

13. Appendices

This volume is composed of all the appendices of the *Proposed Comprehensive Plan for the Town of Riverhead, Draft for Public Review* of July 2002. The appendices include extensive background information consulted in preparation of the Proposed Plan. Additional information is included in the text of the Proposed Plan itself, which is available under separate cover. Copies of the Proposed Plan can be obtained by contacting the Town of Riverhead Planning Department at (631) 727-3200.

The following appendices are included herein.

- Appendix A: Agriculture.
- Appendix B: Natural Resources.
- Appendix C: Scenic and Historic Resources.
- Appendix D: Economic Trends.
- Appendix E: Population and Housing Trends.
- Appendix F: Parks and Recreational Facilities.
- Appendix G: Transportation.

Appendix A: Agriculture

A.1 HISTORY OF AGRICULTURE IN RIVERHEAD

Since the earliest settlements, agriculture has been a mainstay of Riverhead's economy. The first settlers grew just enough food to survive. However once basic survival was assured, they began growing grains to sell to communities in New England. They also cultivated fruits and vegetables and raised livestock to feed their own families and for local trade. In the 18th century, intensive farming led to the depletion of the soil. By about 1810, farmers adjusted their practices and began fertilizing their fields with fish scrap from local fisheries and later imported manure from New York City stables.

Throughout its history, farmers in Riverhead have grown a variety of crops, the best known of which are potatoes and cauliflower. Potato production began in 1700's, but did not become a standard crop until the mid-1800's, when the introduction of the railroad enabled farmers to send their crops to more distant markets. The result was a food-producing economy that closely resembles farming today. In 1867, John W. Duryee of Mattituck introduced cauliflower to Suffolk County. That same year the Suffolk County Agricultural Society distributed a pound of cauliflower seed among its members. With the resounding success of this experiment, Riverhead established its second major commercial crop.

Historically, Riverhead farmers have grown such crops as flax for linen thread, wheat, rye and other grains, corn and vegetables, and fruits of all sorts. Specialty products such as cranberries have also contributed to the agricultural economy. In 1893, twenty years after the first seven "Peking" ducks were imported from China, duck farms were flourishing in Riverhead. Duck production peaked just after World War II when there were almost 800 duck farms in Suffolk County, raising two-thirds of all ducks produced in the United States.

The 20th century brought other changes to Riverhead's farming economy. Truck farming enabled the production of specialized crops such as berries, fruits, and other produce that required even faster transportation to market. The potato industry, which had grown immensely with the coming of the railroad, continued to be strong. Cauliflower production peaked in 1949, with 5,500 acres planted locally.

By 1990, cauliflower acreage had dipped to 200. Meanwhile, farmers were experimenting with new crops such as cabbage, beets, and sprouts. While the number of acres in agriculture has decreased since the days of potato and cauliflower production, alternative crops such as grapes, sod and greenhouse growing — which provide high profits on fewer acres — have maintained Suffolk County's role as the state leader in agricultural production.

A.2 DECLINING AGRICULTURAL LANDS

Between 1950 and 1992, farmland in Suffolk County decreased 71 percent, from 123,000 acres to 35,000 acres. (See Table A-1.) According to the Suffolk County Planning Department, farmland continues to decline at a rate of 1,289 acres per year. Yet, as the amount of farmland has declined in Suffolk County, the Town of Riverhead's share of agricultural land has increased. In 1968, Riverhead had 30 percent of the County's farmland (19,550 acres), but in 1996, despite a 9 percent drop in the Town's agricultural acreage, Riverhead had 38 percent of the County's farmland. These figures indicate that Riverhead plays a critical role in the protection of prime agricultural lands in eastern Long Island. In both 1968 and 1996, Riverhead had the largest number of farmland acres in Suffolk County.

Table A-1: Change in Farmland Acreage, 1968-1996

	1968	1996	Change in Total Acres 1968-1996		
			Number	Percent	Annual Average
Babylon	370	7	- 363	- 98.1%	- 13.0
Brookhaven	11,560	6,439	- 5,121	- 44.3%	- 182.9
East Hampton	2,420	1,672	- 748	- 30.9%	- 26.7
Huntington	4,170	1,294	- 2,876	- 69.0%	- 102.7
Islip	640	136	- 504	- 78.8%	- 18.0
Riverhead	19,550	17,662	- 1,888	- 9.7%	- 67.4
Shelter Island	80	156	76	+ 95%	2.7
Smithtown	1,240	338	- 902	- 72.7%	- 32.2
Southampton	12,450	8,617	- 3,833	- 30.8%	- 136.9
Southold	11,920	9,820	- 2,100	- 17.6%	- 75.0
County Total	64,400	46,141	-18,259	- 28.4%	-652.1

Source: Suffolk County Planning Department.

Figure A-1: Agricultural Lands by Crop

Back of Figure A-1.

Figure A-2: Agricultural Status

Back of Figure A-2.

Figure A-3: Protected Land

Back of Figure A-3.

A.3 ECONOMIC CONTRIBUTION OF AGRICULTURE

Agriculture plays an important role economically in Suffolk County. The County has lead New York State historically in a variety of agricultural categories and continues to lead in the market value of agricultural products sold. In 1997, the reported total market value for crops in Suffolk County was \$160,784,000 — an average of \$276,993 per farm¹. Suffolk County leads all New York State counties with an average sales per farm figure of \$227,874 — almost three times the State average. In 1997, Suffolk County accounted for 6 percent of total State farmland.²

In 1992, an economic input-output model was used to estimate the impact of Suffolk County's farming industry. The study results indicated that 8,000 jobs are created and \$241 million dollars added to the economy as a result of the local farming industry. With one third of the County's remaining farmland located in Riverhead, much of this money benefits the Town of Riverhead.³ Additionally, studies by the American Farmland Trust have shown that farmland — in contrast to residential development — brings more to municipalities in taxes than it requires in services.

Important agricultural products in Suffolk County include: nursery and greenhouse products, potatoes, rye, cauliflower, broccoli, pumpkins, and spinach. A growing part of the County's agricultural economy is the wine industry, which contributes \$30 million to it's the local economy.⁴ Suffolk County has the largest premium wine industry of any county in the United States outside of California. The wine industry has the potential to bring further economic benefits to Riverhead through increased agro-tourism.

A.4 WINE INDUSTRY IN EASTERN LONG ISLAND

The Long Island wine industry was born in 1973, when the Hargrave Vineyards planted its first vines; this operation produced its first bottle in 1977. Based on extensive research and a nationwide search, the owners of Hargrave Vineyards found that the North Fork offered the ideal climate and soil conditions for growing the vinifera grapes used in producing the high quality wines of France, Italy, and California. During the 1970's and 1980's, additional vintners began converting potato fields to vineyards and producing high quality wines. As of 2001, eastern Long Island had 23 wineries and 1,600 acres of vineyards, which produced 500,000 gallons of wine, or nearly 3 million bottles each year. While this output accounts for only 2 percent of the State's total wine production, Long Island wines account for 90 percent of the State's premium wine sales.

¹ 1997 Census of Agriculture - County Data. USDA, National Agriculture Statistics Service. 1997.

² Ibid.

³ *Southampton Tomorrow, Southampton Comprehensive Plan Update*. Town of Southampton, NY. 1998.

⁴ Suffolk County Planning Department. www.co.suffolk.ny.us/planning.

Today, the Long Island wine industry has become recognized as a premier wine producing region (unlike the upstate New York region, which relies primarily on hybrid grape varieties), gaining national as well as international recognition. After the wines produced in California, Washington, and Oregon, Long Island wines vie with Virginia and Texas wines for recognition among high quality American wines.

The Long Island industry features two federally recognized wine appellations: “North Fork” and the “the Hamptons.” Of the two, the North Fork is the more established. Of the 23 wineries operating on the East End, 17 are found on the North Fork, due to historical and climatological factors. While separated by only a few miles, the North Fork climate differs significantly from that of the South Fork. The South Fork is often blanketed by fog, which is formed when prevailing winds moving up the East Coast encounter warmer land temperatures on Long Island. This fog dissipates as the air moves over land, and the air gains warmth as it moves over the warm waters of Peconic Bay. As a result, North Fork vineyards have the benefits of a warm, dry climate, lighter soils, a longer growing season and crops subject to fewer diseases. The North Fork, unlike the South Fork, is able to produce premium red varieties.

Overall, the wine industry presents an excellent opportunity for economic development in Riverhead. Vineyards provide an economically viable use for agricultural open spaces and enhance the region’s rural image and attractiveness for tourists. In addition, the peak season for winery tours is the autumn harvest season, and wine industry experts on Long Island and in other states such as Ohio and Virginia report that the wine industry extends the summer tourist season by 8 to 10 weeks.

While the Long Island wine industry is constrained by the region’s small scale, the region derives an advantage from its close proximity to New York City, which is one of the world’s foremost wine consumption markets, and which provides the home base for leading wine industry publications and writers, many of whom spend vacations on the eastern Long Island. This provides an advantage to Long Island vintners in enhancing the image and reputation of Long Island wines, and will help ensure the continued growth of the industry. According to industry experts, the Long Island industry should be capable of penetrating far larger segments of the New York wine market. While many of New York’s high-profile restaurateurs feature Long Island wines, less prestigious restaurants offer a huge potential for expansion.

ECONOMIC TRENDS AND IMPACTS

While per capita wine consumption has been declining at a moderate rate, overall consumption is increasing, due to population growth. Also, the domestic industry’s share of the market has been rising, and national demand has shifted away from generic “jug” wines to higher-priced, non-generic, premium table wines.

The average price of Long Island wines is \$9 per bottle, and annual sales of \$27 million generate \$2 million in sales tax revenues. One winery estimates that it receives as many as

10,000 visitors each week during the summer tourist season. The wine industry accounts for nearly 50 percent of total agricultural sales in the area, and generates year-round employment opportunities for labelers, laboratory technicians, salespersons, and tour guides; one North Fork vintner claims that there are very few families in the neighboring Town of Southold in which no family member works for one of the wineries.

Statistics from other wine producing regions show additional economic benefits of the wine industry. In Virginia, each dollar spent on wine injects \$4.19 into other sectors of the local economy, and the corresponding multiplier for new job generation is 7.09. The wine industry contributes significantly to the Virginia's tourism business, with 3 percent of all visits oriented toward winery tours, and 5 percent of all visits including wine tours as part of travel plans.

A.5 AGRICULTURE IN RIVERHEAD TODAY

Suffolk County and the Town of Riverhead represent an agricultural economy on the urban fringe. The transformation from commodity-based production to (mostly) land intensive production of high value crops that can be differentiated in the market is underway in many urban fringe areas in New York State and in fact represents a kind of agricultural resurgence. There are several important components to this change.

A. The transformation from commodity production to specialty crop production requires additional labor.

Given the low unemployment rate in Riverhead and the region in general, a lack of available labor may, at some point, represent a constraint to continued growth. However, Riverhead's low unemployment rate may mask underemployment and/or discouraged workers. Furthermore, if agriculture remains profitable, it may be able to compete for workers from other industries. Today, Riverhead farmers rely, in part, on migrant labor to meet their needs during the busiest seasons. Interns represent another labor source.

B. The transformation from commodity production to specialty crop production may contribute positively to the agricultural economy.

This will depend, in large part, on the capacity of farmers to employ more information and management intensive approaches to production. Farmers will need to have the financial capital to invest in modern technologies. This transformation will depend as well on continued growth in consumer demand for specialty products, such as local wines and organic produce.

C. Diversification of agricultural production will increasingly include service provision in tourism, recreation, and education.

Farms may strive to become diversified through direct marketing (e.g. roadside stands, pick your own) or activities such as farm vacations, school field trips, riding lessons, hay rides, wine tasting events, or farm tours. There are two reasons for this trend. First, services provide an additional income opportunity to farmers who face ever-higher costs of production. Second, consumers rank access to Long Island Sound and the Atlantic Ocean as their number one most popular vacation setting, followed in third place by rural destinations. There is both a “push” and a “pull” factor likely to lead to increased viability of and interest in natural resource-based tourism, recreation, and education experiences.

D. Agricultural diversification into specialty products and agro-tourism can lead to increased vertical integration of farm operations (with a wider scope of activities relating to the product on site).

Specific examples are found in many of the North Fork wineries. Vertical integration includes processing, packaging and shipping, and/or on-site sales. Additional opportunities for vertical integration are likely to emerge, and there will be an increasing need to accommodate related uses and infrastructure on farms.

E. Diversified agricultural activity with a significant service and processing component will require new approaches to land use regulation.

Since “agriculture” is composed of diverse activities, land use regulations and preservation programs should be designed with enough flexibility to allow farms to remain competitive.

A.6 FARMLAND AND DEVELOPMENT PRESSURES

The combination of strong economic growth, the scarcity of land, and the intense housing demand on Long Island create pressure for new development. With a conversion rate of 1,454 acres per year over the last ten years, County farmland is under particular pressure for development. Changing agricultural trends, the decline of the family farm, and increasing land values are also exerting pressure on farmers to sell or develop their land. Taxes also exert some financial pressure on farmers, but the available information suggests that tax burdens for Riverhead farmers are manageable. Although Suffolk County farms pay \$3.4 million in property taxes annually or \$96 per acre, the third highest per acre tax in New York State, Suffolk County farms spend the smallest percentage of their farm expenses on property taxes compared to any other County in New York State.⁵

Housing development is now leapfrogging from Brookhaven, over the Pine Barrens region, into Riverhead. The Pine Barrens Protection Act established a 50,000-acre core

⁵ Suffolk County Agricultural Protection Plan. Suffolk County Planning Department. June, 1996.

preservation area in which residential development is precluded in order to allow for aquifer recharge, and provides for the transfer of development rights to areas outside the core. The Pine Barrens region is partly located in southwestern Riverhead and also spans large areas of Brookhaven and Southampton.

Development pressure is also spreading north from Southampton, due to overflow demand for both year-round and seasonal housing. The South Fork has relatively little land left for development, and some households are getting priced out of the wealthy neighborhoods in and around the Hamptons.

The approximately 3,000 new residential units built in Suffolk County each year represent a demand for at least 3,000 developable acres annually.⁶ Riverhead's farmland is desirable for development because it is flat and mostly cleared. Between 1990 and 1996, the Town of Riverhead was the fastest growing town in Suffolk county.

A.7 AGRICULTURAL PRESERVATION

Efforts to protect and sustain agriculture in eastern Long Island are evident at the State, County and local levels. These efforts take effect at two levels — those programs that work *directly* to preserve or purchase agricultural lands, and those that work *indirectly* by supporting farmers and farming as an occupation and a way of life. For example, a purchase of development rights program (PDR) preserves agricultural land directly by purchasing the right to develop on that land; right-to-farm laws work indirectly by legally protecting the farmer's right to engage in farming practices.

Additionally, there are programs that work directly to preserve open space in general. These programs target a variety of kinds of open space — from farmland, to recreational lands, to environmentally critical areas. Although such programs can appear to work against the preservation of agricultural lands (e.g., the Drinking Water Protection Program/Pine Barrens Protection) by placing added development pressure on existing farmlands, these programs are evidence of the broad level of concern throughout Long Island communities for the need to balance growth and quality of life issues.

The variety of State, County and local efforts aimed at preserving farmland and other kinds of open space are best understood as diverse efforts directed toward a common goal. Using a variety of different tools provides more options for farmers and government agencies wishing to preserve land and thereby increase the likelihood of saving open space.

⁶ Suffolk County Agricultural Protection Plan. Suffolk County Planning Department. June, 1996.

PRESERVATION TOOLS — STATE LEVEL

Sales Tax Extension Program

(Direct: Agricultural Lands and Open Space)

Authorized by legislature and subject to voter approval; extends the sales tax starting in 2001. Would run until 2013, funded annually depending on the economy and sales tax revenue. Several separate and dedicated accounts:

- Farmland for continued purchase of development rights (projected total \$62 million)
- Drinking Water and Open Space for land acquisitions including the Peconic Estuary and the South Shore Estuary Reserve (projected total \$114 million)

Farmland Protection Program

(Direct: Agricultural Lands)

This program directly supports preservation of farmland through purchase of development rights. Grants are awarded to town or county farmland boards for 75 percent of the funds needed to purchase development rights; the municipality provides the remaining 25 percent. Selection criteria include: whether there is significant development pressure on a particular piece of property; whether the farm is economically viable; and whether the farm is close to an ecological resource or an adjacent protected farm. In 2000, Suffolk County was awarded over \$5 million. Since the program was introduced in 1996, more than \$7 million has been dedicated to farmland protection projects, nearly half the total program allocation Statewide.

Farm Link & Farm On Programs

(Direct and Indirect: Agricultural Lands)

Matches retiring farmers with people who would like to own a farm. In many cases, new farmers cannot afford the expense of buying an operating farm. This program gives them a chance to work a farm and learn from an expert as they build up enough equity in the farm to eventually buy it. This program is designed to ensure that working farms continue to function as working farms, thus keeping agricultural lands out of development, even as farmers age.

New York State Agricultural Development Program

(Indirect)

The program coordinates policies, plans and actions of State agencies, commissions, and committees in order to strengthen the State's agricultural resources and promote the State's

agriculture industry. The new law authorizes the State Department of Economic Development to approve demonstration projects designed to improve the marketing, processing, storing, and manufacturing of agricultural products. A key focus of the program will be the significant untapped agricultural resources in the State. These resources present economic development opportunities to promote growth while enhancing the economic well being of farm communities through job creation and job retention.

Included in the program is the development of financing mechanisms for the establishment, retention, diversification, and expansion of new and existing value-added agricultural products. Effort will also be made to determine if any regulatory barriers impede the development, retention, diversification, or expansion of the agricultural resources industry. According to State Senator Nancy Lorraine, the program “will help farmers refine specialty niches, enhancing the State’s reputation for agricultural quality and innovation.” By working to preserve an agricultural economy, this program helps farmers maintain their farms, thus supporting efforts to preserve and protect active farmland.

State Agricultural Districts

(Indirect)

Farmers can ease financial pressures by joining a State Agricultural District for a renewable 8-year period, with the effect of lowering the farmers’ tax bill. Agricultural Districts do not protect farmland over an extended period of time, but do provide temporary protection from development pressure. This tool works best in conjunction with other farmland preservation and protection strategies. One drawback of this program is that it increases land speculation.

“Grow New York” Program to Fund Agricultural Economic Development

(Indirect)

This \$500,000 agricultural economic development grant program is designed to create jobs, boost the rural economy and help New York’s 39,000 farms thrive. It provides one-to-one matching funds for demonstration projects, feasibility analyses, and project research aimed at addressing New York’s agricultural development needs and opportunities. The “Grow New York” Program offers producers and processors new opportunities to expand, diversify and develop market niches that will meet the increasing consumer demand for fresh, quality agricultural commodities and specialty foods.

Other State-level Initiatives Passed as Part of the 2000/2001 Budget:

(Indirect)

- Farmers Markets Grant Program: \$200,000
- Farmland Viability Program: \$200,000

- Pride of New York Marketing Program: \$300,000

Community Supported Agriculture

(Indirect)

This approach to sustaining farmers and farmland works by strengthening ties between working farms, the local economy, and non-farming residents. A farmer calculates the farm's expenses, including salaries, and sells shares to the number of families needed to support the farm. The farmer benefits by having the income guaranteed up-front without waiting for the harvest, and the risk of crop failure is spread among all shareholders. Shareholders benefit by having a supply of fresh vegetables throughout the season at wholesale prices. The Peconic Land Trust has operated a CSA project at its Quail Hill Preserve in Amagansett since 1989.

On-Farm Composting

(Indirect)

This program integrates farms and farmers into the local economy through the recycling of resources. Started in 1995 by the Cornell Cooperative Extension and the Town of Riverhead Highway Department, this program diverts large quantities of leaves from the Town landfill to growers willing to accept them.

Regional Markets

(Indirect)

In November of 1999, Governor Pataki signed legislation creating the Long Island Regional Market. Describing the benefits of these new markets, the Governor stated, "agriculture and commercial fishing have been integral components of Long Island's economy and its history. This legislation will help ensure they will always be an important part of Long Island's future. The establishment of a regional market not only will provide the region's farmers and fishermen a local market to sell their wares, it will give Long Island consumers direct access to world-class agriculture and fish products." The creation of regional markets helps to keep dollars in the local economy and builds an economic infrastructure that helps support area farmers.

PRESERVATION TOOLS — COUNTY LEVEL

Suffolk County Farmland Purchase of Development Rights Program

(Direct: Agricultural Lands)

The first such program in the United States, the Suffolk County Farmland Purchase of Development Rights program, was created in the early 1970's for the purchase of acquiring development rights to working farms. As of 1996, about \$40 million had been spent to preserve 7,000 acres.

Community Greenways

(Direct: Agricultural Lands and Open Space)

Authorized in 1998, this program sets aside \$62 million for several purposes:

- *The Open Space component* of this program (\$20 million) targets drinking water protection parcels, stream tributaries, greenbelt and habitat enhancement.
- *The Active Recreation component* (\$20 million) authorizes the County to buy land for active recreation purposes; a town, village or community group is required to design, build and maintain the improvements. Golf courses are specifically excluded.
- *The Farmland component* (\$20 million) is targeted for purchase of development rights on active farms, provided another level of government covers 30 percent of the cost of acquisition. This program is expected to preserve 2,000 acres.
- Finally, \$2 million is set aside for the construction of a natural history interpretive center to be built at an indeterminate site.

Land Preservation Partnership

(Direct: Agricultural Lands and Open Space)

Created to acquire land, in partnership with a town or village, for various purposes, not including active recreation. Costs are split 50-50. Development rights and conservation easements can be acquired. As of 1996, funding level of \$9 million in County dollars.

Suffolk County Open Space Program

(Direct: Open Space)

Created in 1986, this program was designed to acquire land under development pressure that cannot be clustered, rezoned, or partially developed. Generally, lands acquired are managed as passive open space. As of 1996, \$144 million had been spent to preserve 5,000 acres.

Drinking Water Protection Program

(Direct: Open Space)

This program targets the acquisition of open space critical to the protection of the region's groundwater drinking supplies. As of 1996, \$35 million had been spent annually to acquire

12,000 acres, mostly in the Pine Barrens. Since the inception of the program in 1987, over \$220 million has been spent on acquisitions.

Review of Tax Lien Properties for Environmental Value

(Direct: Open Space)

Tax lien parcels are reviewed for environmental evaluation after redemption period has expired to determine if the County should retain these parcels for open space/park/municipal purposes or sell them at auction. In 1999, over 350 acres were transferred to Department of Parks, Recreation, and Conservation.

Right-to-Farm Law

(Indirect)

Designed to conserve, protect, and encourage the use of agricultural land for the production of food and other agricultural products. Agricultural activities such as irrigating, spraying, fertilizing, and tractor use do not constitute a nuisance if they are consistent with good agricultural practices and were established prior to surrounding nonagricultural activities. Approved by Suffolk County Legislature in 1982.

PRESERVATION TOOLS — LOCAL LEVEL

Transfer of Development Rights Program, Town of Riverhead

(Direct: Agricultural Lands and Open Space)

A Transfer of Development Rights (TDR) program has been established in the Town of Riverhead, but its impact has yet to be seen. Similar to the Purchase of Development Rights program, the TDR program also establishes priorities for properties that can be included. At a minimum, the land must be classified by the County as Class 1 or Class 2 Prime Agriculture Soils with a competitive priority determined by:

- Agricultural significance due to open space value, scenic beauty, historic significance, and environmental sensitivity;
- Soil quality and productivity;
- Irrigation needs and water availability;
- Economic value based on size of farmland and capital investment in buildings and production facilities;

- Annual sales for the past 7 years; and
- Contiguity to other County farmland preservation properties.

Prior to the acquisition of development rights, offers to purchase development rights must be presented in a public meeting. In addition, the Farmland Preservation Committee must submit a written recommendation to the Town Board. At that point, the Town Board has 45 days to accept or reject the offer to purchase development rights.

The Farmland Preservation Committee consists of seven (7) members serving staggered two (2) year terms. They consist of four (4) residents currently engaged in the ownership and operation of a farm, one member of the Riverhead Planning Board, the Planning Director of the Town of Riverhead, and one member at large. In its review of prospective purchases, the Committee considers the following criteria: soil suitability for future agricultural use, history or agricultural production, contiguity with other agricultural lands from which development rights have been or are planned to be severed, the appraised value of development rights, and the parcel's frontage on major thoroughfares.

Right-to-Farm Provisions, Town of Riverhead

(Indirect)

Chapter 44 of the Riverhead code addresses Agricultural Land Preservation. It targets the conservation and preservation of prime agricultural lands used in bona fide agricultural production because of their vital role in both the character of the Town and its economy. The code addresses a farmer's right to partake in activities related to farming practice.

PRESERVATION TOOLS — OTHER

- *Donations of Conservation Easements.* (Direct: Agricultural and Open Space)
- *Bargain Sales.* (Direct: Agricultural and Open Space)
- *Rights of First Refusal.* (Direct: Agricultural and Open Space) A signed guarantee that owners will first offer their property to the County before they can sell it to anyone else. Allows the County the option to purchase outright farmlands and other open space under development pressure.

Estate Planning

(Direct: Agricultural and Open Space)

The Peconic Land Trust employs conservation planning and limited development techniques in its work with farmers and other landowners.

AGRICULTURAL PRESERVATION IN RIVERHEAD

Because there are so many State and County initiatives targeted at the preservation of farmland and open space, it may appear that there is no need for additional programs or refinement of existing programs within the Town of Riverhead. However, State and County dollars are spread across many communities; Riverhead stands to receive only a portion of these funds. Since Riverhead taxpayers contribute financially to these preservation programs, it makes sense for the Town to get as much “bang for the buck” by making sure that farmland preservation efforts at the local level take advantage of the synergy of State and County initiatives. This is best accomplished by ensuring that Riverhead’s own programs for preserving farms and farming are effective and workable.

Riverhead is uniquely situated to benefit from agricultural preservation. Relative to other communities on eastern Long Island, Riverhead still has a large amount of contiguous agricultural land. Also, Riverhead has highly productive and lucrative agricultural operations that are an economic asset to the Town. Moreover, those farm operations have the potential for continued growth and success in the future. Finally, Riverhead’s location at the mouth of the Peconic River, where the North Fork conjoins the South Fork, and at the end of the Long Island Expressway creates a unique opportunity for agro-tourism. Agricultural preservation efforts can build upon these assets to both: (1) protect the Town's character; and (2) contribute to the growth of agricultural business.

AGRICULTURAL PRESERVATION IN SUFFOLK COUNTY

It is important for Riverhead to consider its farmland protection strategies in the context of regional issues and characteristics. The issues at play in the region and the character of surrounding towns help identify Riverhead's opportunities and challenges vis-à-vis farmland preservation. These issues and characteristics are not limited to agriculture, but include economics, land use, transportation, natural resources, and others.

An important cornerstone of the regional effort to preserve farmland is the 1996 Suffolk County Agricultural Protection Plan. Because this plan looks at farmland preservation Countywide, it provides valuable information for Riverhead as the Town addresses its own agricultural preservation concerns. The 1970 Nassau-Suffolk Comprehensive Plan targeted 30,000 acres of farmland for preservation.⁷ However, the 1996 plan dropped that target to 20,000 acres, acknowledging that “30,000 acres may still be desirable” but that factors such as land speculation, the rate of farmland conversion, the high cost of acquiring land, and the voluntary nature of acquisition programs made a 20,000-acre target more realistic.⁸

⁷ Suffolk County Agricultural Protection Plan. Suffolk County Planning Dept. June, 1996.
www.suffolk.ny.us/planning/z08GOALS.html

⁸ Suffolk County Agricultural Protection Plan. Suffolk County Planning Dept. June, 1996.
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Although the 1996 plan targeted 20,000 acres for farmland protection, it also indicated that there is not enough money to reach that goal. Nearly 7,000 acres of development rights on farmlands in Suffolk County have been acquired, but the additional 13,000 acres will cost more than \$100 million to purchase. At the budgeted acquisition rate of \$1.5 million per year, only an additional 3,000 acres in Suffolk County can be acquired over sixteen years at a cost of \$24 million. If farmland conversion continues at the same rate during that sixteen year period, only 10,000 acres of farmland will remain in Suffolk County — half the currently targeted amount, and about one third of the 1996 target. According to the plan, about 10 times the budgeted amount (or \$15 million per year) is needed over the next 7 years to achieve the goal of 20,000 acres.⁹ If Suffolk County is to accomplish its target, additional preservation techniques as well as thoughtful and creative land use planning will need to be used. It is clear that the efforts of communities like Riverhead will be important in reaching regional goals.

Riverhead does not have to be a sacrificial lamb, preserving farmland for the benefit of the entire County at a cost to itself. Intelligent land use planning can make it possible for Riverhead to benefit and grow economically, while also helping to attain regional goals. In fact, land use planning at the local level that dovetails with larger regional efforts is most successful and effective for all involved. When planning efforts at the local and regional levels work at cross-purposes, everyone loses.

A.8 AGRICULTURAL OPPORTUNITIES AND THREATS

As Riverhead evaluates the best approach to accommodating growth while conserving and protecting its prime agricultural lands, opportunities and threats facing the region and its agricultural producers must be considered.

OPPORTUNITIES

A number of forces support the continued viability of agriculture in Suffolk County, including Riverhead:

1. Suffolk County has a *natural comparative advantage* in agriculture due to its relatively long growing season, fertile soils and high percentage of sunshine.
2. Structural changes in agriculture in Suffolk County have removed relatively unproductive agricultural land from farming leaving a *high percentage of land in cropland*. Seventy-nine percent of the County's total farmland is cropland, compared with sixty-two percent statewide.
3. County farmers enjoy relatively *high revenues from farming activities*. This has allowed a relatively high percentage of farmers, 70 percent, to continue to list

⁹ Suffolk County Agricultural Protection Plan. Suffolk County Planning Dept. June, 1996. www.suffolk.ny.us/planning/z08GOALS.html

farming as their principal occupation at a time when many other regions are experiencing a trend toward part-time farming. In 1997, Suffolk County sales per farm averaged \$276,993 and generated an average of over \$68,000 net cash return per farm¹⁰.

4. *Proximity to markets* is another plus. There are 6.9 million people living in the four Long Island counties and 1.3 million in Suffolk County alone. Retail sales of food in Suffolk County were estimated at approximately \$2.6 billion in 1994.¹¹
5. Riverhead's agriculture is concentrated in *product areas predicted to experience increasing demand* on the urban fringe. Professional planners throughout the northeastern U.S., including New York State, recently predicted that future demand will increase for fresh and/or organic fruits and vegetables, greens, herbs, table grapes, wine, horses, bedding plants, cut flowers, turf/sod, animal boarding, breeding, and training, and wine tasting. All of these products and services are currently produced in Riverhead. In addition, planners anticipate increased demand for mushrooms, goat's meat and milk, lamb, local beef and pork, organic eggs and poultry, specialty cheese, veal, venison, farm retreats, tours and vacations, hay rides, school field trips, and mail or direct food delivery services. These represent areas that may provide further agricultural diversification and income opportunities for Riverhead's agricultural entrepreneurs.
6. *Initiatives occurring at State, County and local levels* (see Section A.7) are indicative of broad levels of support among the public and varying levels of government for the preservation of agriculture and its associated lands.
7. New and increased *marketing and publicity efforts* designed to support regional farms and a farming economy reflect the continued interest in building a strong regional economy with agriculture as a major component. These efforts include many of the State and County programs (see Section A.7), as well as efforts by the Long Island Tourism and Convention Commission, the Peconic Land Trust, and the Long Island Farm Bureau to help inform people of the diversity and availability of farm products in Suffolk County. To assist farmers in selling produce on Long Island, the Peconic Land Trust has sponsored the Long Island Community Markets Program funded by both private and public funds, including a grant from Suffolk County. Farmers markets are currently operating in a number of communities.
8. Willingness on the part of lawmakers to support agricultural preservation through a variety of means is reflected in recent *favorable changes to tax investment laws and State agriculture laws* that have fostered the expansion of horse farms in Suffolk County. Additional initiatives underway at the State level to address threats from property tax burdens include a bill to create circuit breaker tax credits for farmers, as well as Statewide property tax reform.

¹⁰ 1997 Census of Agriculture - County Data. USDA, National Agricultural Statistics Service. 1997.

¹¹ Suffolk County Planning Department.

THREATS

1. Major forces threatening the continuation of farming in Riverhead are *high land values*.
2. High land values are supported by an increasing demand for second homes golf courses/communities.
3. High land values coupled with the *continued reliance in New York State to use property taxes to fund education* increase the opportunity cost for continuing to farm on the one hand and the fixed costs associated with farming on the other, creating a pincer movement likely to:
 - a. Accelerate the need to adopt high value-added strategies to support farm enterprises, and
 - b. Drive more marginal commercial farmers out of business over time if not adequately addressed.

Some farmers have already chosen to “cash out” their holdings in Riverhead in exchange for farm real estate in areas facing fewer development pressures.

4. The continuation of agriculture is also threatened by the *high degree of reliance on rented land* for farming in Suffolk County. In 1992, 15 percent of the County’s farmland was rented, a rate nearly 3 times that for all of New York State and by far the highest rate for any County in New York State. An estimated 60 percent of Suffolk County farmers rent land. Farmland owners who seek rental payments sufficient to cover property tax obligations will force farmers in turn to seek ever-higher value and more land-intensive production methods. As development pressures increase, so do incentives for conversion of rented farmland to alternative uses. Stabilizing land tenure patterns and related costs is one important component of fostering a sustainable and economically viable environment for agriculture.
5. In Suffolk County, the largest production expense is hired labor.¹²

A.9 INSTALLMENT PURCHASE PROGRAM

With the recent passage of State enabling legislation for installment purchase programs, a new mechanism for leveraging funds is available to the Town. An Installment Purchase Program generally works whereby the Town enters into an agreement with the landowner to pay interest and/or interest plus principal payments over a period of years. Installment Purchases have the benefit of reducing tax liability for the landowner along with reducing the total amount of funds required by the Town to ultimately purchase key parcels of land. Installment Purchase Programs differ in duration and intensity, but can leverage significant amounts of money as well as save the Town money in the purchase of development rights.

¹² Suffolk County Agricultural Protection Plan. Suffolk County Planning Dept. June, 1996.

ADVANTAGES TO THE PROPERTY OWNER

1. **TAX-EXEMPT INTEREST.** Semi-annual interest paid on the outstanding balance of the purchase price is exempt from federal, State, and local income taxes to the same extent as interest on the County's general obligation bonds. An opinion of bond counsel on this issue is provided at settlement.
2. **DEFERRAL OF TAXES ON CAPITAL GAINS.** Pursuant to the Internal Revenue Code of 1986, property owners entering into installment purchase agreements for the sale of development rights may, in certain circumstances, defer recognition of capital gain until they actually receive the principal amount of such purchases. As a general rule, installment-sale treatment allows deferral of part or all of a capital gain until part or all of the purchase price is received under an installment purchase agreement, unless the agreement is "readily tradable in an established securities market." Under certain circumstances, the capital gain may be recognized for tax purposes and become taxable if the installment purchase agreement is sold, assigned, pledged, or otherwise transferred. Therefore, properly structured, an installment purchase agreement can be used to avoid immediate recognition of capital gain. No opinion as to these matters is provided by bond counsel or the County. Property owners should consult with their tax advisors regarding these possible tax attributes.
3. **TRANSFERABILITY.** The installment purchase agreement is a negotiable instrument, and property owners are permitted to securitize and sell their interests in installment purchase agreements at settlement or later.
4. **BETTER ESTATE PLANNING.** Because installment purchase agreements can be transferred, they offer flexibility in estate planning. They can be placed into marital trusts or used in connection with various estate-planning techniques. Additionally, separating the development rights from the land and making the agreement transferable allows the property owner's heirs to sell their interest in the agreement than in the land in order to pay estate taxes.

ADVANTAGES TO GOVERNMENTAL UNIT

A securitizable tax-exempt installment-purchase offers several advantages to a governmental unit. These advantages include:

1. **LEVERAGE.** Governmental organizations, such as a municipal government, use dollars to be realized over 30 years to preserve open space today, while it is still available. By making semiannual tax-exempt interest payments over 30 years and lump-sum principal payments in 30 years, governmental units pay for preservation over the period during which their citizens enjoy the open space.
2. **DISCOUNT PURCHASES.** Because of the value of benefits offered over a 30-year period, landowners should be willing to sell their land(s) or easements at prices as low as 50 to 60 percent of appraised value.

3. **SIMPLICITY OF FUNDING.** Governmental units would still need to publicize their programs, identify participants, and negotiate prices for the lands or easements being acquired. Once that process is completed on the local level, however, preservation is in place: no waiting for State approval of funding, no worry about whether the program will have enough money, no drawn-out bond sale.

EXAMPLE OF INSTALLMENT PURCHASES

A table showing the *Securitizable Tax-Exempt Installment-Purchase Open-Space Financing Program Assumptions for Cashflows Advantages* is presented below (Table A-2, excerpted from Evergreen Capital Advisors and Howard County, MD). Each installment purchase agreement into which Howard County enters has a term of approximately 30 years. Every 2 years after execution, the County pays a portion of the purchase price (usually \$5,000) with the remaining amount of the purchase price paid in a lump sum at the end of the agreement.

In addition, the County pays semi-annual interest on the outstanding balance of the purchase price. The interest rate is determined at closing on the agreement, and is no less than the prevailing interest rate on certain long-term U.S. Treasury obligations. However, Howard County's current policy is that the interest rate on any agreement will be no less than 6.5 percent regardless of rates on U.S. Treasury obligations at closing. Principal and interest payments are made by check sent directly to each property owner.

Table A-2: Cashflow Assumptions

	<i>Developer Cash Purchase of Land</i>	<i>Installment Purchase of Easement</i>
Prorata Basis in Farmland (per acre)	\$577	\$577
Prorata Basis in Easement (per acre)	\$923	\$500
Prorata Basis in Contribution (per acre)	\$0	\$423
Basis in Land (per acre)	\$1,500	\$1,500
Value of Farmland (per acre)	\$2,500	\$2,500
Value of Easement (per acre)	\$4,000	\$4,000
Total Land Value (per acre)	\$6,500	\$6,500
Sale Price (per acre)	\$6,500	\$2,167
Total Acreage	150	150
Total Sale Price	\$975,000	\$325,050
Closing Costs @ 5%	(\$48,750)	\$0
Capital Gains Tax	(\$245,438)	\$0
Replacement Housing	(\$150,000)	\$0
Total Costs Paid at Closing		
Net Proceeds Invested	\$530,813	\$325,050

Income Tax Rate - Federal	31%	31%
State and Local	7%	7%
Capital Gains Tax Rate- Federal	28%	28%
State and Local	7%	7%

As a general rule, installment-sale treatment allows deferral of part or all of a capital gain until part or all of the purchase price is received under an installment purchaser agreement, unless the agreement is “readily tradable in an established securities market.” However, under certain circumstances, the capital gain may be recognized for tax purposes and become taxable if the installment purchase agreement is sold, assigned, pledged, or otherwise transferred. Therefore, properly structured, an installment purchase agreement can be used to avoid immediate recognition of capital gain. No opinion as to these matters is provided by bond counsel or the County. Property owners should consult with their tax advisors regarding these possible tax attributes.

Value of Landowner’s Advantages

Cashflows in Table A-3 show that a \$2,167 per acre installment-purchase of easements (54 percent of their appraised value) allows a hypothetical farmer to realize the same value as from a \$6,800 per acre land sale to a developer, given the assumptions illustrated below. This analysis assumes that the farmer selling his land pays from proceeds:

1. Closing costs equal to five percent of proceeds;
2. A capital gains tax equal to 35 percent of the net appreciation in his land; and
3. \$150,000 for replacement housing.

The remaining proceeds are assumed to be invested in a long-term tax-exempt bond yielding 6.75 percent. Although most homeowners are entitled to roll the proceeds of house sales into the purchase of new houses without incurring capital gains tax, this analysis assumes that the sale price is allocated to the land, since the house will probably be destroyed after sale in order for development to occur.

Federal tax law restricts an investor’s ability to claim-tax exempt interest when he uses the project financed with tax-exempt obligations. For this reason, lands could only be purchased from farmers who would no longer farm such lands, even as tenants. Such installment-purchases might be attractive to farmers who want to continue living in and owning farmhouses that were subdivided out of the installment-purchased lands, or to farmers who wish to leave their farms altogether and live elsewhere. Such installment-purchases would also be attractive to owners of environmentally sensitive lands or lands to be used for parks.

Table A-3: Developer Cash-Purchase of Land - Cashflows

<i>Year</i>	<i>Gross Proceeds</i>	<i>Total Costs at Closing</i>	<i>Net Proceeds Invested</i>	<i>Investment Income @ 6.75%</i>	<i>Value of Charitable Deduction</i>	<i>Net Farm Income</i>	<i>Present Value Factors</i>	<i>Present Value at 6.75%</i>
0	\$975,000	(\$444,188)	\$530,813					
1				\$35,830			0.9368	\$33,564
2				35,830			0.8775	31,442
3				35,830			0.8220	29,454
4				35,830			0.7701	27,591
5				35,830			0.7214	25,847
6				35,830			0.6758	24,212
7				35,830			0.6330	22,681
8				35,830			0.5930	21,247
9				35,830			0.5555	19,904
10				35,830			0.5204	18,645
11				35,830			0.4875	17,466
12				35,830			0.4567	16,362
13				35,830			0.4278	15,327
14				35,830			0.4007	14,358
15				35,830			0.3754	13,450
16				35,830			0.3517	12,600
17				35,830			0.3294	11,803
18				35,830			0.3086	11,057
19				35,830			0.2891	10,358
20				35,830			0.2708	9,703
21				35,830			0.2537	9,089
22				35,830			0.2376	8,514
23				35,830			0.2226	7,976
24				35,830			0.2085	7,472
25				35,830			0.1953	6,999
26				35,830			0.1830	6,557
27				35,830			0.1714	6,142
28				35,830			0.1606	5,754
29				35,830			0.1504	5,390
30				566,642			0.1409	79,850
								530,813

Table A-4: Installment Purchase of Easement - Cashflows

Year	Gross Proceeds	Total Costs at Closing	Net Proceeds Invested	Investment Income @ 6.75%	Values of Charitable Deduction	Net Farm Income	Percent Value Factors	Present Value @ 6.75%
0	\$325,050							
1			\$325,050	\$26,004	\$85,235	\$6,800	0.9368	\$110,575
2				26,004		6,800	0.8775	28,787
3				26,004		6,800	0.8220	26,966
4				26,004		6,800	0.7701	25,261
5				26,004		6,800	0.7214	23,664
6				26,004		6,800	0.6758	22,168
7				26,004		6,800	0.6330	20,766
8				26,004		6,800	0.5930	19,453
9				26,004		6,800	0.5555	18,223
10				26,004		6,800	0.5204	17,071
11				26,004		6,800	0.4875	15,991
12				26,004		6,800	0.4567	14,980
13				26,004		6,800	0.4278	14,033
14				26,004		6,800	0.4007	13,145
15				26,004		6,800	0.3754	12,314
16				26,004		6,800	0.3517	11,536
17				26,004		6,800	0.3294	10,806
18				26,004		6,800	0.3086	10,123
19				26,004		6,800	0.2891	9,483
20				26,004		6,800	0.2708	8,883
21				26,004		6,800	0.2537	8,321
22				26,004		6,800	0.2376	7,795
23				26,004		6,800	0.2226	7,302
24				26,004		6,800	0.2085	6,841
25				26,004		6,800	0.1953	6,408
26				26,004		6,800	0.1830	6,003
27				26,004		6,800	0.1714	5,623
28				26,004		6,800	0.1606	5,268
29				26,004		6,800	0.1504	4,935
30		(\$87,513)	351,054	754116.07		6,800	0.1409	38,096
								\$530,820

Appendix B: Natural Resources

B.1 WATER RESOURCES

Eastern Long Island is a geographic area defined in large part by its proximity to and relationship with water. These water features — from Long Island Sound to the Peconic Bay system — are formative landscape features that help define the geography and personality of Riverhead (see Figure B-1). The region's water resources are important to the people of Riverhead as natural resources of great beauty, as well as economic resources.

Many of the individual communities of eastern Long Island, including Riverhead, are blessed with considerable shoreline frontage. In Riverhead, the Town's northern and southern boundaries (which are considerably longer than its eastern and western boundaries) are defined by water features. To the north is Long Island Sound, and to the south, the Peconic River and the Peconic Estuary system.

Less visible but equally important are the below-ground water resources contained in Long Island's aquifers. The water in these aquifers provides drinking water for many Long Island communities, including Riverhead. The water in these aquifers is filtered through the porous soils of the Central Pine Barrens area, a portion of which lies within the boundaries of Riverhead.

Other key water resources in the Riverhead include non-coastal surface waters, such as ponds and intermittent streams, which represent unique habitat zones supporting important plant and animal populations.

ECONOMIC IMPORTANCE

In Riverhead, many local residents depend on water resources for employment and income. For example, fishermen need to have high-quality water resources. Fish and shellfish must be safe to eat and must occur in high enough abundance so that fish populations are sustainable. Small business owners are also tied to the region's water resources. Their livelihood depends on residents and visitors, many of whom are drawn by the beauty and quality of the Town's water bodies. Property values are also tied to water resources and their quality. Property in coastal communities is generally perceived to be highly attractive, therefore increasing its value.

SCENIC AND RECREATIONAL CONTRIBUTIONS

Water resources also contribute to the scenic quality of a community, while providing diverse recreational opportunities. These aspects of water resources — scenic quality and recreational opportunities — are, in turn, economically beneficial because they improve the

overall quality of life and attract people to live, work and recreate in the community. This helps build a strong economic base.

Views of and across water bodies are can contribute to scenic vistas. The unique plant and animal communities found in and near water bodies also contribute to the landscape. High quality water bodies play an important role in creating the habitat to support the distinctive plant and animal populations that are so critical in conveying the unique regional character and setting of a community. When these regionally characteristic plant and animal populations are lost or destroyed due to insensitive development practices or invasive species, a community loses a large part of its distinctive “sense of place.”

Physical access to water — both public and private — is an important component of the recreational aspect of water resources. Recreational activities associated with water resources — such as boating, fishing, swimming, and observing nature — all require the ability to get in, on, or near the water.

In Riverhead, important scenic and recreational water resources include Long Island Sound, the Peconic River, and the Peconic Estuary system (which includes the Peconic River and Flanders Bay). All are unique scenic amenities that provide recreational opportunities as well as economic benefits to the Town.

Because existing development, future development, and agricultural practices have the potential — if improperly planned and managed — to harm, degrade, and limit public access to these essential pieces of Riverhead’s landscape, the impacts of development on scenic and recreational water resources should be taken into account when developing a plan for accommodating future growth within the community.

IMPACTS OF LANDSCAPING PRACTICES AND DEVELOPMENT

Areas where land and water meet — of which Riverhead possesses many — are often seen as highly desirable places to live and work. Yet, these are often the most fragile landscape areas, and because they are so attractive, they are at greater risk from the impacts of human activity. Overuse, insensitive building or design, and poorly conceived planning efforts can compromise the beauty and integrity of these fragile and sensitive areas.

In these areas of interface between land and water, the water bodies (and the scenic, economic and recreational amenities they provide) may be at risk due to the landscaping practices of both homeowners and business owners. Agricultural practices (such as the overuse of herbicides, pesticides and fertilizers) as well as the landscape practices used to maintain large recreational areas such as golf courses, parks, and athletic areas (that also use large inputs of herbicides, pesticides and fertilizers) can also seriously harm a community’s prized water resources.

If a community wishes to retain and build upon the benefits derived from its water resources, the impact of existing and future development in areas close to or hydrologically connected

to a community's essential water bodies needs to be carefully considered. In Riverhead, key water resources include:

- Long Island Sound;

Figure B-1: Water Resources

Back of Figure B-1.

- Peconic River;
- Peconic Bay Estuary, including Flanders Bay;
- Groundwater reserves, specifically in the Central Pine Barrens area; and
- Other important and sensitive surface waters, such as the Coastal Plain Ponds in the southwestern part of Town.

It is important to carefully evaluate the potential impacts of human activity on the Town's water resources, so as to ensure the continued scenic quality and economic vitality of the community.

ESTUARINE RESOURCES

Long Island Sound

Long Island Sound is about 110 miles long from east to west and is about 21 miles across at its widest point. More than 8 million people live within its watershed. According to research commissioned by the Long Island Sound Study, more than \$5 billion is generated annually in the regional economy from boating, commercial and sport fishing, swimming and beach going associated with the Sound.¹³ The ability of the Sound to support these activities depends on the quality of its waters, living resources and habitats — all of which are affected by the amount and type of development that occurs along the borders of the Sound and throughout its watershed. Communities along the north shore of Long Island, including Riverhead, are closely tied to the Sound and its overall health and visual character.

An Estuary of National Significance

Long Island Sound is an estuary, a place where fresh and salt water mix. Like other estuaries, Long Island Sound is rich in fish, shellfish, and waterfowl. It provides feeding, breeding, nesting, and nursery areas for diverse animal and plant life and is an important component of the overall landscape and economy of the region.

In 1987, as part of the National Estuary Program (NEP), Long Island Sound was designated an "Estuary of National Significance." Two years earlier, in 1985, the Sound's importance had been formally recognized by citizens and government through the formation of the Long Island Sound Study (LISS), a cooperative endeavor focused on analyzing and correcting the Sound's most pressing environmental problems.

As part of that effort, a group of stakeholders — known as the LISS Management Conference — first met in 1988 and has continued to work together collectively to implement the *Comprehensive Conservation and Management Plan for Long Island Sound* (CCMP), which was released in 1994. The group of stakeholders working on this project

¹³ See "References," at the end of this "Findings" section.

includes citizens, environmental groups, businesses and industries, academic institutions and local, State, and federal governments. Seven important issues concerning Long Island Sound and its present and future well being have been identified by the LISS Management Conference group:

- Low Dissolved Oxygen (Hypoxia)
- Toxic Contaminants
- Pathogen Contamination
- Floatable Debris
- Living Resources and Habitat Management
- Land Use and Development
- Public Involvement and Education

The first four items listed above – *Low Dissolved Oxygen*, *Toxic Contaminants*, *Pathogen Contamination*, and *Floatable Debris* – represent undesirable conditions that can occur in Long Island Sound, each of which is tied in some way to human activity and/or development practices and impacts. Some of these conditions and their development-related impacts are described more fully below. The living resources and habitat of the Sound, and related development impacts, are described in more depth in Section B.3. The final two items — *Land Use and Development* and *Public Involvement and Education* — represent two action areas where Towns like Riverhead can make a difference in preserving and protecting Long Island Sound.

Low Dissolved Oxygen (Hypoxia)

Just as people need oxygen to breathe, so do marine organisms. The oxygen used by marine organisms is “dissolved” in the water in which they live; when the level of dissolved oxygen falls below a certain point, the organisms become stressed. They may become ill, die or move to more oxygen-rich waters, thus decreasing the health and vitality of the water body.

One of the major contributing factors to low dissolved oxygen is the release of nitrogen from land-based sources, such as sewage treatment facilities, storm water runoff and agriculture. Designated by LISS as the priority water quality problem in the Sound, hypoxia — or low dissolved oxygen — results from a combination of natural and human-induced events. Nitrogen sources such as sewage treatment plant effluent, storm water runoff from residential, agricultural, and downtown areas, and atmospheric deposition over-fertilize the Sound, fueling the growth of algae. These microscopic plants ultimately sink to the bottom and decay, depleting oxygen in the bottom waters and leading to potentially serious consequences for marine life.

Hypoxia is an issue of concern for Riverhead and its residents because Long Island Sound is an important scenic and economic resource for the Town. This concern will continue to inform current and future planning and development along the northern shore of Riverhead

Toxic Contaminants

Of the 55,000 chemicals being used today, many are poisonous and toxic. In high concentrations, some of these substances can kill marine life. Others can have more subtle effects on behavior and reproduction or may impact intricately balanced food webs. Additionally, toxic substances can accumulate at high levels in the tissue of marine organisms, creating a health risk for seafood consumers.

Land use and the manufacture, use, and disposal of everyday products all contribute contaminants to our water systems. It is important to understand the relative contributions of various sources of toxic substances in order to develop effective strategies for protecting the Sound. Management strategies are most cost effective when they are preventative. Once contamination occurs, cleanup is extremely costly and difficult. In the Long Island Sound area, sewage treatment plants appear to be a major source of copper pollution, while much of the lead contamination comes from areas of urban runoff.

Fortunately, pollution controls and changes in manufacturing trends have decreased the amount of contaminants discharged in Long Island Sound and have resulted in decreased concentrations of contaminants in the surface sediments. Although the most serious problems with toxic contamination are located in the western portion of the Sound, increasing development pressures on the eastern end of the Sound could put the western part of the Sound at greater risk.

Pathogen Contamination

Pathogen contamination occurs as a result of disease-causing bacteria and viruses that can enter Long Island Sound from inadequately treated human sewage and domestic and wild animal wastes. Another source is the discharge of sewage from boats. Studies conducted in Long Island Sound and other estuaries around the country have confirmed that boats can be a significant source of fecal coliform bacteria in coastal waters, particularly in areas with high boat densities and low hydrologic flushing. Swimming beaches and shellfish beds may be closed if coliform levels exceed designated thresholds.

Some of the primary sources of pathogens to the Sound are older sewer systems that overflow during rainfalls (called combined sewer overflows), failing septic systems, illegal connections to storm sewers, sewage treatment plant malfunctions and vessel sewage discharges. People can become sick by swimming in waters contaminated by pathogens or by eating raw or partially cooked shellfish that contain pathogens. As a result, pathogen contamination can seriously affect the region, economically and socially. Although the most serious problems with toxic contamination are located in the western portion of the Sound, increasing development pressures on the eastern end of the Sound, could put the western part of the Sound at greater risk.

Benefiting Riverhead and Its Residents Through Best Use of Taxpayer Dollars

Taxpayer dollars have been and will continue to be invested in the Sound to deal with issues such as nitrogen pollution, sediment contamination, habitat degradation and loss, and the health and abundance of living resources. New York State citizens have shown their support for efforts to protect and improve the quality of their natural resources through legislation such as the 1996 Clean Water/Clean Air Bond Act, which was proposed by Governor Pataki and approved by New York voters. The act included \$200 million for projects to address the priorities identified in the CCMP, including the reduction of nitrogen releases. To date, \$83.2 million has been committed for projects to upgrade and improve sewage treatment plants, restore critical aquatic habitat, purchase open space, and reduce non-point sources of pollution.

Taxes paid by Riverhead residents support these and other programs at the federal, State, and regional level. Riverhead should optimize the use of its residents' tax dollars by ensuring that the Town's comprehensive planning efforts dovetail with ongoing and future efforts to protect and maintain the quality of eastern Long Island's natural resources. The Town and its residents stand to benefit from these programs. Protecting and maintaining the area's natural resources results in economic, scenic, recreational and ecological benefits that will boost the town's overall quality of life.

The Peconic Estuary

Many of the issues identified above for Long Island Sound are also of concern for the Peconic Estuary system. In fact, the Peconic-based issues may be even more significant for Riverhead and its residents since the majority of the Town's waters drain into the Peconic River and Peconic Bay system.

Riverhead is at the western end of the estuary system, where the waters are poorly flushed compared to waters further east. The dynamics of flushing mean that just as the western end of the Long Island Sound has more severe water quality problems than the eastern Sound, so the western end of the Peconic Estuary system has the potential for significant and lingering water quality problems.

However, although there is a downside to being located at the western end of the estuary system, there is a benefit as well. Because the overall flow of water through the system is west to east, Riverhead is in a better position to influence and maintain water quality in its adjacent waters, than communities further east. These more eastern, or "downstream," communities are sited along waters whose quality is affected by the inputs, activities, and land use policies of many communities. Therefore, they have less control over impacts to their adjacent water bodies. In contrast, the western portion of the estuary absorbs the impacts of only two communities: Riverhead and Southampton.

As noted earlier, many of the critical issues for Long Island Sound (low dissolved oxygen, toxic contamination, pathogen contamination, floating debris) are also critical issues for the Peconic River and Bay system. Both water systems are estuaries, and both abut already

developed areas or areas expected to accommodate increasing levels of development in the near future.

As estuaries, both Long Island Sound and the Peconic Estuary System are transition zones between land and sea, freshwater and saltwater and therefore extremely sensitive to the impacts of human activity and development. These parts of the landscape (including both land and water areas) are fragile environmentally and sensitive to disturbance. Careful land use planning and wise landscaping practices — by homeowners, the business community and governmental entities — coupled with effective outreach and education is essential.

What Is an Estuary?

An estuary is a partially enclosed body of water that is formed where freshwater from rivers and streams flows into the ocean. Estuaries are characterized by the mixing of freshwater and salty seawater. Although influenced by the tides, estuaries are protected from the full force of ocean waves, winds, and storms by reefs, barrier islands, or fingers of land, mud, or sand that define an estuary's seaward boundary. Estuaries are found in a variety of shapes and sizes and are described by many different names — including bays, lagoons, harbors, inlets, and sounds — all found within Riverhead's coastal environment.

The tidal, sheltered waters of estuaries support unique communities of plants and animals specially adapted to life at the edge of the sea. Estuarine environments are among the most productive on earth, creating more organic matter each year than comparably sized areas of forest, grassland, or agricultural land. Many different habitat types are found in and around estuaries, including shallow open waters, freshwater and salt marshes, sandy beaches, mud and sand flats, rocky shores, oyster reefs, river deltas, tidal pools, sea grass and kelp beds, and wooded swamps. Estuaries are ecologically diverse and scenically varied environments.

Estuaries provide many benefits, from contributing to the economic base of a community to providing education and recreational opportunities to important ecological and environmental functions.

Economic Benefits

Tourism, fisheries, and other commercial activities depend on the richness of natural resources in estuaries. The protected coastal waters of estuaries also support important public infrastructure, serving as harbors and ports vital for commercial and recreational boating and associated activities. As the following facts and figures indicate, estuaries are critical to the economic life of many communities. If the health of estuaries is harmed, estuarine communities — like Riverhead — suffer economically.

- Estuaries provide habitat for more than 75 percent of America's commercial fish catch, and for 80 to 90 percent of the recreational fish catch.¹⁴
- Estuarine-dependent fisheries are among the most valuable within regions and across the nation, worth more than \$1.9 billion in 1990, excluding Alaska.¹⁵
- Nationwide, commercial and recreational fishing, boating, tourism, and other coastal industries provide more than 28 million jobs.¹⁶

Educational and Recreational Benefits

Estuaries also are important in providing opportunities for recreation, education, the acquisition of scientific knowledge, and the experience of nature and beautiful surroundings. Boating, fishing, swimming, surfing, and bird watching are some of the numerous recreational activities people enjoy in estuaries. In many places, estuaries are considered the cultural centers of coastal communities, serving as focal points for local commerce and recreation.

Habitat for Wildlife

Estuaries are critical for the survival of many species. Birds, mammals, fish, and other wildlife depend on estuarine habitats as places to live, feed, and reproduce. Estuaries provide ideal spots for migratory birds to rest and refuel during their journeys. And many species of fish and shellfish rely on the sheltered waters of estuaries as protected places to spawn. Hundreds of marine organisms, including most commercially valuable fish species, depend on estuaries at some point during their development.

Other Benefits

The wetland areas found along the fringes of many estuaries contribute to the overall quality of life in many communities because of the important ecological functions they perform. These wetland areas filter water from upland areas, cleansing it of sediments, nutrients and other pollutants, ultimately releasing cleaner and clearer water to larger bodies of water. Wetland plants and soils also act as a natural buffer between the land and ocean, absorbing floodwaters and dissipating storm surges. These wetland areas help alleviate potential damage to valuable real estate from storm and flood damage. Finally, salt marsh grasses and other estuarine plants help to prevent erosion and stabilize the shoreline.

¹⁴ *Coastal Challenges: A Guide to Coastal and Marine Issues*, a publication of the National Safety Council's Environmental Health Center, prepared in conjunction with Coastal America, February, 1998.

¹⁵ *Estuaries of the United States: Vital Statistics of a Natural Resource Base*, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, October, 1990.

¹⁶ *Coastal Challenges: A Guide to Coastal and Marine Issues*, a publication of the National Safety Council's Environmental Health Center, prepared in conjunction with Coastal America, February, 1998.

The Peconic Estuary System

The Peconic Estuary System is one of 28 estuaries in the National Estuary Program (NEP), administered by the U.S. Environmental Protection Agency. The estuary was accepted into the program as an “Estuary of National Significance” in 1992.¹⁷

The Peconic Estuary is located at the eastern extremity of Long Island, between the North and South Forks. With 340 miles of coastline, the Peconic Estuary System is made up of over 100 distinct bays, harbors, and tributaries spanning more than 110,000 acres of land and 121,000 acres of surface water.

In addition to the surface waters of the Peconic River and the Peconic-Flanders Bay systems, the Peconic Estuary system includes Gardiner’s Bay and a portion of Block Island Sound. It also includes what is known as the “storm water runoff-contributing watershed” and the “groundwater contributing area.” All these areas are connected hydrologically by the flow of water through the system and are sensitive to impacts from development.

Especially important for the Town of Riverhead are the Peconic River and Flanders Bay. These two bodies of water form the southern shoreline of the Town. Like the estuary system overall, the Peconic River is an extremely fragile water resource and vulnerable to many of the same land use-related impacts. The water of the river, and whatever impacts it absorbs, is carried downstream and into the estuary system. The shores of Flanders Bay contain a relatively large (800 acre) undisturbed salt marsh complex. The area is considered a very productive marine ecosystem that serves as an important nursery for a variety of fish and shellfish.

Although the Peconic estuary system is characterized generally by high water quality that provides the public with many important benefits, rapid development of the surrounding area threatens water quality and other important resources associated with the estuary¹⁸.

The Economic Value of the Peconic Estuary

As part of a project to help the Peconic Estuary Program (see below) and coastal managers determine priorities for managing and protecting the estuary, the Department of Environmental and Natural Resource Economics at the University of Rhode Island has assessed the economic value of the Peconic Estuary. As part of that study, 29 estuarine-dependent sectors were identified. These sectors are those areas of the economy that are supported by services or products attributed to the estuary.

¹⁷ See “References,” at the end of this “Findings” section.

¹⁸ The National Estuary Program. *Coastlines: Information About Estuaries and Near Coastal Water* (August 1999, Issue 9.4). National Estuary Program, U.S. Environmental Protection Agency, 1999.

For the Peconic Bay, these included over 1,000 establishments which employ more than 7,000 people, pay wages in excess of \$117 million and have total annual revenues of over \$400 million. According to the study, overall estuarine-dependent economic activity conservatively accounted for a minimum of 20 percent of the local economy. As a group, tourism and recreation establishments dominate and comprise over 80 percent of the identified estuarine-dependent economic activity.¹⁹

The Peconic Estuary Program

The Peconic Estuary Program (PEP) is part of the National Estuary Program and is an alliance of federal, State and local interests working together to preserve and protect the Peconic Estuary System and its natural resources. PEP is sponsored by the U.S. Environmental Protection Agency (USEPA), the New York State Department of Environmental Conservation (NYSDEC) and the Suffolk County Department of Health Services (SCDHS). The SCDHS operates the program and provides day-to-day management as well as technical and administrative support.

In September 1999, a group of stakeholders — known as the PEP Management Conference and including citizens, technical experts, and federal, state and local officials — developed a draft Comprehensive Conservation and Management Plan (CCMP) designed to protect and preserve the Peconic Estuary System. The Management Conference will continue to work towards effective implementation of the plan. The three committees that compose the Management Conference — the Citizens Advisory Committee, the Local Government Committee, and the Technical Advisory Committee — will be integral to the long-term management process. The participation of local governments, including the Town of Riverhead, will also be crucial to the implementation process, especially in terms of land use, zoning, and non-point source control programs.

What Are the Priority Issues Facing the Estuary?

The CCMP has identified five priority management issues facing the estuary:

- Brown Tide;
- Nutrient Pollution;

¹⁹ Grigalunas, Thomas A. and Jerry Diamantides. *The Peconic Estuary System: Perspective on Uses, Sector and Economic Impacts*. (February 1996; unpublished technical report submitted to the Peconic Estuary Program); Opaluch, James J.; Thomas A. Grigalunas, Jerry Diamantides, Marisa Mazzotta and Robert Johnston. *Recreational and Resource Economic Values for the Peconic Estuary System*. (February 1999; unpublished technical report submitted to the Peconic Estuary Program); The National Estuary Program. *Coastlines: Information About Estuaries and Near Coastal Water* (August 1999, Issue 9.4). National Estuary Program, U.S. Environmental Protection Agency, 1999.

- Threats to Habitat and Living Resources;
- Pathogen Contamination; and
- Toxic Chemicals.

The Management Conference also identified the need for public education and outreach, financing, and a framework for the long-term management of the estuary.

Issues and concerns associated with the *Brown Tide* and *Nutrient Pollution* are described below. *Threats to Habitat and Living Resources* are described in the Section B.3. Issues associated with *Pathogen Contamination* and *Toxic Chemicals* are similar to those described for Long Island Sound above.

The Brown Tide

The Brown Tide is a serious problem plaguing the Peconic Estuary. An algae bloom caused by a small and historically unknown species (*Aureococcus anophagefferens*), the Brown Tide was first detected in June 1985 and has occurred off and on since then. It's onset, duration, and cessation have been unpredictable. The impacts of the recurring Brown Tide blooms are widespread, having a serious effect on natural resources, the local economy, the general aesthetic value of the estuary and possibly to regional tourism. Although advances have been made regarding the identification and characterization of the brown tide organism and its growth needs, the causes of the brown tide are not known.

The Brown Tide has been particularly devastating to the shellfish resources of the estuaries. In the Peconic Estuary, the scallop harvest accounted for 28 percent of the U.S. landings in 1982 with a dockside value of \$1.8 million dollars. By 1988, the scallop harvest had dropped from pre-brown tide levels of 150,000 to 500,000 pounds per year to only 300 pounds per year. By 1994, the scallop population had rebounded but was then hit with a brown tide in 1995 that caused significant scallop mortality.²⁰

In 1992, the Suffolk County Department of Health Services released the Brown Tide Comprehensive Assessment and Management Program Report (BTCAMP) in response to the Brown Tide problems. The BTCAMP study recommended that a host of pollution abatement strategies be pursued in the Peconic Bay area, including:

- Upgrading of the Riverhead Sewage Treatment plant;
- Stricter zoning;
- Restoration of wetlands and eelgrass beds;
- Storm water runoff management;

²⁰ Peconic Estuary Program, Office of Ecology. *Draft Comprehensive Conservation and Management Plan – September 1999*. Suffolk County Department of Health Services,, September 1999, Riverhead: New York.

- Boating and marina controls; and
- Further monitoring of water quality and the Brown Tide

Nitrogen and the Peconic Estuary

Prior to the establishment of the Peconic Estuary Program, the ground and surface water quality of the Peconic Estuary and its surrounding watershed was studied in some depth. The primary emphasis at that time was on the western estuary, including the Peconic River and Flanders Bay — the area of the estuary bordered by the Town of Riverhead.

At that time, significantly elevated nitrogen concentrations were found along the North Fork (typically 5 to 7 mg/l). These elevations were attributed to agricultural and residential influences, resulting in part from the fertilizers used in these areas.

At that time, studies also found that the groundwater in the Peconic River was of relatively high quality. This was attributed to that fact that much of that land draining into the river was at the time vacant — consisting primarily of undeveloped land, parkland or nature preserves. As land in the Peconic River watershed becomes more highly developed, the Peconic River and its associated waters will be increasingly at risk. Because of its quantitative input of freshwater to a poorly flushed area, the Peconic River's role is very important. If quality of the ground water in the river corridor degrades, the impacts on Flanders Bay could be serious.

Studies also revealed another area of concern. There is the need to control point source — most notably nitrogen — loading in the estuary from the municipal sewage treatment plant whose discharge location is at the mouth of the Peconic River.

The PEP has adopted a “no net increase” nitrogen loading policy for the tidal Peconic River and Flanders Bay. This nitrogen level “freeze” is being implemented through point source discharge permits for the three sewage treatment plants in the area. In the river corridor, land use controls, a public education and outreach campaign, and demonstration projects are critical parts of the management strategy.

AQUIFER AND GROUNDWATER RESOURCES

Central Pine Barrens Area

The Central Pine Barrens is an important landscape feature for Long Island and its inhabitants because it is essential to maintaining the sole natural source of drinking water for over two and half million residents of Long Island. The drinking water for much of Long Island is drawn from this aquifer system. This system is regularly replenished by rainwater, which falls within the Pine Barrens region and then infiltrates through the soil and then into the aquifer below, which holds and distributes the water. The water percolates downward to these lower layers through a hydrological phenomenon known as “deep flow recharge.” It

is because the soils in the Pine Barrens area are so porous that they work so well storing and distributing the rainwater that falls over the area. This water — which begins as rainwater and is eventually stored in the aquifer — is the source of drinking water for most of Long Island’s residents, including those who live in Riverhead.

The Central Pine Barrens once covered approximately 250,000 acres in central Suffolk County. However, due to landscape changes wrought by development, the ability of portions of the original area to serve their original ecological function as aquifer recharge areas has been diminished or lost. As a result, the Central Pine Barrens area now consists of less than half its original area, covering approximately 100,000 acres of relatively undeveloped land.

The soil features that make the Central Pine Barrens an ideal area for groundwater recharge also make the drinking water supply especially vulnerable to the risk of pollution. Because the soils are so permeable, they are not as capable of filtering or degrading contaminants as well as some other soils. Thus, contaminants can enter, and in sufficient quantity, contaminate the aquifer system.

In addition to its importance as a groundwater recharge area, the Pine Barrens area contains an unusually high concentration of species that have officially been classified as endangered, rare, or otherwise subject to the protection of federal laws. The Pine Barrens area contains over 300 species of vertebrate animals, 1,000 species of plants, and 10,000 species of insects and other invertebrate animals, many of them rare and restricted to pine barrens or other similar areas. Among the more endangered species inhabiting the Pine Barrens are the Tiger Salamander, the Red-Shouldered Hawk, the Northern Harrier, and the Mud Turtle.²¹

How have citizens expressed their desire to preserve and protect the Pine Barrens?

Because of the importance of the Long Island Pine Barrens to the citizens and residents of New York State and Suffolk County, laws and policies that recognize the ecological significance and fragility of the area have been adopted at a variety of government levels in order to protect it from the negative impacts of development. The following is a list of some of the key policies and laws that has been formulated at the federal and State levels:

- The EPA designated the underlying Long Island aquifer a “sole source aquifer” after noting that the aquifer system is the principal source of drinking water for Nassau and Suffolk Counties and is highly vulnerable to contamination. (1978)
- The Long Island Regional Planning Board released a comprehensive waste treatment plan (“the 208 study”). It included the mapping of an area known as “Hydrogeologic Zone III,” which closely matches in outline the area of the Central Pine Barrens. The plan indicated that this zone should be protected from contamination through land use restrictions and other controls.

²¹ See “References,” at the end of this “Findings” section.

- The New York State Legislature adopted the first in a series of enactments designed to protect the Pine Barrens by amending the Environmental Conservation and Public Health Laws to provide for special review of business, commercial, and industrial uses in Suffolk County, with a view toward preserving the purity of the groundwater. (1974)
- The State Legislature adopted the Landfill Law, which prohibits the placement of new landfill sites in Zone III and most of the Central Pine Barrens. (1984)
- The State Legislature authorized the Department of Environmental Conservation to prohibit land uses involving hazardous wastes in certain portions of Long Island because of the “direct relationship that exists between land use activities and the quality of the groundwater reservoir beneath.” (1983)
- A Statewide framework for water resource planning was established and the Department of Environmental Conservation issued a report, the Long Island Ground Water Management Plan, which singled out the Long Island Pine Barrens for protection. (1984)
- State legislation enacted the Sole Source Aquifer Special Groundwater Protection Areas Law (codified as article 55 of the Environmental Conservation Law). The Central Pine Barrens area in the Towns of Brookhaven, Riverhead, and Southampton was included as one of nine listed Special Groundwater Protection Areas.

Laws to protect the Central Pine Barrens area and its resources have also been adopted at the local level. Suffolk County has adopted laws that:

1. Encourage towns and villages within the Pine Barrens Zone to develop “unified policies” with regard to land uses within that zone (Local Law 7, 1984).
2. Designate the Central Pine Barrens as a critical Environmental Area pursuant to State Environmental Quality Review Act (Local Law 24, 1987).
3. Create a Pine Barrens Wilderness and a Water Protection Preserve (Local Law 40, 1987).
4. Establish funding mechanisms for projects to protect the drinking water (Local Law 35, 1988).

More recently, the interests of citizens have been expressed through local planning efforts including the adoption of the Long Island Pine Barrens Protection Act of 1993, which initiated a process for regional planning and permitting which continues today. The plan officially defined the Central Pine Barren area at the junction of the Towns of Riverhead, Brookhaven, and Southampton and also:

1. Created a five member Central Pine Barrens Joint Planning and Policy Commission.
2. Formed an Advisory Committee.
3. Mandated the production and adoption of the *Central Pine Barrens Comprehensive Land Use Plan* (which was adopted in June 1995).

What is the Central Pine Barrens Comprehensive Land Use Plan?

The *Central Pine Barrens Comprehensive Land Use Plan* came about as a result of the 1993 legislation (see above). Among its responsibilities, the Joint Planning and Policy Commission was charged with overseeing the creation and implementation of a comprehensive land use plan for the Central Pine Barrens aimed at protecting and preserving valuable Pine Barrens resources. The *Central Pine Barrens Comprehensive Land Use Plan* is this plan.

The Plan identifies two regions within the Central Pine Barrens — the Core Preservation Area and the Compatible Growth Area. The Plan regulates land uses in these areas with the goal of managing development in a way that preserves and protects the Pine Barrens' ecological and hydrological resources. Successful implementation of the Plan will protect a significant portion of eastern Long Island's deep recharge watershed. It will also result in the protection of a large contiguous forest within the Core Preservation Area. In the Compatible Growth Area, new development "will be directed in a compact, efficient and orderly pattern."

The **Core Preservation Area** consists of 55,000 acres (4,720 in Riverhead). Within this area, the Plan is designed to protect the critical ecological and hydrological functions of the Pine Barrens. This is achieved by:

- Preserving the Core Area in its natural state;
- Promoting compatible agricultural, horticultural, and open space uses; and
- Minimizing impacts on the Core Area by prohibiting or redirecting new development

The **Compatible Growth Area** consists of 47,500 acres (5,484 in Riverhead). Within this area, the plan is designed to:

- Discourage piecemeal and scattered development; and
- Encourage appropriate patterns of compatible residential, commercial, agricultural and industrial development

Within the Compatible Growth Area, the Plan aims to accommodate regional growth in an orderly way and to accommodate a portion of the development redirected from the Core.

The Plan includes a strategy for the public acquisition of private vacant property in the Core Preservation Area, with a goal of purchasing 75 percent of the remaining privately owned vacant land. As part of the strategy to reach this goal, a transfer of development rights (TDR) program called the Pine Barrens Credit Program has been created. Through this program, landowners with property in the Core Preservation Area may transfer the right to develop a parcel in the Core to another more suitable parcel.²²

²² For further information, see the *Central Pine Barrens Credit Program Handbook*, published by the Central Pine Barrens Joint Planning and Policy Commission, February 1994.

Finally, an important aspect of the plan is the component describing the “Standards and Guidelines for Land Use”. Consistent with the goals of the Plan to protect and preserve irreplaceable Pine Barrens resources while accommodating appropriate use and development, these standards and guidelines regulate land use in the Central Pine Barrens. Created to ensure that new development is consistent with the goals of the Act and the Plan, the Plan provides clearly defined and efficient review procedures.

These standards and guidelines are important to the people of Suffolk County, including Riverhead, because they are designed to protect their long-term interests — safe, available drinking water, and essential natural resources for the benefit and enjoyment of all.²³

The Central Pine Barrens area is an important natural resource area for Riverhead and its residents because of its role in providing healthy drinking water to Long Island residents. Development in, or hydrologically connected to, the Pine Barrens area, could jeopardize those resources. The Central Pine Barrens also provides important scenic and recreation benefits to the Town.

B.2 SOILS AND TOPOGRAPHY

The soils, topography, and terrain of Riverhead are important natural resources and features not only because of their specific physical and chemical character, but also because these physical and chemical properties underlie and define the unique visual character of the town.

For example, the kind of soils in a particular area determines the type of land use that can be accommodated. Some soils are well suited to farming; others are not. Some soils can readily accommodate residential development, but may limit the density of that development. Soils affect the visual character of the Town because of the kinds of land uses that can be accommodated. Soils well suited for farming, when preserved for agricultural use, create areas with the broad open expanses and scenic rural character that are so highly valued by Riverhead residents.

Other soils are extremely fragile, or may support rare or unique plant and animal communities. On or near soils like these, any building or development has the potential to alter the soils and the communities they support in irreparable ways. In addition to their fragility and ecological importance, these types of soil are often key in defining the visual character of a region. For instance, the beach soils, escarpment soils, muck soils, and tidal marsh soils of the Town of Riverhead occur mostly along the interface between land and water, areas that contribute strongly to Riverhead’s unique sense of place.

²³ For further information, see Chapters 4 and 5 in Volume 1 of the *Central Pine Barrens Comprehensive Land Use Plan*.

GEOLOGICAL FORMATIONS OF LONG ISLAND

Over time, a variety of forces have shaped and continue to shape the landscape of Long Island. These forces include the advance and retreat of glaciers many thousands of years ago; the weathering action of rain that slowly erodes the landscape over time; the movement of soil particles through the landscape by rivers and streams; and the shifting of landforms created by the movement of large water bodies, particularly those that are tidally influenced. The most prominent landforms in Suffolk County are:

- Two hilly ridges (called moraines) that extend in long strips from west to east;
- Two gently sloping outwash plains that fall to the south of each moraine;
- Eroded headlands found along the northwestern shore of the county;
- Barrier beaches of the south shore; and
- Tidal marshes.

The moraines and outwash plains were formed by the action of glaciers. Countywide, elevation ranges from almost 400 feet at West Hills to sea level. The weathering effect of rainfall that has occurred over many hundreds, even thousands of years, has slowly eroded hills and other upland features throughout the county. Meanwhile, the barrier beach and tidal marshes have probably been formed in relatively shorter time frames by water movement and particle deposition, from streams, rivers, oceans and bays.

Figure B-2: Soil Map

Back of Figure B-2

Glacial Landforms of Riverhead

The advance and retreat of glaciers played a primary role in forming the soils and landforms of Long Island. The Wisconsin stage, the last of four major glacial stages, produced Long Island Sound as well as many of the significant topographic features apparent on Long Island today. In Suffolk County, as well as Riverhead, glacial landforms define the overall landscape character and correlate strongly to the existing soil associations.

Moraines

During the earlier part of the Wisconsin stage, the glacier moved south across what is current-day Long Island. The glacier acted much like a bulldozer, pushing a complex mix of soil and glacial debris ahead of it. When the glacier retreated, the pile of debris was left behind, forming an extensive, irregular, hilly mound called a moraine. This moraine, known as the *Ronkonkoma moraine* extends in a long band from the Nassau County line (near Smithtown) to Montauk Point. Part of this moraine passes through Riverhead, along the southern edge of the Town, in the area of course-textured, excessively drained soils just north of the Peconic River. This area corresponds to the Plymouth-Carver Rolling and Hilly soil associations described below.

Following this period of glacial retreat, the glacier advanced one last time. However, with this final advance, the glacier did not advance as far south before beginning its retreat. Once again, the bulldozer effect of the glacier left behind a hilly pile of morainal debris. In Suffolk County, this second moraine — known as the *Harbor Hill moraine* — forms the northern shore of the county, extending in a long band from the western edge of the county all the way to Orient Point. In Riverhead, this morainal landform is found along the northern edge of the Town, in the hilly strip that borders Long Island Sound. This area corresponds to the Carver-Plymouth-Riverhead soil association described below.

Outwash Plains

Each time the glacier reached its southern limit, it began to melt. As the glacier melted, streams flowed south away from the glacier and its morainal deposits. These “meltwater” streams carried large amounts of sand and gravel that were deposited in a more or less flat plain, forming broad relatively flat landscape features known as outwash plains.

There are two outwash plains in Suffolk County. One outwash plain lies between the Ronkonkoma moraine and the Atlantic Ocean. This outwash plain, which extends along the southern edge of the county, does not pass through Riverhead. The other outwash plain lies between the Harbor Hill moraine and the Ronkonkoma moraine. In Riverhead, this outwash plain occupies the majority of the Town’s land area, extending from west to east in a broad band across the entire town. This central landform, framed by the Harbor Hill moraine to the north and the Ronkonkoma moraine to the south, forms the agricultural core of Riverhead. This area corresponds to the Haven-Riverhead soil association described below.

Riverhead Soils

Seven important soil types found in Riverhead are described below. The first set of three soil types is key to understanding the overall geographic makeup of the Town. These soils cover the largest overall land area within Riverhead and occur in three bands that run parallel to Long Island Sound. The second set of four soil types represents a combination of unique or especially fragile soil types that are essential to Riverhead's unique identity as a coastal community. These four soil types cover a much smaller percentage of land within Riverhead and are generally found in pockets or narrow strips along or near the coastal edges.

Primary Soil Associations

There are three primary soil associations found in Riverhead (See "Riverhead Soils Map," next page). Each of these soils was created by a different geologic event. Each of these soils is characteristically different from each other. Each of these soils is made up of different kinds of particles, in differing amounts, and therefore, each has different "capabilities." These soils and their capabilities are described below. In addition to the three primary soil associations, other important Riverhead soils are the beach, muck, escarpment, and tidal marsh soils described below.

Carver Plymouth Riverhead Association (Harbor Hill Morainal Area – North Shore)

- These soils are described as "deep, rolling, excessively drained and well-drained, coarse textured and moderately coarse textured soils on moraines."
- This association is located mainly along the north shore adjoining Long Island Sound. The area characterized by this soil association is typically rolling, with slopes ranging from nearly level to steep. In the eastern part of the area covered by these soils, a low ridge or a series of narrow parallel ridges is dominated by strongly sloping soils.
- The rolling landscape, many wooded areas, and nearness to water make soils in this association highly desirable as sites for estates. The eastern part of the area covered by these soils (including Riverhead) is wooded or the sites have summer homes on them. The general trend in land use is toward housing and recreation.
- The sandy texture and steep slopes make the soil much of this association poorly suited to farming. Slope is the dominant limitation to use of these soils as building sites.²⁴

²⁴ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

Where is the Carver-Plymouth-Riverhead Association in Riverhead?

These soils are located in a band across the northern edge of the Town.

What are these soils suited for?

These soils are not well suited to farming. These soils can accommodate development, with some limitation due to the hilly topography.

What precautions need to be taken?

Residential and any other development in this area should be sensitive to the limitations of the soil. Grading and clearing of land should be minimal in order to prevent erosion and loss of scenic qualities contributed by the topography. Although desirable location for homes, care needs to be taken to preserve the essential rolling and wooded character of these soils.

Haven-Riverhead Association (Outwash Plain Area – Central Agricultural Zone)

- These soils are described as “deep, nearly level to gently sloping, well-drained, medium-textured, and moderately coarse textured soils on outwash plains.”
- This association occurs mainly in the northern part of Suffolk County. This association is found on outwash plains. These soils are characteristically nearly level and have short gentle slopes along shallow drainageways. Some areas are pitted by steep-sided kettle holes. Slopes range from 1 to 12 percent.
- Most of the areas covered by this soil association have been cleared. Moving east from the Brookhaven-Riverhead Town line, the soils in this association make up the largest area of farmland in Suffolk County.
- Mostly, these soils are gently sloping to nearly level. They have moderate to high available moisture capacities. Crops respond well to applications of lime and fertilizer. These factors make this association one of the best farming areas in the County. Because drainage is good in these soils, and they can be excavated with ease, this association also has excellent potential for housing developments and similar uses. In places where the soils have a high water table or are strongly sloping, limitations are more severe for most non-farm uses.²⁵

Where is the Haven-Riverhead Association in Riverhead?

These soils are located in a wide band across the central area of the Town.

²⁵ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York, 1975.*

What are these soils suited for?

These soils, which are extremely well suited to agricultural use, these prime agricultural soils are located in the central core area of Riverhead. Because they are relatively flat and relatively clear of trees, they are also considered attractive for development.

What precautions need to be taken?

Because these soils are desirable for both farming and residential development, valuable agricultural lands and open space could be permanently lost to residential development. The Town needs to carefully consider the implications of converting farmland to residential development and develop policies that provide opportunities for residential development without destroying the overall integrity and long-term sustainability of agricultural lands.

Plymouth-Carver Association, Rolling and Hilly (Ronkonkoma Morainal Area – South)

- These soils are described as “deep, excessively drained, coarse-textured soils on moraines.”
- These soils are part of the Ronkonkoma moraine. They are characteristically strongly sloping to steep, with slopes ranging from 8 to 35 percent.
- Typically, these soils have a characteristically poor cover of scrub oak, white oak, and pitch pine. Only a small part of this association has ever been farmed, and many of these areas have been allowed to revert to brush.
- The soils of this association are coarse and droughty. Permeability is rapid. Natural fertility is low to very low. These factors make them very poorly suited or only fairly well suited to most crops commonly grown in the County. The use of these soils for housing developments or similar non-farm uses is severely limited due to steep slopes on much of the area and the difficulty of establishing and maintaining lawns and landscape plantings. Areas of soils that have a high water table severely limit the use of some areas for sewage effluent disposal. Rapid movement of water and wastes from cesspools and septic tanks can contaminate ground water supplies beneath the rapidly permeable soils of the association.²⁶

Where is the Plymouth-Carver, Rolling and Hilly Association in Riverhead?

These soils are located in a narrow band along the southern edge of the town, bordering the Peconic River and Flanders Bay.

What are these soils suited for?

²⁶ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

These soils are not well suited to farming because water passes through them so quickly. The development potential of these soils is very limited because of the terrain, soil permeability, and water table. This is a relatively fragile zone.

What precautions need to be taken?

Residential and any other development in this area should be sensitive to the limitations of the soil and terrain. It is best suited to passive recreation and limited residential development. Density of development should be limited and the Town's zoning code and design and construction standards should address the fragile nature of this area.

Special Riverhead Soils

Other important Riverhead soils are the beach, muck, escarpment, and tidal marsh soils described below. These soils are important because of their fragility and uniqueness. They support unique plant and animal communities characteristic of eastern Long Island, and they also contribute strongly to the Town's visual character and sense of place. These soils are found mostly along the coastal edges of the Riverhead, on the narrow interface between land and water. Measures should be taken by the Town to preserve and protect these soils from the impacts of development.

Beaches (Bc)

Beach soils are made up of sandy, gravelly, or cobbly areas that develop between dunes and escarpments and the line of water at mean sea level. The slope of beach soils is nearly level in most areas but it is as much as 16 percent in some places on the Atlantic shore. All the beaches along Long Island Sound are very gravelly and cobbly. A few very large boulders that rolled down from the adjoining bluffs of the Harbor Hill Moraine are present. The Atlantic Ocean beaches are sandy except for a few small areas near Montauk Point. In most places, beaches on the bays are sandy, but varying amounts of gravel are mixed with the sand.²⁷

Escarpments (Es)

- Escarpment soils are made up of bluffs that have slopes greater than 35 percent. Most of the areas characterized by this soil type occur along the north shore, but a

²⁷ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

few are near Peconic Bay and along the Atlantic coastline near Montauk Point. Areas also occur along the coastline of offshore islands.

- Soil horizons have not formed in this actively eroding material. Except for a few scattered areas, this unit is devoid of vegetation. Generally, the slopes are uniform with very little dissection, except on the more resistant material around Montauk Point and on parts of Gardiner's Island. The height of the escarpments ranges from about 20 feet to more than 100 feet.
- Along the north shore of Long Island, the material in the escarpments is sand. Many escarpments have large boulders embedded in the soil, which roll to the beach as the escarpment erodes.
- Escarpments are used as habitat by some species of songbirds.²⁸

Muck (Mu)

- Muck soils are made up of very poorly drained organic soils that have formed from partly decomposed or almost completely decomposed woody or herbaceous plants. The areas are nearly level and occur in the bottom of closed depressions or kettle holes and along some larger streams. Most areas are found along the Peconic River and near Montauk in depressions that are irregular in shape. A few areas, however, are between tidal marshes and areas of better drained upland soils.
- Muck is made up of 16 to 48 inches of spongy, black, or dark-reddish organic material over loose sand and gravel. The amount of partly decayed plants in the organic layer varies. The water table is at or near the surface most of the year. Typically, the surface is covered by several inches of water late in winter and in spring.
- Mapping of this land type includes small areas that are muck to a depth of more than 48 inches and a few areas of fresh-water marsh along the Peconic River that are under water throughout the year.
- Muck is suited to cranberries in some places; however, most areas are small, and it is not economically feasible to develop them. Almost all of this land type is in woodland or marsh grass. It is better suited to habitat for wetland wildlife than to other uses.²⁹

Tidal Marsh (Tm)

- Tidal marsh soils are made up of wet areas that occur throughout the County around the borders of calmer embayments and tidal creeks. These level areas are not

²⁸ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

²⁹ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

inundated by daily tide flow, but they are subject to flooding during abnormally high moon or storm tides.

- Tidal marsh soils have an organic mat on the surface that ranges from a few inches to several feet in thickness. The organic mat overlies pale-gray or white sand. In many places, the profile of the marsh is made up of alternating layers of sand and organic material that has developed as a result of sand being deposited on the organic mat during abnormally high storm tides.
- These very poorly drained areas are not suitable to any kind of farming. They are best suited to use as habitat for types of wildlife.³⁰

Where are Beach, Escarpment, Muck and Tidal Marsh soils in Riverhead?

Primarily, these soils are located in narrow bands along the interface between landforms and water bodies — along the shoreline of Long Island Sound, the Peconic River, and Flanders Bay.

What are these soils suited for?

These soils are not well suited to either farming or development of any kind, and sensitive to alteration and disturbance. They also tend to support sensitive or fragile plant and animal communities. They are best suited to passive recreational use.

What precautions need to be taken?

Due to the fragility of these soils and the plants and animals they support, no development should occur on these soils. Also, development on adjacent areas should be adequately set back to avoid negative impacts to these soils and should be conducted in a manner that minimizes negative impacts to these soil areas. Riverhead’s zoning code and design and construction standards should be modified as needed.

B.3 PLANTS AND ANIMALS

In addition to soil and water resources, the natural plant and animal communities found within the Town’s borders are another important part of Riverhead’s natural resource framework.

In protecting plants and animals, the focus is often on individual species of plants and animals, those that are especially rare, endangered, or at risk. However, it is also important to understand that these native species are part of a larger ecological framework — one that is often visualized as a “web” or “community.” The individual species are part of a larger, interrelated whole that involves complex relationships between many species and their

³⁰ U.S. Department of Agriculture, Soil Conservation Service, in cooperation with Cornell Agricultural Experiment Station, *Soil Survey of Suffolk County, New York*, 1975.

surroundings. Plants and animals are woven together into a complex web of food, water, and shelter relationships. Thus, when a particular plant or animal is at risk, its broader habitat must be adequately protected from adverse impacts in order to ensure that species' continued existence.

Are all plants and animals desirable natural resources?

From a natural resources perspective, some of the plants and animals found within Riverhead are considered valuable and desirable. These are the plants and animals described as “native,” or indigenous to the region. These species are important for a number of reasons — they are part of the region's natural and environmental heritage and they also provide scenic and recreational benefits.

Other plants and animals — including many agricultural weeds and an increasing number of garden and ornamental species — can be extremely problematic in natural areas. These problem species, one example being the popular landscaping plant Norway Maple (*Acer platinoides*), readily escape into natural areas, eventually choking out native plant and animal communities. Because they are so easily transferred by wind, water, or birds, and because they spread so aggressively, the impact of these plants can be severe.

Why are native plants and animals important to Riverhead?

Communities like Riverhead value their native plants and animals — and the broader communities of which they are a part — for many reasons. Overall, native plants and animals are an essential part of the ecological, scenic, historic, and economic fabric of the community.

These species may be important ecologically because they are rare or special, or they may be important to other valued species as food and habitat. Native plants and animals are also important as educational and scientific resources. Humans may also rely on them economically and as a food source. For instance, the fish, shellfish, and crustaceans of eastern Long Island are an important component of the regional economy. Additionally, native plants and animals are part of the scenic and recreational amenities of a region. They provide opportunities for enjoying and observing nature. These plants and animals are also an essential part of the community's regional heritage. They play a role in conveying the distinct “sense of place” that makes a community like Riverhead special and unique.

Finally, native plants and animals (and the ecosystems of which they are a part) perform important and often under-appreciated “functions and services” to human communities. In eastern Long Island, the Pine Barrens region (with its distinctive soils and vegetation) plays an important role in absorbing and filtering the water that the region depends on for its drinking water needs. The vegetative communities that make up Eastern Long Island's wetlands and marshes act as filters, removing pollutants and sediments from water as it flows into sensitive waterways such as the Peconic Estuary system.

This filtering process keeps water bodies like the estuary clean, making them better environments for fish and other wildlife. As a result, fish and bird populations are more likely to remain sustainable and will be safer for human consumption. Native wetland areas also provide an important benefit to human communities by acting as a sponge to absorb the surge of excess water that comes with storms and flooding. This helps avoid the economic losses associated with storms and flooding. Thus, the loss and degradation of area of native plants and animals can have serious impacts on the economic infrastructure and overall health of human communities.

How can valued plants and animals be protected from development impacts?

In many instances, human activity disturbs the equilibrium of these natural communities. Activities associated with building and development and with common landscape maintenance and design practices can negatively impact natural areas. For example, hydrology and soil conditions may be altered so that opportunistic species flourish at the expense of native plants and animals.

The natural environment of Long Island, including Riverhead, has a variety of unique and highly productive ecosystems, some aquatic and some terrestrial. These ecosystems include a diverse array of living resources, from microscopic plants and animals; seaweed; economically important fish, shellfish, and crustaceans; birds, sea turtles; marine mammals; and plants associated with aquatic habitats; to the many plants, insects, amphibians and mammals associated with the region's terrestrial habitats.

The following section highlights some important natural resource issues and concerns regarding certain plant and animal species and communities in Riverhead. This overview is by no means comprehensive. Instead, it is intended to give a sense of the types of issues and problems that need to be addressed as Riverhead plans for future development.

Riverhead: At the Heart of the Peconic Region

Riverhead is part of a broad area in eastern Long Island known as the Peconic Region. This region encompasses the watershed of the Peconic Estuary, and spans an area from the Pine Barrens at its western edge to the easternmost tips of the North and South Forks.

Important for its natural resources, the Peconic Region provides habitat for one of the highest concentrations of rare plants and animals in the State. Of these species, 21 are globally rare. Additionally, beaches in the Peconic Region provide habitat for two federally endangered shorebirds: piping plovers and roseate terns.

Located within the Peconic Region is the Long Island Pine Barrens. A low, flat forest on nutrient-poor, glacially deposited, sandy soils, the Pine Barrens includes a globally rare natural community of Dwarf Pine Trees and supports a wide variety of species including the Coastal Plains Buck Moth and the Harrier Hawk.

The Peconic Region also includes the watershed for the Island's longest river, the Peconic. Other important natural resources in the Peconic Region are the Coastal Plain Ponds, with their insectivorous plants and white cedar swamps, as well as the four interconnected bays that link the Peconic Estuary to the Atlantic Ocean. The salt marshes and submerged eelgrass beds found within estuary give food and shelter to commercially important fish and shellfish. Sea turtles, such as the Kemps-Ridley, seals, whales, and countless shorebirds also use the estuary for breeding or feeding grounds.

PLANTS AND ANIMALS OF THE PECONIC REGION ESTUARIES

Riverhead's estuarine environment — which includes the Long Island Sound estuary system and the Peconic Estuary system — support unique communities of plants and animals specially adapted to life at the interface between land and water. Estuarine environments are among the most productive on earth, creating more organic matter each year than comparably sized areas of forest, grassland, or agricultural land. Many different habitat types are found in and around estuaries, including shallow open waters, freshwater and salt marshes, sandy beaches, mud and sand flats, rocky shores, oyster reefs, river deltas, tidal pools, sea grass and kelp beds, and wooded swamps. Estuaries are ecologically diverse and scenically varied environments.

The productivity and variety of estuarine habitats results in abundant and diverse wildlife and plant communities. Shore birds, fish, crabs and lobsters, marine mammals, clams and other shellfish, marine worms, sea birds, and reptiles are just some of the animals that make their homes in and around estuaries. These animals are linked to one another and to an assortment of specialized plants and microscopic organisms through complex food webs and other interactions.

Estuaries are subject to both freshwater inputs from rivers and tidal inputs from the ocean. They provide important habitat, as well as spawning and nursery grounds, to a wide variety of marine organisms, most notably:

- Shellfish, such as bay scallops, hard clams; and
- Fish such as bay anchovy, Atlantic silverside, scup, (also called porgy), summer flounder (also called fluke), winter flounder, windowpane flounder, weakfish (also called grey sea trout), and tautog (also called blackfish).

One of the most important underwater habitats of estuary systems are areas of eelgrass, such as those found along the edges of the eastern end of the Peconic Estuary. These eelgrass beds provide food, shelter, and nursery grounds to many marine animals including worms, shrimp, scallops and other bivalves, crabs, and fish.

Commercially Valuable Fish in Long Island Estuaries

Long Island Sound produces some of the best shellfish in the nation. Oysters are the dominant commercial shellfish. However, commercial and recreational shellfishers also

harvest hard clams (or quahogs), soft-shell clams (or steamers), bay scallops, blue mussels, surf clams and razor clams. At the end of the 19th century, oyster farming had developed into a major industry in Long Island Sound. Today, after a long period of decline, the Sound's oyster industry is once again one of the largest in the nation. The Sound's oysters are marketed throughout the country, and their high quality commands a premium price. The oyster is, by far, the most economically important shellfish harvested from Long Island Sound.

American lobster is one of the most important and valuable seafood products harvested in New York and Connecticut. Long Island Sound's lobster fishery was the third largest in the country behind Maine and Massachusetts, earning a dockside value in New York alone of over \$29 million in 1998.³¹

However, the health of the Long Island Sound lobster industry is now in question. Lobster fishermen and dealers began reporting dead and dying lobsters in their gear in the western third of Long Island Sound in mid-September of 1999. Continuing through 1999 and 2000, the die-off was unprecedented in scope and catastrophic to the lobster fishery.

Scientists are unsure what is causing the lobsters to die in the western Sound, although all the dead lobsters had the same protozoan parasite called *Paramoeba*. Research is under way to determine whether changes in weather conditions (such as storms or average temperature fluctuations), pollutants in the water or sediments, hypoxia (lack of oxygen), dietary change, or management practices (such as dredging and pesticide applications) could have weakened the animals so that they became susceptible to diseases and parasites.

Threats to Long Island Estuaries

Conservation and management plans for eastern Long Island's two primary estuary systems — Long Island Sound and the Peconic Estuary System — have identified key concerns for the region's estuaries:

- Low Dissolved Oxygen (Hypoxia)
- Toxic Contaminants
- Pathogen Contamination
- Floatable Debris
- Brown Tide
- Nutrient Pollution

All of these are areas of concern for the plants and animals of the estuary systems. In addition to these problem areas, attention has been called to the need for wise land use

³¹ See "References," at the end of this "Findings" section.

planning and development policy coupled with education and outreach. Both of these action areas will be critical to ensuring the long-term health of the estuaries.³²

Estuarine and Coastal Birds

There are more than 125 species of birds, mainly waterfowl, water birds, and raptors that rely on the estuary systems of eastern Long Island for food and habitat. Bird populations in and near eastern Long Island vary seasonally. In winter, mergansers, scaups, scoters, mallards, black ducks, loons, cormorants, and Canada geese are found in large concentrations. Spring brings the annual migration of a wide variety of plovers, terns, sandpipers, waterfowl, herons, egrets, and songbirds. During the summer months, birds are busy tending their nests and young. Fall, once again, brings masses of birds migrating along the coast to southern wintering grounds.

The Peconic Bay region is considered an “Important Birding Area” (IBA) by the New York State Audubon Society. An IBA is a site providing essential habitat to one or more species of breeding or non-breeding birds. According to the Audubon Society, the area is an important breeding area for colonial waterfowl including: American Oystercatchers (10 pr. in 1996, 6 percent of State population); Piping Plovers (18 pr. in 1996, 7 percent of State population); Common Terns (9 pr. in 1996); Least Terns (369 pr. in 1996, 12 percent of state population); Black Skimmers (1 pr. in 1996). In addition, ospreys nest in the Peconic Bay region and forage in the wetlands. The area is also important as a wintering and staging area for waterfowl, loons, and grebes, particularly Common Loons, Canada Geese, American Black Ducks, scaup, Long-tailed Duck, and Red-breasted Mergansers.

Osprey Nesting Adults

Ospreys are fish-eating birds of prey that live throughout the world. The availability of fish, water conditions, and health of the environment directly affects the health, reproductions, and nesting success of osprey populations. Because they are high in the marine and coastal food web, ospreys are important indicators of the health and integrity of the water bodies where they live. As an example, the osprey population around Long Island Sound fell sharply during the 1950's and 1960's due to the effects of pesticides, particularly DDT. Since the ban on DDT, which occurred during the 1970's, and the placement of nesting platforms in wetlands all along the Sound, the osprey population has been making a recovery.

Least Tern

³² Long Island Sound Management Conference. *The Comprehensive Conservation and Management Plan for Long Island Sound*. Long Island Sound Management Conference, September 1994; The Peconic Estuary Program. *Comprehensive Conservation and Management Plan for the Peconic Estuary System*. Peconic Estuary Program Management Conference, 1999.

The least tern is likely to be seen in eastern Long Island from May to early August. They were hunted to near-extinction for the hat trade in the 1800's. Numbers rebounded after hunting was banned. More recently, disturbances, loss of habitat, and habitat degradation are affecting the population of Least Terns in eastern Long Island. The Least Tern population has fluctuated over the last 15 years, with relatively lower numbers present during the late 1980's and the early 1990's. Overall, between 1985 and 1997, there has been no statistically significant trend. The Least Tern is listed as a Threatened Species by New York State. Least Terns are found on the shorelines of bays, the Sound, and the ocean. Approximately 1,500 to 2,000 pairs of least terns nest on Long Island.³³

Piping Plover

Piping plovers are small shorebirds that nest on beaches, often with least terns. Their nesting and reproduction are threatened by human intrusion, storm tides, and predators. Since protection and monitoring efforts began in 1984, nesting success has improved, resulting in more returning adults in subsequent years. The piping plover is listed as a Threatened Species by the federal government. For habitat, piping plovers require large undisturbed open sandy beaches with access to shallow waters for feeding. Long Island beaches are home to approximately 200 nesting pairs, the largest piping plover population on the Atlantic coast.³⁴

Threats to Tern and Plover Populations

The populations of Piping Plovers and Least Terns are lower than they've ever been. The development and recreational use of the species' essential habitat — Long Island's beaches — is the cause of their decline. Specific threats include:

- *Loss of Habitat.* Due to commercial, residential, and recreational development, the amount of coastal habitat available for nesting and feeding has decreased.
- *Human Disturbance.* Both eggs and the young birds are very well camouflaged, putting them in danger of being stepped on or otherwise disturbed by humans. Off-road vehicles pose a serious threat. Consistent use can degrade and destroy habitat.
- *Sunbathing.* Even innocent sunbathing can have its effects on the birds; if the beach is crowded with people, feeding is interrupted and young birds may not get the nourishment they need to survive. Those that do survive need to be strong enough for the long migration south.
- *Pets.* Dogs roaming unleashed disturb the birds. Cats prey on chicks and adults at night.

³³ See "References," at the end of this "Findings" section.

³⁴ See "References," at the end of this "Findings" section.

- *Predators.* Predation is a major factor limiting nesting success at many Long Island sites. Predators such as foxes, gulls, crows, raccoons, and skunks feed on eggs, young plover, and tern chicks. Picnic waste attracts predators to the beach.

Eelgrass

Eelgrass is an aquatic plant that grows in shallow water generally less than 10 feet deep, and is found in temperate coastal bays and estuaries around the world. Eelgrass provides critical habitat for shellfish and fish. Its long blades create a miniature aquatic jungle that provides a hiding place for many juvenile fish. Without this nursery habitat, many young fish would not be able to escape from predators.

Eelgrass performs other important functions, including bottom stabilization and nutrient cycling. Eelgrass is very efficient at capturing nutrients from the water column and helps to reduce eutrophication (a buildup of nutrients). The roots stabilize the sediment and the plants themselves slow currents and allow suspended sediments to settle out — all of which helps improve water quality. The Long Island Chapter of The Nature Conservancy highlighted the importance of eelgrass in 2000 by naming it “Species of the Year.”

In the Peconic Estuary, eelgrass is mostly found east of Shelter Island. Anecdotal evidence indicates that eelgrass once existed in Flanders Bay. These eelgrass beds no longer exist due to brown tide, excess nutrients, and a disease which decimated populations in the 1930's. Eelgrass grows very slowly and can take years to expand even one foot.

Threats to Eelgrass Beds

Eelgrass beds are declining in the Peconic Estuary. Although the exact causes are not known, it is believed that the beds have been impacted by the effects of brown tide and poor water quality conditions, including high levels of nitrogen and suspended sediment (which are often side effects of human development, building and other activities). Other factors causing declines in eelgrass include wasting disease, dredging and filling operations, and disturbance by powerboats. Loss of eelgrass beds may also result in the elimination of other species that rely on the beds for habitat.

Plants and Animals of the Central Pine Barrens

Another important area in eastern Long Island for native plant and animal populations is the Central Pine Barrens. The center of the Central Pine Barrens area is a mosaic of regionally distinctive (and in some cases globally rare) communities. Found within the Pine Barrens area are pitch pine and pine-oak forests, coastal plain ponds, marshes and streams. In addition to its importance as an area of groundwater recharge, this region contains one of the greatest concentrations of endangered, threatened, and special concern plant and animal species in New York. The pine barrens constitute a unique forest ecosystem, found only on Long Island, southern New Jersey and in a few other places.

Birds in the Central Pine Barrens

The Central Pine Barrens is the largest pine barren ecosystem in New York and hosts State-listed species like breeding Common Nighthawks and Whip-poor-wills.³⁵ The area includes the last remaining viable grassland bird community on Long Island, with breeding Upland Sandpipers, Vesper Sparrows, and Grasshopper Sparrows. Other characteristic species found in the Central Pine Barrens area include: Brown Thrashers, Blue-winged Warblers, Pine Warblers, Prairie Warblers and Field Sparrows.

Figure B-3: Significant Plant & Animal Communities, page 1

³⁵ Common Nighthawk (*Chordeiles minor*) and Whip-poor-will (*Caprimulgus vociferous*) are both on New York State's list of Special Concern species. Special concern species are defined as "Any native species for which a welfare concern or risk of endangerment has been documented in New York State."

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Figure B-4: Significant Plant & Animal Communities, page 2

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The Calverton Ponds Preserve

Contained within the Central Pine Barrens area, and located within the boundaries of Riverhead, is Calverton Ponds Preserve, a 350-acre assemblage of pine barrens and coastal plain ponds that comprises one of the rarest and most fragile wetland ecosystems in North America. The preserve is cooperatively owned and managed by The Nature Conservancy and Suffolk County Parks.

Calverton Ponds and the headwaters of the Peconic River contain one of the highest concentrations of rare and endangered species in New York State, with more than 30 rare plants, including three that are globally threatened. The ponds are home to several rare amphibians, fish and insects, including Tiger Salamanders, and banded sunfish.

Coastal plain ponds are characterized by nutrient-poor, acidic water and gently sloping shores. Most coastal plain ponds are not stream-fed, but are directly connected to groundwater. Pond water levels rise and fall with the water table, reflecting seasonal and annual rainfall patterns. As a result, a unique community of plants grows along the pond shores. Periods of both low and high water levels are essential for their survival.

Threats to Coastal Plain Ponds

As a result of being connected to groundwater resources, coastal plain ponds and their associated plant and animal communities are extremely sensitive to fluctuations in water levels and to any physical or chemical change in the water such as increased nutrient loads. Changes in ground and surface water level due to human activities such as building and development could alter the normal hydrological conditions of the ponds and thereby significantly endanger these communities. Since building and development located at some distance from these ponds has the potential to alter groundwater conditions, extreme care needs to be taken in the kind development that is permitted in areas hydrologically connected to the coastal plain ponds within the pine barrens region.

Other Significant Plant Communities

In addition to the plant and animal species and communities described above, there are several other significant native plant communities in Riverhead that are valuable natural resource assets to the community.

These communities have been identified and are tracked through GIS and other systems by the New York Natural Heritage Program (see “Significant Plant and Animal Community Locations,” next page). As described earlier, these communities are important not only

ecologically and scientifically, but because they are what helps distinguish Riverhead as a community with a unique “sense of place.”³⁶

Table B-1: Plant Communities in Riverhead

Community Name	Acres in Riverhead
Maritime Beech Forest	97
Coastal Oak-Beech Forest	410
Coastal Plain Pond	3
Coastal Plain Pond Shore	162
Coastal Plain Poor Fen	10
Pine Barrens Shrub Swamp	26
Pitch Pine-Oak Forest	500

Threats to Significant Native Plant Communities

Threats to these communities include:

- Displacement from filling;
- Cutting of trees;
- Spread and invasion of non-native species;
- Impacts from road runoff;
- Alterations in hydrology;
- Removal of downed wood;
- Loss of surrounding forest integrity;
- Increase in trails;
- Impacts from development and building in surrounding landscape;
- Impacts from recreational use;
- Changes in vegetation due to fire suppression;
- Impacts from residential development (septic tanks);

³⁶ For more information, see “Ecological Communities of New York State” and the addendum “Newly Described Communities by the New York Natural Heritage Program Since 1990” (published by the New York Natural Heritage Program, New York State Department of Environmental Conservation.) Both documents are available at the New York State Natural Heritage Program at <www.dec.state.ny.us/website/dfwmr/heritage>. Reschke, Carol. *Ecological Communities of New York State*.

- Impacts from fertilizer use, weeding, and mowing;
- Erosion; and
- Changes in plant and animal communities due to changes associated with storm water runoff.

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Appendix C: Scenic and Historic Resources

C.1 POTENTIAL FUNDING SOURCES FOR CONSULTANT SERVICES AND/OR VOLUNTEER PROGRAMS

A variety of organizations and grants are identified that can provide funding or guidance in obtaining funding to support volunteer-based documentation efforts. This list is by no means comprehensive, and funding opportunities for other types of historic preservation activities may also be available from these and other organizations.

PRESERVATION LEAGUE OF NEW YORK, <WWW.PRESERVENYS.ORG>

Dedicated to the protection of New York's diverse and rich heritage of historic buildings, districts, and landscapes. It actively encourages historic preservation by public and private organizations, agencies, and individuals in local communities.

Conferences and workshops sponsored by the League provide preservation activists, property owners, and community groups with the tools they need to protect their irreplaceable architectural heritage. The quarterly newsletter, *Preservation News*, and technical/professional updates, *Preservation Network News*, offer substantive information on timely historic preservation issues. The League also publishes technical bulletins with easy-to-understand answers to questions regarding local preservation laws, the State Historic Preservation Act, sources of funding for preservation projects and many other topics. They also offer a number of other excellent and useful publications.

Grants administered by The Preservation League of New York:

- *Preserve New York*, a Grant Program of the Preservation League of New York and the New York State Council on the Arts. Provides support for three types of projects: cultural resource surveys, historic structure reports, and historic landscape reports. Grants range between \$3,000 and \$15,000.

RURAL NEW YORK HISTORIC PRESERVATION GRANT PROGRAM

Provides support for small, locally based projects. Goals are to: protect the built and natural environments of small towns, villages, and rural areas; strengthen local groups and institutions; improve local economies; and preserve the landscape and cultural values of the State's rural communities. Municipalities, not-for-profit organizations, and citizens groups working on rural preservation projects are eligible to apply. Projects eligible for funding include: building and design studies, surveys and public awareness, technical assistance or

circuit rider programs. Special emphasis is given to economic development activities and downtown revitalization. Grants do not exceed \$5,000.

NATIONAL TRUST FOR HISTORIC PRESERVATION, <WWW.NTHP.ORG>

The National Trust for Historic Preservation provides leadership, education, and advocacy to save America's diverse historic places and revitalize our communities. As part of the wide range of programs and activities it offers, The National Trust provides technical and financial assistance to State and local organizations. It also sponsors a consulting program on heritage tourism. The National Trust is a source of grants and loans through five funding programs. The applicant group must be a not-for-profit organization or a public agency and a member of the National Trust. Some programs require the recipient to match the award dollar for dollar. Grants administered by The National Trust for Historic Preservation:

- *Preservation Services Fund.* Provides financial assistance for consultant services, feasibility studies, public programming, and heritage education activities. Grants can be as large as \$5,000, with an average of \$1,000 to \$1,500.
- *Johanna Favrot Fund.* Provides support to not-for-profit organizations and governmental agencies. The project must involve a National Historic Landmark. Eligible activities include consultant services, production of educational materials, and conference or workshop costs. Grants range from \$2,500 to \$8,000.
- *National Preservation Loan Fund.* Provides support to not-for-profit organizations and governmental agencies. The project must involve a National Historic Landmark. Eligible activities include consultant services, production of educational materials, and conference or workshop costs. Grants range from \$2,500 to \$8,000.

NEW YORK STATE OFFICE OF PARKS, RECREATION, AND HISTORIC PRESERVATION, <NYSPARKS.STATE.NY.US/HIST>

Certified Local Government (CLG) Subgrants

These grants are awarded only to CLG communities. Eligible projects include historic resources surveys and designations; public education programs, commission training; planning studies; and publications. Grants generally range from \$3,000 to \$20,000 and can fund up to 100 percent of total project costs. A match is not required but is encouraged. Provides support for three types of projects: cultural resource surveys, historic structure reports, and historic landscape reports. Grants range between \$3,000 and \$15,000.

C.2 LOCAL, REGIONAL AND NATIONAL HISTORICAL SOCIETIES AND ORGANIZATIONS

FEDERAL AND STATE ORGANIZATIONS

Organizations that Can Provide Advice and Assistance with Documentation and/ or Funding

- New York State Office of Parks, Recreation and Historic Preservation, <nysparks.state.ny.us/hist>.
- New York State Office of Parks, Recreation and Historic Preservation Field Services Bureau, <nysparks.state.ny.us/field/welcome>.
- Society for American Archeology (SAA), <www.saa.org>.
- National Trust for Historic Preservation (NTHP), <www.nthp.org>.
- Advisory Council on Historic Preservation, <www.achp.gov>.
- Preservation League of New York, <www.preservenys.org>.

LOCAL/REGIONAL HISTORIC RESOURCE ORGANIZATIONS

The organizations listed below may be useful for networking, collaboration, guidance and information.

Friends for Long Island's Heritage
1864 Muttontown Road
Syosset, NY 11791
Phone: (516) 571-7600

Other Address:
PO Box 144
West Sayville, NY 11796
Phone: (631) 854-4971

Commentary: Operates a large number of museums and historical sites throughout Long Island.

New York Folklore Society
PO Box 764
Schenectady, NY 12301
Phone: (518) 346-6617
<www.nyfolklore.org/about/about.html>

Society for Preservation of Long Island Antiquities
161 Main Street
Cold Spring Harbor, NY 11724
Phone: (631) 692-4664

Commentary: Maintains four historic house museums, school discovery programs, gallery with changing exhibits, publishes books on related subject.

Suffolk County Historical Society
300 West Main Street
Riverhead, NY 11901
Phone: (631) 727-2881

Commentary: Collects, preserves and interprets the history of Suffolk County and its people. Maintains a research library, a manuscript repository, a museum, and a variety of programs and activities.

Wading River Historical Society
North Country Road
Wading River, New York 11792
Phone: (516) 929-4802

OTHER HISTORICAL SOCIETIES IN SUFFOLK COUNTY

The organizations listed below may be of interest for networking and for collaborative purposes in developing local/regional historic themes and connections.

Amagansett Historical Society
P.O. Box 7077
Amagansett, NY 11930
Phone: (516) 267-3020

Amityville Historical Society
170 Broadway
Amityville, NY 11701
Phone: (516) 598-1486

Bellport-Brookhaven Historical Society
31 Bellport Lane
Bellport, NY (516) 286-0888

Bohemia Historical Society
P.O. Box 67
Bohemia, NY 11716
Phone: (516) 244-2707

Bridgehampton Historical Society
Main Street
Bridgehampton, NY 11932
Phone: (516) 537-1088

East Hampton Historical Society
101 Main Street
East Hampton, NY 11937
Phone: (516) 324-6850

East Islip Historical Society
East Islip, NY
Phone: (516) 581-1384

Greenlawn-Centerport Historical Association and Museum
31 Broadway
Box 354
Greenlawn, NY 11740
Phone: (516) 754-1180

Huntington Historical Society
209 Main Street
Huntington, NY 11743
Phone: (516) 427-7045

Irish Family History Forum
PO Box 67
Plainview, NY 11803-0067
Phone: (516) 616-3587

Italian Genealogical Group
7 Grayon Drive
Dix Hills, NY 11746

Other Address:
Bethpage Public Library
47 Powell Avenue
Bethpage, NY

Jewish Genealogical Society of Long Island
37 Westcliff Drive
Dix Hills, NY 11746-5627

Other Address:
Plainview-Old Bethpage Public Library
999 Old Country Road
Plainview, NY

Lake Ronkonkoma Historical Society
PO Box 2716
Lake Ronkonkoma, New York 11770
Phone: (516) 467-3152

Lindenhurst Historical Society
PO Box 296
Lindenhurst, NY 11757
Phone: (516) 957-4385

Other Address:
215 S. Wellwood Avenue
Lindenhurst, NY 11757

Lloyd Harbor Historical Society
Lloyd Harbor Road
Lloyd Harbor, NY 11743
Phone: (516) 424-6110

Mattituck Historical Society
Route 25 at Cardinal Drive
P.O. Box 766
Mattituck, NY 11952
Phone: (516) 298-5248

Miller Place Historical Society
1720 William Miller House
Box 651
N. Country Road
Miller Place, NY 11764

Montauk Historical Society
Montauk Highway
Montauk, NY 11954
Phone: (516) 668-5340

Moriches Bay Historical Society
Chet Swezey and Montauk Highway
Center Moriches, NY 11934
Phone: (516) 878-1776

Northport Historical Society
215 Main Street
Northport, NY 11768
Phone: (516) 757-9859

Oyster Bay Historical Society
20 Summit Street
P.O. Box 297
Oyster Bay, NY 11771
Phone: (516) 676-7077

Oysterponds Historical Society
Village Lane
P.O. Box 844
Orient, NY 11957
Phone: (516) 323-2480

Port Jefferson Historical Society
115 Prospect Street
Box 586
Port Jefferson, NY 11777

Puerto Rican-Hispanic Genealogical Society
25 Ralph Avenue
Brentwood, NY 11717

Rocky Point Historical Society
<www.buoy.com/rphs/index.html>

Sag Harbor Historical Society
P.O. Box 1709
Sag Harbor, NY 11963
Phone: (516) 725-5092

Sayville Historical Society
P.O. Box 41
Sayville, NY 11782
Phone: (516) 563-0186

Other Address:
39 Edwards Street
Sayville, NY 11782

Shelter Island Historical Society
PO Box 847-24
North Ferry Road
Shelter Island, New York 11964

Smithtown Historical Society
Route 25A
Smithtown, NY 11787
Phone: (516) 265-6768

Southampton Historical Society
17 Meeting House Lane
Southampton, NY 11968
Phone: (516) 283-2494

Southold Historical Society
Main Road & Maple Lane
Southold, NY 11971
Phone: (516) 765-5500

Other Address:
P.O. Box 1
Southold, NY 11971

Stirling Historical Society
Main Street
Greenport, New York
Phone: (516) 477-0099

Stony Brook Historical Society
Box 802
Stony Brook, New York 11790

Three Village Historical Society
PO Box 76
E. Setauket, NY 11733
Phone: (631) 751-3730
<members.aol.com/TVHS1/index.html>

Wading River Historical Society
North Country Road
Wading River, NY 11792
Phone: (516) 929-4082

William K. Vanderbilt Historical Society
Box 433
Oakdale, NY 11769

Yaphank Historical Society
Yaphank Avenue and Main Street
Yaphank, NY 11980
Phone: (516) 924-3401

C.3 HISTORICAL TRENDS

ETHNIC HISTORY

Although there are a variety of ethnic backgrounds existing in the Town today, the histories of only three groups — Native Americans, European colonists, and African Americans — have been even partially documented. More research on these and other ethnic groups is needed and can be incorporated into the documentation and survey work to be conducted by volunteer groups and individuals.

Native Americans

Before the coming of the English to the East End of Long Island, the Indians that occupied the land from Wading River to Orient Point were known as the Corchougs. “Their villages were at places now called Aquebogue, Cutchogue, Mattituck and Hashamomuk.”³⁷ These places had access to fresh water and to salt water landings.

At Aquebogue, the village site of the Corchougs and today of Riverhead, the Indians had access to Flanders Bay, which provided a connection to the other villages of their tribe. They could also go by canoe to the villages of the Shinnecoeks, the Montauks, and the Manhassets at Canoe Place, East Hampton, and Shelter Island.

Throughout the 1700’s and well into the 1800’s, Native Americans still lived in and around Riverhead. It is impossible to say exactly when they disappeared as a statistically important portion of the population in the Town.

Further research into Native American history would be fruitful, especially in terms of whether and how their landscape management practices, such as burning of certain natural areas, may have affected the development and survival of certain fire-dependent natural communities.

European Settlers

The history of European colonists — mostly of British origin — is well-documented in secondary sources. Descendants of founding families can be found within Riverhead today. Later groups, however — including Polish, Irish and Italian — are not as well documented. Further research into these areas is necessary to further expand this theme. This research can be incorporated into the documentation and survey work to be conducted by volunteer groups and individuals.

³⁷ *Riverhead Bicentennial Album*, 6.

African Americans

In 1626, the first group of slaves was brought to New York either directly from Africa or by way of the West Indies. The burgeoning economies of the developing colonies created an intense demand for labor, and black slaves were used to fill this demand. Slave labor ranged from skilled to unskilled and included work as stone cutters, carpenters, blacksmiths, shipbuilders, field hands, seamstresses, and cooks, among others. In Suffolk County, as in other counties, the wide spread use of slave labor accounted for significant contributions to the agrarian and maritime economies.

By the mid-1700's, slaves constituted 15 percent of New York's population, the largest percentage found in the northern colonies. In Suffolk County, at the end of the 17th century, 21.5 percent of Long Island's inhabitants were black. The pattern of slave ownership on Long Island was similar in form to that found throughout the State, with most slave-holding families owning one or two slaves. For example, in the Town of Huntington the ratio of slaves to slave-owners was approximately 1 to 1.5. On the property of wealthy landowners, larger numbers of slaves were found.

By the time of the Revolutionary War, the citizens of New York were beginning to question the morality of slavery. There was an inherent conflict between the principles of bondage and the principles of independence for which they were fighting. This conflict of conscience gradually led to the passing of a series of emancipation laws in the State of New York. The first law, enacted in 1788, permitted manumission (i.e., emancipation from slavery) while providing protection for sick and elderly emancipated slaves. A compromised form of abolition followed with enactment of a 1799 law that freed all slaves born after July 4th, 1799, but continued to hold them in bondage until the women turned 25 and the men 28. Finally in 1817, a law was passed providing for the complete emancipation of all slaves by 1827.

In 1790, the African American population of Suffolk County totaled 2,236. Fifty years later, that number was greatly reduced, however, and those who stayed behind built pockets of ex-slave communities in Amityville, Eastville, Bridgehampton, The Mile Harbor, Huntington, and Greenport to name just a few. These communities continued to make significant contributions to the agrarian and maritime economies of Long Island.

Further research into the history of African Americans in Riverhead is needed, especially since African Americans constitute a sizable portion of the Town's historical and current population. This research can be incorporated into the documentation and survey work to be conducted by volunteer groups and individuals.³⁸

³⁸ Marcus, Grania, B., *A Forgotten People: Discovering the Black Experience in Suffolk County (NY)*.

THE RAILROAD

By 1825, New York City had gained recognition as a major international seaport. One outcome of this development was the strengthening of transportation patterns and systems surrounding the city. A major challenge to this effort was development of a mainland connection to Boston. Since it was perceived as too difficult to build a rail route through Connecticut's varied and often times rough terrain, an alternative land and water route was developed, a significant portion of which included a rail route through Long Island from Brooklyn to Greenport. The Long Island Rail Road (LIRR) thus began its lengthy history on April 24th, 1834, when it received its charter from the New York Legislature. There was however a recurring obstacle in development of the railroad — namely, financial difficulty, which (coupled with the eventual construction of a mainland rail-route) resulted in the short-lived success of the Long Island Rail Road as the preferred route to Boston.

Another factor contributing to the shaky beginnings of the LIRR was the location of the rail bed down the desolate, uninhabited center of Long Island. This route was chosen because it provided an unobstructed path for construction and improved speed. However, when the railroad turned to local ridership for patronage (after the failure of long-haul Boston travel), this choice proved a major error in foresight. Other railroads began to develop in the 1850's to the north and south of the LIRR, servicing and connecting the developing shoreline villages. The competition between railroad companies was fierce and eventually resulted in the merging of the Flushing & North Side lines with the LIRR in 1876. This landmark event set the stage for the eastern extension of the railroad into the Town of Riverhead and Wading River.³⁹

It was not until 1896 that the North Shore Branch was completed with stations at Miller Place, Rocky Point, Shoreham, and Wading River. Many conductors and trainmen came to make this area home permanently, since this was called the "end of the line."⁴⁰

When the railroad system was finally complete, it had acquired a network of roadbeds that traversed the length of Long Island. Three roughly parallel lines provided the framework stretching from Brooklyn to Montauk Point. Half a dozen cross road intersections linked these main lines into the metropolitan western half of the railroad system with the south shore village connections provided at one-third increments down the linear frame.⁴¹ This inefficient rail design, limited to servicing local ridership, brought financial trouble back to the Long Island Rail Road at the turn of the 20th century.

At this same time, however, the development of the Pennsylvania Railroad master plan was under way, which included as an integral component the purchase of the LIRR. The Long Island line was needed to complete a grand scheme of an all-rail connection between New

³⁹ Kramer, Frederick, *Long Island Rail Road*.

⁴⁰ Wading River, founded in 1671.

⁴¹ Smith, op. cit.

York and the New Haven & Hartford Railroad Company. In 1900, the Pennsylvania Rail Road acquired the majority stock from the LIRR for \$6,000,000. This transaction ended the 132-year history of the independent line.⁴²

The primary freight carried by the railroad was agricultural products. As summer tourism increased in the early part of the century, passenger traffic also became important for the railroad. Starting in the late 1920's, the Sunrise Special featured a through parlor car from Washington D.C. and Pullman sleeper service from Pittsburgh. Even with the great increase in the summer population, there was not enough railroad travel to warrant continuation of the Wading River Branch of the LIRR. In October 1927, steam service was suspended and a trolley system implemented. By the 1930's, even the trolley service was discontinued.⁴³

INDUSTRIES

The industrial development of Riverhead is a major theme for the Town. Although it is clear that agriculture was the major industry in the Town's development, other industries were also significant. Due to the strategic location of the Town, at the head of the Peconic River, Riverhead became the place for mills — gristmills, sawmills, and fulling mills. Other industries included tanneries and poultry. Further research and documentation of the history of the Town's industries should be completed to allow for a complete understanding.

Agriculture

Agriculture has been a mainstay of Riverhead's economy from its earliest settlement. Once settlers were assured of their survival in their new homes, the first farmers in the Riverhead area grew grains to sell to communities in New England. They also cultivated fruits, vegetables, and livestock to feed their families as well as trade locally. Intensive farming in the 18th century led to the depletion of the soil. It wasn't until about 1810 that farmers began fertilizing their fields with fish scrap from local fisheries.⁴⁴

Throughout the Town's history, Riverhead farmers have grown a variety of crops, such as flax for linen thread, wheat, rye and other grains, corn, and vegetables and fruits of all sorts. But the best known are potatoes and cauliflower. Potato production began as early as the 1700's but did not become a standard crop until the mid 1800's, with the coming of the railroad, which enabled transport to urban markets. Return shipments on the rail lines contained tubs of manure from New York City streets and stables for Long Island farmers to use as fertilizer on their fields.

⁴² Ibid.

⁴³ *Wading River, Founded in 1671*.

⁴⁴ *Journey Through Time*, 28.

In addition to potatoes, cauliflower and duck became major cash crops in the 1800's, also fueled by the presence of the railroad. In 1867, John W. Duryee of Mattituck introduced cauliflower to Suffolk County. That same year, the Suffolk County Agricultural Society distributed a pound of cauliflower seed among its members as an experiment. The experiment proved a success and Riverhead discovered its second major commercial crop. Duck farms flourished as well. The first seven "Peking" ducks were imported from China in 1873, and within twenty years Long Island and the water fowl were synonymous. By 1898, Riverhead boasted the world's largest duck farm.⁴⁵ Duck production reached its peak just after World War II when there were approximately 788 duck farms in Suffolk County, raising two-thirds of all ducks produced in the United States.

The automobile further improved the ability of Riverhead farmers to reach their markets. By the 1920's, Long Island was turning to truck farming and such specialized crops as berries, fruits, and other produce that needed fast transportation. The potato industry in the northeastern townships had grown immensely with the coming of the railroad, and greater expansion was now possible in other areas. Experiments were conducted with new crops such as cabbages, beets, and sprouts.⁴⁶ Cauliflower production peaked in 1949, with 5500 acres planted locally. (By 1990, however, the average had dipped to 200).⁴⁷ Calverton made a specialty of growing "that indispensable delicacy, the cranberry."

As of 1992, there were about 20,000 acres of farmland in production in Riverhead. While the number of acres has decreased since the days of potato and cauliflower production, alternative crops such as grapes, sod, and greenhouse vegetables, which require fewer acres but yield higher profits, have maintained Suffolk County as the leading agricultural producer in New York State.

Timber

The most important industry on the eastern Long Island in the second half of the 19th century was the cordwood business. Firewood was in great demand, not only in New York City, but all along the Hudson River as well. Much of the cutting was done during the winter months. The wood was then hauled to the landing by sled. Along Sound Road, near the Wading River Landing, as much as 3000 cords of wood were sometimes stacked. At half-tide, the sloops approached the shore, using the "Lay Ashore Rock," located just east of the Landing and a landmark well known by seamen, to indicate when the tide was right. Horses were driven into the water along side the boats and the cordwood was transferred to the sloops. When the flood tide came, the boats would float out again heavy with commerce.⁴⁸

⁴⁵ Between Ocean and Empire: An Illustrated History of Long Island.

⁴⁶ Smith, op. cit.

⁴⁷ Journey Through Time, 29.

⁴⁸ Wading River, founded in 1671.

Ice Harvesting

Local farmers had for years been filling their own small icehouses to keep milk and food cool. By the 1800's, the demand from cities for ice to cool their perishables coupled with a bigger demand from the ice cream companies (in Riverhead, Reid Ice Cream Co.) resulted in a growing market for ice. The Peconic River, with its large quantity of clean, clear water, was a natural, convenient, and economical choice. Icehouses were built near the millponds along the Peconic River.

In 1886, the Suffolk County Ice Company built the largest icehouse on the Peconic River. Located at the Forge, it was situated close to the side of the railroad and was 300 feet long, 80 feet wide and 60 feet high, with a capacity of approximately 30,000 tons of ice.⁴⁹ In April 1922, the huge icehouse experienced a dramatic and unfortunate end. A spark from a passing train started a fire in the nearby woods and with strong wind blowing, the house caught ablaze. The fire lasted several days. Once extinguished, it left behind an enormous block of ice (about 75' x 50' x 40'), which remained for several months into the summer.

Manufacturing

Riverhead's location at the mouth of the Peconic River made it the logical site for water-powered mills. The earliest reported mill was a sawmill constructed by James Horton and John Tucker in about 1659. Riverhead has the oldest flourmill in the State of New York. The Hallett Brothers flour mill dates back to the early years of the Island. Records from April 14th, 1693 state that the Town of Southampton granted John Wick the use of the stream known as Little River on condition that he establish a fulling mill and full cloth for the Town and Southold. Two years later, John Parker and his heirs obtained the privileges that Wick appears to have neglected. Parker built the mill in 1696.⁵⁰ One hundred years later, mills dotted the length of the river and included a number of sawmills, iron forge, fulling mills, and gristmills. By 1870, a molding and planing mill, paper mill, wagon jack manufactory, the J. H. Newins and Son cigar factory and Earle's organ factory were added to the list of already expanding mills along the Peconic.

Shipbuilding

Shipbuilding and the outfitting of ships became a thriving industry in the towns of Northport, Sag Harbor, Port Jefferson and Sterling (now known as Greenport) during the early to mid 1800's. Many young men moved to these towns where the pay was better and where far more economic opportunities existed than at home on the farm. A small shipyard located near the public beach in Wading River built many of the produce sloops active in shipping along the

⁴⁹ Lapham, Elisabeth. *Echoes From the Past*, 7.

⁵⁰ *The Boroughs of Brooklyn and Queens, Counties of Nassau and Suffolk, Long Island 1609-1924*, 727.

Long Island Sound coast. Riverhead shipyards along the north bank of the Peconic built larger boats, many of which carried passengers to and from eastern Long Island.⁵¹

Summer Vacationing

The summer resort industry began to flourish during 1860's, spurred in part by the expansion of the LIRR. Further research and documentation is needed, including identification of relevant structures and sites, determination of their integrity, and assessment of their significance.

C.4 HISTORIC RESOURCES SURVEY LISTINGS

The following lists, from page D-16 through page D-38, are from the New York State Office of Parks, Recreation, and Historic Preservation.

⁵¹ Wading River, founded in 1671.

Appendix D: Economic Trends

D.1 RETAIL TRENDS

POPULATION GROWTH AND RETAIL DEMAND

Between 1970 and 2000, Riverhead's population grew about one percent per year on average, a relatively moderate rate of growth. Riverhead's population is expected to increase dramatically over the next 10 to 20 years, fueled by ongoing employment growth in western Suffolk County, including Riverhead. The expansion of the suburbs from the west, and the lack of affordable housing in the Hamptons to the east are prompting residential development in Riverhead.

As the population has grown and continues to grow, retail development has grown and will grow in kind. In addition, Riverhead's retail draws from a tourist regional clientele, to achieve a net inflow of retail dollars. In 1998, Riverhead residents spent approximately \$138 million in non-gasoline products. However, in the same year, Riverhead's stores had retail sales in excess of \$310 million, far surpassing the expenditure of the residents alone.

Seasonal and tourist populations contribute to the higher-than-expected retail sales figures. In addition to about 6,500 second-home residents, Riverhead attracts about 4,100 houseguests and 2,100 campers during the summer and can accommodate up to 1,200 motel guests per night, not to mention day-trippers. The seasonal population not only adds to the population base, but also brings in a larger disposable income level that can benefit Riverhead stores. Riverhead year-round residents have lower median incomes than residents in other Suffolk County towns, on average, (\$40,200 in Riverhead vs. \$65,400 Countywide). Riverhead's second-home residents tend to have higher incomes than the County average (to afford a second home in Riverhead, a household would need an income of at least \$170,000⁵²). Thus, although they may stay in Riverhead only half the year or less, they generate nearly as much retail spending, especially on dining out.

But a doubling of Riverhead's spending potential still doesn't account for the power of its retail sector. Clearly, Riverhead taps into the population of other towns, especially for comparison retail spending, such as on clothing, appliances, and furniture. The County has a population of about 1.4 million, and the five East End towns have a combined population of about 112,000, a substantially retail larger market than Riverhead alone. Between second-home households and vacationers, the population of the five East End towns nearly triples during the summer months from about 112,000 to 311,000.

⁵² Town of Riverhead, *Revitalization Strategy for Downtown Riverhead*, August 2000.

For some residents in Southampton, Southold, and Brookhaven, Route 58 is their closest and largest shopping district. For Southold residents, Route 58 is their only full-service shopping district — one that they must pass by as they travel off of the North Fork peninsula. Tanger Mall taps into an even larger regional market, drawing people on excursion shopping trips from as far away as Nassau County and New York City.

RETAIL SUPPLY FACTORS

Over the last four decades, Route 58 has had the location and visibility to attract retailers, the land to accommodate most commercial development, and the road capacity to absorb the increases in traffic. Route 58 is Riverhead's largest and most important commercial center, providing essential convenience shopping (grocery stores, drug stores, hardware stores), comparison shopping (Tanger Mall), auto sales, gas stations and auto repair centers, restaurants, personal and professional services, and agricultural products and supplies. In the resident survey conducted in summer 1999, 68 percent of the respondents said they usually go to Route 58 for groceries, and 52 percent usually go there for quick errand shopping. Also, 46 percent said that Tanger Mall was their primary destination for clothing and furnishings.

Route 58's success had several consequences for Riverhead. On the positive side, Route 58 absorbed all the commercial sprawl that would otherwise have spread to the Town's rural corridors. On the negative side, Route 58 destroyed conventional shopping downtown, replacing Main Street with strip malls.

Today, the Business-zoned sites along Route 58 are nearly all developed, although retail demand continues to grow. It is inevitable that every Industrial-zoned or Office/Service-zoned parcel along Route 58 will eventually be targeted for commercial development through use variances or rezoning. Rather than allow parcels to convert in a haphazard fashion, a thoughtful, comprehensive rezoning could provide structure to the inevitable trend.

Conventional retailers are less interested in sites beyond Route 58 because they are less centrally and prominently located, and therefore have smaller potential trade areas. For example, only 15 percent of the survey respondents do their grocery shopping somewhere in Riverhead other than Route 58. Specialty retailers, however, will gravitate to historic centers, especially downtown. In these places, space is less expensive, more eclectic, and therefore more suitable for entrepreneur-driven restaurants, boutiques, antique stores, “mom and pop” businesses, etc.

Beyond Route 58, the hamlet centers, and downtown, vast tracts of land area are presently zoned Business. This zoning is a leftover from the 1970's, when the Town's population buildout was expected to exceed 150,000 people. The commercially zoned areas were thought to be necessary to disperse grocery stores, drug stores, and other necessity shopping throughout the Town.

Since then, the planned residential densities have been reduced, and the population buildout has been shrunk to less than 60,000 people. The smaller population buildout suggests that Riverhead is over-zoned for commercial development outside Route 58, downtown and the existing hamlet centers. If Riverhead's expansive commercial zoning remains intact, the low levels of demand will attract small, scattered, marginally profitable businesses in a strip style pattern. A more clustered zoning pattern would limit commercial sprawl and strengthen business activity in the hamlet centers.

D.2 TOURISM

TOURIST ATTRACTIONS

Downtown Cultural Attractions

Downtown Riverhead already has a number of cultural attractions that appeal to tourists. The recently built Atlantis Aquarium has been a huge success since its opening in summer 2000, and expansion plans are already underway. Aquarium visitors can be seen walking up and down Main Street and patronizing the local shops and restaurants. Other downtown cultural attractions include the Suffolk County Historical Museum, the Long Island Railroad Museum, the East End Arts Council, and Levitt Music Hall. In addition, as of 2001, there was a proposal to build a Science Center children's museum on West Main Street, and there was an ongoing proposal to restore the Suffolk Theater. Annual downtown events, including the Country Fair, the Polish Fair, the Blues Festival, and the Community Mosaic, have also been successful in attracting visitors.

While these attractions and events have had an extremely positive impact, downtown has not reached its full potential as a tourist attraction. Some storefronts still remain vacant, and many others have not experienced significant patronage by tourists or visitors. The *Downtown Revitalization Strategy*, which was completed in September 2000, lays out an economic development plan for building up the downtown tourism engine. While continuing to develop downtown attractions, the Strategy calls for cultivating "market niches" oriented to tourists, so that downtown shops, services, and restaurants can better capitalize on the increasing tourist traffic.

Long Island Wine Country

The first vineyard on the East End was planted in 1973, and since then, the North Fork of Long Island has become one of the most widely recognized and appreciated wine regions in the country and has even gained an international reputation. There are now more than 20 vineyards on the East End, with nearly 2,000 acres of land in production. Most vineyards are clustered along Route 25 and Sound Avenue, roughly between downtown Riverhead and Greenport, although there are a few vineyards on the South Fork as well.

In the mid- to late-1990's, the East End wine country started attracting significant tourism traffic for the first time. The success of the Napa Valley wine country in northern California in the 1980's established the model for wine country tourism. Following in the footsteps of Napa, the East End vineyards and wineries developed Napa-style tourist facilities and activities, such as guided tours, wine tasting, wine sales, eateries, gourmet delis, and gift shops. Many also have banquet facilities for parties, weddings, business functions, and other events.

The Long Island Wine Council and the North Fork Promotion Council have been extremely active in promoting tourism in the wine country, through their web sites and published brochures. The *Long Island Wine Country* brochure circulated by the Wine Council is directed toward the residents of Long Island, New York City, New Jersey, and Connecticut, enticing them to make day or weekend trips. The brochure specifically points out that the journey to the Long Island wine country, unlike a trip to Napa Valley, is "delightfully short".

The success of wine country tourism is not just a matter of high-quality wine. It is also a matter of good transportation. While the North Fork may be a "delightfully short" distance away, the roads leading to the North Fork are notoriously congested, particularly during the summer months. Traffic gridlock can deter some visitors from exploring the wine country and could thus dampen the success of wine country tourism. However, road widening in the wine country could be detrimental to the area's rural character, therefore detracting from the wine country experience.

As the road-widening issue suggests, rural character is a key concern. Part of the success of Napa Valley is not only that it has active vineyards and wineries, but that it has maintained its rural character that is appealing to tourists. Vineyard-bound tourists are delighted by landscapes of planted vines, dotted with estates and winery buildings, and interspersed with undisturbed open space areas. Limiting sprawl may be an important goal Townwide, but it is absolutely critical in the wine country in order to maintain tourist appeal.

A final concern with wine country tourism, from Riverhead's point of view, is how to ensure that there are beneficial spillover effects from wine country tourists. In Napa and Sonoma counties, the small rural hamlets in the midst of the wine country — communities like Calistoga, St. Helena, and Sonoma — have repositioned themselves for tourism, with restaurants, specialty shopping, gourmet food stores, bed-and-breakfasts, inns, and events. In Riverhead, both Jamesport and downtown could be repositioned for tourism in a similar way.

Other Agro-tourism

Wine country tourism falls into the more general category of agro-tourism. Agro-tourism is any agricultural activity that attracts tourists who are interested in touring, learning about, or participating in that activity. In addition to vineyards and wineries, there are farms in Riverhead and Southold that provide tours, allow visitors to pick-their-own produce, and sell a variety of locally grown and homemade products, from baked goods, to canned goods and

preserves, to cut flowers. The best example in Riverhead is Woodside Farm in Jamesport, which grows blueberries, peaches, and other fruits. Tours are offered, and farm products are sold.

There may be additional agro-tourism concepts that could be explored for Riverhead in the future, based on national and international models. In the western United States, "dude ranches" have been popular for more than 100 years. Traditionally, the hallmark activities on a dude ranch have been horseback riding, participation in cattle drives, and overnight camping "on the range". More and more, however, the most successful dude ranches provide opportunities for all sorts of outdoor activities that appeal to a wider range of visitors. These activities include fishing, hunting, hiking, swimming, river rafting, crafts workshops, mountain biking, and hayrides. Also, dude ranches provide a variety of social activities, from square dancing to cookouts. "Farm experience" vacations often provide children's programs, making them popular with families. Thus, "dude ranches" are not primarily agricultural in their orientation, functioning, in fact, more like a summer camp with agriculture and/or husbandry as one of its components.

Another concept that could be explored in Riverhead is the concept of "agro" bed-and-breakfasts. Such a bed-and-breakfast would be similar to a normal bed-and-breakfast, with the exception that a portion of the food offered to guests would be produced on the premises. This concept has been developed extensively in northern Italy. Family farms there provide overnight accommodations as well as dinner and breakfast to travelers. The meals often feature homemade bread, sausage, wine, and cheese, as well as fresh fruit, vegetables, and eggs produced on-site. With the growing popularity of organic produce, there may be an untapped market for such accommodations.

Theme Park Attractions

Theme parks cater to children and families, one of the largest segments of the travel market. According to the Travel Industry Association of America, one in every five domestic trips include children under 18 years old, and nearly all of those trips are leisure-oriented. Some of the most popular activities that parents do with their children on leisure trips include shopping, engaging in outdoor recreation, visiting cultural attractions like museums and historic sites, and going to amusement or theme parks.

Theme parks need several essential factors in order to be successful. They need to provide activities and events that are appealing to children. They also need to provide an activity that parents know will be rewarding for their children, providing either an educational experience (implying cultural or historic attractions), a fun experience, or both. Also, they need to have excellent access and visibility, ideally from a major highway.

Riverhead already has one of the most popular and successful theme parks on Long Island — Splish Splash. This 40-acre park, which is open for business between Memorial Day and Labor Day, features water rides and swimming, as well as family-oriented shows. There are two other theme parks on the East End: the Animal Farm and the Long Island Gamefarm.

Located in Manorville, both of these animal parks are located within a short driving distance of Splish Splash, off the Long Island Expressway (LIE). With the only concentration of theme parks on the East End, the Calverton/Manorville area has cornered the market on this particular tourism niche.

With the opening of Enterprise Park at Calverton (EPC), there may be an opportunity for adding another theme park attraction in Riverhead. The NWIRP Disposal and Reuse Plan for the site designates a 400-acre parcel in the northwestern corner of the property for a theme park or a series of smaller recreational attractions. Located midway between Splish Splash and Manorville, a theme park in this attraction would fit into and strengthen the Calverton/ Manorville theme park niche.

One issue to consider with theme parks is how to encourage spillover economic impacts on surrounding areas. Often, theme parks are designed to be worlds of their own, such that people can arrive in the morning, spend the entire day within the park, and leave in the evening. People can eat all their meals in the park, and the parks may offer gift stores or other shops as well. Many parents with young children *prefer* such an environment, because of the additional security and supervision implied, and thus, theme parks should continue to be outfitted with such amenities. Nevertheless, there may be opportunities to entice theme park visitors to visit other parts of Town, patronizing other attractions and businesses. The Town should work with theme park operators to encourage such cross-fertilization.

Active Outdoor Recreation

Parks and recreational facilities not only serve local residents, but they often attract out-of-town visitors as well. According to the Travel Industry Association of America, "adventure" travel (such as off-road mountain biking) and biking vacations are on the rise. A vast majority of Americans engage in recreational sporting activities while on vacation, with tennis and golf being among the most popular.

Equestrian riding is also experiencing a resurgence in popularity. Although most of the horse barns, equestrian clubs, and riding academies on Long Island are located on the South Fork or in Brookhaven, Riverhead has several such facilities throughout Town.⁵³ In addition, the second largest annual horse show on Long Island — the North Fork Classic — is now held on a 100-acre portion of EPC.⁵⁴ These trends suggest that Riverhead can use its parks and recreational amenities as a way of attracting tourists and generating tourism-related business.

Riverhead has a variety of parks and recreational facilities. As discussed in the Parks and Community Facilities Element, there are approximately 1,940 acres of Town, County, and State parks within the Town boundaries, plus an additional 920 acres of land in the form of

⁵³ <www.longislandhorse.net>, visited December 19, 2001.

⁵⁴ Bob Liepa, "The Heart of Horse Country," *The Times Review*, <www.timesreview.com>, visited December 19, 2001.

public golf courses. Riverhead's parks and open spaces allow for a wide range of recreational activities. During focus groups, Riverhead residents stated that they engaged in the following activities on an ongoing basis: sailing, canoeing, kayaking, fishing, hunting, swimming, hiking, bird watching, biking, golf, tennis, horseback riding, and all sorts of team sports.

It should also be noted that Riverhead's parks are strung together by a vast network of open space (farmland, meadows, and woodlands), which provide a scenic setting for biking, hiking, horseback riding, running and other outdoor sports. The scenic beauty of Long Island Sound, Peconic Bay, and the Peconic River are also attractive places for engaging in water sports like swimming, sailing, kayaking, and canoeing.

Currently, the Town has plenty of parkland to accommodate both residents and tourists. As discussed in the Park and Community Facilities Element, the Town has approximately 71 acres for every 1,000 residents. This figure — which includes Town, County, and State parks — is much higher than the national standard of 6.5 acres per 1,000 that is recommended by the National Recreation and Park Association (NRPA). In addition, there are three public golf courses, as well as several private golf clubs.

However, the Town is lacking some other important facilities that would be particularly attractive to tourists. In particular, Riverhead has little in the way of walking or hiking trails, nor biking paths and lanes. The Town is also lacking in terms of active recreational facilities like tennis courts, swimming pools, and playing fields. Tourists may have an interest in using such facilities, particularly those tourists whose overnight accommodations do not provide recreational facilities.

Beaches

Trips to the beach are one of the most popular forms of tourism. According to the Travel Industry Association of America, nearly one in ten domestic leisure trips involves going to a beach, and beach visits are even more frequent among people who are on vacations of seven nights or more. Riverhead has five public beaches that attract numerous visitors during the summer months: Wading River Beach, Wildwood State Park, Reeves Park Beach, Iron Pier Beach, and South Jamesport Park. There are also numerous private beaches on the Sound and Flanders Bay.

Despite the attractiveness of Riverhead's beaches, the Town should not focus on beaches as major tourist attractions. The primary beach destinations on the East End have traditionally been on the south shore of the island: Fire Island, West Hampton Beach, and other locations in the towns of Southampton and East Hampton. Because these beach environments are so well known and so well tooled for beach recreation, Riverhead would have difficulty competing for beach-bound tourists. For this reason, Riverhead should focus on alternate forms of tourism, as discussed in the other sections of this chapter — cultural attractions, agro-tourism, and active recreation.

This conclusion does not obviate the need for beach improvements and enhanced beach parking. The Town's public beaches will always draw a following, and the Town should ensure that those beaches are attractive and accommodating to tourists. However, from an economic development perspective, the Town's resources would be best spent promoting other forms of tourism.

OVERNIGHT ACCOMMODATIONS

Tourists require overnight accommodations. Riverhead, in particular, will require additional hotel space over time, as the tourist market increases in volume. Unlike the South Fork, which caters to households with second homes spending the whole summer, the North Fork's emerging tourist industry caters more toward day-trippers and weekend travelers. These tourists rely primarily on hotel accommodations or bed-and-breakfast inns, or they may stay with friends or relatives, but they do not typically have vacation homes. Those who look to Riverhead for seasonal accommodations are typically seeking out housing that is more affordable than what can be found on the South Fork.

Hotels and Motels

The largest hotel in Riverhead is the Ramada Inn East End, located adjacent to Tanger Mall, on Route 25. This hotel caters to a wide range of people, from tourists seeking an inexpensive alternative to the South Fork, to out-of-town business travelers. The Ramada Inn benefits enormously from its visibility and easy access from the LIE. There are also several small hotels and motels scattered throughout Town. Two of them are located on Flanders Bay and are successful as a result of their location near the beach and their views of the water. The first is Dreamers Cove Motel in Aquebogue, and the second is Motel on the Bay in Jamesport. Both of these hotels are relatively small in size, with 18 rooms each.

In the future, additional hotel space is likely to be needed in Riverhead, due to increasing tourist traffic. New hotel space should be provided in locations and designed in a manner that are appealing to tourists. Currently, the Town's zoning provisions for "county inns" provides for moderate-size hotel space in areas throughout Riverhead. This has the potential to allow for hotel development in or adjacent to places that are popular with tourists — beaches, marinas, hiking trails, equestrian facilities, or golf courses.

Cottages

There are several places in Riverhead that offer summer cottages (for example, J&S Reeves Summer Cottages in Aquebogue; Woodcliff Park and Cottages in Baiting Hollow; Moore's Cottages in Jamesport). These cottages provide a lower-cost alternative to more expensive summer rentals on the South Fork of the island. In the future, there may be some additional room in the Riverhead market for similar types of cottage rentals, particularly if they are of the less expensive variety. The South Fork has cornered the market on expensive, up-

scale summer homes and rentals, but there may be an opportunity to provide a more affordable version in Riverhead.

Summer cottage rentals require unique settings, ideally adjacent to open waters where visitors can go swimming or sailing, and quaint, charming architectural styles that evoke a feeling of repose. Proximity to beaches, marinas, and other outdoor recreational opportunities is also important. Some of the older, smaller, historic homes along Flanders Bay — in Jamesport or Aquebogue — or in downtown Riverhead could be converted into summer rentals.

Bed-and-Breakfast Inns

A bed-and-breakfast inn is typically defined as a private residence, where the live-in owner provides overnight accommodations and a meal to a traveler. There are several bed-and-breakfast inns found throughout Riverhead. Bed-and-breakfasts are preferred by many tourists, who enjoy the experience of staying in a residence, as opposed to a hotel.

Bed-and-breakfast inns are typically found in historic Victorian houses, Arts and Crafts homes, or farmhouses, which evoke old-style domestic charm. Many are filled with antiques and artwork. For this reason, historic preservation, which encourages the adaptive reuse of historic homes, is an important policy direction for the Town.

Like a summer cottage, a bed-and-breakfast can benefit from proximity to either beaches or outdoor recreation facilities, as visitors are attracted by the serene setting. However, bed-and-breakfasts can also fit into a more built-up environment, such as downtown Riverhead and Jamesport, where there are restaurants, entertainment venues, and shopping, and where there are opportunities for visitors to circulate on foot.

Country Clubs, Resorts, and Spas

Country clubs, resorts, and spas provide another unique form of overnight accommodation for East End tourists. These facilities provide hotel rooms in combination with a variety of private recreational facilities and health-oriented activities. These could include golf courses, tennis courts, swimming pools, running tracks, health clubs, marinas, or therapeutic facilities that offer massages, mineral pools, or mud baths. Often, restaurants, bars, and entertainment facilities are provided as well within the resort. Typically, country clubs, resorts, and spas are located on a campus, providing a private, quiet, and relaxing environment, picturesque views, and access to open space. Such facilities are geared toward rest and relaxation, with an emphasis on customer comfort and service.

Riverhead currently does not have any resorts or spas, and although there are several golfing country clubs, they do not have overnight accommodations. However, there is a potentially strong market for such facilities. They would cater to the vineyard tourists eager to enjoy a scenic, serene experience in the countryside. Also, they are geared toward short visits, concentrated on weekends and during the summertime. Moreover, there is little in the way

of resorts, spas, or overnight country clubs in Southampton or East Hampton, so Riverhead could carve out a niche in this particular form of accommodation.

Banquet and Convention Facilities

There is also demand for banquet and convention facilities in Riverhead and other parts of the East End. Banquet facilities provide opportunities for holding private parties, such as weddings, and convention facilities provide space for meetings, events, and expositions of various sizes. Banquet facilities are often provided in conjunction with hotels, resorts, spas, bed-and-breakfasts, wineries, or country clubs. Convention halls are often provided in conjunction with hotels as well.

The most popular and successful banquet facilities are those that take advantage of a picturesque or characteristic setting, with views of open space, water bodies, marinas, farmland, or historic buildings. People often are willing to pay a premium for such settings, because they provide a beautiful backdrop for photographs and an evocative setting for important personal events or family gatherings (e.g., weddings).

The success of a convention facility is typically less dependent on scenery. For convention centers, the more critical prerequisites are excellent access, a central location, and facilities of an adequate size. There is a proposal to allow convention facilities on the EPC site, which would be an ideal location, because of the easy access to and from the LIE and the large land area available to create a sizeable facility.

TOURIST-ORIENTED RETAIL

There are two locations in Riverhead where tourist-oriented shops, restaurants, entertainment, and events should be concentrated: downtown Riverhead and Jamesport. Tourists typically seek out charming, quaint, historic centers that offer a unique mix of stores, and they tend to avoid conventional malls and strip centers. They must also be located in proximity to a major tourist attraction.

Downtown and Jamesport are the only business centers in town with all of these qualities. Downtown has a traditional Main Street with turn-of-the-century buildings and a long waterfront park along the Peconic River. It has a variety of cultural attractions, including the popular Atlantis Aquarium. Jamesport is located in the North Fork wine country, it has a cluster of historic buildings that form a traditional hamlet center. The retail mix in both places can be improved in order to tap into a greater share of the tourism market.

It should be noted that Tanger Mall and the "destination retail" cluster planned for the western end of Route 58 would also attract tourists and other out-of-town visitors. Nevertheless, whereas downtown and Jamesport would primarily function as cultural or rural attractions, with shopping and restaurants being secondary, Tanger Mall functions as a destination in itself. This means that Tanger Mall and the "destination retail" cluster require a different approach, from an economic development perspective.

D.3 OFFICE AND INDUSTRY

Until the early 1990's, the Long Island economy depended heavily on the defense industry. During the economic boom of the mid- to late-1990's, the economy shifted from a reliance on the defense industry and to a variety of service and light industrial sectors, such as high-tech manufacturing, business and professional services, biotechnology, computers, and electronics.⁵⁵ The high-tech industry experienced a slow-down nationwide in 2000 and 2001, but the service industry remains very strong, both nationally and on Long Island.

The service sector⁵⁶ is currently one of the largest elements of the Suffolk County economy. It generated roughly \$18.8 billion in sales in 1998, representing 26 percent of the County's \$72.1 billion economy. Throughout the 1990's, the major locus of office growth was in western Suffolk County, particularly in the towns of Brookhaven, Huntington, and Islip. Riverhead, by way of comparison, had relatively little office growth during this period.

This is not to say that Riverhead's service sector has been unsuccessful. On the contrary, Riverhead's service sector is extremely profitable, generating more than \$500 million in annual sales, about 28 percent of the Town's \$1.9 billion economy. Nevertheless, compared to the County as a whole, Riverhead has a relatively small share of service businesses. As of 1998, the County overall had 15,300 businesses in the service industry, while Riverhead had only about 440 such businesses.

The manufacturing sector is a much smaller piece of the County and Town economies. Manufacturing represents only about 7.2 percent of the County economy and 6.9 percent of the Town economy, in terms of annual sales. Again, as with the service sector, the manufacturing sector is heavily concentrated in the western part of the county. In 1998, Riverhead had about 45 manufacturing businesses, whereas the County as a whole had more than 3,000 businesses.

DEMAND FOR OFFICE AND INDUSTRIAL SPACE

The service sector relies on office space. Because of the Long Island's rapidly growing service industry, the demand for office space is expected to grow as well. In particular, future demand is expected to attract more and more businesses to Riverhead, for several of reasons.

- First, as land becomes scarcer and more expensive in the towns to the west, more and more businesses will explore Riverhead for new business locations.

⁵⁵ Long Island Association, <www.longislandassociation.org>, visited December 20, 2001.

⁵⁶ Includes sectors with NAICS codes 60-67, 73, 80, 81, 87. There are depository institutions; nondepository credit institutions; security/commodity brokers and services; insurance carriers; insurance agents, brokers, and service; real estate; holding and other investment offices; business services, health services, legal services; and engineering, accounting, and related services.

- Second, although Riverhead is about 15 to 20 miles east of the more developed areas of the county, the Long Island Central Pine Barrens area restricts development for much of that stretch. This means that despite Riverhead's distance from existing business centers, it is next major location available for significant office and industrial growth.
- Third, Riverhead has a great deal of developable land available for office and industrial development, particularly in the former Calverton NWIRP site and adjacent areas next to the LIE.

Based on recent trends, Riverhead is likely to experience a greater demand for office space than industrial space. However, the future of the high-tech manufacturing sector is uncertain. It is possible that high-tech manufacturing (i.e., computers, electronics) could rebound from the current recession and continue to grow. Riverhead's land use regulations should be flexible enough to accommodate both office and industrial development, provided that environmental performance standards and site planning standards are met.

ENTERPRISE PARK AT CALVERTON

Enterprise Park at Calverton (EPC) is uniquely suited for office and industrial development, because of its central location and convenient access from the LIE. Also, the site is already outfitted with some of the essential infrastructure necessary for large-scale development, including sewers and electricity. Moreover, development on the EPC site can easily be made to fit into the Town's rural landscape. As a single compound with an enormous land area, EPC can be surrounded with wide setbacks and densely vegetated buffers that screen office and industrial development and their parking lots from the surrounding residential and rural areas.

EPC has the added advantage of public ownership. Because the majority of the site is still publicly owned, the Town has a unique opportunity to effectuate the appropriate development of the site. The Town can hold onto the property until development pressures are ripe and the best development proposal is put forward. The Town is under no pressure or obligation to sell the site in the short run, as there is no shortage of land elsewhere in town for private development. When land is ultimately conveyed to a private developer, the Town can use its status as the original owner to negotiate for specific improvements or site design requirements on the property.

OTHER OFFICE AND INDUSTRIAL SITES

The Town has set aside an enormous land area to accommodate more than ample office and industrial development for many years to come. In addition to EPC, there are large areas zoned for industrial and office development adjacent to the LIE and along Route 58, as well as smaller sites in the eastern part of Town. The available land area is so large, in fact, that it could actually be problematic. Although it is important to make enough land available for office and industry, an excessive supply of land could result in sprawling, disconnected office

and industrial sites. This could have a very detrimental impact on traffic patterns in Town and could mar the scenic landscapes for which Riverhead is well known.

Tenants do want large land areas and good access, but it is also beneficial to be located in business clusters, where there is greater access to business and employee amenities. These amenities include business support services (printing and binding services, financial advisors, professional consultants, shipping services, and so on), convenience shopping and eateries, public transportation, conference and hotel facilities, and security. Thus, the Town should reduce its industrial and office zoning and concentrate office and industrial development in a few strong business clusters. This conclusion, once again, suggests that EPC is an ideal place for office and industrial development. In addition to EPC, areas adjacent to the LIE would be well suited for office and industrial development.

Small-scale professional offices, such as doctors, dentists, small law firms, accountants, social workers, and so on, need not be isolated on such large campuses. In fact, because of their smaller size, they can fit quite well into the downtown area, the hamlet centers, and even some commercial strips like Route 58 and Route 25A.

ENVIRONMENTAL AND SITE PLANNING STANDARDS

While continuing to allow office and industrial development in appropriate locations, the Town must balance development with environmental conservation, open space preservation, and good site planning. Riverhead's zoning regulations can be strengthened in terms of environmental protection. Industrial and office development should be required to meet performance standards for noise, emissions, effluent, and glare. Performance standards are flexible, in that they allow a wide variety of industrial uses, provided that the off-site impacts can be limited or contained.

Office and industrial development should also be subject to stringent standards for open space preservation, site planning, buffering, and landscaping. Similar to the situation with the EPC site, most of the parcels in the office and industrial zones are large enough that large areas of open space can be preserved. Those preserved open space areas could continue to be used for agriculture, through rental agreements between the office/industrial proprietor and local farmers, or they can be maintained as woodlands or meadows, serving as habitat areas for plants and animals. Wide setbacks and densely vegetated buffers should also be provided. Riverhead's relatively flat landscape makes such buffers absolutely critical, because without them, there would be nothing to prevent a new office or industrial buildings from being seen from miles away, ruining the Town's scenic quality.

Parking lots in these areas should also be subject to stringent landscaping standards, in order to prevent the development of vast expanses of asphalt, which can contribute to problems with regard to storm water runoff and flooding.

D.4 AGRICULTURE

As discussed in the Agricultural Element, agriculture plays an important role in the economy of the Town and the County. Historically, Suffolk County has lead New York State in agricultural production and sales. In 1997, the reported total market value for crops in Suffolk County was approximately \$161 million. In 1992, an economic input-output model estimated that 8,000 jobs are created and \$241 million dollars added to the economy as a result of the local farming industry. With one third of the County's remaining farmland located in Riverhead, much of activity benefits the Town of Riverhead.

Important agricultural products in Suffolk County include: nursery and greenhouse products, potatoes, rye, cauliflower, broccoli, pumpkins, and spinach. A growing part of Suffolk County's agricultural base is the wine industry, which contributes \$30 million to the economy. Suffolk County has the largest premium wine industry of any county in the U.S. outside of California. The wine industry has the potential to bring further economic benefits to Riverhead, through increased agro-tourism, as discussed in Section D.2.

While wineries are on the rise and produce farms continue to be productive, livestock has been a declining portion of Riverhead's agriculture industry. About 50 years ago, Riverhead was a major center of duck production. Just after World War II, there were almost 800 duck farms in Suffolk County, raising two-thirds of all ducks produced in the U.S. Today, there is only one duck farm left in Riverhead — Crescent Duck Farm in Aquebogue — and only a handful of other duck farms throughout Long Island. Still, the Long Island duck industry is extremely profitable, taking in about \$18 million annually.⁵⁷ There are also a number of farms that raise livestock (cows and pigs) as well as chickens, although these make up a smaller portion of the agricultural industry.⁵⁸

Nursery and greenhouse products are a growing portion of the agricultural sector. Nurseries and greenhouses typically specialize in growing decorative plantings for landscaping purposes or vegetable plants for small private gardens. This sector of the economy has grown in conjunction with suburban development all over Long Island. After sites are cleared and built with new buildings, they are replanted with nursery-grown trees, shrubs, and other plants. In addition, nurseries and greenhouses grow and sell cut flowers year-round.

⁵⁷ Steve Wick, "It's a Tall Tail, but True: Born as a Creature of Commerce, the Big Duck Grew to Symbolize Long Island," <www.lihistory.com>, visited December 19, 2001.

⁵⁸ U.S. Census of Agriculture: Suffolk County, New York, 1992, as cited in the *Suffolk County Agricultural Protection Plan*, June 1996.

Appendix E: Population and Housing Trends

E.1 POPULATION AND HOUSEHOLD COMPOSITION

According to Table E-1, the two largest age groups in Riverhead are children between 5 and 14 years old and adults between 35 and 54 years old. This pattern suggests that Riverhead is a popular place to live among couples with young children. There is sharp drop-off in the population after age 19, reflecting the fact that teenagers graduate from high school and move away during the college and post-college years. Also, there is sharp drop-off in population after age 64, suggesting that many older adults choose to relocate after retirement.

Table E-1: Population by Age Group in the Town of Riverhead, 2000

	2000	
	<i>Number of Residents</i>	<i>Percent of Total</i>
Under 5 years	1,706	6.2%
5 — 14 years	3,724	13.5%
15 — 24 years	2,626	9.4%
15 — 19	1,452	5.2%
20 — 24	1,174	4.2%
25 — 34 years	3,284	11.9%
35 — 44 years	4,535	16.4%
45 — 54 years	3,887	14.0%
55 — 64 years	2,811	10.2%
65 — 74 years	2,540	9.2%
75 — 84 years	1,923	6.9%
85 years and over	644	2.3%
Total	27,680	100.0%

Sources: U.S. Census Bureau, Profile of General Demographic Characteristics, 2000.

The age distribution in Riverhead is also partly reflective of the baby boom generation. People born immediately after World War II, between 1945 and 1960, were between 40 and 55 years old as of the year 2000. This partially explains the large number of people in the

35 to 54 age bracket and also explains the fact that the median age in 2000 was 37 years old. In the future, as the baby boom generation enters retirement, the number of Riverhead residents in the 35 to 54 age range may drop, with a corresponding increase in the number of retired senior citizens. At the same time, as baby boomers age, they may move out of town in large numbers if they are unable to find age-appropriate housing.

Consistent with the analysis of age groups, a large number households in Riverhead are composed of married couples with children, as shown in Table E-2. However, an even larger number of households consist of married couples without children. These are either couples who do not have children or are "empty nesters" whose children have moved away. The category "Other Family Households" includes a wide variety of family arrangements: single or divorced parents with children, senior citizens who live with their adult children, cohabitating extended families, and so on.

Table E-2: Households by Type in the Town of Riverhead, 2000

	<i>Number of Households</i>	<i>Percent of Total</i>
<i>Family Households</i>		
Married Couples with Children Under 18	2,289	21%
Other Married Couples ¹	3,515	33%
Other	1,484	14%
<i>Non-family Households</i>		
Person Living Alone	2,839	26%
Other	622	6%
Total households	10,749	100%
Total household population ²	26,835	

1. Includes married couples who have no children at all, or who have adult children (18 years old or older).

2. Does not include people living in group quarters (845 people in 2000).

Sources: U.S. Census Bureau, Profile of General Demographic Characteristics, 2000.

In addition to "family" households (people related by blood or marriage), over 30 percent of the households in Riverhead comprise "non-family" households. In particular, Riverhead has a large population of people who live alone, many of whom are widowed or single senior citizens. "Other Non-family Households" include many different types of living arrangements, but particularly roommates (unrelated adults who live together for the purpose

of sharing living expenses) and cohabiting unmarried couples. There are relatively few households of this type in Riverhead.

On average, Riverhead has approximately 2.5 persons per household, which is lower than the average ratio at the County level. This rate is even lower than national rates, which have been declining for many years due to the fact that people are having fewer children and that divorces result in the division of one large household into two smaller ones. The low rate in Riverhead reflects the particularly high number of people living alone. When family households are examined separately, there are about 3.0 persons per household.

As shown in Table E-3, the majority of households in Riverhead are owner-occupied. The predominant development trend in Riverhead for many years has been single-family housing in new subdivisions. Some rental housing development had also occurred, particularly in and around the downtown area. Many of the large, older homes in the downtown area, in addition, have been divided into smaller rental units.

Table E-3: Households by Occupant in the Town of Riverhead, 2000

	<i>Number of Households</i>	<i>Percent of Total</i>
Owner-occupied	8,288	77%
Renter-occupied	2,461	23%
Total households	10,789	100%

Sources: U.S. Census Bureau, Profile of General Demographic Characteristics, 2000, <www.monmouthplanning.com>.

E.2 EXISTING STOCK OF AFFORDABLE HOUSING

Much of Riverhead's privately developed housing stock in Riverhead is affordable. In particular, the older neighborhoods in the vicinity of downtown have smaller housing units on smaller parcels that are generally more affordable than newly developed units in rural subdivisions. The housing on the western edge of town tends to be less affordable. Housing demand there is quite intense, because a large number of prospective homebuyers spillover from Brookhaven.

Riverhead has a large stock of age-restricted housing that is affordable for senior citizens, as well as subsidized housing for people with developmental disabilities and people living with HIV or AIDS, as well as shelters for homeless people.

The Town of Riverhead has been working with the County and with the Long Island Housing Partnership to increase the supply of affordable housing in Town. In June 2001, the Town approved a special permit for a long-planned project sponsored by the Housing Partnership

to build 13 affordable owner-occupied single-family housing units in the downtown area. The Housing Partnership obtained approximately \$775,000 in federal and state grants to cover the bulk of the construction costs for the project, called "Millbrook Gables". The resulting units will have a market value of about \$160,000, but will be sold for approximately \$83,000 to \$111,000.⁵⁹

AGE-RESTRICTED HOUSING

The majority of Riverhead's age-restricted housing is in the form of mobile home parks. In all, there are eleven mobile home parks for senior citizens in Riverhead. These provide housing at a range of prices and rents. Glenwood Park on Old Country Road offers mobile homes for sale at \$149,000. Seniors are responsible for monthly mortgage payments on the mobile home, the rent for their parcel, and the property taxes for the parcel (passed on by the park manager).⁶⁰ The total payments on such a home would be somewhat less than the total payments (mortgage, plus taxes, plus maintenance) on a typical single-family detached home in Riverhead.⁶¹

Seniors with more limited incomes would not be able to afford mobile homes. The John Wesley Village and Riverhead Landing apartments are age-restricted units that provide housing opportunities for individuals with maximum income levels of about \$30,000. John Wesley Village also has HUD-subsidized units, for which there is a three- to five-year waiting list. As Riverhead attracts more second-home buyers who are being priced out of the Hamptons, housing values will continue to climb, and the need for affordable senior housing will only increase.

Riverhead Landing, a recently built retirement community, is also available to low-income seniors. Riverhead Landing has met with overwhelming success. Apartments were reserved even before construction was completed, reflecting the strong overall demand for senior housing.

PEOPLE WITH DEVELOPMENTAL DISABILITIES

The de-institutionalization of people with developmental disabilities has resulted in a critical housing need for those groups, while housing options are limited. Many patients who leave institutions have nowhere to go, or go back to family members who are ill equipped to care

⁵⁹ Kelly, Tim, "It's a Go for Gables Homes," *The News Review*, June 14, 2001.

⁶⁰ Interview with Judy Doll, Director of Riverhead Senior Center, June 28, 2000.

⁶¹ Median housing values were \$158,000 in 1990. Assuming that housing values increased approximately 1.5% per year between 1990 and 1999, median housing values are estimated to be about \$180,000 in 1999. As of January 2002, information from the 2000 census on housing values was not available.

for them. To prevent this problem, the State has adopted a temporary moratorium on the closing of County hospitals.

The preferred living environment is a "community living" group home, where someone with a developmental disability can obtain appropriate services and professional attention, while still living in a typical residential setting. Group homes are required by federal law to be permitted in residential neighborhoods. In Riverhead, many group homes have been established in the downtown area.

PEOPLE LIVING WITH HIV OR AIDS

With the advent of protease inhibitors, people with HIV and AIDS have much longer life expectancies. As a result, while HIV and AIDS are still life-threatening, it is also a chronic condition that people live with for many years. Although people taking the protease inhibitors may be healthy enough to continue living, they may not be well enough to continue working. At the same time, they have increasing health care costs. Thus, they are often in need of inexpensive housing, the cost of which can be covered through their fixed incomes.

The federal government plays a major role in providing housing opportunities for people living with HIV or AIDS. The Housing Opportunities for Persons with AIDS (HOPWA) program HOPWA provides housing assistance and supportive services for low-income people with HIV/AIDS and their families. State and local governments can be eligible for receiving HOPWA funds. The Town of Riverhead could be eligible to receive some of the funding that goes to New York State.

HOPWA funds are primarily intended to benefit low-income persons with HIV or AIDS and their families, especially those who are homeless or at risk of becoming homeless. Funds can be used to build a broad range of housing types, including emergency shelters, shared housing, apartments, single room occupancy units (SROs), group homes, and housing combined with supportive services. Funds can also be used for a variety of housing-related expenses, social services, and program development costs such as:

1. Housing information and resource identification;
2. Purchase, rehabilitation, conversion, lease, and repair of housing;
3. New construction for SROs and community residences;
4. Paying rent, mortgages, and utility payments;
5. Paying housing operating costs;
6. Technical assistance;
7. Administrative expenses; and
8. Supportive services, such as health care, mental health services, chemical dependency treatment, nutritional services, case management, and help with daily living.

Households receiving rental help or living in housing funded under the program are obligated to pay a portion of the rent, based on their income.⁶²

HOMELESS PEOPLE

Based on the increasing demand for beds in emergency shelters throughout the U.S. over the course of the 1990s, the problem of homelessness is thought to have increased markedly.⁶³ According to social service workers in Riverhead, some homeless people are known to live in the downtown area,⁶⁴ although the exact number and condition of homeless people in Town is uncertain.

Estimating the number of homeless people in a given area is not an exact science. In many cases, homelessness is a temporary circumstance, rather than a permanent condition. The number of people who experience homelessness at any one time may fluctuate greatly, depending on local economic conditions, seasons, business cycles, housing construction trends, and so on. Moreover, homeless people are less often in the public eye. With decreasing tolerance of loitering, they are often skirted away by police officers, property owners, or residents. They may hide in backyards and alleyways to avoid detection, or they may live out of their cars or makeshift structures in secluded locations. Also, because of the harsh Long Island winters, people who are chronically homeless for long periods of time are thought to migrate in and out of Riverhead with the seasons. As a result, conducting outreach to homeless persons, estimating their numbers, and understanding their needs is extremely difficult.⁶⁵

There are a variety of housing opportunities for homeless people. Persons who are homeless or in danger of becoming homeless can apply for assistance at one of the County's Social Services Centers, one of which is located on East Main Street in the downtown area. There are shelters throughout the County, including two in Riverhead: Love'M Sheltering in Calverton (permanent housing and emergency shelter) and Madonna Heights/Peconic Heights in downtown (for women). There are also various soup kitchens and food pantries throughout Riverhead, several of which are operated through religious institutions.⁶⁶ In addition, there are some hotels and motels throughout the County that provide ongoing housing for individuals and households, in exchange for financial assistance from County, State, federal, or private funding.⁶⁷

⁶² U.S. Department of Housing and Urban Development, <www.hud.gov>, visited December 28, 2001.

⁶³ National Coalition for the Homeless, <www.nationalhomeless.org>, visited January 7, 2002.

⁶⁴ Interview with Bernadette Gilday and Larry Weiss, Family Service League, June 28, 2000.

⁶⁵ Interview with Bernadette Gilday and Larry Weiss, Family Service League, June 28, 2000.

⁶⁶ Nassau-Suffolk Coalition for the Homeless, <www.nsch.org>, visited January 7, 2002.

⁶⁷ Suffolk County Legislature, "Tonna's Bill to 'Clean Up' Emergency Housing is One Step Closer to Becoming Law," August 23, 2001, <www.co.suffolk.ny.us/legis/press/>, visited January 7, 2002.

E.3 EXISTING HOUSING REGULATIONS AND PROGRAMS

As noted, Riverhead has long had a supply of relatively affordable housing, compared to surrounding communities. However, with increasing development pressure and housing demand spilling over from adjacent towns, the Town has taken several steps to increase affordable housing opportunities in Riverhead and to support low- and moderate-income households.

In 1980, the Town created the Residence Redevelopment Community RDC District to create opportunities for affordable housing. This floating district allows multi-family residences "for moderate/low income persons or handicapped, including social, health care, or other supportive services and facilities, to be owned and operated for such purposes". The zone is not currently designated anywhere on the Town's zoning map, but it can be designated by the Town Board. So far, the RDC District has not been used.

A number of other zoning districts in Riverhead provide relatively affordable housing, by virtue of allowing higher-density development. The Town does not *require* housing units in these districts to be affordable to low- and moderate-income households as defined under State regulations, but higher-density units (townhouses, single-family houses on small lots, apartments) are typically less expensive than large-lot single-family homes, the predominant housing type in Riverhead. The following zones allow for relatively high-density density housing:

- *Multi-family Residential Professional Office Zone.* Allows 3 to 4 units per acre in the form of multi-family residential condominiums. Areas currently zoned are located on the north side of Route 25A in the Route 25A business district.
- *Residence Retirement Community District.* Allows multi-family residences "for aged persons over the age of fifty-five (55) years or handicapped, including social, health care, or other support services and facilities, to be owned and operated for such purposes." There is no limit as to the number of housing units. Based on the minimum lot area of 15 acres and the maximum building area of 30 percent, a building of approximately 196,000 square feet could be built. If 10 percent of the building area is used for common spaces, and residential units are 800 square feet on average, then such a building could contain approximately 220 units, resulting in an average density of 15 units per acre. Currently zoned areas include two sites along Middle Road, east of Roanoke Avenue, and another site along Sound Avenue, east of the Route 25A business district.
- *Residence C District.* Allows single-family housing on 1/2-acre lots (2 units per acre), half the size of the one-acre lots permitted in the Residence A and Agricultural A districts. Also, allows single-family residences to be converted into two-family residences, which could result in average densities being increased to 4 units per acre.

Areas currently zoned are found around downtown Riverhead, along Route 58, along Route 25 in Aquebogue, and along the shores of Long Island Sound and Flanders Bay.

- *Residence D District.* Allows single-family housing on 1/2-acre lots (2 units per acre), half the size of one-acre lots permitted in the Residence A and Agricultural A districts. Areas currently zoned are found around the Jamesport hamlet center.

The Town's Community Development Department offers a Home Improvement Program for low- and moderate-income households. Low- and moderate-income homeowners in need of emergency home repairs or improvements necessary for the health and safety of the residents are eligible for funding. The department also offers loans for handicapped access renovations under this program. Local soup kitchens also receive funding from the Department of Community Development.

Appendix F: Parks and Recreational Facilities

Existing park and recreational sites are listed in Table F-1.

Table F-1: Existing Parks and Recreational Facilities in Riverhead, 2001

<i>Park Name</i>	<i>Acreage</i>	<i>On-site Recreational Facilities</i>
<u>State Parks</u>		
Wildwood State Park, North Wading River Rd, Wading River	771.8	Beach, campgrounds, trailer hookups, trails
New York State Conservation Area, Beach Way, Wading River	77.3	Access by permit only
East Creek Marina, Peconic Bay Blvd, Jamesport	17.9	Docking facility, boat ramp
Total	867.0	
<u>County Parks</u>		
Indian Island County Park, Cross River Dr, Aquebogue	284.2	Campgrounds, trails, fishing, picnic areas
Robert Cushman Murphy County Park, River Rd, Manorville	634.0 ¹	Trails, boating, fishing, hunting, biological research center
Total	918.2	
<u>Town Parks</u>		
Stotzky Memorial Park, Pulaski St, Downtown	30.1	Softball & Little League fields, tennis courts, playgrounds, skate park, picnic area
Grangebél Park, Peconic Ave, Downtown	3.2	Picnic area, walking trails, riverfront
Lombardi Memorial Park Roanoke Ave, Downtown	0.2	Gazebo
Jamesport Community Center, South Jamesport Ave, Jamesport	3.0	Indoor meeting hall, gazebo
South Jamesport Park, Town Beach Rd, Jamesport	18.5	Tennis courts, basketball court, picnic area, beach
Wading River Community Park, Bayberry Rd, Wading River	7.0	Softball field, tennis/handball courts, bocci, basketball, & shuffleboard courts
Reeves Park Beach, Park Rd, Roanoke	19.5	Beach, boat ramp
Iron Pier Beach, Pier Rd, Northville	61.4	Beach, boat ramp
<i>Town Parks (continued)</i>		
Wading River Beach, Creek Rd,	12.0	Beach, boat ramp

Table F-1: Existing Parks and Recreational Facilities in Riverhead, 2001

<i>Park Name</i>	<i>Acreage</i>	<i>On-site Recreational Facilities</i>
Wading River		
Total	154.9	
<hr/>		
<u>School Recreational Facilities²</u>		
Aquebogue Elementary School	1.3	
Riley Elementary School	3.8	
Roanoke Elementary School	1.0	
Pulaski Intermediate School	6.8	
Riverhead Middle School	2.5	
Riverhead High School	9.3	
Wading River Elementary School	2.3	
Total	27.0	
<hr/>		
<u>Public Golf Courses</u>		
Calverton Links, Edwards Ave	176.1	18 hole course
Indian Island Country Club, Riverside Dr	158.0	18 hole course
Long Island National Golf Club, Northville Tnpk	159.2	18 hole course
Swan Lake Golf Club, River Rd, Calverton	430.7	18 hole course
Total	924.0	
<hr/>		
<u>Private Institutions</u>		
Camp Wauwepex, Manorville Rd, Wading River	404.4	Nassau County Boy Scouts
Camp Baiting Hollow, Sound Ave, Wading River	89.9	Boy Scouts of America
Long Island Beagle Club, Edwards Ave, Calverton	149.8	
Babylon Rod & Gun Club Wildlife Reserve, Swan Pond Rd, Calverton	59.2	
Total	703.3	
<hr/>		
Total	3,594.4	

1. Estimated portion of the park that lies within the boundaries of the Town of Riverhead.

2. Acreage represents the portion of the school site used for outdoor playing fields and other outdoor recreational facilities. Acreage is estimated by assuming that approximately one-quarter of the total school site is used for outdoor recreation.

STATE PARKS

Riverhead has a major State park, Wildwood, located on the shore of Long Island Sound, and a State conservation area, also on the Sound. Wildwood has some of the longest stretches of

publicly accessible beach in Riverhead and provides a very special waterfront experience for Riverhead residents. The conservation area is accessible via permit only and, because access is restricted, the area has an unspoiled quality that is truly unique along the Sound.

COUNTY PARKS

Riverhead has two significant Suffolk County parks within its boundaries, totaling more than 900 acres. Indian Island County Park is located at the mouth of the Peconic River, a scenic and environmentally rich site. Robert Cushman Murphy County Park is in the Town's southwestern corner, in the Pine Barrens area. The parks have a mix of woodlands and wetlands and both have unique waterfront areas. Indian Island Park fronts onto the lower Peconic River and Flanders Bay, while Murphy Park is situated along the upper Peconic River and a string of small ponds.

Although these parks serve the County as a whole, Riverhead residents have a unique ability to take advantage of them. They not only provide places for recreation (hiking, biking, birding, kayaking, boating), but they also help preserve to the countryside and woodland character of the community.

OTHER RECREATIONAL AREAS IN RIVERHEAD

Riverhead has three large public golf courses, which occupy nearly 750 acres of land. Although public golf courses are open to the general public, they typically charge a fee for use. In contrast, private courses require a membership.

Two Boy Scout camps are located in the Wading River area and amount to almost 500 acres. A small wildlife reserve operated by the Babylon Rod and Gun Club is located in the Calverton area, and the Long Island Beagle Club can be found in Edwards Avenue, north of Route 25. These facilities are generally open to members only, but they are quasi-public in nature, because they serve recreational/educational institutions. Their land is likely to be maintained for open space and recreational uses in the foreseeable future.

PARKS AND RECREATIONAL AREAS NEAR RIVERHEAD

Riverhead is literally surrounded by large areas of open space and parkland. Several large County parks line the southern shores of Flanders Bay and the Peconic River, in addition to the large Riverhead State Conservation Area. Brookhaven State Park and the continuation of Robert Cushman Murphy County Park are located immediately to the west of Riverhead in Brookhaven. Much of the area immediately to the southwest of Riverhead is included in the Pine Barrens Core Preservation Area. On the north side, Riverhead has a long, continuous shoreline along the Sound. The proximity of these areas create provide recreational opportunities for residents.

Riverhead's location on the East End allows residents to reach numerous attractive parks and recreational sites within a short driving distance. The beaches of Fire Island, Southampton,

and East Hampton are world-famous, and the outer reaches of the island — Montauk, Orient Point, Shelter Island, and numerous small hamlets — are popular get-away destinations.

PARK IMPROVEMENTS

In focus groups conducted for the Master Plan, participants cited a number of improvements that are necessary in the Town's existing parks. They said that some of the facilities in Stotzky Park need to be upgraded (picnic areas, playground equipment) and that the bulkheads in Grangebél Park need to be improved.

They also called for public restroom facilities and indoor playing facilities. According to the Recreation Director, the Town needs an indoor gym facility that provides space for wintertime sports activities. Currently, programs and lessons offered by the Recreation Department must be juggled around the schedules for other activities at the Armory Building and the Town's schools.

Other facility needs identified by participants include: fishing piers, nighttime (i.e., lit) playing fields and courts, and a senior recreational facility. Participants also called for additional parks and community centers in hamlet centers (i.e., in Wading River), so that the Town has a multi-level park system, with both Townwide parks like Stotzky and hamlet/neighborhood parks and facilities like the Young Community Center in Jamesport.

EVALUATION OF PARK NEEDS

Currently, Riverhead has a relatively large amount of parkland for population levels. If Town, County, and State parks and schoolyards are taken into account, Riverhead has approximately 71.1 acres of parkland for each 1,000 residents as of the year 2000.⁶⁸ This number is extremely high compared to national standards. The National Recreation and Park Association (NRPA) recommends that a municipality provide between 6.25 to 10.5 acres of parks per 1,000 residents. Clearly, Riverhead is far above the minimum standard, meaning that it is providing residents with more than enough park space.

However, if Town parks and schoolyards alone are counted — subtracting out County and State parks — then Riverhead has only about 6.6 acres per 1,000 residents. This number is just barely above the minimum standard. Because most of the Town's active recreational facilities are located in the Town parks and schoolyards, there is a particular need for more of such facilities. This finding is consistent with the results of focus groups, during which participants said that recreational facilities were overcrowded. As the population continues to increase, additional Town parks and schoolyards will be needed. This point is discussed in greater detail below.

⁶⁸ Based on a population of 27,680, as reported in U.S. Census of 2000. Source: www.census.gov.

Park Location

While Riverhead has an adequate amount of parkland, as measured in total acreage, it is also necessary to address the location of parks. Currently, parks are fairly well distributed throughout the Town. Some of the largest parks and open space areas are situated in between the Town's two largest population centers, Wading River and downtown. The largest expanses of parkland are found in Wildwood State Park, Murphy County Park, and Camp Wauwepex, all of which are located in the western part of town. The Pine Barrens Core Preservation Area, similarly, is concentrated in the southwestern part of Riverhead, west of the EPC site. From Wading River, these parks are easily accessed via Sound Avenue or Manorville Road. From downtown, Route 25 and Sound Avenue provide the major connections.

Town parks are well distributed as well. Stotzky Park, with the largest concentration of recreational facilities, is located in downtown. Wading River Community Park and South Jamesport Park provide similar facilities on a smaller scale; the former is located in the western half of Town, and the latter is found in the eastern half. Town beaches are also well distributed. The Town's only community center, however, is located in the Jamesport hamlet center, and it is a long trip for residents in the western part of Town. If a second community center were to be built, sites in the western part of Town should be considered first.

Generally, school sites are also well distributed throughout Riverhead. The largest outdoor recreational facilities are found at the Pulaski Intermediate School, Riverhead Middle School, and Riverhead High School, and these sites are centrally located downtown. Two additional school sites — Riley and Wading River — are located in the western part of Town and serve the residents living in those areas. There is only one school site in the eastern part of Town, the Aquebogue School, whose small site provides a relatively limited schoolyard. Thus, from a recreational point of view, residents would benefit from having another school site in the eastern part of Town or an expanded yard at the Aquebogue School. However, the primary purpose of a school is not recreation, and for a variety of other factors, it may be preferable to locate the school elsewhere.

Park Type

The amount and location of parkland in Riverhead is not the only issue of concern. Residents need a mix of community parks, schoolyard/neighborhood parks, and small pocket parks, each of which serves a different function:

- *Community Parks.* Community parks attract residents from all over Riverhead, because they offer particularly large open space areas. They also have unique recreational facilities that are not found elsewhere in the community (e.g., a swimming pool, a golf course, a "regulation" soccer field, etc.). Community parks are generally 20 acres or more in size. For most residents, driving would be the most convenient ways to reach this type of facility.

- *Schoolyard/Neighborhood Parks.* Neighborhood parks have playing fields, tennis courts, basketball courts, and other recreational facilities that attract residents from the surrounding neighborhood. They can range in size from about five to twenty acres. Children and their families are generally willing to make use of the local schoolyard or neighborhood park, even if the walk is more than 5 minutes, because it provides more space and a wider range of facilities than a pocket park (described below). If the park is too far to reach on foot, children may ride their bikes, or adults may drive.
- *Pocket Parks.* Pocket parks are generally less than five acres in size and provide a local place for residents to stroll, visit with neighbors, walk the dog, and take the kids to use the playground. Pocket parks have lawns, trees, playgrounds, and walkways, but typically do not have large recreational facilities like baseball fields. Pocket parks serve nearby residents who are within walking distance of the park. Generally, residents would be willing to walk no more than 5 minutes (about a 1/4-mile or 1,300 feet) to a pocket park.

Currently, Riverhead does have a range of pocket, neighborhood/schoolyard, and community parks. Table F-2 organizes the Town's parks into the functional categories outlined above.

Table F-2 Existing Parks and Recreational Facilities, by Function

<i>Community Parks</i>	<i>Schoolyard/ Neighborhood Parks¹</i>	<i>Pocket Parks</i>
-Stotzky Memorial Park	-Wading River Community Park	-Reeves Park Beach
-Grangebel Park		-private parks
-Lombardi Memorial Park	-Aquebogue School	-subdivision parks
-Young Community Center	-Riley School	
-South Jamesport Park	-Roanoke School	
-Iron Pier Beach	-Wading River School	
-Wading River Beach		
-Pulaski School		
-Riverhead Middle School		
-Riverhead High School		
-Indian Island County Park		
-Murphy County Park		
-Wildwood State Park		
-Baiting Hollow NYS Conservation Area		
-East Creek Marina		

Despite the fact the Riverhead High School, Riverhead Middle School, and the Pulaski School are technically schoolyards, they actually function as one large community park. Located adjacent to one another, they have a large combined land area and unique facilities (in

particular, a track) that attract residents from all over Town. Also, Grangebel Park and Lombardi Memorial Park serve as community parks, not because of their size or facilities, but because of their prominent location in downtown and their important influence on the Town's image. Because there are so few publicly accessible beaches in Town, parks with significant beach frontage end up functioning as community-wide parks during the summer.

Table F-2 suggests that Riverhead has an abundant number of community parks. However, the table does not reflect the fact that different community parks serve different functions. Most of the land in community parks is currently given over to open space areas suited to passive recreation, such as biking, hiking, boating, swimming, and walking. Relatively little acreage is available for active recreational facilities like ball fields and playing courts. Thus, the Town will need additional land for active recreational facilities as the population continues to grow.

The table suggests that the Township is deficient in pocket parks, although the information in the table is not complete. There are many pocket parks that have been set aside as part of a subdivision or that are maintained jointly by homeowners as a private park. The Town's zoning ordinance requires major residential subdivisions to provide 5 acres of parkland for every 100 lots and requires that all individual parks be no smaller than one acre in size.⁶⁹ For example, in the subdivision located northeast of the Middle Road/Roanoke Avenue intersection, a 1.5-acre park was set aside and is accessible from both Nadel Drive and Joyce Drive.

Maintenance and security has been a problem in some of these small parks. However, provided that maintenance and security can be addressed, pocket parks are extremely valuable for a variety of reasons.

- First, they are targeted to the needs of young children, older adults, and seniors. While the sporting facilities in the schoolyards, neighborhood parks, and community parks are primarily suited to the interests and activities of school-age children and young adults, pocket parks provide a quiet place for older adults to stroll, read, and enjoy the outdoors. They also provide an ideal place for parents to take their children to play.
- Second, because pocket parks are within walking distance of residential areas, they have the potential to encourage recreational walking and biking, eliminating some car trips from local streets. Thus, if maintenance and security issues are resolved, the Town should continue requiring these extremely valuable neighborhood spaces. Finally, they can bolster property values in the immediate neighborhood.

Schoolyards and neighborhood parks are also low in number, although those that exist are well distributed throughout Town. However, some community parks actually double as neighborhood parks. For example, parks with beaches draw a community-wide crowd during

⁶⁹ If a subdivision would result in inadequate park space, then the Planning Board could allow the developer to pay a fee in lieu of providing park acreage.

the summer months, but in the fall, winter, and spring, they are used almost exclusively by residents in the surrounding neighborhoods. If these are taken into account, then schoolyard and neighborhood parks can generally be considered adequate.

Trails and Bikeways

Riverhead has very little in the way of trails and bikeways, and thus, they are the Town's single greatest recreational need. In community meetings, residents have expressed great interest in creating a network of greenways. The Downtown Strategy called for an expansion of Grangebelle Park, which would include additional trails and bikeways along the Peconic River waterfront.

Trails and bikeways provide an ideal location for some of the most popular forms of exercise and recreation: walking, running, biking, and roller-blading. They can also be used to link together individual parks, creating a comprehensive park system, and they would also connect residential areas with parks, offering an alternative to driving. In the end, trails and bikeways would result in most residents living next to or near a linear park, potentially bolstering property values Townwide.

Stream corridors, rural lanes, the large County and State parks, the shoreline, and the wide distribution of existing parks — combined with open space preservation programs — provide an opportunity for creating these "greenways". In addition, as arterial roads are expanded to accommodate additional traffic, there is the opportunity to use the roadway shoulders for pedestrian and bicycle paths.

OTHER PARK AND RECREATION NEEDS

During a focus group discussion on parks and recreation, participants cited a number of other needs, beyond the need for additional parkland or facilities. One of the biggest problems was access. There is inadequate public access to waterfront areas (Long Island Sound and the Peconic River, in particular), inadequate parking at Town parks and beaches, and inadequate access for pedestrians and bicyclists.

Participants also cited the need for additional security, maintenance, and enforcement at parks and beaches. There have been problems with violation of beach rules and loose dogs at beaches and parks. Some suggested that park rules be posted, so that patrons know upfront what activities are permitted in the parks.

Another issue is the use of land around existing parks. Stotzky Park, for example, is contiguous to a number of industrial and institutional uses to the south and west. These land uses create an unattractive visual impact on the park and partially diminish enjoyment of the park by residents and visitors. The presence of incompatible land uses around an existing park does not mean that the park needs to be moved. Instead, a mix of plantings, berms, and fencing can be used to buffer the park from the problems associated with adjacent land uses.

Appendix G: Transportation

G.1 HIGHWAY SYSTEM

There are approximately 215 miles of roadways in the Town of Riverhead. Of these, 14 miles are County roads, 23 miles are State highways, including the LIE, and the remaining 178 miles are Town roads. A listing of the major State, County and Town highway facilities in the Town is presented in Table G-1.

State Highways in the Town include NYS Route 25, which extends the entire length of the Town, NYS Route 25A, in western Riverhead, and the easternmost two miles of the LIE. Three major roads comprise nearly 12 of the 14 miles of County roadways: (1) County Route 43 (Northville Turnpike); (2) County Route 105 (Cross River Road); and (3) County Route 58 (Old Country Road). County Route 54 (Hulse Landing Road), and County Route 73 (Roanoke Avenue) account for nearly all of the remaining County road miles in the Town.

Existing traffic volume information available from the various agencies was compiled for the purpose of this study.⁷⁰ Average Annual Daily Traffic (AADT) volumes are presented for those facilities where data was available in Figure 9-1 in the Transportation Element (see Chapter 9). AADT represents traffic volumes for any single day in a year, a value typically used in standard transportation planning practice. It should be noted that due to the recreational nature of much of the land use in Riverhead, summer traffic volumes are typically higher than AADT.

LONG ISLAND EXPRESSWAY

The Long Island Expressway (LIE, I-495) is a 6-lane east-west interstate that traverses most of Long Island. The LIE terminates in Riverhead. It extends approximately 1.25 miles into the Town, terminating at County Route 58 (Old Country Road). The LIE is the primary route by which travelers from the west reach Tanger Mall and downtown Riverhead. As originally conceived, the LIE was intended to terminate at County Route 48 in Southold. However, NYSDOT has no current plan to extend the facility beyond its present terminus.

There are no congestion issues related to the LIE in Riverhead. Capacity at present far exceeds demand, and can be expected to continue in the near future. Existing average annual daily traffic volumes (AADT) on the Riverhead segment of the LIE is approximately 18,000 vehicles per day (VPD), significantly below capacity.

⁷⁰ Information was obtained from the NYSDOT North Fork Recreational Travel Needs Assessment, the Long Island Transportation Plan to Manage Congestion (LITP 2000) and the Suffolk County Department of Public Works.

Table G-1: Major Roadways

<i>Route Number</i>	<i>Associated Street Names</i>
NYS Route 25	Middle Country Rd, West Main St, East Main St, Main Rd
NYS Route 25A	Hulse Ave, North Country Rd, Parker Rd
County Route 43	Northville TnPk
County Route 51	East Moriches Riverhead Rd
County Route 54	Hulse Landing Rd, Wildwood Rd
County Route 55	Eastport-Manorville Rd
County Route 58	Old Country Rd
County Route 63	Peconic Ave, Old East Moriches-Riverhead Rd
County Route 73	Roanoke Avenue (from NYS Route 25 to SC Route 58)
County Route 94	Edwards Avenue South, Nugent Dr, Center Dr
County Route 94A	Center Dr Spur
County Route 104	Quogue-Riverhead Rd
County Route 105	Cross River Dr
Town Route 22	Manor Ln
Town Route 23	Church Ln
Town Route 25	Wading River-Manorville Rd, Schultz Rd, Wading River Rd
Town Route 48	Sound Ave
Town Route 73	Roanoke Ave (north of CR 58)

A considerable amount of the transportation-related input received from the public focused on the LIE. Comments received varied, however, from "do absolutely nothing" to "extend the facility to its originally conceived endpoint at County Route 48 in Southold". Other comments specifically related to entrance or exit ramps at either the NYS Route 25 or County Route 58 interchanges.

As part of the *North Fork Recreational Travel Needs Assessment*, a sub-study of the Long Island Transportation Plan to Manage Congestion (LITP 2000; NYSDOT's long range transportation plan for Long Island), an extensive postcard motorist origin-destination survey was conducted, much of it focused in eastern Riverhead. The results of the survey, which were reviewed for the purpose of this Plan, indicate that many of the motorists surveyed on Route 58 east of the LIE, were destined to the easterly portion of the North Fork, including many who were going to the Cross Sound Ferry Terminal in Orient.

Since, at present, Route 58 and Route 25 essentially function as eastward extensions of the LIE, motorists destined for the North Fork choose between these facilities for the part of their trip in western Riverhead, then either divert to Sound Avenue/County Route 48 or remain on Route 25 for the balance of their trip. The number of these “through-traveling” vehicles, which contribute significantly to the congestion that occurs on the two facilities, can be expected to increase significantly in the future, due to the continuing popularity of the region as a tourist destination, continuing residential development, and the increasing congestion on western Long Island roadways, which will make the ferry a more and more attractive alternative to driving through New York City to reach destinations in New England. At the same time, local traffic volumes on these two facilities can be expected to rise, especially if the Town implements the Master Plan recommendations for increased destination commercial development on CR 58.

The most effective measure to relieve this congestion would be to provide an alternate route for vehicles with destinations east of the Riverhead business districts on Route 58 and in the downtown area. Indeed, in Southold, this alternate route around the hamlet centers exists, in the form of Route 48. Increasingly, Sound Avenue and Middle Road are fulfilling this role in Riverhead Town. However, Sound Avenue in Riverhead is a 2-lane roadway, with significant horizontal and vertical curvature and old growth trees along the south side, resulting in poor sight distance. Shoulders are narrow or nonexistent; there are few if any sidewalks; and agriculture-related businesses such as farm stands with little or no formal access or off-street parking are numerous. Therefore, for safety and aesthetic reasons, diversion of through traffic to Sound Avenue is not desirable.

Middle Road has been suggested as a candidate for this bypass route, and is also experiencing increased traffic as vehicles use it to bypass the westerly portion of Route 58. Middle Road has its current terminus at Route 58 east of Roanoke Avenue, so traffic rejoins Route 58 just west of County Route 105. Middle Road also provides one lane in each direction and would only relieve the western portion of Route 58 and Route 25. In addition, the two roads that connect Middle Road with Route 58 and Route 25, Mill Road and Osborn Avenue, have a northwest orientation, making the connection somewhat circuitous.

Strictly speaking, from a traffic engineering standpoint, the extension of the LIE to either Middle Road or to Route 48 would result in the greatest benefit. The benefit would extend beyond the border of Riverhead, in that through traffic would no longer travel through the hamlet centers in Southold as well.

This concept, if pursued, would have to be spearheaded by NYSDOT and the SCDPW. This facility, if ever built, would take the form of a 4-lane parkway facility, 2 lanes in each direction, separated by a wide planted median. Sufficient right-of-way would be acquired such that a vegetated buffer would be provided, reducing potential noise and aesthetic impacts on adjacent properties. The alignment should be chosen to minimize any potential impact on properties through which it would pass, and no at-grade intersections should be constructed. Rather, a minimum number of interchanges would be developed, perhaps only one at Route

105. Access should be strictly controlled, with no local access permitted along the entire length of the facility. This would help to limit development pressure along the roadway.

Development of such a facility would attract through traffic from both Route 25 and Route 58, as well as from Sound Avenue. The newly available additional capacity on these facilities would have the further beneficial impact of attracting traffic that previously had been seeking alternate routes through residential neighborhoods, since travel time would be improved and congestion reduced on Route 58 and Route 25.

The new facility would be a NYS Highway, and NYSDOT would take over jurisdiction of the entire length of Route 48 in Southold from Suffolk County. In that scenario, the segment of Route 25 between the LIE in the west and Greenport in the east should become converted into a County roadway.

STATE ROUTE 25

NYS Route 25 is a 2-lane east-west highway that extends from western Long Island to the North Fork of eastern Long Island. Approximately 17.5 miles of Route 25 lies within the Town of Riverhead. The easternmost and westernmost portions of Route 25 are relatively undeveloped. In the future, however, demand along the westernmost portion of Route 25 will increase significantly as the EPC site is developed. Route 25 will be the major roadway providing access as it runs along the northern frontage of EPC.

In Riverhead Hamlet, Route 25 is very developed, and serves runs along Main Street in downtown. It is the main route through downtown Riverhead and provides essentially unlimited access to the surrounding area. Congestion regularly occurs along Route 25 in the downtown area due to side friction from parking maneuvers, turning vehicles at intersections, and driveways and pedestrian activity, but not more than can be reasonably expected on a facility of this kind.

The AADT on Route 25 varies throughout the Town, from approximately 7,500 VPD in Wading River, to 10,000 VPD in the downtown area. Where County Route 58 joins Route 25, east of Doctor's Path, the AADT is about 23,000 VPD, and east of County Route 105 it is 15,000 VPD.

State Route 25 — West of the LIE

The westernmost portion of Route 25 in Riverhead will experience significantly increased demand due to the development of EPC. According to the Final Environmental Impact Statement (FEIS) prepared by the U.S. Navy preparatory to turning the property over to the Town, the preferred alternative for the development of this approximately 2,700-acre site envisions a combination of industrial, commercial, aviation and recreational uses, as well as significant open space. Table G-2 presents projected traffic volumes that could be generated by the preferred alternative: 4,000 vehicle trips per hour during the weekday peak hour, and 3,000 trips per hour during the Saturday peak hour.

**Table G-2: New Vehicle Trips on Route 25
Generated by the Preferred Alternative for
the EPC Site**

<i>Time Period</i>	<i>Weekday</i>	<i>Saturday</i>
AM Peak	2,693	n.a.
PM Peak	4,161	n.a.
Peak Hour Enter	n.a.	1,737
Peak Hour Exit	n.a.	3,145
Daily Trips	42,856	33,834

*Source: Department of the Navy Final
Environmental Impact Statement*

On a daily basis, over 42,000 weekday and 33,000 Saturday trips could be generated. Clearly, this has the potential to have major impacts on the transportation system in the vicinity of the property. According to the NYSDOT, an increase in peak hour traffic volumes of 1,000 vehicles might result in the need to widen Route 25. At present, the NYSDOT has no plans for any widening or capacity improvements for Route 25 in Riverhead. In order to examine the impact of this future traffic, the FEIS presented traffic analysis at four locations along Route 25, namely, the intersections at:

- Rocky Point Road;
- Edwards Avenue;
- North Country Road; and
- Manorville Road

The results of this analysis indicate that operating conditions would deteriorate to the extent that unacceptable levels of service (LOS) would prevail during all weekday peak hours at all four locations. With the exception of the intersection of North Country Road, the same deterioration of LOS will occur during the Saturday peak hour. Deterioration to this extent would have far reaching impacts, perhaps extending to the stifling of commercial interest in the site itself. The FEIS goes on to suggest some minor intersection specific widenings at these locations that would serve to marginally improve LOS.

Discussions with representatives of the Planning Department of the NYSDOT indicate that, in order to anticipate and plan for the mitigation of transportation impacts of this

development on both State and local roads, NYSDOT has been willing to fund a Calverton Corridor and Local Roads System Assessment for the Town. The Assessment would:

1. Characterize the impacts of development at and ancillary to the Calverton site;
2. Evaluate and identify improvements to State and local roads that would mitigate these impacts;
1. Evaluate and identify alternative land uses and development patterns that might mitigate or alleviate these impacts; and
2. Discuss potential funding strategies for the local system improvements.

NYSDOT continues to feel this type of study is needed. However, funding that had been available was reallocated elsewhere. It is strongly recommended that the Town contact NYSDOT and urge them to try to locate alternative sources of funding for this study. The Town should be willing to participate financially in the study, perhaps through a local matching program, or by contracting for some of the study requirements on its own, such as traffic data collection.

Furthermore, the Town should ensure that the issue of the redevelopment of this site is given prominent consideration in the recently launched Sustainable East End Development Strategies (SEEDS) study, which is being conducted under the auspices of NYMTC. This organization, NYMTC, is the quasi-public clearinghouse for federal transportation funds for the New York metropolitan region, which includes all of Long Island. The studies should result in a set of strategies for transportation improvements along Route 25 and local roadways in the vicinity of the property, and should identify the means for funding as well.

State Route 25 — LIE to Downtown

On the portion of Route 25 between the LIE in the west and the downtown area, including that segment adjacent to the southerly end of Tanger Mall, capacity deficiencies are not apparent. In the near future, the developer of the Riverhead Centre shopping center intends to install a traffic signal at the intersection of Route 25 and Mill Road. This signal is being installed as part of the developer's off-site traffic mitigation responsibility. As there are sight distance and grade issues at this location, the traffic signal will serve to improve safety at this location.

The Peconic River, which is included on the list of waterways protected by the Wild and Scenic Rivers Act, is in close proximity to this stretch of Route 25. As such, development opportunities are extremely limited, since the Act prohibits most development within 500 feet of a protected river. Therefore, significant new sources of traffic are not likely to materialize in the area, and the sources for increased traffic volumes would lie outside the immediate area and be limited to through vehicles. Therefore, no capacity improvements are likely to be required. In fact, it is questionable whether the Act would permit significant work to be done on the roadway itself. This portion of Route 25 would experience a reduction in traffic volumes, should capacity improvements be made along Route 58.

State Route 25 — Downtown

The downtown portion of Route 25 is literally Main Street, Riverhead. It is lined with shops and businesses for much of its length, essentially built right to the property lines. As is fitting in a downtown area, on-street parking is allowed and should be retained. On-street parking is vital to the businesses that attract short stays, such as newsstands, coffee shops, and so on. These businesses in turn add a sense of bustle and vitality to the downtown area, and attract potential customers for other businesses. This type of activity, however, leads to a certain amount of traffic congestion and, due to the fact that buildings are so close to the street, adding capacity to Route 25 is not possible without having a serious impact. This is particularly undesirable in light of the historic nature of some of the structures.

Congestion is not solely due to the volume of traffic and friction in the area, rather a good deal stems from geometric features, the signalized intersection of Peconic Avenue and Roanoke Avenue being a major contributor. Although there has been discussion of converting these facilities to one-way operation, this is an extremely disruptive measure and is not recommended at this time. Traffic and activity in the downtown area are desirable, unless the congestion leads potential customers avoiding the area and shopping elsewhere due to the inconvenience and lost time associated with it.

Traffic calming measures, which would seek to divert through traffic traveling on Main Street to other facilities, are likely to be ineffective, due to the lack of a logical alternative. Indeed, travel time measurements taken along Route 58 and Route 25 between the LIE and Route 105 indicate that Route 25 has become the faster of the two routes. Essentially, the bypass route, Route 58, has become congested to the point that it is now faster to travel on Rt. 25, the very facility that the bypass was constructed to relieve. Therefore, the solution lies in capacity improvements to Route 58, which would attract through vehicles destined outside the downtown area back to the appropriate facility.

The Cornell Cooperative Extension Headquarters, located on Griffing Avenue at Railroad Street, is being relocated to a site north of the LIRR tracks. Suffolk County intends to use the original site to provide additional parking for the County court facilities, which are to be expanded. The Town is pursuing the concept of extending Court Street to Railroad Avenue as part of this project, which would require the County to allow a small section of the Court Street extension to be built on County property.

In return, the Town would cede a portion of Railroad Street to the County to compensate. Extending Court Street would improve local circulation and access to the parking facilities, which would have a corresponding positive effect on Main Street, in that vehicles destined to the Court facilities could use Court Street rather than Main Street to access the parking area. Appropriate signing on Main Street west of Court Street should be installed to direct traffic to the area.

State Route 25 — East of Downtown

The portion of Route 25 east of the downtown area rarely experiences considerable congestion, except during summer months when Route 58 is congested and vehicles destined for the eastern North Fork are diverting onto Route 25 for their trip. East of the terminus of Route 58, from just west of Route 105 through Jamesport, congestion is more frequent due to the lack of Route 58 as an alternate route. Capacity improvements on Route 58 as discussed in the following section of this plan should result in decreased delays and faster travel times on that facility, which will in turn reduce the number of through vehicles using Route 25. Again, a certain amount of the congestion occurring in this area is due to the activity at the various roadside attractions, such as farm stands, nurseries, etc. This type of activity is considered desirable.

COUNTY ROUTE 58

County Route 58 is a 2-lane east-west road that extends from the westerly terminus of the LIE eastward to NYS Route 25, a distance of approximately 4 miles, all within the Town of Riverhead. Route 58 was built as a bypass to Route 25. However, increasing congestion — much of it due to active commercial development along the roadway — has compromised its usefulness as a bypass.

Tanger Mall and many retail stores, restaurants, and businesses have access points along Route 58. During peak periods, traffic volumes are high, travel speeds are low; and roadway level of service is poor. Congestion on Route 58 is significant enough that drivers familiar with the area seek out alternate routes through residential communities, bypassing both Route 58 and Route 25. It is expected that commercial and industrial development pressure along Route 58 will continue.

Proposed developments along the roadway include two major home improvement stores (Home Depot and Lowe's), retail stores, a grocery store, restaurants, and a major multiple screen movie theater. To mitigate the impact of these developments, capacity improvements will be necessary in the near term. Depending on the effectiveness of the capacity improvements, traffic calming may be required on local roadways to encourage traffic to return to using Route 58 rather than local roadways. The AADT on Route 58 is approximately 23,000 VPD.

With the ongoing success of Tanger Mall and the impending development of new shopping centers, the western end of Route 58 is a burgeoning as a commercial center. In addition, this activity is beginning to attract ancillary uses such as the Applebee's Restaurant, which take advantage of the commerce attracted by these destination uses. Application for a number of other developments of this sort are pending, and driveways are proliferating, most of which allow for full turning movements. Allowing full turning movements creates large numbers of conflicts with through traffic. The eastern portion of Route 58 also supports considerable commercial development.

New commercial development will certainly exacerbate the area's already considerable congestion. Through the County permitting process, some portions of Route 58 have been widened to 4 lanes, but for the most part, the facility provides a single lane in each direction, with various turning lanes. A recent analysis performed for the County indicated that retention of the traffic circle at the Roanoke intersection, after the widening to four lanes, would result in an undesirable increase in accidents at this location. Furthermore, the County is unlikely to agree to undertake the study of any major capacity improvement on Route 58 if the removal of the traffic circle is not to be considered.

OTHER MAJOR ROADS

Middle Road

Middle Road is a 2-lane east-west roadway that extends from Service Road A (the service road north of NYS Route 25 which is approximately 0.25 miles west of the terminus of the LIE) to Doctors Path immediately north of Route 25. All of Middle Road (roughly 4.75 miles) lies within the Town of Riverhead. Because there is currently very little development along Middle Road, existing traffic volumes are low. Drivers familiar with the downtown Riverhead area have begun to use Middle Road as a bypass to congestion on Route 25 and Route 58. For this reason, it is expected that development along Middle Road will increase. If congestion along Route 58 persists, it is expected that Middle Road will become a more utilized bypass road. The AADT is 11,000 VPD.

Sound Avenue

Sound Avenue is a 2-lane east-west roadway that extends from NYS Route 25A to NYS Route 25 in Southold. Approximately 14.5 miles of Sound Avenue lies within Riverhead. Sound Avenue, combined with County Route 48 in Southold forms a major east-west alternative to Route 25 for motorists traveling to points east of Riverhead on the North Fork of Long Island. The AADT on Sound Avenue is 7200 VPD.

Sound Avenue is a two lane Town roadway extending along the north or Riverhead between Calverton and Mattituck. Although the right of way is 66 feet wide, for most of its length the pavement is between 28 and 30 feet wide. Few sidewalks and shoulder areas are provided.

The road is lined with old trees and historic homes, farms, and farm stands. In some cases, landscape features of the homes such as fences and plantings encroach on the Town right-of-way. The road has significant horizontal and vertical curvature, which limits stopping sight distances. In 1974, as part of the upcoming bicentennial celebration, the road was designated a historic corridor by the Department of State Parks and Historic Preservation.

There are no ongoing capacity issues on Sound Avenue. Information from the NYSDOT North Fork Study indicates that traffic volumes are relatively low, on the order of 7,000 VPD in both directions. In recent years, the road has experienced an increase in traffic

volume, in part due to the increasing popularity of the rural North Fork as a tourist destination, and also due to traffic seeking to avoid congestion on Route 58 and Route 25. What little congestion does occur is related to activity at the agriculture-related businesses such as farm stands along the road.

Recently, however, there have been a number of accidents on Sound Avenue, some involving agriculture workers walking or bicycling along the road to and from their places of employment.

NYMTC is presently considering an application by the Town of Riverhead for funding a safety improvement project along Sound Avenue between Route 105 and the Southold Town line. This project will provide for the installation of 5-foot wide shoulders on either side of the road and resurfacing of the existing pavement. These shoulders will allow bicyclists to use the roadway in a much safer manner. NYSDOT supports the project, and funding is likely.

County Route 105

Route 105 (Cross River Drive) is a north-south highway that extends from County Route 104 (Quogue-Riverhead Road) in Southampton to Sound Avenue in Riverhead. It has 4 lanes from Route 104 to Union Avenue and then reduces to 2 lanes from Union Avenue to Sound Avenue. Approximately 4.0 miles of Route 105 is within Riverhead. Route 105 allows high-speed north-south movement and is a north-south bypass to downtown Riverhead. South of NYS Route 25, the AADT on County Route 105 is about 17,000 VPD. North of County Route 43 (Northville Turnpike), the AADT drops considerably to 3000 VPD.

State Route 25A

NYS Route 25A is a 2-lane east-west highway that splits from NYS Route 25 in western Long Island and then runs along most of the north shore of Long Island. Route 25A rejoins Route 25 in Riverhead. Approximately 2.75 miles of Route 25A is within the Town. The point at which they join is immediately north of Enterprise Park at Calverton (EPC). It is expected that one of the main entrances to EPC will be situated at the intersection of Route 25 and Route 25A. The AADT on Route 25A is 15,000 VPD west of Sound Avenue and 7,500 VPD east of Sound Avenue.

County Route 43

County Route 43 (Northville Turnpike) is a 2-lane north-south roadway that extends from Roanoke Avenue in the downtown area to Sound Avenue in the northern part of Town. All 3.5 miles of Route 43 are within Riverhead Town. Vehicles destined to the North Fork from downtown Riverhead can utilize Route 43 to reach Sound Avenue, then use Sound Avenue to travel east. Similarly, northbound vehicles on County Route 105 destined for the North

Fork turn onto Route 43 to reach Sound Avenue. The AADT on County Route 43 is between 3,500 and 5,500 VPD, depending on location.

County Route 73

County Route 73 (Roanoke Avenue) is a 2-lane north-south roadway that extends from NYS Route 25 in the south to Sound Avenue in the north. Roanoke Avenue intersects with County Route 58 at a 4-leg traffic circle that is a familiar sight for both locals and visitors. During peak times, considerable congestion occurs at the traffic signal. The AADT on Roanoke Avenue south of Route 58 is 8,700 VPD, and north of Route 58, the AADT is 10,300 VPD.

Swan Pond Road—River Road

Swan Pond Road is a 2-lane east-west roadway that extends from Wading River-Manorville Road to River Road. All 2.25 miles of Swan Pond Road is within Riverhead. River Road is a 2-lane east-west roadway that extends from Old River Road to NYS Route 25. All 5.0 miles of River Road is within the Town of Riverhead. Swan Pond Road intersects River Road to the south of the EPC site. Swan Pond Road then continues to the east as River Road.

In the 1997 Final Environmental Impact Study (FEIS) for EPC redevelopment, Swan Pond Road combined with River Road is referred to as Grumman Boulevard. Grumman Boulevard will be the major roadway that runs along the southern frontage of EPC. No AADT information is available for Swan Pond Road-River Road.

Wading River-Manorville Road

Wading River-Manorville Road is a 2-lane north-south roadway that extends from River Road to North Country Road. All approximately 4.0 miles of Wading River-Manorville Road is within Riverhead. Wading River-Manorville Road will be the major roadway that runs along the western frontage of EPC. No AADT information is available for Wading River-Manorville Road.

Edwards Avenue

Edwards Avenue is a 2-lane north-south roadway that extends from the LIE to Silver Beach Lane. Approximately 4.0 miles of Edwards Avenue is within Riverhead. Edwards Avenue is approximately 1.25 miles east of the proposed EPC. It is expected that a significant number of travelers will use Edwards Avenue to access new development. Due to increased traffic volume on the roadway, Edwards Avenue will need to be widened, and the intersection of Edwards Avenue and Sound Avenue improved.

Doctors Path

Doctors Path is a 2-lane north-south roadway that extends from NYS Route 25 to Sound Avenue. All approximately 2.3 miles of Doctors Path lies within Riverhead. Middle Road intersects Doctors Path about 125 feet north of Route 25. Route 58 intersects Route 25 about 250 feet west of Doctors Path. Four busy roadways, therefore, meet in very close proximity to each other. The odd geometric configuration of this area combined with high traffic volumes makes certain lane changes and turning movements very difficult. Construction to improve the intersection of these roadways has recently been completed. No AADT information is available for Doctor's Path.

G.2 LONG ISLAND RAILROAD

The Long Island Rail Road (LIRR), a subsidiary of the Metropolitan Transit Authority, provides passenger rail service to Suffolk County, Nassau County, Queens, Brooklyn, and Manhattan. A map of the LIRR is shown in Figure G-1. At major transit hubs in Nassau County and the New York City area, LIRR passengers can transfer to Long Island buses, New York City buses, or the New York City subway. At Penn Station, LIRR passengers can also transfer to Metro North Railroad or the New Jersey PATH trains. Commuters between Long Island and the New York City area often choose to take the LIRR rather than travel by automobile.

The train station in downtown Riverhead is the only LIRR station in Riverhead. It is on the Ronkonkoma (Main) Branch of the LIRR and is located on Railroad Street between Osborn Avenue and Griffing Avenue. The station recently restored by LIRR as part of an historic restoration project. On weekdays, four westbound and three eastbound trains service the Town of Riverhead. On weekends, two westbound and two eastbound trains service the Town of Riverhead.

Because of its distance from New York City and major employment centers in the west, as well as its relatively small population, there are not as many long distance commuters from Riverhead as there are from Nassau County and other areas of Suffolk County. There is, therefore, not as high a demand for the LIRR in Riverhead as there is in some areas.

The LIRR is predominantly a commuter railroad. Information contained in the LIRR's East End Transportation Study indicates that 64 percent of total ridership consists of commuters who ride the railroad daily. Furthermore, station counts performed for that study indicated that only 18 passengers boarded westbound LIRR trains during the weekday AM peak at all the North Fork stations combined (Riverhead, Mattituck, Southold and Greenport), while more than 6,000 boarded at Ronkonkoma alone. Infrequent service no doubt contributes to the low ridership levels, but it is not likely that a significant number of new riders would materialize no matter what the frequency of service.

At the public meetings held for this study, residents of Riverhead did express a desire for more frequent trains and better scheduling of trains than currently exists. The train schedule

is also so infrequent that many passengers cannot make the trips that they desire. For passengers traveling between Riverhead and New York City on the weekends, the schedule is such that it is not possible to travel round-trip on the LIRR in a single day.

Even if demand were to increase to the point where the LIRR felt it was worthwhile to provide additional service to Riverhead, there are basic constraints on the infrastructure that make it difficult and costly to do so. According to the LIRR's East End Transportation Study, the main line of the LIRR east of Ronkonkoma has only a single track. Passing sidings, where provided, are equipped with hand-thrown switches, instead of remote controlled switches found elsewhere on the system. In addition, there is no signal system, a condition referred to as "dark territory".

Figure G-1: Long Island Rail Road

Back of Figure G-1.

In dark territory, train control depends on verbal communication and written authorization between train crews and dispatchers. These situations combine to make it extremely difficult to run more than one train at a time on the single-track portion of the railroad, especially in opposite directions.

However, the LIRR is planning improvements to the system. The improvements include the planned implementation of a Communications Based Train Control (CBTC) signal system, which, if successful, will allow for much more efficient train movements. In addition, the railroad has plans to install power-operated switches, controlled from a central location. Pilot implementation of the CBTC system is included in the railroad's 2000-2004 capital program, as is the beginning of the installation of the power switches.

On the part of Riverhead Town, it is recommended that the Town implement measures that will support and encourage use of the railroad. The Town has been awarded funding to develop a transportation center in the area between Court Street and Railroad Street, east of Osborn Avenue. Conceptual plans for this center provide increased parking for the railroad station and the expanded County Court facilities, a place for bus stops and shelters as a source of real time information regarding conditions on the transportation system, perhaps through an electronic link to the NYSDOT's INFORM system and other sources of data.

The success of the Tanger Mall has led to some discussion of the construction of a new train station near the center. Construction of a new train station is an extremely expensive and time-consuming process. In addition to station costs, infrastructure such as access roads and parking lots would also have to be provided. In light of the needs of the rest of the LIRR system, it is highly unlikely that this concept would be given any consideration. Furthermore, it is questionable as to what level of ridership could be expected. Instead, the Town should seek to provide bus service between the downtown transportation center and Tanger Mall. A description of the recommended service is provided in Section G.3.

G.3 SUFFOLK COUNTY TRANSIT SYSTEM

Suffolk County Transit (SCT) provides public bus service Countywide. The six SCT bus routes that run through the Town of Riverhead are described below.

- The *S-8A* is the Calverton-Riverhead-Suffolk County Community College (SCCC) route. It runs between Calverton Hills and SCCC East. Stops along this route include Central Suffolk Hospital, downtown Riverhead, and Riverhead County Center. The bus operates on hourly headways, that is the time between buses is one hour. The most recent weekly ridership data available from Suffolk County Transit is for 1999. Weekly ridership on the *S-8A* in 1999 was 770 persons.
- The *S-58*, is the downtown-Route 58-Smith Haven Mall route. It serves East Northport, Smithtown, Selden, Coram, Calverton, and Riverhead. Major stops include Huntington Square Mall, Mayfair Shopping Center, Smithtown Station

(LIRR), Smith Haven Mall, Splish Splash, Tanger Mall, Riverhead Station, and the County Courthouse. The bus operates on hourly headways.

- The *S-62* is the Hauppauge-Smith Haven Mall-Riverhead route. It runs between Hauppauge Industrial Complex and Riverhead County Center. Stops along this route include the government offices in Hauppauge, Smith Haven Mall, and Tanger Factory Outlet Center. Headways are hourly. Weekly ridership in 1999 was 2,215 persons.
- The *S-66* is the Patchogue-Center Moriches-Riverhead route. It runs between the Patchogue railroad station and Riverhead County Center. Stops along this route include Bellport, Shirley, Mastic, and Center Moriches. Headways are hourly. Weekly ridership for this route was not available.
- The *S-90* is the Center Moriches-Riverhead route. It runs between the Center Moriches railroad station and Riverhead County Center. Stops along this route include Eastport, Speonk, Westhampton, and Quogue. Two buses are provided in the AM, approximately 2 hours apart, one during the midday and 3 during the afternoon, again at approximate 2-hour headways. Weekly ridership in 1999 was 449 persons.
- The *S-92* is the Orient Point-East Hampton route. It runs between the Orient Point ferry dock and the East Hampton railroad station. Stops along this route include Greenport, Mattituck, downtown Riverhead, Riverhead County Center, and Sag Harbor. Headways are hourly. Weekly ridership in 1999 was 3,653 persons.

Maps and schedules for each of these routes are presented in Figures G-2 through G-11, except for Route S-58, for which a map and schedule are not available.

Suffolk County Accessible Transportation (SCAT) provides permanently or temporarily disabled passengers curb-to-curb public bus service to any location within 0.75 miles of a Suffolk County public bus route. SCAT also provides rides to the companions and personal care attendants of disabled passengers. Reservations must be made one to seven days in advance of the trip by calling the Reservation Office at (631) 491-6500. Both SCT and SCAT operate Monday through Friday, 6:00 AM to 8:30 PM, and Saturday, 7:00 AM to 8:30 PM.

The minimum headway on any route is one hour. During the public outreach effort undertaken for the Master Plan, the long wait between buses was second only to insufficient routes as the reason given for not using bus service. Similar sentiment was expressed in the survey performed for the NYSDOT's North Fork Study.

G.4 BICYCLE AND PEDESTRIAN FACILITIES

Pedestrian and bicycle circulation in Riverhead is limited by a lack of continuous and safe routes. Sidewalks in Riverhead are numerous; however, the only location in which pedestrian traffic is significant is in the downtown area where the sidewalks provided are narrower than

desirable. Bicycle routes in Riverhead are essentially non-existent. The only official bicycle route in the Town is 2 miles of unpaved path in Wildwood State Park.

A map of unofficial bicycle route designations is provided in *Your Guide to Long Island Bikeways*. Although this is a NYSDOT publication, designations shown are the unapproved recommendations of local bicyclists. The New York Metropolitan Transportation Council (NYMTC) provides a map of existing and proposed bike routes in their Regional Transportation Plan.

Plans have been made to improve sidewalks and pedestrian paths in downtown Riverhead. In Grangebel Park, pedestrian paths will be lighted so that safety in the area is improved. No plans have been made to improve existing bicycle facilities in Riverhead. Until roadways are widened to allow for bicycle lanes or until exclusive paths for bicycles are built, travel by bicycle will not be a safe and viable alternative to travel by automobile.

Importantly, NYMTC has recently issued a Request for Proposals (RFP) for the Long Island Non-Motorized Transportation Study, the purpose of which is to develop a comprehensive master plan for existing and proposed non-motorized transportation facilities on Long Island. This plan is to identify and prioritize programs that should be completed in the region that would support pedestrian travel, bicycling, and other non-motorized modes as alternatives and complements to vehicular modes.

G.5 AIR TRAVEL

Riverhead Airpark, which serves mostly private planes, is the only functioning airport in Riverhead. It is located at the intersection of Sound Avenue and County Route 105. Long Island MacArthur Airport (Islip) is the closest airport to the Town of Riverhead that provides passenger service. Islip is located in the Town of Islip in Suffolk County. Kennedy International Airport (JFK) and La Guardia Airport also provide passenger service. Both of these airports are located in Queens County on the western end of Long Island. In the future, it is possible that EPC may re-open some of the airport facilities that currently lay idle there.

G.6 ACCESS MANAGEMENT & TRAFFIC CALMING

ACCESS MANAGEMENT

Access management has been defined as the coordination of access to land and traffic flow, or the practice of optimizing access to land uses while preserving the capacity and safety of traffic on the surrounding roadway network. Roadways perform the dual role of providing access to abutting properties and accommodating through travel. It is important that these roles be balanced and maintained, in that traffic congestion can result when poorly planned development and improperly located driveways cause operations to degrade.

Typically, a well-designed access management plan includes the classification of roadways into various levels of access control. Stricter standards are applied to major streets while local streets have more flexible requirements. In a statewide access management plan, there might be seven levels in the roadway hierarchy: freeway, expressway, strategic arterial, principal arterial, secondary arterial, collector, and local street. Urban areas may have five layers, while rural areas with low traffic volume might allow for three or four. Major streets should serve through traffic, while collector and local roads provide access to property.

Access management on major State and County roadways falls under the purview of those municipalities. However, the Town governments play an important role in how those roadways operate, though their review of site plans under the SEQRA process and the establishment of zoning ordinances. Typically, the State or County cannot deny access to an uncontrolled arterial if it is the sole possible access point to the property.

TRAFFIC CALMING

The concept and practice of traffic calming is known by a number of names across the U.S., including neighborhood traffic management, traffic abatement, and traffic mitigation. Regardless of what it is called, the objective remains the same, namely to reduce the speed and volume of traffic to acceptable levels for the nature and function of the street and bordering activity. The Institute of Transportation Engineers (ITE) defines traffic calming as “the combination of mainly physical measures that reduces the negative effects of motor vehicle use, alters driver behavior, and improves conditions for non-motorized street users.” In addition, ITE states that traffic-calming devices are intended to be self-enforcing, that is, as opposed to devices that are regulatory in nature, such as STOP signs and speed limit signs.

Traffic calming in its varied guises has been implemented in a large number of communities throughout the United States, and even the world. Contrary to what some advocates profess, it has met with mixed success. However, the specific device or strategy implemented usually has precisely the effect on traffic speeds or driver behavior that was intended.

The perceived lack of success of some of the programs has more to do with the expectations of the public rather than the effectiveness of the strategy deployed. A local neighborhood street that is experiencing increased traffic volumes due to vehicles seeking to circumvent congestion on a major roadway will not see reductions in traffic volumes unless the travel time on the short-cut route can be increased to the extent that it is no longer worthwhile taking. This often involves drastic reductions in vehicle speeds, only rarely achievable through self-enforcing traffic calming strategies. Active enforcement of low speed limits is expensive and unrealistic in most communities.

Implementation of unsuccessful projects is not only wasteful of funds, but they undermine the public’s confidence in the usefulness of the entire body of techniques for neighborhood traffic management. Therefore, the most important component of a traffic calming policy is that which educates the public as to expectations for the impacts of the various traffic calming techniques on the targeted behavior. Equally important, the most effective traffic

management strategy is the availability of adequate capacity on the appropriate facility. It is the lack of such capacity that results in the short cutting behavior described previously. The following sections describe the various traffic calming techniques available and provide a discussion of their benefits and drawbacks.

Traffic Circles

Traffic circles are small circular islands located in the center of existing intersections. No other modifications are usually made to the intersection configuration. Typically, traffic circles help in reducing the number of turning and angle collisions and also cause drivers to slow down near the intersection. However, speeds in the middle of the block may increase as some drivers try to make up for time lost going around the traffic circle.

Advantages

- Effectively reduces vehicle speeds at intersection.
- Improves safety conditions.
- Can be visually attractive.

Disadvantages

- Adds a potential hazard to the middle of the roadway.
- Can cause bicycle/vehicle conflicts at intersections due to narrowed travel lanes.
- Can restrict emergency or transit vehicle movement if vehicles are parked illegally near the circle.
- Can increase emergency vehicle response times.

Roundabouts

Roundabouts guide traffic with a raised island built in the center of an intersection to create a one-way circular flow of traffic. A roundabout is placed in an intersection to prevent vehicles from traveling in a straight line. This device is very successful in reducing crash frequency by reducing the number of conflict points and lowering the travel speeds.

Although they are very similar to the traffic circle, vehicles must yield at all entry points to the traffic that is already within the roundabout. The roundabout usually has tapered approaches while the traffic circle does not. The roundabout guides vehicles into the circle in a more efficient manner than the traffic circle.

In roundabouts, the speed at which a vehicle is able to negotiate the circulating roadway is controlled by the location of the central island with respect to the alignment of the entry curb and its size. Traffic circles are designed for higher speeds within the circulating roadway. Also, roundabouts have raised splitter islands on all approaches. These islands are a safety feature separating traffic moving in opposite directions and provide refuge for pedestrians.

Advantages

- Can noticeably reduce speeds.
- Reduces accident potential.
- Reduces the number of conflict points at an intersection.
- Provides an orderly and continuous flow of traffic.
- Clarifies priority and simplify decision-making.
- Increases conspicuity at the intersection.
- Provides landscaping opportunities within circle.

Disadvantages

- Requires a relatively large right-of-way.
- May be restrictive for some larger service and emergency vehicles unless mountable.
- May lose some aesthetic quality due to required safety signing.
- Requires pedestrians and bicyclists to adjust to less traditional crossing patterns.
- May increase accidents until drivers become accustomed to change.
- Requires additional maintenance if landscaped.

Chicanes

Chicanes are devices that alter the linear progression of a vehicle so that the driver must change paths in order to avoid an obstacle. This horizontal alignment change is accomplished by constructing the edge of the travel lane, typically curb extensions, laterally into the initial centerline of the roadway. The alignment change forces a driver around the lateral obstruction at a slower speed. A method of installing chicanes is to have a series of reverse curves along an otherwise straight roadway. Chicanes are typically staggered on opposite sides of the street. They are more effective when used in pairs and placed approximately 500 feet apart.

Advantages

- Can reduce speeds at the chicane location.
- Can reduce speeds on the entire street length if used in series.
- Can be installed for aesthetic purposes.
- Can improve pedestrian safety.

Disadvantages

- May be restrictive for emergency and service vehicles.
- Creates crash potential for drivers.

- Violates driver expectancy if used in isolation.
- Can force encroachment into opposing lane due to carelessly parked vehicles.

Roadway Narrowing

Geometric features such as curbs may be used to narrow a roadway. Modifications of traffic control materials (pavement striping or buttons) can be used to effectively reduce the roadway width. Roadway narrowing techniques are different than chicanes in that the roadway cross-section generally remains constant for a continuous length of the roadway. Adding wider pavement markings, pavement buttons, bike lanes, parking areas, tree planters, or painted or raised medians may narrow lanes.

Advantages

- Provides continuous, visual channelization.
- Can be quickly implemented, depending upon the technique used.
- Creates shorter pedestrian crossing distances.
- Does not negatively affect emergency response times.

Disadvantages

- Requires regular maintenance of narrowing techniques.
- May be unfriendly to cyclists unless appropriately designed.

Speed Tables, Raised Intersections, and Speed Cushions

Vertical changes in roadway surface reduce the speed of vehicles traveling over them. As drivers approach the raised surface, their reaction is to slow down until they have passed over the vertical change. Such vertical changes include speed tables, raised intersections, and speed cushions. Speed tables are elevated plateaus in the roadway with a descending ramp on each side. They may be constructed of asphalt pavers or tiles and placed at intersections or midblock. Typically, speed tables have a 6-foot parabolic approach transition rising to 3 to 4 inches above the existing pavement surface. The flat section of the table is 10 to 12 feet wide. Each speed table extends across the entire width of the roadway.

Raised intersections elevate the entire intersection above street grade to reinforce the character of the area. Raised intersections are used more frequently in commercial areas with high pedestrian volumes, and they are typically constructed of bricks, pavers, or other textured material to draw attention and provide a change in roadway surface. The plateaus are generally 4 inches higher than the surrounding pavement.

Speed cushions cover only a portion of a traffic lane and are designed to limit the vertical deflection of vehicles with wide track widths by allowing these vehicles to straddle the cushions. Vertical deflection for vehicles with smaller track widths is maintained as these

vehicles are forced to ride over the cushions with at least one set of wheels. Speed cushions may be constructed of asphalt, rubber, brick pavers, or concrete.

Advantages

- Reduce speeds.
- Draw attention to intersection and pedestrian areas.
- Can be used on both high and low volume streets.
- Can be aesthetically pleasing.

Disadvantages

- May effect emergency vehicle response times.
- Require additional signage and driver education.

Speed Humps

A speed hump is a raised area in the roadway pavement surface extending transversely across the travel way, perpendicular to the traffic flow. The humps are constructed of paving materials to the height and width specified by local standards. Speed humps are typically installed in a series of at least two humps, spaced at a minimum interval to provide continuity in speed reduction. When designed and installed with proper planning and engineering review, speed humps have generally been found to be effective at reducing vehicle speeds without increasing accident rates. Speed humps have the advantage of being largely self-enforcing and of creating a visual impression that a street is not intended for speeding. The extent to which a series of speed humps will reduce the speed on a particular street is effected by several factors, including the space between humps, the individual driver's perception of comfort, and the type of vehicle being driven. The greatest effect by speed bumps is on drivers exceeding the posted speed limit by more than 10 mph. The trade-off is that they affect all drivers, even those drivers who obey the speed limit. Longer and heavier vehicles such as buses, garbage trucks, and larger fire vehicles will need to slow down over speed humps more than automobiles. Also, there may be an increase in noise when these larger vehicles travel over the speed humps.

Typically, speed humps are 3 to 4 inches high and are approximately 12 to 14 feet wide (longer than the wheelbase of an automobile). Some are rounded so that the highest point is only at the center of the hump, while some humps are square in shape. In either case, speed humps should be constructed so that there is a smooth transition for vehicles traveling at the posted speed.

Within typical residential speed ranges, humps create a gentle vehicle rocking motion that causes some driver discomfort and results in most vehicles slowing to 15 miles per hour or less at each hump and to accelerating to 25 to 30 miles per hour between properly placed

humps in a system. At high speeds, the hump can act as a bump and jolt the vehicle's suspension and its occupants or cargo. Speed humps, generally, have a continuous effect on vehicle speeds if spaced 250 to 800 feet apart. If spacing exceeds 800 feet, speed reduction occurs only at the hump itself.

Advantages

- Reduce speed.
- Do not affect intersection operations.

Disadvantages

- Can slow emergency vehicles and affect emergency response times.
- Can shift vehicle contents.
- May increase noise levels from braking and acceleration at speed humps.
- May increase noise levels from the vehicles themselves.

Rumble Strips

Rumble strips can be treatments on top of the pavement surface including asphalt strips, patterned sections of rough pavement, traffic buttons or dots glued to the pavement, brick paving blocks, or layers of thermoplastic striping material. Rumble strips may also be installed by making grooves in the pavement. To be effective in slowing traffic, rumble strips are placed in groups of 6 to 8 at each location.

Advantages

- May reduce speeds up to 5 mph.
- Creates driver awareness to increase safety.
- Are inexpensive to install and may be removed or changed as necessary when created with thermoplastic materials.

Disadvantages

- May adversely impact bicyclists.
- Are noisy by design and may not be appropriate for neighborhood setting.

While not technically considered traffic calming in the specific definition, since they are not self-enforcing, enforcement techniques are discussed here because they are often considered together.

Conventional Enforcement

Increased enforcement involves use of public safety or police personnel to reduce speeds, using radar and ticketing of violators. Speeds can be appreciably reduced, but usually only as long as enforcement is present. While speeds are reduced, accidents are lower and safety is improved. In order to be effective, enforcement must be long term, which results in high cost for personnel and equipment.

Advantages

- Speeds are reduced.
- Driver awareness increased.
- Safety is improved.

Disadvantages

- Periodic enforcement required to be effective.
- Expensive.

Speed Trailers

Speed trailers, also known as speed display boards or mobile radar trailers, were developed in the 1980's. They use radar to measure the speed of passing vehicles and record and display the speeds to drivers. In some cases, speed trailers are used in conjunction with police officers for enforcement. However, they are mainly used for informational purposes to encourage motorists to voluntarily reduce speeds.

Speed trailers have been shown to be effective in reducing speeds downstream of the trailer. However, after removal, little residual effect is achieved. Used in conjunction with enforcement, a California study demonstrated a carryover alongside and downstream of the trailer for one week after removal of the device. Speeds were reduced by 10 percent alongside and 7 percent downstream of the device.

Advantages

- Public becomes more aware of posted and excessive speeds in given locations.
- May result in increased safety.
- Easily moved from one location to another.
- Good for educational and public relations purposes.

Disadvantages

- Not effective in reducing speeds after removal of the device.

- Limited effect when not combined with automated or conventional enforcement.
- Not practical for multi-lane roadways.

Automated Enforcement

Automated enforcement is traffic law enforcement via the monitoring of vehicles and the later ticketing of vehicle drivers or owners. Vehicles are spotted with radar. A processing unit determines whether the driver of the vehicle has violated a traffic law, and if a violation has occurred, a camera photographs the license plate of the vehicle and/or the driver of the vehicle. The violation is then documented and a ticket sent to the violator by mail. It should be noted that New York State does not at present have statutes in place that would allow for the employment of automated speed limit enforcement.

Automated enforcement is most commonly used to ticket drivers who travel above the speed limit or who run red lights. It allows the police department or enforcing agency to catch traffic law violators without the presence of a policeman and without the inconvenience of pulling a violator off onto the side of the road to issue him a ticket. Enforcing traffic laws by photographing the violation enables the enforcing agency to catch over six times as many violators as police enforcement.

Research indicates that automated enforcement is most effective at reducing the number of vehicles that speed when at least 15 percent of the speeding vehicles travel 10 mph or more above the speed limit. This is the case along Waterside Road. When the percentage of vehicles exceeding the speed limit is not at least 15 percent, automated enforcement only decreases the average and 85th percentile speeds by a few mph. At the location of the radar, the overall speeds of vehicles decrease by about 5 mph. Downstream, the speeds of vehicles decrease by 4 mph.

Advantages

- Detecting and recording information about a large number of speeders
- Reducing the number of police pursuits and resulting confrontations
- Improving traffic flow by reducing rubbernecking at the ticketing site
- Making law enforcement officer time more efficient
- Providing enforcement in areas where roadway geometry makes it difficult
- Increasing traffic safety by reducing accidents and fatalities
- Targeting speeders objectively

Disadvantages

- The violator caught on film is essentially guilty until proven innocent
- Impaired drivers or unsafe vehicles remain on the road because no traffic stop is made

- The violator may forget the details of the event due to the lag time between processing the photo and issuing the citation
- An officer cannot give discretion for an emergency situation
- May be a less effective learning tool than if the violator were stopped and given a citation immediately
- May be considered an invasion of privacy by some citizens
- People who purposely fail to register their vehicle cannot be sanctioned by this system.⁷¹

⁷¹ Texas Transportation Institute, *Handbook of Speed Management Techniques*.

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