize and implement roadway floodproofing measures.

South Road underpass

As the Town is prioritizing road flood-proofing measures, the best available model for sea level rise should be used when the recommendation is implemented. One model, available in September of 2016 called the Long Island Sound Sea-level Affecting Marshes Model (SLAMM) data set will identify roads subject to tidal and storm flooding under different SLR scenarios, including flooding frequency and depths. This kind of information, together with information about the number of properties served by these roads, will be helpful in prioritizing flood-proofing resources.

Capacity and Congestion

Traffic congestion can be measured by the ratio of traffic volumes to roadway capacity. Intersections or roadway segments with ratios of volume to capacity of greater than one routinely suffer from delays and the breakdown of traffic operations; the SCCOG Long Range Transportation Plan, 2011-40 identified 37 such sites in the region. There are nine locations in Groton, including along Route 117, Route 184, Route 349, and Route 12. An additional 13 sites within Groton have traffic to volume ratios between .8 and .99, which indicates congestion. These additional sites are along Interstate 95 and Routes 1, 12, 117, and 184. These locations are shown on the Map I-2 - Congestion and Accidents.

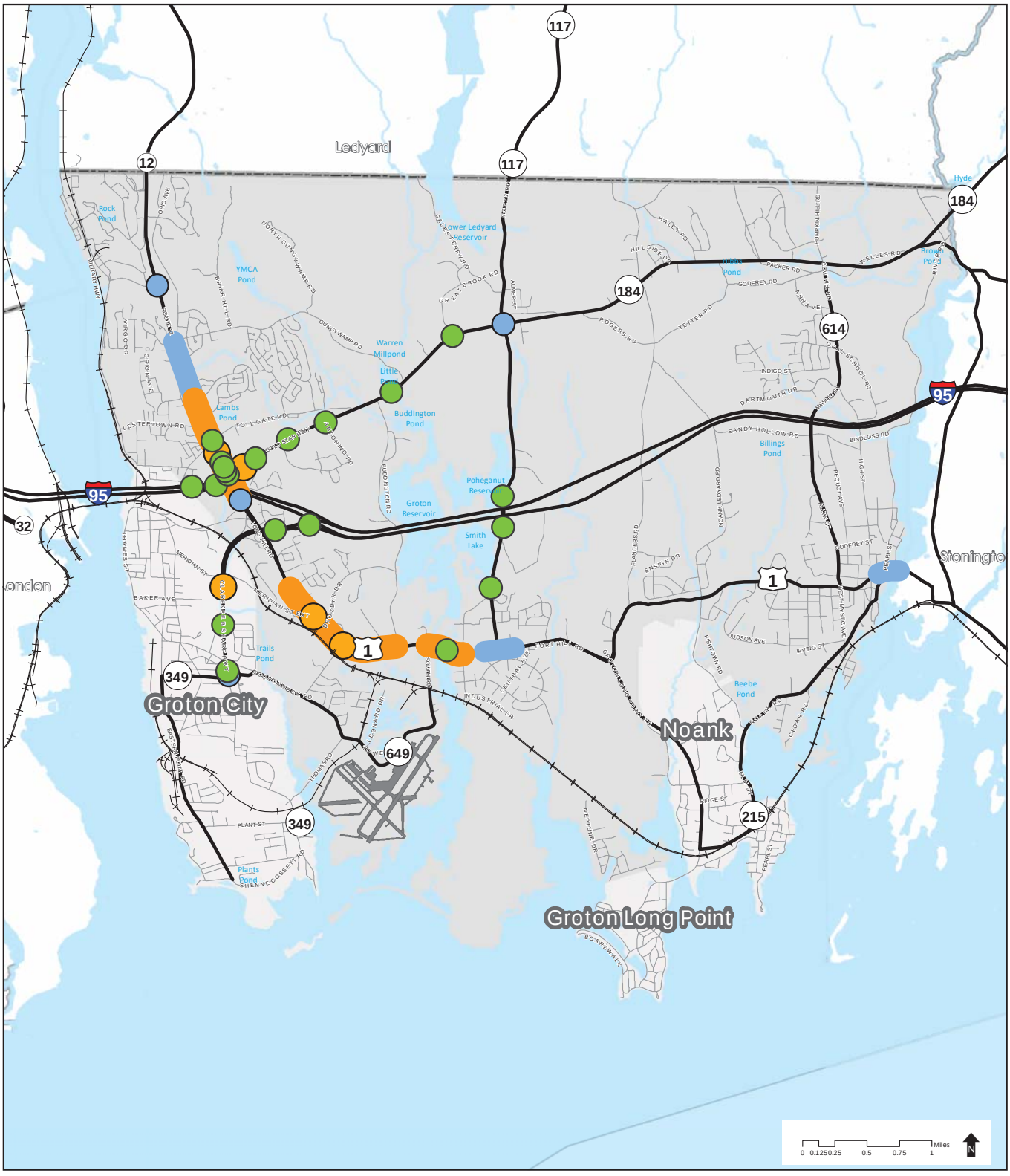
SLOSSS Locations (2007- 09)
Route 1
At Rt. 1 off-ramp
Between Wayne Rd. and Meridian St.
At Meridian St. Ext.
Between Meridian St. Ext. and Drozdyk Dr.
Between Drozdyk Dr. and Poquonnock Rd.
Between Poquonnock Rd. and Plaza Ct.
Between shopping center drive and Laurelwood Rd.
Between Laurelwood and Buddington Rd.
Between Depot Rd. and North Rd.
Route 12
At Rt. 1/ Kings Hwy
Between Kings Hwy and Route 184 ramps
Between 184 ramp and Pleasant Valley Rd. South
At Pleasant Valley Rd. South
Between Tollgate Rd. and Hickory Dr.
Route 184
At Rt. 12 N of the ramps
At Pumpkin Hill Rd.
Route 349
At Meridian St. Ext.

Source: CT DOT

Accidents

Frequent accidents in specific locations may indicate problems with the road network such as congestion or inadequate roadway design. The CT DOT maintains a database of accident data on state and federal roadways. While accidents can be expected to occur anywhere, when a location experiences more accidents than the average similar roadway, it is included on the Suggested List of Surveillance Study Sites (SLOSSS) for further investigation. Since the 2002 POCD, there has been a reduction in the number of SLOSSS spot locations from

Map I-2: Congestion & Accidents



Groton PLAN OF CONSERVATION + DEVELOPMENT

Congestion & Accidents

Interstate, US, and State Highways

Local Roads

SLOSSS Intersection

No Longer SLOSSS Intersection

SLOSSS Segment

No Longer SLOSSS Segment

N New SLOSSS Intersection

Traffic to Volume Ratio > .8

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

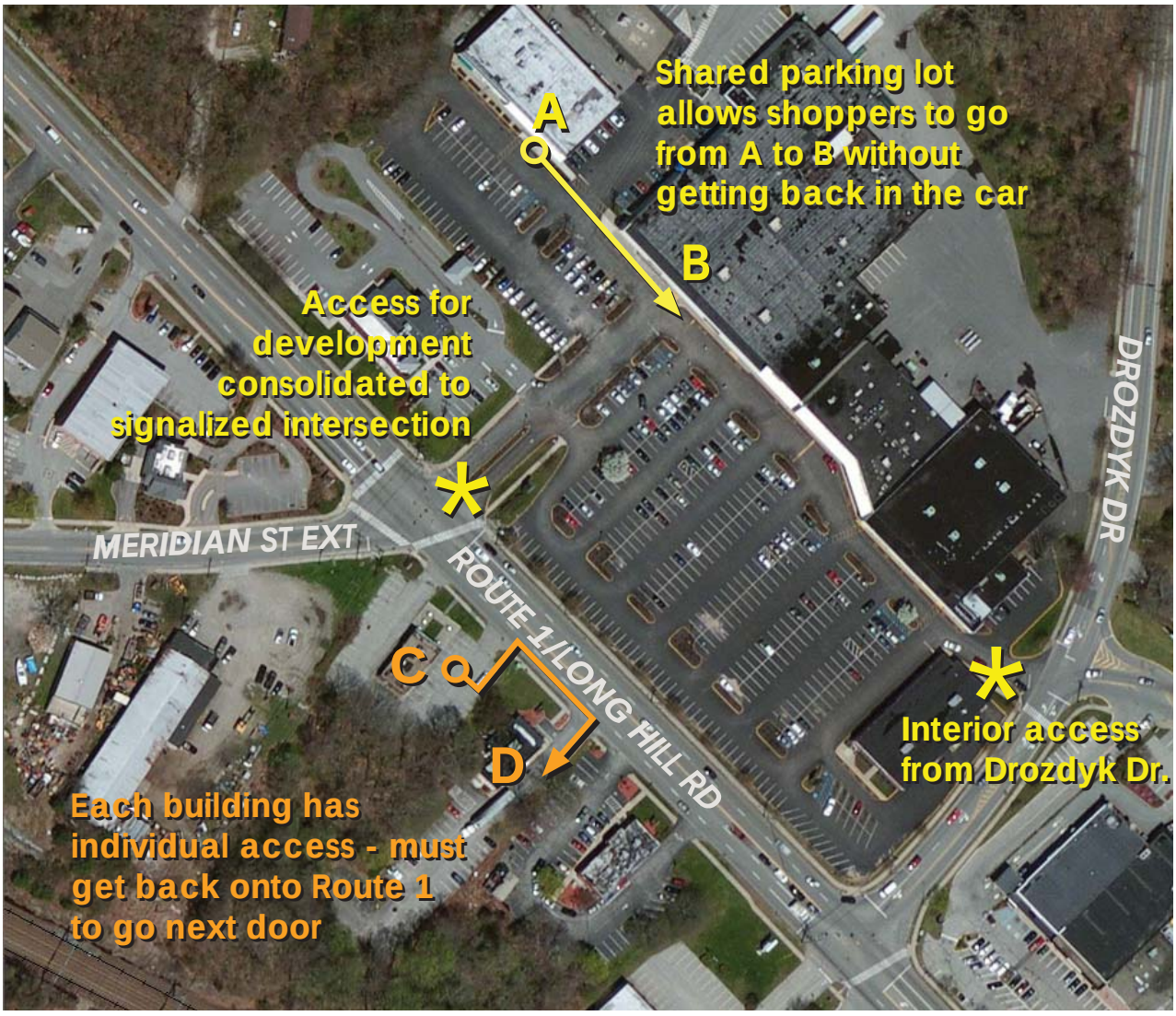
April 2014

eight to five but an increase in roadway segments from nine to 12. Overall, the SLOSSS locations identified in the 2007 to 2009 SLOSSS update continue to impact Routes 1, 184, 12, and 349; however, some of the locations have changed (see Map I-2).

Access Management

"Access Management" attempts to balance the need to provide access to land development (such as driveways to private homes or businesses) while also preserving a safe flow of traffic on the surrounding road system. As the number of curb cuts or entrances onto the road system increases, the less safe it becomes for vehicles to move at speed as drivers must watch out for other vehicles coming out from driveways.

Access Management strategies would be appropriate in Groton in order to minimize and consolidate access points onto highways and arterial roads, especially for commercial development on main transportation corridors. Strategies could include limiting the number of driveways per lot to one per parcel, locating driveways away from intersections, connecting parking lots, and consolidating driveways so that vehicles can travel internally without reentering an arterial road. These strategies would promote a connected street system and could provide adequate residential access through neighborhood streets, encouraging internal access to outparcels such as shopping centers located on arterial streets. Some of



these strategies are currently required by the zoning or subdivision regulations. Others are encouraged through the development review process.

An example of some of these strategies can be seen along the east side of Long Hill Road (Route 1) across from the intersection of Route 1 and Meridian Street Extension. Several shops share parking, allowing for one main consolidated entrance at a signalized intersection. This creates safer and more efficient access than multiple entrances onto Route 1, a busy arterial road. The shopping center also has secondary access from Drozdyk Drive, which has several large multifamily developments – the Ledges Apartments, La Triumphe Apartments, and Windham Falls Estates (and more homes further north on Buddington Road). Having access to this interior road allows these residents to access the shopping center without going onto Route 1. In addition, once shoppers have parked, they may access multiple shops easily on foot rather than driving to each shop separately.

In contrast, the small commercial buildings on the west side of Long Hill Road have separate parking lots, which require shoppers to get back onto Route 1 (the only access point for these buildings) in order to go next door. Seeking to minimize and consolidate access onto Route 1 and other busy arterials will greatly improve congestion and help to create a safer, more efficient, and more sustainable transportation system.

DESIRABLE CONNECTIONS

In an effort to improve the connectivity of the road network, the Future Land Use Plan depicts proposed vehicular transportation connections. These connections are shown on Map I-3 for general planning purposes and are not fixed locations. Many of the proposed road connections connect dead-end local streets or cul-de-sacs to other local roads to provide greater neighborhood access for local traffic. These include the following:

- Antonino Road to Buddington Road
- Murphy's Drive to Briar Hill Road
- Whittle Street to Godfrey Road
- Crosswinds Drive to Fishtown Road

Another connection between two larger north-south arterial roads would serve to provide more east-west connectivity as an alternative to needing to take I-95 for local trips.

- Route 117 to Flanders Road, south of I-95

Recommendations

4-1 Develop a plan to prioritize and implement roadway floodproofing measures., including signage to guide drivers away from flooded underpasses.

4-2 Revise the subdivision regulations regarding design and classification of proposed roads to limit impervious surfaces, to increase use of Low Impact Development practices, and to incorporate Complete Streets principles.

4-3 Construct appropriate road connections and consolidate access points as development occurs.

Map I-3: Proposed Street Connections

Groton PLAN OF CONSERVATION + DEVELOPMENT

Proposed Street Connections

- Interstate, US, and State Highways
- Local Roads
- Proposed Vehicular Transportation Connections

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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ENCOURAGE USE OF MULTI-MODAL TRANSPORTATION

The Groton Greenhouse Gas Emissions Inventory found that about a quarter of total town carbon dioxide emissions were the result of transportation-related emissions. As the automobile is responsible for development patterns in Groton today, future development decisions must make Groton less vehicle dependent. This can be done by encouraging denser village Nodes instead of strip mall and highway development that does not mesh well with alternative modes of transportation.

The town is already moving towards more sustainable transportation options. The fiscal year 2014 Capital Improvement Program included transportation projects such as a 10-foot-wide multipurpose path to run the length of Crystal Lake Road to give more travel options to connect the Navy housing units south of the main base with the main entrance gate.

Public transit is a more sustainable option than using individual cars as the number of passengers on a full bus or train result in less fuel expended per passenger as well as freeing up congested roadway space. Groton's public transit is currently served through Southeast Area Transit (SEAT), which provides some local and regional routes with hour or every-other-hour headway times from roughly 6:30 a.m. to 8:00 p.m. The railway runs through Groton, providing opportunity to travel by rail. There are train stations in New London for Amtrak and Shoreline East service and in Mystic for Amtrak service.

The town has committed to purchasing hybrid vehicles for the town fleet and has already added 22 hybrid and fuel-efficient vehicles. This is a laudable step in reducing the amount of fossil fuels being burned by the town. The Energy Action Plan includes a Fuel Use Evaluation, which lists the fleet's vehicles, including make, model, year, annual miles driven, and miles per gallon. This tool provides a good catalyst for recommendations to make the town fleet even more efficient.

RAIL

The State of Connecticut's State Rail Plan (2012 to 2016), states the following:

> "The vision for rail transportation in Connecticut is a system that provides high-speed, intercity, regional commuter and freight services that will be a catalyst for smart growth, encourage greater mobility, promote the state and regional competitive advantage in the global economy, decrease highway and aviation congestion, reduce energy use, and improve air quality… Rail offers a safer, greener, and healthier alternative to highway travel, one that requires 35 percent less energy per passenger-mile and generates corresponding lower levels of Greenhouse Gas (GHG) emissions."

Upgrading existing branch lines and Shoreline East services in areas that can leverage employment growth and economic development through transit-oriented development (TOD) is listed as a secondary priority after investments in the New Haven Line to New York City.

While the Amtrak rail corridor traverses Groton, there is no local passenger station in town. However, Union Station in New London connects to Amtrak and Shoreline East commuter service to New Haven, and a train station in Mystic on the Stonington side is part of Amtrak's northeast line to Boston along the Massachusetts commuter system through Rhode Island. This could also serve the nearly 1,000 people commuting between Groton and Westerly, Rhode Island every day. As opportunities for augmented commuter and passenger rail service arise, it is important to Groton residents and businesses that intermodal opportunities also increase in order to facilitate commuting and travel into and out of Groton. A passenger rail platform located near downtown Groton could serve as a multi-modal transit hub with bus, taxi, and shuttle links to major destinations. Such a large structural investment will take many resources and take years to come to fruition, but the Town of Groton should start planning for ways to effectively lobby for an expansion.

Amtrak has had a maintenance yard on Industrial Drive in Groton since about 2000 and recently purchased adjacent properties to expand this yard. Amtrak's long-range plans for the Northeast Corridor include reconfiguration of tracks to include two high-speed center tracks and two outside regional/local route tracks. Amtrak's plans may evolve given the coastal route of the tracks in Groton and coastal management concerns.

The Providence & Worcester Railroad Company provides short-line freight service in Groton with tracks running along the eastern branch of the Thames River and with trackage rights along the Northeast Corridor tracks through Groton. The company interchanges freight traffic with several Class I railroads thereby having a nationwide reach. Through an operating agreement with New England Central Railroad on the western branch of the Thames River, it can reach Canada. The State Rail Plan also notes that the Groton to Worcester freight line has potential for passenger service.

The Municipal Coastal Program (MCP) notes that sections of the Amtrak railroad could flood under certain sea-level-rise and storm-flooding scenarios. The Route 649 railroad underpass was identified by public workshop participants as being vulnerable to climate change impacts. The town's Hazard Mitigation Plans (2005 and 2012) recommend that the Amtrak bridge be replaced and additional drainage improvements be added at South Road and Poquonnock Road.

The town should develop a long-term plan to eliminate these restrictive rail clearances.

AIRPORT

The Groton-New London Airport located in southwestern Groton was established in 1929. The State of Connecticut owns the general aviation airport, and it is managed by the Connecticut Airport Authority (CAA). The Groton-New London Airport was once classified as a commercial airport, but in 2003, U.S. Airways ceased operations, and the Federal Aviation Administration (FAA) reclassified the airport as "general aviation."

A general aviation airport supports unscheduled, nonmilitary, private and commercial flights, and a certain amount of activity (usually 10 locally based aircraft). However, the general aviation classification does not preclude other uses, and the Groton-New London Airport handles a number of military flights. According to the Southeastern Connecticut Council of Governments (SCCOG) Long Range Transportation Plan, the airport handled

38,582 flight operations in 2009 when 54 aircraft were based there (and is still averaging 106 aircraft operations per day, or 38,690 per year, in 2016 according to AirNav.com). Approximately 580 full- and part-time personnel worked at the airport in 2009.

The Groton-New London Airport has two paved runways, one that is 5,000 feet long and a second that is 4,000 feet long. The airport recently installed Engineered Material Arresting Systems (EMAs), the first in the state, to achieve runway end safety standards. The airport has a terminal building and control tower, built in 1963. According to the most recent Airport Master Plan, the terminal building is underutilized since scheduled commercial air service ceased. Two fixed-base operators (FBOs) also maintain several hangars at the airport: Columbia Aviation and Lanmar Aviation. Several additional hangars are located at the airport, most under private ownership. Current and forecasted demands do not indicate a need for additional hangars; however, hangar development is a large source of revenue for general aviation airports.

The Groton-New London Airport Master Plan Update Alternatives Analysis, prepared in 2011, identified several landside and airside opportunities for upgrades and further development, from upgrading airfield lighting to upgrading landside facilities. The Alternatives Analysis compares three scenarios: no changes, minimal development, and maximum development. The preferred alternative identified is full buildout in order to maximize revenue opportunities through additional hangar space. However, the Alternatives Analysis acknowledges that full buildout will take years of planning to implement. Therefore, in the short term, the Alternatives Analysis recommends maintaining the current high standards of the facilities, which would include upgrading lighting, snow removal, and firefighting equipment. Groton should continue to work with the state to implement these and other recommendations from the Airport Master Plan.

Due to the low-lying coastal nature of the airport, the MCP has an extensive area plan to address sea level rise for the airport and surrounding areas (see Map I-4). More frequent flooding due to rising sea levels could prevent access to and reduce the function of the Groton-New London Airport in the future. The MCP recommends providing space for marsh advancement as base flood elevations and sea level rises become more resilient to coastal hazards. Details of the MCP as well as the Airport Master Plan and the Hazard Mitigation Plan should be considered and consulted before any major development occurs in the airport area.

MARINE TRANSPORTATION

Groton has a strong tradition of maritime operations. The United States Navy Base and the Electric Boat Corporation (a military contractor that constructs Navy submarines), both on the Thames River, make Groton the "Submarine Capital of the World." The Thames River has been dredged to provide adequate depth for submarines and is also heavily used by other operations such as Hess Oil Terminal along with ferry service out of New London servicing Block Island, Long Island, and Fisher's Island. The Mystic River was also heavily used by maritime operations in Groton's history. Historically used for shipbuilding and fishing, the Mystic River is primarily used for moorings and marinas for recreational craft today.

Map I-4: MCP Airport Area Plan

The 2002 POCD recommends the development of water taxi services for recreation and other purposes. The resurrection of a plan for the Thames River Heritage Park may create these water taxi linkages.

The plan proposes linking various historical and cultural sites on both sides of the Thames River such as the Submarine Force Library and Museum, the Coast Guard Academy, New London City Pier, Fort Trumbull, and Fort Griswold Battlefield State Park. All travel between New London and Groton is currently restricted to the Gold Star Memorial Bridge, an 11-lane highway, so a water shuttle service can also serve to create a more diverse transportation system as well as serving tourism needs. A water taxi service serving both sides of the Mystic River would provide another opportunity to provide car-free transportation of the east side of Groton. Groton should continue to support the development of a robust water taxi/water shuttle service to diversify transportation options.

SEAT bus service in Groton

BUS SERVICE

SEAT runs five major fixed bus routes that connect towns and cities within the region. Of those five, two routes traverse Groton. One connects Groton with New London, Gales Ferry, Norwich, and Ledyard. The other connects the Routes 1 and 12 and Interstate 95 interchange area in Groton with New London and Niantic. In addition to these intercity routes, SEAT also operates local bus service in Groton. The Groton local route connects Route 12 to employment centers in the City of Groton along Rainville Avenue, the Branford Manor Housing complex, Route 1, Drozdyk Drive, the Fort Hill neighborhood, and the Pequot Health Center off Route 117.

Groton should work with regional partners to expand public transit schedules to meet social needs, especially to disadvantaged or disabled groups, by providing more night and weekend service. Most criticisms of the bus system made during public workshops could be solved by service improvements such as real-time bus locators and arrivals. The long headway times and circuitous routes taken by SEAT were seen as a barrier to some residents. Also, bus stops and times may not be clearly marked, may be difficult to get to, or may be located in unwelcoming areas. The town could use public surveys or social media to receive feedback on problem bus stops and work with SEAT to improve signage and bus stop amenities to create a user-friendly transit environment. Bus stop locations could also be periodically reviewed to ensure that Nodes are well served as development occurs. Groton should also work with local employers to encourage programs for their employees to use bus transit, which will ease parking issues as well as have environmental benefits.

MYSTIC MULTI-MODAL STUDY

The Mystic area is an important tourist attraction and economic driver. However, the popularity of the area can result in traffic congestion and a lack of parking within the downtown area. Milone & MacBroom, Inc. and Harrall-Michalowski Associates conducted a Multi-Modal Study in Mystic in 2005 that analyzed parking lot capacity and utilization, public transit services, and nonvehicular transportation options. The main recommendations that came out of this study were as follows:

- Create transit center near I-95/Route 27 interchange
- Reinstitute Mystic shuttle bus service
- Expand Mystic Seaport water shuttle service
- Improve directional signage throughout the Mystic region
- Enhancements to pedestrian and nonvehicular transit linkages (bike lanes, sidewalk improvements, wayfinding, etc.)
- Improvements to the Route 1/Route 27 intersection
- Improvements to sidewalk maintenance and accessibility

Since this study, the town has invested heavily in streetscape improvements in Mystic in order to improve the pedestrian experience. Groton should continue to work with Stonington to facilitate the movement of tourists and residents between destinations on both sides of the Mystic River.

Recommendations

4-4 Develop a plan to eliminate restrictive rail clearances at South Road and Poquonnock Road.

4-5 Develop a justification and request the extension of Shoreline East to link with the Massachusetts commuter system through Rhode Island and create a passenger rail platform in downtown Groton.

4-6 Support a robust water taxi service on the Mystic River and the development of a seasonal water shuttle on the Thames River linking tourist sites.

4-7 Work with Stonington to facilitate the movement of tourists and residents between destinations on both sides of the Mystic River.

ADDRESS PARKING NEEDS

Mystic Parking Conditions

Milone & MacBroom, Inc. and Harrall-Michalowski Associates conducted a Multi-Modal Study in Mystic in 2005 that analyzed parking lot capacity and utilization, public transit services, and nonvehicular transportation options. Based on parking counts taken on a Saturday in August, downtown Mystic's (Stonington) on-street parking was between 83.5% and 91.5% full between the hours of 3:00 p.m. and 8:00 p.m. On-street parking in downtown Mystic (Groton) was between 58.0% and 83.2% full during the same time period; off-street parking peaked at 100% at 2:00 p.m. These parking counts were taken in 2003; a current parking study after extensive streetscape improvements in the downtown Mystic area might yield different numbers, but the popular perception that Mystic has inadequate parking still exists.

Full on-street parking in Mystic

The popularity of tourist attractions in Mystic leads to parking congestion in the area, and this has long been recognized. Mystic tourists are in part attracted by the traditional New England coastal village feel of the area, and adding large amounts of surface parking would detract from the character of Mystic. Groton should continue to plan with Stonington to manage and improve parking and mobility in this area.

Parking at Other Amenities

The MCP notes that several coastal access points, boat launches, and docks have very limited or no parking. Parking-related recommendations include the following:

- Secure additional parking spaces for the numerous public access locations in Mystic.
- Develop a "public access plan" that promotes the connection of public access sites, parking for all sites, controlling the placement of "No Parking" signs that give the impression that public access in not allowed, acquiring new sites of public access, and adding sites that allow people to get into the water for swimming or boating.

The 2009 Parks and Recreation Master Plan also has detailed recommendations for various parking improvements to be made at different parks, trailheads, and bikeways for inclusion into the Capital Improvement Program.

Zoning and Parking

The 2015 Zoning and Subdivision Regulation Audit prepared by Vanasse Hangen Brustlin, Inc. (VHB) has several parking recommendations based on zoning classifications in Groton. For example, the Downtown Design District (DDD), Waterfront Design District (WDD), and Mixed-Use (MX) areas should be reviewed for the possibility of shared, reduced, or phased parking requirements. Reducing parking in some appropriate areas can reduce impervious surface area and reduce potential stormwater runoff into local waterways.

The findings from the 2015 Zoning and Subdivision Regulation Audit should be used to complete a comprehensive review of parking requirements across zones to ensure that appropriate standards are in place for different uses and locations.

Recommendations

4-8 Review parking requirements to ensure appropriate standards are in place for different uses and areas and to minimize water quality impacts.

4-9 Develop a plan to manage and improve parking availability in downtown Mystic.

IMPROVE AND EXPAND THE TOWNWIDE PEDESTRIAN AND BIKEWAY NETWORK

Nonmotorized modes of transportation provide alternatives for those who cannot, or choose not, to drive for some or all trips. Walking and biking are the most common and practical modes of nonmotorized transportation as well as being the most healthy and sustainable. Sidewalks, multiuse trails, bike routes, and greenways form the foundation of the nonmotorized transportation network and can attract and maintain users. The Town of Groton has long supported improvements to pedestrian and bicycling facilities: the Groton Bikeway Proposal was completed in the 1970s, and several other pedestrian and bike plans have been completed in recent years.

BICYCLE, PEDESTRIAN, AND TRAILS MASTER PLAN

The Groton Bicycle, Pedestrian, and Trails Master Plan, completed in 2005, established the following goals for all forms of nonmotorized transportation in Groton:

1) To interconnect neighborhoods
2) To develop commuter routes
3) To develop recreational trails that provide access to open space
4) To build facilities that are safe and attractive

The 2002 POCD also recommended creating an overall pedestrian network, including improving and extending the sidewalk network, developing and improving the trail network, and establishing a bikeway network. In addition to the recommended routes outlined in the 2002 POCD, SCCOG Long Range Transportation Plan, 2011 to 2040, recommends two additional pedestrian/bike routes through Groton.

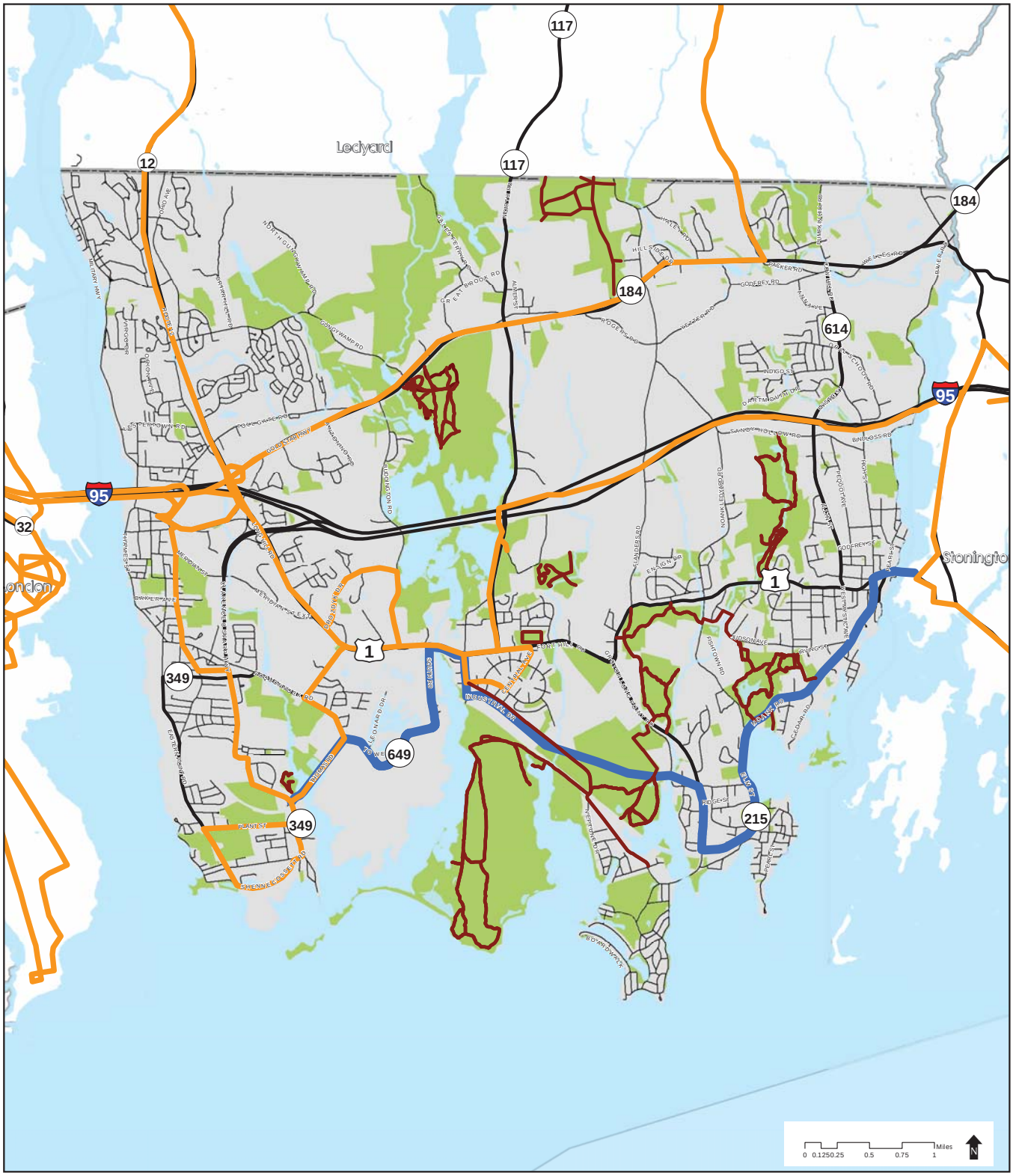
PEDESTRIAN/BIKE NETWORK

Groton should strive to interconnect all sidewalks, multiuse trails, and bikeways into a cohesive, useful overall network, integrated with nodal development. Residents will not extensively use such a network unless it is safe, comfortable, aesthetically pleasing, convenient, and useful, connecting to various destinations in town for shopping and errands. Appropriate support facilities such as bicycle racks at destination areas can also be important additions to the bikeway network. Sidewalks and trails can also further other sustainability goals such as incorporating pervious paving in sidewalks to allow for greater stormwater infiltration.

There are established bike routes through southern Groton as shown on Map I-4. The trail system depicted on the map consists of recreational trails located primarily in town or state parks and privately owned open-space parcels. Suggested improvements to the existing bikeways include upgraded signs to give bikers and walkers appropriate directions to multiuse trails that may be difficult to find such as to the bike lane of the Gold Star Bridge.

Another report, the Tri-Town Trail Master Plan in 2009, recommended connecting a bike trail from Bluff Point in Groton north through Ledyard to Preston. The largest stumbling block in this effort has been resistance from Groton Utilities to allowing bike trail access through water utility lands. Continued collaboration and working toward common goals of access and water quality protection should be pursued to establish this regional trail.

Map I-5: Existing Trails, Bikeways, and Sidewalks



Groton PLAN OF CONSERVATION + DEVELOPMENT

Existing Bus Routes, Trails, and Bikeways

Recreation Trails
SEAT Bus Routes
Established Bikeway

Sources:
* Street Centerlines: Town of Groton GIS Dept.
* State Roads: Streetmaps USA (2011)
* State Road Classifications: CT DOT (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

January 2016

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Based on appropriate locations and uses, the town and the state should work to develop new bikeways and sidewalks along state roadways such as Route 1 and Route 12. The addition of bike lanes, adjacent multiuse paths, and sidewalks should be considered during the rebuilding of local roadways as well. Routes that provide a means for workers to commute to large employment centers such as Electric Boat by walking or biking should be especially targeted to reduce traffic and parking congestion for those areas. In both the siting and construction of new bikeways and sidewalks and the maintenance of existing ways, construction and industry standards should be followed to ensure a safe, smooth surface that is ADA compliant and of adequate width to safely accommodate two people walking side by side.

Sidewalk along Route 1

Recommendations

4-10 Review and update the Groton Bicycle, Pedestrian and Trails Master Plan to encourage alternative modes of transportation.

4-11 When practical, add bike lanes, adjacent multiuse paths, and sidewalks when rebuilding local roadways.

ENHANCE AND MAINTAIN COMMUNITY FACILITIES

A community's facilities contribute to the general wellbeing of its residents and businesses. For the purposes of the POCD, community facilities are defined as public buildings, including schools, police and fire stations, libraries, public housing, senior citizen and/or other community centers, and general government facilities that serve the general or specific needs of the public and are the responsibility of the town to maintain. Municipal infrastructure includes sanitary and storm sewers and flood control structures, public water supplies, dams, and solid waste disposal. Both the availability and quality of community facilities and municipal infrastructure can impact residents' quality of life and community economic development.

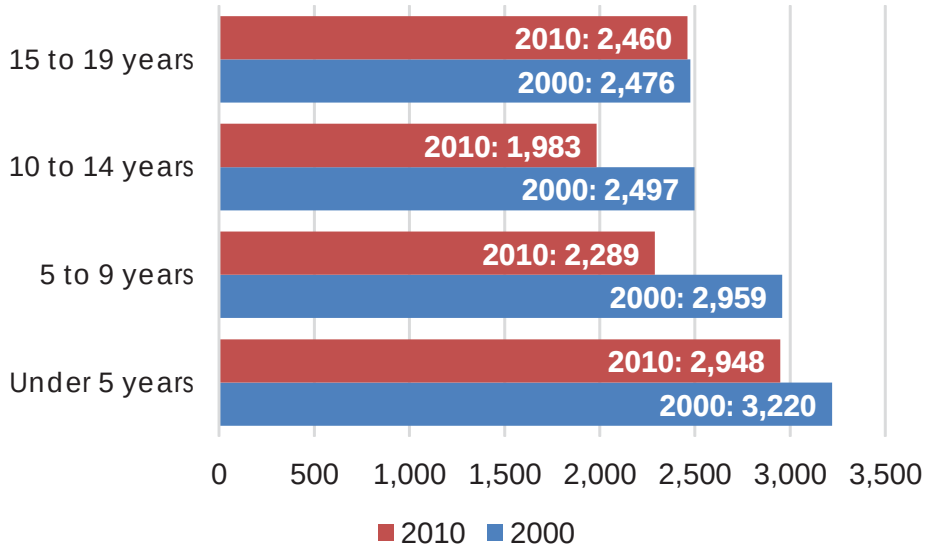
Groton Town Hall

DEMOGRAPHICS AND TRENDS OF SCHOOL CHILDREN

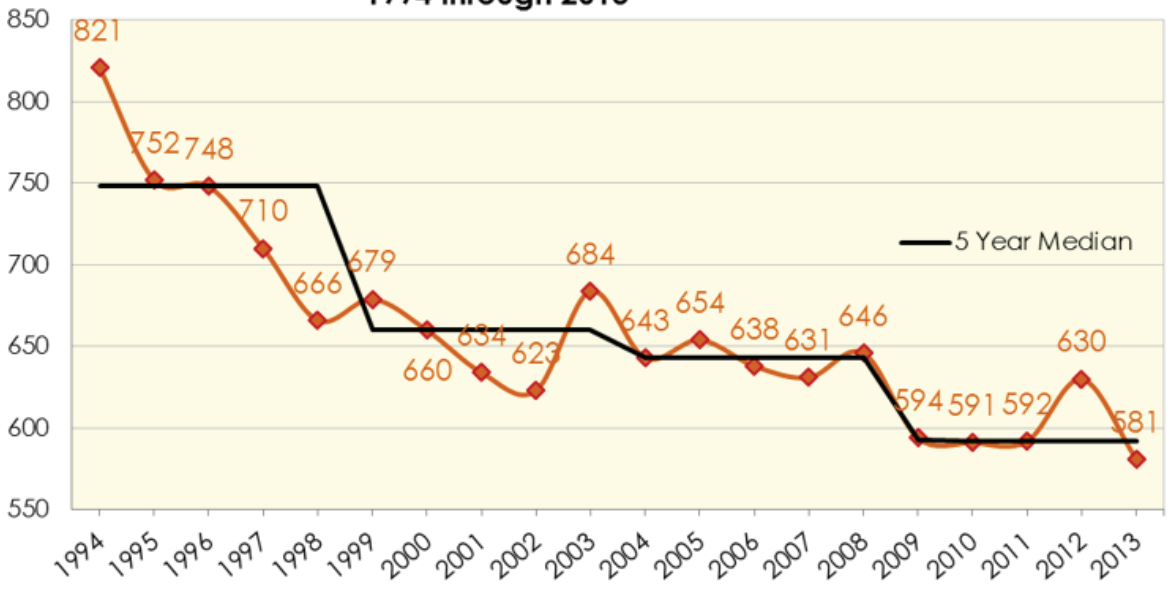
Groton has experienced a reduction in the number of children and the young working age population that typically starts families, impacting school enrollments and school facilities needs.

Births have decreased substantially with provisional births data suggesting that 2013 had a record low of 581 births, compared to 684 births in 2003 and 821 births in 1994. This figure may be adjusted upwards from out-of-state births that are then attributed to Groton but still point to an overall trend of declining birth rates that will likely result in declining Groton Public Schools enrollments in the future.

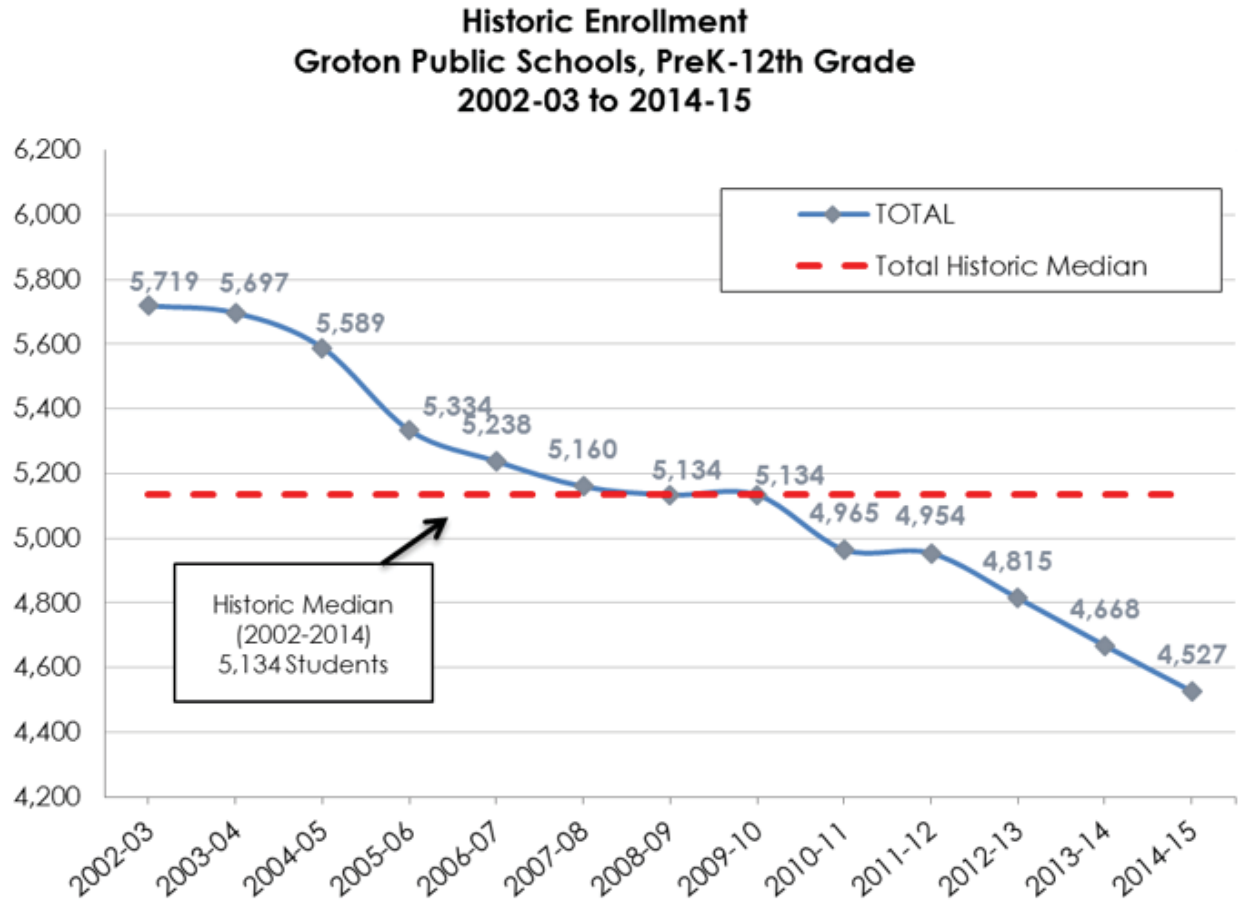
Change in Number of Children in Groton, 2000 -2010



Historical Groton Births 1994 through 2013*



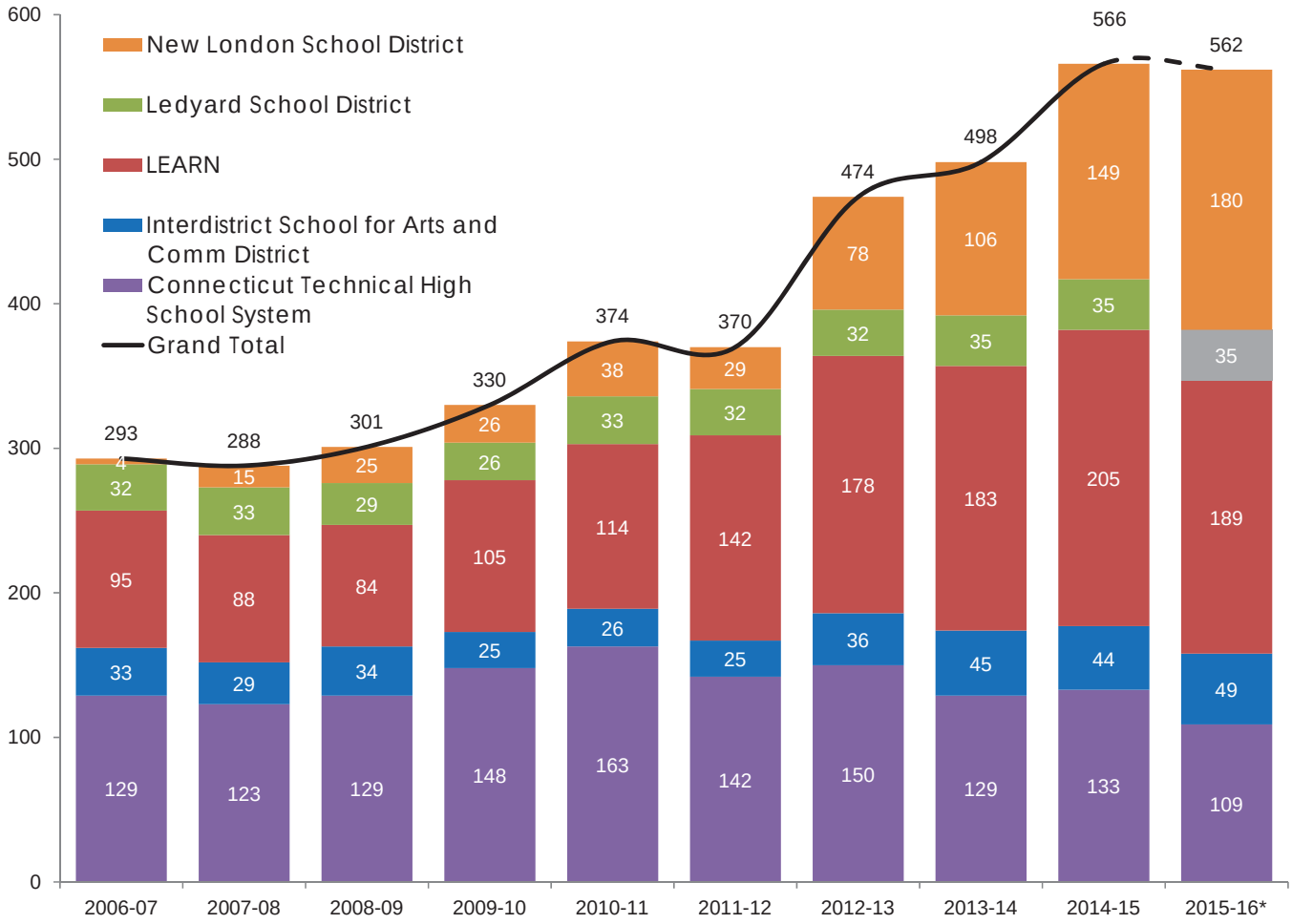
Source: CT Department of Health Vital Statistics *2013 is a preliminary figure. as of 4/13.*



The enrollment trends are reflective of this period of overall decline in births in Groton. Enrollments for the Groton School District have been steadily declining from 2002 (5,719 students) until 2014 (4,564 students), with a median of 5,134 students during that period. These enrollments occurred during a time of a largely static population and labor force.

Total PreK to 12th grade enrollments reached the historic median in 2008 and 2009 and have decreased by an average of 121 students each year since then. Low births will affect total enrollments until the recent rebound in children born in 2012 enter Kindergarten in 2017. Enrollment declines may also be attributed to other public school options including New London Public Schools and LEARN as well as other nonpublic schools. For example, attendance of Groton children in the New London School District has increased dramatically from 29 in 2011-12 to 242 in 2014-15 (a 734% increase) due to the popularity of the magnet school program.

Groton K-12 Enrollment in Other Public Schools, 2006-07 to 2015-16*



Sources: 2006-07 to 2013-14 from CEDaR. Schools with enrollments of fewer than 15 students over the 10-year period were excluded from this graphic.
*2015-16 data is preliminary data from Groton Public Schools.
Missing or incomplete school enrollments are shown in gray with the previous year's enrollment for illustrative purposes only.

According to districtwide enrollment projections conducted in 2014 by Milone & MacBroom, Inc., Pre-K to 12th grade enrollments are likely to continue to drop to 4,068 by the year 2024-25. These enrollment projections were based on the following assumptions:

- The persistency trends (ratio of children that go up a grade in the Groton Public Schools system versus leaving the system year to year) from the last five years will continue into the future.
- Programming will remain the same, including continuation of full-day Kindergarten.
- Based on the influence of the submarine base and trends on the national and local levels, annual births in Groton will only slightly decrease over this period.
- Housing sales will stay between 200 and 250 annually.

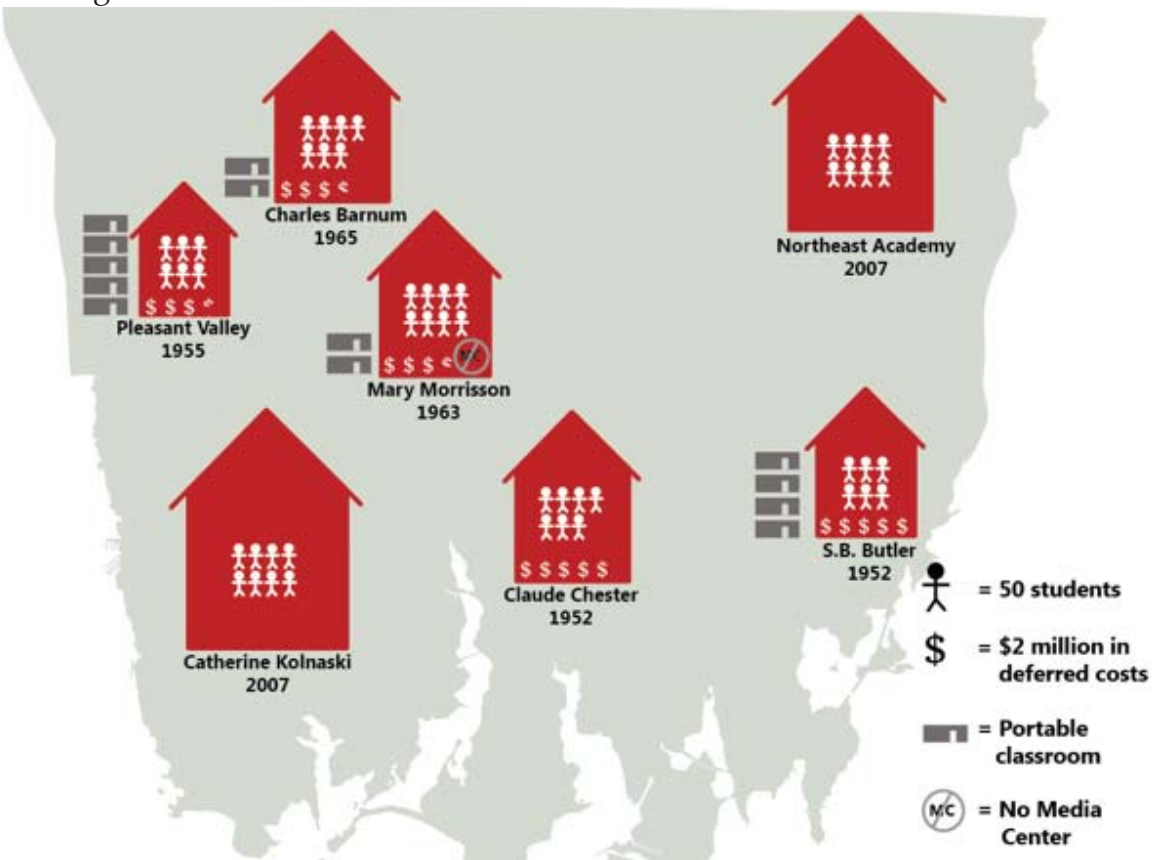
Changes to these underlying assumptions will impact projections of future enrollments.

GROTON PUBLIC SCHOOL FACILITIES

The Groton Public Schools system currently operates seven elementary schools, two middle schools, and one high school. The system closed a third middle school, Fitch Middle, for the 2012-13 school year. Except for Catherine Kolnaski and Northeast Academy, the elementary schools date back to the 1950s and 1960s. There are currently 13 portable classrooms in use across the elementary system. The Board of Education has identified over $41.5 million of deferred costs and capital improvement needs for the elementary schools. In addition, recent enrollment trends have resulted in overcrowding in some schools, such as Catherine Kolnaski, from which an entire grade was moved in 2014.

The middle schools, West Side and Cutler, also date back to the 1950s and 1960s. The Board of Education has identified about $27.9 million of improvement needs, including asbestos removal, fire alarm replacement, and security upgrades. With the closing of Fitch Middle School in the summer of 2012, the middle school attendance boundaries were redrawn to redistribute middle school students evenly amongst the two schools. Fitch High School underwent a major renovation from 2006 to 2008, with construction of a large addition and teardown of some of the existing building. The high school remains in good condition.

Groton has several former school properties under its control. The Eastern Point School site has been leased to Project LEARN, which built a magnet marine sciences high school on the site. The former Colonel Ledyard School has been leased to the City of Groton. The former William Seely School is used by the Parks and Recreation Department for programming.



2015 Groton Elementary Schools Facilities

Remaining vacant schools include Groton Heights and the recently closed Fitch Middle School. These facilities may be marketed for appropriate economic redevelopment or reused by the town following a space needs analysis of town departments. Groton should develop criteria for the evaluation of these properties to determine the appropriate future uses.

RACIAL BALANCE AND REDISTRICTING

Groton middle schools were redistricted in 2011 due to the closing of Fitch Middle School. Groton elementary schools were redistricted again in 2012-13 due to racial imbalance. Connecticut has a state racial imbalance law (CGS §§ 10-226a-10-226e), which has the aim of ensuring that schools within a district are racially integrated. If a school within a district is shown to have a proportion of racial or ethnic minority students that is 25 percentage points above or below the proportion of minority students for the district as a whole, the school is said to be imbalanced. If an imbalance is reported, the local school district must submit a plan to the state to correct the imbalance.

Achieving racial balance in Groton Public Schools has been difficult due to the dynamic nature of Groton's population composition, including the military base and the diversity of housing stock and demographics. The districtwide Kindergarten to 5th grade proportion of minority students has also been rising steadily (from 26.0% in 2001-02 to 43.4% in 2013-14), which presents a moving target for racial balance efforts.

GROTON SCHOOL FACILITIES INITIATIVE TASK FORCE STUDY

In 2011, a Vision Committee developed a set of educational specifications for a construction project to remedy these issues of outdated facilities and racial imbalance. A referendum to approve the cost of the planned construction for the $133.5 million project was rejected by voters in 2012.

The Town Council and Board of Education are again undertaking a long-range school facilities planning process to guide the school system into the future. After the redistricting effort in 2013 did not correct racial imbalance in Groton Public Schools, the stakeholder group agreed that redistricting only provided short-term solutions and that a comprehensive facilities plan was needed. The School Facilities Initiative Task Force (SFITF) process began in 2013 to revise a construction proposal for reconsideration at a future referendum. Due to declining enrollments and the need for substantial school renovations at the older elementary schools, the committee recommended the consolidation of the two middle schools into one middle school and the consolidation of three elementary schools into two elementary schools at the sites of the current middle schools.

SFITF RECOMMENDATIONS

The recommendations of the SFITF continue the consolidation of the Groton Public Schools system in order to address declining enrollments and increase operational staffing efficiency. From 2000 to 2015, Fitch Middle School and five elementary schools were closed, and two new schools were built. The proposed configuration for SFITF's Groton 2020 Plan suggests the following to occur:

- Build a new consolidated middle school near Fitch High School in order to provide equal opportunities and the same programming to all middle school children in Groton.
- Close the three elementary schools with the highest renovation needs to avoid the cost of updating buildings that are 60+ years old.
- Turn the sites of the two former middle schools into updated, 21st Century elementary schools.

In addition to the recommended construction projects, the Groton 2020 Plan would also include an intradistrict magnet component to address further racial imbalance as well as to be competitive in the regional market.

The Groton 2020 Plan would need to pass a public referendum. Since the failed 2012 construction referendum, existing facility issues have not been addressed, the buildings have continued to age, construction costs have increased, and the state reimbursement rates for school construction projects have fallen, resulting in higher project costs in the future. Either outcome of a referendum on the Groton 2020 Plan will have significant impacts on the Groton Public Schools facilities and tax rates in Groton in the future.

ADDRESS PUBLIC SAFETY NEEDS

Police Department

The Public Safety building houses the Police Department, Office of Emergency Management, and the Emergency Communications Center. The Groton Police Department is staffed by 72 full-time employees and is organized into four divisions: Administration, Patrol, Detective, and Animal Control. The Administration Division is responsible for daily operations, youth programs, and all recording and licensing functions. The Patrol Division (including Marine Patrol) is responsible for the prevention of crime and responding to emergencies as well as leading community-oriented policing efforts. The Detective Division is responsible for investigations of major crimes. The Animal Control Division is responsible for the operation and maintenance of the animal shelter, enforcing

Groton Police Station

animal control laws, and investigating nuisance and/or damage claims. The building also houses a regional dispatch center.

The Public Safety building, originally constructed in 1977, is in need of several improvements including modernizing the prisoner processing and detention centers to meet recent state statute and building code changes, replacing firing range equipment, and making structural and building envelope improvements to withstand a Category 3 hurricane. Preliminary design has been completed on the project with the cost estimated at $5.6 million. Additional funds have been budgeted to replace failing boilers, to modernize the prisoner processing and detention areas, and to upgrade Information Technology (IT) systems.

The town has an Office of Emergency Management (formerly Civil Preparedness) that is responsible for planning for, responding to, and recovering from natural and man-made disasters, including accidents at the Millstone Nuclear Power Station. The department works with regional partners, including neighboring towns, the Department of Emergency Management and Homeland Security, and the Federal Emergency Management Agency (FEMA), to prepare for hurricanes, floods, acts of terrorism, or other catastrophic events.

The Town of Groton's Emergency Communications Center (ECC) is a regional 911 emergency communications center or Public Safety Answering Point (PSAP) serving the Town of Groton and all political subdivisions as well as North Stonington. Emergency outreach services are also provided.

It should be noted, both Groton Long Point and the City of Groton maintain separate police departments. The Groton Long Point Police Department was established in 1921, and serves a community of roughly 1,650 year-round residents and a seasonal population of 6,600. The department is comprised of five full-time officers, four part-time officers, and two civilian community service officers. The Groton Long Point Police Department station is located at 3 Atlantic Avenue. The City of Groton Police Department serves roughly 10,000 residents with a force of 29 officers and nine civilians. The City of Groton Police Department is located at 295 Meridian Street.

Fire and Ambulance Services

Fire protection and fire marshal services are provided by ten independent fire districts, each of which has its own governing board and authority to raise taxes, as well as the fire-fighting services at the Navy Base, Airport, Pfizer, and Electric Boat. The town collects taxes on behalf of the fire districts but has no authority over these independently controlled facilities. Volunteer staffing continues to be an issue in the fire districts. The fire districts with taxing authority are as follows:

- Center Groton Fire District – 163 Candlewood Road
- City of Groton – 140 Broad Street
- Groton Long Point Association – 5 Atlantic Avenue
- Mumford Cove Association – 3 Halyard Road
- Mystic Fire District – 34 Broadway, Mystic
- Noank Fire District – 10 Ward Avenue
- Old Mystic Fire District – 295 Cow Hill Road, Mystic

- Poquonnock Bridge Fire District – 13 Fort Hill Road
- West Pleasant Valley Fire District – 140 Broad Street
- US Naval Submarine Base Fire Departtment - 107 Amberjack Road

In addition, Groton has two ambulance services: Groton Ambulance Association, Inc., which covers the City of Groton and much of the Town of Groton, and Mystic River Ambulance, which covers Mystic, Noank, and Groton Long Point. Refer to Map I-5, Public Safety Facilities and Fire Districts, for locations of facilities and fire districts.

Groton Ambulance

ADDRESS TOWN SERVICES NEEDS

Most municipal departments are located in four separate buildings: the Town Hall, Town Hall Annex, Spicer House, and the Human Services Building. Additional buildings are located throughout the town.

Groton Town Hall

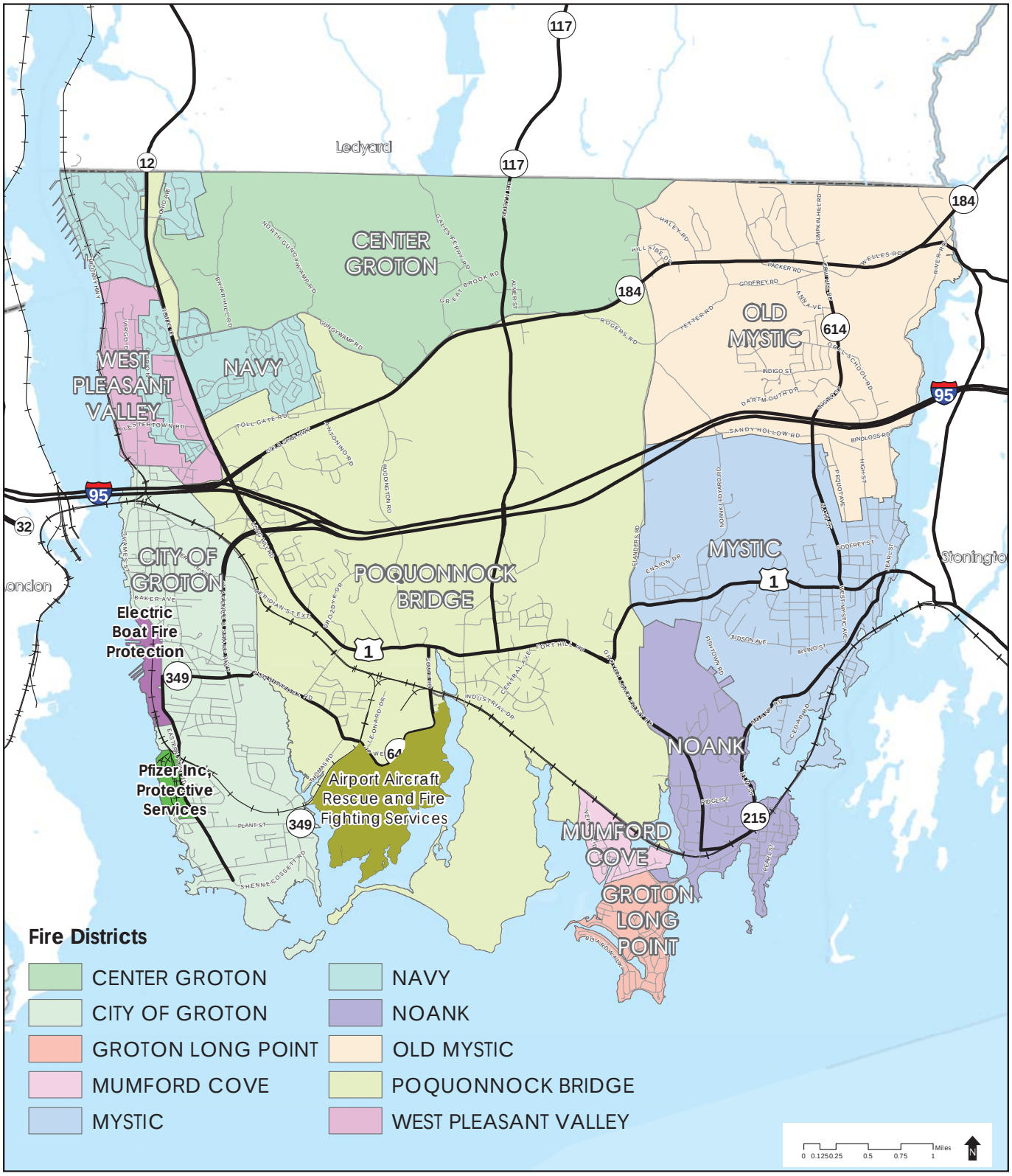
Town Hall and Town Hall Annex

Municipal departments located in the Town Hall building located at 45 Fort Hill Road include the Town Manager, Human Resources, Finance, Town Clerk, and the Probate Judge. The Town Hall Annex, located at 134 Groton Long Point Road, houses the Office of Planning and Development Services as well as Public Works offices. A consultant was hired in 2015 to assess the needs of the building, and the 2016 Capital Improvements Program requested $475,000 to address issues found by the assessment, including roof replacement and repairs.

One possible space for relocation or expansion of general town services would be into the recently vacated Fitch Middle School. The building is centrally located, directly adjacent to Town Hall, and within the Poquonnock Bridge Node area, which has been targeted as the institutional center of the town.

Additionally, the town has identified significant funding for the next six years, through its Capital Improvement Program, to upgrade computer software systems that manage permitting and asset management, and time and attendance.

Map I-6: Public Safety Facilities and Fire Districts



Groton PLAN OF CONSERVATION + DEVELOPMENT

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

Fire Districts

April 2014

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Department of Public Works

The town's vehicle maintenance facility, constructed in 1952, needs to be replaced. The current facility is only 8,380 square feet, when planning guidelines suggest that a 27,000-square-foot facility is necessary for the number and variety of light and heavy vehicles operated by the town, including construction, operations and staff vehicles for general government, public safety, ambulance, Board of Education, fire companies (including chassis work for fire trucks), and City of Groton police. The lack of vertical clearance in the building, the insufficient number of repair bays, the lack of lifts for trucks, and a separate welding shop make the current facility inefficient for fleet maintenance as well as inefficient to operate. In addition to the construction of a new, efficient vehicle maintenance facility, the existing vehicle fueling facility should be upgraded to accommodate alternative fuels. Currently, a temporary vehicle wash facility was made out of four bays of the vehicle storage garage. However, that building was not designed for such a use and, as a result, is experiencing deterioration from interior moisture levels.

The Solid Waste Division of the Department of Public Works is responsible for the disposal of solid waste generated in Groton. The town operates a leaf composting facility and a residential bulky waste transfer station.

Through an agreement with the Southeastern Connecticut Regional Resources Recovery Authority (SCRRRA), the town disposes municipal solid waste at the Preston waste-to-energy facility. The waste-to-energy facility is a 743 ton per day, mass burn plant operated by Covanta Energy. The town's solid waste disposal agreement with SCRRRA has been extended to November 2017. The town should review options and agreements to ensure that the disposal of waste continues after 2017 in a cost effective and environmentally sensitive way.

Curbside residential waste and recycling collection is handled by the various fire districts in Groton and/or private haulers. The town does not provide any residential solid waste collection services directly.

The transfer station, located on Flanders Road just north of Interstate 95, accepts residential bulky and hazardous materials waste. Items accepted at no charge include oils, batteries, electronics, pallets, and leaves. Bulky waste and brush may be brought to the transfer station with either a yearly permit or a day pass. Household appliances may be brought for an additional fee.

Housing Authority

The Town of Groton Housing Authority manages two low-income elderly and disabled housing complexes, Pequot Village and Grasso Gardens, which are part of Connecticut Housing Finance Authority's (CHFA) housing portfolio.

- Pequot Village has 104 total units (48 efficiency and 56 one bedroom) built in two phases in 1969 and 1976.
- Grasso Gardens opened in 1981 with 40 one-bedroom units and added 30 additional units in 1986.

Groton Human Services

Human Services

Social Services, Youth and Family Services, and the Groton Family Support Center are centrally located at the Human Services building at 2 Fort Hill Road. The Family Support Center offers families a variety of supportive services, including one-to-one parent education, counseling, case management, support groups, information and referrals, home visits, and parent education classes. In addition, Groton Social Services offers assistance to residents on issues concerning housing, food, energy, and finances.

The Human Services building was originally built as an elementary school in 1913. It served as the public library for almost two decades, until 1977, when Human Services offices were relocated from the basement of Town Hall. The Groton Food Locker is located in the basement of the building. Funds are being sought for design development to address some interior building issues, including lighting, replacement of windows, repiping of baseboard heaters, dehumidification of the basement, staircase repair, and an evaluation of the existing HVAC system.

Community Development

The Community Development division of the Planning and Development Services administers various grant programs designed to benefit low- and moderate-income residents with emphasis on housing rehabilitation, lead abatement, and capital projects. Primary funding is received through the State of Connecticut Department of Housing under the Small Cities Community Development Block Grant Program of the U.S. Department of Housing and Urban Development. The office also provides administrative support to the Fair Rent Commission, the Neighborhood Revitalization Zone Committee, and the Community Development Advisory Committee. Community Development is housed in the Town Hall Annex.

Senior Center

The Groton Senior Center, located at 102 Newtown Road and adjacent to the public library, is operated by the Parks and Recreation Department. The 36,900-square-foot facility was renovated and a major addition built and opened in 2010. The Groton Senior Center is accredited by the National Institute of Senior Centers and serves as


Groton Senior Center

a recreational center for those over age 55. The center features a computer learning center, fitness room, and full kitchen. The center has seen an increased demand for fitness and active recreation programs. The center also offers an extensive trip program including day trips, overnight trips, cross-country trips, and trips abroad.

While the facility is relatively new and in good condition, staff has requested funds for HVAC improvements to prevent mold and for the installation of an automatic handicapped accessible door to the large meeting room. The Groton Senior Center has been used as an area of refuge during recent severe weather events. The current emergency generator system needs to be upgraded if this function is to be regularly accommodated in the future.

Library

Groton Public Library

The Groton Public Library is located at 52 Newtown Road. Additional libraries operated by the city and or villages include the Bill Memorial Library on Monument Street and the Mystic and Noank Library on Library Street in Mystic. These facilities are not operated by the town, and each is run independently.

The Groton Public Library currently has approximately 21,000 registered borrowers and provides residents and the general public with a variety of educational, informational, technology, and reference services. The library facility's five meeting rooms are well used by community groups, with approximately 1,500 uses per year. Library staff is responsible for the Groton government cable access channel, recording and televising municipal meetings, producing educational and public service announcements, and working with other town departments to provide technical support for audiovisual technology.

There are plans to replace exterior walkways, interior carpeting, blinds and ceilings, as well as design and construction funds for replacing an existing rooftop unit. Funds are also planned for rebuilding the parking lot and modifying overflow parking.

Parks and Recreation

Many parks and recreation areas also have significant community facilities on them. The Spicer House, located at 27 Spicer Avenue, serves as the Parks and Recreation Department office. The Spicer House, adjacent Spicer Park, and multiple barns and storage buildings were donated to the town in 1963 to be used for recreational purposes. Spicer Park is used as a neighborhood park for Noank residents, as well as a boating facility for the town as a

whole with access to the protected waters of Beebe Cove. The Fitch High School Rowing Club uses the boat house and dock as a practice site.

The Parks and Recreation Department also has a parks maintenance building located at the Town Hall Annex complex at 134 Groton Long Point Road. Funds are budgeted for fiscal year 2017 to design and construct an addition to the building to provide vehicle storage.

Jabez Smith House

The town-owned and town-operated Shennecossett Golf Course has a Club House in need of renovation at 93 Plant Street. Shennecossett Golf Course is a historic 18-hole public golf course founded in 1898. The dramatic views from the course's location on Long Island Sound and the Thames River make Shennecossett a top New England golfing destination.

The Jabez Smith House, located at 259 North Road, is a 1783 colonial farmhouse owned by the town and operated as a museum of early colonial history. The Smith House has had extensive stabilization and restoration work done over the years the town has had control of the property. A Facility, Maintenance, Restoration, and Planning Report was recently completed by a historic architect, and subsequent funding is identified to implement the recommendations of the report.

In response to growing needs, the town and the Parks and Recreation Department need to develop plans to establish recreational facilities to meet future needs. Particular needs that have been identified are for additional athletic playing fields and a community center/recreation complex that includes a pool, fitness center, and gymnasium. Another identified area of need is to develop a park to serve the downtown area of Groton. While the Poquonnock Bridge area is well served by parks, the downtown/Route 1 area would benefit from additional green public space to enhance the Downtown Design District and create a "sense of place."

In 2014, the consultant Kent + Frost Landscape Architecture conducted a Comprehensive Athletic Fields Needs Assessment study. As a result of this study, several recommendations were made for the town to construct multipurpose fields at the Merritt property located at the intersection of Route 1 and Groton Long Point Road in order to address growing demands from different local athletic groups. Groton should seek to provide additional athletic fields to meet current and future demands.

Information Technology

The Information Technology (IT) division manages the town's information databases, Geographic Information System (GIS), and Wide Area Network (WAN). Many software systems have reached the end of their useful lives. The town has hired a firm to assess software needs for the entire town including the Board of Education.

Recommendations

4-12 Develop criteria to evaluate the reuse or sale of all closed facilities.
4-13 Plan for the needs of the school-age population and the aging school infrastructure.
4-14 Upgrade the police station to modernize and to meet recent state statute and code changes.
4-15 Construct an efficient vehicle maintenance facility and add alternative fuels to the existing vehicle fueling facility.
4-16 Develop a plan to establish a community center/recreation complex that includes a pool, fitness center, and gymnasium that serves the needs of residents.
4-17 Provide additional athletic fields to meet growing local needs.
4-18 Develop a park to serve the downtown area of Groton.

WATER

Four water companies operate in the Town of Groton: Aquarion, Groton Utilities, Groton Long Point, and Noank Water Company (see Map I-6). Groton Utilities directly services the majority of the town and is operated by the City of Groton. In addition, Groton Utilities also supplies water to Groton Long Point, Noank Water Company, and recently established an interconnection with Aquarion Water Company to supply its Mystic Division. There are many private wells and community systems in the town that also provide water to users.

Groton Utilities relies on five reservoirs with a combined capacity of 2.5 billion gallons located in a watershed of 15.6 square miles within the Town of Groton and neighboring Ledyard along with emergency wells to supply its system.

A water treatment plant located off Poquonnock Road treats an average of 5.7 million gallons per day and delivers water to approximately 44,000 customers in the Town of Groton, Groton Long Point, Noank, and parts of Ledyard and Montville through over 100 miles of water mains. Refer to Map I-7, Water District Area, on the following page.

The Southeastern Connecticut Drinking Water Quality Management Plan (DWQMP) discusses land development practices that aim to maintain watershed hydrology for the entire region. Infrastructure expansion as recommended in the DWQMP should be pursued as appropriate.

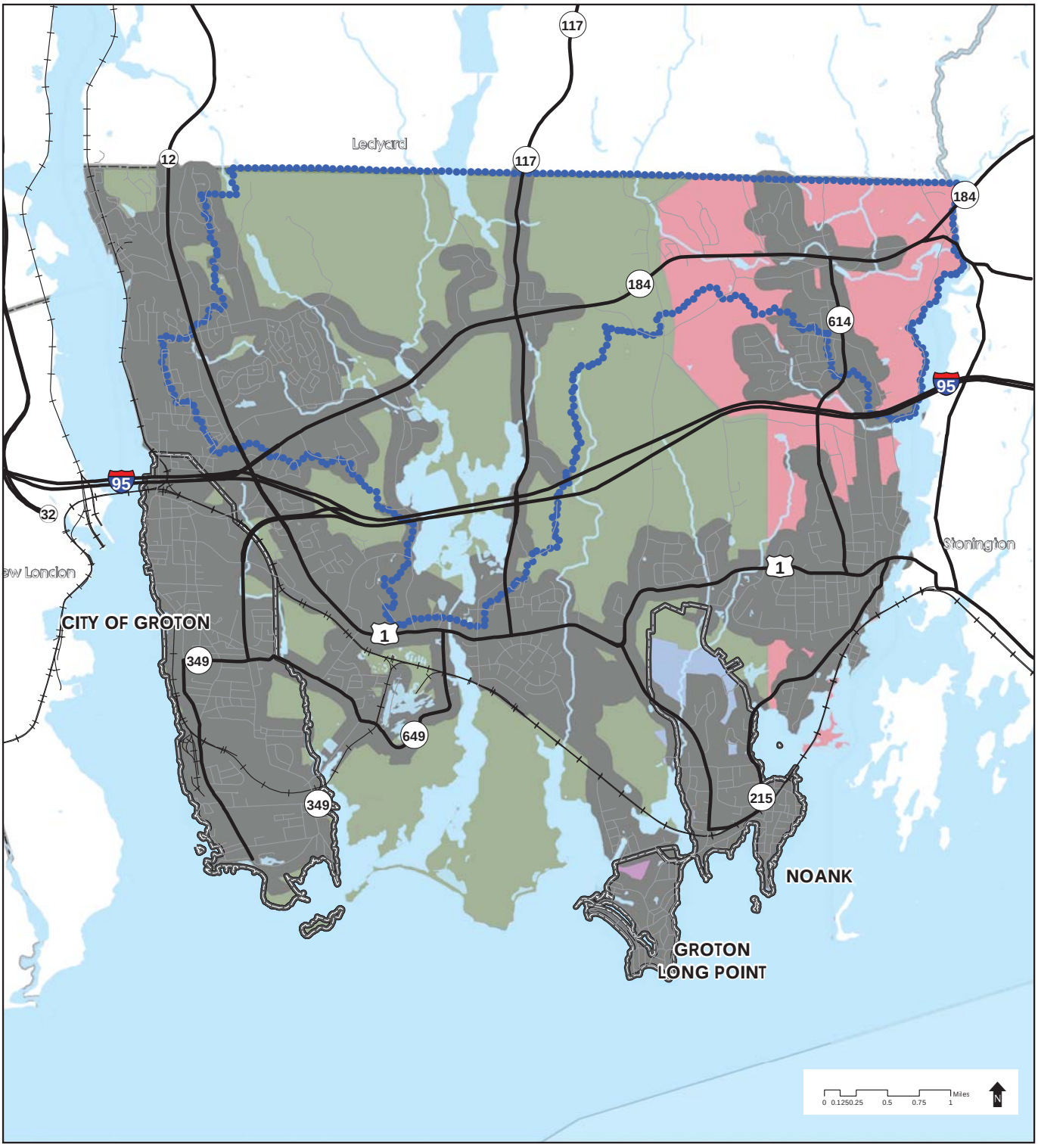
SEWER

The Water Pollution Control Facility (WPCF), a division of the Department of Public Works, is responsible for the operation and maintenance of the Groton sanitary sewer system, which consists of approximately 136 miles of sewer line, 23 pump stations, 159 grinder pumps (town-owned individual residential sewage pump units), 6,692 laterals of which 5,400 are connected, and a secondary treatment facility. WPCF division employees are responsible for the repair and maintenance of all collection, treatment, and instrumentation systems.

The wastewater treatment plant, located at 170 Gary Court, was upgraded in 2009 to be able to treat up to 7.5 million gallons per day. The gain in treatment capacity resulted from increased treatment efficiency rather than increased tankage. Treatment was enhanced by providing denitrification through an innovative technique called the Integrated Fixed-Film Activated Sludge (IFAS) process. IFAS technology has been used throughout the world for several decades and is becoming increasingly popular in the U.S. as effluent standards become more stringent. Average daily flow to the treatment plant in September 2012 was 2.62 million gallons. Ample capacity exists at the treatment plant for the foreseeable future.

The operation of the sanitary sewer system is completely funded through user fees. Capital construction is funded through a sewer district tax. While the collection system is in relatively good condition, planned improvements include systematically identifying sections of large diameter collection piping in need of repair or replacement and

Map I-7: Water District Areas



Groton PLAN OF CONSERVATION + DEVELOPMENT

Water District & Service Areas

- Public Water Service Areas
- Water Resource Protection District (WRPD)
- AQUARION WATER COMPANY
- CITY OF GROTON UTILITIES
- GROTON LONG POINT WATER
- NOANK WATER COMPANY

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

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rehabilitating several pump stations. Upgrades to the WPCF operations building are also planned.

Map I-8, Sewer Service Area, shows locations within town with sanitary sewer service available. Industrially zoned areas along Flanders Road should be considered for sanitary sewer extension to serve these developable parcels.

In general, the sanitary sewer system is well maintained and operated. With continued investments, the system will continue to provide ample treatment capacity for the town.

NATURAL GAS

Groton has a few natural gas lines providing service to the Navy base, areas of Route 12 and Route 1, and along Route 349 in the City of Groton (see Map I-9). The town should pursue the extension of natural gas service to unserved areas of concentrated industrial and commercial uses, residential areas with sufficient density, and town facilities.

STORMWATER

The town maintains a stormwater system that is completely separate from the sanitary sewer system. The Department of Public Works maintains approximately 3,285 catch basins throughout town. The town has an adopted Storm Water Management Plan that meets Connecticut Department of Energy & Environmental Protection (CT DEEP) standards and focuses on the following areas:

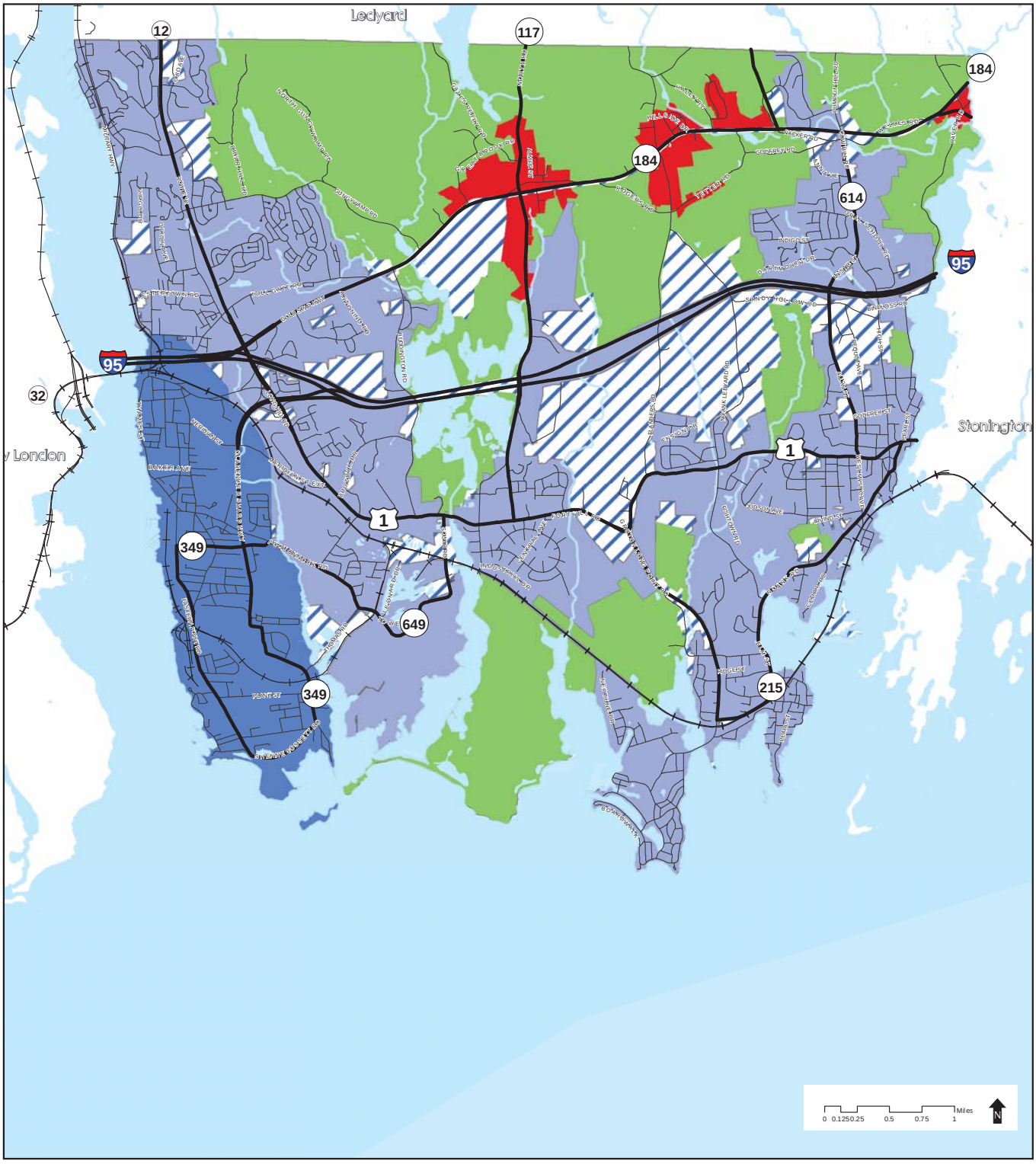
- Public education and outreach
- Public involvement/participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Postconstruction stormwater management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations

In addition, Groton's zoning regulations require submission of a stormwater management plan for any site plan application that would result in disturbance of one or more acres.

Funds have been programed in the Capital Improvement Program for improvements to stormwater discharge facilities, particularly those located in the public water supply watershed. Improvements will include retrofitting catch basins, stormwater quality basins, channels, leakoffs, and other stormwater improvement structures located in town properties, easements, and roads. The major stormwater management issue facing the town is to manage adequately flooding from severe storm events such as the March 2010 rain event and Storm Sandy.

Another aspect of management of stormwater is to address the quantity and quality of stormwater runoff before it reaches the piped systems. The DWQMP discusses land development practices that seek to maintain watershed hydrology through reduction of the quantity of runoff and the extent of pollutants on an individual-site basis before the runoff reaches piped stormwater systems. Using a site's natural hydrology to reduce runoff and the natural pollutant removal mechanisms of vegetated and pervious land are recognized as best land development design practice. For the town to continue to

Map I-8: Sewer Service Area



Groton PLAN OF CONSERVATION + DEVELOPMENT

Sewer Service Area

- Existing Sewer Service Area[1]
- Possible Future Service Areas
- Planned Sewer Avoidance
- Outside Sewer Service area recommended to be sewered when need arises
- City of Groton WPCF

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

1. Not all properties within the Existing Sewer Service Area are currently hooked into sewer access.

This map was developed for use as a planning document. Delineations may not be exact.

August 2015

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Map I-9: Natural Gas Service Area

Groton
PLAN OF CONSERVATION + DEVELOPMENT

1

Sources:
* Street Centerlines: Town of GrotonGISDept.
* State Roads: Streetmaps USA (2011)
* Basemap Data: Connecticut DEEP Map & Geographic Information Center (2012)

1. Not all properties within the Existing Sewer Service Area are currently hooked into sewer access.

This map was developed for use as a planning document. Delineations may not be exact.

October 2016

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Natural Gas Service Area

Legend

Natural Gas Service Lines

develop on a sustainable basis, incorporation of these principles into development and redevelopment activities within the town should be pursued.

SOLID WASTE

The town manages 26,000 tons of solid waste annually. Programs to reduce the amount of waste generated should be developed in order to be more environmentally sustainable.

The town operates a residential transfer station where residents can bring waste that cannot be disposed of in regular household trash (motor oil, antifreeze, consumer electronics, appliances, household hazardous waste, etc.). It also transports construction and demolition waste from the transfer station to an in-state volume reduction facility and maintains three closed landfills. The Town of Groton should develop a plan for the future use of these closed landfills.

The town operates a leaf composting facility to reuse some organic waste. It does not operate a municipal recycling facility for residents, who must hire private contractors for the service.

Recommendations

4-19 Pursue the extension of sewer, water, and natural gas service to unserved areas of concentrated industrial and commercial uses, residential areas with sufficient density, and town facilities.

ENHANCE AND PROMOTE SUSTAINABLE ENERGY INFRASTRUCTURE

Reduction of energy use, especially energy derived from finite stores of fossil fuels such as coal or oil, can greatly benefit the environment, public health, and the town budget. Burning fossil fuels is not only expensive but releases particulate matter into the air that causes pollution, which can impact respiratory health and asthma rates of residents. It also releases CO_2 into the atmosphere that scientists agree contributes to climate change. The Town of Groton has recently completed a Climate Change Sustainable Community Report that identifies energy efficiency strategies as one of the most crucial ways to mitigate climate change impacts.

Groton Utilities

PROMOTE ALTERNATIVE ENERGY USE AND SUSTAINABILITY

PAST ACTIONS

The Town of Groton is committed to reducing energy use. The town has completed an energy audit and Energy Action Plan (EAP) that was funded by a U.S. Department of Energy Efficiency and Conservation Block Grant Program. The EAP objectives were to create a succinct energy efficiency and conservation plan that includes short- and long-term recommendations for mitigation and adaptive strategies to reduce greenhouse gas emissions. The EAP includes an energy audit of municipal buildings and schools as well as a critique of current policies and plans that affect the town as a whole.

Independently, a U.S. Department of Energy Efficiency and Conservation Block Grant funded a Greenhouse Gas Emissions Inventory for the fiscal year 2009 in Groton. While the EAP focused on town buildings, the Emissions Inventory also gathered estimates on energy use and greenhouse gas emissions from the community at large. The estimates in the Emissions Inventory provide a valuable base line from which to make communitywide reduction goals.

ENERGY MANAGEMENT

Electricity

The Town of Groton is served by Eversource (formerly Connecticut Light and Power) and Groton Utilities for electricity. Policies and incentives regarding energy upgrades such as solar panels differ by utility. Groton itself does not have any power plants and relies on its utilities to import energy from other plants in Connecticut and the greater New England area. As of the second quarter of 2013, the New England Power Pool Systems Mix was composed of approximately 42% natural gas, 30% nuclear power, 9% hydropower, 6% oil, and 2% coal. Approximately 9% of the Systems Mix was comprised of renewable sources (NEPOOL Systems Mix, 2013-Q3). By law, Connecticut is required to generate 20% of the state's electricity from renewable energy sources by 2020.

Heating and Cooling

According to 2014 5-year American Community Survey estimates, the most commonly used house heating fuel in Groton is fuel oil (52%) followed by electricity (32%); utility gas (8%); bottled, tank, or LP gas (6%); and wood (1%). There are currently efforts being made locally and at the state level to expand the use of natural gas for home heating. The Northeast is the last region in the country to rely this heavily on heating oil – according to the Energy Information Administration, in 2009, only 6% of homes used heating oil in the country. In current markets, natural gas is also considerably cheaper, spurring demand for oil-to-gas heating conversions in the Northeast.

Natural gas is still a fossil fuel although it produces about 30% less carbon dioxide per British thermal unit (Btu) than heating oil. Natural gas has its own attendant set of sustainability concerns. For example, groundwater pollution can possibly be caused by the hydraulic fracturing ("fracking") process that extracts natural gas from the ground as sand (a "proppant," used to prop open the fractures) and fluids or chemicals are injected into the ground to fracture rocks and force the natural gas to the surface.

Another consequence of the boom in fracking is possible environmental degradation in areas where there is large-scale mining for the sand used for the proppant in the fracking process. While Connecticut has neither natural gas reserves nor the sand used in the fracking process, residents should be encouraged to "think globally, act locally" in their energy decisions.

Alternative methods of heating and/or cooling can include wood or pellet stoves, geothermal systems, active solar heating (with a solar array that heats air or water for radiator systems or radiant systems), and passive heating or cooling (designing a building to collect solar energy through efficient windows and storing and distributing the heat through thermal mass in floors and walls). Groton should develop regulations for alternative heating and cooling practices.

TOWN GOVERNMENT

The Groton EAP breaks down town energy expenses and energy use into four broad categories – town buildings, the WPCF and pump stations, streetlighting, and vehicles. The Greenhouse Gas Emissions Inventory in 2009 added the additional category of the solid waste facility. The findings on energy use, energy cost, and emissions are summarized shown below.

Town Government Energy Use, Cost, and CO_2 Equivalent Emissions*

	Energy Use (%)	Energy Cost (%)	CO_2e Emissions (%)
Buildings and Facilities	62%	55%	29%
WPCF and Pump Stations	18%	22%	46%
Vehicle Fleet	14%	10%	11%
Streetlights and Traffic Signals	6%	13%	3%
Solid Waste Facility	*	*	11%
Total (Units)	92,511 MMBtus	$2,727,636	25,935 tonnes CO_2e

Sources: Energy Use and Energy Cost from Groton Energy Action Plan, FY 2011

CO_2e Emissions from Groton Greenhouse Gas Emissions Inventory, 2009

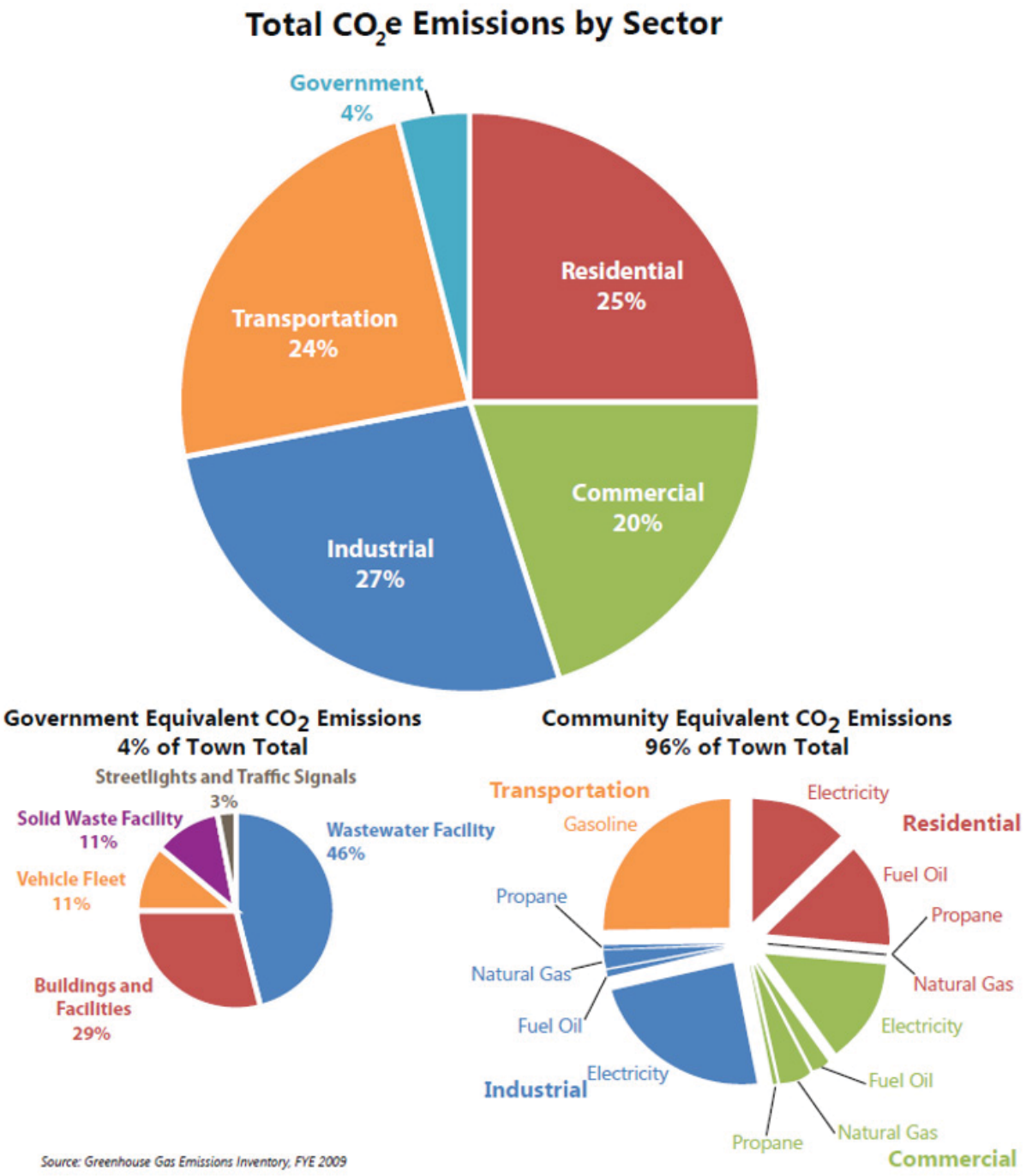
CO_2e stands for carbon dioxide equivalent. For example, each tonne of methane is equivalent to 21 tonnes of CO2 in metric units.

**Does not include City, Groton Long Point, or most of Fire Departments*

Based on the EAP, the town will be making lighting and HVAC efficiency improvements in multiple town buildings and schools as well as replacing a boiler in the Town Hall Annex and pursing a study to replace streetlights with more energy-efficient LEDs.

COMMUNITY

The Greenhouse Gas Emissions Inventory study found that town government operations account for about 4% of the total CO_2 equivalent emissions in the town and 96% came from residential, commercial, industrial, and transportation uses. Consumption of electricity and fuel oil across all sectors accounted for over half of the community's emissions. So, while the town government should act in a leadership capacity, it is important that all people who live and work in Groton contribute in order to reduce energy use and greenhouse gas emissions.



EFFICIENCY

Efficiency and conservation measures can greatly reduce the total demand for power and energy even before switching to renewable power or other measures.

Frequently, efficiency and conservation measures are behavioral and are no cost (such as setting a programmable thermostat lower at night and when a space is unoccupied during the winter to use less heating energy) or low cost (such as putting new weather stripping on an exterior door so less air escapes) measures to reduce energy that is currently wasted. As such, efficiency is often referred to as the "low-hanging fruit" of energy issues.

The Groton EAP has detailed analyses of several municipal buildings and the Groton Public Schools, including recommendations with expected costs and simple payback periods (the amount of time an improvement will take to recoup its initial cost in energy savings or the time it takes to "pay for itself"). The town should incorporate these

recommended improvements into future policies and Capital Improvement Programs. Broadly, these improvements include the following:

- Leverage the excellent Groton Public Schools maintenance capabilities to service municipal buildings as well.
- Convert building heat to natural gas as pipeline access expands across town.
- For projects highlighted in the report as having reasonable payback periods, retrofit older buildings with improvements in building envelope (such as exterior door seals and weather stripping), higher efficiency lighting and appliances such as refrigerators, and upgrades to HVAC systems and control systems.
- Wastewater treatment facilities must operate 24/7, and therefore consume a lot of energy. The Groton EAP suggests that there is a reduction potential of 20% over current base line energy use by upgrading facility lighting, controls, HVAC, and building envelope.
- Include streetlight standards in energy efficient subdivision development and land use.
- Convert streetlights and traffic signals to more efficient LED lights for up to 70% energy reductions.

As town government only accounts for 4% of the total carbon dioxide emissions in Groton, energy conservation needs to be a priority as well in residential, commercial, and industrial areas. Individual actions and behaviors have huge impacts on energy use, and simply changing habits is more cost effective than large infrastructure investments. However, infrastructure improvements can also be an economic development catalyst for attracting and retaining "green-collar" jobs. Partnering with Groton Utilities, Eversource, and other organizations like the school system can help make energy conservation a community priority.

PROCUREMENT

The Town of Groton is served by two electric utilities: Groton Utilities and Eversource. Groton Utilities offers Green Energy Options, which allows residents to choose to pay 1.1 cent per kilowatt-hour to buy renewable energy from wind, landfill gas, and small-scale hydroelectric dams as well as many tools for energy conservation and efficiency. Eversource offers many conservation programs and rebates but does not offer customers the ability to directly buy renewable energy. Eversource offers residents the ability to choose Connecticut Clean Energy Options, a program available through two different independent companies. Residents are not directly purchasing renewable energy for their use, but contributing money to a program that supports the development of renewable energy.

The EAP recommends that the town partner with Groton Utilities for renewable energy electricity infrastructure upgrades as municipal utilities are uniquely positioned to support local renewable energy investments compared to investor-owned utilities. Such investments may improve system reliability, increase renewable energy consumption, and support local green jobs. The town should publicly announce its commitment to renewable energy by enrolling in the Green Energy Options program to get some percentage, up to 100%, of electricity from renewable sources.

PRODUCTION

The town should pursue small-scale renewable energy projects to produce local energy. Both Groton Utilities and Eversource offer incentives, rebates, and tools to assist residents in energy conservation measures as well as renewable energy production. Electric suppliers in Connecticut are required to get 20% of their retail load from renewable energy by 2020. At the state level, by participating in the Connecticut Clean Energy Communities Program the town could earn a free solar voltaic, solar thermal, or wind system, which covers the cost of purchasing, installation, and providing assistance in choosing the site location. Communities get the free renewable energy system by earning credits through enrolling households and businesses in the Connecticut Clean Energy Options Program, having residents install their own renewable energy systems, and by purchasing Renewable Energy Credits. Thus, the free system is a result of collective action by residents and businesses to increase renewable energy use.

Commercial and residential properties can also qualify for Connecticut Clean Energy Fund's On-Site Distributed Generation Grants to help pay for renewable energy installations. Residential properties with renewable energy systems are also eligible for a property tax exemption on the value of the system. By tying systems back to the grid, these systems can also recoup costs by selling surplus energy back to the electric grid.

Development regulations in Groton should provide standards for these and other alternative energy structures or facilities throughout the town. In addition to solar energy, the town should also develop strategies to use other alternative energy sources such as landfill gas or geothermal.

Currently in Connecticut, reclaimed water (waste water that has been through the water treatment plant) does not have a permitting process for reuse. The Water Planning Council is currently overseeing the development of the State Water Plan. The State Water Plan will include recommendations to promote, and remove barriers to, innovative water management methods such as the use of reclaimed water for irrigation. The State Water Plan may also explore the nexus between water management and energy, including such possibilities as increasing power generation using water. The Town of Groton should follow this process, and explore ways that reclaimed water could be used as a resource.

GOALS FOR ENERGY USE

The EAP recommended that the town set measurable reduction goals and adopt strategies to meet those goals. In that report's summary of reduction potentials, implementing recommended changes could result in 20% total savings overall against the fiscal year 2011 base line:

- 16% savings among buildings compared to the 2011 base line from identified improvements
- 20% savings from upgrades to the Water Pollution Treatment Facility
- 20% savings from operation and maintenance and new vehicle purchases
- 70% savings from converting streetlights to efficient LED bulbs

The town should implement these recommendations as a starting point to reduce energy use and be forward thinking in determining new ways to reduce total energy consumption.

The Capital Improvement Program should be reviewed annually to ensure that it is in compliance with recommendations from the EAP as well as the Sustainable Infrastructure and Design component of this POCD.

Recommendations

4-20 Review development regulations to provide standards for alternative energy generation facilities.

4-21 Develop strategies consistent with state plans to use treated wastewater for irrigation and energy.

4-22 Reduce energy use by town facilities by implementing the recommendations of the Energy Action Plan.

Chapter 5: Conclusion

Chapter 5: Map Index

FUTURE LAND USE PLAN

The recommendations of each of the preceding chapters can be combined to present an overall Future Land Use Plan for Groton. The Future Land Use Plan is a reflection of the stated goals, objectives, and recommendations of the Plan as well as an integration of the preceding elements of the Plan of Conservation and Development.

OPEN SPACE AND PARKS LAND USE CATEGORIES

Existing Open Space and Parks

The existing open space and parks areas represent the network of open space and recreation areas in the town. These include town-owned, state-owned, and other privately owned active and passive recreation and open space facilities. These include parks and recreation areas that are maintained for active recreation, open space and parks in a natural state that are not maintained for active recreation, public and private parks, playgrounds, camping areas, golf courses, beaches, cemeteries, and water company holdings with no structures.

Desirable Open Space, Parks, and Connections

This category includes areas that would contribute positively to the town's open space or parkland network and resources, including those properties that would have the most potentially positive effect on the conservation of Groton's natural resources or key connections between resources. This designation may include a part of or the entirety of the underlying parcel.

Desirable Agricultural

This category identifies lands that would contribute positively to the agriculture, aquiculture, and silviculture uses and resources within the town.

RESIDENTIAL LAND USE CATEGORIES

Rural Residential

The Rural Residential category represents those areas where densities would generally be one unit per acre or less.

Low Density Residential

Areas where residential development is expected to occur at a density of between one and two units per acre and some existing residential development may occur at higher densities based on open space subdivision or historical development patterns are identified as Low Density Residential.

Medium Density Residential

Medium Density Residential is the classification for areas where residential development is expected to occur with typical densities between 2 to 7 units per acre.

High Density Residential

Areas where the density of housing units is expected to occur at densities greater than 7 units per acre are considered High Density Residential.

BUSINESS LAND USE CATEGORIES

General Commercial

This category includes general commercial activities that are clustered along Route 1, on Route 184 outside of the Commercial 117 Node, and in other scattered sites. These commercial uses include retail operations, professional offices, standalone day care, and kennels; lodging (including commercial hotel, motel, inn, bed and breakfast and other lodging uses); marine business (including commercial and industrial uses dependent on water access, such as marinas, boatyards, commercial fishing operations, etc.).

Industrial

The Industrial land use designation includes a variety of manufacturing, warehousing, storage, and earth processing operations as well as industrial park uses, such as research, office space, and some retail.

Design Districts

Design Districts are areas that have developed or are intended to develop with significant guidance of use, intensity, and design characteristics including the following districts:

Waterfront Design District (WDD)/Mystic

The Mystic Node incorporates the Waterfront Design District of the zoning code. The purpose is to allow development which will protect and enhance the unique qualities of the downtown Mystic area while protecting coastal resources, providing public access to the Mystic River, and providing a mixture of residential, commercial, and office uses that serve the needs of area residents and visitors.

Nautilus Memorial Design District (NMDD)

The purpose of the Nautilus Memorial Design District is to permit and control development within the designated design district which will protect and enhance the primary entryway to the Nautilus Memorial. This district was created to service tourist-related and Navy needs and to provide protection to adjacent residential areas.

Waterfront (WF)

The purpose of the Waterfront District is to permit water-dependent uses and businesses that are dependent on water access such as marinas, boatyards, and commercial fishing operations.

OTHER USE CATEGORIES

Government Facilities, Institutional, and Infrastructure

Government Facilities, Institutional, and Infrastructure includes local-government owned buildings and facilities such as schools, parks and fields not associated with schools, transfer stations, lands dedicated to flood control, and properties that correspond to SCCOG's "Intensive Institutional" and "Extensive Institutional" categories. Institutional uses include private institutional uses such as places of religious worship, private schools, state or private universities, museums and other non-profit facilities. Infrastructure uses such as the airport include runways, hangars and other supportive aviation facilities. Other state facilities include state lands and facilities otherwise not classified.

NODES

Nodes are areas of more intense activity that serve as a focal point for the surrounding areas. They can include office, retail, and institutional uses at a scale appropriate for the location.

Mixed-Use Nodes

- Noank Node
- Mystic Node
- Center Groton/ Route 184/117 Node
- Route 12 Commercial Node
- Route 1 Downtown Groton Node
- Electric Boat and Pfizer Node

Insitutional Nodes

- Naval Base Node
- Route 1/Fort Hill

SPECIAL FOCUS AREAS

Downtown Groton

The purpose of the downtown Special Focus Area is to encourage a concentration of commercial development with special attention paid to public amenities. This Special Focus Area is seen as the town center, and development within the Special Focus Area should be of a quality and character appropriate for the business and cultural focus of the town. Development should build on the recommendations in the 2006 Groton Strategic Economic Development Plan as well as the Market Analysis and Zoning Regulation Audit. Pattern of development intensity should follow a dense mixed-use form within the center node to a less-intense use and form adjacent to residential areas while creating a pedestrian-friendly environment with logical connections to the surrounding neighborhoods.

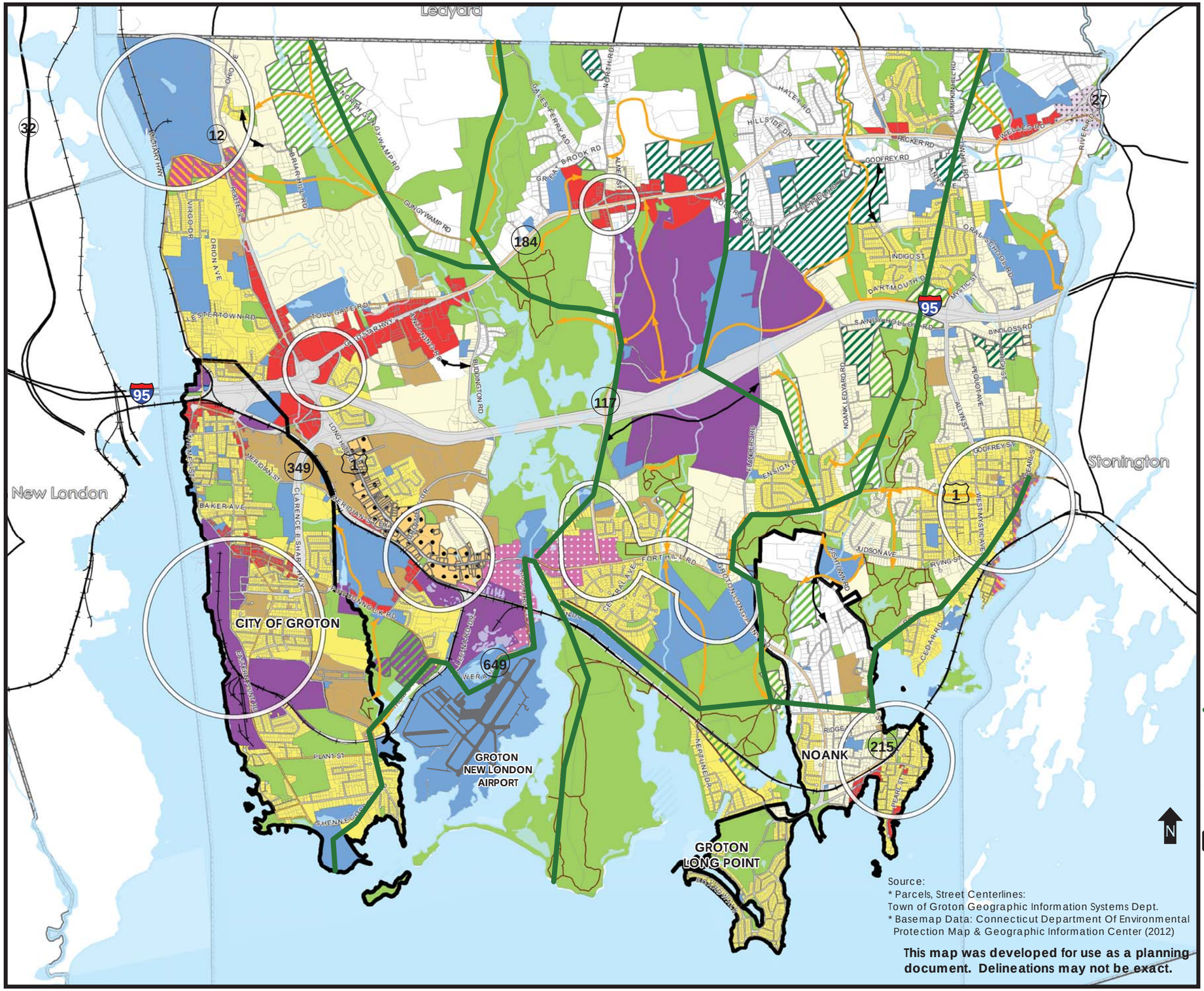
Old Mystic

The purpose of the Old Mystic Special Focus Area is to permit and control development within the designated Special Focus Area, which is consistent with village-scaled uses that will continue to protect and enhance historic development patterns, including architectural styles and massing, mixed uses and a pedestrian friendly environment, while building on the recommendations in the 1996 Historic Preservation Survey and protecting the resources of Haley Brook and the Mystic River.

Poquonnock Bridge Village

The purpose of the Poquonnock Bridge Special Focus Area is to permit and control development within the designated Special Focus Area, which will protect and enhance historic village development patterns, including architectural styles and massing, mixed uses and a pedestrian-friendly environment, while building on the recommendations in the 1996 Historic Preservation Survey and protecting the resources of the Poquonnock River.

Map Conclusion-1: Future Land Use



Groton PLAN OF CONSERVATION + DEVELOPMENT

Future Land Use

Residential

- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential

Open Space & Agriculture

- Existing Open Space and Parks
- Desirable Open Space, Parks, and Connections
- Desirable Agriculture

Business

- General Commercial
- Industrial
- Design Districts

Other Uses

- Government Facilities, Institutional, and Infrastructure
- Nodes

Special Focus Areas

Downtowns

- Downtown Groton

Villages

- Old Mystic
- Poquonnock Bridge

Connectivity

- Proposed Greenways
- Existing Trails or Bikeways
- Proposed Trails or Bikeways
- Proposed Vehicular Transportation Connections

- Airport
- Town and Jurisdictional Boundary

Source:
* Parcels, Street Centerlines:
Town of Groton Geographic Information Systems Dept.
* Basemap Data: Connecticut Department Of Environmental Protection Map & Geographic Information Center (2012)

This map was developed for use as a planning document. Delineations may not be exact.

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PLAN CONSISTENCY

Chapter 126, Section 8-23 of the Connecticut General Statutes, as amended, provides the standards and legal requirements for the creation of or update of a municipal plan of conservation and development. The updated 2016 Groton Plan of Conservation and Development is consistent in all respects with the governing state statute.

2013-2018 CONSERVATION AND DEVELOPMENT POLICIES: THE PLAN FOR CONNECTICUT

Section 8-23(d)(5) of the state statutes requires that municipalities take into account the State Plan of Conservation and Development and note any inconsistencies. The map titled *State Plan of Conservation & Development Areas* illustrates the Land Classifications for Groton according to the recently adopted document *2014-2018 Conservation and Development Policies: The Plan for Connecticut*.

According to the state plan, there are six Growth Management Principles with which the municipal plans of conservation and development should be consistent. It should be noted that "…the statutory mandate for consistency with the State Plan only applies to state agencies, as outlined in CGS Section 16a-31. The State Plan is advisory to municipalities, due to the fact that there is no statutory requirement for municipal plans, regulations, or land use decisions to be consistent with it."Nonetheless, it is important to illustrate the ways in which Groton's updated POCD is consistent with the Growth Management Principles in the State Plan, which mirror the statutory requirements for plans of conservation and development contained in CGS Section 8-23(e)(1)(F).

Growth Management Principle #1
Redevelop and Revitalize Regional Centers and Areas with Existing or Currently Planned Physical Infrastructure

The Conservation and Development chapters of this POCD contain elements that are consistent with this general growth management goal. In addition, the updated POCD, especially Groton's nodal approach to focusing mixed-use development in these areas, is consistent with the following state agency policies under this general goal:

- "Focus on infill development and redevelopment opportunities in areas with existing infrastructure, such as city or town centers, which are at an appropriate scale and density for the particular area."
- "Encourage local zoning that allows for a mix of uses 'as-of-right' to create vibrant central places where residents can live, work, and meet their daily need without having to rely on automobiles as the sole means of transport."

Growth Management Principle #2
Expand Housing Opportunities and Design Choices to Accommodate a Variety of Household Types and Needs

The Development chapter of this POCD recognizes the changing demographics and the need for continued evolution of the town's housing stock. These elements are consistent with this general growth management goal. In addition, the updated POCD is consistent with the following state agency policies under this general goal:

- "Enhance housing mobility and choice across income levels and promote vibrant, mixed-income neighborhoods through both ownership and rental opportunities."
- "Identify innovative mechanisms, utilizing decentralized or small-scale water and sewer systems, to support increased housing density in village centers and conservation subdivisions that lack supporting infrastructure."

Growth Management Principle #3
Concentrate Development Around Transportation Nodes and Along Major Transportation Corridors to Support the Viability of Transportation Options

The Development and Infrastructure chapters of this POCD contain elements that are consistent with this general growth management goal through the nodal approach to revitalizing Groton's established villages and corridors. In addition, the updated POCD is consistent with the following state agency policies under this general goal:

- "Promote compact pedestrian-oriented, mixed-use development patterns around existing and planned public transportation stations and other viable locations within transportation corridors and village centers."
- "Ensure that the planning, design, construction, and operation of state and local highways accommodates municipal plans, and the needs for all users, to the extent possible."

Growth Management Principle #4
Conserve and Restore the Natural Environment, Cultural and Historical Resources, and Traditional Rural Lands

The Conservation and Infrastructure chapters coupled with a focus on energy and sustainability are consistent with this general growth management goal. In addition, the updated POCD is consistent with the following state agency policies under this general goal:

- "Continue to protect permanently preserved open space areas and facilitate the expansion of the state's open space and greenway network through continued state funding and public-private partnerships for the acquisition and maintenance of important multi-functional land and other priorities identified in the State's Open Space Plan (i.e., Green Plan)."
- "Protect and preserve Connecticut Heritage Areas, archaeological areas of regional and statewide significance, and natural area, including habitats of endangered, threatened and special concern species, other critical wildlife habitats, river and stream corridors, aquifers, ridgelines, large forested areas, highland areas, and Long Island Sound."
- "Encourage municipalities to build capacity and commitment for agricultural land preservation."
- "Utilize the landscape to the extent practical and incorporate sound stormwater management design, such as low impact development techniques, in existing and new developments to maintain or restore natural hydrologic processes and to help meet or exceed state and federal water quality standards, so that the state's waters can support their myriad functions and uses."

Growth Management Principle #5
Protect and Ensure the Integrity of Environmental Assets Critical to Public Health and Safety

The Conservation and Infrastructure chapters, guided by energy and sustainability principles, are consistent with this general growth management goal. In addition, the updated POCD is consistent with the following state agency policies under this general goal:

- "Ensure that water conservation is a priority consideration in all water supply planning activities and regulatory decisions."
- "Emphasize pollution prevention, the efficient use of energy, and recycling of material resources as the primary means of maintaining a clean and healthful environment."

Growth Management Principle #6
Promote Integrated Planning Across All Levels of Government to Address Issues on a Statewide, Regional, and Local Basis

This POCD recognizes and addresses the importance of Groton's role in its regional economy and contains elements that are consistent with this general growth management goal. In addition, the POCD is consistent with the following state agency policies under this general goal:

- "Encourage regional planning organizations and economic development districts to develop coordinated and effective regional plans and strategies for implementing projects that address the priorities of each region."

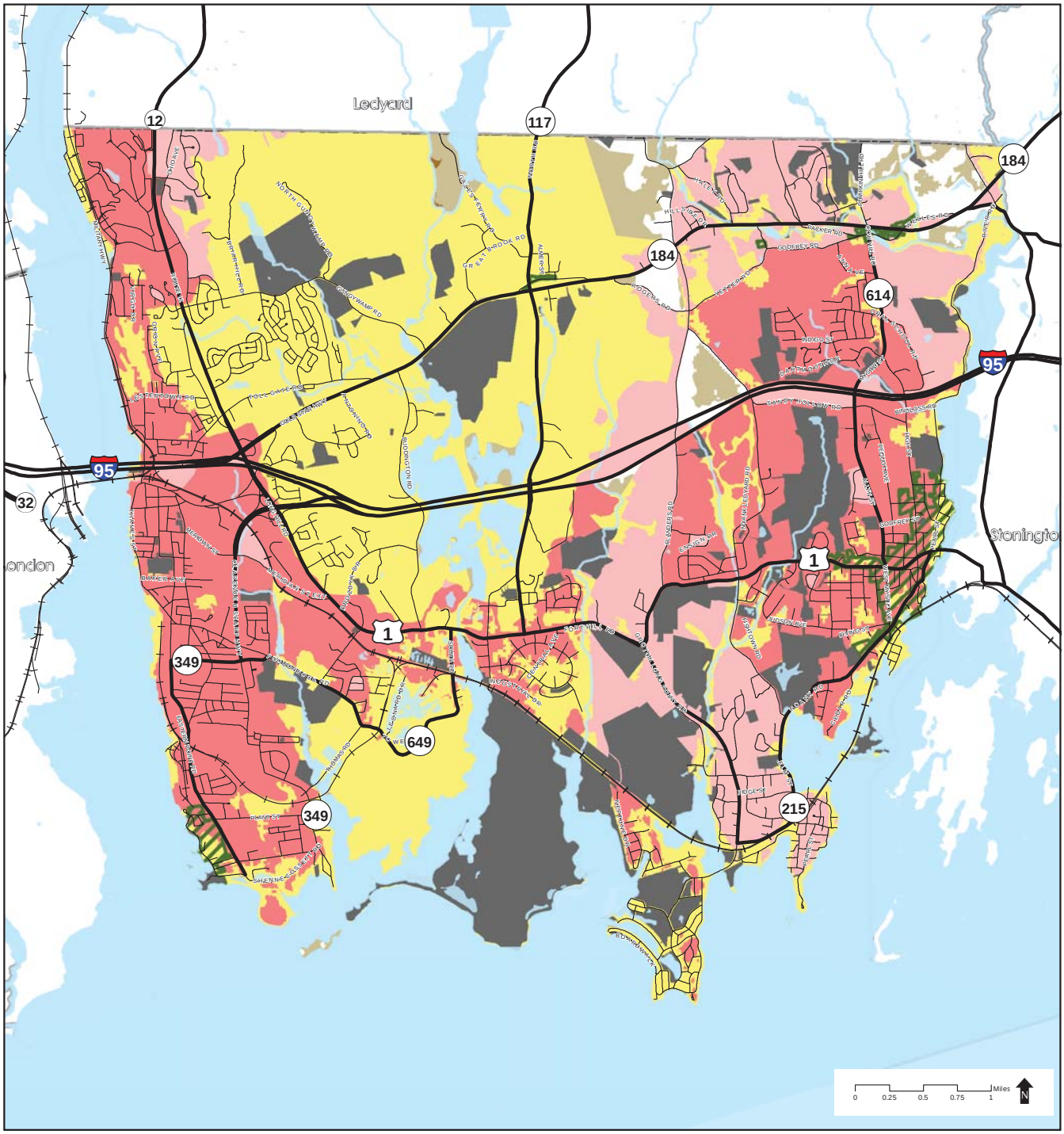
STATE PLAN LOCATIONAL GUIDE MAP

The Future Land Use Plan map for the 2016 Groton Plan of Conservation and Development is generally consistent with the Locational Guide Map contained in the 2014-2018 State Plan. This POCD's Future Land Use Plan conforms closely to the State Plan Locational Guide Map, with an emphasis on guiding future development in Groton with residential, commercial, industrial, and cultural center areas generally aligning with the State identified Priority Funding Areas and/or Balanced Growth Priority Funding Areas. However, several key inconsistencies are present.

The area bounded by Flanders Road, Noank Ledyard Road, and I-95 has long been identified as a growth area. For the 2016 POCD, this area is identified for future industrial park uses which is consistent with present zoning and the 2002 POCD. This area has been identified for extension of future utility service. The State Plan has identified this area as having 1-3 Conservation Factors, and has been excluded from any Priority or Balanced Funding Plans.

The large active farm, south of Yetter Road, has been identified as desirable Open Space in the 2002 POCD, and this designation has been changed to Desirable Agriculture in this POCD. In this POCD, Open Space encompasses working farms, and although the state identifies this property as having 3-4 Priority Funding Criteria, this area should be identified as a conservation area. Although agriculture can be considered an industrial use, Groton considers them critical parts of the conservation network and cultural landscape.

Map Conclusion-2: Connecticut 2013-2018 POCD



Groton PLAN OF CONSERVATION + DEVELOPMENT

Connecticut 2013-2018 POCD

Village PFA

Protected Lands

Local Hist Dist

Balanced PFA

Conservation Areas

- 1-3 Conservation Factors
- 4-5 Conservation Factors
- 6-7 Conservation Factors

Priority Funding Areas

- 1-2 Criteria
- 3-4 Criteria
- 5 Criteria

Sources:
*2012-2018 Plan for CT, OPM (2013)
* Street Centerlines: Town of Groton GIS Dept.
* State Roads: Streetmaps USA (2011)
* State Road Classifications: CT DOT (2011)

This map was developed for use as a planning document. Delineations may not be exact.

April 2014

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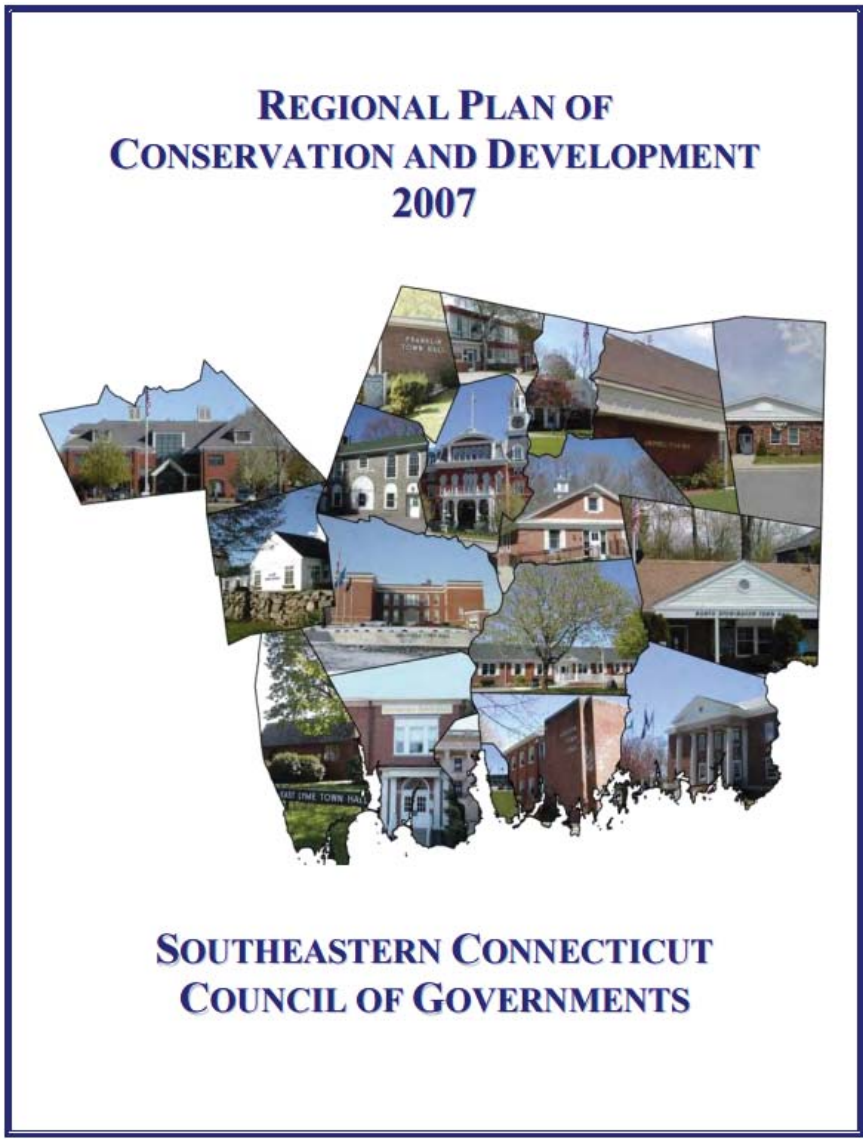
SOUTHEASTERN CONNECTICUT COUNCIL OF GOVERNMENTS REGIONAL PLAN OF CONSERVATION AND DEVELOPMENT 2007

Section 8-23(d)(6) of the state statutes requires that municipalities also take into account the regional Plan of Conservation and Development for its applicable regional planning organization. In Groton's case, this would be the 2007 Southeastern Connecticut Council of Governments Regional Plan of Conservation and Development and its component Future Growth Map. In reviewing the recommendations and Future Growth Map of the regional plan, it has been determined that the Groton Plan of Conservation and Development is generally consistent with the regional plan, including its goals regarding water supply; water resources; wastewater treatment; transportation; curbing global warming; affordable housing; sustaining the regional economy; open space and recreation; mixed land use; transit-oriented development; and pedestrian access.



IMPLEMENTATION TOOLS AND SCHEDULE

Many of the recommendations in the Plan of Conservation and Development (POCD) can be implemented by the Planning Commission and the Zoning Commission through regulation amendments, application reviews, and other means. These Commissions are the primary entities responsible for implementing the POCD.

Other recommendations require the cooperation of, and actions by, other town boards and commissions such as the Zoning Commission, Town Council, Representative Town Meeting, and similar agencies. However, if the POCD is to be successfully realized, it must serve as a guide to all residents, applicants, agencies, and individuals interested in the orderly growth of Groton.

Tools

There are several tools available to implement the POCD's recommendations:

- Community involvement
- An annual implementation program
- Annual update program
- Activity checklists
- Zoning and subdivision regulations
- Capital Improvement Program
- Referral of municipal improvements (CGS 8-24)

Community Involvement

Education about the POCD recommendations is an important first step in implementing the plan. With the dominance of the internet, cell phones and smart phones, and social media, there are many avenues available to inform residents about current issues and important community priorities.

A regularly updated community webpage and social media platform which provides information on meeting agendas and current issues and allows for various forms of communication (email, texting, social media messages, postcards, etc.) would be an important method of community involvement. Similarly, the town should continue to record public meetings related to land use and development in Groton and make the recordings accessible on public television to facilitate community education and involvement.

Annual Implementation Program

While the Planning Commission has the primary responsibility for implementing the POCD's recommendations, successful implementation involves participation by a number of different agencies. The implementation schedules that follow can be used by an oversight committee to develop an annual implementation program of issues to be addressed by boards and commissions.

The oversight committee could meet two to four times a year to establish priorities and guide implementation of the POCD's recommendations. In addition, the committee could assess the status of specific recommendations, establish new priorities, and suggest new implementation techniques.

Annual Update Program

At the present time, it is the practice in Groton to update the Plan of Conservation and Development once every decade. However, during the intervening years there can be situations where the POCD is silent on emerging issues, does not reflect current policy objectives, or does not reflect current conditions, trends or opportunities. When a POCD is considered a reference document rather than a working document, its effectiveness in guiding the community is hindered.

Groton should consider keeping the POCD current and not waiting to update it every ten years. The Action Agenda should at least be reviewed every year to determine if goals are being met and if Action Agenda items are still current and relevant to the town.

Land Use Regulations

The zoning regulations provide specific criteria for land uses and the subdivision regulations provide specific criteria for land subdivision, road layout, and open space. As a result, these regulations are an important tool for implementing the recommendations of the plan.

In order to implement the recommendations of the POCD, the Planning Commission should, in the near future, undertake a comprehensive review of subdivision regulations and make revisions necessary to:

- Make the regulations more user-friendly
- Implement plan recommendations
- Promote consistency between the plan and the regulations

Likewise, the Zoning Commission should, in the near future, undertake a comprehensive review of the zoning regulations and zoning map and make revisions to accomplish the same objectives.

Enforcement of regulations is an important related issue. It makes little sense to develop regulations to encourage positive results if a lack of enforcement or implementation means that little progress is made. Special efforts should be made to support enforcement of local regulations and programs.

Capital Improvement Program

The Capital Improvement Program is a tool for planning major capital expenditures of a municipality so that local needs can be identified and prioritized within fiscal constraints that may exist. The POCD recommends that capital expenditures be included in the town's Capital Improvements Program and that funding for them be included as part of the budget.

Referral of Municipal Improvements

Municipal improvements, by statute, are to be referred to the Planning Commission for a report regarding consistency with the POCD before any town action is taken. Town boards and agencies should be notified of Section 8-24 so that proposals can be considered and prepared in compliance with its requirements.

ACTION AGENDA

In order to implement the various recommendations contained in this Plan of Conservation and Development, the following Action Agenda is presented. The Action Agenda identifies goals, objectives, recommendations and actions under each of the POCD themes; the lead agencies proposed for implementation; and the priority for implementation during the time frame of this plan.

The lead agency (listed first and underlined) is the agency which, by the nature of its mission and authority, is the logical party to spearhead the implementation of a particular proposal. Many proposals will of course involve multiple agencies. The nature of activity required of a lead agency will vary depending on the type of recommendation. Some activities involve budget commitments and capital expenses and some require advocacy and promotion, while others call for administrative action.

Priorities are classified as short term (1-4 years), and long-term (5-10 years). Many of the short-term items may already be activities and policies that are in place and need to be continued. Some short-term recommendations may have evolved as part of the planning and POCD update process.

Long-term priorities are activities which are considered important, but placed "down the road" in recognition of the fact that limited resources are available both in terms of time and money to implement the POCD. Long-term capital projects may also require some intermediate planning and design activity before project implementation can take place.

ABBREVIATIONS

- BOE: Board of Education
- CC: Conservation Commission
- ECC: Emergency Communications Center
- EDC: Economic Development Commission
- EV: Eversource
- GU: Groton Utilities
- HDC: Historic District Commission
- HMC: Harbor Management Commission
- PRC: Parks and Recreation Commission
- PRD: Parks and Recreation Deptartment
- IWA: Inland Wetlands Agency
- PC: Planning Commission
- OPDS: Office of Planning and Development Services
- PW: Department of Public Works
- TC: Town Council
- TM: Town Manager
- ZC: Zoning Commission

PROTECT NATURAL RESOURCES

Protect Water Quality and Water Resources

2-1 Update the Water Resource Protection District regulations, including prohibited uses and impervious surface standards, material handling methods, and consider a tiered system based on proximity to the reservoir or tributary streams. **(Short Term: ZC, OPDS, GU) See also Action 3-20**

2-2 Develop Low Impact Development regulations. **(Long Term: OPDS, PC, ZC) See also Action 4-2**

2-3 Prepare a plan to retrofit town-owned stormwater basins and drainage structures to improve water quality. **(Short Term: PW)**

Protect Other Important Natural Resources

2-4 Update regulations to conserve important natural resources. **(Long Term: OPDS, IWA, PC, ZC)**

PRESERVE AND STRATEGICALLY EXPAND RECREATION AREAS AND OPEN SPACE

Continue to Fund and Improve Open Space

2-5 Fund open space acquisition annually in the Capital Improvement Program. **(Short Term: TC)**

2-6 Amend the zoning map and regulations to include a new Open Space/Recreation district. **(Long Term: ZC, OPDS)**

2-7 Develop an open space management plan for existing town-owned open space to include inventory/monitoring of conservation easements, and to provide standards for improvements. **(Long Term: PRD, CC, OPDS)**

2-8 Develop criteria with which to evaluate proposed open space parcels and develop a map of desirable open space. **(Long Term: CC)**

2-9 Revise the zoning and subdivision regulations to increase open space and recreation requirements and to provide standards for improvements. **(Long Term: PC, ZC, OPDS)**

Preserve Active Agricultural Uses

2-10 Develop regulations to address various farming practices and to allow accessory uses for farms associated with on-farm agri-tourism activities, especially those that promote local food production, such as local food festivals, or other on-site events that capitalize on Groton's agricultural amenities. **(Short Term: ZC, OPDS)**

Continue to Develop and Maintain Greenbelt

2-11 Develop an action plan to establish, expand, and connect greenbelts and state greenways. **(Short Term: CC, PC, OPDS)**

Continue to Build a Trail System

2-12 Update the Groton Bicycle, Pedestrian and Trails Master Plan. **(Short Term: PRD, OPDS) See also Action 4-10**

Implement the Parks and Recreation Master Plan

2-13 Implement the recommendations of the Parks and Recreation Master Plan and continue to set implementation policies for open space and parks based on funding. **(Short Term: PRD)**

Support the Establishment of the Thames River Heritage Park Plan

2-14 Support the implementation of the Thames Heritage Park and plan for connections between a water taxi, a trail network, and existing town infrastructure. **(Short Term: OPDS, TC, PRD)**

PROTECT COASTAL RESOURCES

Protect Water Quality and Coastal Resources

2-15 Complete a Harbor Management Plan for Groton. **(Long Term: OPDS)**

2-16 Develop a program to prioritize and implement the selected strategies outlined in the Municipal Coastal Program, including development of plans to restore eroded tidal marshes, to acquire land for marsh advancement, and to reduce the direct discharge of stormwater to coastal waters. **(Long Term: OPDS, PC, ZC, CC, TC, HMC)**

Provide for Water-Dependent Uses

2-17 Create incentives such as a streamlined approval process to encourage water-dependent uses at waterfront sites. **(Short Term: OPDS, ZC)**

Manage Coastal Development

2-18 Create a coastal overlay zone to manage coastal development. **(Long Term: ZC, OPDS, PC)**

Improve Coastal Public Access

2-19 Create a plan to connect, expand, and improve public access locations and to secure additional public parking for these public access points. **(Long Term: OPDS, PRD, PC)**

2-20 Develop a master plan for Esker Point Beach and Park. **(Long Term: PRD, PRC)**

PROTECT CULTURAL AND HISTORIC RESOURCES

Continue to Identify Historic and Cultural Resources

2-21 Maintain and enhance the historic character of various areas of town by continuing to participate in the Certified Local Government program, continuing to support the local historian, and conducting updated surveys of the local historic districts when funds are available. **(Short Term: OPDS, HDC)**

Protect Historic and Cultural Resources

2-22 Amend zoning and subdivision regulations to allow the land use commissions to require archaeological and historic surveys prior to approval. **(Short Term: ZC, PC, OPDS)**

2-23 Include historic assets and historic districts as critical features that merit protection and/or planning when considering Disaster Mitigation Plans, especially with regard to flooding, storm surge, sea level rise, and coastal erosion. **(Short Term: ECC)**

2-24 Amend zoning regulations to support redevelopment and creative reuse of historic properties while maintaining historic characteristics. **(Short Term: ZC, OPDS, PC, EDC)**

PROMOTE COMMUNITY CHARACTER

Enhance "Sense of Place" and Promote Sympathetic Design

2-25 Align and adjust zoning development standards in older neighborhood areas to reinforce the established development pattern, complement existing structures, and enhance neighborhood character. **(Short Term: ZC, OPDS, PC)**

2-26 Identify and recognize the uniqueness of each Node and Special Focus Area as a component of the entire community. Create development standards, pattern books, and/or design guidelines to enhance a sense of place and sympathetic design in the Special Focus Areas. **(Long Term: OPDS, PC, ZC)**

Protect Scenic Roads

2-27 Develop guidelines to preserve scenic resources (such as stone walls, hitching posts, public views, etc.) that are visible from public rights-of-way. **(Long Term: OPDS, PC, PW)**

Promote Appropriate Sustainable Development Patterns

3-1 Encourage development appropriate for each Node and discourage strip type commercial development patterns. **(Long Term: OPDS, PC, ZC)**

3-2 Focus infrastructure improvements in the Nodes to encourage development. **(Long Term: PW, OPDS, PC, ZC)**

3-3 Modify the MX and other zoning regulations to clarify and simplify the approval process and provide incentives to encourage development in the Nodes. **(Short Term: ZC, OPDS)**

3-4 Inventory existing development in the Special Focus Areas. **(Short Term: OPDS)**

3-5 Create appropriate mechanisms in the zoning regulations to allow the implementation of sustainable development patterns in Special Focus Areas. **(Short Term: ZC, OPDS)**

3-6 Encourage the development of neighborhood- and community-based services and business in Special Focus Areas and Nodes. **(Long Term: EDC, OPDS, ZC)**

3-7 Locate important new civic and institutional facilities in the central Route 1 Node area to reinforce community structure. **(Long Term: TC, OPDS, PW)**

3-8 Develop a plan for the downtown Groton Special Focus Area that provides an orderly transition of land uses and development patterns from a dense mixed-use pattern to a less intensive pattern adjacent to existing residential neighborhoods. Create a pedestrian-friendly, walkable downtown plan with logical connections to adjacent neighborhoods. **(Long Term: OPDS, PC, ZC)**

3-9 Use Creative Placemaking as a tool for creating a viable Downtown Development District (DDD) and enhancing the Village Special Focus Areas. **(Long Term: OPDS, EDC)**

Address Groton's Changing Housing Needs

3-10 Perform a multi-family (alternatives to single-family dwellings) housing analysis including a needs and market analysis. **(Short Term: OPDS, EDC)**

3-11 Modify land use regulations to allow new product types including, but not limited to, additional accessory units, temporary structures, or cottage design in appropriate locations that will meet the needs of Groton's changing household profile. **(Short Term: OPDS, PC, ZC)**

3-12 Revise the regulations regarding the size, standards, and number of accessory units to provide more flexibility for the creation of new or the conversion of existing housing units. **(ShortTerm: ZC, OPDS)**

3-13 Expand universal design (visit-ability) components of the regulations to allow aging in place and adaptive housing needs of all populations. **(Short Term: PC, ZC, OPDS)**

Promote Sustainable Residential Practices and Development Patterns

3-14 Revise the residential zoning north of I-95 to promote appropriate development patterns, taking into account natural resources, infrastructure (or lack thereof), transportation, and sewer avoidance areas. **(Long Term: ZC, OPDS, PC)**

3-15 Revise the open space subdivision regulations to provide more flexibility, development types, and lot configurations to protect sensitive land. **(Long Term: PC, OPDS, ZC)**

3-16 Provide incentives to encourage mixed-use developments and higher housing densities in the Nodes and Special Focus Areas where support services, infrastructure, or transit are located. **(Short Term: OPDS, PC, ZC)**

3-17 Develop design guidelines or pattern books to encourage mixed-use, pedestrian-friendly, neighborhood scale development in the Nodes and the village and downtown Special Focus Areas. **(Long Term: OPDS, PC, ZC)**

ENCOURAGE SUSTAINABLE ECONOMIC DEVELOPMENT

Address Groton's Changing Employment Trends and Commercial and Industrial Needs

3-18 Modify home occupation standards with respect to current technology trends and the ability to operate businesses in numerous locations, and to allow additional uses or more intense uses within the Nodes and Special Focus Areas. **(Short Term: ZC, OPDS)**

3-19 Increase focus of economic development efforts on small businesses, resource sharing, incubator space development, and redevelopment of key areas. **(Short Term: EDC, OPDS)**

3-20 Update the Water Resource Protection District regulations to protect the town's drinking water supply resources and to use creative tools to manage land use in light of current construction and water quality treatment practices. **(Short Term: ZC, OPDS, GU) See also Action 2-1**

3-21 Use the 2015 Market Analysis to establish a program to support the future retail and commercial needs for the town. **(Short Term: EDC, OPDS)**

Promote Sustainable Commercial, Industrial, and Mixed-Use Practices and Development

3-22 Analyze the zoning and allowed uses on currently vacant industrially and commercially zoned land with respect to the availability of utilities, transportation, and constraints imposed by sensitive natural resources and revise the zoning and allowed uses as appropriate. **(Short Term: OPDS, ZC, EDC)**

3-23 Catalogue key industrial and commercial vacant parcels to determine developable acreage and to guide development away from sensitive resources. **(Short Term: OPDS, ZC)**

3-24 Develop strategies to encourage investments within the Nodes for new construction and for reuse, redevelopment, or repurposing existing properties and existing strip commercial developments to walkable, pedestrian-friendly, and mixed-use development. **(Short Term: EDC, OPDS, PC, TC)**

Review and Update the Strategic Economic Development Plan (SEDP)

3-25 Update the Groton Strategic Economic Development Plan, including actively reviewing the Policies and Strategies Implementation tables. **(Short Term: EDC, OPDS)**

3-26 Update the Downtown Groton Plan and engage with stakeholders to adjust or expand the plan for current and future investment opportunities and to create a viable mixed-use downtown. **(Short Term: OPDS)**

Review Commercial Zone Locations, Uses, and Standards

3-27 Evaluate current zones and development standards to determine if districts, uses, setbacks, and other requirements are appropriate. **(Short Term: OPDS, ZC)**

3-28 Modify zoning regulations to create incentives for consolidated development and redevelopment of commercial areas and for enhanced architectural design as part of new business development rather than prototypical architecture. **(Short Term: OPDS, ZC)**

3-29 DDD/Groton Downtown: Implement the policies for design and development of the SEDP and the Special Focus Area Plan recommendations for the downtown Groton area. **(Long Term: OPDS, ZC)**

3-30 NMDD: Revise standards to promote appropriate development and to better address purpose and objectives of the district. **(Long Term: ZC, OPDS)**

3-31 WDD: Consider expanding the WDD and revising the regulations to make permit processing easier while preserving the cultural assets of the area, reusing existing historic structures, serving both tourists and the residents, and balancing the needs of the residential and commercial entities. **(Short Term: ZC, OPDS)**

Review Industrial Zone Locations, Uses, and Standards

3-32 Address recommendations of the 2015 Market Analysis for future small industrial development. **(Short Term: OPDS, EDC)**

3-33 Acknowledge the impact of updated flood zone designations on current and future industrial development near the airport and develop standards for a coastal overlay zone and the use and storage of hazardous materials. **(Long Term: ZC, OPDS, PC)**

Encourage Development and Redevelopment of Fully Serviced Sites

3-34 Map fully and partially serviced sites to identify appropriate locations for economic development in order to guide businesses and developers to serviced sites with appropriate infrastructure. **(Short Term: OPDS, EDC)**

3-35 Develop a priority list and guidelines to assist the Town Council in considering when to fund infrastructure improvements. **(Short Term: EDC, OPDS, PW)**

Pursue Economic Development Opportunities

3-36 Pursue designation of an Airport Development Zone with CT DECD. **(Short Term: OPDS, TM, TC)**

3-37 Work with Mystic Cooperative Task Group and Stonington on transportation and parking options in Mystic and pursue funding to implement. **(Short Term: OPDS) See also Action 4-7**

3-38 Work to align regional and local tourism with economic development opportunities through physical improvements such as the Thames River Heritage Park along with local services. **(Short Term: OPDS, EDC) See also Action 4-5**

3-39 Develop a plan to support the economic viability of the local marine industries, including sport fishing, recreational boating, shell fishing, aquaculture, and the corresponding land based commercial, industrial, and educational facilities. **(Long Term: EDC, TC, OPDS)**

3-40 Study parking requirements and needs in downtown Mystic and revise regulations to reflect best practices. **(Short Term: ZC, OPDS)**

3-41 Implement a simplified process to access Financial Incentives and Economic Assistance Funds. **(Long Term: EDC, OPDS)**

3-42 Work with Groton-New London Airport and local utility suppliers to complete necessary infrastructure improvements such as utilities on South Road and changes to railroad underpasses. **(Long Term: PW, OPDS, State) See also Action 4-4**

3-43 Study feasibility of commuter rail, multi-use transportation hub and TOD for downtown Groton. **(Long Term: OPDS, PW, EDC) See also Action 4-5**

3-44 Work with Providence & Worcester Railroad to determine upgrades, needs, and growth plans for the freight line. **(Long Term: TM, OPDS, PW)**

ENHANCE TRANSPORTATION OPTIONS

Manage the Roadway System

4-1 Develop a plan to prioritize and implement roadway floodproofing measures., including signage to guide drivers away from flooded underpasses. **(Short Term: PW, OPDS)**

4-2 Revise the subdivision regulations regarding design and classification of proposed roads to limit impervious surfaces, to increase use of Low Impact Development practices, and to incorporate Complete Streets principles. **(Short Term: PC, OPDS, PW) See also Action 2-2**

4-3 Construct appropriate road connections and consolidate access points as development occurs. **(Long Term: PW, TC, PC)**

Encourage Use of Multi-Modal Transportation

4-4 Develop a plan to eliminate restrictive rail clearances at South Road and Poquonnock Road. **(Long Term: PW, TM) See also Action 3-42**

4-5 Develop a justification and request the extension of Shoreline East to link with the Massachusetts commuter system through Rhode Island and create a passenger rail platform in downtown Groton. **(Long Term: EDC, TC, TM) See also Action 3-43**

4-6 Support a robust water taxi service on the Mystic River and the development of a seasonal water shuttle on the Thames River linking tourist sites. **(Short Term: TC, HMC) See also Action 3-38**

4-7 Work with Stonington to facilitate the movement of tourists and residents between destinations on both sides of the Mystic River. **(Short Term: OPDS) See also Action 3-37**

Address Parking Needs

4-8 Review parking requirements to ensure appropriate standards are in place for different uses and areas and to minimize water quality impacts. **(Short Term: OPDS, ZC)**

4-9 Develop a plan to manage and improve parking availability in downtown Mystic. **(Short Term: OPDS)**

Improve and Expand the Townwide Pedestrian and Bikeway Network

4-10 Review and update the Groton Bicycle, Pedestrian and Trails Master Plan to encourage alternative modes of transportation. **(Short Term: PRD, PW, OPDS) See also Action 2-12**

4-11 When practical, add bike lanes, adjacent multiuse paths, and sidewalks when rebuilding local roadways. **(Long Term: PW, PC)**

ENHANCE AND MAINTAIN COMMUNITY FACILITIES

Address Public Facility Needs

4-12 Develop criteria to evaluate the reuse or sale of all closed facilities. **(Short Term: TC, TM, EDC)**

4-13 Plan for the needs of the school-age population and the aging school infrastructure. **(Short Term: BOE, TC, TM)**

4-14 Upgrade the police station to modernize and to meet recent state statute and code changes. **(Short Term: TC)**

4-15 Construct an efficient vehicle maintenance facility and add alternative fuels to the existing vehicle fueling facility. **(Long Term: PW)**

4-16 Develop a plan to establish a community center/recreation complex that includes a pool, fitness center, and gymnasium that serves the needs of residents. **(Short Term: PRD)**

4-17 Provide additional athletic fields to meet growing local needs. **(Long Term: PRD)**

4-18 Develop a park to serve the downtown area of Groton. **(Long Term: PRD)**

Guide Infrastructure to Meet Community Goals

4-19 Pursue the extension of sewer, water, and natural gas service to unserved areas of concentrated industrial and commercial uses, residential areas with sufficient density, and town facilities. **(Long Term: TC)**

ENHANCE AND PROMOTE SUSTAINABLE ENERGY INFRASTRUCTURE

Promote Alternative Energy Use and Sustainability

4-20 Review development regulations to provide standards for alternative energy generation facilities. **(Short Term: ZC, OPDS)**

4-21 Develop strategies consistent with state plans to use treated wastewater for irrigation and energy. **(Long Term: PW, PRD)**

4-22 Reduce energy use by town facilities by implementing the recommendations of the Energy Action Plan. **(Long Term: PW)**

BACKGROUND INFORMATION

During the process of preparing this Plan of Conservation and Development, the following memos were prepared to summarize information and frame policy discussions. These background materials (as well as other materials) can be reviewed at the Groton Public Library, 52 Newtown Road, Groton, Connecticut 06340, or the Office of Planning and Development Services at the Town Hall Annex, 134 Groton Long Point Road, Groton, Connecticut 06340.

Demographics	October 2012
Development Patterns/Trends	November 2012
Natural Resources	November 2012
Community Character and Historic Resources	December 2012
Housing	April 2013
Transportation and Circulation	April 2013
Public Workshop #1	May 2013
Community Facilities	June 2013
Groton POCD Community Survey	September 2013
Parks, Recreation and Open Space	October 2013
Build Out	November 2013
Public Workshop #2	November 2013
Economic Development	February 2014
Energy and Sustainability	February 2014
Town of Groton Municipal Coastal Program Update	February 2014

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