TOWN OF EAST GREENBUSH

RENSSELAER COUNTY, NEW YORK

WESTERN EAST GREENBUSH

FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT

JULY 2009

Laberge Group
ENGINEERING ARCHITECTURE SURVEYING PLANNING
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Western East Greenbush GEIS

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RENSSELAER COUNTY, NEW YORK

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SECTION I. EXECUTIVE SUMMARY

A. Project Overview and Purpose

The project involves the preparation of a Generic Environmental Impact Statement (GEIS) to evaluate the cumulative impacts of potential future development in the Town in order to plan for and mitigate impacts due to growth. A GEIS is an environmental assessment/planning tool available under the New York State Environmental Quality Review Act (SEQRA). A GEIS allows for the evaluation of broad land areas or developments affecting quality of life and/or the environment and is commonly used for the adoption of land use plans. Unlike a project-specific Environmental Impact Statement (EIS), which evaluates the known and probable impacts associated with a specific action, a GEIS is, by design, a more flexible evaluation tool. The technical difference between generic and site specific EIS is the level of detail provided in the supporting documentation. While the level of detail for a site specific EIS must be sufficient to clearly identify the immediate construction and operation related impacts, the level of detail for a GEIS is usually at a planning or concept level (or "generic"). This allows the preparer of the GEIS to focus on the broader issues and cumulative impacts while establishing thresholds and procedures for future growth. A GEIS provides a hypothetical exploration of potential development scenarios and a plan to address the associated cumulative impacts within the prescribed study area.

For a planning document to truly function as an effective tool of community development, communities must be cognizant of the fact that, in the face of ongoing development, specific plan elements may warrant more frequent updating. Although the Town of East Greenbush's 1993 Comprehensive Plan continues to be an important community resource, changes stemming primarily from community and regional growth prompted the Town Board to update the Plan's land use component in 2006. This land use update, entitled the ***Land Use Plan Update and Zoning Study***, was conducted to ensure that the Town's existing and emerging land use pattern was in harmony with the community's vision for the future. This document serves as the basis for assessing and distributing future growth projections in the Town. This analysis of the Town's future growth pattern was used to evaluate geographically sensitive issues, as well as appropriate densities and update the Town's zoning regulations accordingly.

In an effort to ensure the preservation of the Town of East Greenbush's continued quality of life, the Proposed Action evaluates the cumulative impacts of continued population growth in accordance with the Town's recently amended zoning and land use regulations. In order to better understand and quantify the impacts of future development, an evaluation was made of the cumulative impacts associated with continued growth on the Town's transportation network, water and sewer infrastructure, stormwater management program, and recreational resource inventory. The GEIS was limited to the western portion of the Town due to the concentration of new development primarily in this area. Such development has and will continue to directly and heavily affect the existing infrastructure in this portion of the Town. The Study Area is delineated on the **Map 1: Base Map – Study Area.**

The primary purpose of the GEIS is to evaluate the cumulative impacts of growth on the Town of East Greenbush and provide suitable mitigation to minimize the affect of development. Once established, the mitigation process provides guidance to the Town during the project review process and clearly defines

responsibility for developers. The resulting mitigation fees help to provide an equitable means of distributing the cost of the improvements identified in the GEIS. Developers are able to contribute to their fair share of the development impact, without carrying an unnecessary burden often associated with capital improvement costs. To evaluate the impacts associated with the Town's anticipated growth trends, a 20-year planning period was chosen. This time frame is a reasonable period considering historical patterns. The growth associated with the 20-year planning period provides the basis for the analysis of the potential impacts.

Limitations, or constraints, identified in the GEIS are expressed as thresholds for future development based upon existing studies, current development trends, and evaluation of potential adverse impacts to the Town's resources based upon known challenges. Future development projects shall be required to complete site specific evaluation and analysis, and those that meet the thresholds shall be considered in compliance with this GEIS.

In instances where a future action is not in conformance with the conditions and thresholds established in the GEIS, the Town shall require applicants to submit an Environmental Assessment Form (EAF) to be used to evaluate the potential adverse impacts associated with the proposed action. Thereafter, the Town will determine whether the future action was not addressed or was not adequately address in the GEIS. If the subsequent action will not result in any significant environmental impacts, a negative declaration will be prepared by the Town. Alternatively, if the future action may have one or more significant adverse environmental impacts, a Supplemental EIS may be required. This process provides flexibility and allows the Town to consider site specific environmental issues and to modify requirements of the GEIS based on the results of the supplemental SEQR analysis.

The GEIS should be considered a dynamic document that may necessitate periodic review of the existing conditions and mitigation fees identified in this GEIS. As improvements are made to the Town's critical infrastructure or as growth patterns alter the Town's landscape, it may be appropriate for the Town to update the mitigation fees through a Supplemental EIS. Furthermore, subsequent studies prepared locally or regionally may provide new information or alter land use patterns in the Town. Such new information may require the preparation of a Supplemental EIS. In addition, the mitigation fees are based upon 2009 dollars and the Town may review these mitigation costs every year to account for inflation and adjust them as necessary so that sufficient funds are available to pay for the improvements.

Map 1: Base Map – Study Area

B. Environmental Setting, Impacts & Mitigation

The *Land Use Plan Update and Zoning Study* identified several ongoing trends and growth pressures facing the Town of East Greenbush. Due to the easy accessibility presented by I-90 Exit 9, growth pressures are increasing along NYS Route 4 in the vicinity of Exit 9 and northward primarily along the west side of NYS Route 4. This, coupled with the construction of the University at Albany's East Campus, located at the northwestern gateway to the Town of East Greenbush just off Route 9/20 on Discovery Drive has sparked additional residential and commercial development in the area.

This resultant impact from additional residential development is further intensified by the changing nature of development. Housing trends have shifted from primarily detached single-family to a mix of housing types including multiple dwellings such as duplexes, twin homes (attached single-family), and townhomes. While water and sewer infrastructure exist in the western/central part of Town, and have for the most part been historically available, the cumulative impact of new development, particularly in the western part of the Town, has resulted in a significant increase in the demand for these services.

Mitigation measures prescribed as part of this GEIS are a form of development guidelines designed to assist both the developer and the Town during the project review process. Most of East Greenbush's infrastructure is sustainable for its current capacity and existing users. However, growth creates the need for improvements to the Town's infrastructure through the form of mitigation measures. Typically, such improvements can be costly; through the GEIS, there is an opportunity to spread the costs over future developments such that no one project will bear the full cost of improvement. These are referred to as mitigation fees.

Mitigation fees were developed for the following critical elements in East Greenbush: land use, water/sewer, recreation, and traffic. The cost of preparing the GEIS is also included, as it was prepared as a tool to understand and analyze future development impacts. A summary of the mitigation fees identified in this GEIS are provided in the following table:

Table 1: Mitigation Fee Summary

Mitigation Fee Summary					
	GEIS	Land Use/GIS	Water/Sewer	Recreation	Traffic
Total Cost	$195,190	$60,240	$11,550,000	$9,094,259	$24,460,000
Private Share	100% $195,190	90% $54,216	100% $11,550,000	10% $1,364,139	$20% 4,890,000
Unit of Measure	Trip	Trip	EDU	Commercial Square Foot	Trip
Cost Per Unit	$52.29	$14.52	$5,100	$0.98	$1,310

The rationale and justification for establishing the mitigation fees is discussed in Section III and summarized under the respective planning elements. Implementation of the mitigation fees typically involves review of site specific documentation from an applicant or developer, as projects come forward, to determine the amount of impact based upon a unit of measurement. This unit of measurement can be expressed as an equivalent dwelling unit (EDU), vehicle trip, commercial square footage, and/or acres of disturbance.

It is anticipated that applicants and/or developers will be responsible for the identified improvements in the GEIS based upon future development trends. In addition, applicants/developers will be responsible for any required site specific improvements as a direct result of a proposed project that is not identified in the GEIS. Once a mitigation fee has been determined, it is the applicant/developer's responsibility to pay that fee in accordance with the Town's adopted fee policies and/or conditions of approval. The Town may periodically review and revise such schedule as may be appropriate. In addition, the Town may consider alternative payment schedules for specific projects when it is in the public's best interest. All mitigation fees collected will then be placed in separate accounts designated for each of the identified improvements.

Below is a summary of the issues identified in the GEIS by topic.

Land Use and Zoning

The Town contains 6,442 parcels comprising approximately 21,005 acres. By comparison, the Study Area contains 5,433 parcels and comprises approximately 8,422 acres. The Town's two largest land classifications include Vacant and Residential properties. Vacant land is the largest land use category in the Study Area, consisting of nearly 40% of the total land area, or about 3,341 acres.

The Western East Greenbush Study Area currently contains six (6) residential use districts and six (6) commercial and industrial districts. There are also two (2) overlay or floating districts within the Study Area. The zoning districts within the Study Area include: R-OS (Residential-Open Space), R-B (Residential-Buffer), R-1 (Residential), R-1A (Residential), R-2 (Residential), R-3 (Residential), PPB (Personal/Professional), B1 (General Business Mixed Use), B2 (General Business), O (Corporate Office Only), OC (Corporate Office/Regional Commerce), OI (Corporate Office/Light Industrial) Districts, and the WMO Watercourse Management Overlay District and the PDD Planned Development District (floating zone).

Natural Resources

The predominant soils found in the Study Area include Chenango, Hudson, Riverhead, Rhinebeck, and Bernardston. The northeastern portion of the Study Area is comprised almost entirely of Bernardston Soil, which is characterized by gently sloping terrain to very steep terrains that buffer the low lying Hudson River valley. This soil is very deep and well drained, making it good for agricultural uses in its flatter locations. The central and western parts of the Study Area are gently sloping to moderately steep, with slopes ranging from 0 to 60%. Large portions of Hudson Soil can be found in this area, which is a well drained soil usually located next to lower valley side slopes. In general, a majority of the Study Area is well drained and contains very deep soils, with varying terrain and slopes.

The Town has two wetland designations: the Hudson River, a tidal wetland from the Troy Dam south to New York City, and one freshwater wetland in the southeastern corner of the Study Area. The Hudson River tidal wetland classification limits development in the western portion of the Town located between the Study Area and the Hudson River.

There are several creeks, lakes, streams, waterfalls and tributaries in the Town that contribute to groundwater aquifers and then ultimately drain into the Hudson River. Surface water in the Town includes Hampton Manor Lake, Mill Creek, Papscanee Creek, Moordener Kill, and the Hudson River. The Town of East Greenbush shares two major aquifers with the Town of Schodack and Columbia County, which are referred to as the Schodack and Kinderhook Terraces. The aquifers cover 18.5 square miles, consisting of ice contact and outwash sand and gravel that form an unconfined, stratified, and regional water source. Yields from public-supply wells, screened in confined sections of the Schodack Terrace aquifer, range from 50 to 1,050 gallons per minute and average 305 gallons per minute.

The Town of East Greenbush has two types of floodplain zones, Zone A and Zone AE. Zone AE flood areas contain Base Flood Elevations (BFE) derived from detailed hydraulic analysis, while Zone A flood areas do not. Both of these zones are classified as 100-year Flood Hazard Areas, which means that there is a one (1%) percent chance in any given year that the land will flood. Most of the area along the Hudson River is designated Zone AE, which is outside the Study Area. In the Study Area, there are three (3) corridors designated Zone A, each located along or near a body of water, Mill Creek, Hampton Manor Lake, and an unnamed stream.

All future development proposals should be evaluated on a case-by-case basis. Potential impacts and mitigation measures related to natural resources should be analyzed and reviewed prior to approval of permits.

Water and Wastewater

Public water for the Town of East Greenbush is purchased from the City of Troy. The City of Rensselaer and the Town of East Greenbush jointly own a water system, consisting of transmission and storage facilities that convey water from the City of Troy to the Town of East Greenbush, which in turn conveys water to the City of Rensselaer. Joint expenses, including pumping costs, are shared by the two municipalities. Both East Greenbush and Rensselaer purchase water separately from the City of Troy based on use.

Town owned water systems in the Study Area serve approximately 4,940 users including 680 users in the Hampton Manor Water District. Distribution storage for the General Water District consists of one 4-million gallon (mg) steel reservoir located on Grandview Drive in the northern part of the Study Area. Only about 2.3 mg or 58% of this storage is available due to limitations in the range of allowable operating tank water levels.

Planned and recommended water system improvements include:

- Installation of a new 7.0 mgd (4,900 gallons per minute) engine driven back-up pump for the Cross Street Pump Station for auxiliary operation during electrical power outages.
- Storage: Construction of two 5 mg storage reservoirs to increase available storage and improve reliability. This addresses current and anticipated storage deficiencies.
- New master meter installations to measure water uses in the system.
- Increase the size of the existing 14-inch transmission main on Elliott Road from Iroquois Place to US Route 9&20. This will improve residual pressures during emergency flows and increase operating pressures downstream as demands increase in the southern portion of the study area.

The Town provides sanitary wastewater collection, conveyance and treatment services to approximately 4,800 connected properties. Since 1997, the Town has been operating under a DEC Consent Order to reduce I & I (infiltration and inflow) flows to the plant. The two major pump stations ultimately responsible for conveying wastewater to the treatment plant are the Barracks Road pump station on the north end of the Study Area and the Corliss Avenue pump station on the south end of the Study Area.

Improvements will be needed to the existing wastewater infrastructure to:

- Increase the capacities of conveyance and treatment facilities to handle flow increases expected from future growth and development
- Reduce quantities of I & I through a program of sewer rehabilitation, repair and replacement in areas where most needed, to preserve existing capacity for future growth and development.
- Provide for increased reliability, efficiency, and sustainability of system components that are presently stressed and are expected to be stressed further by future growth and development.

Planned and recommended wastewater system improvements include:

- Treatment/Conveyance: It is expected that future development and resultant increases in wastewater flow will eventually result in the existing treatment facilities' maximum capacity being exceeded. Based on this, the Town proposes to construct improvements at the existing plant to maximize its utility and to construct a plant bypass sewer.
- I & I Removals: The Town must implement a program of various sewer improvements and repairs to eliminate infiltration and inflow to reduce peak flow loads on existing wastewater infrastructure and enhance the Towns ability to accept flows from projected development. The program envisioned will target as much as 20 to 30 percent of the collector sewers in the Hampton Manor and General Sewer Districts.
- Corliss Avenue Forcemain Improvements: This proposed improvement entails construction of up to 3,000 feet of 14-inch forcemain in parallel with an existing single 12 –inch portion.

- Barracks Road Lift Station: Future development in the northern portions of the study area will require greater capacity at the Barracks Road pump station. Improvements envisioned include construction of a larger wet well for flow equalization along with aeration equipment, pumps, controls and piping.
- Rt. 4 and Rt. 9&20 Gravity Sewer: Flow increases tributary to the existing 10-inch gravity sewer in this area will require a larger 12-inch sewer. Approximately 2,000 feet of new trunk sewer pipe and appurtenances is envisioned.
- Corliss Avenue Lift Station: According to Town representatives, the Corliss Avenue Lift Station operates satisfactorily now except during heavy rain events. Proposed improvements would include upgrading pump discharge capacity by increasing the size of the existing impellers along with increased motor sizes and new VFD controls.
- Prospect Heights Trunk Sewer: This improvement entails replacement of approximately 500 feet of an older 15-inch segment with larger 18-inch to ensure that the expected additional flow can be handled.
- Hide A Way Pump Station: This station is occasionally inundated during wet weather. Its location is central to significant additional flow from future development. Upgrades to the existing pumps and controls are anticipated at a total estimated capital cost of approximately $100,000.

Water and wastewater system infrastructure improvements anticipated, along with estimated capital costs are summarized in **Table 29: Water & Wastewater Improvement Cost Summary** found in Section III. The total estimated capital cost of all the improvements is **$11,550,000**.

Recreation

The Town of East Greenbush currently has approximately 198 acres of public parkland. Some of this parkland has been fully developed, while approximately 30 acres are undeveloped due to significant slopes. The Town also owns other parcels, which have been dedicated as open space but remain undeveloped. At present, East Greenbush has six (6) public parks and a few quasi-public recreational areas within the Town's limits. These resources, including the Town's existing parks and the school districts' resources, provide residents and visitors with a variety of recreational and scenic opportunities. East Greenbush's parks are dispersed throughout the Town and vary in type and facilities provided. The largest of these parks is the Town Park, which is approximately 190 acres. The other five parks are neighborhood oriented and are used primarily by nearby residents.

The Town of East Greenbush fails to meet the standards provided by the National Recreation and Parks Association (NRPA), which recommend the community to have at least 10 acres of parkland for every 1,000 residents. East Greenbush has only 8.3 acres of parkland per 1,000 residents.

The Town does meet the State standard recommended by the 1994 New York State Comprehensive Outdoor Recreation Plan (SCORP) at 5 acres of parkland per 1,000 residents. However, with exception that the Town does not meet the SCORP facility standards, which may include tennis courts, basketball

courts, boating access, ice-skating, and swimming pools. The Town will need to continue to enhance recreational amenities to ensure the quality of life for both existing residents and future residents

While the Town has open space requirements in place for the R-3 Zoning District and the PDD, these informal areas do not address the recreational needs of residents who do not live in these areas. For example, recreational needs such as multi-use playing fields for soccer and softball and improved hiking /biking trails are not being met.

Implementing the recommendations of the Parks and Recreation Master Plan would greatly improve the Town's recreational and open space opportunities. The Town of East Greenbush currently has a deficient amount of recreation and open space to accommodate its current population and future populations. In addition to the acreage that would be afforded by the Pheasant Hollow Golf Course, it is anticipated that the Town would need an additional 46 acres for active recreational fields, 4 tennis courts, and 4 basketball courts. In addition, several additional park improvements were proposed in the Town's Recreation Master Plan, including trail/bike connections and access to the Hudson River. The total cost of these amenities, improvements, and the purchase of the golf course is approximated to cost **$10,534,259.** This cost may be reevaluated in the future by the Town Board should substantial recreational amenities be purchased or constructed by private developers for a public benefit.

With a total of 1,440 units estimated to be developed over the next 20 years, the contribution from residential development would be $1,440,000. It is recommended that this minimum fee be $1,000 per residential dwelling unit. This leaves $9,094,259 to be paid for through other means. Therefore it is calculated that commercial development should be responsible for ten (10%) percent allocation of the total estimated recreation costs or **$0.98 per square foot** of new commercial development.

Transportation Network

The transportation network within the Town of East Greenbush includes the following key corridors: the principal arterials of US Route 4 and US Routes 9 & 20, the minor arterial of 3rd Avenue Ext. (NYS Route 915E), and the major collector road, NYS Route 151. These roadways provide direct access to residential and commercial land uses and serve as the main travel corridors for commuters and through traffic, outside of the interstate system.

Based on the projected traffic volumes, several transportation network recommendations have been developed for the Study Area based on several previous traffic studies discussed in Section III.

- US Route 4 (between northern Town line and Mannix Road) – The estimated cost of improvements is $3,320,000.
- US Route 4 (between Mannix Road and NYS Route 151) – The estimated cost of improvements is $4,480,000.
- US Route 4 (between NYS Route 151 and US Routes 9 & 20) - The estimated cost of improvements is $4,610,000.

- NYS Route 151 (between 3rd Avenue Ext. and US Route 4) - The estimated cost of improvements is $2,200,000.
- NYS Route 151 (between US Route 4 and I-90) - The estimated cost of improvements is $6,200,000.
- NYS Route 915E (between NYS Route 151 and US Route 4) - The estimated cost of improvements is $2,000,000.
- US Routes 9 & 20 (between western Town line and US Route 4) - The estimated cost of improvements is $1,280,000.
- US Routes 9 & 20 (between US Route 4 and southern Town line) - The estimated cost of improvements is $370,000.

Though the total cost listed above will be required to make all the recommended improvements, it is estimated that the local share of the projects listed above will be 20% of the overall cost. Several State and Federal programs may be leveraged as potential funding sources to offset these costs. The financial burden to the Town would then be approximately **$4,890,000** to initiate, design, and construct the improvements listed above (see **Section III, Table 42: Mitigation Improvement Costs**).

Stormwater Management

The Town's stormwater conveyance system consists of roadside ditch networks or storm sewer systems that discharge to streams in the Town. The Study Area generally slopes from east to west, towards the City of Rensselaer. Recent development has required that project applicants construct stormwater detention facilities that limit the discharge rates to the pre-developed 10-year storm runoff and to store a 25-year storm event. Older areas within the Study Area are not served by stormwater detention or retention facilities; stormwater simply flows downstream unabated. The ultimate discharge location for all stormwater is the Hudson River.

Current New York State and federal standards require stormwater management to address stormwater quantity and quality from new development. Future developments in the Town must provide all the required detention and water quality measures without impacting down stream development. The Town does not have a system of large collector storm sewers and detention facilities for use as cumulative conveyance method for existing or proposed development. As such, an individual site may be required to retain additional runoff if down stream receiving systems are not of suitable size to convey the proposed discharges.

The single largest impact of stormwater is the cost associated with the operation and maintenance of the facilities installed. This cost has been typically passed along to the Town for residential and commercial subdivisions while single site commercial improvements are maintained by the property owner and/or operator. In order to generate revenue to cover the cost of maintenance on existing and future facilities, the Town should consider the use of stormwater management districts.

C. Unavoidable Adverse Impacts

By its very nature, development of land and resources may result in some level of unavoidable impact. These impacts may include, but are not limited to, a loss of land, change in community character and/or cultural resources. Future development projects shall be required to complete site specific evaluation and analysis to allow the Town to consider all potential adverse impacts, including all unavoidable adverse impacts. Included in the GEIS is an analysis of the potential impacts to many of the Town's resources and any associated mitigation measures. Future site specific studies shall be necessary to understand the site specific potential impacts of development on the Town's resources. Unavoidable adverse impacts of development should be minimized to tolerable levels to preserve the quality of life and the existing Town's resources.

D. Alternatives

Two alternatives were considered in the GEIS. The first was a "No Action" scenario, in which the Town would continue to review the potential impacts of development without mitigation fees and without understanding the potential adverse impacts of development on the Town's resources. This alternative would result in strained municipal services/infrastructure, increased traffic, and a general lack of foresight to protect finite resources.

The other alternative is the "Mitigation" scenario. This alternative assumes there will be a constant growth rate suggesting the conditions driving growth in the past years will remain constant for the next twenty years. Such growth would be predictable from a planning standpoint and the Town could therefore easily assess each development with a reasonable mitigation fee to offset potential adverse impacts of development. Implementation of the mitigation fees would create great predictability for applicants or developers in understanding the amount of impact or burden each development would have on the Town.

Section II: Project Description

SECTION II. PROJECT DESCRIPTION

A. Introduction

The project involves the preparation of a Generic Environmental Impact Statement (GEIS) to evaluate the cumulative impacts of future development in the Town in order to proactively plan for and mitigate the impacts of growth. A GEIS is an environmental assessment/planning tool available under the New York State Environmental Quality Review Act, commonly referred to as SEQRA. A GEIS allows for the evaluation of broad land areas or programs effecting land use and the environment and is commonly used for the adoption of land use plans. Unlike a project-specific Environmental Impact Statement (EIS), which evaluates the known and probable impacts associated with a specific action, a GEIS is, by design, a more flexible evaluation tool. The technical difference between generic and site specific EIS is the level of detail provided in the supporting documentation. While the level of detail for a site specific EIS must be sufficient to clearly identify construction and operation related impacts, the level of detail for a GEIS is usually at a planning or concept level. Ultimately, a GEIS provides for a hypothetical exploration of proposed alternative actions or development scenarios with a broader focus on cumulative impacts.

For a planning document to truly function as an effective tool of community development, communities must be cognizant of the fact that, in the face of ongoing development, specific plan elements may warrant more frequent updating. Although the Town of East Greenbush's 1993 Comprehensive Plan continues to be an important community resource, changes stemming primarily from community and regional growth prompted the Town Board to update the Plan's land use component in 2006. This land use update, entitled the *Land Use Plan Update and Zoning Study*, was conducted to ensure that the Town's existing and emerging land use pattern was in harmony with the community's vision for the future. This document serves as the basis for assessing and distributing future growth projections in the Town. This analysis of the Town's future growth pattern was used to evaluate geographically sensitive issues, as well as appropriate densities and update the Town's zoning regulations accordingly.

Over time, the cumulative impacts of multiple projects can have significant and often irreversible impacts on community character and resources. In an effort to ensure the preservation of East Greenbush's continued quality of life, the Town has prepared this GEIS in accordance with §617.10 of SEQRA regulations to assess the potential and likely environmental impacts due to cumulative growth in the Study Area.

B. Project Overview

The *Land Use Plan Update and Zoning Study* identified several ongoing trends and growth pressures facing the Town of East Greenbush. Due to the easy accessibility presented by I-90 Exit 9, growth pressures are increasing along NYS Route 4 in the vicinity of Exit 9 and northward primarily along the west side of NYS Route 4. This, coupled with the construction of the University at Albany's East Campus, located at the northwestern gateway to the Town of East Greenbush off the Columbia Turnpike has sparked additional residential and commercial development in the area.

The result from additional residential development is an impact further intensified by the changing nature of development. Housing trends have shifted from primarily detached single-family to a mix of housing types including multiple dwellings such as duplexes, twin homes (attached single-family), and townhomes. While water and sewer infrastructure exist in the western/central part of Town, and have, for the most part, historically been available, the cumulative impact of new development, particularly in the western part of the Town, has resulted in a significant increase in the demand for these services.

As a result of the development trends in the western part of the Town, the GEIS Study Area is generally defined as the area bounded by the railroad tracks on the west and on the east by the I-90 (**Map 1: Base Map – Study Area**). The Town of East Greenbush has determined the need to evaluate the cumulative impacts of growth within the Study Area to proactively plan for the Town's future, to ensure high levels of service are continued to be provided, and to preserve the community's quality of life.

In order to better understand and quantify the impacts of future development, an evaluation has been made of the cumulative impacts of continued growth on specified infrastructure and resources most directly and heavily affected. The areas examined include the Town's transportation network, water and sewer infrastructure, stormwater management, and the recreational resource inventory.

Current Town policy dictates that developers must pay for those improvements necessary to achieve their respective projects. This scenario works fine for incremental improvements associated with the level of development. However, over the long-term, capacity is diminished to a point where major infrastructure improvements are necessary, such as road widening, intersection modifications, or a new sewer pump station. Such major improvements would be cost prohibitive to an individual developer. The GEIS process provides the Town the opportunity to identify the needed major improvements and proactively plan and finance them by creating a mitigation fund. New development projects in the study area will be subject to fees associated with their projected infrastructure impact cost. The Study Area build-out was forecasted for a 20-year period. The growth estimates become the basis for impact evaluation. The Study Area is delineated on **Map 1: Base Map – Study Area**.

C. Project Purpose, Need, and Benefits

The purpose of the Western East Greenbush GEIS is to evaluate the cumulative impacts of potential future development within the Town of East Greenbush on the Town's transportation network, water and sewer infrastructure, stormwater management program, and the recreational resource inventory. Completion of this GEIS provides East Greenbush with an opportunity to evaluate the major issues of growth; to be proactive in guiding future development; to maintain a preferred level of service; and to preserve a high quality of life for Town residents.

As indicated, the need for this study stems from increasing growth pressures occurring in the Town along NYS Route 4 in the vicinity of I-90 Exit 9 and northward primarily along the west side of NYS Route 4. This, coupled with the construction of the University at Albany's East Campus, located at the northwestern gateway to the Town of East Greenbush on the Columbia Turnpike has sparked additional residential and commercial development in the area.

Residential development in the Town has further intensified due to shifts in housing trends. While detached single-family housing continues to be the most common residential unit constructed in the Town, new pressures and needs for a mix of housing types have developed, including multiple dwellings, duplexes, twin homes, townhomes, condominiums, and senior housing. While water and sewer infrastructure exist in the western/central part of Town, and have, for the most part, historically been available, the cumulative impact of new development, particularly in the western part of the Town, has resulted in a significant increase in the demand for these services.

Implementation of the findings identified in the Final GEIS will allow the Town to reasonably and fairly determine the impacts associated with anticipated future growth. The GEIS will assist in the establishment of a capital improvements program for the Town, using a 20-year planning period, and will provide a mitigation fee schedule to pay for planned improvements required as a result of the anticipated growth.

The preparation of an area-wide GEIS, inclusive of mitigation fees, provides the following benefits:

- Allows for the identification of the cumulative impacts of growth that cannot be ascertained from site-specific Environmental Impact Studies.
- Provides a growth management tool to protect important community resources and to plan for orderly growth.
- Identifies potential major growth impacts that may be inconsistent with community character and vision.
- Eliminates the inequitable scenario whereby impacts are not evaluated cumulatively and eventually thresholds are crossed as a result of growth, requiring major improvements at a high cost to the (final) developer and the community.
- Addresses the potential social, environmental, and economic impacts that additional development may incur on residents.

D. Geographic Limits of Project

The Town is located along the Hudson River, and is nearly bisected by I-90, a major Capital District highway. The western half of the Town, adjacent to the City of Rensselaer, has experienced more development, while the eastern half of Town continues to be very rural in nature, containing both forests and farmland. Surrounding communities include the Towns of North Greenbush to the north, Schodack to the south, Sand Lake to the east, and the City of Rensselaer to the west.

The Study Area comprises a major piece of the western portion of the Town, extending west along the railroad tracks to the Town boundaries with Rensselaer, north to the boundary with North Greenbush, then east to Upper Mannix Road and I-90. The Study Area is approximately 8,422 acres of residential, commercial, vacant/natural, recreational, and industrial land. The Study Area boundaries are provided on **Map 1: Base – Study Area**.

E. Study Area Build-Out

A Build-out Analysis was conducted for the Town to identify the development potential under current zoning regulations. The purpose of this analysis was to quantify and illustrate the implications of continuing growth under existing conditions over the next 20 years. To conduct this Build-out Analysis, Geographical Information Systems (GIS) and Town datasets were used. The resultant "growth" or "development" scenario serves as the basis of the "build" alternative in this GEIS. The Build-out Analysis was developed in accordance with the following parameters:

- Datasets analyzed included tax parcel data, soils, slope, water, sewer districts, floodplains, municipal boundaries, waterbodies and State and Federal wetlands.
- Consideration of those parcels that are potentially developable based on certain natural physical constraints and those parcels that are underutilized based on real property data, physical constraints and zoning regulations.
- Parcels were developed based upon the allowable bulk and area requirements for the zoning districts in which each parcel was located.

The Build-out Analysis identified the development potential for residential and non-residential (commercial and industrial) uses within the Study Area. Available mapping was used to identify development constraints, which were excluded from the potential developable area. Density was defined by the Town's Zoning Code and refined by current development practices. The results are summarized below:

- Approximate area included within the GEIS Study Area: 8,422 acres.
- Approximate area of potentially developable land: 5,149 acres.
- Maximum number of additional homes that could be built: 5,617 - 5,782 units.
- Approximate new residential based upon construction trends: 1,360 new single-family and 80 multi-family housing units.
- Maximum amount of new commercial space including complete expansion of existing facilities: 8,496,310 square feet.
- Approximate new commercial space based upon construction trends: 931,706 square feet.

F. Growth Projections

The results of the Build-out Analysis were compared to the Town's historic growth trends to understand the appropriate growth rate per year. The two elements critical to projecting growth are the rate of growth and the planning period. The Town determined that a 20-year planning period was appropriate due to costly infrastructure improvements that have a typical life span expected to exceed the 20-year planning process.

The baseline growth rate was established by reviewing building permits over the past 28 years (1980 - 2007) for single-family residential, multi-family residential and commercial development. **Table 2: Residential and Commercial Permits** displays the number of building permits for each land use over the 28-year period to illustrate the fluctuations in construction activity. An approximate annual growth rate was calculated based upon the average growth rate experienced by the Town during the previous 28-years.

Based on the residential building permit data, approximately 1,916 single-family homes were built over the past 28 years, which is a rate of 68 homes per year. In the same time period, approximately 105 multi-family units were constructed with an average rate of 4 units per year. It should be noted that most multi-family residential permitting and construction was done between 2003 and 2005 and therefore future projections may be underestimated. Growth projections are also tempered by periodic slow downs in development due to economic conditions.

Table 2: Residential and Commercial Permits

	Single-Family (1980-2007)	Multi Family (1980-2007)	Commercial (1995-2007)	Total Units Authorized by Building Permit Per Year
Total Units Authorized by Building Permits by Type	1,916	105	369	2,390
Average # of Units Per Year	68	4	28	85

Source: Town of East Greenbush
Note: Twin homes and townhouse (attached single-family) are included in the single-family permit totals. Two-family dwellings are included in the multi-family permit totals.

Commercial building permit data was available from 1995-2007 and shows that 369 commercial buildings were erected over the 13-year period at an average rate of 28 per year. The square footage of these commercial building permits was not provided in the data. The greatest number of commercial permits was issued in 1995 (46 permits) and the Town has since experienced a gradual decline with only 17 commercial units constructed in 2007.

G. Growth Distribution

As previously discussed, East Greenbush completed a full update of its Comprehensive Plan in 1993. In 2006, the Town amended the Comprehensive Plan to reflect current growth forecasts. This update, *Land Use Plan Update and Zoning Study*, closely examined recent development and growth patterns to ensure that ongoing development trends were consistent with the community vision outlined in the 1993 plan. The Town's Zoning regulations were also updated based upon the 2006 *Land Use Plan Update and Zoning Study*, which presently serves as the basis for guiding future growth in the Town.

The Study noted the Town's accessibility to I-90 Exit 9 and the associated growth pressures along NYS Route 4 and the University at Albany's East Campus. The accessibility and the growth pressures have led to increased residential and commercial development in the western part of East Greenbush.

The Build-out Analysis completed as part of this project sought to identify how much future growth could occur within the Study Area in East Greenbush on the basis of the zoning and land use regulations recently adopted by the Town.

H. Other Relevant Studies

Several recent planning documents were examined as part of the GEIS. These documents were reviewed to understand any prior assessments related to the impact of continued growth on the Town's infrastructure and resources.

Town of East Greenbush Land Use Plan

This 2006 partial update to the Town's 1993 Comprehensive Plan was developed to address the extensive changes occurring within East Greenbush in recent years, particularly new commercial and residential growth. This demand has largely been fed by the Town's proximity and convenience to the state capital. The plan also noted that the Town's proximity to downtown Albany and other technological centers in the region combined with its available open lands have also made it attractive for the expansion of technological and institutional development. The Plan noted the availability of infrastructure and amenities to serve the current demand. Water and sewer is available primarily within the western/central part of Town, west of I-90, and a very small area adjacent to and east of Route 4.

Route 4 Corridor Study Final Report

Route 4, a primary commercial corridor, has been the location of most of the "Big-box" retail development occurring in both the Town of East Greenbush and the Town of North Greenbush. In addition to the retail development occurring along the northern section of Route 4, East Greenbush has been the site of office/technology development along Mannix Road (East Greenbush Tech Park) and a large complex is proposed within the Mill Creek Commerce Park, situated between Route 4, Third Avenue Extension, and Route 151. Other segments of Route 4 experiencing growth and development include Third Avenue Extension, I-90 Exit 9, Route 151, and Routes 9&20. A new YMCA and Town Library were constructed within the area east of Route 151. The southern segment of Route 4, primarily residential, is also an area of concern as land uses change and traffic increases.

The Route 4 Corridor Study and the Town's 2006 *Land Use Plan Update and Zoning Study* were both prompted by the scale of recent and proposed development in East Greenbush and surrounding communities. The purpose of this study, which was funded by the Capital District Transportation Committee (CDTC) and Transportation Linkage Planning Program, was to examine the Route 4 Corridor, in its present and its likely future state, and to provide a planned set of conceptual transportation improvements and management actions designed to enable the Town to pursue its goals.

Major goals of this plan are to incorporate multi-modal transportation improvement concepts and to create a walkable corridor. Improvements are designed to provide safe and efficient access for pedestrians, bicyclists, transit users, and motorists, while also contributing to the development of a strong network of interconnected walkable corridors linking neighborhoods and destination areas.

This multi-modal corridor improvement plan is intended to:

- Create opportunities for attractive gateways and enhancement of nearby civic uses;
- Preserve and enhance the quality of life for surrounding residential neighborhoods; and
- Optimize the area's development potential by making the area more attractive for a variety of quality development options, similar to that described in the Mill Creek GEIS.

In order to maintain traffic flow and traffic safety along Route 4, the following techniques were recommended for consideration:

- Traffic calming;
- Signal coordination;
- Roundabout designs;
- Access management; and
- Limited capacity improvements.

Town of East Greenbush Route 9&20 Corridor Master Plan Final Report

CDTC funded the Route 9&20 Corridor Master Plan, completed in 2003, as part of its Community and Transportation Linkage Planning Program. The goals of the planning effort were to develop a plan for the Route 9&20 Corridor that identifies a desired street system, access plan and land use structure for the corridor, and also to identify mechanisms to help achieve the desired vision. Specific opportunities identified through the plan included functionally connecting to and attracting workers from the University at Albany East Campus to the Sherwood Avenue/Hampton Avenue commercial district; enhancing the commercial/public transit centers at the Sherwood/Hampton Avenue; enhancing the major commercial Town Center at the Route 4 intersection; enhancing the historic village center at Hayes Road; developing a trail on the existing trolley corridor; and improving the overall appearance of the corridor with landscaped medians, street tree plantings, architectural lighting and by burying overhead power lines.

Proposals within this plan highlighted promotion of local employment opportunities and providing more pedestrian, bicycling, and public transportation options for local residents. Other ideas include redesigning existing areas to be more pedestrian friendly, adding street trees and restricting roadway widths, and acquiring undevelopable open lands along the corridor and converting these lands into formal parklands. Other ideas included implementing traffic calming, improving corridor maintenance, reducing left turn movements, and developing a sense of place by creating clearly defined gateways, activity centers, and other unique features.

Route 151 Study Final Report

In 2004, the Town of East Greenbush completed a Corridor Study to assess the transportation system along Route 151 from Route 4 to Columbia High School. Planning recommendations identified in this document included the following: residential and commercial development should be connected to

adjacent establishments; secondary access points to major traffic generators such as Columbia High School and Community Way (to reach the Library and YMCA) should be constructed; and pedestrian and bicycle facilities, including off-road facilities, should be developed to ensure safe pedestrian access.

Short-term actions focused on improvements to the High School access road designed to eliminate backups onto NY 151. Other actions included incorporating pedestrian related signage and lighting along NY 151. Longer term recommendations included providing sidewalks, bicycle lanes, high visibility crosswalks, pedestrian crossing signals at signalized intersection(s), a signal at Michael Rd (as it becomes warranted), and a secondary access road to the High School from Mannix Road. Other recommendations included installing landscaping and various median treatments that would improve the visual character of the area and calm traffic, and installing pedestrian scale lighting to enhance pedestrian activity and calm traffic.

I. SEQR Process

Through the proposed action, the East Greenbush Town Board proposes to identify, examine, and mitigate the cumulative effects of future development on the provision and installation of attendant municipal services within the Study Area. Among the most significant of the aforementioned municipal services are improvements to the transportation network, provision of water and sewer utilities, management of stormwater in accordance with State and Federal mandates, and provision of local recreational opportunities. The Lead Agency has prepared the Generic Environmental Impact Statement (GEIS), under 6 N.Y.C.R.R. § 617.10 (State Environmental Quality Review).

The proposed action is an Unlisted Action, pursuant to the New York State Environmental Quality Review Act (SEQRA), Part 617. The following potentially Involved and Interested Agencies have been identified:

Involved Agencies

Town of East Greenbush Town Board
Town Hall
225 Columbia Turnpike
Rensselaer, NY 12144

Interested Agencies

Town of East Greenbush Planning Board
Town Hall
225 Columbia Turnpike
Rensselaer, NY 12144

New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-1750
Attn: Commissioner

NYS Department of Transportation
50 Wolf Road
Albany, NY 12205

Rensselaer County Department of Economic Development & Planning
1600 7th Avenue
Troy, NY 12180

Rensselaer County Department of Public Health
Ned Pattison Government Center, 2nd Floor
Troy, NY 12180

Capital District Transportation Authority (CDTA)
110 Watervliet Avenue
Albany, New York 12206

Capital District Transportation Committee (CDTC)
One Park Place
Albany, NY 12205-1606

No permits or approvals will be required from other local, State, or Federal agencies in response to or in connection with the proposed action.

Section III: Environmental Analysis

SECTION III. ENVIRONMENTAL ANALYSIS

A. Land Use and Zoning

Existing Conditions

Existing Land Use

Existing land use patterns, when compared to existing zoning districts, represent a snapshot of the current and potential future pattern and extent of development in East Greenbush. Land use patterns are a result of historic settlement characteristics coupled with modern building codes, zoning ordinances and subdivision regulations. East Greenbush's development patterns reflect such influences.

GIS Analysis of Existing Land Use Patterns

The Town's development patterns have been greatly influenced by many factors, including its waterfront location, natural terrain, fertile farmland, lakes and water courses and the existing railroad, road and bridge network. The majority of the Town's land is categorized as Vacant Land.

A detailed land use map was created to illustrate the existing land uses for the Study Area, as well as for the remainder of East Greenbush (**Map 2: Land Use)**. The Town of East Greenbush existing land use data was taken from 2006 Geographic Information System (GIS) data supplied by the Rensselaer County Department of Planning and Development. Each individual parcel was assigned a land use category based on the New York State Real Property Type Classification Codes. The local tax assessor uses these codes to complete the real property tax assessments for the Town. Accuracy and completeness of this information is not guaranteed, as the information is only updated on an annual basis. The database will not always reflect the most current use of a particular parcel (e.g. parcels may be abandoned or sold without notification to the local Assessor).

The following land use categories are depicted on **Map 2: Land Use**:

- Agricultural –- Property used as a part of an operating farm that does not have living accommodations and is used for the production of crops and/or raising of livestock.
- Commercial – Property used for hotels, restaurants, automobile services, storage, retail, banks, offices, funeral homes, etc.
- Community Services – Property used for schools, libraries, places of worship, cultural facilities, welfare services, hospitals, clinics, government, police, armed forces, correctional facilities, shelters, cemeteries, etc.
- Industrial – Property used for the production and fabrication of durable and non-durable goods, mining, quarrying, etc.

Map 2: Land Use

- Public Services – Property used for electric or gas power generation or transmission, public drinking water and water treatment facilities, communications, train, plane, and bus terminals, canals, waste disposal, sewer treatment, etc.
- Recreation & Entertainment – Property used for parks, theaters, racetracks, bowling centers, health spas, beaches, campgrounds, etc.
- Residential – Property used for all year round residences. This category may include single-family, two family, and/or three family dwellings.
- Vacant Land – Property that is not in use, in temporary use, or is lacking any permanent improvements.

Table 3: Town-wide Land Use Coverage breaks down the Town's properties into the classifications described above. The information listed in the Table is based on the Rensselaer County GIS system. The Town contains 6,442 parcels comprising approximately 21,005 acres. By comparison, the Study Area contains 5,433 parcels and comprises 8,422 acres. The Town's two largest land classifications are Vacant Land and Residential. These figures relate to taxable parcels only and do not include land area covered by roads and rivers and hydrologic features.

Table 3: Town-wide Land Use Coverage

Land Use Classification	Parcels	Acreage	Percent
Agricultural	22	1,064.2	5.1
Commercial	273	1,135.8	5.4
Community Services	55	876.1	4.2
Industrial	13	444.4	2.1
Public Services	23	332.3	1.6
Recreation & Entertainment	16	208	1.0
Residential	5,241	7,684.9	36.6
Vacant Land	799	9,260.1	44.1
Total	**6,442**	**21,005.8**	**100.0**

Source: Rensselaer County GIS

As indicated in **Table 4: Study Area Land Use Coverage** and visible on **Map 2: Land Use Map**, the largest land area within the Town's Study Area are properties assessed as Vacant Land (40% of the total land area or about 3,341 acres). A detailed summary follows.

Table 4: Study Area Land Use Coverage

Land Use Classification	Parcels	Acreage	Percent
Agricultural	4	103.5	1.2
Commercial	198	753.8	9.0
Community Services	44	635.0	7.5
Industrial	9	346.8	4.1
Public Services	13	66.5	0.8
Recreation & Entertainment	10	98.2	1.2
Residential	4,658	3,077.0	36.5
Vacant Land	517	3,341.2	39.7
Total	**5,453**	**8,422.0**	**100.0**

- **Agriculture** includes a few parcels in the north, and a few in the south end of Study Area. This land use comprises 1.2% of the land area within the Study Area.
- **Commercial** is located along either side of U.S. Route 9, and clustered along U.S. Route 4, I-90, and CR 151 in the eastern central section of the Study Area, where the roads intersect. CR 915c in the northwestern corner of the Study Area is also dotted by commercial enterprises. This land use makes up approximately 9.0% of the Study Area.
- **Community Services** includes several sizable community services properties that are located in the northern portion of the Study Area. Others are located along U.S. Route 9 in the center and southern portions of the Study Area. These 36 parcels represent about 7.5% of the Study Area.
- **Industrial** comprises two sizable industrial properties that are located along I-90 in the northern part of the Study Area and seven that lie adjacent to the rail tracks in the central Study Area. Together, these properties comprise 4.1% of the Study Area.
- **Public Services** land, in addition to right-of-ways for utilities, includes two large parcels occupied by public services uses in the west-central section of the Study Area. These parcels represent 0.8% of the Study Area.
- **Recreation and Entertainment** includes three properties located where U.S. Route 9 and U.S. Route 4 intersect. Several smaller properties exist off U.S. Route 9 in the west-central section of the Study Area. One large property overlaps the Town of Schodack border on Phillips Road. Recreation and entertainment uses make up 1.2% of the Study Area.
- **Residential** land uses are distributed throughout the Study Area. A total of 4,658 properties comprising 3,077 acres account for 36.5% of the Study Area.
- **Vacant Land** parcels are distributed throughout the Study Area. These 517 parcels consist of 3,341.2 acres and together comprise 39.76% of the Study Area.

Existing Zoning and Land Use Regulations

Neighborhood stability, future economic growth, and natural resource preservation are directly impacted by a community's local zoning regulations. District boundaries, permitted uses, accessory uses, conditional uses, and prohibited uses, as well as the development requirements of the various zoning districts have a great impact on resultant development patterns. The Town of East Greenbush recently updated its Zoning Ordinance and adopted the amended regulations on June 11, 2008. The amended zoning regulations were evaluated as part of the GEIS.

Zoning Districts

The Western East Greenbush Study Area currently contains six (6) residential use districts and six (6) commercial and industrial districts. See **Map 3: Zoning**. There are also two (2) overlay or floating districts within the Study Area. Brief synopses of the permitted uses for each zoning district are provided in the paragraphs that follow.

Map 3: Zoning

Residential Districts:

- R-OS (Residential-Open Space)
- R-B (Residential-Buffer)
- R-1 (Residential)
- R-1A (Residential)
- R-2 (Residential)
- R-3 (Residential)

Commercial and Industrial Districts:

- PPB (Personal/Professional)
- B1 (General Business Mixed Use)
- B2 (General Business)
- O (Corporate Office Only)
- OC (Corporate Office/Regional Commerce)
- OI (Corporate Office/Light Industrial)

Overlay Districts and Floating Zones:

- WMO Watercourse Management Overlay District
- PDD Planned Development District (floating zone)

Residential Zoning Districts

The **Residential-Open Space District (R-OS)** is intended to permit agricultural, rural, and open space uses, and as well as low density residential uses (1 unit per 2 acres) designed to retain the open space and rural character of the district. This district encompasses much of the area of the Town east of Interstate 90. However, within the Study Area, there is only a relatively small area zoned R-OS along Upper Mannix Road. Total land in the Study Area zoned R-OS is approximately 183 acres or 2.2% of the Study Area. Permitted uses include single-family residential dwellings, farming/agriculture, farm stands, horse farms and stables, civic uses (both cultural and religious), recreation uses (such as golf courses or campgrounds), schools, and daycare centers. The minimum lot size is 87,120 square feet. There are 13 special permit uses ranging from bed and breakfasts to airports. Accessory uses range from as-of-right uses such as off-street parking, garages, and private stables to Special Permit Uses including accessory dwelling units, dormitories and home occupations.

The purpose of the **Residential-Buffer District (R-B)** is to support low-density residential, agricultural, rural, and open space uses and to serve as a transition from the medium-density neighborhoods of East Greenbush to the more rural areas of the Town. Approximately 42.8% of the Study Area is zoned R-B

(3,494 acres). This district encompasses a large swath of land adjacent to I-90 in the southern half of the Study Area, a large area between the railroad tracks and U.S. Route 9 in the southwest, and several areas located along Mannix Road and County Route 151 in the northern portion of the Study Area. Permitted uses include single-family residential dwellings, farming/agriculture, farm stands, horse farms and stables, civic uses (both cultural and religious), recreation uses (such as golf courses or campgrounds), schools, daycare centers, and senior housing. The minimum lot size is 65,340 square feet. There are 15 special permit uses. The district also offers a higher density incentive to developers. To be eligible for the increased density (smaller lot dimensions 21,780 square feet and two dwelling units per acre instead of one), applicants must have municipal water and sewer service existing on-site or sufficiently adjacent to the site such that the Town Board approves the extension. Developers seeking the R-B Incentive must also adhere to the cluster ordinance procedures and standards, with the exception that preserved open space must total 50% of the total site.

The purpose of the **Residential–1 (R-1) District** is to provide moderate density residential housing opportunities of approximately four (4) residential units per acre of land. There are four (4) areas zoned R-1 within the Study Area. These areas include the residential developments located off Huntswood Lane in the south; Old Red Mill Road and Robin Lane in the center; and Woodlawn Avenue in the northern portion of the Study Area. In total, these areas equal approximately 381 acres, or 4.2% of the Study Area. Permitted uses include single-family residential dwellings, farming/agriculture, civic uses (both cultural and religious), recreation uses (such as outdoor parks or campgrounds), schools, daycare centers, and senior housing. There are ten (10) special permit uses. The minimum lot size is 12,500 square feet.

The purpose of the **Residential–1A (R-1A) District** is to provide medium density residential housing opportunities of around five (5) residential units per acre of land. This zone is located on and off U.S. Route 9 and U.S. Route 4, totals approximately 106 acres and makes up 1.2% of the Study Area. Permitted uses include single-family residential dwellings, farming/agriculture, civic uses (both cultural and religious), recreation uses (such as outdoor parks or campgrounds), schools, daycare centers, and senior housing. There are ten (10) special permit uses. The minimum lot size is 9,000 square feet.

The purpose of the **Residential-2 (R-2) District** is to provide higher density residential housing opportunities of around six (6) residential units per acre of land to match some of the older housing development patterns in the area. This zone is located on and off U.S. Route 9, U.S. Route 4, and County Route 915e, totals approximately 1,467 acres and makes up 17.4% of the Study Area. Permitted uses include single-family residential dwellings, bed and breakfasts, civic uses (both cultural and religious), recreation uses (such as outdoor parks or campgrounds), schools, daycare centers, and senior housing. There are seven (7) special permit uses. The minimum lot size is 7,500 square feet.

The purpose of the **Residential-3 (R-3) District** is to continue to provide high-density housing opportunities with a mix of one, two, and multi-family housing. There are six (6) R-3 zones in the Town, all are located off U.S. Route 9 and U.S. Route 4, and all lie within the Study Area. Together these areas total approximately 138 acres and comprise 1.6% of the Study Area. Permitted uses include single-family, two-family, and multi-family residential dwellings, bed and breakfasts, civic uses (both cultural and religious), recreation uses (such as outdoor parks or campgrounds), schools, daycare centers and senior

housing. There are six (6) special permit uses. The minimum lot size is 10,000 square feet or 3,500 square feet per dwelling unit (whichever is greater). Single-family homes in the R-3 district must comply with the area and bulk regulations listed for the R-2 District. In addition, each dwelling unit constructed in the R-3 District requires a provision of 300 square feet minimum of designed open area. For each dwelling unit that contains more than two (2) bedrooms (or equivalent suitable rooms), an additional 100 square feet of open area must be provided.

Table 5: Area and Bulk Schedule, Residential Zoning Districts

Minimum Lot Dimensions	R-OS	RB	RB Incentive Zoning	R-1	R-1A	R-2	R-3
Area (sq ft)	87,120 (2 acres)	65,340 (1.5 acres)	21,780	12,500	9,000	7,500	10,000 sf or 3,500 sf/DU
Width (feet)	200	200	100	80	75	75	100
Minimum Yard Dimensions							
Front (feet)	50	40	25	35	35	25	25
Side (feet)	50	25	10	10	8	8	25
Rear (feet)	50	30	30	25	25	25	25
Maximum lot coverage	10%	10%	10%	20%	25%	25%	35%
Density (Dwelling units per acre)	0.5	0.66	Up to 2.0	4	5	6	12
Maximum building height (feet)	35	35	35	35	35	35	40

Source: Town of East Greenbush Zoning Code, Adopted June 2008
*The Zoning Code allows for some non-residential development through special use permits, such as heath/medical offices or clinics. For purposes of the buildout analysis, these districts were assumed to be developed as residential only.

Commercial and Industrial Zoning Districts

The intent of the **Personal / Professional District (PPB)** is to provide transitional areas where existing single family home structures can be converted into personal and professional offices, allowing commercial services while maintaining the small scale community neighborhood. Permitted uses include existing single-family dwellings, civic uses (both cultural and religious), recreation uses (such as outdoor parks or campgrounds), schools, daycare centers, personal care services, and professional offices. This district exists in various sized zones along U.S. Route 9, U.S. Route 4, and Phillips Road within the Study Area. Together these properties total approximately 107 acres and comprise 1.3% of the Study Area. The minimum lot size is 43,560 square feet. There are twelve (12) special permit uses ranging from restaurants to senior housing. Accessory uses range from as-of-right uses such off-street parking and garages, to Special Permit Uses including accessory dwelling units, dormitories, and home occupations. All new uses and structures (except one and two family dwellings) and all changes of use require site plan review. Except by special permit, maximum building area used for non-residential purposes is restricted to either 3,000 square feet or a demand of 10 off-street parking spaces, as needed. The maximum number of dwelling units per building, provided through either adaptive reuse or new construction, is restricted to four (4) dwelling units except by special permit.

The intent of the **General Business Mixed Use (B-1) District** is to promote redevelopment with high-density, mixed-use structures, which help define a coherent village atmosphere, providing local goods and services and linking nearby residential neighborhoods with a pedestrian-friendly environment. These districts are located along U.S. Route 4 and U.S. Route 9 in the center of the Study Area, totals

approximately 222 acres, and make up 2.7% of the Study Area. The minimum lot size is 21,780 square feet. Permitted uses include hotels and bed and breakfasts, civic uses (cultural, religious, banks or government offices), recreation uses (such as outdoor parks or campgrounds), existing single, two-and multi-family housing units, restaurants, retail uses (less than 15,000 square feet), shopping centers, senior housing, residential and commercial mixed use, schools, daycare centers, personal care services, and professional offices. There are thirteen (13) special permit uses. The requirements for side and rear setbacks are waived if the structure contains an approved party-wall / Firewall in accordance with NYS Fire Codes and Building Inspector approval. All new uses and structures (except one and two family dwellings), and all changes of use, require site plan review. Through Planning Board approved "shared parking" arrangements, up to 20% of the parking required for commercial/residential mixed use developments may be waived.

The intent of the **General Business (B-2) District** is to provide contained areas for low to medium density commercial highway development along the traveled corridors. The permitted uses of the district would otherwise not be appropriate for the more pedestrian oriented B-1 and residential districts. The B-2 District allows many uses included animal boarding, hotels and motels, various civic uses, health and medical facilities, garages and parking lots, recreation, restaurants, retail, services, storage, and transportation uses. Single, two and multi-family housing units existing prior to the adoption of the zoning ordinance are grandfathered. Eleven (11) additional uses are allowed through Special Permits. Six (6) B-2 zones existing along U.S. Route 9 and one zone existing by the intersection of U.S. Route 4 and County Route 915e together total approximately 383 acres and comprise 4.6% of the Study Area. The requirements for side and rear setbacks are waived if the structure contains an approved party-wall / Firewall in accordance with NYS Fire Codes and Building Inspector approval. All new uses and structures (except one and two family dwellings), and all changes of use require site plan review.

The **Corporate Office Only (O) District** is intended to encourage a grouping of office uses, easily accessible by major roads, built to a high standard and primarily intended for corporate office centers and office buildings. There are three (3) such zones within the Town (and within the Study Area). They are located along Mannix Road, northeasterly of I-90 and off U.S. Route 9, accessible via Bass Lane. Together they total approximately 120 acres and comprise 1.4% of the Study Area. Permitted uses include existing single and two family dwellings, various civic uses, garages and parking lots, recreation (such as outdoor parks and campgrounds), light industry (such as research and development labs), and professional offices. All new uses and structures (except one and two family dwellings), and all changes of use require site plan review. Professional office buildings must have a minimum floor space of 10,000 square feet.

The **Corporate Office/Regional Commercial (OC) District** is intended to permit and encourage a grouping of office and commercial uses, easily accessible by major roads, and built to a high standard. The intended uses include corporate office centers, tourist accommodations, convention centers, and regional level commercial uses such as a regional shopping center. The regulations are designed to encourage large-scale campus-type developments, and to discourage a strip form of development. Three sizable OC Districts in the northern half of the Study Area (adjacent to I-90) total approximately 356 acres and comprise 4.2% of the Study Area. Permitted uses include agriculture, hotels, civic uses, health and medical uses, industrial uses, garages and parking lots, various recreation uses, pre-existing

restaurants, schools, and professional offices. Pre-existing single and two family dwellings and personal care offices are also allowed. All new uses and structures, and all changes of use require site plan review. Professional office buildings must have a minimum floor space of 10,000 square feet.

The **Corporate Office/Light Industrial (OI) District** is intended to permit and encourage the development of light manufacturing, research, offices and warehousing uses, which do not require rail or water access. Permitted uses include agriculture, civic uses, industrial uses, garages and parking lots, recreation uses, professional offices, and storage facilities. Ten (10) additional uses are allowed through the issuance of a Special Permit. One large OI zone exists within the Town (and Study Area) along Carpinello Road southeast of the City of Rensselaer. This zone, at approximately 160 acres, comprises 2% of the Study Area. All new uses and structures, and all changes of use require site plan review.

Table 6: Area and Bulk Schedule, Commercial and Industrial Zoning Districts

Minimum Lot Dimensions	PPB	B-1	B-2	O	OC	OI
Area (sq ft unless otherwise noted)	43,560	21,780	21,780	5 acres	5 acres	3 acres
Width (feet)	100	100	100	400	400	300
Minimum Yard Dimensions						
Front (feet)	25	0 ft min 15 ft max	25	25	25	35
Side (feet)	12	12	12*	12	12	12
Rear (feet)	25	12	12*	25	25	25
Maximum lot coverage	35%	70%	35%	35%	35%	35%
Density (Dwelling units per acre)	4	12	N/A	N/A	NA	N/A
Maximum building height (feet)	35	2 story min 50 ft max	50	50	50	50

Source: Town of East Greenbush Zoning Code, Adopted June 2008
*No setback required if constructed of an approved Party-wall / Fire-wall in accordance with NYS Fire Codes and building inspector approval. For purposes of the buildout analysis, the setback requirements were included.

Overlay Districts and Floating Zones:

The **Watercourse Management Overlay (WMO) District** was created to achieve several different objectives. These include the following:

- To preserve and protect natural and cultural resources in the stream corridor.
- To enhance surface water quality.
- To control non-point source pollution sources such as erosion and sedimentation.
- To protect people and structures from flood hazards.

The WMO District applies to all lands within a horizontal distance of 50 feet from the high water mark of ponds, lakes, and from the nearest bank of streams and rivers. WMO controls are superimposed over any other district regulations. WMO Districts affect waterbodies classified by the New York State Department of Environmental Conservation (NYSDEC).[1]

1 WMO water bodies are shown on map I-B-2 of the Town Zoning Ordinance, Stream Classification, Town of East Greenbush, and are listed in Table I-B-3 in the Town Zoning Ordinance, Major Streams in the Town. The designated water classes, "AA" through "D" are listed in Table I-B-2 of the Ordinance, Water Quality Classification System.

For projects located within a WMO District, applicants must submit plans to the Planning Board that provide specific details regarding the proposed activity. In reviewing the plans, the Planning Board considers the following:

- Possible deterioration of stream or lake quality due to erosion, siltation, or point or non-point pollution.
- Natural habitats for birds, mammals, reptiles, and aquatic organisms.
- Active and passive recreation activities.
- Flood hazards.

The **Planned Development (PDD) District** is a floating zone, which was intended to encourage creative, compact development while fostering community amenities such as a usable open space system for residents and nearby neighborhoods throughout the Town. Once approved, PDDs address the unique environmental, physical, and cultural resources through a customized, site-specific master plan and accompanying regulatory framework. There are approximately 1,300 acres zoned PDD, comprising 16.7% of the Study Area.

A PDD may be created within any underlying zoning district, except within the A-R or R-OS Districts. Residential or general use PDDs require a minimum of twenty (20) contiguous acres, while commercial or light industrial PDDs require ten (10) contiguous acres. The calculation of the minimum land area does not include existing streets, easements, parks, or otherwise dedicated land or water areas in excess of five percent (5%) of the minimum gross acreage, lands designated on the official map for public purposes, or lands not developable for reasons of topography, drainage, periodic inundation by flood waters, or adverse sub-soil conditions. Proposals containing two or more use classifications require an aggregate of the gross land areas required for each use.

In PDDs established in primarily residential districts, appropriate permitted uses include residences of any variety of type; private garages, storage spaces, recreational and community facilities; and limited commercial, service and other non-residential accessory uses scaled to serve only the PDD residents. Within PDDs established in other zoning districts, additional uses may include commercial, service and other non-residential accessory uses scaled to serve PDD residents and the surrounding community; and commercial, service, light industrial, and other non-residential land uses as either the sole principal use, or a co-principal use in a mixed use development.

Density for a PDD located within a former residential district is limited to the base density otherwise permitted per developable area in the "District Area and Bulk Schedule" for that district. Increased density and/or smaller lot size per developable area may be permitted in consideration of the project amenity package provided.

Base residential density for a PDD located within a former non-residential district and/or within districts where residential is currently not permitted, is limited to two (2) units per acre of developable area, exclusive of areas used for nonresidential uses. Increased density and/or smaller lot size per developable area may be permitted in consideration of the project amenity package provided.

PDD amenity packages must include provision of on-site and/or off-site amenities beyond measures required to service the needs of the subject project and/or beyond the measures needed to mitigate the impact of the subject project. The Town Board may require a payment to the town in lieu of community benefits, if the Board determines that a suitable community benefit or amenity is not immediately feasible, or otherwise not practical. Community benefit amenities may include but not be limited to:

- An open space system open to the public including a comprehensive multi-purpose path system and conservation lands (including developable land) permanently protected by conservation easement or other measure acceptable to the Town.
- Recreation amenities including parks, athletic fields beyond that required for the immediate residents of the project.
- Provision for the enhancement of public facilities including the public water, wastewater (sewage) and community services/public safety/transportation facilities.
- Housing facilities for persons of low to moderate income.
- Cash payment to the Town for improvements or acquisition of public/community facilities such as parks, trails, water, sewer, etc.

As a general guideline, amenity packages must commensurate with any density increase or use change proposed, based on each additional unit beyond the base or allowed residential density and/or per 1,000 square feet of previously not permitted nonresidential (e.g., commercial) use. The Planning Board may establish and maintain a required amenity schedule, which outlines cash or equivalent reimbursements.

Off-Street Parking & Loading

To ensure adequate parking is available while also reducing the amount of impervious asphalt surface created by overly-large or redundant parking areas, the Town has identified alternatives to permit smaller, more efficient parking layouts and pervious parking surfaces. In all zoning districts, at the time any new building or structure is erected, existing building enlarged, or changed in use, off-street parking and loading space shall be provided in accordance with the minimum standards identified in the Town's Zoning Ordinance. For uses not specifically listed, the Planning Board at the time of site plan review determines the use most similar to the proposed use, establishing the parking requirement. Spaces mandated by ADA for handicapped accessibility are counted toward the overall amounts required, while fractional results for the number of spaces are rounded up to the next whole number.

In the case of a mixture of uses on nearby or adjacent parcels, off-street parking requirements may be reduced with Planning Board approval if the applicant can prove that staggered hours of use would permit the adjacent lots to share some of the parking demand. The Planning Board may require that a redevelopment project that has excessive parking for its new use, remove excess parking and asphalt and reclaim the land as landscaped islands, medians, or perimeter buffers. Other negotiation factors can affect the amount of parking required or permitted (i.e. the extent of employees carpooling, telecommuting, and traveling, as well as the nearby access of on-street parking provisions and the provision of pervious parking or structured parking). All parking areas abutting a public right-of-way are required to have a

minimum perimeter buffer strip of fifteen (15) feet. All off-street loading areas must be located on the same lot as the use for which they are required. Loading berths, which may be open or enclosed, must have the following minimum dimensions: 35 feet long, 12 feet wide, 14 feet high.

Landscaping

The Town has mandated minimum landscape requirements for several of the Town's Commercial, Industrial, and Business Districts, in particular the PPB, PDD, B-1, B-2, O, OC, OI, and CI Districts. A minimum of 25% of the developable area is required to be maintained as greenspace, with greenspace defined as areas free from built structures, parking lots, loading areas and areas covered by vegetation, as appropriate. The provided greenspace may not include wetlands, streams, or slopes in excess of fifteen (15%) percent unless further designing and planting is planned to enhance their function and aesthetic quality and the proposal meets with Planning Board approval. Developable Area is defined as the lot area, exclusive of those areas containing streams, ponds, wetlands, or areas of slope greater than fifteen(15%) percent.

Potential Impacts

Build-out Analysis

In order to understand the potential impacts of future development, it is useful to calculate the total theoretical development allowed under the Town's current zoning, given existing development patterns and natural resource constraints. In general, a build-out analysis is an exercise designed to estimate the amount of development that can possibly occur if all developable land within a municipality is built in accordance with current land use regulations. This analysis employs land use regulations, considers environmental constraints that would limit development in certain areas, and calculates the total residential and commercial density allowed at full build-out. The Town of East Greenbush's Zoning Ordinance adopted on June 11, 2008, was used to determine the permitted build-out density for the parcels contained within the designated Study Area.

It should be understood that the data available for this analysis is not detailed enough to allow an accurate prediction of the total development potential on every specific parcel. Furthermore, the assumptions made, (for example with respect to the impact of natural resource constraints) will affect the results. In general, studies of this type tend to overstate development potential because very few landowners develop their property to the maximum extent allowed by zoning. Nevertheless, the analysis does provide an order of magnitude estimate of total potential future development in the Town.

This Build-out Analysis does not predict when development would occur, at what rate it would occur, or where it would occur first. It only predicts the possible end result if the Study Area were fully developed per the Town's current zoning regulations.

This study was prepared using GIS datasets provided by the Town and Rensselaer County. The analysis utilized multiple datasets, including 2007 tax parcel data, soils, slope, water and sewer districts, floodplains, municipal boundaries, waterbodies and NYSDEC wetlands. Consideration was given to those

parcels that are potentially developable based on certain natural physical constraints and those parcels that are underutilized based on real property data and physical constraints. Nearly all of East Greenbush's Zoning Districts are represented in the Study Area, with the exception of the A-R (Agriculture-Residential) and the CI (Coastal Industrial) Districts; these Districts lie entirely outside the Study Area boundaries. Current and applicable zoning regulations were applied to all parcels within the Study Area.

Zoning

The Town recently amended its Zoning Ordinance in June 2008. These recently amended zoning regulations were used to determine the development potential of each parcel within the Study Area. As previously noted, the Study Area consists of six (6) residential zoning districts and six (6) non-residential, commercial zoning districts. These districts are listed in **Table 7: Residential Zoning Districts** and **Table 8: Commercial Zoning Districts.** The minimum lot size and minimum density for each zoning district is also identified.

Residential Zoning Districts

The Town's zoning regulations require that all lots within the R-B Zoning District that are subdivided set aside 30% of the land as an undisturbed natural area. The R-B Zoning District allows for a higher density development if the lot(s) have access to municipal sewer and water. Only two potentially developable parcels within the Study Area conformed to this standard. Therefore, no alternative analysis was performed.

The R-3 Zoning District permits multi-family and two-family housing by right. Single-family homes built within the R-3 Zoning District must conform to R-2 Zoning District regulations which have a slightly larger minimum lot size. Therefore, two alternatives were explored for this zoning district, one demonstrating the number of single-family homes that could be built, and the other the maximum number of multi-family residential units that could be built. The R-3 Zoning District also has an open space requirement that is contingent on the number of bedrooms each residential unit contains. Open space must be suitably graded and planted with lawn seed or sodded for active recreational activity. The open space requirement is 300 square feet for residential units with two bedrooms and an additional 100 square feet is required for each additional bedroom.

Table 7: Residential Zoning Districts

District	Minimum Lot Size	Permitted Residential Uses & Allowed Density
R-OS Residential Open Space	87,120 sq ft or 2 acres	• One single family unit per lot
R-B Residential Buffer	65,340 sq ft or 1.5 acres 21,780 sq ft or 0.5 acres	• One single family unit per lot (30% natural area requirement for all sub-dividable lots)
R-1 Residential	12,500 sq ft	• Four residential single-family units per acre**
R-1A Residential	9,000 sq ft	• Five residential single-family units per acre**
R-2 Residential	7,500 sq ft	• Six residential single-family units per acre**
R-3 Residential	10,000 sq ft or 3,500 sq ft dwelling unit	• Twelve residential units per acre with two-family and multi-family housing permitted by right (300 sq ft open space requirement with an additional 100 sq ft added for each additional bedroom above two) • Single-family houses must comply with R-2 zoning requirements

Source: Town of East Greenbush. Please note that Zoning District A-R (Agriculture-Residential) is excluded because this district does not exist within the Study Area boundaries
* Only two parcels in the Study Area conformed to this standard so an alternative analysis at this density was not performed
** The allowable density per acre is greater than the minimum lot size requirement per acre. Therefore in order to take a conservative approach, the minimum lot size was used in the analysis.

Non-Residential Commercial Zoning Districts

For each commercial zoning district, a minimum of 25% of the developable area must remain as greenspace. Greenspace is defined as areas free from built structures, parking lots and loading structures and covered by vegetation meeting certain landscaping requirements. The greenspaces may not be made up of wetlands, streams, or slopes exceeding 15% unless their function and aesthetic quality is enhanced through design and planning efforts.

Table 8: Commercial Zoning Districts

District	Minimum Lot Size	Maximum Permitted Building Coverage	Greenspace Requirements
PPB Personal/Professional	43,650 sq ft or 1 acre	35%	25%
B-1 General Business Mixed Use	12,780 sq ft	70%	25%
B-2 General Business	12,780 sq ft	35%	25%
O Corporate Office Only	5 acres	35%	25%
OC Corporate Office/Regional Commercial District	5 acres	35%	25%
OI Corporate Office/Light Industrial	3 acres	35%	25%

Source: Town of East Greenbush. Please note that Zoning District CI (Coastal Industrial) is excluded because this district does not exist within the Study Area boundaries.

Other Zoning Districts

The Town of East Greenbush also has two additional zoning districts within the Study Area. The first is a Planned Development District (PDD) that encourages creative compact development. Each development is customized through a site-specific master planning process that accompanies the regulatory processes. **Map 3: Zoning** illustrates the approved PDD areas that exist throughout the Study Area. The approved PDD areas each have an adopted master plan. The Town Board must approve all modifications to existing PDDs or new PDDs. Therefore, the development potential for these sites varies widely and was not included as part of this analysis.

The second district is a Watercourse Management Overlay District. This district regulates the lands lying within a horizontal distance of 50 feet from the high water mark of ponds and lakes, and the nearest banks of streams and rivers. Development is still permitted within this area but all such lands are subject to Town Planning Board scrutiny before any development may occur to ensure protection of these resources

In addition, streams, ponds, and wetlands regulated by the Watercourse Management Overlay District and areas of slope greater than 15% cannot be included in the calculation of the "flag" portion of a flag lot. The Watercourse Management Overlay District may also impact the minimum lot size of residential subdivision lots. However, these regulations would be applied site-specifically and therefore are not included as part of this analysis.

Physical Constraints

Potential physical environmental constraints were reviewed for consideration as part of the Build-out Analysis. For the purposes of this analysis, physical constraints to development included the following:

- Slopes greater than 15% are typically considered severe constraints to development due to design demands on septic systems (where sewer districts are absent), erosion, and stormwater run-off, steep grades of roads and driveways as well as the increased potential for environmental impacts associated with construction.
- All New York State Department of Environmental Conservation (NYSDEC) wetlands and Federal wetlands as per the National Wetland Inventory (NWI) were considered a severe constraint to development per federal and state regulations.
- Land lying within 100 feet of NYSDEC wetlands is a required buffer and similarly was considered a severe constraint subject to State regulations.
- Land lying within the Federal Emergency Management Agency (FEMA) 100-year floodplain was deemed a constraint for health and safety reasons.

The current Zoning Ordinance was reviewed for any limitations related to these physical constraints. The minimum lot size of each parcel in each zoning district may contain streams, ponds, wetlands, or areas of slope greater than fifteen percent (15%). Generally, these areas are then avoided through site plan design. Currently, only the PDD District strictly prohibits or restricts development of land constrained by the

aforementioned environmental constraints. However, as previously mentioned all PDD developments are handled site-specifically by the Town Planning Board and were not included in this analysis.

Therefore, physical constraints do not mean that development cannot occur; only that it introduces a higher degree of difficulty and cost to the developer. See **Map 4: Physical Constraints.** Such lands, even if eventually developed, tend to be developed in a less dense fashion than allowed by zoning due to the difficulties involved. For the purposes of this Build-out Analysis, only land containing NYSDEC wetlands was removed from consideration (approximately 14 acres in the Study Area).

Build-out Methodology

Tax parcel data was classified as either "Developable," "Underutilized" or "Developed/Excluded" based upon the parcel's property class code and existing zoning regulations. Note that this method does not take into account the peculiarities of individual parcel configurations (e.g. land locked parcels) that may therefore tend to overstate development potential. Developed/Excluded land included parcels that were currently developed or had a property classification identified in **Table 9: Excluded Lands Due to Property Class**.

Table 9: Excluded Lands Due to Property Class

Land Use Code	Description	Number of Parcels	Acreage
380	Electric Transmission Lines and Associated Right-of-Ways	7	238.2
500, 534, 544, 553, 557	Social/Recreational Organizations	5	61.1
560, 591, 592	Beaches, Playgrounds, Athletic Fields	3	18.5
612	Schools	4	99.7
632	Benevolent Organizations	2	105.4
642	Health Facilities	3	15.5
651	Highway Garages	2	23.3
662	Fire and Police Protection	9	6.8
682	Recreational Facilities	1	7
695	Cemeteries	4	167.5
822, 845, 853	Water Facilities	4	10.6
831, 835	Telephone and Cable Facilities	4	3.8
852	Landfills	1	47.4
860	Sewage Treatment	1	4.2
TOTAL		50	809.9

Source: Town of East Greenbush

Developable land (or vacant land) included land that was vacant and not excluded due to its property classification (see **Table 9: Excluded Lands Due to Property Class**). A residential lot was considered underutilized if the parcel's undeveloped area was greater than or equal to twice the minimum required lot size. An additional 20% was excluded to account for infrastructure such as driveways, roadways, right-of-ways, sidewalks, etc. All developable and underutilized parcels were evaluated using the criteria displayed in **Table 10: Residential Build-out Methodology Requirements**.

Map 4: Physical Constraints

Table 10: Residential Build-out Methodology Requirements

Zoning District	Minimum Lot Size to be Determined Developable (Acres)	Minimum Lot Size to be Determined Underutilized (Acres)	Infrastructure Requirements
R-OS	2	4	20%
R-B	1.5	3	20%
R-1	0.28	0.56	20%
R-1A	0.20	0.40	20%
R-2	0.17	0.34	20%
R-3	0.23 (multi-family)	0.46	20%
R-3	0.17 (single-family)	0.34	20%

Source: Laberge Group, 2008

The following additional calculations were used to determine the total residential build-out of "developable" and "underutilized" parcels in a residential zoning district:

- A deduction of 20% for infrastructure was taken from each developable and underutilized parcel within the Study Area.
- An additional 30% deduction was taken from developable and underutilized parcels in the R-B Zoning District to comply with the open space requirement within the Study Area.
- The land in acres was then divided by the minimum lot size requirement for its respective zoning district to obtain the number of potential lots.
- For single-family units in the R-3 District, the Build-out Analysis used the general assumption that all future single-family units would have three-bedrooms and would therefore be required to provide a minimum of 400 square feet of open space per unit. Consideration was given to both the minimum lot size and the open space requirement in the effort to calculate the total number of single-family residential units in the R-3 District within the Study Area.
- Alternatively, multi-family housing units in the R-3 Zoning District were calculated with the assumption that all future multi-family units would have two-bedrooms and would therefore require 300 square feet of open space. Based upon the total remaining developable acres in the R-3 District, each developable acre was multiplied by 12 housing units to arrive at the total number of multi-family housing units for the R-3 Zoning District within the Study Area.

A nonresidential/commercial parcel was considered underutilized if it met the following three requirements: 1) if the unconstrained area was greater than or equal to the minimum lot size, 2) contained buildings less than the maximum building coverage as stated in the Town's zoning regulations, 3) and could accommodate the minimum 25% set aside for greenspace. All parcels in each commercial zoning district were evaluated using the criteria displayed in **Table 11: Non-Residential/Commercial Build-out Methodology**.

Table 11: Non-Residential/Commercial Build-out Methodology Requirements

Zoning District	Minimum Lot Size in Acres	Maximum Square Footage Allowed	Infrastructure Requirements
PBB	1	3,000	20%
B-1	0.5	15,246	5%
B-2	0.5	7,623	20%
O	5	76,230	20%
OC	5	76,230	20%
OI	3	45,738	20%

Source: Laberge Group, 2008. Please note that the B-1 District's coverage and greenspace requirements total 95% of the minimum lot size.

In addition, the following calculations are included in the build-out methodology to determine the total nonresidential/commercially zoned "developable" lands and "underutilized" lands:

- The maximum square footage for buildings situated on underutilized lots was established using the building coverage percentages taken from the zoning regulations. The B-1 District building coverage and greenspace requirements add up to 95% of the total lot, and infrastructure needs are necessarily held at 5%.
- A deduction of 20% for infrastructure (e.g. parking areas, roadways, stormwater management, walkways, etc.) was taken from each developable and underutilized parcel within the Study Area.
- An additional deduction of 25% for greenspace was taken from each developable and underutilized nonresidential/commercial parcel within the Study Area.

Once the deductions for each developable or underutilized nonresidential/commercial parcel were completed, the following methodology was employed to determine the maximum building square footage that could be constructed in the Study Area:

- The land in acres was then divided by the minimum lot size requirement for its respective zoning district to obtain the number of potential lots. This number was then multiplied by the maximum allowable building square footage per lot. This calculation yielded the total building square footage allowable for each zoning district in the Study Area.
- Underutilized commercial lots subtracted the existing building square footage (when known and/or provided by the Town Assessor) from the maximum allowable building square footage coverage. The results yielded the total additional building square footage that could potentially be constructed for each underutilized parcel in a nonresidential/commercial zoning district in the Study Area.

Build-out Analysis Results

There are approximately 5,149 acres of potentially developable land and approximately 143 acres of potentially underutilized land in the Study Area (see **Table 12: Study Area – Total Lands by Type & Acreage**). The results of this analysis are also illustrated in **Map 5: Developable Land.** The excluded lands included those excluded due to their property class, parcels currently developed, and approximately 1,300 acres currently zoned as PDD. The constrained land is land composed of NYSDEC wetlands and

wetland buffers. The Build-out Analysis of the Study Area indicates that over one-half of the Study Area is developable.

Table 12: Study Area – Total Lands by Type & Acreage

Land	Size in Acres
Approximate Study Area	8,422
Future Developable Land (undeveloped and underutilized parcels for all zoning districts)	5,149
Potentially Underutilized Land (commercially zoned with unknown building square footage)	143
Land Excluded (including PDD-zoned land)	3,116
Land Constrained (required to be removed)	14

Source: Laberge Group 2008

Table 13: Residential - Undeveloped & Underutilized Lands displays the total acreage of undeveloped and underutilized parcels residentially zoned parcels in the Study Area. The acreage was evaluated based on single-family zoning requirements, with the exception of the R-3 Zoning District. The R-3 Zoning District allows both a single-family scenario and a multi-family alternative. The multi-family acreage is highlighted to provide a range in potential development. **Map 6: Developable Residential Land** illustrates the residentially zoned land potentially available for future development.

Table 13: Residential – Undeveloped & Underutilized Lands

Zoning District	Undeveloped Land (Acres)	Underutilized Land (Acres)	Excluded/Developed Land (Acres)	Total Study Area (Acres)
R-OS	3.6	39.8	139.7	183.1
R-B	1,965.7	812.5	715.8	3,494
R-1	62.7	178.9	139.2	380.8
R-1A	1.2	36.3	68.5	106
R-2	386.7	572.2	511	1,469.9
R-3 (Single-family)	30.7	33	74.4	138.1
R-3 (Multi-family)	30.7	31.1	76.3	138.1
Total	**2,450.6**	**1,670.8 - 1,672.7**	**1,648.6 - 1,650.5**	**5,771.9**

Source: Laberge Group 2008. Please note that Zoning District A-R (Agriculture-Residential) is excluded because this district does not exist within the Study Area boundaries.

Map 5: Developable Land

Map 6: Developable Residential Land

Map 7: Developable Commercial Land

Table 14: Commercial – Undeveloped and Underutilized Lands illustrates the potential developable nonresidential property by zoning district. The table also identifies the total acreage of the developed sites with an unknown existing building square footage. These parcels were considered to be "potentially" underutilized due to the unknown building sizes. **Map 7: Developable Commercial Land** displays the commercially zoned land that is potentially available for future development.

Table 14: Commercial – Undeveloped and Underutilized Lands

Zoning District	Undeveloped Land (Acres)	Underutilized Land (Acres)	Potentially Underutilized Land – Building Size Unknown (Acres)	Excluded / Developed Land (Acres)	Total Study Area (Acres)
PPB	11.2	65.4	12.5	18.6	107.7
B1	12.2	123	56.1	31	222.3
B2	9.7	299.9	52.6	20.7	382.9
O	41.5	59.4	8.2	11.4	120.5
OC	73.6	172.5	14.2	96.1	356.4
OI	46.5	112	0	1.7	160.2
TOTAL	**194.7**	**832.2**	**143.6**	**179.5**	**1,350**

Source: Laberge Group 2008. Please note that Zoning District CI (Coastal Industrial) is excluded because this district does not exist within the Study Area boundaries.

Residential Build-out Results

Based upon the available developable and underutilized lands, the potential number of residential units was calculated for each zoning district (see **Table 15: Residential – Potential Build-out Results**). Each new unit represents a three-bedroom single-family unit, with the exception of the R-3 District. A range of potential units was calculated for the R-3 District to illustrate the permitted multi-family units. The multi-family units are highlighted in the Table to demonstrate the potential development range. According to the Build-out Analysis, future growth of the Study Area may result in approximately 5,617 to 5,782 new residential dwelling units. The Town's population in 2000 was 15,560, based upon the current household size of 2.5 persons (per the National Census 2000 data); the Town of East Greenbush would potentially experience a maximum population growth of approximately 14,042 to 14,455 people from these new residential units. In twenty years at full-buildout, the growth in the western part of East Greenbush would double the Town's current population.

Table 15: Residential – Potential Build-out Results (Dwelling Units)

Zoning District	Residential Units for Undeveloped Land	Residential Units for Underutilized Land	Total Potential New Dwelling Units
R-OS	1	10	11
R-B	642	207	849
R-1	179	459	638
R-1A	4	85	89
R-2	1,819	2,018	3,837
R-3 (Single-Family)	106	87	193
R-3 (Multi-Family)	188	170	358
TOTAL	**2,751 - 2,833**	**2,866 - 2,949**	**5,617 - 5,782**

Source: Laberge Group 2008. Zoning District A-R (Agriculture-Residential) is excluded because this district does not exist within the Study Area boundaries.

Nonresidential/Commercial Build-out Results

According to **Table 16: Commercial – Potential Build-out Results (Building Square Footage),** the total potential commercial development growth was calculated for both the developable and underutilized parcels. According to the Build-out Analysis, future growth of the Study Area may result in approximately 8,496,310 square feet of new commercial space.

Table 16: Commercial – Potential Build-out Results (Building Square Footage)

Zoning District	Undeveloped Land (Square Footage)	Underutilized Land (Square Footage)	Total Potential New Commercial Square Footage
PPB	18,570	126,474	145,044
B1	262,536	2,195,226	2,457,762
B2	81,566	2,453,767	2,535,333
O	348,066	493,377	841,443
OC	617,615	1,312,140	1,929,755
OI	390,297	196,676	586,973
TOTAL	**1,718,650**	**6,777,660**	**8,496,310**

Source: Laberge Group 2008. Please note that Zoning District CI (Coastal Industrial) is excluded because this district does not exist within the Study Area boundaries.

Residential and Commercial Development Trends

The national supply of housing in recent years has increased at a rapid pace due to a strong market and quickly appreciating real estate valuations. The housing market bubble "burst" in 2007, after enjoying several years of unparalleled historic success. The downturn in the market was caused by an oversupply of housing by investors who were speculating on continued appreciating housing values. Several regions in the Country have experienced a housing crisis in the last couple years with large amounts of foreclosed housing, including recently built residential subdivisions and townhouses.

The development trends in the Town of East Greenbush follow the highs and lows of the housing market, with a noticeable increase of building permits in 2001 and a below average number of building permits in 2006. The Town of East Greenbush is a community that has received a steady growth of residents over the last few decades and is anticipated to continue to grow in the future. As population grows, the demand for housing will continue, thus causing further development of new residential and commercial structures to support the influx of residents.

Located across the Hudson River from the downtown Albany skyline, and with easy access to major transportation connections, the Town of East Greenbush offers the benefits of an easy commute with the ability to own a large residential lot. Historically development in the Town has been primarily single-family detached housing, making the Town the typical definition of a bedroom community. During the mid 1990's however, there was an increase in commercial development in the Town, especially along NYS Route 4 and NYS Route 9. In 2003, there was a noticeable increase in multi-family residential construction permits, and one year later, multi-family residential permits (48) outnumbered single-family residential permits (37) before returning back to historic trends.

According to **Table 17: Historic Annual Residential & Commercial Building Permits**, the Town authorized 2,390 permits since 1980. Over 80% of those permits were single-family residential housing units, with peaks of construction between the years of 1987 to 1989 and 2001 to 2005. The increase in permits from 2001 to 2005 was during the peak of the previously described housing market bubble that witnessed housing prices inflating to overvalued prices all over the Country, thus encouraging investors to build new units. The average permits per year, including residential and commercial for the Town is 85 permits annually between the years of 1980 and 2007. In the last recorded year, 2007, during the downturn of what has been noted as a national housing crisis, the Town issued 57 permits, which is below the historic annual average.

Table 17: Historic Annual Residential & Commercial Building Permits

Year	Single-Family	Multi Family	Commercial	Total Units Authorized by Building Permit Per Year
1980	6	1	N/A	7
1981	26	0	N/A	26
1982	25	0	N/A	25
1983	64	2	N/A	66
1984	56	1	N/A	57
1985	81	1	N/A	82
1986	95	1	N/A	96
1987	153	1	N/A	154
1988	177	0	N/A	177
1989	111	0	N/A	111
1990	64	0	N/A	64
1991	85	1	N/A	86
1992	71	1	N/A	72
1993	92	0	N/A	92
1994	58	0	N/A	58
1995	35	0	46	81
1996	58	0	31	89
1997	43	0	38	81
1998	57	0	23	80
1999	66	0	30	96
2000	45	0	32	77
2001	89	0	22	111
2002	104	0	22	126
2003	66	16	27	109
2004	37	48	32	117
2005	66	28	27	121
2006	49	4	22	75
2007	37	0	17	54
Total Units Authorized by Building Permits by Type	**1,916**	**105**	**369**	**2,390**
Average # of Units Per Year	**68**	**4**	**28**	**85**

Source: Building Permit information provided by Town of East Greenbush & the Capital District Regional Planning Commission

The United States Census Bureau records the number of housing units constructed each year. **Table 18: Residential Units Built Per Year** details the number of housing units built during each designated time period, dating as far back as structures were recorded. The Table also distinguishes which of the housing units are owner occupied or renter occupied properties. This information can be used to examine existing housing infrastructure in the Town and forecast what types of housing units may be built in the future.

Table 18: Residential Units Built Per Year

Year Structure Built	Owner-Occupied Housing	Renter-Occupied Housing	Total Housing Units Built	% of Total Units
Built 1999 to March 2000	42	0	42	0.7%
Built 1995 to 1998	239	28	267	4.4%
Built 1990 to 1994	339	47	386	6.3%
Built 1980 to 1989	737	153	890	14.6%
Built 1970 to 1979	671	542	1,213	19.9%
Built 1960 to 1969	515	173	688	11.3%
Built 1950 to 1959	806	174	980	16.1%
Built 1940 to 1949	421	166	587	9.7%
Built 1939 or earlier	799	229	1,028	16.9%
Total Housing Units	**4,569**	**1,512**	**6,081**	**100.0%**

Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices H36, H37, H38, and H39.

Almost 20% (1,213) of the total existing housing units in the Town were built between the years of 1970 and 1979, which were the most units constructed during any 10-year period in the Town. During the last 28 years, approximately, 26% of the existing housing stock was constructed, documenting that over one quarter of the total housing stock is relatively new. Almost half (47.9%) of the total housing was built between the years of 1950 and 1979, indicating that there is a large amount of older housing stock which probably consist of smaller to medium sized units compared to the traditional larger modern suburban units. During the 1970's, there was a large number of renter occupied housing units built (542). However, the number of renter-occupied housing units constructed significantly decreased in the years following.

Table 19: Projected Future Annual Residential & Commercial Building Permits is a forecast of potential residential and commercial properties built by the year 2027. The twenty-year forecast uses the average annual number of units constructed in the Town of East Greenbush in the last 28 years. The average annual number of units built for single-family (68), multi-family (4), and commercial (28), were expanded out over a twenty-year period. The resulting numbers assign an approximate numerical value of potential future residential and commercial units that will be constructed in the Town. The findings of this analysis will be useful in determining the future capacity of the Town to support increased development in regards to quality of services, and necessity for construction of additional infrastructure.

According to the Table, if the Town continues to average 85 building permits per year, then by 2027, there will be approximately 1,700 new residential and commercial units constructed. This forecast includes a total of 1,360 new single-family and 80 multi-family housing units, which represents a 23.7% increase in the total housing stock. Almost 95% of new residential units constructed are anticipated to be

single-family housing units, continuing the historic development pattern in the Town. Based upon the current household size of 2.5 persons (per the National Census 2000 data), the Town of East Greenbush would potentially experience a population growth of approximately 3,600 people from these new residential units during the next twenty years.

Table 19: Projected Future Annual Residential & Commercial Building Permits

Year	Single Family	Multi Family	Commercial	Total Units Authorized by Building Permit Per Year
2008	68	4	28	85
2009	136	8	56	170
2010	204	12	84	255
2011	272	16	112	340
2012	340	20	140	425
2013	408	24	168	510
2014	476	28	196	595
2015	544	32	224	680
2016	612	36	252	765
2017	680	40	280	850
2018	748	44	308	935
2019	816	48	336	1,020
2020	884	52	364	1,105
2121	952	56	392	1,190
2022	1,020	60	420	1,275
2023	1,088	64	448	1,360
2024	1,156	68	476	1,445
2025	1,224	72	504	1,530
2026	1,292	76	532	1,615
2027	1,360	80	560	1,700
Total Units Authorized by Building Permits by Type	**1,360**	**80**	**560**	**1,700**
Average # of Units Per Year	**68**	**4**	**28**	**85**

Source: Laberge Group, 2008

Between the years of 1995 and 2007, there were 369 commercial structures built in the Town. If the Town continues on its current trend of commercial development, then there will be 560 new commercial structures constructed by the year 2027. However, an approximate square footage of potential total future commercial buildings is estimated by dividing the known square footage by the total acreage in which existing development has occurred (**Table 20: Estimated Square Footage of Commercial Floor Area**). Based upon this calculation, if construction trends continue, it is anticipated that approximately 4,024,557 square foot (or 1,596,658 square feet of new commercial space) of commercial space could exist in the Study Area over the next twenty years.

Table 20: Estimated Square Footage of Commercial Floor Area (Construction Trends)

Commercial Buildings in Study Area	Number of Lots	Number of Acres	Total Square Feet	Building Square Foot Per Acre	Total Square Feet
Existing Buildings	277	628	2,427,899	3,866 square feet per building (=2,427,899/628 acres)	2,427,899
Unknown Buildings (Existing)	119	172	Unknown		664,952
Vacant Lots/Future Buildings	75	241	Unknown		931,706
Total	**396**	**1,041**			**4,024,557**

Mitigation Measures

The integration of the future development will be pivotal in addressing the impacts of potential growth. The Town could utilize tools such as design guidelines, architectural review, and landscaping standards to mitigate the impacts of future development. These tools will help any new development be compatible and in character with existing development.

In addition to the above land use regulation tools, the Town would also benefit from an updated geographic information system (GIS) to improve the quality of services provided to residents and to increase efficiency. A *Geographic Information System (GIS) Needs Assessment* was conducted by Bowne Management Systems Inc in March 2007. Three phases were recommended for implementation by the Town. Phase I includes expanding the capabilities of the Town's GIS including data collection, digitization of existing data, access to ArcGIS ArcEditor and the Map Production application, and access to the Town's viewer application over the internet. Phase II recommendations include geocoding and radius mapping applications, additional hardware purchases, and training of users. Phase III includes refining, expanding, and creating new GIS applications within the Town and what is hosted on the internet.

In order to plan for future development in an efficient manner, a comprehensive GIS system is necessary to more efficiently process applications and allow the public at large to have greater access to information. Based upon current and historical development trends, the bulk of future development would occur in the western section of East Greenbush. Therefore, it is anticipated that ninety (90%) percent of the total cost for the GIS mitigation would be recovered from future development in the western portion of the Town.

A summary of implementation costs is found below:

Table 21: Land Use/GIS Needs Mitigation

PHASE I	Cost
Software	$5,620
Data Development	$12,000
System Development	$34,200
Training	$8,000
TOTAL PHASE I COST:	(Previously Funded through Grant) $69,020
PHASE II	
Hardware	$10,000
Software	$3,940
Application Development	$4,000
Training	$4,000
TOTAL PHASE II COST:	$43,940
PHASE III	
Hardware	$0
Software	$2,300
Application Development	$10,000
Training	$4,000
TOTAL PHASE III COST:	$16,300
TOTAL COST:	$129,260
TOTAL COST PHASE II & III ONLY:	$60,240
Total Western GEIS Responsibility (90%)	**$54,216**

B. Natural Resources

Topography and Slope

Existing Conditions

The Town of East Greenbush is located in the New England geological province, between the Taconic Mountains and the Hudson-Mohawk Lowlands sub-provinces. A complex process of structural and bedrock folding and thrust faulting of Cambrian and Ordovician sedimentary rocks formed the existing geology of the Town of East Greenbush.[2] The deformation that occurred resulted in three distinct geological areas, the Taconic Mountain Range, the Rensselaer Plateau, and Taconic Slate Belt. Each geological area varies greatly in their topography, giving Rensselaer County a diverse landscape of mountain peaks, plateaus, and river valleys.

The Study Area, which is located in the western part of the County, is in the Taconic Slate Belt, which is characterized by its low elevations. Following repeated glaciations that occurred over 13,000 years ago, the result was a wide variety of overburdens that now cover the Study Area, including Lodgement till, which is poorly sorted, stony and loamy material laid down by advancing ice. Drumlins are also abundant throughout the Slate Belt, associated with the formation of Bernardston, Pittstown, and Scriba Soils. As a result of its range of elevation and topography, development has been steered towards the flatter areas in the river valley, with the eastern mountain range being less populated.

Slopes are defined by the U.S. Department of Agriculture (USDA) as the inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance and then multiplied by 100. This formula was combined with the existing information provided through Geographic Information Systems (GIS) to create **Map 4: Physical Constraints**, which documents the topography and slopes of the Study Area.

There are many parts of the Study Area that have over 15% slopes, making them unattractive for development. A large portion of these steeply sloped areas is located along Ridge Road between Hayes Road and Route 9. There is also a high concentration along Mill Creek between the western boundary line and New York State I-90. The remainder of steeply sloped areas is located throughout the entire Study Area, with a slight concentration towards the northern and western regions. Those areas that do not have a steep slope in the Study Area have gentle pitches or are flat, ranging from 0% to 3% slopes.

Potential Impacts

The landscape of the Town changes elevations greatly in certain areas, with flatter lands closer to the Hudson River and steeper slopes in the Taconic Mountain Range to the east. Development of steeply sloped land is not considered sustainable, as it erodes the land, changing soil formation, groundwater, and causing sedimentation and stormwater runoff.

[2] All information obtained from Soil Survey of Rensselaer County, New York

Mitigation Measures

The Town of East Greenbush should evaluate all future development proposals on a case-by-case basis. Potential impacts and mitigation measures for slopes should be analyzed and reviewed prior to approval of permits. Projects should be designed consistent with the topography (limited grading) to limit impacts to topography and the visual environment.

The Town recently created a Planned Development District (PDD) in their updated zoning code with the intent of promoting smart, compact growth that is environmentally conscious, including no new development on slopes greater than 15%. The PDD is a floating zoning district for any developable areas within the Town, except in zones A-R or R-OS. The PDD requires twenty (20) adjacent acres for residential development and ten (10) adjacent acres for commercial or light industrial development. When possible, the Town should implement this zoning district in areas with steep slopes that are receiving pressure for new development.

Soils

Existing Conditions

Soil Surveys are one of the main tools available to help land users and planners determine the potentials and limitations of the land through examination of the soils. In 1988, the United States Department of Agriculture and the Natural Resources Conservation Service (NRCS), in cooperation with Cornell University Agricultural Experiment Station, prepared the Soil Survey of Rensselaer County.[3] The Soil Survey is intended to analyze the existing soils and determine what outcomes might occur from certain types of development or land uses. Land use planners and developers are able to evaluate the environmental impacts that might occur and make recommendations for best uses based on whether those outcomes are desirable in the future.

This section details the different types of soils found in the Town of East Greenbush GEIS Study Area utilizing the Soil Survey. **Table 22: Top 5 Soil Types in Western East Greenbush** identifies the different soil types by their classifications, slope, depth to groundwater, depth to bedrock, erodability potential, and other factors that may affect future development or have environmental impacts on the community.

The predominant soils found in the Study Area are Chenango, Hudson, Riverhead, Rhinebeck, and Bernardston. The northeastern portion of the Study Area is comprised almost entirely of Bernardston Soil, which is characterized by gently sloping terrain to very steep terrains that buffer the low lying Hudson River valley. This soil is very deep and well drained, making it good for agricultural uses in its flatter locations.

The central and western parts of the Study Area are gently sloping to moderately steep, with slopes ranging from 0 to 60%. Large portions of Hudson Soil can be found in this area, which is a well drained

[3] All information obtained from Soil Survey of Rensselaer County, New York

soil usually located next to lower valley side slopes. In general a majority of the Study Area is well drained and contains very deep soils, with varying terrain and slopes.

Table 22: Top 5 Soil Types in Western East Greenbush

Soil Type	Soil Characteristics
Bernardston	Very deep, well-drained and moderately permeable over slowly permeable soils on glaciated uplands. These soils formed in glacial till derived from shale, slate, and schist. They are gently sloping to very steep. Depth to high water table 1.5 to 2 feet. Depth to bedrock greater than 60 inches.
Chenango	Very deep, well and somewhat excessively drained soils formed in water-sorted material on outwash plains, kames, eskers, terraces and alluvial fans. Slope ranges from 0 to 60%. Depth to high water table 3 to 6 feet. Depth to bedrock greater than 60 inches.
Hudson	Very deep, moderately well drained soils formed in clayey and silty lacustrine sediments. They are nearly level to very steep soils on convex lake plains, on rolling to hilly moraines and on dissected lower valley side slopes. Permeability is moderately slow, with slope ranges from 0 to 60%. Depth to high water table 1.5 to 2 feet. Depth to bedrock greater than 60 inches.
Rhinebeck	Very deep, somewhat poorly drained soils formed in clayey lacustrine sediments. They are on glacial lake plains and uplands mantled with lake sediments. Slope ranges from 0 to 15%. Depth to high water table .5 to 1.5 feet. Depth to bedrock greater than 60 inches.
Riverhead	Very deep, well drained soils formed in glacial outwash deposits derived primarily from granitic materials. They are on outwash plains, valley trains, beaches, and water-sorted moraines. Slope ranges from 0 to 50%.

Source: Natural Resource Conservation Service, www.soils.usda.gov/technical/classification/

When studying soils there are several characteristics and properties that warrant further investigation and mitigation in regards to the potential for site development. The NRCS, in cooperation with the Cornell University Agricultural Experiment Station have grouped each soil type according to these characteristics and rated them on their limitations and suitability towards development.

Hydric soils, as defined by the NRCS, are soils that are somewhat poorly drained and have a water table at the surface during the growing season. This description, as well as frequency of ponding or flooding for long durations during the growing season, was used to identify soils that would not be suitable for certain uses or potentially no uses at all. The Study Area contained only limited, small areas of hydric soil, including Fluvaquents and Limerick Soils.

The NRCS provided a rating of the potential for small commercial and residential dwelling development in relation to soil limitations in the Soil Survey. The results showed that of the major soil types found in the Study Area, all but Chenango were limited in their potential for development.

The most common soil type, Bernardston, was rated as a very limited soil type for development, with a high occurrence of ponding, requiring further onsite investigation prior to construction. Ponding as described by the NRCS has standing water on soils in closed depressions, unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.[4] The collection of water or ponding has the potential for flooding of residential dwellings or small commercial buildings. See **Table 23: Soil Suitability for Building Site Development in Western East Greenbush.**

[4] All information obtained by the NRCS website, www.soils.usda.gov

Table 23: Soil Suitability for Building Site Development in Western East Greenbush

	Shallow Excavation	Dwellings Without Basement	Dwellings With Basement	Small Commercial Building	Local Roads & Streets	Lawns & Landscaping
Bernardston	Severe: dense layer, wetness, slope	Moderate: wetness, slope	Moderate: wetness, slope	Severe: slope	Moderate: wetness, frost action	Moderate: small stones
Chenango	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding, frost action	Moderate: small stones, droughty
Hudson	Severe: wetness	Moderate: wetness, shrink-swell	Severe: wetness	Moderate: wetness, shrink-swell, slope	Severe: frost action, low strength	Moderate: wetness
Rhinebeck	Severe: wetness, cutbanks cave	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength, frost action, wetness	Severe: wetness
Riverhead	Severe: cutbanks cave	Slight	Slight	Slight	Moderate: frost action	Slight

Source: Soil Survey of Rensselaer County, New York

Another soil characteristic to be considered is agricultural productivity. Although farming is no longer a dominant land use in the Study Area, it is important to recognize the value of these soils for agriculture, particularly on undeveloped lands. The U.S. Department of Agriculture (USDA) classifies farmland soils as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. The Study Area contains a large portion of Bernardston Soils, which are listed as prime farmland or farmland of statewide importance. This classification is given based upon certain desirable qualities for agricultural activities, such as an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity, an acceptable salt and sodium content, and few or no rocks.

Farmland of statewide importance is land that produces nearly as much crops as prime farmland with acceptable farming methods. The Study Area contains several soils in this classification, including Bernardston, Hudson, and Rhinebeck Soils. These soils are located throughout the Study Area, with concentrations in the southwestern, central, and northwestern portions. The U.S. Department of Agriculture (USDA) recognizes the importance of preserving both prime farmland and farmland of statewide importance, and techniques for preservation of such lands should be included in plans for future development within the Study Area.

Potential Impacts

Soil wetness and erosion are the major development constraints in the Town. Soil wetness is overly saturated grounds caused by poorly designed drainage systems and septic system placements. Soil erosion is commonly caused by clearing, grading and construction activities, and can cause both short and long term disturbance to the natural environment of a particular site. These disturbances can include increased water runoff, soil movement, sediment accumulation, altering the groundwater and drainage systems, and obstructing stream flow.

The erosion potential for a specific site is determined by five factors outlined by the New York State Department of Environmental Conservation (NYSDEC), soil erodability, vegetative cover, topography, climate, and season.[5] Soil erodability measures the vulnerability of a soil to erosions based on soil structure, texture, and percentage of organic matter. Vegetative cover refers to the ability of existing vegetation to protect the underlying soil from runoff and other natural processes. Once vegetation is removed, the soil is much more susceptible towards erosion. Topography affects the delivery and volume of runoff. Climate and seasonal factors affect the amount of rainfall frequency and intensity, as a result making the soil oversaturated and less able to handle runoff.

Mitigation Measures

The Town of East Greenbush should evaluate all future development proposals on a case-by-case basis. Projects will need to be reviewed for site specific impacts to soils, as part of the site plan review process. The properties of each soil type may warrant investigation for site specific development in order to identify constraints and the required engineering practices to mitigate these constraints. Development of soils classified as prime farmland will be subject of further investigation, with final analysis of best uses and alternative development scenarios.

Soils identified as poorly drained or excessively drained often present a variety of engineering problems related to the design and construction of septic systems. The provision of sewer service in these areas will mitigate potential impacts resulting from poorly drained or excessively drained soils. Areas that do not have municipal sewer should be investigated prior to development to ensure that an appropriate septic system design can be employed.

Erosion control is required for the State Pollutant Discharge Elimination System (SPDES) General Permit for the disturbance of one acre or greater of undeveloped land. Developers must provide a Soil Erosion and Sedimentation Plan based on New York Guidelines for Urban erosion and Sedimentation Control (SCS 1989) to the Town prior to commencement of site work. Some typical erosion control techniques include:

- Installation of silt, fences or silt fences in combination with staked hay bales, at the toe of slopes around the construction area.
- Utilization of temporary drainage swales with hay bale or silt dike check dams to direct water away from the construction area.
- Seeding all areas with a quick germinating grass or other cover species upon completion of final grading.
- Staging site development to minimize disturbed area.

Other special techniques or conditions may be imposed as final design plans and developed to ensure protection of sensitive environmental features.

[5] New York Standards and Specifications For Erosion and Sediment Control, August, 2005

Wetlands

Existing Conditions

According to the Environmental Protection Agency (EPA), wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.[6] Wetlands perform many necessary and important natural processes that allow for ground water and runoff purification through removal of excess nutrients from the water, as well as provide a sufficient environment for the growth of certain types of vegetation.

The NYSDEC classifies wetlands into two categories, tidal wetlands and fresh water wetlands. Tidal wetlands are marshy and grassy areas that adapt to the rise and fall of the salt-water tide and provide habitat for juvenile fish and other animals. The Hudson River has been classified as a tidal wetland from the Troy Dam south to New York City. This classification limits development in the western portion of the Town located between the Study Area and the Hudson River. There is only one freshwater wetland in the Study Area, which is located in the southeastern corner. **See Map 4: Physical Constraints.**

The NYSDEC recognized that New York State was losing many of its wetlands to development, thus it passed the Freshwater Wetlands Act in 1975 in an act to protect and preserve such lands.[7] The qualifying criteria for protection under the Act is a unified wetland larger than 12.4 acres, with different functions and activities warranting a classification ranging from Class I to Class IV. Dependent upon its classification, receiving a permit for construction or alteration of the wetland is more difficult, with Class I being the most difficult to receive a building permit. The Act also enforces a 100-foot buffer zone between the wetlands and any new development, regulating where development can occur.

Potential Impacts

In their natural state, wetlands serve a myriad of valuable ecological functions. As development encroaches upon existing wetlands, the ecological function of the wetland may be impacted. New development may result in the removal and alteration of existing vegetation, wildlife, and fish habitats. If the original state of the wetland is compromised, then it has a lasting effect on surrounding ecological systems and habitats.

There are three different types of wetland disturbances, direct, indirect, and cumulative impacts. Direct impacts are caused by disturbances to wetlands such as filling, grading, removal of vegetation, building construction, changes in water levels, and drainage patterns. Indirect impacts are caused by disturbances to waterways or areas upland from wetlands. Influx of surface water and sediments, fragmentation of a wetland from a contiguous wetland complex, loss of recharge area, or changes in local drainage patterns are forms of indirect wetland impacts. Cumulative impacts are those impacts resulting from combined direct and indirect impacts to the wetland over time.

[6] All information obtained by EPA website, www.epa.gov
[7] All information obtained by the NYS DEC website, www.dec.ny.gov/lands/305.html

The clearing and construction of large developments cause erosion in upland areas, resulting in increased sedimentation in lowland wetlands. Increased sedimentation alters the chemical and hydrologic wetlands systems. Construction related activities also have an effect on wetlands, such as stream channelization, dam construction, point source pollution, and non-point source pollution.

Mitigation Measures

As stated previously, the Town of East Greenbush should evaluate all future development proposals on a case-by-case basis. Potential impacts and mitigation measures for wetlands should be analyzed and reviewed prior to approval of permits. New construction must meet the standards of the NYSDEC Freshwater Wetlands Act of 1975. Any new development must meet the required permits in accordance to the established regulations of the NYSDEC and the U.S Army Corps of Engineers if the site is over 12.4 acres. Also permits are required for projects proposing to drain, dredge, excavate, fill, build a structure or obstruction within, or otherwise disturb a designated freshwater wetland, including a 100-foot buffer around the wetland. Permit applications will allow the NYSDEC and the Town to identify all associated vegetation, animals, and organisms that will be affected by the development, and identify necessary mitigating procedures to preserve the original habitat.

Groundwater/ Aquifers

Existing Conditions

Groundwater is an important resource, as it provides half of the drinking water to all Americans and one quarter of New Yorkers. The Town of East Greenbush has an abundance of groundwater and aquifers due to its location in the Hudson River Valley. Wells located in valleys naturally produce more available water, as they are closer to the high water tables than hilly or mountainous locations.

Groundwater naturally seeps through the ground, between rocks, sand, gravel and clay, and then when large amounts of the water gather in mass, forming a sizable water source; it is referred to as an aquifer. Land is measured for ability to supply water based on porosity, permeability, and material. An example is clay, which will not allow water to flow easily because of its impermeability.

The Town of East Greenbush shares two major aquifers with the Town of Schodack and Columbia County, which are referred to as the Schodack and Kinderhook Terraces.[8] The aquifers cover 18.5 sq. miles, consisting of ice contact and outwash sand and gravel that form an unconfined, stratified, and regional water source. Sand and gravel aquifers are the best sources for supply of large quantities of groundwater, thus the Town should take measures to protect the aquifer land, so as not to pollute or damage the underlying water source. The areas with the highest concentration of existing development are not in contact with land associated with the aquifers, as the highest percentage of aquifer related land in the Town is in the Taconic Mountain range to the east.

[8] U.S Geological Survey, 1999: Hydrogeology of the Schodack-Kinderhook Area, Rensselaer and Columbia Counties, New York

Water supply yields from public-supply wells sampled from the Schodack Terrace aquifer range from 50 to 1,050 gallons per minute and average 305 gallons per minute. As a comparison, the average single family home with 3.5 bedrooms consumes approximately 315 gallons per day.

Potential Impacts

New construction and building may cause adverse effects that may permanently damage the water source, such as runoff of fertilizers and pesticides, sewage waste and groundwater contamination. The importance of clean drinking water and the availability of its supply source are dependent upon the action taken to preserve land associated with aquifers. The Town of East Greenbush should detail which parcels are located above or near the existing Schodack and Kinderhook Terraces, and prevent development along such areas.

Shallow aquifer systems associated with sands overlying finer grain material, such as silt or clay have a greater potential for contamination from development than deep aquifers. Poorly drained soils with high water tables are the most easily impacted by contamination. In these soils, poorly designed or poorly functioning septic systems have the potential to pollute groundwater. Of the top five (5) soils found in the Study Area only Rhinebeck is poorly drained and has a high water table (2 feet or less from the ground surface). Bernardston, Hudson, and Riverhead all drain moderately to very well, however have high water tables. Chenango is the only soil that is extremely permeable and has a low water table of three (3) to six (6) feet.

Mitigation Measures

The Town of East Greenbush should evaluate all future development proposals on a case-by-case basis. Potential impacts and mitigation measures for groundwater should be analyzed and reviewed prior to approval of permits. Construction should be kept above the water table to limit potential pollutant sources. Mitigation measures for construction projects should include the items previously identified for surface water. Proper drainage control and consideration of the elimination or reduction of pollutants, such as salts and pesticides, would decrease the potential for contamination.

Prior to the installation of basements, septic systems and foundations, there should be a detailed analysis regarding location of groundwater and aquifers, so that development does not cause any potential pollution or contamination. The Town should conduct studies to implement a Critical Aquifer Recharge Area (CARA), which is a zoning overlay district that would allow the Town to protect its current supply of drinking water. Aquifer recharge areas are regions where the water source recharges itself through rainfall or runoff that seeps into the ground and maintains the underground water table necessary for efficient supply of water for the Town residents.

The Town should work to identify any potential CARA land and establish the necessary overlay district to protect these areas. New development should be discouraged in these areas, because it will eventually diminish the water supply and quality of water for the Town. Each new development should be examined individually and determined based on proximity to location of the existing aquifer, if there would be any potential impacts to the recharging of the Town aquifer.

Other factors that should be considered when reviewing development plans for projects in or near recharge areas include the identification of areas that would require excavation below the water table and the identification of land uses that could have the potential to store contaminants on-site.

When potential impacts to groundwater are identified, specific mitigation measures should be employed. These measures could include:

- Slab-on-grade construction in areas of high groundwater,
- Fill systems meeting NYS Department of Health regulations, if standard septic system construction is not feasible in areas of high groundwater,
- Underdrains in appropriate areas to maintain road integrity,
- Verification of groundwater quality and quantity from on-site testing if private water supplies are to be utilized,
- Proper containment for contaminants associated with new development during pre- and post-construction periods, (i.e. containment for above ground tanks and proper design for underground tanks in accordance with NYSDEC standards).

Floodplains

Existing Conditions

The Federal Emergency Management Agency (FEMA) has designated certain lands as a hazard because of their locations and susceptibility towards flooding.[9] FEMA prepares flood insurance studies and floodplain boundary maps for communities throughout the country. Development occurring within the floodway can result in higher flood elevations. In addition, upstream development cannot occur in the regulatory floodway unless a hydraulic analysis shows that the new development will not cause more than a 1-foot rise in the 100-year flood elevations within the floodway. Any development that occurs on these lands is subject to protection available through the FEMA National Flood Insurance Program. Through this program, insurance is made available to property owners based upon zones designated by FEMA.

The Town of East Greenbush has two types of floodplain zones, Zone A and Zone AE. Zone AE flood areas contain Base Flood Elevations (BFE) derived from detailed hydraulic analysis, however Zone A flood areas do not. Both of these zones are classified as 100-year Flood Hazard Areas, which means that there is a 1% chance in any given year that the land will flood. Most of the area along the Hudson River is designated Zone AE, which is outside the Study Area. In the Study Area, there are three (3) corridors designated Zone A, each located along or near a body of water, Mill Creek, Hampton Manor Lake, and an unnamed stream.

[9] All FEMA information obtained by the FEMA website, http://www.fema.gov/about/programs/nfip/index.shtm

Potential Impacts

Construction in floodplains may increase potential for floods and disturbance to stormwater management. Each of the three (3) floodplain zones in the Town border current development; the Hampton Manor Neighborhood has a floodplain running through the development. The Town should avoid new development near these flood zones, as it causes problems to the natural environment, such as removal of vegetation and the creation of impermeable areas that add to erosion and flooding potential.

Natural soil and drainage conditions in the Town have resulted in large areas of well-drained, usable land. However, development without the use of appropriate stormwater management techniques may disturb natural drainage and cause localized flooding problems.

Mitigation Measures

On a case-by-case basis, the Town of East Greenbush should evaluate all future development proposals. Potential impacts and mitigation measures for floodplains should be analyzed and reviewed prior to approval of permits. Development near or adjacent to Flood Hazard Areas will be subject to New York State and FEMA regulations and guidelines for floodplain development and insurance permitting.

FEMA establishes the designation of Base Flood Elevations, and Special Flood Hazard Areas through the creation of Flood Hazard Boundary Maps and Flood Insurance Rate Maps. Following these designations, it is the responsibility of the Town to administer and monitor potential development of floodplains and areas susceptible to floods. Development within the 100-year floodplain or floodway as defined by FEMA is regulated in the Town in accordance with the National Flood Insurance Program. Any development that does occur in the 100-year floodplain must adhere to FEMA regulations.

The application of existing FEMA, NYSDEC and Town regulations regarding floodplains provide protection from flooding on-site and downstream. This, combined with the limited area that is in the 100-year floodplain, effectively limits the potential impacts to the floodplain as a result of development. However, given the importance of floodplains in the process of natural stormwater management, any impact to a floodplain is considered inconsistent with this GEIS.

Possible exceptions to this might be a stream crossing necessary to access a parcel or portion thereof, or the installation of outfalls. The Planning Board must be provided with sufficient information on the potential impacts and mitigation for these encroachments to be considered.

Surface Water/ Watersheds

Existing Conditions

The Town of East Greenbush is located in the Middle Hudson Watershed, which extends approximately from the City of Troy to the City of Kingston, encompassing 10 Counties and crossing over into western Massachusetts.[10] There are several creeks, lakes, streams, waterfalls and tributaries in the Town that

[10] Information obtained from the NYSDEC website, www.dec.ny.gov/lands/34488.html

contribute to groundwater aquifers and then ultimately drain into the Hudson River. Surface water in the Town includes Hampton Manor Lake, Mill Creek, Papscanee Creek, Moordener Kill, and the Hudson River.

Mill Creek is a major stream that flows east to west through the center of the Town and the Study Area, with several waterfalls and tributaries, until entering the Hudson River at the City of Rensselaer. Papscanee Creek is another major stream that runs parallel to the Hudson River, just west of the Study Area, and is an important area for birds and wildlife. Hampton Manor Lake, which covers 13 acres in the center of the Study Area is widely used by Town residents and neighboring developments for recreational activities.

Surface water features in New York are designated with a water quality classification for the purposes of regulating discharges into these waterbodies in accordance with the State Pollutant Discharge Elimination System (SPDES). These classifications refer to the suitability of a given water feature (lake, pond, river, stream) for human use; the higher the classification (i.e. A), the better the water quality. For example, Class A water is suitable for "primary contact" (swimming) and for a drinking water supply.

Classifications include water supply designations (AA-S, A-S, AA) and normal designations ranging from A (suitable for most uses, including drinking) to D (unsuitable for primary contact). Each water quality classification carries with it a set of discharge limitations (standards) designed to protect or improve the water quality. A "T" modifier is used for those streams that have a breeding trout population. Streams with a classification of C(T) or higher are regulated pursuant to Article 15 of the NYS Environmental Conservation Law ("Protection of Waters") and its implementing regulations (6 NYCRR 608). The waterbodies in the Study Area have a rating of the following:

Table 24: Water Supply Classifications

Name	Classification
Hudson River	C(TS)
Mill Creek	C
Hampton Manor Lake	C
Moordener Kill	C(T)
Papscanee Creek	C

Source: NYSDEC (www.dec.ny.gov/lands/34488.html)

Construction activities regulated under Article 15 include:

- Stream bank or stream bed disturbance;
- Construction of artificial obstructions in or across a natural watercourse when the drainage areas of the watercourse is greater than one square mile, the dam exceeds 10 feet in height, or there is an impoundment of one million gallons (approximately 3 acre feet);
- Placement of fill in navigable waters; and
- Any activity that may result in discharge of runoff into navigable waters (NYSDEC 1991)

Potential Impacts

Future construction activities that disrupt the landscape through clearing, digging, or any other activity may alter the natural processes that are occurring in that area. During construction of various projects within the Town, clearing and grading activities could expose soils to erosion. If the soils erode, the sediment-laden stormwater eventually would decrease in velocity and deposit the material (sedimentation) in surface waters. As with any construction activity, sedimentation can occur downstream within the floodplain, wetlands, and other portions of the stream corridor. This sedimentation could impact the aquatic environment and may also change the physical characteristics of the stream.

When the cycle of runoff and drainage is disrupted, it has a lasting impact on surface water areas, such as lakes, streams, and rivers. Site development includes grading of land and altering patterns of drainage and stormwater management. The processes and materials used to develop a residential or commercial site may bring new chemicals and pollutants to an area, disrupting the natural habitat of fish and other animals, as well as existing vegetation. Impervious surfaces accumulate pollutants deposited from the atmosphere, vehicle fluids, roadway de-icing, materials and windblown materials.

Mitigation Measures

For all future developments, potential impacts and mitigation measures for surface water and stormwater management should be analyzed and reviewed prior to approval of permits.

Stormwater discharges from construction activities involving one acre or more of land are regulated under SPDES General Permit. To obtain coverage under this general permit, the project sponsor must submit a "Notice of Intent" (NOI) to NYSDEC. Prior to submission of the NOI, the project sponsor must prepare a Stormwater Pollution Prevention Plan (SWPPP) that complies with the permit requirements and technical standards. Proposed erosion and sediment control measures for a project would be implemented in such a way as to reduce the risk of soil loss from disturbed areas and to prevent sedimentation within existing drainage channels. Erosion control measures for future development within the Town should include the following:

- Construction and maintenance of erosions and siltation control measures in accordance with the New York State Guidelines for Urban Erosion and Sediment Control.
- Prompt vegetative stabilization of disturbed areas with topsoil, seeding and mulch.

- Use of stone riprap at culvert inlets and outlets and proposed drainage channels in excess of 5% longitudinal slope.
- Stabilization of proposed pavement areas by compaction and the application of gravel base as soon as all utilities are installed.
- Excavation work not to be carried out during periods of extreme inclement weather.
- Protection of all areas of the project site disturbed during construction, by sediment basins, providing at a minimum 1,800 cubic feet of storage per acre drained. The use of polymers shall be evaluated to aid in the "settling-out" of smaller-sized sediment particles in proposed sediment basins.
- Use of rock check dam s along proposed drainage channels in excess of 5% longitudinal slope.
- Use of sediment filter dams at sediment basin outfalls, as well as other critical locations of concentrated stormwater discharge locations.

The New York State Stormwater Management Design Manual, issued in October 2001, provides standards for design of Stormwater Management Practices (SMPs) that are part of the SWPPP. The purpose of the manual is threefold:

- To protect the waters of the State of New York form adverse impacts of urban stormwater runoff.
- To provide design guidance on the most effective stormwater management practices for new development sites.
- To improve the quality of SMPs constructed in the State, specifically with regard to their performance, longevity, safety, ease of maintenance, community acceptance, and environmental benefit.

The SWPPP should include the following:

- An erosion and sedimentation control plan that addresses specific site concerns, such as wetlands, watercourses and other sensitive features;
- Storage and treatment of the Water Quality Volume. This is the volume of stormwater runoff from the site that typically contains the highest concentration of sediment and pollutants.
- Protection of stream channels from erosion by providing extended stormwater detention (holding back storm flow) for the 1-year, 24-hour storm event. A 1-year storm event is defined as a storm that occurs once a year, on average.
- Protection from flooding through detaining storm flow on site such that the developed conditions of the site do not result in more frequent and/or larger flood events. This is generally accomplished by storing the excess water as determined through hydrologic modeling.

Another consideration for the site plan review procedures is the use of Low Impact Development (LID) stormwater management methods. LID focuses on how the developed site is planned and designed to minimize hydrological impacts. The goal of LID is to restore important ecological functions in a watershed, such as the hydrologic regime by using site design techniques called integrated management practices (IMP's) that store, infiltrate, evaporate, and detain runoff.

Trees and native vegetation provide for natural storage of rainfall. Permeable pavement, grass swales along roads, rain gardens, and amended soils store, filter, and infiltrate runoff. Rain barrels and other cisterns provide additional water storage. The design of each lot can be incorporated into the larger overall site plan to create a "functional" landscaped neighborhood community within the built environment.

Some management practices that could be incorporated into the final design of new buildings and parking areas could include bio-retention facilities, dry wells, filter/buffer strips and other manufactured landscape areas, infiltration trenches, permeable pavers, and roof gardens.

C. Water and Sewer

Existing Conditions

Water Supply

Public water for the Town of East Greenbush is purchased from the City of Troy. The City of Rensselaer and the Town of East Greenbush jointly own a water system, consisting of transmission and storage facilities, that conveys water from the City of Troy to the Town of East Greenbush, which in turn conveys water to the City of Rensselaer. Each municipality purchases its water from the City of Troy separately based on use. Joint expenses, including pumping costs, are shared by the two municipalities. Water is pumped from Troy to East Greenbush via the Cross Street Pumping Station in Troy along approximately five miles of 30-inch water transmission main. The current purchase agreement with Troy allows for the taking of up to 7 million gallons per day (mgd) including a 1.0 mgd per day allowance for water sales to the Town of North Greenbush.

Map 8: Existing Water Infrastructure shows the general location and size of major transmission mains, storage facilities, and booster stations within the Study Area. The figure also shows the approximate boundaries of the existing water districts. As shown, the Study Area includes two existing Town water districts, the East Greenbush General Water District (General District) and the Hampton Manor Water District (Hampton Manor). In addition to supplying Rensselaer and East Greenbush, water from the Cross Street Pump Station also supplies portions of the Town of North Greenbush and the Town of Schodack.

Currently, the estimated average daily aggregate demand on the Troy supply line breaks down among municipalities as follows:

Table 25: Estimated Average Daily Aggregate Demand

Municipality	Estimated Average Daily Aggregate Demand (mgd)
Town of East Greenbush General District	1.65
City of Rensselaer	1.40
Town of North Greenbush	0.12
Town of Schodack	0.05
TOTAL DEMAND	3.22

In summer, when demands are higher, the total demand approaches approximately 4.2 mgd with about 2.4 mgd attributed to the three Towns and 2.0 mgd to Rensselaer with the greater relative increase being presumptively attributed to higher overall irrigation demands in the Towns. In May 2008, City of Rensselaer engineering consultants J. Kenneth Fraser and Associates, P.C. projected that the City's water demands will increase by about 600,000 gpd over the next ten years and that the Town of East Greenbush could see similar or slightly higher increases in water demand. It is expected that there be some moderate increase in use from North Greenbush. However, the Town of Schodack soon will have its own supply.

Hampton Manor currently obtains its water from groundwater wells within its boundaries and serves approximately680 users, mostly residential. Average demand in Hampton Manor is estimated at 0.14

mgd. Due to the higher water quality provided by the City of Troy, Town officials indicate it is likely that Hampton Manor will one day be served by the Troy water supply as well. The Hampton Manor has its own 150,000 gallon elevated distribution storage reservoir.

Town owned water systems in the Study Area serve approximately 4,940 users including 680 users in the Hampton Manor Water District. Distribution storage for the General Water District consists of one 4 million gallon steel reservoir located on Grandview Drive in the northern part of the Study Area. Only about 2.3 million gallons (mg) or 58% of this storage is available due to limitations in the range of allowable operating tank water levels.

Planned water system improvements, as indicated by Town officials include:

- Installation of a new 7.0 mgd (4,900 gallons per minute) engine driven back-up pump for the Cross Street Pump Station for auxiliary operation during electrical power outages.
- Storage: Construction of two 5 mg storage reservoirs to increase available storage and improve reliability. This addresses current and anticipated storage deficiencies.
- New master meter installations to measure water uses in the system.

Wastewater Infrastructure

The Town provides sanitary wastewater collection, conveyance and treatment services to approximately 4,800 connected properties.

Map 9: Existing Wastewater Facilities presents the location, size, and approximate flow capacities of major wastewater infrastructure components including trunk sewers, lift stations, force mains, and treatment facilities. The boundaries of the various sewer districts are also shown. The Town's wastewater treatment facility serves four sewer districts within the Study Area; the General Sewer District, the Couse Sewer District, the Third Avenue Sewer District and the Hampton Manor Sewer District.

The treatment facility has a current rated capacity of 2.5 mgd and a peak hydraulic capacity of approximately 6.75 mgd. Average daily flows to the plant, as measured and recorded at the plant, for the years 2005 thru 2007 and the overall three-year average are presented in **Table 26: Existing Wastewater Flows**.

Table 26: Existing Wastewater Flows

Year	Average Daily Flow (mgd)
2005	2.41
2006	2.27
2007	1.69
3-Year Average	2.12

Map 8: Existing Water Infrastructure

Map 9: Existing Wastewater Facilities

Peak hour flows recorded at the plant for the same three year period show a maximum flow-rate of 6.9 mgd that occurred in 2005.

The lower annual average flows in 2006 and 2007 are most likely attributed to lower overall precipitation and consequent flow effects within the existing sanitary sewer collection system, for those years. Rainfall data as provided by Weather Underground for the three years are as follows:

Table 27: Annual Rainfall Data

Year	Total Annual Rainfall (Inches)	Greatest Month	Monthly Total (Inches)
2005	48	October	9.00
2006	47	June	8.74
2007	45	July	7.03

Source: www.wunderground.com

Since 1997 the Town has been operating under a DEC Consent Order to reduce I & I (infiltration and inflow) flows to the plant. Order on Consent R4-2000-1013-125 Schedule of Compliance Item 5b allows new connections for "measured" reductions in I & I at the ratio of one gallon of additional wastewater flow for every four gallons of I & I removed. For "estimated" reductions in I & I the ratio is one gallon of additional wastewater flow for every 10 gallons of I & I removed. The NYSDEC has recently (June 2009) drafted a sixth modification to the Consent Order. The allowance for new connections based on the reduction of I & I as stated in the aforementioned ratios, now pertains to the entire Town. It now becomes imperative that the Town address and reduce extraneous flows attributed to I & I in order to provide treatment system capacity for future flows. Further, the draft Order has a provision that if the Town cannot divert raw wastewater to the County treatment facilities by December 31, 2009, then it either must reduce flow through affirmative I & I reduction measures or provide for additional treatment capacity at the existing plant to accommodate future flows.

Since 1997 the Town has made only limited progress in I & I removals due to the widespread nature of the problem within the collection system, the lack of funding, and the limited effectiveness of the efforts to date.

The Town currently utilizes a network of wastewater pumping stations, force mains, and gravity sewers to convey wastewater to the treatment plant. In total there are thirteen pump stations ranging from just a few years old to forty years in age. Two major pump stations ultimately responsible for conveying wastewater to the treatment plant are the Barracks Road pump station on the north end of the Study Area and the Corliss Avenue pump station on the south end of the Study Area. The Corliss Avenue pump station also utilizes a one-million gallon equalization basin during periods of heavy flow to limit flow received at the treatment plant. Several of the pump stations, force mains, and gravity trunk sewers are currently at their rated design capacity, particularly during and immediately after rain events due to infiltration and inflow.

Improvements will be needed to the existing wastewater infrastructure to:

- Increase the capacities of conveyance and treatment facilities to handle flow increases expected from future growth and development

- Reduce quantities of I & I through a program of sewer rehabilitation, repair and replacement in areas where most needed, to preserve existing capacity for future growth and development.
- Provide for increased reliability, efficiency, and sustainability of system components that are presently stressed, and are expected to be stressed further by future growth and development.

Planned wastewater system improvements, as indicated by Town officials include:

- Treatment/Conveyance: It is expected that future development and resultant increases in wastewater flow will eventually result in the existing treatment facilities' maximum capacity being exceeded. Based on this the Town plans to construct improvements at the existing plant to maximize its utility and to construct a plant bypass sewer to send some of the excess flow to the Rensselaer County Treatment facility. Treatment plant improvements include modifications to the plant's preliminary treatment and primary settling works. The plant and bypass improvements have an estimated capital cost of $ 2,300,000.
- I & I Removals: The Town must implement a program of various sewer improvements and repairs to eliminate Infiltration and Inflow to reduce peak flow loads on existing wastewater infrastructure and enhance the Towns ability to accept flows from projected development. This program will include, but not be limited to, sliplining collection sewers, sealing manholes, constructing storm sewers to accept flow from sump pumps, and sewer pipe replacement. Targeting as much as 20 to 30 percent of the collector sewers in the Hampton Manor and General Sewer Districts is anticipated to remove significant quantities of inflow and infiltration. These sewer districts contain an estimated 40,000 to 60,000 feet of collector sewers requiring improvements. It is estimated that these measures will have capital costs ranging anywhere from $60 to $120 per lineal foot of sewer pipe or from $ 2,400,000 to $ 7,200,000. For purposes of this report the capital cost is placed at $5,000,000.

Potential Impacts

The study area was divided into nine (9) sub-areas for the purposes of estimating growth impacts on existing water and sewer infrastructure. These areas are shown on **Map 10: Water/Wastewater Analysis Areas.**

Water demands and wastewater flow increases were derived from a build-out analysis of each water wastewater analysis area. Using GIS data the quantity of developable and under-utilized land area for each sub-area was approximated. Deductions were made for right-of-ways, green space, and public areas. Using the remaining land areas and applying zoning guidelines for lot sizes yielded residential equivalent dwelling units or EDU's. For non-residentially zoned portions, we building square foot projections were developed by applying the same existing average commercial development density presented in Table 20 of approximately 3,900 square feet per acre.

Each EDU is estimated to demand water, and generate wastewater, at the rate of 200 gallons per day. This is an approximation based upon realistic metered water consumption of typical households. This is approximate and is based on an estimated 2.5 people per dwelling unit and 75 gallons per person per day.

The figure of 75 gallons per person per day is taken from NYSDEC Design Standards for Wastewater Treatment Works – 1988 guidelines. Non-residential demands and flows are more difficult to estimate owing to the varied nature of permitted commercial and industrial uses and unit water demands. Therefore non-residential flow demands were estimated using a blanket unit quantity of 0.1 gallons per day per square foot of floor area in accordance with NYSDEC Design Standards for Wastewater Treatment Works – 1988 guidelines for "Office Buildings" and "Shopping Centers."

The NYSDEC design standards cover other typical non-residential uses as well and should be consulted for applicable specific proposed future uses. It should be noted that non-residential demands/flows can be converted to their flow equivalence in residential units by dividing the flow by 200 gallons per equivalent dwelling unit to achieve Equivalent Dwelling Units. It should also be noted that some communities, particularly those without customer water meters, utilize EDU's for water and sewer billing purposes.

Wet industry water demands are not included in the build-out flow analysis as these are usually special cases of development and are subject to specific local regulation with respect to impacts on water and wastewater infrastructure and water and sewer use charges. The data used and the water demand and wastewater flow increases derived for each of the sub-areas is shown in **Table 28: Sub-Area Water and Wastewater Build-Out Flow Analysis.**

It should also be noted that where the design guidelines used to estimate non-residential flows are deemed not applicable, it is recommended that the Town allow the applicant to provide evidence of flows acceptable to the Town.

Water Infrastructure

Projected growth within the Study Area will increase water supply and storage infrastructure requirements. Water supply or source infrastructure must be capable of meeting the maximum projected water demand of the service area(s). Storage facilities should have a capacity equal to the average day demand plus fire protection requirements.

Average day demand on the source is expected to increase from the present 3.22 mgd to 5.02 mgd as a result of build-out in the Study Area. The following improvements are anticipated as a result of the anticipated growth:

- Increase available storage capacity from the present 2.6 mg (available capacity) to at least 5.1 mg, an increase of almost 100 %. The Town's planned 10.0 mg storage improvement project has an estimated capital cost of $5.5 Million, according to Town officials. The increase in storage requirements attributable to growth in the Study Area of 2.5 mg represents 25% of this cost or $1,400,000.
- Increase the capacity of the Cross Street Pumping Station from its present capacity of 6.0 mgd to at least 7.0 mgd, an increase of 17 %. This will require pumps with greater flow and head capacity than currently exist. The estimated capital cost of this improvement including pumps, valves, and controls is $600,000.

- Increase the size of the existing 14-inch transmission main on Elliott Road from Iroquois Place to US Route 9&20. This will improve residual pressures during emergency flows and increase operating pressures downstream as demands increase in the southern portion of the study area. This improvement entails approximately 700 feet of 24-inch main and appurtenances at an estimated capital cost of $250,000.

Table 28: Sub-Area Water & Wastewater Build-Out Flow Analysis

Service Area	Developable or Under-Utilized Land Area (Acres)	Zoning Code	Proportional Zoning Assignments & Deductions			Remaining Land Area (Ac.)	Applied Lot Size (Acres) (Note 2)	Units	Estimated Quantity (EDU or Sq. Ft.) (Note 3)	Unit Water & Wastewater Flow (GPD/Unit)	Total Water Demand & Wastewater Flow (GPD)
			Area Split (Acres)	Deductions (Note 1)							
				Deductable % of Acreage	Deduct (Acres)						
1	929	R-B	465	30%	140	325	1.5	EDU	217	200	43,000
			465	50%	230	235	0.25	EDU	940	200	188,000
2	352	R-1/R-1A/ R-2/R-3	352	10%	40	312	0.25	EDU	1,248	200	250,000
3	952	R-B	476	30%	140	336	1.5	EDU	224	200	45,000
			476	50%	240	236	0.25	EDU	944	200	189,000
4	713	R-1/R-2	713	10%	70	643	0.25	EDU	2,572	200	514,000
5	264	PPB/B-1/ B-2/O	264	0%	0	264	NA	SF	1,029,600	0.1	103,000
6	430	R-B	215	30%	60	155	1.5	EDU	103	200	21,000
			215	50%	110	105	0.25	EDU	420	200	84,000
7	192	PPB/B-1/ B-2/OI	192	0%	0	192	NA	SF	748,800	0.1	75,000
8	671	OC/PDD/ O/B-1/ B-2/PPB	671	0%	0	671	NA	SF	2,616,900	0.1	262,000
9	128	R-OS	43	30%	10	33	2	EDU	17	200	3,000
		R-B	43	30%	10	33	1.5	EDU	22	200	4,000
			43	50%	20	23	0.25	EDU	92	200	18,000
						TOTAL EDU'S (RESIDENTIAL)			6,799	**TOTAL**	**1,799,000**
						TOTAL SF (NON-RESIDENTIAL)			4,395,300	**SAY**	**1.80 MGD**

Note 1. Deduction percentages represent approximations for right-of-ways, green space, lot coverage limits, and common spaces.

Note 2. Density for R-1, R-1A, R-2, and R-3 zones are estimated at an average of four units per acre when more than one classification is in the same Service Area.

Note 3. Residential EDU's or Square foot of floor area for non-residential zoning. Non-Residential floor area development projected at existing levels or approximately 3,900 square feet per acre.

Map 10: Water/Wastewater Analysis Areas

Map 11: Proposed Wastewater Facilities

Wastewater Infrastructure

Projected growth within the Study Area will increase flow loads on existing wastewater infrastructure. This will require capacity improvements in specific areas of the collection/conveyance system, in addition to those improvements already discussed. **Map 11: Proposed Wastewater Facilities** depicts the locations of the improvements. The following improvements are anticipated as a result of the anticipated growth:

- Corliss Avenue Forcemain Improvements: Build-out adds an estimated 300,000 gallons per day flow to the Corliss Avenue lift station. In order to pass the larger flows at reasonable power requirements, it is expected that the hydraulic capacity of the forcemain will be increased. The existing forcemain consists of two pipes (14-inch and 12-inch) in parallel for the first part of its run followed by a single pipe (12-inch) for the remainder. The proposed improvement entails construction of up to 3,000 feet of 14-inch forcemain in parallel with the existing single 12 –inch portion. This improvement has an estimated capital cost of $600,000.
- Barracks Road Lift Station: Additional development in the northern portions of Service Area 4 will require greater capacity at the Barracks Road pump station. Wastewater flow records provided by the Town for the Barracks Road pump station indicate that the station is currently loaded at or near its rated capacity of 980 gpm. Estimates for additional flow in this area indicate that development could add an additional 240 gpm to this station. Therefore the design and construction of a larger wet well for flow equalization along with aeration equipment, pumps, controls and piping is recommended. These improvements have an estimated capital cost of $500,000.
- Rt. 4 and Rt. 9&20 Gravity Sewer: Development in Service Area 3 could place an estimated additional flow of 650 gpm to the ten-inch gravity trunk sewer on Rt. 4. The additional flow combined with the estimated existing flow of 300 gpm from the Hide-A-Way pump station and estimated 150 gpm contribution from Elliot Road gravity sewer totals 1,100 gpm for the ten-inch gravity sewer on the south end of Rt. 4. Flow of this volume will require upgrades of approximately 2,000 linear feet of twelve-inch gravity sewer pipe and appurtenances at $200.00 per foot for a total of $400,000.
- Corliss Avenue Lift Station: According to Town representatives, the Corliss Avenue Station operates satisfactorily during normal flow conditions but has a history of becoming inundated during heavy rain events even when utilizing the 1 million gallon equalization basin and 1,900 gpm VFD pumps. Analysis of available information indicates that during peak flow the pump station currently experiences an inlet flow of approximately 2,900 gpm. Future development from Service Area's 1, 3, and 6 could contribute approximately 600 gpm of additional flow for a new total of approximately 3,500 gpm. Proposed improvements would include upgrading pump discharge capacity by increasing the size of the existing impellers along with increased motor sizes and new VFD controls. The estimated capital cost of these improvements is $300,000.

- Prospect Heights Trunk Sewer: The downstream receiving fifteen-inch gravity sewer would need to be upgraded to a minimum eighteen-inch diameter to ensure that the additional flow could be handled. This would consist of replacing approximately 500 linear feet of pipe at $200.00 per foot for a total capital cost of $100,000.
- Hide A Way Pump Station: This station receives flow from two upstream pump stations. According to Town representatives the Hide A Way pump station operates satisfactorily during dry-weather flow conditions but it is occasionally inundated during heavy rain events. Flow records for the pump station are sporadic. Because the station already experiences overflow and it is centrally located, the station is a candidate for receiving significant additional flow from new development in Service Area 6, upgrades to the existing pumps and controls are anticipated at a total estimated capital cost of approximately $100,000.

Mitigation Measures

Water and wastewater system infrastructure improvements anticipated, along with estimated capital costs are summarized in **Table 29: Water & Wastewater Improvement Cost Summary**. The total estimated capital cost of all the improvements is $11,550,000. It is proposed that the capital costs of the improvements be recouped through the assessment of mitigation fees on new development within the Study Area as it occurs.

It is anticipated that the projects contemplated will be implemented and completed over the next twenty years. Therefore, the costs should be apportioned on the basis of the projected number of equivalent dwelling units (EDU), residential and non-residential, expected to occur over the next twenty years.

It is assumed that residential and commercial growth will continue, over the long term, at a rate approximately equivalent to historical levels. These historical levels were discussed and presented in Section III – Build-Out Analysis of this document. Single-family housing starts have averaged approximately 68 per year. Multi-family housing starts have averaged 4 per year. Assuming multi-family starts are two-family duplexes, the total residential starts equates to an average of 76 units per year or 1,520 EDU's over twenty years. This represents a water demand and wastewater flow increase of 300,000 gpd over the next twenty years.

Non-residential (commercial) building start data indicates a historical growth rate of 243,600 square feet per year or a total projected square footage of 4,872,000 square feet over twenty years. This is based on 28 starts per year and an existing average of 8,700 square feet of floor area per developed parcel. At 0.1 gpd per square foot this represents a water demand/wastewater flow of 487,000 gallons per day. This flow is equivalent to 2,435 EDU's.

The total projected increase in EDU's (residential and non-residential) is 3,955 EDU's over the twenty year planning period. The total capital cost of $11,550,000 bonded for twenty years at six (6%) percent interest results in an annual loan payment of $1,007,000.00 per year. The annual loan payment divided by 197.5 EDU's per year equates to $5,098.73 per EDU. It is therefore recommended a water and wastewater mitigation fee of $5,100.00 per EDU be implemented.

Table 29: Water & Wastewater Improvement Cost Summary

	Description of Improvements	Capital Cost
Water System Improvements	Additional Distribution Storage	$1,400,000
	Cross Street Pumping Station (Pumps And Controls)	$600,000
	Elliott Road Transmission Main Improvement (24-Inch)	$250,0000
	Water Subtotal	**$2,250,000**
Wastewater System Improvements	Wastewater Plant Bypass Trunk Sewer To RCSD (15-Inch) Including Preliminary & Primary Treatment Plant Improvements	$2,300,000
	I & I Remediation Repairs/Improvements	$5,000,000
	Corliss Avenue Force Main Improvements (14-Inch)	$600,000
	Barracks Road Lift Station Improvements	$500,000
	Rtes 4 And 9&20 Couse Sewer District Trunk Sewer Improvement (12-Inch)	$400,000
	Corliss Avenue Lift Station Improvements (Pumps, Motors And Controls)	$300,000
	Prospect Heights Trunk Sewer Improvements (18-Inch)	$100,000
	Hide A Way Lift Station Improvements (Pumps And Controls)	$100,000
	Wastewater Subtotal	**$9,300,000**
	Total Water And Wastewater	**$11,550,000**

Notes: All Costs Are Indexed To Enr Construction Cost Index (2nd Quarter 2008)

D. Recreation

Existing Conditions

Town of East Greenbush Parks and Recreation Master Plan

In 2002 the Town of East Greenbush developed its first Parks and Recreation Master Plan. The plan was developed to lay the foundation for the future use and development of the Town's parks and recreation system. In addition to identifying residents' desires for future park and recreation resources, the plan, as East Greenbush is a participating member of the Hudson River Valley Greenway, also called for further goals consistent with the Greenway objectives, including protecting natural and cultural resources; fostering economic development, including tourism, agriculture and urban redevelopment; and promoting public access, regional planning, and heritage and environmental education.

The plan noted that, with the Town's 10.5% population increase during the 1990s, East Greenbush had done little to grow its supply of park and recreational facilities to meet that population growth. Serving historically as a suburban Capital District bedroom community, the Town's population in 2000 was 15,560, up 1,484 residents from its 1990 total 14,076.

The plan outlined many recommendations to enhance the Town's parkland and recreational resource inventory. The following paragraphs summarize some of the more pertinent objectives that warrant consideration as the Town envisions its future growth.

It was recommended that the Town work with adjacent communities, including Schodack and Sand Lake on developing a regional bike/hike trail system. A former rail line right-of-way that once housed an Albany and Hudson rail line and is situated parallel to Route 9/20 and is held in easement by Niagara Mohawk (now National Grid) was identified as an excellent opportunity the Town could pursue. The plan also recommended East Greenbush work with the City of Rensselaer on their endeavors to create a "River Walk Trail" along the Hudson River. Developing a greenway trail and sidewalk system that allows for safe pedestrian access to all parks was also identified as a priority.

The plan identified the Papscanee Island Preserve, Hudson River, Mill Creek, and Moordener Creek as four important assets that present opportunities for passive and active water recreation, such as boating and fishing. For these areas, improved access and recreational opportunities were identified priorities. At the time of the Park and Recreation Master Plan, the Town was investigating the possibility of establishing, through a lease agreement, a public multi-use boat launch on the Hudson River.

The Mill Creek's environmentally sensitive floodplains, wetlands, and ravines were noted for the passive recreation opportunities—such as hiking and nature study—they offer. Requiring developers to avoid negatively impacting the stream and to dedicate lands buffering the Creek as a condition of Site Plan Approval were two suggestions posed for the Town to preserve this unique natural area as a resource. Similarly, it was recommended that the Moordener Kill's stream banks and floodplains be dedicated for open space and used for a natural trail system.

Another recreational need identified in the plan included an amphitheater for music festivals and outdoor events. To offset the Town's growing need for multi-use fields, in 2001, the Town applied for an Environmental Protection Fund to acquire land for multi-use recreation fields.

According to the National Parks, Recreation, and Open Space standards, each community should have at least 10 acres of parkland for every 1,000 residents. East Greenbush fails to meet this standard, having only 8.3 acres per 1,000 residents. However, the Town did meet the standard recommended by the 1994 New York State Comprehensive Outdoor Recreation Plan (SCORP) at 5 acres per 1,000 residents. However, the Town fell far short of meeting the facility standards for tennis courts, basketball courts, boating access, ice-skating, and swimming pools. See **Table 30: Facility Standards Based on SCORP** below.

Table 30: Facility Standards Based on SCORP

Facility Type	Recommended Standard/1,000 population	Recommended Facilities Based on Census 2000	Existing Facilities
Tennis Courts	1/2 Court	8 Courts	4
Basketball Courts	1 Court	15 Courts	4
Boating Access	1/5 Ramp	3+ Ramps	0
Ice Skating	1/5 Site	3+ Sites	1
Swimming Pool	750 sq ft	11,670 sq ft	0

Source: Town of East Greenbush Park and Recreation Master Plan

Table 31: Parks & Recreation Expenditure Compared to Other Towns/Cities

Towns/Cities Name	Population (2000)	Spending Per Person
Town of Bethlehem	31,304	$28.36
City of Glens Falls	14,354	$25.16
Town of Niskayuna	20,295	$24.42
Town of East Greenbush	15,560	$14.73
Town of Brunswick	11,664	$12.00
City of Cohoes	15,521	$9.43
Town of Schodack	12,536	$7.56

Source: Town of East Greenbush Park and Recreation Master Plan

The Town of East Greenbush currently has approximately 198 acres of public parkland. Of this parkland, some has been fully developed, while approximately 30 acres are steeply sloped. The Town also owns other parcels, which have been dedicated as open space but remain undeveloped. At present, East Greenbush has six (6) public parks and a few quasi-public recreational areas within Town limits. These resources, including the Town's existing parks and the school districts' resources, provide residents and visitors with a variety of recreational and scenic opportunities. East Greenbush's parks are dispersed throughout the Town and vary in type and facilities provided.

The largest of the parks is the Town Park, which is approximately 190 acres. The other five parks are neighborhood oriented and are used primarily by nearby residents.

Developed Parks

Town Park

East Greenbush's Town Park is located in the southeast section of the Town on Town Park Road off of Elliot Road. Approximately 190 acres, it is the Town's largest public recreation facility. However, only about 15 acres of the entire 190-acre parcel is formally developed, the rest has been left as wooded greenspace areas. See **Map 12: Existing Parks & Recreation**.

The Town Park offers a variety of recreation amenities to the public, both active and passive. Activity resources include one (1) interactive playground, one (1) non-regulation softball field, one (1) basketball hoop, two (2) horseshoe pits, one (1) dog park, and 1.5 miles of hiking and trails. One (1) volleyball court is planned for construction in 2008. Along Luther Road, a Miracle League field is being constructed. This custom-designed field incorporates a cushioned synthetic turf rubber surface that allows children in wheelchairs and walkers to glide unrestricted to their positions without fear of injury. Open areas provide space for lawn games such as croquet and bocce. The dammed section of the Moordener Kill provides fishing and non-motorized boating opportunities. Winter activities include ice-skating, cross-country skiing on the trails, and downhill sledding.

Two (2) picnic pavilions as well as several barbeque pits make the park a popular location for outdoor parties. The lower pavilion, located next to the swimming area, contains picnic tables, an outdoor barbeque area, and individual grills. The upper pavilion is located on a hilltop overlooking the park playgrounds and the Moordener Kill. This pavilion contains a large outdoor deck, a kitchen with indoor barbeque, picnic tables, and restrooms. Both pavilions have lighting for nighttime use. The pavilions can be reserved for a nominal rental fee.

In addition to the restroom facility located within the upper pavilion, there are two other restrooms. A seasonal bathhouse is also available to swimmers.

The Town Park facilities are also used for other Town-sponsored events like the Annual Easter Egg Hunt. Private organizations, schools, and local residents also use the facilities for other special events. During the summer, the Town of East Greenbush Summer Day Camp Program, organized by the East Greenbush Youth Services and Recreation Department, is operated at the park. In addition to teaching campers aged 5 to 15 to swim, the Day Camp also offers other activities including, arts and crafts, field games, and occasional off-site field trips.

Hampton Lake Park

Hampton Lake Park is located in the northwesterly section of the Town on Lake Shore Drive adjacent to Hampton Manor Lake. With 2.26 acres, it is the second largest public park in the Town. Hampton Manor residents are the primary users of the park.

The park's recreational facilities include two (2) tennis courts and one (1) basketball court. In addition to a playground, Hampton Lake Park has a sandbox, three slides, two swing sets, a sea saw, a modular play unit, bouncers, and a merry-go-round. Passive amenities include picnic tables, benches, and a beach house

with restrooms. Seasonal activities include fishing and non-motorized boating at the park's water edge. Swimming has not been encouraged at the park for several years. Hampton Manor Lake is stocked regularly with bass, channel catfish, and crappies.

The interior room of the Beach House has capacity for about twenty people and is used year round for youth oriented activities, such as teen meetings and other gatherings. Hampton Lake Park is host to many of the Town-sponsored programs and events including: tennis lessons, Rhythm & Rhymes (an adult supervised playgroup for toddlers), *Saturday in the Park* (includes music, food, rides, crafts and games), Karaoke, and the Annual Ole Tyme Fishing Derby which is co-sponsored by the Greenbush Bass Association and Kiwanis Club.

The Town has considered improving Lake Shore Drive, which circles Hampton Manor Lake and is used daily by residents for walking and jogging. Improvements considered included a potential a waterfront esplanade; a retaining wall to stabilize the banks of the lake and widen Lake Shore Drive; dedicating a wider area to pedestrians for improved safety when jogging and walking around the lake.

Woodland's Eckman Park

Woodland's Eckman Park, located off Phillips Road on Grant Avenue is a small neighborhood park of approximately 1.67 acres. Located within a residential area, nearby residents are the primary park-users. Woodland's Eckman Park contains two (2) tennis courts, one (1) basketball court, and an open field area for lawn games. In addition to a small interactive playground, the park houses a swing set, slide, and bouncers. At present, there are no Town-sponsored programs or other organized activities held at this park.

Onderdonk Memorial Park

Onderdonk Memorial Park is located on Hampton Avenue at the north end of Hampton Manor Lake. The approximate 1.5-acre park is surrounded by a densely populated neighborhood. Designed to be a handicapped accessible adult oriented park, activity resources at the park include two (2) bocce courts, one (1) shuffleboard court, two (2) horseshoe pits, and one (1) putting green. Other amenities include a small pavilion with picnic tables and restrooms.

The East Greenbush Youth Services and Recreation Department holds a number of programs and events at Onderdonk Memorial Park. The pavilion is used for social gatherings and senior adult activities such as bocce, horseshoes, and card and domino games. The *Music in the Park* program is a very successful summer event. Musical shows, held every Tuesday, are well attended by local residents as well as families from neighboring towns.

Map 12: Parks & Recreation

Prospect Heights Park

Prospect Heights Park is a small neighborhood park located on Neptune Street in the western part of East Greenbush. The approximate 0.4-acre park is in the midst of a dense neighborhood known as Prospect Heights.

Active recreation facilities at Prospect Heights Park include one (1) basketball court. The playground contains one (1) slide, one (1) sandbox, two (2) swing sets (one baby swing and one for older children), bouncers, and one (1) jungle gym. At present, there are no Town-sponsored programs or other organized activities held at this park.

Ontario Park

Ontario Park is located in the northwestern part of the Town on Ontario Avenue. This 1.5-acre park is surrounded by single-family homes. Active recreation facilities include one (1) basketball court. In addition, approximately one-third of the park is open space with grass and trees. Currently, there are no Town-sponsored programs or other organized activities held at this park.

Undeveloped Parklands

Papscanee Island Nature Preserve

Papscanee Island Nature Preserve is located on the Hudson River in the towns of East Greenbush and Schodack just east of Route 9J. The 156-acre preserve is owned by the Open Space Institute and managed by the Rensselaer County Legislature through the Rensselaer County's Environmental Management Council (RCEMC). Although it is not Town-owned parkland, Papscanee Island Nature Preserve is a major park resource to East Greenbush residents.

The Preserve contains about seven miles of trails, ranging from the short easy Red Trail to the lengthy White Trail, which traverses the entire Preserve through farmed fields. The Preserve also provides more than 2 miles of public access to the Hudson River Shoreline. In addition to environmental education, visitors to the Preserve are able to picnic, hike, and cross-country ski. The Preserve is home to: 72 bird species (such as eagles, sandpipers, catbirds, herons, hummingbirds and hawks); 12 mammal species and 19 varieties of fish.

In March 2002, the Rensselaer County Legislature approved making Papscanee Island Nature Preserve a part of the Greenway Trail system. This action has made the preserve eligible for more state and federal funding opportunities.

Town Recreational Resource Assessment

Table 32: Existing & Projected Recreational Facility Needs Assessment provides a detailed needs assessment of the Town of East Greenbush's recreational facilities. Originally created for the Town's 2002 Park and Recreation Master Plan, this table was updated for this Study.

Although the Town currently does not have a golf course, it has been working to acquire the Pheasant Hollow Golf Course and an adjacent property on Phillips Road. While the land acquisition has not yet been finalized, it is hopeful that the sale, for a reputed $1.6 million, will go through. Acquisition of these two properties, which together total 245 acres, would allow the Town to restore the 46-acre Pheasant Hollow's 9-hole golf course. In addition, there is land available to build another 9 holes. With this acquisition and the restoration of the 9-hole golf course, the Town's outstanding golf recreation needs would be met.

East Greenbush has only one Town field in an official park, located at the Town Park. Poorly maintained, this field is inadequate to meet existing field needs. Fortunately, between the various school districts, other Town lands, and private parcels where ball playing is permitted, Town residents are able to play ball. It should be noted that Town lands currently used for ball games, located adjacent to the Town's Department of Public Works (DPW), are also desired by the DPW for storage purposes. The Town has also been exploring options to acquire an additional property south of Pheasant Hollow. This land, former farmland, is particularly flat and conducive to playing fields.

Although the Town does not have a swimming pool, seasonal swimming is permitted at the Town Park beach area. (Swimming used to also be allowed at Hampton Lake Park.) East Greenbush did receive a grant for $95,000 for the construction of a swimming pool. The proposed site for the pool is the proposed park at Pheasant Hollow Golf course. If this acquisition falls through, it is undetermined whether or not an optional pool site has been identified. It should be further noted that these monies were earmarked specifically for a pool; they cannot be used to fund any other type of recreational improvement.

As evidenced in the Facility Needs Assessment table below, East Greenbush falls far short of providing existing residents with recreational facilities that meet New York State guidelines. The Town has half the number of tennis and basketball courts that it should. In addition, it should be noted that many of the tennis courts are in poor shape, with broken surfaces and cracks. The basketball courts, which are unlined, also need to be resurfaced. If the acquisition of the Pheasant Hollow Golf course goes through, there is an idea to develop new tennis courts, as well as new trails, at this new Town park.

Table 32: Existing & Projected Recreational Facility Needs Assessment

Type of Facility	Standard Per 1,000 People*	2000			2010		2020	
		Existing Resources	Population Needs (15,560 people)	Surplus / Shortage	Population Needs (16,708 people)	Surplus / Shortage	Population Needs (17,801 people)	Surplus / Shortage
Golf Course	0.5 holes per 1,000	0	8	-8	8	-8	9	-9
Field Games (Baseball, Softball, Soccer)	3 acres per 1,000	1	47	-46	50	-49	53	-52
Swimming Pool	750 sq. ft. per 1,000	NA[1]	11,670	-11,670	12,531	-12,531	13,351	-13,351
Tennis Courts	1 court per 2,000	4	8	-4	8	-4	9	-5
Basketball Courts	1 court per 1,999	4	8	-4	8	-4	9	-5

Source: Town of East Greenbush Park and Recreation Master Plan updated 2008. * Per NYS Statewide Comprehensive Outdoor Recreation Plan guideline standards. Population forecasts are from the Capital District Regional Planning Commission.
[1] The Town of East Greenbush allows seasonal swimming at the Town Park beach area.

Town Parks Assessment

Table 33 provides a detailed assessment of the Town of East Greenbush's parklands, both developed and undeveloped, natural resource areas. In evaluating Town resources in accordance with New York State recommended guidelines, the Town falls far short of New York State recommended minimum quantities. In assessing existing park resources available to serve current Town residents (Census 2000 population estimate of 15,560), the Town's existing supply of parks represents only 14% of what the Town should have. Therefore, there is an 86% deficit in parklands. Given this deficit, it is apparent that many Town residents use other resources. Residents may use the school districts facilities, other community resources, or fee-based facilities, such as the YMCA.

Table 33: Recreation Needs Assessment

TOWN OF EAST GREENBUSH				Census 2000		2010		2020	
Type of Park	SCORP Standard Per 1000 Pop	Approx. Size in Acres	Existing Park Capacity	Existing Need (Census 2000 Population = 15,560)	Existing Surplus or (Shortage)	Projected Need (2010 Population = 16,708)	Projected Surplus or (Shortage)	Projected Need (2020 Population = 17,801)	Projected Surplus or (Shortage)
(1) Play Lot (1 - 2 acres)	2 acres		0	31.1	**-31.1**	33.4	**-33.4**	35.6	**-35.6**
None		0							
(2) Pocket Park/ Mini Park (.25 - .50 acres)	.25 acres		0	3.9	**-3.9**	4.2	**-4.2**	4.5	**-4.5**
None		0							
(3) Neighborhood Park (4 - 7 acres)	1 acre		7.3	15.6	**-8.2**	16.7	**-9.4**	17.8	**-10.5**
Hampton Lake Park		2.26							
Woodman's Eckland Park		1.67							
Onderdonk Memorial Park		1.5							
Prospect Heights Park		0.4							
Ontario Park		1.5							
(4) District Park (20 - 100 acres)	2 acres		0	31.1	**-31.1**	33.4	**-33.4**	35.6	**-35.6**
None		0							
(5) Community Park (50 - 100 acres)	5 acres		15	77.8	**-62.8**	83.5	**-68.5**	89.0	**-74.0**
Town Park		15							
Total Developed Parks	10.25		22.3	159.5	-137.2	171.3	-148.9	182.5	-160.1
Needs Analysis (%)					**-86.0%**		**-87.0%**		**-87.8%**

UN - DEVELOPED PARKS

Type of Park	Park Capacity	Size (in acres)
Special Use Park (variable size)	-	0
None	0	
Natural Resource Area (variable size)	-	156
Papscanee Island Nature Preserve	156 acres	

Note - The Natural Resource Area and Special Use Park classification are not included in the Total Developed Parks acreages.
NYS SCORP Guidelines do not have a "Natural Resource Area" and "Special Use Park" classification.
"Natural Resource Area" and "Special Use Park" are both classified under NRPA, 1995.
Population forecasts are from the Capital District Regional Planning Commission.

The recreational facilities of the East Greenbush public schools can be considered a Town resource because many residents who live near schools use the school facilities for their recreational purposes. The community uses many of the outdoor play areas including: the playgrounds, basketball courts, tennis courts and handball courts. Several of the public schools also allow private leagues to book their fields or courts for practice and games. Groups like Pop Warner and Little League baseball use the public school fields for football, baseball, and soccer.

In order to determine the extent of available recreational facilities existing within the Town, an inventory of East Greenbush school facilities was taken. The six (6) schools inventoried included Columbia High School, Genet Elementary School, Goff Middle School, Green Meadow Elementary School, and Red Mill Elementary School. The following table shows the results of that inventory.

As noted earlier in this document, The Town of East Greenbush completed its first Parks and Recreation Master Plan in 2002. Among the recommendations, the Plan included the development of greenway trails and sidewalk systems to parks, development of a regional bike/hike trail in cooperation with neighboring

towns, creation of multi-use playing fields, and building a venue for outdoor activities and musical events. These recommendations remain to be implemented.

Taken altogether, **Table 34** inventories all recreational facilities located in East Greenbush, including school facilities.

Table 34: Inventory of Existing Recreation Facilities at East Greenbush Public Schools

	Columbia High School	Genet Elementary School	Goff Middle School	Green Meadow Elementary School	Red Mill Elementary School
Basketball	✓			✓	✓
Football	✓	✓	✓		
Backstop, softball, baseball		✓		✓	✓
Soccer, open fields	✓	✓	✓	✓	✓
Track	✓	✓			
Tennis	✓	✓			
Playgrounds		✓		✓	✓
Sledding Hill					✓
Hiking Trails					✓

Source: Town of East Greenbush Park and Recreation Master Plan

Potential Impacts

The Town's recreation faculties have not kept pace with the Town's growth in population. In addition, budgetary constraints have led to reduced maintenance and capital infusion at existing facilities. Build-out projections clearly illustrate the demand for more recreational facilities to serve the increased population. Since East Greenbush does not meet the recreational requirements for New York State currently, it will need to move decisively to ensure the quality of life for both existing residents and future residents through improvement of the Town's recreational facilities. Improving recreational facilities will not only enhance the quality of life for residents, it will also improve the ability of businesses in the Town to attract employees, which in turn will benefit the economic future of East Greenbush.

The requirements in place for the R-3 Zoning District that permits denser development by right and PDDs to provide open space and/or recreational amenities for residents is a step in the right direction, however these informal areas do not address the recreational needs of residents who do not live in these developments. Additionally, recreational needs such as multi-use playing fields for soccer and softball, and improved hiking /biking trails are not being met.

Table 35: Inventory of Existing East Greenbush Recreation Facilities

Park or Resources	Location (Within Study Area (Yes/No)	Park Size (acreage)	Type of Park	Baseball Field/Softball Field	Basketball Court	Benches	Fishing/Boating/Lake Access	Football Field	Golf Course	Horseshoe Pit	Multi-Use Field	Multi-Use Trail/Hiking Trail	Picnic Tables/Grills/Pavilions	Playground/Tot-Lot	Swimming Areas	Soccer Field	Tennis Court	Volleyball Court	Other Resources
Town of East Greenbush Parks																			
Town Park	Town Park Road/No	190 acres; 15 acres developed	Community Park	(1) non-regulation size	(1) hoop		X			2		1.5 miles	X	X	X			1*	108 acres undeveloped woods; open fields for lawn gams; winter activities include ice skating, X-country skiing, and sledding.
Hampton Lake Park	Lake Shore Drive/Yes	2.26 acres	Neighorhood Park		(1) court		X						X	X	X		2		winter-time ice skating.
Woodland's Eckman Park	Grant Avenue/Yes	1.67 acres	Neighorhood Park		(1) court									X			2		open field for lawn games
Onderdonk Memorial Park	Hampton Avenue/Yes	1.5 acres	Neighorhood Park							2									2 bocce courts; 1 shuffleboard court; 1 putting green; handicap accessible adult park.
Prospect Heights Park	Neptune Street/Yes	0.4 acres	Neighorhood Park		(1) court									X					
Ontario Park	Ontario Avenue/Yes?	1.5 acres	Neighorhood Park		(1) court														0.5 acres open space.
Other Public Parks and Resources																			
Papscanee Island Nature Preserve	Hudson River/No	156 acres	Undeveloped									7 miles							Owned by Open Space Insitute and managed by the Rensselaer County Legislature.
Town of East Greenbush School District Resources																			
Columbia High School		NA	School		X			X			X					X	X		Track
Genet Elementary School		NA	School	X	X			X			X			X		X	X		Track
Goff Middle School		NA	School					X			X					X			
Green Meadow Elementary School		NA	School	X	X						X			X		X			
Red Mill Elementary School		NA	School	X	X						X	X		X		X			Sledding hill

* Volleyball court under construction summer 2008.

Mitigation Measures

Build-out of the Town of East Greenbush as projected over the twenty-years will demand additional recreational facilities to serve the increased population. Improving the Town's recreation system will enhance the Town's quality of life thus enhancing the ability of local corporations to attract employees. This will aid improving the future economic of the Town. Given the limited capacity at existing Town facilities, it is evident that additional facilities will need to be constructed and land acquired to meet the recreation needs of the Town's future businesses and residents.

Informal recreation areas created as part of larger scale developments provide a place for families who live in the homes that surround these recreation areas. However, thee informal areas do not address the recreational needs of residents who do not live in these developments. Also, these recreation areas do not help to meet the increasing need for space for organized league play, access to water, or improved opportunities for walking/hiking.

In addition, moving ahead with the purchase of the Pheasant Hollow Golf Course and the adjoining property would fill several recreational needs and provide a site for construction of the community swimming pool. The total cost estimate for the purchase of this property has been estimated to cost the Town $1,600,000. Future commercial development should support future recreation and open space needs of the Town. Therefore it is calculated that commercial development should be responsible for fifteen (15%) percent allocation of the total estimated recreation costs.

Implementing the recommendations of the Parks and Recreation Master Plan would greatly improve the Town's recreational and open space opportunities. The Town of East Greenbush currently has a deficient amount of recreation and open space to accommodate its current population and future populations. In addition to the acreage that would be afforded by the Pheasant Hollow Golf Course, it is anticipated that the Town would need an additional 46 acres for active recreational fields, 4 tennis courts, and 4 basketball courts. In addition, several additional park improvements were proposed in the Town's Recreation Master Plan, including trail/bike connections and access to the Hudson River. These are each identified in **Table 36: Estimated Recreation Facilities & Acreage Costs**. The total cost of these amenities, improvements, and the purchase of the golf course is approximated to cost **$10,534,259.**

Table 36: Estimated Recreation Facilities & Acreage Costs

Amenity	Quantity / Area	Unit Cost	Total Cost
Tennis Courts (60' X 120')	4 courts each 7,200 sq ft	$68,500 each	$274,000
Basketball Courts (90' X 60')	4 courts each 5,400 sq ft	$62,000 each	$248,000
Recreation Field	46 acres	$10,000 per acre	$460,000
Pheasant Hollow Golf Course	245 acres		$1,600,000
Town Park Improvements			$6,897,409
Hampton Manor Park Improvements			$317,643
Prospect Park Improvements			$46,890
Woodlands Park Improvements			$15,125
Hudson River Access			$544,532
Hike / Bike Trail System			$101,165
Senior / Youth Activity Center			$29,495
Total			**$10,534,259**

In general, as the population continues to increase so will the need for recreational amenities. It is anticipated based upon the Town's historic growth trends that an additional 1,360 single-family dwelling units and another 80 multi-family dwelling units (total of 1,440 new dwelling units) will be located in East Greenbush over the next twenty years. These dwelling units are anticipated to increase the Town's population to 19,160 people. The Town of East Greenbush currently requires a recreation fee per approved new dwelling unit subject to the fee schedule that is annually reviewed by the Town Board. It is recommended that this minimum fee be $1,000 per residential dwelling unit. The fee schedule should continue to be reviewed annually to ensure sufficient fees are collected for recreation mitigation. With a total of 1,440 units estimated to be developed over the next 20 years, the contribution from residential development would be $1,440,000. This leaves $9,094,259 to be paid for through other means.

The following calculations were completed to determine future commercial development's mitigation fee associated with the GEIS.

Table 37: Estimated Recreation Mitigation Fee

Total Estimated Recreation Capital Cost:	Recreation Costs / Fee
Total Estimated Recreation Costs	$10,534,259
Estimated Residential Contribution ($1,000 per dwelling unit)	$1,440,000
Remaining Recreation Costs	$9,094,259
Commercial Percentage	10%
Estimated Commercial Share:	$1,364,139
Commercial Square Footage Projected for the next 20 years	931,706 sf
Mitigation Fee Per Square Foot	**$0.98**

E. Transportation Network

Existing Conditions

The transportation network within the Town of East Greenbush is comprised of several key corridors, most notably, the principal arterials of US Route 4 and US Routes 9 & 20, the minor arterial of 3rd Avenue Ext. (NYS Route 915E), and the major collector road, NYS Route 151. These roadways provide direct access to residential and commercial land uses and serve as the main travel corridors for commuters and through traffic, outside of the interstate system. Each of these corridors must balance land use access and mobility to provide access to existing and projected developments while maintaining a satisfactory level of service for the roadway users.

To assess the existing and future needs of the transportation network within the Study Area, available data, and traffic studies for the key corridors were compiled. From these sources, some of which are listed below, data was obtained concerning existing traffic volumes, roadway descriptions, trip generation, level of service, and recommended mitigation measures.

- Route 4 Corridor Study, Capital District Transportation Committee (CDTC), 2006
- NYS Route 151 Corridor Study (Route 4 to Columbia High School, Laberge Group, June 2004
- Village of Tempel Farms Traffic Impact Study, Creighton Manning Engineering, December 2006
- Mill Creek Planned Development District (PDD), The Chazen Companies, October 2000
- SUNY East Campus Expansion Traffic Impact Study, URS Corporation, September 2001
- Route 9 & 20 Corridor Plan, July 2003
- Other Miscellaneous Smaller Traffic Impact Studies
- CDTA Route Performance Data

Based on these previous studies and projected development, a transportation improvement plan was developed for the eight major roadway segments that comprise the key corridors. Those segments include:

- US Route 4 between the northern Town line and Mannix Road
- US Route 4 between Mannix Road and NYS Route 151
- US Route 4 between NYS Route 151 and US Routes 9 & 20
- NYS Route 151 between 3rd Avenue Ext. and US Route 4
- NYS Route 151 between US Route 4 and I-90
- 3rd Avenue Ext. between NYS Route 151 and US Route 4

- US Routes 9 & 20 between the western Town line and US Route 4
- US Routes 9 & 20 between US Route 4 and the eastern Town line

Within those segments, traffic operations at several critical intersections were evaluated. Those intersections include the following:

- US Route 4 and 3rd Avenue Ext. (Route 915E)
- US Route 4 and Wal-Mart Access
- US Route 4 and Mannix Road
- US Route 4 and I-90 Eastbound Ramps
- US Route 4 and I-90 Westbound Ramps
- US Route 4 and NYS Route 151
- US Route 4 and US Routes 9 & 20
- NYS Route 151 and Michael Road
- NYS Route 151 and Tempel Lane
- NYS Route 151 and Sherwood Avenue
- NYS Route 151 and Discovery Drive (formerly CSC Way)
- 3rd Avenue Ext. (Route 915E) and Woodlawn Avenue

Description of Roadways

Each of the major roadway segments within the project area are described below.

US Route 4 (between northern Town line and Mannix Road)

This area is primarily commercial in nature and has experienced recent growth. Zoning districts include Corporate Office/Regional Commercial on the west side of Route 4 with Residential and a small area of B2 zoned on the east. Land uses include large format retail such as Home Depot, Staples, and Target, as well as a movie theater, restaurants, and other smaller retail type facilities within the larger shopping plazas, in addition to some commercial or institutional parcels that have direct access to Route 4 or adjacent roadways.

The site layout of most of the development in this area is typical of other suburban-style sites in the Capital District and elsewhere across the nation in that it is primarily auto-oriented with stores and other buildings set back significant distances from the main street with the parking lots between the buildings and the street. Pedestrian connections within the sites or from the buildings to the roadway are limited or non-existent.

This section of the corridor is also home to the former Albany International which sits on a large parcel on the west side of Route 4. There are some fields and residential uses found along the east side of the corridor.

The roadway in this area varies between one and two lanes per direction northbound and southbound, with much of the section utilizing a two-way left turn lane. There are turn bays at signalized intersections and the posted speed limit within this segment is 45 mph. The intersections at 3rd Avenue Ext. (NYS Route 915E) and Wal-Mart are signalized. All other intersections are stop sign controlled for the minor street. The shoulder width in this area is generally 4 ft. wide. No sidewalks existing along this principal arterial.

Transit service in this segment is centered around the major park and ride facility located in the vicinity of the 4/43 intersection in North Greenbush, and includes service on CDTA Routes #24, 14, 15, and Shuttle Bee.

US Route 4 (between Mannix Road and NYS Route 151)

Land uses in this section include some commercial activity, important Town civic institutions, and surrounding residential neighborhoods found within this section of the study area, including the East Greenbush Technology Park with access provided via Mannix Road. Several hotels, one within the East Greenbush Technology Park, have recently been built on either side of Route 4 along Mannix Rd. Single parcel developments for beverage and convenience uses (i.e. Dunkin Donuts, Stewarts) with individual driveways accessing Route 4 can be found north of Route 151 along with some larger commercial office or health/institutional uses as well as individual residential parcels on the east side of the roadway that front onto it and have direct single driveway access.

The roadway is one to two lanes per direction in this area with turn lanes at the major intersections. The posted speed limit within this segment is 45 mph. The I-90 eastbound ramps are the only signalized location within this roadway segment. No sidewalks exist in this area, but there is a shoulder of between 4 feet and 10 feet. The 10 foot shoulders are predominantly in the area of the I-90 Interchange. The only current transit service in this section is the ShuttleBee.US Route 4 (between NYS Route 151 and US Routes 9 & 20)

The roadway section from Route 151 to Routes 9 & 20 is primarily residential in nature. There are a few interspersed commercial uses that were primarily residential conversions. An apartment complex and the Genet Elementary School are located on the eastern side of Route 4 along this section. The southern extent of the corridor at Routes 9 & 20 is another commercial shopping area. The land uses in this area include Friendly's restaurant, Pizza Hut, True Value Hardware, and several retail facilities within the Hannaford shopping plaza, south of Routes 9 & 20.

The roadway within this segment is two-lane undivided (single lane per direction) with limited turn lanes. Shoulders along this segment of roadway are between 0 feet and 4 feet. There are no sidewalks or other pedestrian amenities. The posted speed limit is 45 mph. The only current transit service in this section is the ShuttleBee.

NYS Route 151 (between 3rd Avenue Ext. and US Route 4)

Land uses in this section are primarily residential with some limited office/light industrial uses such as the CSC and Fujicolor offices. Though CSC has currently relocated to a new location, a company called Regeneron will be occupying the CSC building and will continue with a similar land use. Planned developments such as the Mill Creek PDD and Village at Tempel Farms are also included in this roadway segment as you approach the US Route 4 intersection.

This collector roadway is two-lane undivided with a posted speed limit of 45 mph. There are 8 foot to 10 foot shoulders throughout, but no sidewalks exist. Sherwood Avenue is the only signalized intersection between 3rd Avenue Ext. and US Route 4.Transit service consists of one minor variant of CDTA Route #33 that serves Hampton Manor for six trips per day.

NYS Route 151 (between US Route 4 and I-90)

This segment of NYS Route 151 is zoned for a mix of residential and commercial land uses, but is primarily residential. It links US Route 4 to the Columbia High School located just east of the I-90 overpass. This 2 lane undivided highway has 4 ft. shoulders throughout, but no sidewalks or other pedestrian or bicycle amenities. The posted speed limit for this roadway is 45 mph. CDTA's Shuttle Bee serves this area upon request.

Third Avenue Ext. (NYS Route 915E) (between NYS Route 151 and US Route 4)

Land uses within this area of the Minor Arterial are primarily residential to the west and commercial to the east. This segment of the roadway is 2-lane undivided with shoulder widths of 3 feet or less. There are no pedestrian or bicycle amenities within the corridor, and the posted speed limit is 45 mph. CDTA Route 24 serves this area.

US Routes 9 & 20 (between western Town line and US Route 4)

Land uses on this segment of this Principal Arterial include a mix of residential and commercial uses. Several residential developments directly access the roadway, but the corridor has several predominant commercial developments that occupy much of the road frontage. These developments include Columbia Plaza, the Kmart Plaza, Advance Auto Parts, and numerous other smaller retail developments. This section of the corridor also includes the East Greenbush Town Hall, the Greenbush Cemetery, and SUNY Albany East.

The roadway for this segment of the corridor is a 4-lane divided highway with a two-way left turn lane throughout. There are turn bays at all major intersections. The roadway is curbed throughout and no marked shoulders exist, though the curb lane is wider in areas to accommodate shared bicycle usage. There is a sidewalk on the north side of the road for most of the corridor and a south side sidewalk exists along a short section at the west end of the corridor. However, additional sidewalk segments are still required to allow continuous pedestrian access throughout the corridor. There are four traffic signals

within this 2.5 mile section of roadway. The posted speed limit within the corridor ranges between 35 and 40 mph. CDTA Route #33 provides service on this corridor.

US Routes 9 & 20 (between US Route 4 and southern Town line)

Land uses within this section of the corridor are a mix of commercial and residential, with the majority of the frontage having direct access to residential properties. Commercial developments include Rite-Aid, Dunkin Donuts, and the Fuccillo Ford car dealership, but for the most part they are relatively small in nature.

This section of the corridor is primarily a curbed 4-lane undivided roadway with turn lanes only present at major intersections. There are a few disjointed sidewalks along this roadway section, but for the most part, pedestrian and bicycle amenities are extremely limited. There are three signalized locations within this one mile corridor and the posted speed limit is 40 mph. CDTA Route #33 serves this corridor.

Traffic Volumes

The 2008 existing Average Annual Daily Traffic (AADT) was developed for each of the roadway segments described above. These AADT's are based on volumes found in the *2006 Traffic Data Report for New York State*, published by NYSDOT, and were interpolated to 2008 values through applying a calculated annual growth rate at each of the location based on historic count data. Hourly volumes for the PM peak hour were developed by applying these growth rates to hourly volume information contained in the various other traffic data sources obtained. The AADT and peak hour volume information are shown in **Table 38: Existing Traffic Volume Data.**

Table 38: Existing Traffic Volume Data

Roadway Segment	Published 2006 AADT (veh/day)	Projected 2008 AADT (veh/day)	PM Peak Hour Volume	Peak Directional Volume
US Route 4 (northern Town line and Mannix Road)	19,320	19,750	1,680	915 SB
US Route 4 (Mannix Road and NYS Route 151)	25,530	26,100	2,590	1,420 SB
US Route 4 (NYS Route 151 and US Routes 9 & 20)	17,070	17,450	1,800	990 SB
NYS Route 151 (3rd Avenue Ext. and US Route 4)	8,640	9,080	940	595 EB
NYS Route 151 (US Route 4 and I-90)	3,730	3,920	375	250 EB
NYS Route 915E (NYS Route 151 and US Route 4)	8,630	9,210	820	430 EB
US Routes 9 & 20 (western Town line and US Route 4)	21,610	22,050	2,825	1,785 SB
US Routes 9 & 20 (US Route 4 and southern Town line)	16,870	17,140	1,600	1,005 SB

Source: New York State Department of Transportation, 2006 and Laberge Group, 2008

Operating Conditions

The existing conditions of a study area are typically evaluated to establish a baseline from which the impacts of future growth scenarios can be assessed. To quantify the existing conditions within the Study Area, information from the Town, New York State Department of Transportation (NYSDOT) and the Capital District Transportation Committee (CDTC) was obtained to supplement the data found in several previously completed traffic studies.

The operating conditions of transportation facilities are evaluated based on the relationship of existing or projected traffic volumes to the theoretical capacity of the highway facility. Various factors affect capacity including traffic volume, travel speed, roadway geometry, grade, number and width of travel lanes, and intersection control. The current standards for evaluating capacity and operating conditions are contained in the 2000 *Highway Capacity Manual*, published by the Transportation Research Board. The procedures describe operating conditions in terms of Level of Service (LOS). In general, "A" represents the best operating condition and "F" represents the worst. Level of service "D" or better normally represents acceptable operating conditions for an intersection during peak periods, but LOS E is considered acceptable for individual movements at an intersection under CDTC's regional and corridor planning efforts. In limited cases, LOS F may also be acceptable for specific movements, but that is only is cases where community context makes it inappropriate to widen or add lanes at an intersection.

Table 39 shows the existing levels of service for the weekday PM peak hour at each of the study intersections as presented in various source materials. For stop controlled intersections, the worst case side street approach level of service is shown. For signalized intersections, the LOS shown is for the overall intersection.

Table 39: Existing Level of Service

Intersection	Existing Traffic Control	PM Peak Hour Level of Service	Analysis Year
US Route 4 and 3rd Avenue Ext. (Route 915E) i	S	C	2004
US Route 4 and Wal-Mart Access i	S	B	2004
US Route 4 and Mannix Road i	TW	F	2004
US Route 4 and I-90 Westbound Ramps ii	TW	F	2008
US Route 4 and I-90 Eastbound Ramps 1	S	C	2008
US Route 4 and NYS Route 151 ii	S	F	2008
US Route 4 and US Routes 9 & 20 i	S	D	2004
NYS Route 151 and Michael Road 2	TW	D	2004
NYS Route 151 and Tempel Lane ii	TW	F	2008
NYS Route 151 and Sherwood Avenue ii	S	B	2008

NYS Route 151 and Discovery Drive [3]	TW	B	2001
3rd Avenue Ext. (Route 915 E) and Woodlawn Avenue [ii]	TW	C	2008

TW = Two-Way Stop Control, S = Signalized Control
Sources: New York State Department of Transportation, Capital District Transportation Committee
[i] Route 4 Corridor Study, Capital District Transportation Committee (CDTC), 2006
[ii] Village of Tempel Farms Traffic Impact Study, Creighton Manning Engineering, December 2006
[iii] NYS Route 151 Corridor Study (Route 4 to Columbia High School, Laberge Group, June 2004

Future Traffic Projections

Outside of general regional growth, several developments are anticipated to occur within the 20-year design horizon used to evaluate the transportation network impacts within the study area. These developments, their size and the number of potential added trips on the roadway network, as presented in the source traffic studies, are listed in **Table 40**. Please note, data in the table below is based on known developments only and does not encompass all development that could occur based on future zoning within the Town. It should also be noted that the developments shown may have had changes in size and type since the publication of the references cited.

Table 40: Known Future Land Use Development

Development	Location	Size	Units	Peak Hour Trip Generation
Restaurant [i]	Grandview Drive	200	Seats	63
Eddy Senior Housing (Hawthorne) [i]	Michael Road	80	Units	9
Residential Development [i]	Michael Road	34 54 80	Single-family Twin Homes 4-Plex	34 36 50
Hamlet at East Greenbush [i] Single-Family Residential Residential Condos/Townhouses Apartments Office/Commercial	Phillips Road/Rts. 9&20 west of Rt. 4	 48 98 102 150,000	 Single-family Townhouses Apartments sq ft	 48 51 63 227
Forrest Pointe [i]	Rts. 9&20 west of Rt. 4 (behind Price Chopper)	200 80	Apartments Twin Homes	124 42
Carver Court	Thompson Hill Road	200	Single-Family	200
Residential Development [i]	Thompson Hill Road	29	Single-family	29
Witbeck Subdivision [i]	Hampton Manor near Rt. 151	40	Twin Homes	21
Ridge Road Senior Housing [i]	Ridge Road	80	Units	9
Forrest Ridge Residential Develop. [i]	Hayes Road	32	Single-family	32
Park Ridge Residential Develop. [i]	Rt. 151 east of Columbia H.S.	29	Single-family	29
East Greenbush Technology Park (Phase 2) [i]	Mannix Road east of Rt. 4	455,000	sq ft	667
Mill Creek Commerce Park [i]	West of Rt. 4 and south of 3rd Ave. Ext.	1,380,000 *-650,000**	sq ft sq ft	1,780 *-837**
Village at Tempel Farms [ii] Apts. Hotel Retail Restaurant Home Improvement Center	West of Rt. 4 and North of Rt. 151	424 100 175,000 20,000 175,000	Apartments Rooms sq ft sq ft sq ft	225 53 387 152 240

New Trips Added to Roadway Network over the next 20 years from Known Developments	3,734

* Note: Square footage and new trips shown in the Route 4 Corridor Study for the Mill Creek Development were adjusted as a result of revisions contained in the subsequent Village of Tempel Farms Traffic Impact Study.
Sources: Town of East Greenbush, Laberge Group, 2008
[i] Route 4 Corridor Study, Capital District Transportation Committee (CDTC), 2006
[ii] Village of Tempel Farms Traffic Impact Study, Creighton Manning Engineering, December 2006
[iii] NYS Route 151 Corridor Study (Route 4 to Columbia High School, Laberge Group, June 2004
[iv] SUNY East Campus Expansion Traffic Impact Study, URS Corporation, September 2001

In addition to the developments listed above, previous studies also showed an increase in roadway traffic as a result of regional growth expected to travel along the Town's roadway network. This growth, which was determined through CDTC's Step Model as part of the Route 4 Corridor Study, was reviewed, and included as part of the overall growth rates shown below. Applying the regional growth and additional trips shown in the referenced studies to the roadway network, it is projected that PM peak hour traffic volumes along each of the study corridors would increase at the rates shown in **Table 41**.

Table 41: Projected Growth Rates from New Development (20 Year Scenario)

Roadway Segment	Overall 20-Year Growth	Equivalent Annual Growth Rate	20-Year Peak Hr. Directional Volume
US Route 4 (between northern Town line and Mannix Road)	15%	0.7%	1,085 SB
US Route 4 (between Mannix Road and NYS Route 151)	45%	1.9%	2,060 SB
US Route 4 (between NYS Route 151 and US Routes 9 & 20)	15%	0.7%	1,140 SB
NYS Route 151 (between 3rd Avenue Ext. and US Route 4)	75%	2.8%	1,040 WB
NYS Route 151 (between US Route 4 and I-90)	100%	3.5%	500 EB
NYS Route 915E (between NYS Route 151 and US Route 4)	75%	2.8%	750 EB
US Routes 9 & 20 (between western Town line and US Route 4)	15%	0.7%	2,050 SB
US Routes 9 & 20 (between US Route 4 and southern Town line)	Negligible	Negligible	1,005 SB

Source: Capital District Transportation Committee, Laberge Group, 2008

In looking at the historic growth rates along each of these corridors, it appears that the level of development shown is consistent with localized growth rates that have occurred over the last several years along each of the corridors and it is feasible that the level of growth shown will be realized within the 20-year design horizon. It should be noted that some growth rates shown are slightly lower than historic growth rates within each corridor. This does not necessarily mean that lower growth is occurring in those areas. It only means that existing traffic may be choosing different routes in the future based on the new development scenario. Since CDTC's Travel Demand Model, which was used to estimate the traffic flows under the development scenario listed in the Route 4 Corridor Study, accounts for this type redistribution of traffic in its analysis, the volumes shown above should accurately represent realistic traffic growth within each corridor.

Though the projected development does not include all possible build-out based on future zoning regulations, the growth rates shown are similar to historic rates, so it is unlikely that the magnitude of development would change significantly over the next 20 years from what is shown. However, further study with a more in-depth analysis of the potential build-out traffic under future zoning would be required to determine that conclusively.

Traffic Mitigation Measures

Based on the projected traffic volumes, several transportation network recommendations have been developed for the study area. These recommendations, which were developed and presented for limited study areas as part of several previous traffic studies, have been compiled and presented below. The mitigation measures shown have been reviewed within the context of the overall needs of the western section of the Town and remain applicable for inclusion in the proposed Transportation Improvement Plan.

Please note that the recommendations below are based on the previously performed studies referenced earlier. It is assumed that the analysis, assumptions, and findings found in those studies are valid and accurate.

US Route 4 (between northern Town line and Mannix Road)

Safety and higher than desired travel speeds have been identified as issues in this area. It is difficult for a vehicle to turn left out of unsignalized intersections, including Mannix Road, which currently experiences left turning vehicle delays during the evening peak hour. The high travel speeds, traffic volumes, and apparent driver confusion regarding lane configurations are contributing factors that lead to this left turn delay. Traffic volumes have grown along this segment since 1998. Additional future development is planned at the East Greenbush Technology Park east of Route 4. Pedestrian or bicycle travel is limited to existing roadway shoulders in this section. The entire Route 4 corridor was identified by Town survey respondents as benefiting from improvements to the bicycle and pedestrian environment, the highest percentage of any Town corridor.

With the exception of fixed route service to Rensselaer County Plaza by CDTA fixed routes (24, 14, 15) the majority of CDTA service in this segment is limited to shuttle service only due to the unsafe pedestrian environment. Fixed route service is not possible as riders would not be able to walk to/from bus stops because of the lack of sidewalks, long distances between the roadway and destinations, as well as few places to safely and comfortably cross the road. The Shuttle Bee, as it is called, is not widely used because this poor pedestrian environment detracts potential ridership.

For any future reconstruction of this portion of Route 4, the following conceptual transportation improvements are recommended to increase the safety and operational efficiency for motor vehicles, bicycles, pedestrians, and transit, as well as the overall attractiveness of the roadway.

- Coordinate the Wal-Mart traffic signal with the existing traffic signals along Route 4 north of Wal-Mart to Route 43 in North Greenbush.
- Install WALK/DON'T WALK count down signals at the Route 4/Wal-Mart signalized intersection crosswalks.
- Install "street print" for flush median between Third Avenue Extension and Empire Drive.
- Provide for a continuous raised median between Empire Drive and Mannix Road; explore narrowing of roadway north of Mannix Road.

- Narrow travel lanes, if possible.
- Install a 5 foot bike lane along Route 4 in each direction.
- Install sidewalks with ADA-compliant ramps on both sides of Route 4.
- Provide additional landscaping on each side of Route 4 to calm traffic speeds, where possible.
- New development or redevelopment should provide pedestrian access, including pedestrian paths on-site. Cost shall be incurred by the affected developers alone and is not included in the improvement costs shown in this report.
- In conjunction with the addition of sidewalks, paired bus stop installation should be considered where there are signalized crosswalks. Ideally, bus stops should include an expanded sidewalk pad to accommodate the installation of benches and/or shelters.
- Install a 2-lane roundabout with appropriate landscaping, signage, lighting, provisions for pedestrians and transit stops, and medians at the US Route 4 and Mannix Road Intersection.
- Install a 2-lane roundabout with appropriate landscaping, signage, lighting, provisions for pedestrians and transit stops, and medians at the US Route 4 and 3rd Avenue Ext. (NYS Route 915E) Intersection.
- Consider modifying the alignment of the Thompson Hill Road intersection with Route 4 to make it a "T" intersection or restrict access to right-in/right-out only.
- Provide support for increasing transit service levels on this major corridor as a long-term traffic mitigation strategy by insuring that all development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

The cost for the above improvement was listed in the 2006 *Route 4 Corridor Study* as $656,000, exclusive of the two roundabouts. Adjusting this cost by a 3% annual inflation rate over two years and adding both a 20% surcharge for increased fuel prices and a 10% design fee, the cost for these improvements, in 2008 dollars, is estimated at $920,000.

The cost of the two proposed roundabouts is shown in the Corridor Study as $400,000 each. However, a recent more detailed estimate for the Mannix Road 2-lane roundabout was completed in 2008 and showed that the construction, minor right of way takings and design would be approximately $1,200,000. Based on this information, knowledge of other roundabout costs in the area and a discussion with CDTC, it is felt that the larger more conservative number is more representative of realistic costs for a 2-lane roundabout. As a result, that value was used to estimate the cost of both 2-lane roundabouts. This results in an overall estimated cost of $3,320,000 for improvement on this roadway segment.

US Route 4 (between Mannix Road and NYS Route 151)

This segment has the highest traffic volumes along the corridor within the Town and has experienced significant traffic growth. Several intersections exceeded the statewide average crash rate and some also experience evening peak hour delay. Public comments were received regarding concern over current

intersection lane and signal configurations. Field observations found a significant queuing of vehicles waiting to get through the traffic signal at Route 151, which for short periods (15-20 minutes) during peak hour extends north along Route 4 to the I-90 Eastbound ramps. The residential LOC rating was "poor" for portions of this segment. The high traffic volumes and travel speeds along the corridor make it difficult for motorists to find acceptable gaps in traffic to make safe left turns onto Route 4 and to merge safely onto Route 4 in some locations. Left turns into driveways for commercial uses on the northwest side of the Route 151 intersection were identified as a concern as some northbound vehicles have been reported to be illegally using the southbound left turn lane for this purpose. In addition, west of the NY 151/Rte 4 intersection along NY 151, concern was expressed regarding the ability to make left turns to/from parcels on either side of the roadway. Pedestrian or bicycle accommodations are lacking. CDTA service in this segment is limited to shuttle service only, which is not widely used. The need for better aesthetics was identified. There are a number of civic destinations near and adjacent to Route 151.

New development or redevelopment should include site designs that minimize walking distances to Route 4. By reducing the number of overall parking spaces per site and placing parking to the side and/or rear of buildings, in addition to orienting buildings to the street and minimizing driveway length appropriately while providing safe pedestrian connections, use of transit will be supported and more attractive, while enhancing the overall walkability of the area as well as enhancing community quality of life.

Additional conceptual transportation improvements recommended for this segment of Route 4 that include vehicular as well as bicycle and pedestrian enhancements to the corridor include:

- Install a raised (preferred) or flush median along this segment of Route 4, using "street print" type material. If roundabouts are installed at Route 151, the Exit 9 Interchange Ramps, and Mannix Road, then left turns can be accommodated via U-turns at these roundabouts, which makes raised medians the most appropriate for this segment of Route 4.
- Provide ADA-compliant sidewalks along both sides of Route 4.
- Designate the existing shoulders as 5-foot striped bike lanes on both sides of the roadway.
- At the I-90 Exit 9 eastbound ramp include a leg to the new signalized intersection (or in the long-term a roundabout leg) that provides access to the SEFCU/Cracker Barrel development.
- Explore narrowing the section of the bridge between the I-90 ramps to calm traffic and to provide room for sidewalks, bike lanes, and landscaping.
- New development or redevelopment should provide pedestrian access, including pathways on-site. Cost shall be incurred by the affected developers alone and is not included in the improvement costs shown in this report.
- In conjunction with the addition of sidewalks, paired bus stop installation should be considered where there are signalized crosswalks. Ideally, bus stops should include an expanded sidewalk pad to accommodate the installation of benches and/or shelters.
- Provide one consolidated access driveway and shared access between parcels in the vicinity of the northwest quadrant of the Rte 4/NY 151 intersection. Consider prohibiting left turns

into these sites, or some other measure, to mitigate a current situation where northbound traffic on Rte 4 uses the southbound turn lane to access these sites.

- At the US Route 4 and I-90 Westbound Ramps Intersection, modify intersection to remove the westbound right turn slip ramp and bring right turns under stop sign control. Once the Mannix Road roundabout has been constructed, prohibit westbound left turns at this location and accommodate that traffic as U-turns at the roundabout.
- Install a 2-lane roundabout with appropriate landscaping, signage, lighting, pedestrian and transit accommodations and medians at the US Route 4 and I-90 Eastbound Ramps Intersection.
- Install a 2-lane roundabout with appropriate landscaping, signage, lighting, pedestrian and transit accommodation and medians at the US Route 4 and NYS Route 151 intersection.
- A new right-in/right-out only access driveway should be considered along the west side of Route 4 across from Glaz Street to help ease the Mill Creek Commerce Park's traffic impacts to the Route 4 at Route 151 intersection.
- Provide support for increasing transit service levels on this major corridor as a long-term traffic mitigation strategy by insuring that all development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

Costs for the above roadway improvements, exclusive of the intersection treatments, are listed in the *Route 4 Corridor Study* as $750,000. It also shows the cost for improvements at the I-90 westbound ramp intersection as $164,000. Again, adjusting these 2006 costs by a 3% annual growth and adding a fuel surcharge (20%) and design fee (10%), the cost for these improvements, in 2008 dollars, is $1,280,000.

The remaining improvements listed above include the installation of two separate 2-lane roundabouts. The roundabout at the I-90 Ramps would be similar in, scope and magnitude, to the Mannix Road roundabout previously discussed and is estimated to cost $1,200,000. For the Route 151 roundabout, a separate cost estimate was recently performed, and due to its complexity and additional pavement, a cost of $2,000,000 is anticipated for its construction. Adding these costs to the total for other improvements and the overall total cost for improvements on this roadway segment is estimated at $4,480,000.

US Route 4 (between NYS Route 151 and US Routes 9 & 20)

Traffic volumes in this segment of the corridor have remained relatively unchanged since 1998. By retaining existing residential zoning, traffic growth along this segment is forecast to be very moderate. However, this segment currently receives "poor" ratings for residential/arterial compatibility. Based on the traffic analysis and field observations, left turns out of most of the unsignalized intersections evaluated are difficult; the need for better options to turn left onto Couse Place from Route 4 northbound and for turning left onto Couse Place from Route 151 westbound were identified as issues. Concern was also expressed regarding traffic speeds and safety along this segment of Route 4. The number of average annual crashes between NY 151 and Commons Drive was higher than other sections of the corridor. Concern was also expressed about the difficulty of making left turns out of driveways on Route 4 south of

Route 151. The Genet Elementary School is located in this segment and safe access to/from this facility is important. Limited pedestrian facilities exist at the Rte 4/9&20 intersection and along the corridor pedestrian and bicycle accommodation is limited to the existing shoulders. Proposed improvement concepts should focus on making the residential area more livable through access management, traffic calming/speed management and streetscaping elements. CDTA service in this area is limited to the shuttle along Route 4 itself, but regular fixed route service is provided along Rtes 9 & 20; due to the lack of frequency of these routes transfers between these two routes/services is an issue.

The following are recommended conceptual transportation improvements for this segment of the Route 4 corridor, which includes enhancements for both vehicular and pedestrian traffic:

- Designate the existing shoulders as 5-foot striped bike lanes along each side of Route 4.
- Narrow travel lanes, if possible.
- Install a flush median that has a "street print" application of contrasting texture and color or raised landscaped median where possible. (Left turn bays or TWLTL (two way left turn lane) arrows would most likely also need to be incorporated into any median treatment). This will provide space for left turning vehicles into adjacent residences while also serving to somewhat calm traffic.
- Install ADA-compliant sidewalks along both sides of Route 4.
- In conjunction with the addition of sidewalks, paired bus stop installation should be considered in conjunction with signalized crosswalks. Ideally, bus stops should include an expanded sidewalk pad to accommodate the installation of benches and/or shelters.
- Along the edge of the roadway, install either continuously spaced tree plantings the length of the segment or alternatively consider clustering trees and other landscaping at intersections/other desired areas to calm traffic. This will also provide dampening of roadway sounds and enhance the look of the corridor.
- Where properties have access to side streets, access should be restricted to side streets only, which is already the case for some properties around Columbia Drive. Within the limited commercially zoned area along this segment, any commercial development or redevelopment should be required to provide inter-parcel connections and/or shared driveways where possible as well as appropriate pedestrian access ways into these sites.
- Redesign access in the future when redevelopment occurs in the vicinity of the southwest corner of the roundabout intersection of NY 151/Rte 4. This redesign should result in consolidated driveways with turn restrictions (rights in/out only) and adequate corner clearance. Specific access changes to address Couse Place turning issues were explored but none are proposed at this time.
- Future access to newly developed parcels near the southeast quadrant of the NY 151/Rte 4 roundabout should also be designed with turn limitations (rights in/out only), adequate corner clearance and in a manner that limits the number of access points.

- At the intersection of US Route 4 and US Routes 9 & 20, right turn slip ramps should be removed and the right turns should be brought under traffic signal control to improve pedestrian safety. Long term option for this intersection would be the installation of a 2-lane roundabout.
- Provide support for increasing transit service levels on this major corridor as a long-term traffic mitigation strategy by insuring that development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

The cost for the above improvements was also shown in the *Route 4 Corridor Study*, where the cost for items outside of the US Route 4/Routes 9&20 intersection was listed at $1,865,000. Once again adjusting this value for inflation, excessive fuel prices, and design costs, it is estimated to cost $2,610,000 in 2008 dollars to install these improvements.

For the Route 4/Routes 9&20 intersection, the improvements once again included the installation of a 2-lane roundabout. Given the more constrained area surrounding this roundabout, it is estimated that costs will be approximately the same as the Route 151 roundabout previously discussed. As a result, $2,000,000 is assumed as a cost for this improvement. Combining the costs for all items listed above, it is estimated that the recommended improvements for this roadway segment will cost $4,610,000.

NYS Route 151 (between 3rd Avenue Ext. and US Route 4)

This 2-lane roadway appears sufficient to accommodate future traffic growth. However, intersection improvements will be required to accommodate specific developments. It is anticipated that the SUNY East campus will extend its road system to connect to Discovery Drive in order to provide a secondary access point to the campus and the Village at Tempel Farms development will cause the need for significant improvements at Tempel Lane. As mentioned previously, a 2-lane roundabout at the intersection of US Route 4 and NYS Route 151 should be constructed to accommodate future traffic. The recommendations for this roadway segment are as follows:

- Provide an access road connection between Discovery Drive and the SUNY East Campus. Provisions for transit accommodation on this new road should be made.
- Install a traffic signal at Discovery Drive and NYS Route 151. Given the close proximity to the Sherwood Avenue signal, it should be considered to provide interconnected coordination between the two traffic signals. Pedestrian signals and countdown timers should be provided, as well as bus stops.
- Install a traffic signal with pedestrian features at the NYS Route 151 and Tempel Lane intersection. This signal will be an interim measure until the roundabout at US Route 4 is constructed. At which time, a single lane roundabout with pedestrian accommodation should be constructed at NYS Route 151 and Tempel Lane. While signalized, the intersection configuration should include an eastbound left turn lane and two lanes southbound (1-LT, 1-RT). The signal should be interconnected to the US Route 4 and NYS Route 151 until both intersections are converted to roundabouts.

Assumptions made to estimate the cost of recommended improvements for this roadway segment include; a cost of $1.5M per lane-mile for new construction and widening and a cost of $120,000 per traffic signal installation. In addition, the $400,000 cost shown in the *Route 4 Corridor Study* for the single lane roundabout at Tempel Lane was adjusted for inflation, fuel, and design to yield a cost of $650,000 to install. Given those values, the improvements listed above for this roadway segment are estimated to cost $2,200,000.

NYS Route 151 (between US Route 4 and I-90)

To meet the Town's vision of greater multi-model use within this corridor that leads to Columbia High School and includes the library and YMCA, improved pedestrian/bicyclist safety and amenities are needed. To that end, several improvements should be implemented within the corridor. They include the following:

- Provide ADA-compliant sidewalks with non-mountable curbing along NYS Route 151, Michael Road, and Community Way. Include a buffer zone between the curb and sidewalk.
- Provide a pedestrian connection from Donna Lynn Drive area to Community Way.
- Utilize high visibility crosswalks at all intersections.
- Provide bicycle lanes along NYS Route 151 and shared lanes along Michael Road and Community Way.
- Reconstruct NYS Route 151 to improve sight distance at the crest vertical curve adjacent to Glaz Street.
- Install a traffic signal at NYS Route 151 and Michael Road. The traffic signal shall include signalized pedestrian crossings with countdown timers.
- Provide a secondary access road from Donna Lynn Drive area to Community Way and Michael Road.
- Remove a portion of Newkirk Road to eliminate its skewed intersection with NYS Route 151.
- Provide landscape treatments that would improve the visual character of the area and calm traffic.
- Provide pedestrian scale lighting to enhance pedestrian safety.
- Utilize decorative retaining walls where needed to minimize right-of-way impacts associated with recommendations above that require roadway widening.

Cost of the improvements recommended above for this roadway segment was detailed in the 2006 *Route 151 Corridor Study*. In that document the total cost is listed as $4,865,000 for design and construction. Adjusting this value for inflation by adding a 3% annual growth over two years and increasing price by 20% to reflect the effect of increased fuel costs over the last few years, it is estimated that the improvements for this roadway segment will cost $6,200,000, in 2008 dollars.

3rd Avenue Ext. (NYS Route 915E) (between NYS Route 151 and US Route 4)

This 2-lane roadway segment has ample capacity to accommodate the projected traffic outside the intersections and no improvements are recommended to increase this road's size or accommodations. It is anticipated that a future connection from Tempel Lane will be made forming a new intersection at the location of Woodlawn Avenue. But it is anticipated that this intersection will be stop sign controlled, so little disruption for 3rd Avenue Ext. through traffic should be seen. As mentioned previously, it is recommended that the intersection of 3rd Avenue Ext and US Route 4 be constructed as a 2-lane roundabout in the future. The only recommendation for this road segment is as follows:

- Construct a roadway connection extending Tempel Lane to 3rd Avenue Ext, forming a 4-way intersection at Woodlawn Avenue. Provide one left turn lane and one right turn lane northbound. Left turn lanes both eastbound and westbound should be constructed as well. Transit stops should be provided at this intersection.

Assuming a price of $1.5M per lane-mile, the cost of the above roadway improvement for this segment is estimated at $2,000,000.

US Routes 9 & 20 (between western Town line and US Route 4)

Traffic operations within this section of the Corridor operate satisfactory and traffic volumes along this route are not projected to change significantly. No capacity improvements are recommended at this time. However, improvements to access management and pedestrian amenities should be considered to improve safety as part of each future development proposed. Improvements for this roadway segment should also include pedestrian amenities on Sherwood Avenue as well. Sherwood Avenue connects this segment of Routes 9 & 20 to NYS Route 151 and will be utilized by cut-through traffic as volumes increase on the arterials. This potential increase of traffic on Sherwood Avenue makes improved pedestrian safety within that corridor critical.

Recommendations for this segment include:

- Develop a detailed access management plan for the corridor and implement with any future development or redevelopment. Plan should focus on combining and eliminating driveways where appropriate and providing inter-parcel connections. Costs for the individual access management improvements at each site are not considered as part of this report and should be paid for by the affected developers outside and addition to any mitigation fee.
- Provide sidewalk connectivity on both sides of Routes 9 & 20.
- Further study should be conducted to determine the need for bicycle lanes and the possibility of widening or restriping of the roadway to accommodate. Costs for these improvements are not included in this report. If determined necessary in the future, costs can be incorporated in future updates to the GEIS.
- Provide sidewalk and drainage improvements on Sherwood Avenue between US Routes 9 & 20 and NYS Route 151.

- Provide support for increasing transit service levels on this major corridor as a long-term traffic mitigation strategy by insuring that development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

The improvement cost for Sherwood Avenue was estimates at $860,000 earlier this year as part of a previous design project. The cost for sidewalk improvements along US Routes 9 & 20 is estimated at $370,000 and fees for a future bicycle needs and access management study is estimated at $50,000. This results in a combined total cost for improvements as part of this roadway segment of $1,280,000.

US Routes 9 & 20 (between US Route 4 and southern Town line)

This 4-lane undivided roadway is underutilized with regard to through traffic, which is projected to see negligible increase over the next 20 years. The peak directional volume is in the LOS D range for single lane roadway based on CDTC guidelines and it is likely that this segment of the road would function satisfactory, with greatly improved safety, if it were converted to a single lane in each direction. This concept, also know as a "Road Diet," would allow for the construction of a median to allow left turn vehicles to be removed from the through traffic flow, thus reducing rear end accidents, and it would allow the development of better bicycle and landscaping amenities.

Recommendations for this segment include:

- Conduct further study to determine if a "Road Diet" is feasible, if so, construct roadway to provide a single lane in each direction. Locations for two-way left turn medians and raised medians should be investigated and implemented as part of this construction. Bicycle lanes and landscaping should also be provided. Cost for implementation of this improvement is not included in the mitigation fees shown later in this report. If determined appropriate, construction costs can be added to future updates of the GEIS.
- Provide sidewalk connectivity on both sides of Routes 9 & 20 where not currently present.
- Provide support for increasing transit service levels on this major corridor as a long-term traffic mitigation strategy by insuring that development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

Costs for sidewalk improvements along this roadway segment are estimated at $320,000 and additional study to determine the applicability of a "Road Diet" is estimated at $50,000, for a total cost of improvements for this segment of $370,000.

Mitigation Cost

As described above, several mitigation measures have been recommended to mitigate the traffic effects of the projected land use development within the Town. The overall cost of these measures, which are also outlined above, is summarized as follows:

Table 42: Mitigation Improvement Costs

Roadway Segment	Improvement Cost Estimate
US Route 4 (between northern Town line and Mannix Road)	$3,320,000
US Route 4 (between Mannix Road and NYS Route 151)	$4,480,000
US Route 4 (between NYS Route 151 and US Routes 9 & 20)	$4,610,000
NYS Route 151 (between 3rd Avenue Ext. and US Route 4)	$2,200,000
NYS Route 151 (between US Route 4 and I-90)	$6,200,000
NYS Route 915E (between NYS Route 151 and US Route 4)	$2,000,000
US Routes 9 & 20 (between western Town line and US Route 4)	$1,280,000
US Routes 9 & 20 (between US Route 4 and southern Town line)	$370,000
Total Cost of Mitigation	$24,460,000
Assumed Local Share of Mitigation Costs (20%)	**$4,890,000**

Source: Laberge Group, 2008

Though the total cost listed above will be required to make all the recommended improvements, it will not all be the cost burden of the Town. Several State and Federal programs are potential funding sources for the projects listed. CDTC's regionally funded Transportation Enhancement Program (TEP) and the federally funded Transportation Improvement Program (TIP) both pay an 80% share on selected projects. In addition, there are other programs that could cover some of the costs; these programs include the NYS Multi-Modal Program Funding (MMPF), the State Administered Community Development Block Grant (CDBG), NYS Marchiselli Funds (NYSMF), Transportation and Community and System Preservation Pilot Program (TCSP), CDTC's Spot Improvement Program and CDTA's Bench and Shelter Program. These are all competitive funding programs requiring the submission of specific applications, and subject to specific limitations and rules. Overall, it is estimated that the local share of the projects listed above will be 20% of the overall cost. This is a financial burden to the Town of **$4,890,000** to initiate, design, and construct the improvements listed.

This cost is a direct result of the assumed land development that will occur within the Town over the next several years. It is understood that the vehicle trips shown in this report may not represent the total possible build-out of the study area over the next 20 years, but the improvements listed are consistent with the order of magnitude development shown, which is estimated to be **3,734 new PM peak hour trips**. It is assumed that if more development occurs, the necessary improvements for those additional trips would be proportional to what is included in this report for the number of trips shown, so any per trip mitigation cost developed from this data will apply, regardless of the level of development that actually occurs. Given the improvement costs required for the level of development shown, the local share of these costs can be accommodated at **$1,310 per new PM peak hour trip generated**. To detail that cost for various land use types, it is recommended that transportation mitigation fees be implemented as shown in the table below.

Table 43: Transportation Mitigation Fee Summary

Land Use Type	Unit of Measure	Cost per Unit (2009 dollars)
Retail	Square Foot of Building Space	$4.91
Office	Square Foot of Building Space	$2.27
Industrial	Square Foot of Building Space	$1.42
Residential	Dwelling Unit	$1,325
Other*	PM Peak Hour Trip	$1,310

Source: Laberge Group, 2009

* For categories outside of the land uses shown or where peak hour trips have been detailed in a traffic impact study for a proposed site. However, site trips should be verified through traffic counts after opening. The Town reserves the right to reassess fee if actual volumes are higher than projected.

Please note that the Mitigation Fees shown above are in 2008 dollars. To account for inflation, the Town may review the fee schedule annually and revise as necessary so that sufficient funds are available for improvements in the future.

As stated earlier, the overview and assessment of the transportation network presented in this report is based on previous traffic studies. The future volumes, trip generation estimates, traffic impacts, and mitigation measures shown have all been referenced from that material. Since trip and cost estimates are only approximations and may not completely reflect actual development over time, it is recommended that the Town periodically review and update the mitigation fee schedule above based on the most current data in the future.

F. Stormwater Management

Existing Conditions

The Town of East Greenbush stormwater conveyance systems is typical of most areas in that stormwater from streets is collected via roadside ditch or storm sewers and discharged to an existing drainage pattern or water way. The Study Area generally slopes from east to west, toward the Hudson River and the City of Rensselaer and as such stormwater runoff ultimately is discharged to the river. Older areas within the Study Area do not have stormwater detention or retention facilities and these flows simply pass down stream unabated. More recent development has required that project applicants construct stormwater detention facilities that limit the discharge rates to the pre-developed 10-year storm runoff and to store a 25-year storm event. Detention ponds are maintained by the Town for subdivisions and by private property owners for commercial ventures.

Potential Impacts

Current standards implemented by the State of New York and as required by the federal government, now require not only stormwater management techniques but also stormwater quality techniques to improve the water quality that discharges for site. As with detention facilities, each project must design and construct the required water quality techniques. For commercial sites, these improvements will be owned and maintained by the property owner where for residential subdivisions the Town normally takes responsibility.

Proposed developments in the Town must provide all the required detention and water quality measures without impacting down stream development. The Town does not have a system of large collector storm sewers and detention facilities for use as cumulative conveyance method for existing or proposed development. As such, an individual site may be required to retain additional runoff if down stream receiving systems are not of suitable size to convey the proposed discharges. Conversely, a project could improve downstream conditions to accept the runoff again assuming there is no adverse impact down stream.

The single largest impact of stormwater is the cost associated with the operation and maintenance of the facilities installed. This cost has been typically passed along to the Town for residential and commercial subdivisions while single site commercial improvements are maintained by the property owner and/or operator. Maintenance of the stormwater management and water quality control practices can range from mowing of basins, cleaning of outfall structures, and periodic inspection of each facility and repair of failing systems.

Mitigation Measures

In the Town of East Greenbush, each development must stand on its own to control stormwater runoff and quality. As such, there are no construction improvements proposed to address stormwater for future

development. Any projects currently being considered by the Town are maintenance oriented in nature and not assignable to potential development.

In order to generate revenue to cover the cost of maintenance on existing and future facilities, the Town should consider the use of stormwater management districts. As with other improvement districts, properties within any special district are required to contribute to the maintenance costs and if necessary the costs associated with improving the district's infrastructure. The size of any particular district would be based upon the common use of management facilities. For instance, a new subdivision will be required to install stormwater management and water quality practices. All the lots in the subdivision benefit from the use of those facilities along with the piping or other stormwater conveyance methods to reach the facilities. The cost of maintaining these facilities can be distributed among the property owners

G. Summary of Mitigation Fees

A benefit of preparing this GEIS for the Western East Greenbush area is the ability to identify capital improvements necessary to serve the future growth and to also distribute the cost of those improvements more equitably among all future development within the study period. This was accomplished for each of the capital improvements and recreation improvements for which the Town would be financially responsible. Typically, major capital improvements are paid for by the taxpayer or district ratepayer through bonding and by outside funding (federal or State). The SEQR process allows the collection of funds associated with the cost of mitigating the impacts of development. Numerous impacts have been identified in the previous sections. Unfortunately, not all of the mitigation can be assigned a dollar value. Some mitigation measures are not enforceable by the Town and, therefore, mitigation fees, if they can be quantified, cannot be collected. Examples include the potential need for facility improvements within a school district or the equipment needs of a volunteer fire district (where funding comes from special district tax). Therefore, the mitigation fee structure for the Town has been limited to land use GIS needs, water and sewer improvements, recreational needs, traffic improvements, and GEIS preparation.

Table 44 provides a summary of the mitigation fees. The means by which costs are identified differs between each mitigation category. Water and sewer mitigation fees are based on equivalent dwelling units (EDUs). The EDU is often used in water and wastewater planning and design to equate non-residential development to residential. Traffic is based on trip generation, recognizing that different uses will add different numbers of trips to the overall traffic volume. In addition, the cost of the land use GIS Needs Assessment and the cost of preparing the GEIS (cost of the entire SEQR process) will be recouped using trip generation. Recreational mitigation fees will be collected for non-residential development only, since residential is subject to a recreation fee. These costs are distributed on a square foot basis.

Table 44: Mitigation Fee Summary

Mitigation Fee Summary					
	GEIS	Land Use/GIS	Water/Sewer	Recreation	Traffic
Total Cost	$195,190	$60,240	$11,550,000	$9,094,259	$24,460,000
Private Share	100% $195,190	90% $54,216	100% $11,550,000	10% $1,364,139	$20% 4,890,000
Unit of Measure	Trip	Trip	EDU	Commercial Square Foot	Trip
Cost Per Unit	$52.29	$14.52	$5,100	$0.98	$1,310

Implementation of the mitigation fee program will be finalized by the Town Board. It is anticipated that the mitigation fees derived from this GEIS will be collected at the issuance of each building permit, while others may need to be tied to approval or commencement of work when a building permit is not necessary/required. It may be appropriate in some case to divide the collection of funds into thirds: one third at stamping of final plans, one third at first building permit and one third at first Certificate of Occupancy (CO). This method spreads the cost over time. The Town may consider alternative fee collection schedules and may periodically review and revise such fee schedule as it deems appropriate to implement the intent of the GEIS.

In addition, the Town reserves the right to prioritize the improvements based upon determined need and/or demand. The Town may use the mitigation fees at its discretion for improvements to the critical areas identified in the GEIS within the Study Area. The Town may determine that such improvements are necessary in advance of a specific development application. If such public betterment improvements are made by the Town within the Study Area, the Town would be reimbursed over time as the funds accumulate.

Section IV: Alternatives

SECTION IV: ALTERNATIVES

A. No Action

Like many other aspects of planning, the GEIS process benefits from review and comparison of alternatives since there are usually different avenues available to reach intended goals, with decisions required along the way. SEQR specifically requires the evaluation of not implementing the proposed action. For the purposes of this GEIS, the No Action Alternative will assess fiscal and other impacts to the Town should the Town Board choose not to implement mitigation fees for future development.

With the recent burst of growth the Town has experienced, some wastewater systems are reaching their capacity during peak rain events and will need to be upgraded in the near future in order to accommodate any additional development. Water supply storage capacity must be increased for future use. Eight out of the twelve major street intersections studied received average to low grades in terms of present operating conditions. This implies that future growth will overburden them and require improvements such as traffic signals and turn lanes to safely accommodate the higher volume of traffic resulting from that growth. Sidewalks are needed in many of the traffic corridors studied as well. These are only a few of the improvements that the Town will need to pay for within the next twenty years as a result of growth.

Allowing continued development to proceed without instituting measures to help shoulder costs associated with growth could result in strained municipal services and infrastructure, worsened traffic conditions, loss of the community's character and a deteriorating quality of life for residents in East Greenbush. It is reasonable to conclude that over the next several years, business owners and prospective homebuyers will continue to find East Greenbush an attractive place to locate. Overall, the No Action Alternative would not result in less impact to the environment since development will continue to occur in East Greenbush. However, under the no action alternative, existing property owners would have to share a greater percent of the burden associated with future growth and strain on municipal resources.

B. Build-out Alternative

The build-out scenario demonstrates the potential growth associated with the total development that could occur based on the Town's own recently adopted land use regulations and zoning. Since a build-out necessarily focuses on total development, it cannot accurately predict when that development will occur. A build-out scenario is considered to be the high end of development potential in that most landowners do not develop their land to the fullest extent allowed by land use and zoning regulations.

The primary purpose of the GEIS under the Build-out Alternative is to evaluate the cumulative impacts of growth on the Town and provide suitable mitigation to minimize the effects of development. Once established, the mitigation process provides guidance to the Town during the project review process and clearly defines responsibility for developers.

In current practice the major portion of capital improvement costs associated with new development are generally funded by developers. Capital improvement funding is concentrated within the confines of a

proposed development and includes costs for roads, sanitary sewer, public water, storm sewer, natural gas, electric service, and recreation. Developers are also responsible for the cost of extending telephone and cable television lines into a new subdivision. The fair share costs of off-site capital improvements, partially dictated by new development, often go undetected until a problem arises. Development would progress to a point where the existing infrastructure (sewer, water, roads) has reached or exceeded its capacity and can no longer provide adequate service to users. When developments are independently reviewed with respect to specific impacts generated by that particular project, one project considered alone may not exceed the threshold which would require major improvements to upgrade adjacent or off-site infrastructure. However, from a cumulative standpoint, the combined impact of other developments that may be proposed within a given area may result in a significant reduction in the level of adequate service of existing infrastructure.

The practice of reviewing projects on an independent basis within defined areas results in the "last one in" scenario for determining who would be responsible for funding required improvements. Major improvements are normally not required until a threshold is reached and the developer whose project exceeds this threshold is generally responsible for the entire cost of upgrading the infrastructure system. The project which exceeds the threshold however, may have only contributed to a small percentage of the total need for additional infrastructure. Therefore, the proposed mitigation fees help to provide an equitable means of distributing the cost of the improvements identified in the GEIS. Developers are able to contribute to their fair share of the development impact, without carrying an unnecessary burden often associated with capital improvement costs.

Section V: No Action Unavoidable Adverse Impacts

SECTION V:
UNAVOIDABLE ADVERSE IMPACTS

Where significant impacts of the Development Plan cannot be mitigated, these will be identified as unavoidable adverse impacts. Impacts may be both short term and long term in nature.

A. Unavoidable Adverse Impacts

Topography and Slope

Future development in the Town may result in unavoidable changes to the Town's topography and steep slopes. Grading associated with development alters the existing landscape and is an unavoidable adverse impact of development.

The Town's regulations currently do not restrict development on steep slopes, with the exception of the development regulations for the PDD District. Slopes greater than 15% are typically considered severe constraints to development due to design demands on septic systems (where sewer districts are absent), erosion, and stormwater run-off, steep grades of roads and driveways as well as the increased potential for environmental impacts associated with construction. The Town currently allows the portions of lands containing steep slopes to be counted towards the lots bulk requirements, and discourages development on the steep slopes through site design.

Generally, these areas are typically avoided during site plan design due to higher associated construction costs. Such lands, even if eventually developed, tend to be developed in a less dense fashion than allowed by zoning due to the difficulties involved. Some development projects will be well designed and sensitive to natural topography and the Town will encourage these types of development.

Soils

Erosion control measures are routinely used in most development projects and there are many methods and products available for developers to choose from. Site plan approval generally requires erosion control but installation and/or maintenance of the erosion control systems can be faulty. When the systems do not work properly, silt and sediment is washed from the site and impacts waterways and areas downstream.

Wetlands

Development increases run-off, as there are more impervious surfaces that shed water. Additionally the run-off may contain contaminants collected from roofs, roadways, and parking lots. Wetlands act as both filters and storage improving water quality while the collected water remains in the wetland. Protecting remaining wetlands and instituting buffering provisions for wetlands near developed areas will help address the impacts.

Groundwater and Aquifers

Water quality will decrease with future development due to increased run-off and fewer natural storage areas. Groundwater matriculates into aquifers thereby affecting the water quality in larger areas. Construction of water quality basins, usage of low impact development stormwater measures, and adherence to the SPDES General Permit for Stormwater Discharges from Construction Activity will alleviate significant impacts. However, enforcement and proper maintenance are vital to the success of these recommendations.

Floodplains

Development on floodplains raises issues of health and safety concerns along with the risk of property damage and increased flooding. Development near flood zones can also contribute to erosion and flooding potential. The Town should direct future development away from areas in and adjacent to floodplains in recognition of these concerns as much as possible. Any new development, even in areas of well-drained land, has the potential to disturb natural drainage and cause localized flooding. Appropriate stormwater management techniques ensure that disturbances are minimized but they must be enforced and maintained.

Surface Water/Watersheds

Surface water and watersheds are impacted by development since run-off increases while water quality decreases. As water runs along impervious surfaces, it can become contaminated or laden with sediment and if not properly managed, this contaminated or sediment-laden water can empty directly in surface water. Residential uses can exacerbate the risks through overuse of fertilizers and pesticides, the spillage of household chemicals, and the removal of vegetation along stream banks. Buffering provisions for streams and waterways together with the consistent usage of low impact development stormwater measures, construction of water quality basins and strict adherence to the SPDES General Permit for Stormwater Discharges from Construction Activity can help prevent significant impacts. Enforcement of the discharge measures as well as maintenance of the related mitigation systems remains important to the success of these recommendations.

Water and Sewer

Water and sewer service play a large role in the growth and distribution of development. The large areas within the Study Area, including along Route 9&20 and Route 4 that are serviced by public water and sewer, encourage higher density development and create opportunities for projects that combat sprawl. It is reasonable to conclude that development will continue to occur in these areas, putting pressure on existing water and sewer infrastructure and opening the door to service expansion possibilities.

Recreation and Open Space

The Town's 2002 Parks and Recreation Master Plan makes a number of recommendations that would serve the community well, both now and into the future. Implementing the Plan's recommendations

would help alleviate the current deficit in recreational opportunities for Town residents and make strides towards providing better than adequate opportunities for future increases in population.

The attractive development climate in East Greenbush will lead to a loss of open space. If development can be directed appropriately within the Study Area, and actions are taken by the Town to balance the loss of open space with increased public access to hiking/biking opportunities, the impact could be softened.

Transportation

Increased traffic is an undeniable result of development. East Greenbush has been seeing the results of its recent growth spurt for some time now as evidenced by some of the lower LOS scores for certain intersections within the Study Area. Continuing development will put increased pressure on the Town's roadways.

Section VI: Irreversible and Irretrievable Commitment of Resources

SECTION VI:
IRREVERSIBLE & IRRETRIEVABLE COMMITMENT OF RESOURCES

The construction of new residential, commercial, and industrial space over the next twenty years will result in the irreversible and irretrievable commitment of a variety of resources. The greatest local commitment of resources lies in the transformation of vacant or undeveloped land within the Study Area to a developed state and the associated increase in urbanization.

Construction of new buildings and the related site improvements would require building materials, equipment, energy, and human resources. During and after construction, these new developments would require utilities such as water, sewer, electricity, natural gas, and telecommunications. Municipal services such as solid waste disposal, police, and fire protection would also be required.

The results of Section III indicate that while resources are generally available to support the existing residents and businesses, increased growth will strain these resources and require some amount of improvement or remediation. Construction projects depend heavily on petroleum products and natural gas. The volatility and limitations of supply, both natural and artificial, will continue to influence today's methods of construction and operation. The prices and availability of petroleum products, in particular, will also have significant impacts on the rate of construction now and into the future.

Section VII: Impacts Upon the Use and Conservation of Energy

SECTION VII:
IMPACTS UPON THE USE AND CONSERVATION OF ENERGY

The future development of East Greenbush will result in potential impacts on the use or conservation of energy. However, each project proposal will be evaluated on an individual basis in accordance with the State Environmental Quality Review Act (SEQRA). The Town of East Greenbush's cumulative growth will continue to include both commercial and residential development and therefore will result in additional energy consumption.

The primary energy sources for the Study Area include electricity and fuel. National Grid is anticipated to provide future electricity for the purpose of lighting, heat, and operation of future development within the Study Area. Diesel fuel may be necessary for construction of a portion of the future development where natural gas is unavailable for heat.

It is anticipated that electricity and natural gas will be used for heat and light for much of the future development. The ability of National Grid to meet future potential demand is not considered to be a significant adverse impact. However, individual projects and their site-specific impacts will need to be examined as part of the permitting and approval process in East Greenbush. The expansion of water, sewer, transportation, and recreation facilities will also increase the Town's need for energy.

It is recommended that future buildings constructed within the Study Area incorporate insulation that is in conformance with State building codes and energy savings guidelines in order to utilize efficient heating and cooling technology. Proposed projects within the Study Area should be in full compliance with the energy conservation regulations of the New York State Energy Conservation Construction Codes (9 NYCRR 7810-7816).

Equipment and vehicles necessary during construction, as well as individual vehicles used by construction workers to commute to the future development sites will require additional fuel usage and energy consumption. A determination of the level of impact will be made based upon associated energy use and conservation of efforts.

Section VIII: Response to Comments

Comment: (Pg 7) Treatment/Conveyance: It is expected that future development and resultant increases in wastewater flow will eventually result in the existing treatment facilities' maximum capacity being exceeded. Based on this, the Town proposes to construct improvements at the existing plant to maximize its utility and to construct a plant bypass sewer ~~to send excess flow to the Rensselaer County Treatment facility~~.

Response: Comment noted and corrected.

Comment: (Pg 9) What happens to the cost or fee if developers buy the Golf Course or construct recreational features in the Town?

Response: This cost may be reevaluated in the future by the Town Board should substantial recreational amenities be purchased or constructed by private developers for a public benefit.

Comment: (Pg 30) The side yard setback for the RB District should be corrected to 25 feet and the maximum building heights R-2 District should be corrected to 35 feet.

Response: Comment noted and corrected.

Comment: (Pg 30) Add a footnote that states: *The Zoning Code allows for some non-residential development through special use permits, such as heath/medical offices or clinics. For purposes of the buildout analysis, these districts were assumed to be developed as residential only.

Response: Comment noted and corrected.

Comment: (Pg 32) Correct the maximum building height for the PPB District to 35 feet and add footnote for the side and rear yards for the B-2 district in Table 6 that addresses the commercial uses.

Response: *No setback required if constructed of an approved Party-wall / Fire-wall in accordance with NYS Fire Codes and building inspector approval. For purposes of the buildout analysis, the setback requirements were included.

Comment: **(**Pg 37) The statement regarding two single family units permitted in the R-B is incorrect and should be removed in Table 7.

Response: Comment noted and corrected.

Comment: **(**Pg 53) Add "Construction Trends" to the Table 20 title.

Response: Comment noted and corrected.

Comment: **(**Pg. 69) Add the following sentence to the second to last paragraph: "It is expected that there be some moderate increase in use from North Greenbush. However, the Town of Schodack soon will have its own supply."

Response: Comment noted and corrected.

Comment: (Pg 73) Delete the fourth sentence of the paragraph following Table 27 which reads:

Since 1997 the Town has been operating under a DEC Consent Order to reduce I & I (infiltration and inflow) flows to the plant. Order on Consent R4-2000-1013-125 Schedule of Compliance Item 5b allows new connections for "measured" reductions in I & I at the ratio of one gallon of additional wastewater flow for every four gallons of I & I removed. For "estimated" reductions in I & I the ratio is one gallon of additional wastewater flow for every 10 gallons of I & I removed. ~~The Order on Consent pertains to flows and new development tributary to the Corliss Avenue Lift Station, the Hideaway Lift Station and the headworks of the treatment plant facility.~~ Since 1997 the Town has made only limited progress in I & I removals due to the widespread nature of the problem within the collection system, the lack of funding, and the limited effectiveness of the efforts to date.

And replace with the following information:

The NYSDEC has recently (June 2009) drafted a sixth modification to the Consent Order. The allowance for new connections based on the reduction of I & I as stated in the aforementioned ratios, now pertains to the entire Town. It now becomes imperative that the Town address and reduce extraneous flows attributed to I & I in order to provide treatment system capacity for future flows. Further, the draft Order has a provision that if the Town cannot divert raw wastewater to the County treatment facilities by December 31, 2009, then it either must reduce flow through affirmative I & I reduction measures or provide for additional treatment capacity at the existing plant to accommodate future flows.

Response: Comment noted and corrected.

Comment: (Pg 74) Add a clarification regarding why 200 gallons per day for wastewater generation is used in the DGEIS.

Response: This is an approximation based upon realistic metered water consumption of typical households.

Comment: **(**Pg 76) In Table 28, why is EDU in the column "units" why is EDU used for some and SF used for others.

Response: EDU is used for the residential calculations and SF is used for the commercial calculations in the Table.

Comment: CDTA suggest rewording a paragraph that is found in the DGEIS recommendations. For example, on pages 103 and 109, it states:

Provide support for increasing traffic service levels on this major corridor as long-term traffic mitigation strategy by insuring that the development and redevelopment proposals specifically consider pedestrian and transit access at the site plan level.

CDTA recommends changing the wording to say:

Provide support for increasing traffic service levels on this major corridor as long-term traffic mitigation strategy by insuring that all the development and redevelopment proposals specifically address transit, pedestrian and bicycle access and accommodations at the site plan level.

Response: Comment noted

Comment: DGEIS states that new development should provide pedestrian access and links to and through the site and all costs for such improvements is the sole responsibility of developers. CDTA strongly supports this requirement. Such improvements will create more pedestrian friendly environment for site visitors and tenants. In addition, it will make transit use more attractive and reduce parking needs.

Response: Comment noted

Comment: Finally, CDTA support all the other recommendations included in the plan for various locations that are targeted at promoting transit service and use such as, for example, reducing overall parking spaces per site (US Route 4, b/n NYS Route 151 and US Routes 9 & 20). All these measures will help to make transit more attractive and service possible.

Response: Comment noted and corrected.

Comment: The Town's DGEIS proposes mitigation payments for water and sewer at $5,100.00 per EDU. It is my understanding that an EDU is based on a single family home (4 bedrooms; as a result the condominiums/townhouses in the Carver Court proposal will be less than 1 EDU if they are 2/3 bedroom units. Is my understanding correct?

Response: No. This is an averaged unit of measurement.