

CHAPTER 4 INFRASTRUCTURE: RETROFITTING NASSAU

POLICY 4: IMPROVE TRANSPORTATION INFRASTRUCTURE AND ENCOURAGE ALTERNATIVES TO AUTO DEPENDENCY

POLICY 5: REDUCE COSTS TO RESIDENTS, BUSINESSES AND COUNTY GOVERNMENT THROUGH ENERGY CONSERVATION, AND RENEWABLE ENERGY PRODUCTION

YEAR 2030 GOALS

TRANSPORTATION ALTERNATIVES AND INCREASING THE PEOPLE-CARRYING CAPACITY OF COUNTY ROADWAYS

- INCORPORATE ELEMENTS OF BUS-RAPID TRANSIT (BRT) ON COUNTY ROADWAYS
- INCREASE NORTH-SOUTH TRANSIT CONNECTIVITY
- INCORPORATE BICYCLE INFRASTRUCTURE ON ROADWAYS TO CONNECT TRANSIT HUBS WITH EMPLOYMENT CENTERS, PARKS AND RECREATION, AND RESIDENTIAL NEIGHBORHOOD

COUNTY GOVERNMENT

- INCREASE THE ENERGY EFFICIENCY OF COUNTY FACILITIES AND INFRASTRUCTURE, AND INSTALL RENEWABLE ENERGY GENERATORS WHERE APPROPRIATE
- ADOPT MODEL ZONING ORDINANCE FOR THE PERMITTING AND INSTALLATION OF PRIVATE RESIDENTIAL/COMMERCIAL ENERGY EFFICIENCY UPGRADES AND RENEWABLE ENERGY GENERATORS

Nassau's infrastructure is the foundation that underpins its economy. Sound transportation, energy and school systems are essential to achieving this Master Plan's overarching goal of reducing property taxes. While these systems have long served the County in their current form, in order for Nassau to remain competitive in the 21st century they must evolve to address pressing economic, environmental and educational needs. Addressing traffic congestion and providing alternatives to auto dependency, reducing dependence on non-renewable energy sources, is essential to reducing costs to county residents and making Nassau a sustainable suburban County for this and future generations.

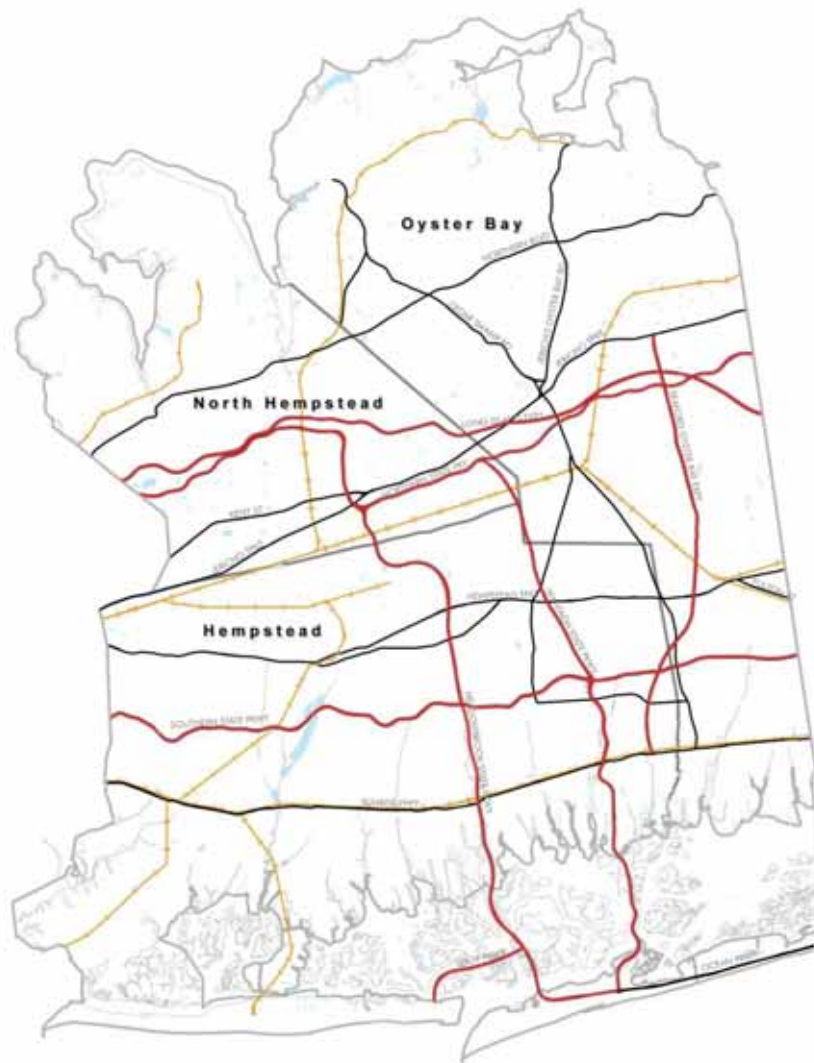
A. EXISTING CONDITIONS

1. TRANSPORTATION

Today Nassau County's roadway system consists of over 4,000 miles of paved roads including parkways, highways, major arteries, and collector and local streets which are operated and maintained by different levels of government (see Figure 4-1). The eight (8) major east-west roadways that provide direct

through service to New York City and Suffolk County include: Northern Boulevard (NY 25A), the Long Island Expressway (I-495), Northern State Parkway, Jericho Turnpike (NY 25), Hempstead Turnpike (NY 24), Southern State Parkway, and Sunrise Highway (NY 27). North-south roadways in the County are more limited. The Cross Island Parkway (immediately east of the County line and mostly in Queens), Meadowbrook State, and Wantagh State Parkways and the Seaford-Oyster Bay Expressway represent the major north-south limited access highways. State Routes 106 and 107, in the eastern part of the County, are major arterials which also provide this service.

Figure 4-1
Nassau County's Transportation Network



Source: BFJ Planning

According to the US Census Bureau's American Community Survey (2005-2007), 76 percent of Nassau County residents rely on vehicular transportation for their journey to work, and 16 percent rely on mass transit (see Table 4-1). Of those taking mass transit to work, only 3.6 percent of commuters take the bus and approximately 11 percent commute by train. Approximately 3 percent walk or bike to work. As

shown on Table 4-2, approximately 59 percent of Nassau residents commute to jobs within the County and 40 percent commute to jobs outside the county. Approximately 1 percent of residents commute to jobs outside of the state.

[Pull Quote: According to the US Census 76 percent of Nassau County residents rely on vehicular transportation to get to work]

Table 4-1
Nassau County: Means of Transportation to Work

| | 1990 | 2000 | 2005-2007 |
|--------------------|--------|--------|-----------|
| Car, Truck, or Van | 77.54% | 77.94% | 76.29% |
| Bus | 2.55% | 2.57% | 3.56% |
| Railroad | 11.97% | 11.79% | 10.72% |
| Subway | 1.13% | 1.07% | 2.05% |
| Work at Home | 2.52% | 2.97% | 3.20% |
| Walk | 3.38% | 2.71% | 2.81% |
| Bicycle | 0.22% | 0.22% | 0.29% |
| *Other | 0.69% | 0.73% | 1.06% |

Source: US Census, 2000; American Community Survey, 2005-2007

**Other includes streetcar, ferry, taxi and motorcycle*

Table 4-2
Nassau County: Place of Work

| Workers | 1990 | 2000 | 2008 |
|---|--------|--------|-------|
| Worked in county of residence | 59.51% | 58.05% | 58.74 |
| Worked in NY, outside county of residence | 39.21% | 40.72% | 39.84 |
| Worked outside state of residence | 1.28% | 1.22% | 1.42% |

Source: US Census, 2000; American Community Survey, 2008

The New York Metropolitan Transportation Council (NYMTC) is the metropolitan planning organization (MPO) for the New York City metropolitan area. It addresses transportation-related issues from a regional perspective and makes decisions on the use of federal transportation funds. NYMTC is responsible for assembling the region's Transportation Improvement Program (TIP), which is a five-year program that identifies all proposed federally funded transportation improvement projects in the NYMTC region, including roadways and bridges, bicycle and pedestrian facilities, transit equipment and services, safety improvements and demand management programs.

NYMTC also maintains a regional transportation model that is used to document existing areas of congestion, project the effects of proposed improvements contained in the TIP, and design and implement

a Congestion Management System. The last Congestion Management System report was prepared in 2005.

[Pull Quote: “Nassau County is one of the worst performers in the region in terms of virtually any congestion statistic”]

Traffic Congestion

As shown in Table 4-3, Nassau County is one of the worst performers in the region in terms of virtually all congestion statistics. While vehicle miles of travel (VMT) for the region is expected to grow from approximately 130 million miles per typical weekday to approximately 142 million in the 2005 – 2030 period, VMT for Nassau County is expected to grow only slightly during this period.

**Table 4-3
 Summary of Congestion Performance Measures for 2005**

| County | TTI | | RCI | Lane Miles of Congestion | | % of Total Lane Miles Congested | | Total VHD | VMT | PHD | Daily PHD/ Capita |
|-------------------------|-------------|-------------|-------------|--------------------------|---------------|---------------------------------|-------------|------------------|--------------------|---------------------|-------------------|
| | AM | PM | | AM | PM | AM | PM | | | | |
| NYC Counties | | | | | | | | | | | |
| New York | 1.54 | 1.48 | 1.17 | 200.4 | 282.0 | 18.6 | 26.2 | 143,855 | 8,687,000 | 212,949.80 | 0.13 |
| Queens | 1.47 | 1.75 | 1.28 | 346.3 | 655.9 | 17.7 | 33.4 | 227,575 | 18,697,000 | 336,811.00 | 0.15 |
| Bronx | 1.21 | 1.41 | 1.05 | 81.9 | 170.3 | 7.4 | 15.3 | 46,491 | 7,317,000 | 68,806.68 | 0.05 |
| Kings | 1.38 | 1.68 | 1.20 | 219.0 | 504.3 | 15.3 | 35.2 | 151,918 | 10,984,000 | 224,838.64 | 0.09 |
| Richmond | 1.43 | 1.52 | 1.11 | 78.4 | 88.8 | 13.1 | 14.8 | 35,553 | 4,494,000 | 52,618.44 | 0.11 |
| Non-NYC Counties | | | | | | | | | | | |
| Nassau | 1.48 | 1.73 | 1.26 | 418.7 | 987.8 | 15.4 | 36.4 | 288,801 | 23,870,000 | 505,401.75 | 0.37 |
| Suffolk | 1.23 | 1.50 | 1.08 | 324.6 | 874.0 | 8.0 | 21.5 | 192,524 | 29,085,000 | 336,917.00 | 0.23 |
| Westchester | 1.21 | 1.23 | 0.93 | 235.9 | 323.2 | 8.6 | 11.8 | 63,322 | 18,328,000 | 91,183.68 | 0.09 |
| Rockland | 1.19 | 1.23 | 1.01 | 55.0 | 92.9 | 6.2 | 10.4 | 186,968 | 6,156,000 | 27,313.92 | 0.09 |
| Putnam | 1.08 | 1.08 | 0.72 | 9.5 | 6.7 | 1.4 | 1.0 | 2,994 | 2,443,000 | 4,311.36 | 0.04 |
| Region | 1.36 | 1.55 | 1.09 | 1969.4 | 3985.8 | 11.4 | 23.1 | 1,172,031 | 130,061,000 | 1,861,152.27 | 0.15 |

Source: NYMTC CMS 2005 Status Report, Table 5-4 (edited)

Abbreviations:
 TTI: Travel Time Index
 RCI: Roadway Congestions Index
 VHD: Vehicle Hours of Delay
 VMT: Vehicle Miles of Travel
 PHD: Person Hours of Delay

The 2005 Travel Time Index (TTI), also shown in Table 4-3, describes the flow of traffic during peak periods. This index reveals that Nassau County's peak period traffic is the worst of all the state's metropolitan area counties outside of New York City. Projections to 2030 continue to rank Nassau County as the most traffic constrained of all the counties outside NYC. The TTI is important because it is an indicator of how much time it will take a driver to travel a certain distance during the peak period.

Another important NYMTC congestion performance indicator is the Roadway Congestion Index (RCI). The RCI is an indicator of both intensity and duration of congestion on major roadways (both freeways and arterials). It measures traffic conditions according to the amount of travel on each type of roadway. An RCI equal to or greater than 1.0 indicates that congested conditions exist area-wide; an RCI less than 1.0 indicates that congestion is not a major problem. In 2005, the RCI for Nassau County was 1.26, worse than any other county in the region other than Queens.

Together all of these statistics demonstrate that Nassau's traffic congestion is the worst in the NYMTC region. In terms of (freeway and arterial) lane miles experiencing recurring congestion, the NYMTC study estimates that congestion will increase from 36.4 percent of lane miles in 2005 to 42.5 percent by 2030.

The NYMTC modeling process models "recurring" delays, or those caused by "bottlenecks" in the existing roadway network. However, additional congestion is caused by "non-recurring delays such as accidents, construction, weather conditions, special events, or other periodic or less predictable occurrences. In the NY Metropolitan area, non-recurring delays account for roughly two-thirds of total congestion according to the 2005 Urban Mobility Report by the Texas Transportation Institute. Hence, while it is important to address recurring causes of congestion, it is equally important to institute measures aimed at addressing the non-recurring causes. New York State does not have driver stop laws (mandates drivers must stop their vehicle near scene of accident but outside of traveled lanes if possible), driver removal laws (driver must move vehicle out of travel lanes if accident occurred there, if vehicle can be moved), or an authority removal law (authorizes a predetermined authority or authority designee to clear vehicles from travel lanes with no liability, which may also include spilled cargo). Such laws would help minimize the delays caused by accidents.

[Pull Quote: In the NY Metropolitan area, non-recurring delays such as accidents, construction, weather conditions and special events account for roughly two-thirds of total congestion- Texas Transportation Institute Urban Mobility Report, 2005.]

Freight

Only three percent of all the freight in the downstate or "East of Hudson" New York region is shipped by rail; the balance is shipped by truck. Rail freight service on Long Island is operated by the New York & Atlantic Railway on Long Island Rail Road tracks, with an annual volume of 20,000 carloads. Currently, only about one percent of freight tonnage on Long Island is handled by rail, while the comparable national figure is about 15 percent. The LIE is the only limited access freight route on Long Island.

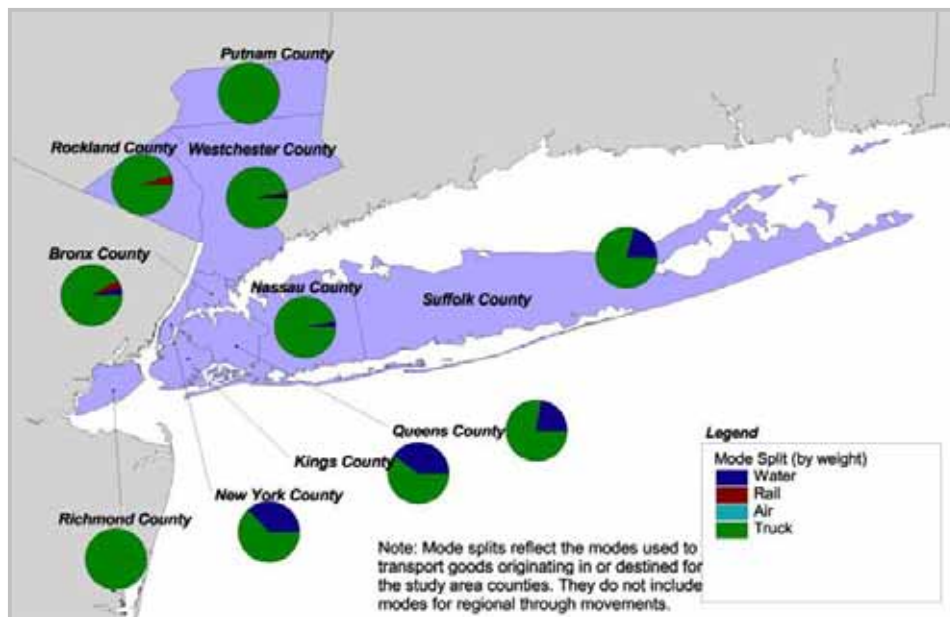
Sunrise Highway is also an important arterial for freight movement. According to NYMTC’s most recent freight data, 28.8 million tons of freight entered, moved within, and left Nassau County in 1998. Of that total, about 97 percent was transported by truck, and the remainder by water and rail.

[Pull Quote: “Only three percent of all the freight in the downstate or “East of Hudson” New York region is shipped by rail. Freight movement on Long Island is handled almost exclusively by truck.”]

As shown in Figure 4-2, north-south freight movement by rail and water east of the Hudson River is limited. Trucking is the dominant freight mode across the region. Because very little freight moves by rail on Long Island, freight trucks must use the LIE and Sunrise Highway for east-west freight movements, contributing to traffic congestion on these roadways. Currently there is a proposal to construct the Long Island Truck Rail Intermodal Facility (LITRIM) on approximately 117 acres at the site of the former Pilgrim State Hospital in the Town of Islip, Suffolk County. Construction of LITRIM would permit the shipment of goods by train to the site where containers would be off-loaded and transferred to trucks for local delivery. This would reduce the number of the trucks on Nassau’s major roadways. Potential environmental and local impacts warrant further study.

Construction of the proposed Cross Harbor Freight Tunnel might also help reduce the volume of truck traffic on Long Island. The proposed tunnel, designed to accommodate rail freight cars with “double stack” containers, would be constructed between Greenville Yard in Jersey City and the Bay Ridge Branch of the LIRR in Brooklyn. Currently, the only trans-Hudson rail freight crossing is the Selkirk Bridge near Albany. A major reason for the tunnel’s construction is to diminish the volume of truck traffic entering the New York metropolitan area east of the Hudson.

**Figure 4-2
Regional Freight Movement**



Source: NYMTC Regional Freight Plan Project 2004

A Draft Environmental Impact Statement, conducted by the New York City Economic Development Corporation, was released in 2005, when work on the project was suspended. The Draft EIS recommended a cross-harbor rail freight tunnel between Brooklyn and Jersey City, linking the region east of the Hudson River to the national rail network, as the preferred alternative (see Figure 4-3).

Sponsorship of the EIS was transferred to the Port Authority in 2008. The Port Authority is now responsible for conducting the necessary supplemental EIS and moving the process forward. The current plan is to complete the EIS by late 2010, in time for the reauthorization of the next major federal transportation bill.

Figure 4-3
Proposed Cross Harbor Freight Tunnel



Source: *Cross Harbor Freight Movement Project*, www.crossharborstudy.com

Mass Transit

Long Island Rail Road

Mass transit on Long Island includes train, bus and ferry service. The Long Island Rail Road provides train service east to west across Nassau County (see Figure 4-4). With an annual system-wide ridership of around 88 million passengers, the LIRR is the busiest railroad in North America. Between 2001 and 2008 LIRR ridership increased by 3.39 percent (see Table 4-4). Over 60 percent of the LIRR's passenger trips originate in Nassau County. On weekdays about 70 percent of the system's passenger trips occur during morning and evening peak travel periods. The Long Island Rail Road is primarily oriented to provide service for Manhattan commuters; intra-island service is limited. Many commuters living on Long Island are unable to use the LIRR to reach jobs on Long Island. Today, the stopping patterns that have been

established to serve the heavy flows into Manhattan have many trains bypassing possible destination stations on Long Island. It is not feasible for commuters to use the railroad to reach jobs in Mineola, Hicksville, Syosset, Farmingdale, Ronkonkoma or Brentwood, as trains heading east in the morning do not stop at these stations. The same problem occurs westbound in the evening when service is focused on bringing commuters back to Long Island from Manhattan.

Table 4-4
Long Island Rail Road Ridership (in millions)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2001-2008 |
|------------------------------|------|--------|--------|--------|--------|--------|--------|--------|-----------|
| LIRR Annual Ridership | 85.6 | 83.9 | 80.9 | 79.3 | 80.1 | 82.0 | 86.1 | 88.5 | +2.9 |
| Percent Change | | -1.99% | -3.58% | -1.98% | +1.01% | +2.37% | +5.00% | +2.79% | +3.39% |

Source: LIRR, 2008

Figure 4-4
Long Island Rail Road System Map



Source: Long Island Rail Road, 2009

[Pull Quote: “The Long Island Rail Road (LIRR) provides train service for the entire County. With an annual system-wide ridership of around 85 million passengers, the LIRR is the busiest railroad in North America.”]

Train Station Parking

The provision of parking at and around LIRR train stations can be a contentious issue. Commuters living outside walking distance from their local train station must either drive and park at the station, take a bus or taxi, or be dropped off (kiss and ride). Adding parking at train stations can support and encourage commutation by train, but it can also lead to increased traffic congestion around stations. At the same time, providing more parking at local stations reduces the number of vehicles that must travel farther distances to find train station parking, reducing traffic congestion and pollution. One important way to mitigate parking shortages at LIRR stations is to encourage transit-oriented development around train stations. Providing opportunities for people to live in Nassau's downtowns where they can walk from home to nearby LIRR stations will reduce the number of people that will drive to and park at train stations.

MTA Long Island Bus

MTA Long Island Bus (MTALIB), a subsidiary of the Metropolitan Transportation Authority (MTA), is Nassau County's principle public surface transit provider and the third largest suburban bus system in the United States. Operating a network of 48 routes, the MTALIB provides transit service for most of the County as well as parts of eastern Queens and western Suffolk County (see Figure 4-9). MTALIB also operates Able Ride, a para-transit service which provides service across the Queens-Nassau line to subway and bus stations in Flushing, Far Rockaway and Jamaica.

MTALIB also operates the Hempstead Transit Center (HTC). The HTC is the bus system's indoor customer facility between Jackson and Columbia Streets in Hempstead, Long Island. It serves 17 of MTALIB's 48 routes, and serves as a major transfer point for customers using a second Long Island Bus route or the LIRR. Included within the facility are a waiting area, transit information, MetroCard vending machines, a newsstand and restrooms.

The Mineola Intermodal Center, operated by the LIRR and MTALIB, is located on the south side of the LIRR Mineola train station, and has more than 700 LIRR commuter parking spaces. The center is also a stop for seven MTA LIB routes, and long term parking is available for longer term commuters.

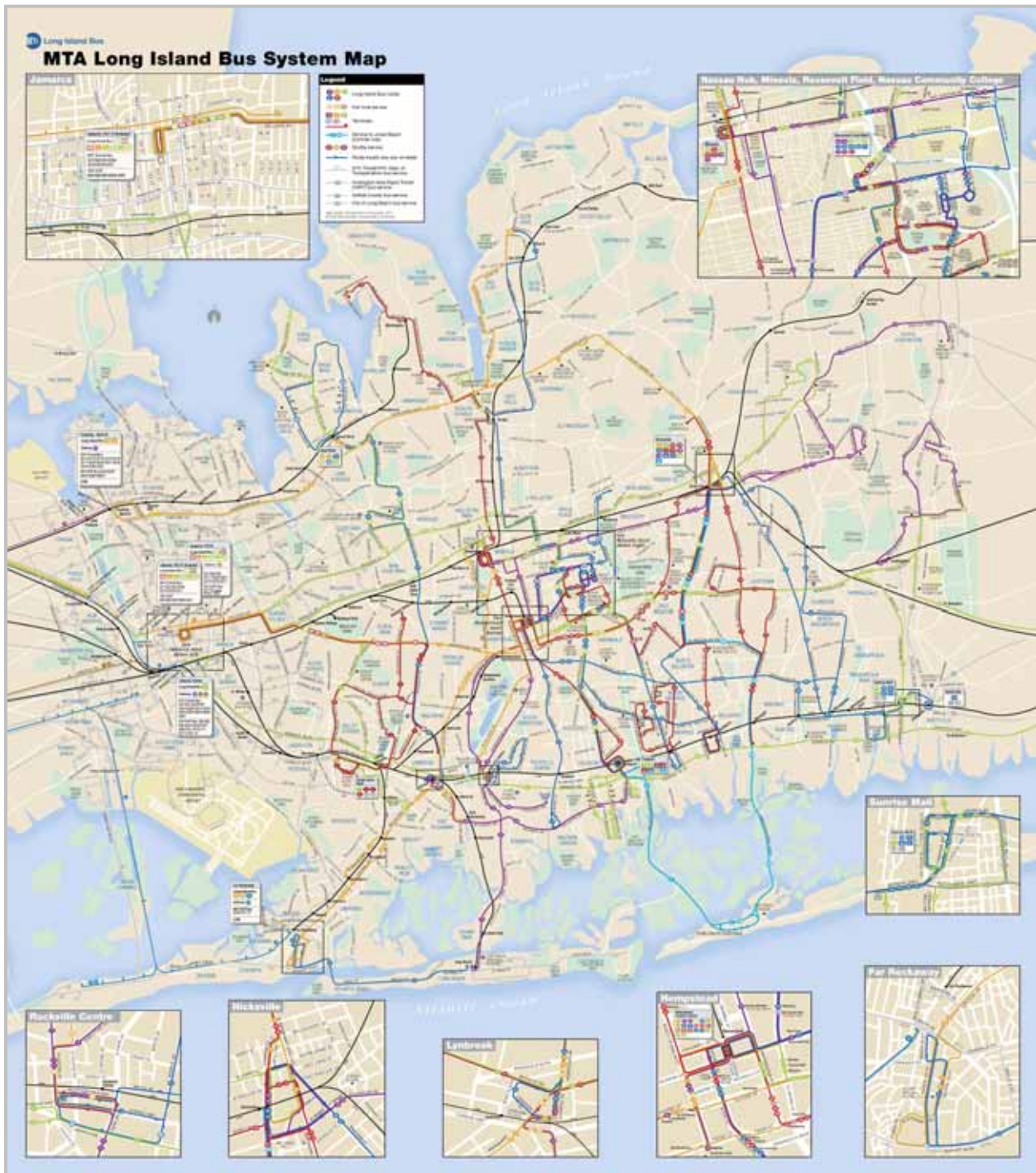
MTALIB has an average ridership of 105,300 passengers each weekday (2007) (up from 102,400 in 2003) and serves 96 communities, 48 Long Island Rail Road (LIRR) stations, most area colleges and universities, as well as employment centers and shopping malls (see Table 4-5). According to the MTA, annual ridership on MTALIB has shown greater percentage growth than that of the LIRR. For the period between 2001 and 2008, ridership in MTALIB increased by 6.77 percent.

Table 4-5
Long Island Bus Ridership (in millions)

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2001-2008 |
|--------------------------------|------|--------|--------|--------|--------|-------|--------|--------|-----------|
| LI BUS Annual Ridership | 31 | 31.3 | 30.4 | 30.6 | 31.09 | 32.6 | 32.5 | 33.1 | +2.1 |
| Percent Change | | +0.97% | -2.88% | +0.66% | +1.60% | +4.6% | -0.31% | +1.85% | +6.77% |

Source: MTALIB, 2008

Figure 4-5
MTA Long Island Bus Map



Source: MTA Long Island Bus

[Pull Quote: “MTA Long Island Bus (MTALIB) is Nassau County’s principle public surface transit provider and the third largest suburban bus system in the United States.”]

Regional Bus Service

Nassau County supports the concept of regionalization of the transportation system and the incorporation of Long Island Bus into a regional MTA-run bus system with expanded service. Long Island Bus is currently experiencing record ridership volumes with much of the increased activity occurring between Queens and Nassau.

Ferry Service

There is one public ferry facility in Nassau County, which is located in Glen Cove. Currently no service is provided from this facility, as it is undergoing a \$16 million reconstruction. In 2001, before ceasing operation, the ferry had a daily demand of about 250 round trips. The projected date of completion of the new facility is 2012. Preliminary projections for the ferry indicate demand as high as approximately 600 round trips in 2012. Major destination points for the service are expected to be Manhattan and LaGuardia Airport.

Bikeways

The development of exclusive bikeways in Nassau County have primarily been oriented toward providing recreation and have been built under the sponsorship of NYSDOT. Existing major facilities include:

- Bethpage Bikeway (7 miles) between Bethpage State Park and Merrit Road in Massapequa
- Jones Beach Bikeway (4.5 miles) along Wantagh Parkway between Jones Beach and Seaford

The 2006 Hub Major Investment Study identified an “Emerald Ribbon,” which would be a pedestrian/bicycle greenway connecting the cultural, educational and recreational nodes within the Hub, including Eisenhower Park, Nassau Coliseum, and Hofstra University (see Figure 4-6). This “ribbon” would also connect to the downtown Hempstead Long Island Rail Road station and could be extended to points beyond, including Adelphi University.

Table 4-6
New York Metro Area Airports

| | Enplanements | % of Total |
|--------------|---------------------|-------------------|
| JFK | 23,401,351 | 41.4% |
| Newark | 18,163,652 | 32.1% |
| LaGuardia | 12,529,890 | 22.2% |
| MacArthur | 1,167,515 | 2.1% |
| Westchester | 23,478 | 1.5% |
| Stewart | 455,045 | 0.8% |
| Total | 56,540,931 | 100% |

Source: Historical Travel Trends in New York State, NYSDOT, May 2009

According to a 2007 Regional Air Service Demand Study, prepared by the New York State Department of Transportation, MacArthur Airport operates below its service capacity. The existing airfield has sufficient capacity to serve projected demand through the year 2025. Base, optimistic, and pessimistic forecasts were prepared for 2007 through 2025, with the “optimistic” and “pessimistic” forecasts representing the range of realistic possibilities that could cause future activities to deviate from the baseline forecast. Between 2005 and 2025, it was projected that total aircraft operations would increase at an average annual rate of 1.6 percent in the base case. The optimistic forecast had an average annual growth rate of 1.9 percent, and the pessimistic forecast had an average annual growth rate of 1.5 percent. The number of commercial passengers was projected to increase at an average annual rate of 2.0 percent in the base case, 3.8 percent in the optimistic forecast and 1.2 percent in the pessimistic forecast.

2. ENERGY

Communities are seeking ways to implement regulations that will reduce and mitigate energy costs. Energy improvement districts are being considered by municipalities throughout the tri-state region in an effort to save money, reduce costs for residents and business owners and encourage economic development and urban reinvestment. These districts are similar to public utility districts, but rely on a renewable energy-based power generation system.

Plans have considered solar panels atop municipal buildings, small wind turbines and fuel cells powered by natural gas. Municipalities maintain the capacity to send power to the regional grid ultimately resulting in cost savings.

[Pull Quote: Energy improvement districts are being considered by municipalities throughout the tri-state region in an effort to save money, reduce costs for residents and business owners and encourage economic development and urban reinvestment.]

The greatest benefit to County residents may be achieved by reducing energy consumption. Reducing consumption will result in reduced utility costs and emission of greenhouse gases. Costs are relatively easy to calculate on a site-by-site basis; however, benefits to our environment as a result of large scale public awareness and action are immeasurable. Existing buildings should be the prime target since they are major contributors to greenhouse gases that impact our climate. Heating, cooling and electrifying our buildings accounts for more than 30% of our emission of carbon dioxide, a greenhouse gas linked to global warming. Energy audits most often demonstrate that cost to renovate and modernize building systems may be recouped in less than a decade through reduction in energy costs. Considering that the County owns over 800 buildings, significant progress and precedents may be set for municipalities and the private sector to follow.

[Pull Quote: Energy audits most often demonstrate that the cost to renovate and modernize building systems may be recouped in less than a decade through reduction in energy costs.]

The greatest energy related gains in Nassau County may be achieved by encouraging renovation and replacement of household and business appliances to achieve greater energy efficiency and continuation of the County's initiative to increase the percentage of energy purchased from renewable resources. Great gains have been made and, in 2007, Nassau County was recognized as the seventh largest local government in the United States utilizing renewable energy sources. Of particular note, energy rebates by use of solar panels on County buildings have and will be used to purchase additional renewable energy. Also of note, nearly 10 County buildings are currently powered entirely by renewable wind energy.

Electric Supply and Distribution

Electrical service to Nassau County is provided by the Long Island Power Authority (LIPA). As of June 30, 2007, LIPA owned 1,292 miles of transmission and sub-transmission lines that deliver power to 177 substations in its electric network. From these substations 13,132 circuit miles distribute the power to 1.1 million customers in Nassau and Suffolk counties and the Rockaway Peninsula in Queens County. In general, LIPA's transmission substations receive power from the power grid and step it down to lower voltages for further transmission to distribution substations through the sub-transmission system. The 345 kV and 138 kV circuits feed step-down transformers at these substations that in turn will feed 69 kV and 33 kV sub-transmission lines emanating from those substations.

Rockville Centre and Freeport maintain local power generating facilities i.e. natural gas conversion to electricity. The number of these types of facilities is not expected to increase in Nassau County; however, more localized initiatives would be more effective in reducing energy demand. The County supports low interest loans for homeowners to implement energy efficiency improvements including heating and cooling systems and appliance upgrades assuming energy reduction standards are achieved. In addition to the loan incentives, participants will yield energy cost savings over time that exceed their share of the cost for the initial upgrades.

Non-Renewable Energy Consumption

Non-renewable energy resources are understood to include fossil-fuels such as oil, coal, and natural gas. In 2005, fossil fuels accounted for approximately 86 percent of all energy consumed in the United States. Renewable sources supplied about 6.5 percent of total energy consumed with nuclear accounting for the remainder. Most of Nassau County's total energy consumption is based on non-renewable energy sources including conventional fuel sources such as petroleum-based products, coal, and other fossil fuels. Major components of the County's energy usage include:

- **Electricity**: Means to run lighting, equipment, and air conditioning units.
- **Heating fuels**: Most County buildings use natural gas-fired heating equipment. Some have oil-fired equipment. All natural gas and heating oil purchased by the County is derived from non-renewable sources.
- **Vehicle fuels**: Most vehicles run on either conventional diesel or gasoline. Regular unleaded gasoline in this region of the U.S. contains as much as 10 percent ethanol, a type of biofuel. Otherwise, the remainder of gasoline blends and all diesel purchased are manufactured from non-renewable sources.

[Pull Quote: In 2005, fossil fuels accounted for 86 percent of all energy consumed in the United States.]

Quantifying the County's overall energy consumption is a complex task. Usage data appears to be only available through utility or vendor invoices issued for individual meters or uses. Some County facilities have multiple meters for various functions. Given these complexities, determination of the total energy consumption is not accounted for here.

Sustainable and Renewable Energy

Nassau County supports sustainable development through integrated energy, environment, housing, economic development and transportation programs. Comprehensive planning will manage patterns of development to benefit residents of the County. Sustainable growth should balance development while protecting the environment, encouraging social and economic equity, and conserving energy and water resources.

With sustainable growth comes new jobs, opportunities for economic advancement, homes for people of various incomes, and many other quality of life benefits. By contrast, predominant suburban growth patterns that have occurred over the past 60 years have wasted precious resources, degraded the natural environment, and fueled inequality throughout the region. Over time, this practice has compromised Nassau County's (and Long Island's) competitiveness and many of the characteristics that make the County a special place to live, work and play.

Numerous initiatives will help to achieve sustainable energy practices. LIPA is considering wind and solar power initiatives. Flat roofs and parking areas provide excellent locations for solar collection. Off-shore locations provide possible options for wind turbine placement. Incentives may also be promoted to encourage industrial, commercial and residential property owners to install smaller localized units that collectively could have regional benefits. Sustainable energy sources will also need to be evaluated for their impact on existing utility rates.

Nassau County is also in the process of evaluating a long term energy plan for the Hub. The geographic area in question may go beyond the actual Hub site but the idea is that electrical distribution in Nassau County's economic center could be controlled by the County on behalf of residents and commercial enterprises. The goal is to create a more cost effective energy alternative for prospective development, hence, alternative energy sources should be linked directly to future development of the Hub.

[Pull Quote: Alternative energy sources should be linked directly to future development of the Hub.]

Alternative energy can be defined as energy generated from renewable resources. *Renewable energy resources* are ones which derive from the natural movements and mechanisms of the earth and are naturally replenishable at a rate proportionate with their rate of use. Renewable energy resources include sunlight, wind, biomass, moving water, and the heat of the earth”.¹

There are a variety of renewable energy technologies that the County has and should explore further. The stage of development varies widely and some may not be currently suitable to consider for full-scale implementation. Some are more readily available and have been viable in regional applications. These include:

- Wind power - Wind turbines
- Photovoltaic - Solar panels that produce electricity, usually roof-mounted.
- Solar heating - Solar panels that produce hot water, usually roof-mounted.
- Hydroelectric - Typically located in or adjacent to a stream or river.
- Geothermal – In this region, limited to heat capacity of the earth used for smaller-scale heating and cooling only.
- Biodiesel – Plant or animal-based fuel usable in diesel engines.
- Methane capture/wastewater by-product and energy generation
- Digested sludge and collection of fats, oils and grease at treatment plants as energy source
- Purchasing alternatives

Other alternative energy technologies are potentially promising for future use but less developed at the present time. Tidal energy, for example, is the extraction of energy from ocean and river level fluctuations and currents.

As Nassau County explores and manages the development of renewable energy resources, careful analysis and planning should be undertaken first to identify the most beneficial projects with the greatest chance of success. In order to make best use of County resources, it will be important to establish a process to screen the most feasible projects. These should then be prioritized to identify the most beneficial and feasible alternatives to pursue. Consideration should be given to the issues noted below.

- Site Selection: As with any development project, issues such as site access, zoning restrictions, impacts on natural resources, topographic limitations, deed restrictions, and ownership issues must be accounted for. Also environmental impacts such as interference with and fatalities realized by migratory and predator bird species requires careful study.
- Technology: Aspects of certain technologies require special consideration. For example, wind turbines, because of the size of some modern structures, may require special geotechnical investigations to ensure underlying soils will provide bearing capacity and are economically and environmentally feasible to utilize. Also, the height of some structures may require permitting by civilian and military aviation authorities.

¹ Definition obtained from the Massachusetts Division of Energy Resources Renewable Energy & Distributed Generation Guidebook: http://www.mass.gov/Eoca/docs/doer/pub_info/guidebook.pdf

- **Energy Availability:** The amount of available renewable energy may vary significantly from one location to another. For example, wind energy is dependent on local geography and can be highly variable within relatively short distances.
- **Surrounding Uses:** Compatibility and support from abutting property owners is essential for project success. For example, large, visible infrastructure such as wind turbines can draw substantial criticism from neighboring property owners.
- **Visual Impact:** The size of some components may alter the visual characteristics of the surrounding area in ways that are highly subjective. Others, such as smaller-scale geothermal heating and cooling systems may have very little visual impact.
- **Legal and Regulatory Restrictions:** The legal framework governing energy generation and distribution is complex. There are a number of issues in this area that may influence the feasibility and economy of projects.

The County aims to invest public funds wisely in smart growth and equitable development, give priority to investments that will deliver good jobs and wages and improve transit access, housing, and open space. Furthermore, the County shall seek to advance these principles in partnership with regional and municipal governments, non-profit organizations, business owners, and other stakeholders.

Caption: Wind Turbine



Source: Pioneer Valley Renewable Energy Association

Caption: Solar Panel



Source: Perkins Eastman Architects

3. WATER RESOURCES

Public Water Supply

Forty-six (46) major public water suppliers in Nassau County provide water service to nearly 100% of the County's 1.3 million residents. Each supplier serves a specific geographical area and independently operates their respective water supply system. The majority of systems are interconnected with neighboring systems which provides a mechanism for transferring water and to better manage emergency conditions. The smallest supplier serves 25 residents, whereas the largest supplier serves approximately 250,000 residents.

Groundwater

Nassau County's complex groundwater system consists of three major aquifers—the Upper Glacial, the Magothy, and the Lloyd—and one major, relatively impermeable clay layer—the Raritan Clay. In addition, several smaller aquifers (Jameco and North Shore) and confining clay layers (North Shore confining unit and Gardiners Clay) contribute to the complexity of the system and affect aquifer behavior in localized parts of the County. The thickness of each of these subsurface formations is variable. Beneath the south shore, for instance, the Magothy and Lloyd aquifers are thickest. Overall, the average saturated thickness of the entire groundwater system in Nassau County is approximately 800 feet deep.

As groundwater is withdrawn for public water supply, new water from precipitation continuously recharges the aquifers as it infiltrates through the soil. Water also flows back and forth between aquifers, and is continuously discharged underground to the Atlantic Ocean and Long Island Sound through a process called underflow.

Nassau County's 46 water districts are all independently run by either private or municipal entities. According to a Long Island population study conducted by the Long Island Regional Planning Board, the population of Nassau County by 2010 is expected to remain relatively consistent at the present level of 1.3 million residents. Based on additional studies regarding projected residential, commercial and industrial water use, by 2010 Nassau County's water demand from Long Island's groundwater supply is expected to remain consistent at approximately 190 million gallons per day.

Section 5 below addresses recharge (see Recharge Basins) and withdrawal from existing aquifers. Although overall recharge exceeds groundwater withdrawal, County representatives have indicated that some suppliers experience capacity and quality issues during unusually hot and dry summer months primarily due to excessive irrigation demands.

Groundwater Quality

It is important to emphasize the difference between groundwater quality and the potable water delivered to Nassau County consumers. Groundwater extracted by Nassau County public water suppliers is

monitored for the presence of potential contaminants. If contamination is detected at levels above drinking water standards, the water source is either removed from service or treated to remove the contamination. Current issues regarding water quality in Nassau County include the potential of contamination by nitrates, volatile organic compounds (VOC s), industrial solvents, chemical spills, as well as chlorides resulting from saltwater intrusion. A recent example of groundwater monitoring and potable water safeguarding is in the mapping of a soil contamination plume at the Grumman Property in Bethpage. Pending the findings of the geographic extent of contamination, remediation efforts will commence.

The majority of public water supply wells across Nassau County are considered highly susceptible to nitrate and VOC contamination. Nitrate contamination is frequently associated with septic systems, non-sewered residential areas and over application of lawn fertilizers in residential areas while VOCs are associated with the presence of industrial facilities and commercial land uses. Several public water suppliers have experienced elevated nitrate levels that have necessitated corrective measures such as blending water and the installation of nitrate removal systems. Numerous water suppliers have experienced low levels of VOCs in some wells which have necessitated treatment methods that include aeration and carbon adsorption to remove these compounds. The main VOCs that have been detected in Nassau s groundwater include tetrachloroethene, trichloroethene, and 1,1,1 trichloroethane.

[Pull Quote: The majority of public water supply wells across Nassau County are considered highly susceptible to nitrate and VOC contamination.]

Other contaminants, such as methyl tertiary butyl ether (MTBE) and perchlorates have been detected in some groundwater sources, but are not present at levels above drinking water standards in any public water system. As recently as 2006, a suspected gasoline spill caused elevated MTBE levels in a water system located in western Nassau resulting in the issuance of a health advisory. The condition was addressed quickly and was successfully resolved.

Saltwater intrusion has occurred in southwestern Nassau and along portions of the north shore of the County. As a result of this intrusion, the Magothy aquifer beneath the Long Beach barrier island is no longer usable for public water supply. Saltwater intrusion in both the Magothy and Lloyd aquifers along the south shore is proceeding at a very slow rate and is a result of the rise in sea level over the past 18,000 years, coupled with the effects of water supply withdrawal for public use. Even if all pumping along the south shore were to cease, landward saltwater intrusion would nevertheless still occur due to the need to reach equilibrium with the rise in sea level. On the north shore, saltwater intrusion has occurred at localized areas on the Great Neck and Manhasset Neck peninsulas, in Bayville, and in Centre Island. As a result of the saltwater intrusion, portions of the Lloyd, North Shore, and Upper Glacial aquifers in these localized areas have become unusable for public water supply purposes. Saltwater intrusion along the north shore is driven by groundwater withdrawal from public supply wells located near the shorelines. Water suppliers in the north shore areas where localized saltwater intrusion has impacted some public supply wells have taken action to address saltwater intrusion. Such actions include the development of public supply well management plans to reduce pumping from specific existing wells, seeking new public

supply well locations to replace lost capacity at impacted wells, and implementation of water conservation measures.

Other quality issues facing the water supply include the presence of iron. While iron is naturally occurring in the soil and groundwater and is generally not a health concern, its removal by filtration. High levels of iron in the water result in discoloration and staining, particularly for laundry or where water stands in basins and fixtures. Iron levels are especially high in Nassau County along the south shore.

Although Nassau County itself is not a public water supplier and does not pump groundwater for delivery to the consumer, the Nassau County Department of Public Works monitors raw groundwater quality and fluctuations in groundwater levels through a vast network of over 500 monitoring wells spread throughout the County. The Nassau County Department of Health oversees the water suppliers by enforcing federal and state drinking water maximum contaminant levels (MCLs) or standards.

Groundwater Protection Programs and Activities

Various groundwater protection programs and activities are in place to prevent or reduce contaminant loading to the aquifers. The 1992 Long Island Comprehensive Special Groundwater Protection Area Plan establishes Special Groundwater Protection Areas (SGPA). SGPAs are significant, largely undeveloped or sparsely developed geographic areas of Long Island that provide recharge to portions of the deep flow aquifer system. They represent a unique final opportunity for comprehensive, preventative management to preclude or minimize land use activities that could be detrimental to groundwater. Current programs and activities include the following:

- Article X of the Nassau County Public Health Ordinance (NCPHO) entitled Groundwater Protection - Regulation of Sewage and Industrial Wastewater, exists to preserve the quality of the aquifers receiving recharge from areas which have been designated as Special Groundwater Protection Areas (SGPAs). . This is achieved by limiting the amount of residential and commercial wastewater being discharged to these aquifers. The discharge of industrial wastewater, whether or not it has received treatment, is prohibited in the SGPAs. Article XI of the Nassau County Public Health Ordinance regulates the storage of toxic and hazardous materials. This ordinance requires secondary containment for liquid and bulk storage to prevent an accidental spill into the ground thereby safeguarding groundwater.
- Over 90% of Nassau County s population is served by municipal sewer systems. This municipal sewer system has been very effective in reducing groundwater contamination from sanitary, industrial and commercial wastewaters. Public sewers prevent nitrates, detergents and other contaminants from reaching the groundwater.
- The Nassau County Department of Health has participated in the USEPA s Underground Injection Control (UIC) Program which locates, abates and remediates sources of groundwater

contamination resulting from the use of interior floor drains and dry wells in automotive repair facilities, dry cleaning establishments and other commercial establishments.

- The Nassau County Departments of Health and Public Works have conducted or participated in studies of areas of known groundwater contamination to identify the level, extent and movement of contaminants as a basis for corrective action.
- The Nassau County Department of Health (NCDH) collects and analyzes potentially contaminated soil and groundwater to evaluate the impact on the environment. NCDH works with Federal and State agencies in preparing reports of investigations. Sites identified as containing hazardous wastes are referred to the New York State Department of Health for environmental and health assessment and to the New York State Department of Environmental Conservation for Superfund listing and remediation.
- Currently, there are no active landfills in Nassau County. An amendment to the 1978 Article 27 of New York State Environmental Conservation Law banned the siting of new landfills in deep recharge zones and mandated the closure of existing landfills.
- The Town of Hempstead, Town of North Hempstead and the Town of Oyster Bay have established STOP (Stop Throwing Out Pollutants) Programs to collect and dispose of household hazardous wastes.
- Localized groundwater remediation facilities focus on treating groundwater at contaminated sites and improving overall groundwater quality.

[Pull Quote: Based on present County-wide ground water withdrawal and recharge conditions, the water demand for a large-scale development is not expected to significantly impact water supply.]

Stormwater

Nassau County occupies a 285.4 square mile area (182,680 acres) that is located between New York City on the west, Suffolk County on the east, the Atlantic Ocean to the south and Long Island Sound to the north. There are 2 cities, 3 towns and 62 villages that are located within the boundaries of Nassau County. Nassau County regulations require that storm water generated from developed sites be retained onsite. The onsite storage of storm water is typically achieved by the installation of drywells, recharge basins or drainage reserve areas. Nearly half of the land area in the County drains to surrounding surface waters while the remaining half enters local recharge basins.

The current inventory of stormwater facilities within the County include:

- 3,720 stormwater outfalls to federal waters,
- 800 stormwater recharge basins, 555 of which are owned by Nassau County, and
- Approximately 57 miles of open stream corridors maintained by Nassau County.

Stormwater runoff that may be polluted is often transported to Municipal Separate Storm Sewer Systems (MS4s) and ultimately discharged into local surface waters without treatment. Storm water runoff from impervious surfaces carries varying but potentially large amounts of pollutants to the surface waters of the United States. These pollutants include nutrients, silt/sediment, pathogens, oil/grease, metals, debris and litter. Of particular concern to the water bodies surrounding Long Island are pathogens, phosphorus, PCBs, silt and sediment, and nitrogen. Such pollutant discharges impair waterways thereby discouraging recreational use of the resource, contaminate groundwater and disrupt habitat for fish, other aquatic organisms, and neighboring wildlife.

When a stormwater discharge enters a New York State Department of Environmental Conservation 303(d) listed water body, the municipality's stormwater program must ensure no increase of the listed pollutant of concern to the designated water body. There are 32 water bodies on the 303(d) list that have the potential to receive stormwater runoff from a municipality within Nassau County.

The New York State Department of Environmental Conservation, Nassau County and a coalition of local municipalities are working together to reduce pollutants contained in stormwater runoff. This coalition includes the Cities of Glen Cove and Long Beach, the Townships of Hempstead, North Hempstead and Oyster Bay and 55 villages. Existing County and local municipal governments' storm water programs and activities designed to protect the County's water quality have been supplemented with new Best Management Practices (BMP's).

In accordance with NYSDEC regulations, all regulated municipalities require a permit for the release of stormwater runoff into their surface waters. As a condition of this permit, regulated municipalities must establish and execute a comprehensive stormwater management program that includes mandated programs and practices in the following six categories:

- Public education and outreach on stormwater impacts
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Post-construction stormwater management in new development/redevelopment
- Pollution prevention/good housekeeping for municipal operations

One of the requirements of the SPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewers (MS4s), is the preparation of a report that depicts pollutants of concern and their sources, steps being taken to diminish waste in stormwater runoff, and the effectiveness of pollution prevention practices. Municipalities are obligated to organize a yearly statement that describes how its programs deal with the impacts of stormwater discharges upon water bodies, the pollutants of concern and their sources, steps being taken to condense pollutants in stormwater runoff, and the efficiency of BMP's. Municipalities are required to make the report accessible to the public and to present the public with an opportunity to comment on the program prior to it being filed with the New York State Department of

Environmental Conservation. A public hearing is no longer a requirement as long as the Draft Annual Report is made available for comment via the County website.

In addition, Nassau County has developed a Stormwater Management Program and a Stormwater Runoff Impact Analysis Procedures Manual. The Manual provides a procedure to assess and rank all of the sub-watersheds in Nassau County in an organized and consistent manner. The Manual also provides guidance and standardization of stormwater impact analysis procedures to all regulators, planners and designers involved in stormwater management to achieve the required regulatory standard of reducing pollutants in stormwater to the maximum extent practicable.

Developments in excess of one-acre require preparation of a Storm Water Pollution Prevention Plan (SWPPP) under regulations set forth by the NYSDEC and the local municipality where appropriate. SWPPP plans specifically address storm water management, post development water quality, and soil erosion and sediment control measures during construction. During site plan development, detailed analyses should be performed to determine the appropriate storm water storage volume to be provided onsite; the storage volume to be provided off-site in recharge basins, the post development water quality to be included with the development and details of the SWPPP proposed during project construction.

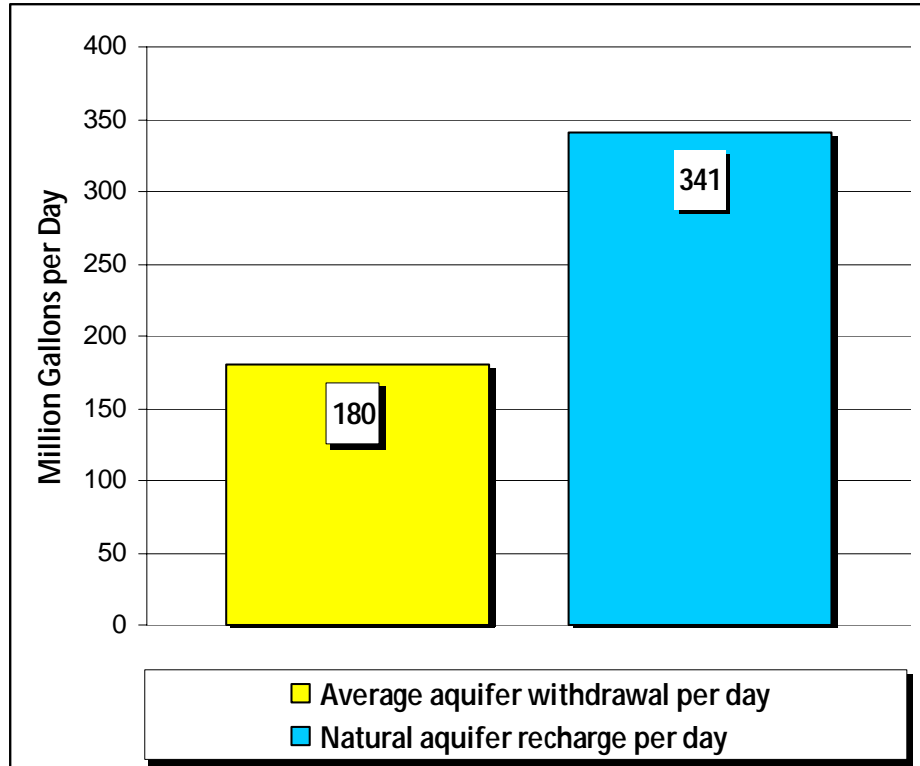
Recharge Basins

Precipitation recharges the County's groundwater system. Slightly less than half of the precipitation falling within the County is returned to the atmosphere through evapotranspiration, and the remainder replenishes the aquifers or flows to surface waters. There are currently 800 recharge basins in Nassau County, most of which are located in the central portion of the County generally between Northern Boulevard and Hempstead Turnpike.

[Pull Quote: There are currently 800 recharge basins in Nassau County]

An average of 44 inches of precipitation falls within the County each year. This amounts to approximately 660 million gallons of precipitation within the County each day. Approximately 341 million gallons of precipitation, slightly more than half, recharges the groundwater system either by infiltrating through the soil in unpaved areas or through recharge basins. Based on an estimated average of 190 million-gallon per day demand in 2010, recharge to the aquifers is significantly greater than the amount of groundwater withdrawn. Since recharge to the groundwater system exceeds the amount of groundwater withdrawn from the system, available groundwater resources are more than sufficient to meet present and future demands. Figure 4-7 compares average daily groundwater recharge to the County's aquifers with the average daily withdrawal rate.

Figure 4-7
Comparison of Nassau County Groundwater Recharge and Public Water Demand, 1997



4. WASTEWATER TREATMENT

County Facilities and Capacity

Nassau County collects and treats 90% of the sewage generated in the County at its two sewage treatment plants located at Bay Park and Cedar Creek. These two plants each treat approximately 60 millions gallons per day (mgd), operating below their respective permitted capacities of 70 and 72 mgd. Recently, Nassau County as part of its consolidation initiative assumed responsibility for the operation of the City of Glen Cove's Water Pollution Control Plant. This plant is permitted for 5.5 mgd and was recently upgraded to meet standards applicable to Long Island Sound Improvement requirements (to address hypoxia condition). This plant currently treats approximately 3.0 mgd leaving a surplus capacity of over 2.5 mgd which could be used to sewer other communities along the North Shore that are currently served by cesspools and septic systems. Additionally the County is proceeding with consolidating both the Village of Cedarhurst and Lawrence sewage treatment facilities. This consolidation of services will have an environmental benefit since both Village plants currently utilize less efficient treatment technology and greater efficiency should yield cost savings to the rate payer. Once complete the County will process approximately 92% of the sewage generated within its jurisdiction.

The County also owns and operates an additional sewage collection area at Lido Beach that is not within the service area of either of the County treatment plants. The sewage collected within this district is processed at the City of Long Beach's sewage treatment plant. Additionally, six villages in the County (Freeport, Garden City, Hempstead, Mineola, Rockville Centre and Roslyn) own and operate their own collection systems which discharge to the County's treatment facilities.

Caption: Cedar Creek Water Pollution Control Plant



Source: Nassau County Department of Public Works

Municipal Facilities and Capacity

Currently, ten other independent treatment facilities operate by other governmental agencies or special districts within the County. These include the City of Long Beach, Jones Beach, Village of Cedarhurst, Village of Lawrence, Village of Great Neck, Port Washington Water Pollution Control District, Belgrave Water Pollution Control District, Great Neck Water Pollution Control District, Greater Atlantic Beach Water Reclamation District, and the Oyster Bay Sewer District. As discussed, two of these facilities will be consolidated with the County and there is a current initiative to consolidate the Village of Great Neck facility into the Great Neck Water Pollution Control District.

Regional Challenges

The County's Department of Public Works completed in 2007 a Feasibility Study to determine the benefits, both environmental and financial, associated with consolidating the various smaller treatment facilities to the County's two treatment plants that have excess capacity. The findings of the report indicate that there is a significant benefit to consolidate facilities that have not already undertaken recent permit requirements associated with nutrient discharge and disinfection.

Effluent from the Great Neck, Belgrave, Port Washington, Glen Cove and Oyster Bay facilities ultimately discharges into the Long Island Sound. The Long Island Sound supports a large shellfish industry and provides breeding and nursery areas for many other aquatic and plant species. It is also a very popular location for swimming, boating and recreational fishing. For decades, the dissolved oxygen levels in the bottom waters of the western part of the Sound have been extremely low, resulting in the contravention of water quality standards. Accordingly, the United States Environmental Protection Agency (USEPA), with the cooperation of the New York State Department of Environmental Conservation (NYSDEC) and the Connecticut Department of Environmental Protection (CTDEP), initiated a study in the late 1980s to identify water quality issues related to the Sound. This study became known as the Long Island Sound Study (LISS). Among other findings, the LISS determined that excessive nitrogen discharged from wastewater treatment plants and non-point sources contributes to hypoxic conditions, i.e., dissolved oxygen less than 3 mg/l, in sections of the Sound, which is a threat to aquatic life. To improve the hypoxic conditions, the LISS recommended that the total nitrogen loading to the Sound should be reduced by 58.5% of the 1990 baseline loading rate by the year 2014. Recognizing that it was not feasible to achieve a 58.5% reduction in the nitrogen loading on the Sound from non-point sources, the NYSDEC accordingly increased the required reduction in nitrogen loading from wastewater treatment plants to achieve the targeted overall 58.5% reduction.

[Pull Quote: the LISS determined that excessive nitrogen discharged from wastewater treatment plants and non-point sources contributes to hypoxic conditions which threaten aquatic life.]

Discharges to the Atlantic Ocean along the southern coast of Nassau County are governed by the Long Island South Shore Estuary Reserve Comprehensive Management Plan (CMP). The CMP was developed in 2001 to establish a consensus-based blueprint for the protection and restoration of the estuary's natural,

cultural and economic-related resources. The South Shore Estuary Reserve (SSER) stretches from the Nassau - Queens County line to the middle of the Town of Southampton in Suffolk County. Treatment plants discharging effluent into the SSER include Cedar Creek, Long Beach City, Long Island American Water (water supply iron removal treatment), Bay Park, Village of Lawrence, West Jones Beach and Jones Beach. The monitoring and discharge of toxins is regulated by NYSDEC regulations through the State Pollution Discharge Elimination System (SPDES) permitting process. An ocean outfall at Bay Park necessitates further study to alleviate current discharge conditions at Reynold's Channel.

[Pull Quote: Cedar Creek and Bay Park wastewater treatment facilities produce their own energy via sludge digestion and methane usage significantly reducing reliance on natural gas and diesel back-up.]

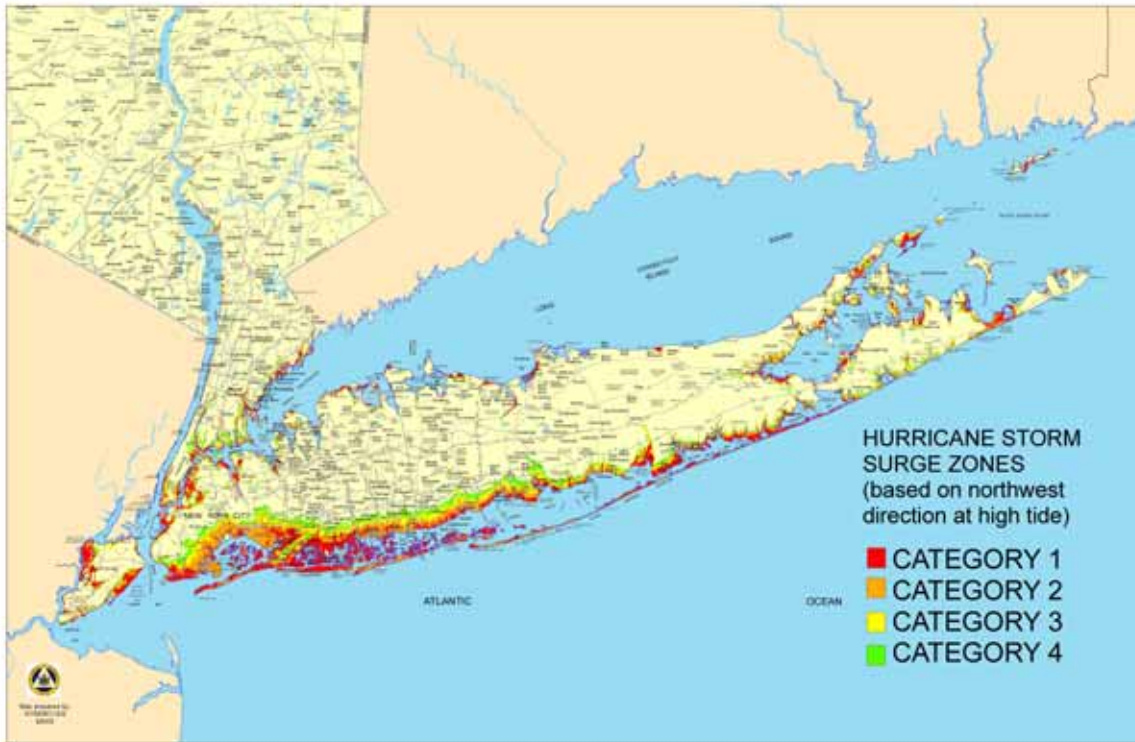
5. CLIMATE CHANGE

Climate change may be one of the greatest economic and environmental challenges of the 21st century both with significant consequences for Nassau County. It is no longer a question of whether climate change is real or not, it's a question of magnitude and when and where such impacts will be felt most. Nassau County officials are actively measuring the threat of sea level rise and the identifying the population that is vulnerable especially to hurricane impact (see Figure 4-8).

Climate change exacerbated by the emission of greenhouse gases has a direct impact on sea level rise. Energy conservation, efficiency and reduction of harmful emissions from automobiles and buildings are the single greatest challenge and opportunity to avert risks of climate change to public health, property and our natural environment. Nassau County has been a leader in implementing positive change through climate change adaptation and must continue to do so.

Scientists have reported that by the year 2100, annual mean temperatures within the tri-state region could increase by as much as 7.5 degrees Fahrenheit. As a result, sea levels are expected to increase by at least 48" depending on how rapidly polar ice melts. Coastal flooding and damage to shoreline infrastructure could be substantial. The costs to identify, plan and implement pre-emptive measures to counter the impacts of rising sea levels will be substantial. However, the cost of physical damage to property, infrastructure and public safety as a result of storm activity could far exceed the cost of preemptive measures.

Figure 4-8
Hurricane Storm Surge Zones – Downstate New York



Source: NYS Emergency Management Office, 2005

B. PROJECTIONS AND POLICY RECOMMENDATIONS:

A strong infrastructure is fundamental to the County's stability and growth. The quality and efficiency of Nassau's roadways, transit systems, pedestrian and bike networks, and power facilities, will have a major impact on its ability to achieve a sustainable future.

POLICY 4: IMPROVE TRANSPORTATION INFRASTRUCTURE AND ENCOURAGE ALTERNATIVES TO AUTO DEPENDENCY

The plan seeks to reduce traffic congestion with a set of integrated solutions that improve the people-carrying capacity of existing roadways, increase the accessibility and attractiveness of public transportation, and encourage pedestrian activity. An important benefit of targeting development in specified growth areas is that it will reduce local vehicular trips as people "park once" and walk to multiple destinations or walk to work and shopping from new residences in surrounding areas.

Improved Transit Access to the Nassau HUB

The Nassau Hub, located in Central Nassau County, has long been recognized for importance as an economic center and its longer term development potential. Multiple studies have been conducted over the last 40 years with a common theme of developing the Hub to its full economic potential. These studies identified problems of growing roadway congestion, a deficient transit system, limited population growth and an overall stagnation of economic growth. However, only recently did the studies start looking at land use and transportation issues in tandem and in 2006 Nassau County completed its *Major Investment Study* of the Hub. This study examined and analyzed the demographic, economic and transportation issues within the Nassau Hub and concluded that the County should further study potential transit and related land use improvements, within the context of the FTA's project development process. In particular, the follow up study should focus on the following issues: current and anticipated future transportation deficiencies and congestion; the existence of large-lot, single-use disjointed land uses that could be effectively linked only by transit; the need to encourage economic development at appropriate scale and in appropriate locations; and the overwhelming desire to maintain and improve the high quality of life for County residents.

In 2010 Nassau County initiated the *Nassau Hub Study Alternatives Analysis/Environmental Impact Statement (AA/EIS)* as a follow up effort to the MIS. The focus of the AA/EIS is to define new transportation options and land use strategies that will help improve access and mobility, promote economic development, and create jobs in the Nassau Hub area, which, in turn, will enhance the overall quality of life for Nassau County's residents (see Figure 4-9).

Figure 4-9
HUB – Primary and Preliminary Regional Study Area



The Nassau Hub Primary Study Area, which is the focus of this study, occupies an approximate 11-square-mile area in the heart of Nassau County, and is home to Roosevelt Field, Hofstra University, Nassau Community College, Museum Row, the Nassau Veterans Memorial Coliseum, the County Government Center, Eisenhower Park, the Grumman Property, and other notable County features. Additionally, thousands of residents, employees, students and others live, work or travel to, within and through the area. This crucial economic center, so vital to the future of Nassau County, has substantial traffic congestion, lacks efficient and direct transit choices and includes large areas of disjointed land use patterns. These factors have contributed to long commutes, decreased environmental quality, and overall difficulty in traveling to, from and within the area.

In addition, a Preliminary Regional Study Area has also been defined based on travel patterns, potential opportunities for connections among activity centers, and key economic development opportunities outside the Primary Study Area, such as the former Grumman site in Bethpage. The Preliminary Regional Study Area influences and is influenced by the Primary Study Area and would be affected to varying degrees by any proposed transportation improvements within the Primary Study Area. Similar to the Primary Study Area, the boundary of the Preliminary Regional Study Area may be modified if warranted by findings of the Study's technical analyses and/or input from the outreach process.

The AA phase is focused on identifying a Locally Preferred Alternative or Alternatives (LPA) or a system of near and long-term improvements. Following the selection of the LPA and with the Federal Transit Administration's (FTA) concurrence, the potential environmental consequences and necessary mitigation required for implementation of the LPA will be evaluated pursuant to the National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) process.

The overarching purpose of the Nassau Hub Study AA/EIS is to improve mobility and accessibility to, from and within the Nassau Hub by achieving the following:

- Improve public transit service in this severely congested area by providing increased transit capacity and faster, convenient access to and from major Nassau County employment and activity centers for residents, employees and visitors alike.
- Enhance regional connectivity by expanding and interconnecting local transit services with LIRR in Nassau County; improve intermodal transit hubs where rail, bus, auto, bicycle and pedestrian links meet.
- Mitigate increases in traffic congestion by providing innovative travel options as an alternative to the automobile.
- Support transportation solutions that will be instrumental in improving the economic vitality of the County and continuing redevelopment in the Hub area.
- Improve regional air quality by helping to mitigate increasing auto-related emissions.
- Support local and regional land use plans and facilitate local municipalities' efforts to direct redevelopment opportunities utilizing transit-oriented development.

The AA is scheduled to be completed mid-2011 and following FTA's approval the environmental review process will begin with a scheduled completion in mid-2013 with the release of a Draft EIS. During both the AA and EIS processes, the public and other stakeholders are given frequent opportunities to review the analyses and provide comments and other input. Upon completion of the AA and environmental review process, the County will be eligible to apply for Federal funding under the FTA's *New Starts/Small Starts Program* to help implement the final LPA.

County-wide Transit Improvements

Other improvements to the public transportation network including rail and bus service, as well as improved pedestrian connections, are necessary to support center-oriented and downtown growth, enhance transit access to these destinations, and reduce overall traffic congestion. Specific transit improvements include:

- Regionalization of bus service
- Increased north-south transit connections using bus rapid transit (BRT) techniques
- Improvements to Long Island Rail Road service
 - East Side Access into Manhattan's Grand Central Station (already under construction),
 - Possible "scoot" train service on the Oyster Bay Branch,

- Increased reverse commute service,
- Third 'passing-lane' along the LIRR Main Line.

Over the past ten years, the MTA has been providing operational funding for Long Island Bus. As of October, 2010, the MTA has proposed to eliminate its entire subsidy. Faced with the additional financial burden, the County is seeking proposals for the operation of the existing bus network. Integration of Long Island Bus into a regional bus system will allow for expansion of service to meet growing demand for bus transit within the County, as well as between Nassau and Queens. A regional, dedicated transportation revenue source will be necessary in order for expanded transit service in Nassau. This system should include express bus or bus rapid transit service to better link existing or planned nodes of mixed use development and provide better north-south transit connections. In addition to regionalization of service, improvements to the County's bus system should include enhanced service for shorter trips and bus rapid transit connections between key transit nodes and facilities. As was recommended in a recent transit study by Sam Schwartz Engineering that was prepared for Nassau County, opportunities to redesign local service to create simple, direct and frequent service should be considered as well as ways to consolidate existing scattered services to and between key attractions in the Hub. New bus rapid transit connections such as Glen Cove to Long Beach, Great Neck to Freeport, and Hicksville/Syosset to Far Rockaway should also be explored.

With no North-South rail service, Nassau County lacks a rapid public transportation connection between the south shore, the Nassau Hub, and the north shore. The County, in partnership with the MTA, should explore the implementation of Bus Rapid Transit (BRT) along select bus routes. Bus Rapid Transit is a family of techniques designed to move people quickly and efficiently using buses and roads. BRT seeks to alleviate delays experienced on a traditional bus caused by slow boarding times, excessively close stops, traffic lights, and traffic. Nassau County could benefit from the implementation of some combination of the following improvements

- Pre-paid fare collection: Bus riders pay upon entering a specially designed bus stop. This allows riders to rapidly enter the bus as soon as the doors open, and with pre-payment riders can enter both front and back doors of the bus. The typical bus spends over 20% of its time loading and unloading passengers.
- Traffic Signal Preemption: Electronics in the bus communicate with specially equipped intersections to reduce the number of red lights a bus encounters or must wait through.
- Queue Jumping: An intersection incorporates a small bus lane near the traffic light. This ensures the bus is always the first vehicle through the intersection if it must stop at a red light
- Bus Lanes: Separating buses from traffic would allow a bus to operate at the speed limit even during rush hour

The Long Island Rail Road's main line between Floral Park and Hicksville is a two track right-of-way. Service is focused primarily on the peak direction commute, with more limited service in the off-peak

direction. The lack of adequate off-peak direction service limits the LIRR's ability to serve intra-county commuters. Service on the Oyster Bay branch is also constrained by capacity. Because this branch serves the City of Glen Cove, it has the potential for increased ridership. Currently, this line's capacity from Mineola westward is filled with peak flow direction trains from the Port Jefferson and Ronkonkoma branches. Constraints on the Oyster Bay branch are compounded because the Oyster Bay line is not electrified east of East Williston and Manhattan-bound passengers must change trains at Jamaica. In addition the capacity constraints on the mainline create long headways for the Oyster Bay branch in the peak periods, further lessening its attractiveness to users. Finally, the East River tunnels to Penn Station operate near capacity during the peak periods. This is problematic in terms of train congestion into Penn Station as well as convenience to commuters with destinations on the east side of Manhattan. The MTA's East Side Access project will provide new Long Island Rail Road service to Grand Central Station. The project will divert a number of trains from the East River Tunnels serving Penn Station via an unused level of the existing 63rd Street tunnel. This added capacity for the East River tunnels will accommodate additional trains both into and out of Manhattan from both Penn and Grand Central Stations. It is expected that East Side Access will increase the demand for housing near Long Island Rail Road stations as commuting to jobs in Manhattan becomes even more convenient.

[Pull Quote: "East Side Access will provide direct service from Long Island to Grand Central Station."]

Roadway Retrofits – Incorporating Bikeways

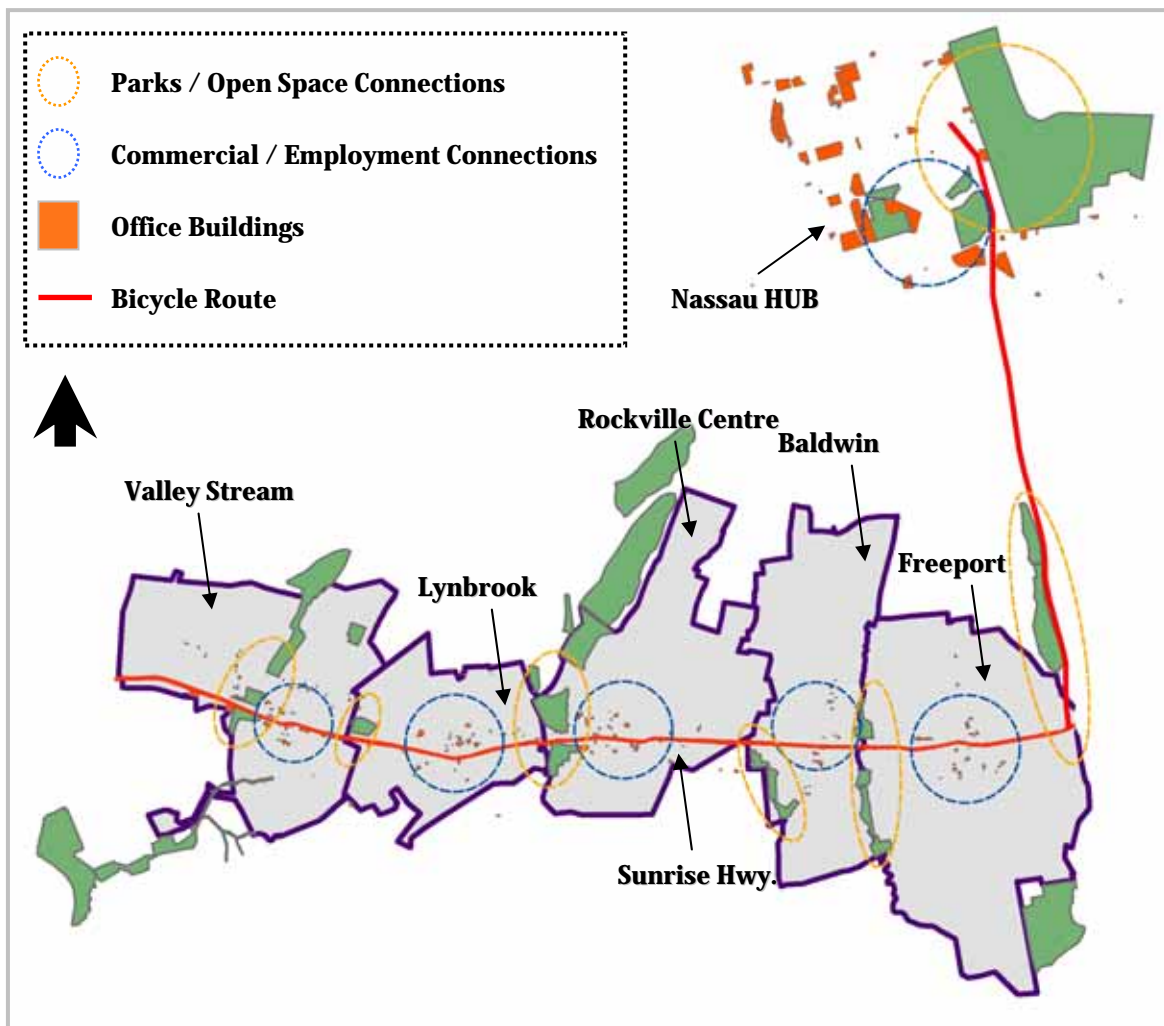
In addition to improvements to Nassau's bus and rail systems, bicycles should be integrated into the transportation system as a real alternative to vehicular travel, rather than merely a form of recreation, particularly in areas with denser development such as existing downtowns as a means to lessen traffic congestion in these areas. Bicycles could potentially utilize sidewalks along arterial roadways, as was shown in Figure 4-10. In addition, the County has submitted a conceptual proposal to NYSDOT for a new bikeway along Sunrise Highway between the Villages of Valley Stream and Freeport that would connect existing commercial and employment nodes and passive and active parklands and open space. It would also connect along the Meadowbrook Parkway corridor to the Emerald Ribbon at the Nassau County Hub. This is a significant step toward establishing a real alternative to vehicular transportation in Nassau linking downtowns (see Figure 4-11).

Figure 4-10
Arterial Pedestrian/Bicycle Lanes



Source: RGR Landscape

Figure 4-11
Southwest Nassau County Downtowns, HUB, Meadowbrook Parkway Bicycle Route



Source: Nassau County Planning Department

The 2006 Major Investment Study for the Nassau Hub recommends a new bicycle/greenway system connecting Nassau’s cultural, educational and recreation nodes. This “Emerald Ribbon” would link Eisenhower Park, the Nassau Coliseum, Hofstra University, Downtown Hempstead and Adelphi University.

Addressing Roadway Congestion

In addition to transit improvements, enhancing the capacity of Nassau’s existing roadways is essential to reducing the rate of growth of traffic congestion in the County. One measure that the County can undertake is to expand County roadway capacity without expanding the actual roadway. Recurring traffic congestion on County roadways may be mitigated by implementing signalization enhancements and intelligent transportation systems. Reducing commuter vehicular trips may also be achieved by providing additional public transit financial incentives to County workers.

Nassau should also encourage both its towns and New York State to enhance traffic signal progression on arterial roadways over which they have jurisdiction. The County should recommend that the State consider the installation of reversible lanes on congested arterials such as Old Country Road, Sunrise Highway, Hillside Avenue, Jericho Turnpike, and Northern Boulevard to reduce peak period congestion. It should also expand the use of TRANSCOM, which can tell drivers how long it will take to get to a certain destination via two or more routes.

In addition to these traffic management measures, Nassau should work to reduce the number of vehicles on roadways by targeting development in growth areas as discussed above and reducing freight and commuter traffic. The County should encourage and support state planning efforts to establish a central Long Island freight distribution center to reduce truck traffic on east-west arterials and the Long Island Expressway. It should also consider employee incentives such as “flex” work hours and “internet commuting.”

Measures to address non-recurring traffic congestion due to accidents, construction, weather, etc. include traffic incident management and road repair management. Implementation of a traffic incident management program that provides for quick clearance of traffic accidents with computer-aided dispatch for towing and recovery, as well as service patrols, will reduce traffic caused by accidents as well as secondary crashes. Nassau should also support adoption of state legislation that would require quick clearance of traffic incidents. Such legislation could mandate that drivers move their vehicles out of travel lanes in the case of an accident, or authorize a predetermined authority to clear vehicles from travel lanes with no liability.

In order to minimize disruptions from roadway construction, Nassau could adopt “time is of the essence” clauses in County roadway construction contracts in congested areas, which could provide incentives for early project completion. The County could also require longer service life materials to minimize frequency of roadway repairs. Other measures that could be employed include limiting lane closures on arterials and expressways/parkways to off peak hours in congested locations and requiring traffic plans to minimize loss of capacity during construction.

START SIDEBAR

THE CROSS SOUND LINK PROJECT (SYOSSET-RYE TUNNEL)



Source: *Westchester Magazine* May 2009

The Cross Sound Link Project proposed by private developer Vince Polimeni would link the Seaford-Oyster Bay Expressway (Route 135) in Syosset with the intersection of Routes 287 and 95 in Rye, Westchester County via a 16-mile tunnel under the Long Island Sound. Proponents of the project stress the need to provide another way off of Long Island, saying that “Long Island’s dead-end status is crimping its economy and presenting a safety hazard in the event of a natural or man-made disaster².”

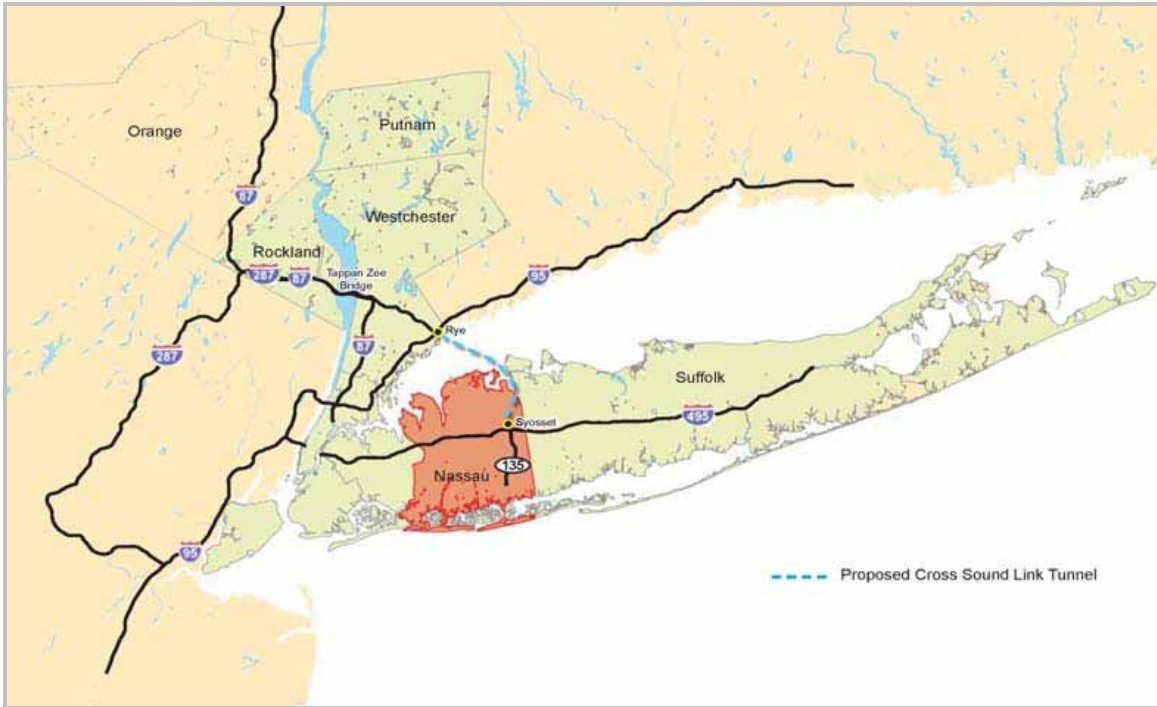
Since the 1930s, transportation planners have debated options for crossing the Long Island Sound either by bridge, ferry or tunnel. Although Cross Sound ferries now exist, both the bridge and tunnel concepts never materialized. In the mid-1960s, master builder Robert Moses presented environmental and planning findings to the Nassau-Suffolk Regional Planning Board for a planned Oyster Bay-Rye Bridge. The proposed bridge would have completed the I-287 beltway around the New York metropolitan area by connecting Nassau County with Westchester County. The proposed bridge concept failed in large part due to its environmental and aesthetic impacts, as well as public cost and political sensitivity.

Now, decades later, the proposed Cross Sound Link would complete the I-287 beltway through a completely private undertaking that would design, build and operate the tunnel. According to the project specifications, the Cross Sound Link would carry a maximum of 200,000 vehicles per day in two tubes. A third tube would be used to service the tunnel and could accommodate mass transit, such as light rail or express bus. The tunnel would be built approximately 150 feet below the seabed and would not be visible

² Bleyer, Bill and Susan Enriquez, *Throgs Neck Fire Renews Cross Sound Link Debate*, Newsday, July 18, 2009.

from the Long Island Sound or its shorelines. The first major test of the feasibility of the plan will be a traffic study by the developer's consultants, which is due in 2011.

Cross Sound Tunnel – Proposed Alignment



END SIDEBAR

POLICY 5: REDUCE COSTS TO RESIDENTS, BUSINESSES, AND COUNTY GOVERNMENT THROUGH ENERGY CONSERVATION, AND RENEWABLE ENERGY PRODUCTION

While enhancement of Nassau’s transportation systems, as described above, is an important component to addressing the pressing issue of carbon emissions and climate change, it is only one piece of the puzzle. A key element of the mission to reduce carbon emissions is to reduce the County’s dependence on non-renewable energy sources. Reducing emissions will help Nassau improve its air and water quality, while reducing costs to heat, cool and power homes and businesses.

Climate change may be one of the greatest economic and environmental challenges of the 21st century both with significant consequences for Nassau County. It is no longer a question of whether climate change is real or not, it is now a question of magnitude and when and where such impacts will be felt most. Nassau County officials recognize the threat of sea level rise and the population that is vulnerable especially to hurricane impact. Nassau County officials are actively measuring threats and potential impacts. Climate change exacerbated by the emission of greenhouse gases has a direct impact on sea level rise. Energy conservation, efficiency and reduction of harmful emissions from automobiles and buildings are the single greatest challenge and opportunity to avert risks of climate change to public health, property and our natural environment. Nassau County has been a leader in implementing positive change through climate change adaptation and must continue to do so.

Global warming as a result of increased emissions and greenhouse gases has contributed greatly to the heating of our atmosphere and melting of polar ice. Heating and cooling our buildings, fueling our automobiles, powering transportation systems, and manufacturing have taken a toll and many scientists believe that climate change has accelerated as a result of human activity. Energy efficiency and use of alternative and renewable sources of power can help to stem the emission of greenhouse gases that contribute to global climate change.

[Pull Quote: Energy efficiency and use of alternative and renewable sources of power can help to stem the emission of greenhouse gases that contribute to global climate change.]

Rising sea levels could greatly impact operations of wastewater treatment facilities and alter ecologically diverse and sensitive tidal marshes and dunes. Rising sea levels and the impact of future storm events could also have significant consequences on public health and safety.

Energy Conservation and Alternative Source Development

Over the years Nassau County has followed through on a number of energy conservation initiatives aimed at reducing energy consumption and utilizing alternative fuels. A sustainable energy action plan calls for the exploration and development of renewable energy sources, education and recognition that energy efficient practices and design are key components to advancing the cause of energy efficiency. In determining the long-term feasibility of commercial renewable energy projects, an analysis of the impacts on power utility rates should be considered.

Nassau County, like many other regional governments across the State, is facing pressures to reduce energy consumption. These pressures come from many factors including: the financial realities of municipal structural budget deficits resulting from various expenses, including utilities, increasing at greater than 2.5% per year; environmental concerns about our nation's over-reliance on fossil fuels; and larger political concerns about the jeopardy to our nation's national security resulting from our dependence on foreign oil.

The County's initiative to examine alternative energy opportunities is focused on development of new generation facilities as well as energy conservation practices. It is generally accepted that wasteful energy consumption practices need to be minimized before starting a potentially long and costly process of building new generation facilities. Along these lines, the County has taken steps to reduce energy consumption and continues to look for ways to further this policy.

Current County-Wide Energy Conservation Initiatives include:

- Energy audits as a means to identify opportunities and set precedents
- Interior lighting upgraded to high-efficiency units
- Exterior photo-sensor lighting
- Thermostat upgrading to programmable models to avoid excessive heating or cooling and regulating buildings during unoccupied times
- Heating equipment upgraded to high-efficiency gas-fired boilers
- Energy-star rated equipment to replace less efficient units
- Supplemental insulation

Nassau County owns nearly 800 buildings and structures in varied sizes which present an opportunity to have a significant impact on energy conservation and carbon reduction. Aside from the County wastewater treatment plants, few buildings are currently powered by non-renewable energy sources. Solar photovoltaics for electricity are a viable option to meet County electrical demand and to offset its use of fossil fuel – derived energy. Systems may sometimes take electricity from the grid and sometimes feed the grid with net zero consumption. Solar viability for heat and hot water systems require further development to appeal to most residential and commercial property owners, however, technology enhancements warrant ongoing evaluation and consideration. Passive solar should be considered for space heat and cooling with new construction or renovation projects effectively utilizing micro-climate studies to minimize energy demand and optimizing user comfort.

Of particular note, over 55 percent of total carbon input from government operations and facilities in Nassau County is produced at two wastewater treatment plants, Cedar Creek and Bay Park. The plants currently utilize only 30 percent of existing methane discharge. Improvements at the treatment plants will achieve significant reduction in carbon emissions. Since the plants are currently powered by methane, digested sludge and diesel, recapture of additional methane could reduce demand for non-renewable sources of energy or be returned to the regional power grid.

START SIDEBAR: CEDAR CREEK SEWAGE TREATMENT PLANT SOLAR ENERGY]

To meet its goal increasing the production of renewable energy Nassau County will explore the substantial opportunity of generating solar electricity on county owned property. Cedar Creek Sewage Treatment Plant, as one of the county’s largest energy consumers, with ample land area, is the perfect test site for the first large scale installation of solar panels on county property.

Cedar Creek consumes approximately 4.4 million kWh (kilowatt hours) per month; 30% of this electricity is generated by burning methane gas generated during the sewage treatment process; 70%, or 3 million kWh, is generated by burning fossil fuels.

Cedar Creek contains nearly 28 acres of grass and asphalt for the installation of solar panels. The grass areas could host solar arrays similar to the BP Solar Array project at Brookhaven National Lab. These panels would be mounted close to the ground on steel posts. Solar "carports", similar to what is being proposed by enXco at several existing parking lots in Suffolk County, would allow the sewer plant's expansive paved areas to be used for both power generation AND parking / storage.

Using sizing and generation guideline in the Brookhaven National Lab Proposal and the enXco proposal, we estimate Cedar Creek could generate 9.4 million kWh per year. This is 25% of the electricity presently generates from fossil fuels it must purchase.

Cedar Creek STP – Solar Energy Feasibility



Source: Nassau County Planning Department

END SIDEBAR

Carbon Reduction Initiatives

Nassau County is committed to supporting emission reduction goals and policies at federal, state, and local levels that will result in reducing greenhouse gas emissions at least 80 percent below 2005 levels by 2050, with appropriate near-term goals to reach that target and minimize cumulative emissions, such as reductions of 40 percent below 2005 recorded levels by 2030. Emission reductions at this level, in conjunction with similar actions worldwide, have a 50 percent chance of stabilizing global average temperatures at 2°C (3.6°F) above pre-industrial levels. Failure to reduce emissions to this level increases the likelihood of catastrophic impacts of climate change such as: melting ice sheets and rising sea levels, widespread land and marine species extinction, intensified natural disasters, and threatened water drinking supplies.

Long Island Carbon Footprint, initiated in 2009, is a County led initiative to determine energy use and greenhouse gas emissions by each local government. The County will inform each municipality as to what steps may be taken to reduce their own carbon footprint. Initiatives at this scale are critical to achieve reduction goals.

START SIDEBAR

ICLEI Local Governments for Sustainability: Long Island Carbon Footprint Project

In October, 2010, the International Council for Local Environmental Initiatives – Local Governments for Sustainability (ICLEI) released its “*Long Island Carbon Footprint Project*” which analyzed annual greenhouse gas emissions from both point and mobile sources in each town and city on Long Island. The project found that in 2005, cumulative greenhouse gas emissions on Long Island totaled 38,290,753 metric tons. Residential emissions accounted for the largest share of greenhouse gas emissions at 39%, followed closely by transportation, 31%, and commercial/industrial point sources at 26%.

For both residential and commercial/industrial land use, the use of electricity accounted for the greatest share of greenhouse gas emissions, followed by fuel oil and natural gas, respectively. Transportation included emissions from passenger cars/light trucks, heavy trucks, and transit/school buses (LIRR excluded). Total emissions from passenger cars/light trucks greatly exceeded that of transit.

Based on the analysis, a substantial reduction in carbon emissions from residential, commercial, and industrial point sources can be achieved through reducing electric demand. Retrofitting buildings with energy efficient appliances, insulation, and lighting is recommended to reduce the net demand for electricity. As single-occupancy vehicles are responsible for the majority of mobile-source carbon emissions on Long Island, the greatest potential for their reduction is in the provision of new and

expanding alternative modes of travel. As local governments, residents and commercial business owners look to initiate or continue greenhouse gas emission reduction strategies, *Long Island Carbon Footprint* will provide a baseline for monitoring performance and success.

END SIDEBAR

In addition, local governments are actively working to increase energy efficiency and reduce carbon emissions by reducing the amount of energy that is consumed by both single and multifamily residences. The Towns of Hempstead, North Hempstead and Oyster Bay have all incorporated Long Island Power Authority (LIPA) Energy Star rating compliance into their building codes. These codes require building permit applications to conform to the New York ENERGY STAR Labeled Homes Program administered by LIPA. This program requires that newly constructed dwelling units meet stated energy efficiency standards.

Another important step that should be taken is for government agencies from the County to local municipalities and school districts to “green their fleets” by replacing all municipal vehicles with clean natural gas (CNG)/hybrid vehicles. Some municipalities are already working towards this goal and others should be encouraged to do so. In addition, public and private bus companies and taxis should be encouraged to replace diesel vehicles with CNG/hybrid vehicles. Laws to eliminate idling of vehicles should also be considered.

Building Green

Nassau County promotes healthy, energy- and resource-efficient building practices and aims to achieve the most advanced standard for energy conservation and use of non-fossil energy in buildings. To achieve better performing buildings, improve public health and reduce our impact on the environment, residents, municipalities, manufacturing and commercial property and building owners must make educated choices. These choices must be based on knowledge of short- and long-term cost benefits, the health of our communities and employees, and availability of technology, materials and practices that are economically and environmentally sound.

Green Building options may include:

- Obtaining utility rebates
- Use of high efficiency HVAC systems
- Use of geothermal building systems
- Effective interior air exchange to reduce mold and bacteria
- Use of low E glass windows
- Use of Energy Star appliances
- Use of high-performance engineered wood products
- Minimizing site disruption during construction
- Use of water conserving household appliances, fixtures and faucets
- Storm water collection for on-site use

- Formaldehyde free finishes and building materials
- Reduced construction waste
- Engineered flooring

Telecommunications

Enhanced telecommunications infrastructure allows telecommuting and greater opportunity for residents to work or conduct their own businesses from home more efficiently. The resulting reduction in vehicle trips will help reduce traffic congestion and carbon emissions.

Landscaping

Landscape interventions may greatly reduce water usage and harmful emissions as well as provide shade and buffering for more comfortable and less energy demanding environments. Well-planned landscape improvements can result in significant energy savings and more comfortable living and working environments for people. Simple measures and their benefits are as follows:

- Pervious surfaces that allow stormwater infiltration are beneficial to landscaping, help to mitigate local and large scale flooding and reduce peak run-off to streams, wetlands and larger water bodies.
- Reduction in pavement areas reduces heat build up and stormwater runoff.
- Reduction in lawn area and preservation of woodlands reduces the need for mowing and chemical use.
- Reduction in fertilizer use, namely nitrogen, reduces lawn growth rates and the need for excessive mowing.
- Maintaining longer grass blades to out-compete lawn weeds and conserve soil moisture reduces maintenance cost and use of fuel fired power equipment.
- Shading of walkways and southern exposure of buildings with deciduous trees set an appropriate distance from building facades, foundations and pavement surfaces significantly reduces heating and cooling costs.
- Planting native and drought resistant plant species that are non-invasive allow greater success of material and reduction in maintenance.
- Collecting roof runoff for landscape irrigation purposes reduces run-off and conserves water.
- Mandating Ecological Pest Management (EPM) that prohibit the use of chemical lawn treatments that have adverse impacts on wildlife and water quality in favor of organic practices.

One of the simplest ways to reduce heat island effect and energy use as well as enhance aesthetics and quality of life is to invest in a new suburban reforestation program. Effective site selection is essential since the primary goal is to increase the rate of plant survival and the likelihood that planted species will attain their optimal size and provide the benefits intended. Programs headed by individual towns and villages, the County and other organizations should be coordinated.