Chapter 8: Surface Water and Wetlands

A. INTRODUCTION

This chapter describes surface water and wetland resources on the Watchtower Educational Center (WEC) properties and the potential for significant impacts to these resources from the proposed project.

PRINCIPAL CONCLUSIONS

The site plan has been designed to avoid any/all direct impacts to wetlands and watercourses and to strictly limit any new disturbance within the 100-foot buffer area (adjacent area) of on-site streams and wetlands. In the limited areas of permanent stream buffer disturbance, new surfaces would be fitted with pervious pavers to allow infiltration of rainwater. A stormwater management plan would be implemented to avoid any impacts to streams/wetlands associated with increases in stormwater runoff. During the construction period, this would be achieved via erosion and sediment control practices. Over the long term, new stormwater management facilities would be installed to detain runoff and avoid water quality and flooding impacts for the life of the project. In sum, these project components would avoid any significant adverse impacts to on-site or off-site surface waters and wetlands.

B. REGULATORY CONTEXT

Surface water resources, including wetlands, are subject to a number of federal, state, and local laws. Disturbance to regulated wetlands and waters, or their adjacent areas (buffers), requires permitting from the regulating agencies.

WETLANDS

Wetlands are defined at the federal level as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include "swamps, marshes, bogs, and similar areas" (Federal Register, 1982). Wetlands are regulated at the federal level by the Army Corps of Engineers (ACOE) pursuant to Section 404 of the Clean Water Act and its implementing regulations.

New York State also regulates wetlands under Article 24 of the Environmental Conservation Law (ECL). Regulated state wetlands are defined as "lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation." New York limits its regulatory authority to those wetlands shown on its State Wetlands Maps that are generally 12.4 acres or greater. In addition, New York regulates a 100-foot "adjacent area" surrounding all state-mapped freshwater wetlands within which disturbance is generally discouraged.

Wetlands are also regulated at the local level by the Town of Patterson in Town Code §154-18. The Town also regulates disturbance activities within a 100-foot buffer surrounding wetlands to protect their function and values.

The purpose of wetlands regulation by federal, state, and local government is to protect the unique functions and values served by wetlands. Wetlands absorb stormwater runoff and improve water quality, thereby mitigating downstream flooding and preventing degradation of water quality in streams and other surface waters. From an ecological perspective, wetlands typically provide higher primary productivity (grams of biomass per area per year) than upland habitat. Many species of plants and animals are endemic to wetlands, and many additional animals rely on wetlands as a source of food, shelter, or breeding habitat. Lastly, roughly half of New York State's threatened and endangered plants and animals are wetland dependent.

STREAMS

In New York State, the Department of Environmental Conservation (NYSDEC) oversees the "Protection of Waters Program" (6 NYCRR Part 608), which regulates activities that may disturb the bed or banks of a regulated waterbody—a stream or lake.

All state waters are assigned a class and standard designation based on existing or expected best usage. The classification AA or A is assigned to waters used as a source of drinking water. Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water. Classification C is for waters supporting fisheries and suitable for non-contact activities. The lowest classification and standard is D. Waters with classifications A, B, and C may also have a standard of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning.

Streams that are designated as C(T) or higher (i.e., C(TS), B, or A) are collectively referred to as "protected streams" and are subject to the stream protection provisions of the Protection of Waters regulations. As discussed below, the two primary streams that pass through the WEC properties are listed as "Class C" by the NYSDEC and are therefore not subject to the provisions of the Protection of Waters Program (6 NYCRR Part 608).

The Town of Patterson also regulates streams in accordance with Town Code §158-18. This includes regulation of disturbance activities within 100 feet of streams and watercourses. These provisions do apply to the streams, wetlands, and surface waters on the project site.

NEW YORK CITY WATERSHED

Another layer of regulatory protection that applies to streams and wetlands on the project site is that enforced by the New York City Department of Environmental Protection (NYCDEP) pursuant to its Watershed Rules and Regulations (Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the New York City Water Supply and its Sources, Chapter 18).

The project site is located within the Croton watershed, part of the larger New York City watershed system, which supplies drinking water to New York City and other municipalities. Construction activities within the City's watershed are subject to certain restrictions—specifically, the construction of an impervious surface within 100 feet of a watercourse or wetland is prohibited without a permit or variance. In addition, land disturbance activities within the watershed must be mitigated with the design and implementation of a Stormwater Pollution

Prevention Plan (SPPP). Stormwater pollution prevention components of the proposed project are discussed in Chapter 7, "Stormwater Management."

NYCDEP conducted a stream corridor site inspection on the WEC properties on April 22, 2008. The purpose of this visit was to confirm the regulatory status of waterbodies and watercourses on-site with respect to the New York City Watershed Rules and Regulations. The NYCDEP-approved surface water map is provided in the large-scale drawings that accompany this DEIS and is shown in **Figure 8-1**.

C. EXISTING CONDITIONS

Surface water drainage on the WEC properties follows the predominant topography, flowing from higher elevation lands occupied by forest on the east toward the properties' lower elevations occupied by fields, orchards, and the existing campus buildings. The drainage continues to the west, past Route 22 and down to the Great Swamp.

The WEC properties contain several surface water features, including two streams and related impoundments, which are mapped by the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) or by the NYSDEC. The extent of on-site wetlands was determined by examining federal and state wetland maps and by a field inspection in August 2008. The footprint of the proposed project's disturbance area was investigated in the field for the presence of additional, unmapped wetlands or water features. Aside from those described below, no additional wetlands or waters were identified within the limits of disturbance of the proposed project. In addition, no 100-year floodplains are mapped for the project site.

The location of on-site streams and waterbodies close to the proposed project is shown in Figure 8-1 and is provided in the large-scale drawings that accompany this DEIS. This figure has been field-verified by the NYCDEP and represents the NYCDEP regulatory bounds of all on-site waters located in proximity to the project site.

The location of wetlands mapped by the U.S. Fish and Wildlife Service (NWI) is shown in **Figure 8-2**.

Wetlands mapped by the NYSDEC are shown in **Figure 8-3**.

MOUNTAIN BROOK

Located in the northern portion of the WEC properties, Mountain Brook is one of two principal surface water drainageways that cross through the project site. The brook flows downslope to the west under Route 22, where it ultimately is tributary to the East Branch Croton River. Mountain Brook has been designated a Class C stream by NYSDEC and has water reference number H-31-P-44-24-23 and trib. 23-2.

The initial construction of the WEC campus created an in-line impoundment within Mountain Brook with the construction of a dam and spillway. This impoundment forms a 3.1-acre reservoir that is now mapped by the NWI as an open water wetland: PUBHh - palustrine, unconsolidated bottom, permanently flooded, diked/impounded. The reservoir embankments consist of riprap along the spillway edge and vegetated borders along the remainder. The southern and eastern reservoir edges generally provide little ecological value. Pioneer species such as purple loosestrife (*Lythrum salicaria*), common reed (*Phragmities australis*), and cattail (*Typha* sp.) are present along the pond margin, and the upland area is maintained by mowing. The northern side of the reservoir edge consists of scrub/shrub and woodland vegetation.

The reservoir impoundment consists of an overflow structure that directs water downslope to the natural grade of Mountain Brook. At the base of the outlet of the reservoir, riprap is present. Plant species are dominated by wetland plants, including common reed, cattail, jewelweed (*Impatiens capensis*), purple loosestrife, dark green bulrush (*Scirpus atrovirens*), woolgrass (*Scirpus cyperinus*), and shallow sedge (*Carex lurida*). Mountain Brook continues south and east of the impoundment through a hemlock-northern hardwood forest community described under "Terrestrial Plant Communities" in Chapter 9, "Natural Resources."

The reservoir water is currently used for irrigation of the lawns and shrubs on the WEC campus during the irrigating season, generally April through October. Water is piped by gravity to a pump house at the base of the dam, pumped to a holding tank above the orchard, and distributed by gravity to the irrigation piping throughout the campus. Records are kept of the use: spring and fall usage is between 10,000 and 15,000 gpd; during drier summer months 40,000 to 50,000 gpd is used.

The Mountain Brook watershed is 507.3 acres with an average runoff of 95.8 million gallons per year. Stream flow data for Mountain Brook was collected between 1988 and 1990 for the purpose of planning the Watchtower reservoir size and safe yield. During this period, Mountain Brook's monthly average daily flow ranged from a low of 0.10 cubic feet per second (cfs) in August 1988 to a high of 3.60 cfs in May 1989. [CHA Safe Yield Study, Appendix D]. As part of the original environmental review of the WEC campus, water quality in Mountain Brook was sampled during normal flow conditions and found to be suitable for a community water supply with the exception of microbiological contaminants. The reservoir water is not currently used as a potable water supply.

In 2002 and 2003, water quality testing of Mountain Brook was conducted in conjunction with a NYSDEC stormwater pilot project implemented on the WEC property west of Route 22. The median value of water quality parameters measured over that time period is provided in **Table 8-1**.

Table 8-1
Mountain Brook Water Quality 2002-2003

Water Quality Parameter (unit)	Median Value (< detection limit)
Ammonia as N (mg/l)	<1.000
BOD-5 (mg/l)	< 3.000
Nitrate as N (mg/l)	3.520
Total Phosphorus (P, mg/l)	< 0.125
TSS (mg/l)	< 4.000
TKN as N (mg/l)	<1.000
Fecal Coliform (c/100ml)	165.000
Sources: Water quality sampled on the following nine occasions: 10/9/02, 10/16/02, 10/23/02, 11/6/02, 11/20/02, 12/4/02, 12/18/02, 1/8/03, and 3/6/03. "<" indicates value was undetected because sample concentration was less than the detection limit listed.	

Mountain Brook was last surveyed by the NYSDEC Bureau of Fisheries in August 1936. At that time, it was described as having a width of 2-3 feet, depth of 2-4 inches, flow of 25 gpm, moderate food availability for trout fishery, sand/mud bottom, poor cover from surrounding trees, and warm temperatures. No fish stocking was called for at that time. The WEC has stocked the Mountain Brook Reservoir with fish in the past. Stocked fish include brook trout, small-mouth bass, large-mouth bass, golden shiner, fathead minnow, and triploid grass carp. 2006 was the last year fish were stocked in the reservoir.

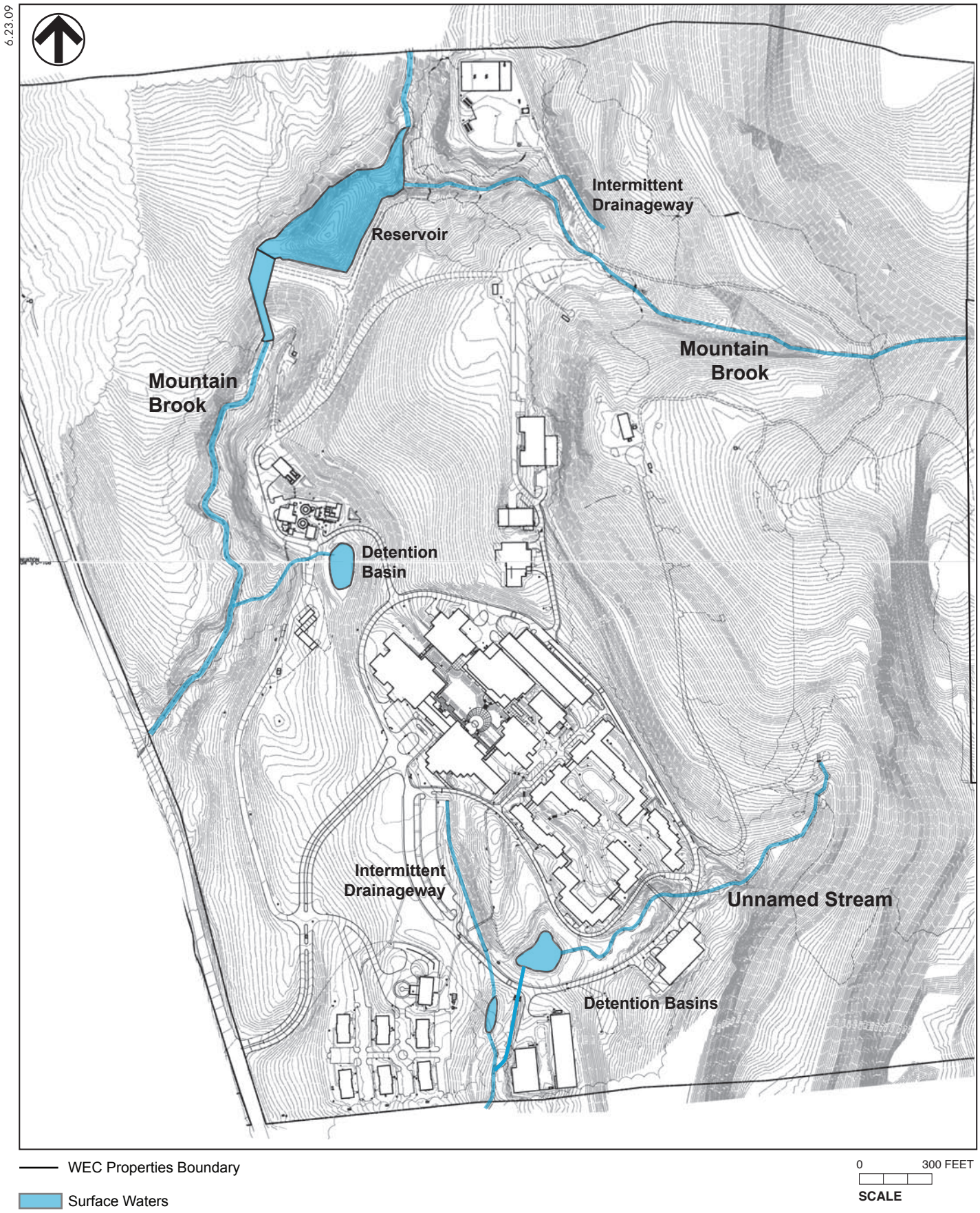

Figure 8-1

Onsite Surface Waters

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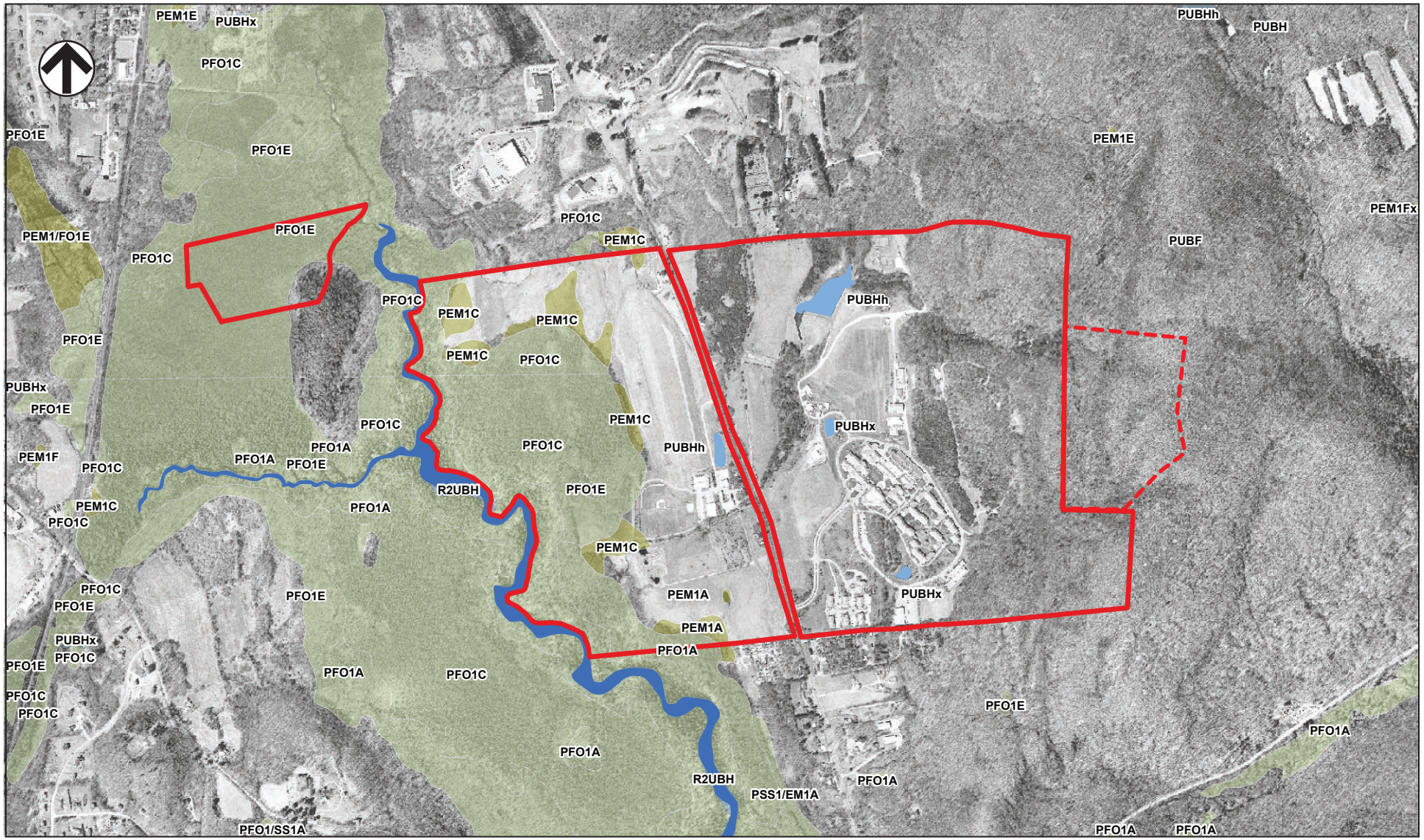

Aerial: March / April 2006, Wetlands Mapping: U.S. Fish and Wildlife Service, National Wetlands Inventory July 2008

0 200 1000 FEET

SCALE

NWI Wetland Classification

- Freshwater Emergent Wetland (PEM)
- Freshwater Forested Wetland (PFO)
- Freshwater Pond (PUB)
- Riverine (R)

- WEC Properties Boundary
- Valley Farms Corporation Property Boundary
- Streams (PCGIS 2008/AKRF)

Figure 8-2

National Wetland Inventory (NWI) Mapped Wetlands

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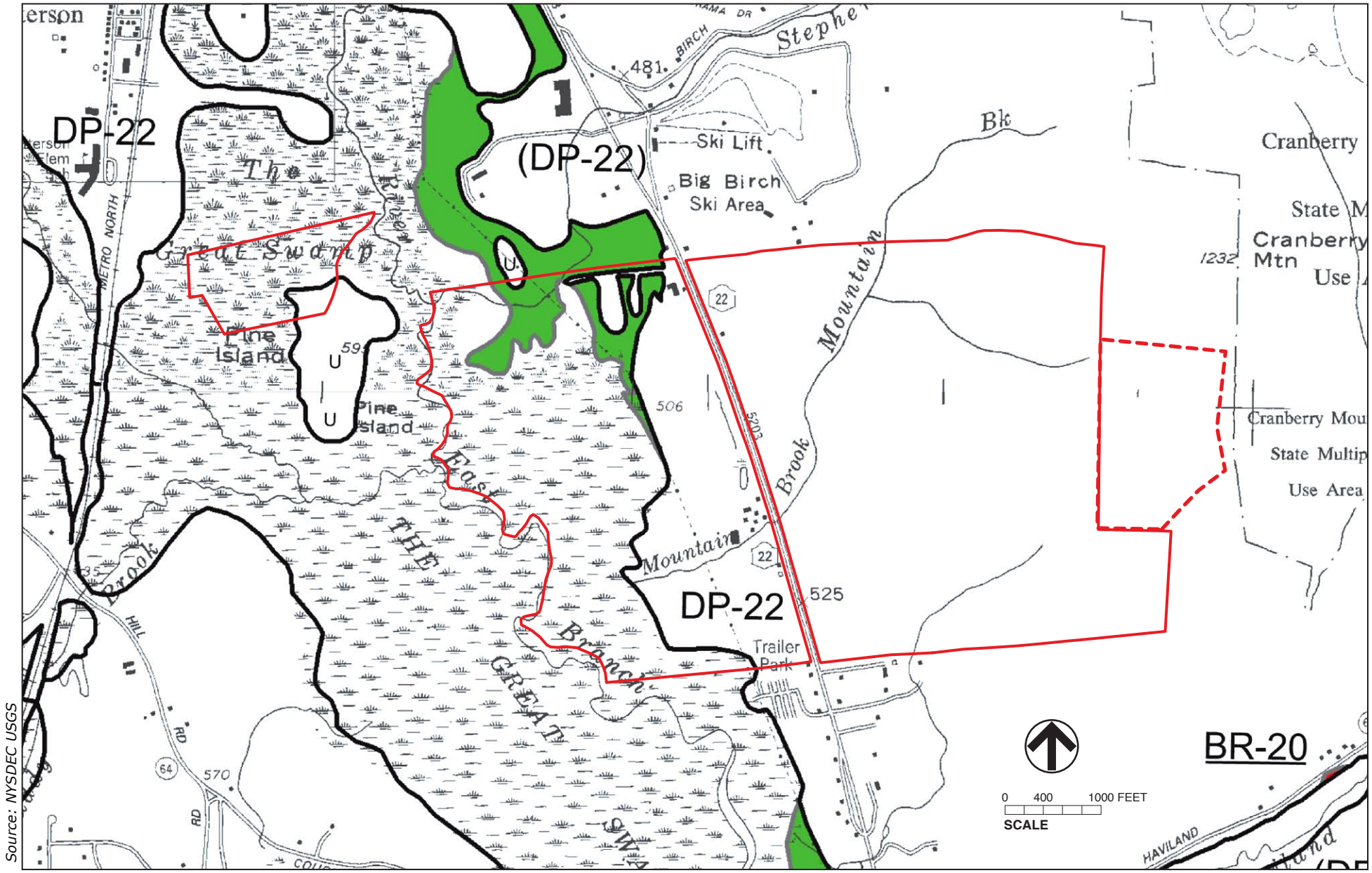

Source: NYSDEC USGS

WEC Properties Boundary

Valley Farms Corporation Property Boundary

Figure 8-3

NYSDEC Mapped Wetlands

UNNAMED STREAM

A second stream traverses the WEC properties south of the existing main campus. This stream, referred to throughout this chapter as "Unnamed Stream," has been designated a Class C stream by NYSDEC and has water reference number H-31-P44-24-22a. It flows from steeply sloped forested land to the east through the existing WEC campus and then downslope toward Route 22 to the southwest, where it too drains to the East Branch of the Croton River. Its contributory watershed area is 171.5 acres, consisting of primarily wooded land.

Within the WEC campus, this stream enters an in-line detention pond constructed at the time of the initial WEC campus build-out. This in-line pond is mapped as a PUBHx (palustrine, unconsolidated bottom, permanently flooded, excavated) wetland by the NWI. The pond is bordered by mowed lawn. Wetland vegetation occupies a narrow border around the pond edge and includes cattail, common reed, moneywort (*Lysimachia nummularia*), purple loosestrife, jewelweed, broom sedge (*Carex scoparia*), American horehound (*Lycopus americanus*), and other ornamental plants.

As the stream descends downslope to the southwest, it flows through a vegetative community that can be described as maintained lawn with scattered trees. Herbaceous species along the stream edge include ornamental ground covers, hosta (*Hosta sp.*), milkweed (*Aesclepias syriaca*), Virginia creeper (*Parthenocissus quinquefolia*), and coltsfoot (*Tussilago farfara*).

A separate drainage course flows from the center of the existing WEC campus beginning in the vicinity of the visitor parking area and joining the larger Unnamed Stream just south of the existing loop road. The shoreline of this drainageway is primarily maintained by mowing, although a thin corridor of wetland plants, such as jewelweed, coltsfoot, purple loosestrife, and climbing hemp weed (*Mikania scandens*), comprise a thin buffer directly on the banks of the stream.

While no water quality testing results are available for the Unnamed Stream, it is presumed that as Class "C" streams, both Mountain Brook and the Unnamed Stream currently conform to the surface water quality standards in 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations.

ADDITIONAL MAPPED ON-SITE WETLANDS

One additional NWI-mapped wetland is located on the project site. This is an excavated pond mapped as a permanently flooded palustrine wetland (PUBHx). This pond, located southwest of the orchard, was constructed at the time of the initial construction of the WEC campus. It is used for stormwater detention. Vegetation surrounding the pond consists of lawn/grass maintained by mowing. Cattail is the dominant emergent plant species found along the pond banks.

THE GREAT SWAMP

The WEC properties include lands west of Route 22 used principally for agricultural uses, water supply wells, and a number of residences. A large wetland system borders the properties at this location and receives runoff from the project site. This is the Great Swamp, designated NYSDEC Wetland DP-22.

The Great Swamp is one of the largest wetlands in New York State, stretching nearly 20 miles across the five municipalities of Southeast, Patterson, Pawling Town, Pawling Village, and

Dover and covering nearly 6,000 acres. The swamp has a 63,018-acre watershed occupied by a mix of forested, agricultural, and suburban land uses.

The watershed is divided into two sections at Pawling. North of Pawling, the water flows from the Swamp River into the Ten Mile River, which leads to the Housatonic River and, eventually, the Long Island Sound. South of Pawling, the river flows southward in the Croton River, eventually into the East Branch Reservoir, one of New York City's drinking water reservoirs. The Great Swamp supports numerous animals and plants listed as rare in New York State, including bog turtle, spreading globeflower, field dodder, and blazing-star. It also contains within it several natural communities identified as rare in New York State, including the Atlantic white cedar, rich sloping fen, and rich graminoid fen communities. The Great Swamp has been designated a Critical Environmental Area (CEA) by the Putnam County Legislature in accordance with the State Environmental Quality Review Act regulations.

As discussed below under "Potential Impacts of the Proposed Project", the proposed project site and all of its roadways, buildings, and surface improvements would be located east of Route 22, on the opposite side of the road from the Great Swamp. The nearest disturbance to this state wetland is the proposed entrance fence, which is 600 feet away from the 100-foot adjacent area boundary of this New York State wetland system. The majority of the proposed project's area of disturbance is more than 1,500 feet from the Great Swamp.

WETLAND DELINEATION

Lands within the area east of Route 22 that would be disturbed for the proposed project were inspected by NYCDEP on April 22, 2008, and by ecological consultants for the applicant in August 2008. The high water mark of all on-site streams and impoundments were surveyed and approved by NYCDEP. (See large-scale Drawing C-105 that accompanies this DEIS. Drawing approved by NYCDEP on March 19, 2009). The footprint of the proposed project area was examined by a wetland ecologist retained by the WEC. No other wetland areas were identified within the proposed disturbance footprint of the amended site plan.

Undeveloped portions of the WEC properties that are not proposed to be disturbed, including forested lands upslope to the east, were not field-inspected for the presence/absence of unmapped wetland resources.

As the design of the proposed project has progressed, the latest cut/fill calculations have determined that excess earth material to be excavated from the construction site would need to be deposited elsewhere on the project site parcel (Lot #53 - 362.50 acres). Following review of the DEIS by the lead agency and in coordination with the Town, one of two possible excess soil deposition areas would be chosen. Next, the chosen site would be examined by a qualified wetlands ecologist during the growing season to determine the presence/absence of regulated wetlands. Initial inspection of two possible sites for disposal of excess earth material (the existing "excess soil deposition area" and the "north pasture area") during the non-growing season found them both to be predominantly upland. The location of the two possible excess soil deposition areas is shown in Figure 14-1 in Chapter 14, "Construction."

Several wetland delineations (field verification of wetland boundaries) have been conducted on the portion of the WEC properties west of Route 22. Representatives of NYSDEC field delineated the eastern boundary of Wetland DP-22 (the Great Swamp) on the WEC properties in

1987, 2002, and most recently in October 2008.[1] These wetlands are located west of Route 22 and would not be disturbed by the proposed project.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

No changes to on-site surface waters or wetlands would occur in the future without the proposed project. As discussed above, those water resources and regulated buffers within or adjacent to the existing WEC campus have been modified as part of the initial construction of the facility. No further clearing, grading, filling, or excavating within the water resources and their buffers would occur, with the exception of ongoing site maintenance.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

The proposed project would avoid causing potential impacts to surface waters and wetlands by not directly disturbing wetlands and streams and by strictly adhering to the requirements of NYSDEC and NYCDEP stormwater management regulations. More specifically, no wetland fill, excavation, or clearing is proposed. In addition, there would be no stream disturbance, either temporary or permanent. A small amount of 100-foot stream buffer would be affected, primarily within the existing WEC campus itself, for minor parking and roadway improvements as discussed below.

PROJECT SITE—AMENDED SITE PLAN

Careful site design and placement of structures and improvements in upland portions of the WEC properties constitute the primary wetland and watercourse impact avoidance measure. As a result, no major impacts to on-site streams or surface waterbodies would occur as a result of the proposed project. Only minor disturbance within the 100-foot buffer of several surface water features would occur.

Figure 8-4 shows the areas of the proposed project that would be located within the Town-regulated and NYCDEP-regulated watercourse/wetland adjacent area (buffers). Most of the areas of proposed buffer encroachment would involve streams or detention ponds within the existing WEC campus in areas that have been previously disturbed. In total, 48,994 square feet (1.12 acres) of land within the on-site stream buffer would be disturbed, of which 15,627 square feet would be only temporary disturbance during construction and revegetated upon project completion.

As shown in Figure 8-4, most of the on-site buffer disturbance would be in and around the existing WEC campus building for the widening of a small portion of the existing loop road to accommodate a passenger drop-off shoulder and expansion of the visitor parking lot. Both of these areas of stream buffer encroachment would displace a small amount of maintained lawn. To mitigate for the stormwater impacts associated with these buffer encroachments, permeable pavers would be installed on the new parking surfaces and passenger drop-off area to allow infiltration of rainfall (see Chapter 7 for further details on the stormwater management components of the proposed project).

Disturbance within the 100-foot buffer of the Unnamed Stream (on the southern portion of the WEC properties) is also necessary for the installation of telephone and electric utility lines,

[1] October 9, 2008, inspection of DP-22 eastern boundary by Douglas Gaugler, biologist, NYSDEC.

which would be trenched and backfilled after construction. These are temporary buffer disturbances that have been approved separately by the Town and DEP. The utility lines will be installed beneath existing roadway paving.

The existing recreation area located on the northern portion of the WEC properties would be used temporarily as a rock crushing and gravel storage area, as shown in Figure 14-1: Construction Phasing Plan. Some minor encroachment into the 100-foot buffer of Mountain Brook would be required for installation of a temporary stormwater conveyance for surface runoff generated from this area of the site. As discussed in Chapters 7 and 14, and as shown on large-scale plans that accompany this DEIS, temporary erosion control measures would be employed during the construction period to avoid impacts to on-site and off-site waters and wetlands.

A final area of buffer disturbance would occur adjacent to an existing stormwater detention basin—although created as a detention basin for the original construction of the WEC, this basin and its 100-foot buffer are regulated by NYCDEP. Some minor disturbance would be necessary in proximity to this basin for installation of a new connection to the on-site sewage treatment plant. Trenching for this utility connection would be backfilled and revegetated, and so it would be considered a temporary disturbance.

SOIL DEPOSITION AREA

The majority of the excess soil and rock material excavated during construction of the proposed project would be used for grading the area west of the proposed detention basins, as shown on the large-scale plans that accompany this DEIS (Drawings CG-101 to CG-107).

As discussed above, excess soil material not required for grading of the construction area would be permanently deposited on the WEC properties at one of two proposed locations. The preferred location is the area in and around the existing "excess soil deposition area." Placement of excess material at this location has been included in the overall 49.1-acre limit-of-disturbance footprint for the project as a whole. An alternate site would be the existing "north pasture" area, currently used for cow grazing. This alternative would require the installation of a stream crossing of Mountain Brook. Bridge abutments would require approximately 72 cubic yards of fill in the stream buffer area. In addition, approximately 680 cubic yards of fill within the stream buffer area would be needed in an average 2-foot-wide swath along the approach road. Permanent disturbance within the buffer would total approximately 9,100 square feet, with an additional 11,849 square feet of temporary disturbance (for construction of the span and approach road). No disturbance would take place to the stream itself. At either location, soil would be deposited with appropriate erosion controls to avoid movement of sediment off-site and would be permanently revegetated to avoid any long-term water quality impacts. Following input from the Town and involved agencies, one of these two sites would be chosen. It is expected that either option can be pursued without adverse impacts to wetlands or surface waters.

On December 8, 2009, the applicant met with the Town's Environmental Conservation Inspector (ECI) onsite to examine these two alternative locations. A forested wetland was identified adjacent to the wooded, "excess soil deposition" alternative. Therefore, use of this alternative for excess soil disposal would require a permit from the Town for disturbance/fill within the Town's 100-foot wetland buffer. Site inspection reveals that the area of potential soil deposition for the "north pasture" option is not located in proximity to regulated wetlands or wetland buffer. However, as discussed above, gaining access to the "north pasture" would necessitate a roadway

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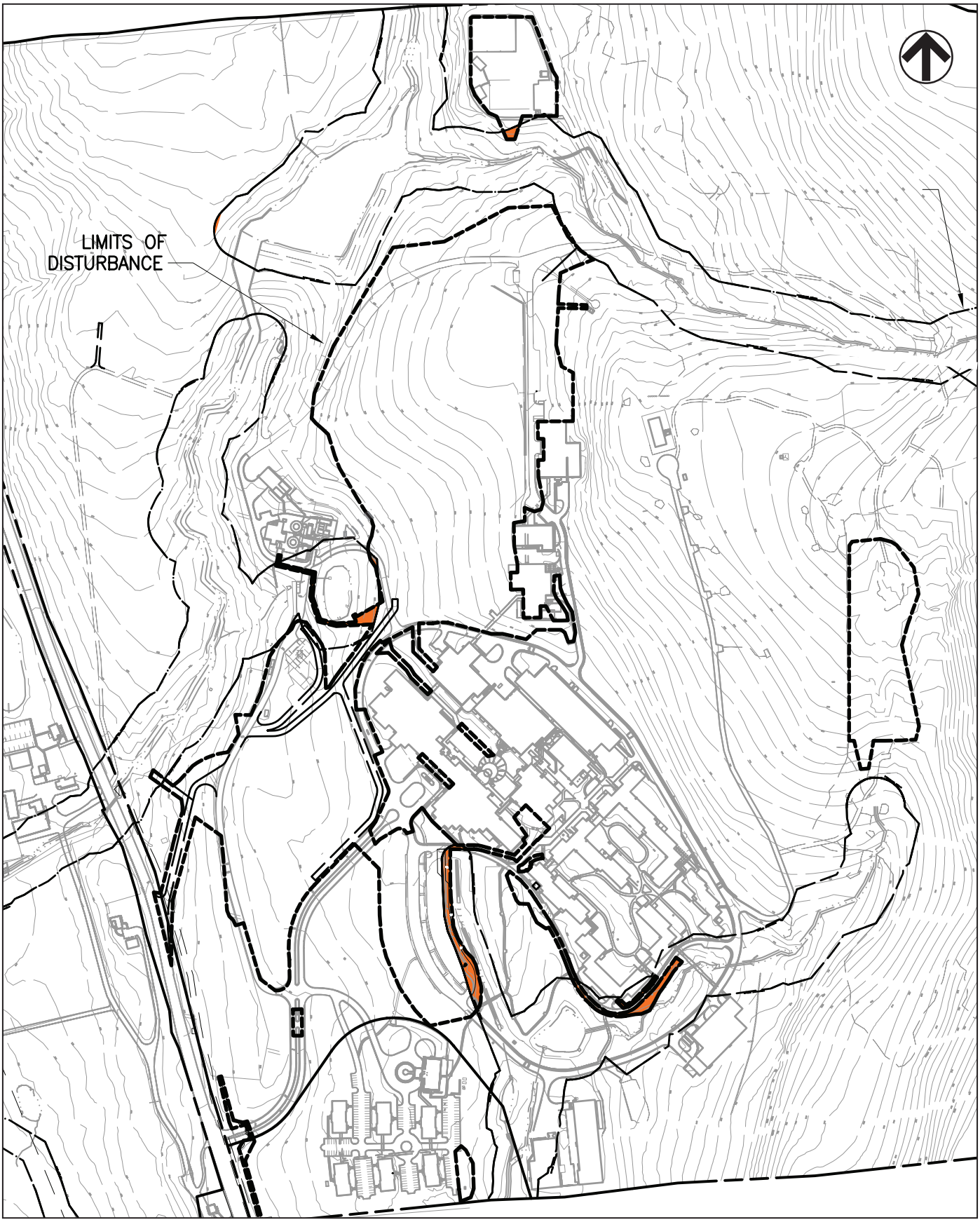

WEC Properties Boundary

Wetlands/Watercourse Buffer Disturbance

0 200 500 FEET

SCALE

Figure 8-4

WATCHTOWER PATTERSON, NY

Wetlands/Watercourse Buffer Disturbance

crossing of Mountain Brook requiring Town and NYCDEP approval. The Town's ECI has submitted a preliminary analysis of both alternative locations (Kozlowski, 12.8.09) which can be found in Appendix A. The Town's ECI has indicated that the wetland adjacent to the "excess soil deposition" area should be delineated in the Spring of 2010.

POTABLE WELL INSTALLATION—WEST OF ROUTE 22

The applicant currently has a water allocation permit with the NYSDEC for the withdrawal and use of 165,000 gallons per day (gpd) based on a site-wide pump test performed on the property in 1988. The applicant is in the process of upgrading its water supply system with the installation of two new groundwater wells to serve as a backup to its water supply well network. These wells are located adjacent to its existing wells in the sand and gravel aquifer on parcels west of Route 22 just outside the NYSDEC and Town of Patterson 100-foot Watercourse/Wetland Adjacent Area. No encroachment in the wetland/watercourse buffers is proposed. Results of pump testing for these backup groundwater wells are expected in the summer of 2009. When available, these results will be made part of the public record of this DEIS. Previous pump tests and related studies are included in this DEIS (see Appendix C[1]).

As discussed in Chapter 6, "Water Supply and Utilities," the maximum projected potable water demand would not exceed the 165,000 gpd limit set by the NYSDEC water-taking and State Pollutant Discharge Elimination System (SPDES) permits. Since the applicant does not intend to pump beyond its current 165,000 gpd water allotment, operation of these wells is not expected to result in any impact to the wetlands.

The pervious ground surfaces on the project site, including forested and landscaped areas, contribute to groundwater infiltration that helps sustain the hydrology of on-site and off-site wetlands and streams. The overall 709-acre WEC contiguous properties[2] currently contain 670 acres of pervious ground surface, which preliminary study has indicated contributes approximately 218,222,000 gallons per year (or 415 gpm) to groundwater recharge.[3] The proposed project would increase total impervious surface on-site by 10.4 acres, thereby reducing the groundwater recharge contribution of the WEC properties to 214,833,000 gallons per year (408 gpm), which represents a very small reduction in recharge of 7 gpm. Despite this reduction, the amount of expected recharge from the WEC properties is well in excess of the 115 gpm (165,000 gpd) currently permitted for withdrawal by the WEC. As discussed in Chapter 6, projected water demand with the proposed project would be below this on average, at 142,980 gpd. Furthermore, wastewater is treated on-site and returned to the same watershed system via surface flow to Mountain Brook and then to the Great Swamp. Thus, although water is transferred from groundwater to surface water, the water budget is conserved and still available to the biological resources dependent on the project site's receiving waters.

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[1] CA Rich 1988 Groundwater Supply Assessment; CA Rich July, 1988 Pumping Test for WEC; Remington 1996 Groundwater Supply Analysis; CA Rich 7.2.08 Letter in Support, Eric A. Weinstock; CA Rich 5.08 Aquifer Mapping and Test Borings.

[2] Excludes the non-contiguous lot #14.-1-37 which is 34.0 acres in size.

[3] Based on average annual rainfall of 48 inches and assuming 75 percent loss to runoff and evapotranspiration. (See Appendix C for recharge calculations.)

STORMWATER MANAGEMENT AND EROSION CONTROL MEASURES

As discussed in detail in Chapters 7 and 14, a complete Erosion and Sediment Control Plan and SPPP have been developed for the proposed project to minimize any potential impacts. The Plans' measures would include the use of silt fencing, temporary sedimentation basins, and project phasing during the construction period. Permanent stormwater management facilities, which have been designed for the proposed project to the latest NYSDEC Phase II and NYCDEP Watershed Rules and Regulations guidelines, would be implemented as well. These stormwater management measures would prevent downstream erosion and sedimentation and avoid stormwater quality and quantity impacts to Mountain Brook, the Unnamed Stream, and to their receiving waters. By adhering to the stormwater management guidelines contained in these regulations, the proposed project would not result in adverse changes to the water quality or quantity of on-site and off-site streams and wetlands. As shown in the large-scale drawings that accompany this DEIS and as described in Chapter 7, two proposed detention basins would capture and detain stormwater runoff from the project site prior to release to Mountain Brook. In accordance with New York State design guidelines, these basins would remove stormwater pollutants, including sediment, nutrients, and oxygen-demanding constituents, to avoid adverse changes to runoff water quality leaving the project site. The periphery of the proposed stormwater basins would be planted with non-woody aquatic bench vegetation to enhance nutrient removal and provide habitat value.

An on-site geomorphic assessment of Mountain Brook conducted in March 2009 found the stream channel to be laterally and vertically stable, with steep, well-vegetated banks. Mountain Brook exhibits bedrock outcroppings and grade controls within its lower reaches on the project site parcel, suggesting a high degree of resistance to channel erosion. Stream bank erosion would be avoided by detaining storm flows to pre-development runoff rates and by releasing detained flows to the lower reach of Mountain Brook, as shown on the large-scale stormwater management and utilities plans that accompany this DEIS. By releasing detained flows to Mountain Brook, runoff from the land area to be disturbed would continue to provide hydrologic inputs to the brook and its downstream waters and wetlands (i.e., the Great Swamp). ✷

A. INTRODUCTION

This chapter discusses the project site's existing ecological resources and describes the potential impacts to these resources that could result from construction of the proposed project.

The project site, consisting of the proposed amended site plan and land immediately adjacent to it, was inspected on July 23, August 7, and October 21, 2008, to conduct an inventory of existing vegetation and to characterize general habitat conditions on-site. Published information on existing ecological resources was also consulted, including U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, New York State Department of Environmental Conservation (NYSDEC) wetland maps, Natural Resources Conservation Service (NRCS) Soil Survey, and records of threatened and endangered plant and animal species maintained by the NYSDEC Natural Heritage Program (NHP). The proposed project's footprint of disturbance was also examined for the presence of regulated wetlands, as discussed in Chapter 8, "Surface Water and Wetlands."

PRINCIPAL CONCLUSIONS

The proposed project would be located on land consisting primarily of existing orchard and lawn. Such habitats have lower ecological value than less disturbed habitats, such as woodlands or shrub/scrub wetlands. The ecological diversity and rarity of plants and animals found within the footprint of the proposed project is low. Further, by keeping the proposed 49 acres of land disturbance in close proximity to the existing Watchtower Educational Center (WEC) facilities, the project would not increase habitat fragmentation appreciably more than that currently existing on the project site. Through careful project siting, and by making use of multiple floors to limit the footprint of the proposed buildings, the vast majority of the project site parcel would be preserved in its forested condition, thereby avoiding significant impacts to ecological resources.

B. EXISTING CONDITIONS

TERRESTRIAL PLANT COMMUNITIES

OVERVIEW

Construction of the WEC began in 1989 on the site of a former dairy farm. An environmental site assessment conducted at that time found that the bulk of the land that was eventually used for the original site plan comprised tillable land planted in corn, hay fields, and pasture. The upper slopes of the site also contained forest comprising second-growth hardwood species, including black oak, chestnut oak, white oak, black birch, American beech, white and green ash, shagbark hickory, red and sugar maple, and American hornbeam. The ravine on the northern portion of the project site containing Mountain Brook exhibited such species as eastern hemlock,

gray and black birch, apple, red and sugar maple, shagbark hickory, and white and black oak. Forested habitats on-site today contain much the same species composition because buildings are generally confined to previously cleared land.

The WEC currently consists of buildings and parking areas in the central portion of the property. From a natural resources perspective, the developed portion of the project site has limited ecological value; much of the native plant communities that existed prior to the original farming operations and subsequent development have been replaced with orchard, mowed lawn and trees, shrubs, forbs, and grasses commonly used in landscaped settings. Of greater ecological value are the woodland areas and open fields that are present at the periphery of the proposed project site and the small pockets of these vegetative communities that are intermixed in the area of the existing WEC site. In describing the project site, eight vegetative cover classes based on the draft *Ecological Communities of New York State* (Second Edition) (Edinger, et al., 2002) are present: mowed lawn, mowed lawn with trees, orchard, pastureland, hemlock-northern hardwood forest, Appalachian oak-hickory forest, successional southern hardwoods, and successional old field.

As listed in **Table 9-1**, both native and non-native trees, shrubs, forbs, and grasses were observed within and adjacent to the project site. The spatial arrangement of each habitat type identified on-site is shown in **Figure 9-1**.

Table 9-1

Flora Observed on the Project Site During 2008 Field Surveys

Scientific Name	Common Name	Primary Cover Class	Species Found Within Proposed Disturbance Area
Trees and Shrubs			
Acer negundo	Box Elder	Successional Field	X
Acer pensylvanicum	Striped Maple	Appalachian Oak-Hickory Forest	X
Acer platanoides	Norway Maple	Mowed Lawn w/Trees	X
Acer pseudo-platanus	Sycamore Maple	Mowed Lawn w/Trees	
Acer rubrum	Red Maple	Appalachian Oak-Hickory Forest	X
Acer saccharinum	Silver Maple	Mowed Lawn w/Trees	X
Acer saccharum	Sugar Maple	Hemlock-Northern Hardwood Forest	X
Ailanthus altissima	Tree-of-Heaven	Successional Southern Hardwoods	X
Amelanchier arborea	Downy Juneberry	Existing Excess Soil Deposition Area	X
Berberis thunbergii	Japanese Barberry	Successional Southern Hardwoods	X
Betula alleghaniensis	Yellow Birch	Hemlock-Northern Hardwood Forest	
Betula lenta	Black Birch	Hemlock-Northern Hardwood Forest	
Carya glabra	Pignut Hickory	Appalachian Oak-Hickory Forest	X
Carya ovata	Shagbark Hickory	Appalachian Oak-Hickory Forest	X
Chamaecyparis sp.	Cypress	Mowed Lawn w/Trees	
Rubus allegheniensis	Common Blackberry	Successional Southern Hardwoods	X
*Cornus florida**	Flowering Dogwood	Mowed Lawn w/Trees	X
Elaeagnus umbellata	Autumn-olive	Successional Field	X
Euonymous alatus	Burning Bush	Mowed Lawn w/Trees	X
Fagus grandifolia	American Beech	Hemlock-Northern Hardwood Forest	
Fraxinus americana	White Ash	Appalachian Oak-Hickory Forest	X
Fraxinus pennsylvanica	Green Ash	Wetland Edge	
Fraxinus sp.	Ash sp.	Appalachian Oak-Hickory Forest	X
Hamamelis virginiana	Witch Hazel	Appalachian Oak-Hickory Forest	X
Juglans nigra	Black Walnut	Wetland Edge	
Juniperus virginiana	Eastern Red Cedar	Successional Red Cedar Woodland	X
*Kalmia latifolia**	Mountain Laurel	Appalachian Oak-Hickory Forest	X
Ligustrum vulgare	Common Privet	Successional Southern Hardwoods	X
Lindera benzoin	Spice Bush	Wetland Edge	
Liriodendron tulipifera	Tulip Tree	Successional Southern Hardwoods	X
Lonicera tatarica	Tartarian Honeysuckle	Successional Southern Hardwoods	X
Malus sp.	Crabapple	Successional Southern Hardwoods	X

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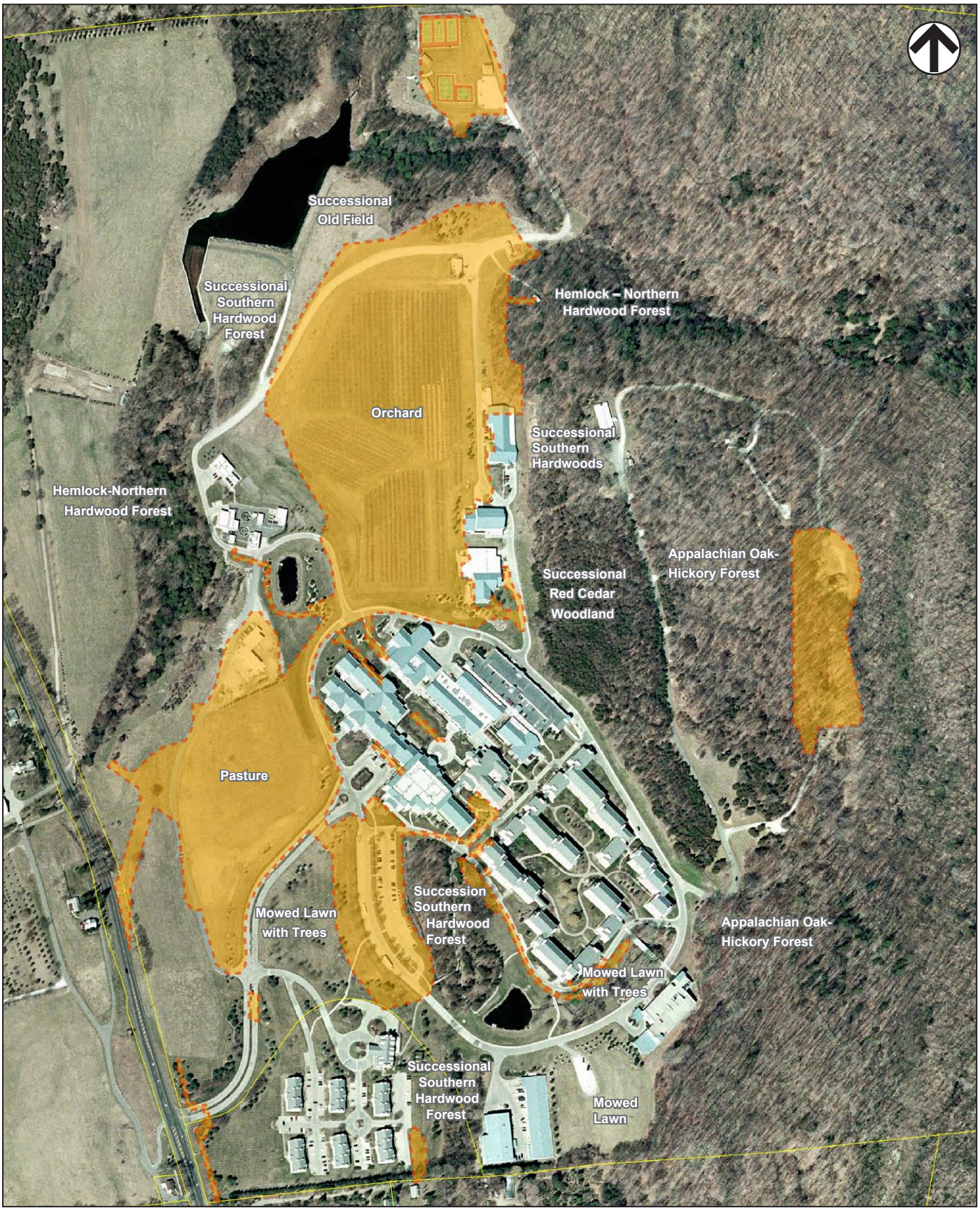

Limits of Disturbance

WEC Properties Boundary

0 200 500 FEET

SCALE

Figure 9-1

Terrestrial Habitats Onsite

Table 9-1 (cont'd)
Flora Observed on the Project Site During 2008 Field Surveys

Scientific Name	Common Name	Primary Cover Class	Species Found Within Proposed Disturbance Area
Trees and Shrubs (cont'd)			
Malus sp.	Flowering Crabapple	Mowed Lawn w/Trees	X
Malus spp.	Apple	Orchard	X
Morus alba	White Mulberry	Pasture	X
Picea glauca	Dwarf Alberta Spruce	Mowed Lawn w/Trees	X
Picea omorika	Siberian Spruce	Pasture	X
Picea pungens	Colorado Spruce	Mowed Lawn w/Trees	X
Pinus strobus	Eastern White Pine	Mowed Lawn w/Trees	X
Pinus thunbergii	Japanese Black Pine	Mowed Lawn w/Trees	X
Platanus occidentalis	Eastern Sycamore	Successional Southern Hardwoods	X
Populus sp.	Cottonwood	Successional Southern Hardwoods	X
Prunus serotina	Black Cherry	Successional Southern Hardwoods	X
Prunus sp.	Peach	Orchard	X
Prunus sp.	Cherry	Successional Southern Hardwoods	X
Pyrus calleryana	Callery Pear	Mowed Lawn w/Trees	X
Quercus alba	White Oak	Appalachian Oak-Hickory Forest	X
Quercus palustris	Pin Oak	Pasture	X
Quercus prinus	Chestnut Oak	Appalachian Oak-Hickory Forest	X
Quercus rubra	Red Oak	Appalachian Oak-Hickory Forest	X
Quercus spp.	Oak	Appalachian Oak-Hickory Forest	X
Quercus velutina	Black Oak	Appalachian Oak-Hickory Forest	X
Rhamnus cathartica	Common Buckthorn	Successional Southern Hardwoods	X
Rhododendron sp.	Rhododendron	Successional Southern Hardwoods	X
Robinia pseudoacacia	Black Locust	Successional Southern Hardwoods	X
Rosa multiflora	Multiflora Rose	Successional Southern Hardwoods	X
Rubus allegheniensis	Common Blackberry	Existing Excess Soil Deposition Area/Pasture	X
Rubus occidentalis	Black Raspberry	Successional Southern Hardwoods	X
Salix discolor	Pussy Willow	Wetland Edge	
Taxodium distichum	Bald Cypress	Pasture	X
Tsuga canadensis	Eastern Hemlock	Successional Southern Hardwoods	X
Ulmus americana	American Elm	Successional Southern Hardwoods	X
Vaccinium corymbosum	Highbush Blueberry	Existing Excess Soil Deposition Area	X
Vaccinium vacillians	Early Low Bush Blueberry	Appalachian Oak-Hickory Forest	X
Viburnum acerifolium	Maple-Leaved Viburnum	Appalachian Oak-Hickory Forest	X
Viburnum dentatum	Southern Arrowwood	Successional Southern Hardwoods	X
Vines			
Amphicarpaea bracteata	Hog Peanut	Existing Excess Soil Deposition Area	X
Celastrus orbiculatus	Asiatic Bittersweet	Successional Red Cedar Woodland	X
Convulvulus sepium	Hedge Bindweed	Successional Field	X
Lonicera japonica	Japanese Honeysuckle	Successional Southern Hardwoods	X
Mikania scandens	Climbing Hempweed	Wetland Edge	X
Parthenocissus quinquefolia	Virginia Creeper	Successional Southern Hardwoods	X
Solanum dulcamara	Bittersweet Nightshade	Successional Field	X
Toxicodendron radicans	Poison Ivy	Successional Southern Hardwoods	X
Grasses			
Agropyron repens	Quackgrass	Successional Field	X
Avena fatua	Wild Oat	Successional Field	X
Carex lurida	Shallow Sedge	Wetland Edge	
Carex scoparia	Broom Sedge	Wetland Edge	
Carex stipata	Awlfruit Sedge	Successional Field	X
Carex vulpinodea	Fox Sedge	Wetland Edge	
Cynodon dactylon	Bermuda Grass	Successional Field	X
Cyperus esculentus	Yellow Nutsedge	Orchard	X
Cyperus strigosus	Umbrella Sedge	Successional Field	X
Dactylis glomerata	Orchard Grass	Successional Field	X
Digitaria sanguinalis	Crab Grass	Successional Field	X
Echinchloa crusgalli	Barnyard Grass	Successional Field	X
Eleusine indica	Goose Grass	Successional Field	X

Table 9-1 (cont'd)

Flora Observed on the Project Site During 2008 Field Surveys

Scientific Name	Common Name	Primary Cover Class	Species Found Within Proposed Disturbance Area
Grasses (cont'd)			
Festuca sp.	Fescue	Successional Field	X
Festuca pratensis	Meadow Fescue	Pasture	X
Juncus effusus	Common Rush	Wetland Edge	
Juncus tenuis	Path Rush	Successional Field	X
Panicum spp.	Panicum sp.	Successional Field	X
Panicum latifolium	Broad-Leaved Panic Grass	Existing Excess Soil Deposition Area	X
Phalaris arundinacea	Reed Canary Grass	Pasture	X
Phleum pratense	Timothy Grass	Successional Field	X
Phragmites australis	Common Reed	Successional Field	X
Poa trivialis	Roughstalk Bluegrass	Wetland Edge	
Scirpus atrovirens	Dark Green Bulrush	Wetland Edge	
Scirpus cyperinus	Woolgrass	Wetland Edge	
Setaria faberi	Giant Foxtail	Successional Field	X
Setaria viridis	Green Foxtail	Successional Field	X
Forbs			
Achillea millefolium	Yarrow	Successional Field	X
Aesclepias syriaca	Common Milkweed	Successional Field	X
Alliaria officinalis	Garlic Mustard	Successional Southern Hardwoods	X
Allium vineale	Field Garlic	Successional Field	X
Amaranthus sp.	Amaranth	Successional Field	X
Amaranthus hybridus	Slender Amaranth	Pasture	X
Ambrosia artemisiifolia	Common Ragweed	Successional Field	X
Apocynum cannabinum	Indian Hemp	Successional Field	X
Apocynum spp.	Dogbane	Successional Field	X
Aralia nudicaulis	Wild Sarsaparilla	Appalachian Oak-Hickory Forest	X
Arctium lappa	Great Burdock	Successional Field	X
Artemisia annua	Annual Wormwood	Successional Field	X
Artemisia vulgaris	Mugwort	Successional Field	X
Aster spp.	Asters	Successional Field	X
Bidens frondosa	Beggars Ticks	Successional Field	X
Brassica kaber	Charlock	Successional Field	X
Brassica rapa	Field Mustard	Pasture	X
Centaurea maculosa	Spotted Knapweed	Successional Field	X
Cerastium vulgatum	Mouse-Ear Chickweed	Wetland Edge	
Chenopodium album	Lamb's Quarters	Successional Field	X
Chichorium intybus	Chickory	Successional Field	X
*Chimaphila maculata**	Striped Wintergreen	Appalachian Oak-Hickory Forest	X
Circaea quadrisulcata	Enchanters Nightshade	Successional Southern Hardwoods	X
Cirsium vulgare	Bull Thistle	Successional Field	X
Convolvulus arvensis	Field Bindweed	Orchard	X
Coronilla varia	Crown Vetch	Existing Excess Soil Deposition Area	X
Cuscuta spp.	Dodder	Successional Field	X
Datura stramonium	Jimson Weed	Successional Field	X
Daucus carota	Queen Anne's Lace	Successional Field	X
Dennstaedtia punctilobula	Hayscented Fern	Appalachian Oak-Hickory Forest	X
Dianthus armeria	Deptford Pink	Successional Field	X
*Dryopteris marginalis**	Marginal Wood Fern	Appalachian Oak-Hickory Forest	X
Equisetum arvense	Field Horsetail	Wetland Edge	
Erigeron annuus	Daisy Fleabane	Successional Field	X
Erigeron canadensis	Horseweed	Orchard	X
Erigeron philadelphicus	Common Fleabane	Successional Field	X
Eupatorium perfoliatum	Boneset	Wetland Edge	
Eupatorium rugosum	White Snakeroot	Appalachian Oak-Hickory Forest	X
Euphorbia maculata	Spotted Spurge	Orchard	X
Euthamia graminifolia	Lance-Leaved Goldenrod	Existing Excess Soil Deposition Area/Pasture	X
Eurybia divaricata	White Wood Aster	Appalachian Oak-Hickory Forest	X
Galinsoga ciliata	Quickweed	Appalachian Oak-Hickory Forest	X

Table 9-1 (cont'd)
Flora Observed on the Project Site During 2008 Field Surveys

Scientific Name	Common Name	Primary Cover Class	Species Found Within Proposed Disturbance Area
Forbs (cont'd)			
Galium circaezans	Wild Licorice	Appalachian Oak-Hickory Forest	X
Galium mollugo	Smooth Bedstraw	Appalachian Oak-Hickory Forest	X
Galium sp.	Bedstraw	Appalachian Oak-Hickory Forest	X
Gaylussacia baccata	Huckleberry	Appalachian Oak-Hickory Forest	X
Geum aleppicum	Yellow Avens	Appalachian Oak-Hickory Forest	X
Hosta spp.	Hosta	Mowed Lawn w/Trees	X
Hypericum perforatum	Common St. John's Wort	Successional Field	X
Impatiens capensis	Jewelweed	Wetland Edge	X
Iris sp.	Iris	Wetland Edge	
Lactuca canadensis	Wild Lettuce	Successional Field	X
Lactuca scariola	Prickly Lettuce	Successional Field	X
Leonurus cardiac	Motherwort	Pasture	X
Lepidium campestre	Peppergrass	Successional Field	X
Lepidium virginicum	Poor-Man's-Pepper	Successional Field	X
Linaria vulgaris	Butter and Eggs	Successional Field	X
Lotus corniculatua	Birdsfoot Trefoil	Successional Field	X
Lychnis alba	Evening Lychnis	Successional Field	X
Lycopus americanus	American Horehound	Wetland Edge	
Lysimachia nummularia	Moneywort	Wetland Edge	
Lysimachia quadrifolia	Whorled Loosestrife	Appalachian Oak-Hickory Forest	X
Lythrum salicaria	Purple Loosestrife	Wetland Edge	X
Medicago lupulina	Black Medick	Successional Field	X
Melilotus alba	White Sweet Clover	Successional Field	X
Melilotus officinalis	Yellow Sweet Clover	Successional Field	X
Monotropa uniflora	Indian Pipe	Appalachian Oak-Hickory Forest	X
Nepeta catarica	Catnip	Wetland Edge	
Nipponanthemum nipponicum	Montauk Daisy	Mowed lawn w/Trees	X
Onoclea sensibilis	Sensitive Fern	Wetland Edge	
*Osmunda cinnamomea**	Cinnamon Fern	Wetland Edge	
Oxalis europea	Yellow Wood Sorrel	Orchard	X
Oxalis stricta	Yellow Wood Sorrel	Orchard	X
Phytolacca americana	Pokeweed	Successional Field	X
Pilea pumila	Clearweed	Wetland Edge	
Plantago lanceolata	English Plantain	Orchard	X
Plantago major	Common Plantain	Orchard	X
Polygonatum biflorum	Smooth Solomon's Seal	Appalachian Oak-Hickory Forest	X
Polygonum caespitosum	Long Bristled Smartweed	Wetland Edge	
Polygonum cuspidatum	Japanese Knotweed	Successional Southern Hardwoods	X
Polygonum lapathifolium	Nodding Smartweed	Wetland Edge	
Polygonum persicaria	Lady's Thumb	Successional Field	X
Polygonum sagittatum	Arrow-Leaved Tear Thumb	Existing Excess Soil Deposition Area	X
*Polystichum acrostichoides**	Christmas Fern	Appalachian Oak-Hickory Forest	X
Portulaca orleracea	Common Purslane	Orchard	X
Potentilla recta	Rough-Fruited Cinquefoil	Appalachian Oak-Hickory Forest	X
Prunella vulgaris	Common Selfheal	Successional Field	X
Rubus flagellaris	Northern Dewberry	Successional Southern Hardwoods	X
Rudbeckis serotina	Black-Eyed Susan	Successional Field	X
Rumex crispus	Curled Dock	Successional Field	X
Saponaria officinalis	Bouncing Bet	Orchard	X
Scutellaria lateriflora	Mad-Dog Skullcap	Wetland Edge	
Smilacina racemosa	False Solomon's Seal	Hemlock-Northern Hardwood Forest	
Solanum carolinense	Horse Nettle	Orchard	X
Solanum ptycanthum	Black Nightshade	Successional Field	X
Solidago caesia	Blue-Stemmed Goldenrod	Existing Excess Soil Deposition Area	X
Solidago graminifolia	Lance-Leaved Goldenrod	Successional Field	X
Solidago graminifolia	Common Flat-Topped Goldenrod	Successional Field	X
Solidago rugosa	Rough-Stemmed Goldenrod	Successional Field	X
Solidago spp.	Goldenrod	Successional Field	X

Table 9-1 (cont'd)
Flora Observed on the Project Site During 2008 Field Surveys

Scientific Name	Common Name	Primary Cover Class	Species Found Within Proposed Disturbance Area
Forbs (cont'd)			
Stellaria graminea	Common Stitchwort	Successional Field	X
Symphyotrichum dumosum	Bushy Aster	Existing Excess Soil Deposition Area	X
Taraxacum officinale	Dandelion	Successional Field	X
Trifolium pratense	Red Clover	Successional Field	X
Trifolium procumbens	Low Hop Clover	Successional Field	X
Trifolium repens	White Clover	Successional Field	X
Tussilago farfara	Coltsfoot	Wetland Edge	X
Typha sp.	Cattail	Wetland Edge	
Urtica dioica	Stinging Nettle	Wetland Edge	
Urtica procera	Tall Nettle	Existing Excess Soil Deposition Area/Pasture	X
Verbascum thapsus	Common Mullein	Successional Field	X
Verbena urticifolia	White Vervain	Successional Field	X
Vicia cracca	Cow Vetch	Successional Field	X
Vicia sativa	Common Vetch	Successional Field	X
Vitis aestivalis	Summer Grape	Successional Southern Hardwoods	

Notes: With the exception of the term "wetland edge," primary cover classes are based on Edinger, G.J, et al., Ecological Communities of New York State: Second Edition. Albany, NY. 2002.

* Species listed as "exploitably vulnerable" in New York State according to the "New York Rare Plant Status List", NYNHP, June 2008.

Source: 2008 field surveys.

MOWED LAWN AND MOWED LAWN WITH TREES

The vegetative community in the vicinity of the main site (i.e., between buildings, front lawns, and along roadways and pathways) is described by Edinger, et al., as "mowed lawn with trees" and "mowed lawn." Mowed lawn with trees is "residential, recreational, or commercial land in which the groundcover is dominated by clipped grasses and forbs, and it is shaded by at least 30 percent cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover." Mowed lawn is groundcover that is "dominated by clipped grasses and there is less than 30 percent cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50 percent cover." Both the mowed lawn with trees and mowed lawn cover types occupy the majority of the WEC to Route 22 and the land area in the immediate vicinity of the Wastewater Treatment Facility.

Tree species observed on-site within lawn areas include native species, such as hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*), sugar maple (*Acer saccharum*), and silver maple (*Acer saccharinum*), and non-native ornamental species, such as Callery pear (*Pyrus calleryana*), Norway maple (*Acer platanoides*), and Japanese black pine (*Pinus thunbergii*). Areas directly around buildings are heavily landscaped with ornamental plants, including burning bush (*Euonymous alatus*), flowering dogwood (*Cornus florida*), hosta species (*Hosta* spp.), dwarf Alberta spruce (*Picea glauca*), and Montauk daisy (*Nipponanthemum nipponicum*).

ORCHARD

Edinger, et al., describes an orchard as a "stand of cultivated fruit trees (such as apples, cherries, peaches, pears, etc.), often with grasses as a groundcover." The orchard community was established in 1985 and covers approximately 13 acres of sloping land on-site and is located on

the northern portion of the WEC. This habitat type constitutes the majority of the land area that would be disturbed by the proposed project. Divided into four blocks, the orchard consists of approximately 1,400 apple trees, including varieties of golden delicious, red delicious, and redkist, and 400 peach trees, including garnet beauty peaches, red haven, early red haven, and Biscoe, planted in mulched rows. The remaining portion of the herbaceous layer is dominated by maintained grasses (i.e., lawn) with scattered plants of horse nettle (*Solanum carolinense*), nut sedge (*Cyperus esculentus*), red clover (*Trifolium pretense*), white clover (*Trifolium repens*), and cow vetch (*Vicia cracca*).

SUCCESSIONAL OLD FIELD

A successional old field is defined by Edinger, et al., as a "meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned. Shrubs may be present, but collectively have less than 50 percent cover in the community."

Successional old field communities are scattered throughout the project site and can be found along roadsides, the orchard community, and on the edges of woodland areas. Dominant plants observed during site inspection include vetch (*Vicia* sp.), Queen-Anne's lace (*Daucus carota*), mugwort (*Artemisia vulgaris*), ragweed (*Ambrosia artemisiifolia*), chicory (*Chicorium intybus*), orchard grass (*Dactylis glomerata*), fescue (*Festuca* sp.), and goldenrod (*Solidago* spp.) species. Autumn olive (*Eleaganus umbellate*) is present in low numbers within the shrub layer.

HEMLOCK-NORTHERN HARDWOOD FOREST

The forest community in the vicinity of Mountain Brook north of the proposed project can be best described as a Hemlock-northern hardwood forest. Edinger, et al., describes this community as "a mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. In any one stand, hemlock (*Tsuga canadensis*) is codominant with any one to three of the following: beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red maple (*A. rubrum*), black cherry (*Prunus serotina*), white pine (*Pinus strobus*), yellow birch (*Betula alleghaniensis*), black birch (*B. lenta*), red oak (*Quercus rubra*), and basswood (*Tilia americana*)."

Site inspection reveals that the canopy in the vicinity of Mountain Brook is dominated by hemlock and sugar maple. American sycamore (*Platanus occidentalis*) also occurs in the canopy stratum. Sugar maples are large; some of which measure approximately 36 inches diameter at breast height (dbh). The subcanopy consists of beech, hemlock, and birch species. The herbaceous layer is quite sparse, although white wood aster (*Aster divaricatus*) and enchanter's nightshade (*Circaea quadrisulcata*) are present in small numbers. Portions of this community overlap with the Appalachian oak-hickory forest community described below.

APPALACHIAN OAK-HICKORY FOREST

Portions of the periphery of the project contain forested areas of what Edinger, et al., would describe as Appalachian oak-hickory forest. This community is a "hardwood forest that occurs on well-drained sites, usually on ridge tops, upper slopes, or south- and west-facing slopes. Characteristic species include red oak (*Quercus rubra*), white oak (*Q. alba*), and black oak (*Q. velutina*). Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut (*Carya glabra*), shagbark (*C. ovata*), and sweet pignut (*C. ovalis*)."

The Appalachian oak-hickory forest community type is the dominant forest type on the eastern, undeveloped slopes of the overall WEC property. Inspection of portions of this community type immediately adjacent to the proposed project disturbance area reveals that the canopy comprises red oak, chestnut oak, and hickories with a similar composition in the subcanopy. Some trees exceed 18 inches in diameter. In the shrub stratum, witch hazel (*Hamamelis virginiana*), white ash, maple-leaf viburnum (Viburnum acerifolium), blueberries (Vaccinium angustifolium) and hickory saplings are common. Non-native invasive plants, including Asiatic bittersweet (*Celastrus orbiculatus*) and multiflora rose (*Rosa multiflora*) occur in certain areas of this stratum. However, the shrub and ground layers are diverse and native plants are dominant, especially the further from areas of development/disturbance. In the herb stratum, native species include white wood aster, wild sarsaparilla (Aralia nudicaulis), striped wintergreen (Chimaphila maculata), enchanter's nightshade, yellow avens (*Geum aleppicum*), wild licorice (*Galium circaezans*), goldenrod sp. (*Solidago* sp.), marginal wood fern (*Dryopteris marginalis*), Christmas fern (*Polystichum acrostichoides*), and Virginia creeper (*Parthenocissus quinquefolia*).

SUCCESSIONAL SOUTHERN HARDWOODS

Fragments of the Appalachian oak-hickory forest type are noticeable in other portions of the project site, but are isolated to small pockets that provide limited ecological value due to the high density of invasive plant species and the fragmentation by roadways, parking lots, and buildings. Although Appalachian oak-hickory forest species are present, the community would be better described as a successional southern hardwood type, due to evidence of disturbance. Edinger, et al., describes successional southern hardwood forest as "a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Characteristic trees and shrubs include any of the following: American elm (*Ulmus americana*), slippery elm (*U. rubra*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), box elder (*Acer negundo*), silver maple (*A. saccharinum*), sassafras (*Sassafras albidum*), gray birch (*Betula populifolia*), hawthorns (*Crataegus spp.*), eastern red cedar (*Juniperus virginiana*), and choke-cherry (*Prunus virginiana*). Certain introduced species are commonly found in successional forests, including black locust (*Robinia pseudo-acacia*), tree-of-heaven (*Ailanthus altissima*), and buckthorn (*Rhamnus cathartica*)."

The woodland areas in the vicinity of the existing development, (i.e., the wooded area adjacent to the visitor parking lot) contain oaks, hickories, and maples characteristic of the Appalachian oak-hickory forest community, but also supports a number of uncharacteristic species, such as black cherry, hemlock, and American elm (*Ulmus americana*). In addition, several non-native and invasive species, including tree-of-heaven (*Ailanthus altissima*), tartarian honeysuckle (*Lonicera tatarica*), privet (*Ligustrum* sp.), and Japanese barberry (*Berberis thunbergii*), are present in the subcanopy and shrub strata. Japanese honeysuckle is a dominant species in the herbaceous layer.

SUCCESSIONAL RED CEDAR WOODLAND

Wooded land bordering the WEC to the east, near the existing picnic area, would be described as successional red cedar woodland by Edinger, et al. A successional red cedar woodland is "a woodland community that commonly occurs on abandoned agricultural fields and pastures, usually at elevations less than 1,000 ft (305 m). The dominant tree is eastern red cedar (*Juniperus virginiana*), which may occur widely spaced in young stands and may be rather dense in more mature stands." The successional red cedar woodland observed at the WEC is a

homogenous stand of red cedar with a sparse understory. Asiatic bittersweet was observed along the edges of this community type in all strata, along with Norway maple, black cherry, and poison ivy.

PASTURELAND

An active pasture area is located northwest down slope from the WEC and also north of the proposed primary WEC buildings' location in an area proposed for alternative excess soil deposition. As defined by the Ecological Communities of New York State (Edinger, et al., 2002), pastureland is "agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock." The pasture areas located within the footprint of the proposed project are gently sloping and actively grazed by cattle. On-site pastureland is largely open grassland with sparse trees, including such species as white ash, pin oak, and bald cypress, planted as ornamental or shade trees.

EXISTING EXCESS SOIL DEPOSITION AREA

An existing cleared area upslope and east of the existing WEC is currently used as a deposition area for compostable leaves and woody debris gathered from landscaping and maintenance activity. This area is proposed to be used as a permanent deposition area for excess soil material generated by the proposed project. Where vegetation is present, dominant herbs and shrubs include invasive or early successional species, including goldenrod (*S. caesia*, *S. rugosa*), mugwort (*Artemesia vulgaris*), burdock (*Arctium lappa*), tall nettle (*Urtica procera*), jewelweed (*Impatiens capensis*), and black raspberry (*Rubus occidentalis*). The existing excess soil deposition area is surrounded by the Appalachian Oak-Hickory Forest community type with its characteristic vegetation described above and also by the co-dominant tree species sugar maple (*Acer saccharinum*) and black birch (*Betula lenta*). Bordering the compost area to the east and confined by a north-south trending rocky outcrop is a more moist forest community containing red maple (*Acer rubrum*), tulip tree, beech (*Fagus grandifolia*), mountain laurel (*Kalmia latifolia*), and spicebush (*Lindera benzoin*) further downslope.

WILDLIFE

This section describes the major wildlife habitat types identified and wildlife species expected to inhabit the project site. Although no targeted wildlife sampling was conducted, such as live trapping or breeding bird survey, wildlife species observed during the vegetation inventory conducted in August 2008 were noted and are identified below. A comprehensive list of wildlife expected to frequent the project site is included in **Table 9-2** based on the habitat documented on the project site itself and in the surrounding landscape.

Table 9-2
Wildlife Species Potentially Present on the WEC Property and Vicinity

Common Name	Scientific Name	Habitat Requirements
Mammals		
Northern Short-Tailed Shrew*	*Blarina brevicauda*	Humid forest w/ loose leaf litter
Coyote	*Canis latrans*	Open to semi-open country
Beaver	*Castor canadensis*	Wooded streams, rivers, lakes
Southern Red-Backed Vole	*Clethrionomys gapperi*	Cool moist forest near water
Starnose Mole	*Condylura cristata*	Low wet ground near waterbodies
Opossum*	*Didelphis marsupialius*	Wet woods/developed areas
Big Brown Bat*	*Eptesicus fuscus*	Abundant in agricultural and developed landscapes
Porcupine	*Erethizon dorsatum*	Hardwood hemlock forest
Southern Flying Squirrel	*Glaucomys sabrinus*	Mature deciduous forest
Silver Haired Bat	*Lasionycteris noctivagans*	Dead trees near water
Eastern Red Bat	*Lasiurus borealis*	Hardwood shade trees, mild temps
Hoary Bat	*Lasiurus cinereus*	Hardwood forest, open cultivated areas
Otter	*Lontra canadensis*	Complex riparian structure
Bobcat	*Lynx rufus*	Successional forest, elusive
Woodchuck*	*Marmota monax*	Well-drained soils, meadows
Striped Skunk*	*Mephitis mephitis*	Variable, suburban to wooded
Meadow Vole*	*Microtus pennsylvanicus*	Fields pastures orchards, abundant
Woodland Vole	*Microtus pinetprum*	Fossorial, well-drained soil
House Mouse*	*Mus musculus*	Buildings, fields, abundant
Ermine	*Mustela erminea*	Successional woodlands, meadow
Longtail Weasel	*Mustela frenata*	Woodland edges near water
Mink	*Mustela vison*	Wetland habitats
Keen's Myotis	*Myotis keenii*	Roosts in caves and trees
Small-Footed Myotis[1]	*Myotis leibii*	Mountain foothills in coniferous woodlands
Little Brown Myotis*	*Myotis lucifugus*	Hollow trees, buildings
Woodland Jumping Mouse	*Napaeozapus insignis*	Moist cool woodlands w/ herbaceous cover near water
White-Tailed Deer*	*Odocoileus virginianus*	Fields and openings
Muskrat	*Ondatra zibethica*	Marshes ponds w/ emergent veg.
Hairy-Tailed Mole	*Parascalops breweri*	Loose sandy loam soil
White-Footed mouse*	*Peromyscus leucopus*	Forest, edges, field
Deer Mouse	*Peromyscus maniculatus*	Mixed forests with nest cavities
Eastern Pipistrelle	*Pipistrellus subflavus*	Forages over water along forest-field edges
Raccoon*	*Procyon lotor*	Edge habitat near water, common
Eastern Mole*	*Scalopus aquaticus*	Pastures, meadows, lawns
Gray Squirrel*	*Sciurus carolinensis*	Mast-producing trees
Masked Shrew	*Sorex cinereus*	Damp woodlands; leaves and herbaceous vegetation
Long-Tailed Shrew	*Sorex dispar*	Cold, damp, rocky coniferous forest
Smokey Shrew	*Sorex fumeus*	Upland forest w/ decaying logs
Pygmy Shrew	*Sorex hoyi*	Moist leaf mold near water
Water Shrew	*Sorex palustris*	Herbaceous cover; cold waterbodies
Eastern Cottontail*	*Sylvilagus floridanus*	Farmland, pastures, hedgerows
New England Cottontail[1]	*Sylvilagus transitionalis*	Brushy areas, open woodlands
Southern Bog Lemming	*Synaptomys cooperi*	Sphagnum bogs, moist soils
Eastern Chipmunk*	*Tamias striatus*	Forests, rock walls
Red Squirrel	*Tamiasciurus hudsonicus*	Coniferous forest, mature trees
Black Bear	*Ursus americanus*	Forest dominated landscapes
Red Fox*	*Vulpes fulva*	Mosaic of field, cropland, forest
Meadow Jumping Mouse	*Zapas hudsonicus*	Moist grassy brushy fields

Table 9-2 (cont'd)
Wildlife Species Potentially Present on the WEC Property and Vicinity

Common Name	Scientific Name	Habitat Requirements
Reptiles and Amphibians		
Jefferson Salamander[1]	*Ambystoma jeffersonianum*	Temporarily flooded depressions with contiguous forest
Jefferson Salamander Complex	*Ambystoma jeffersonianum x laterale*	Wooded swamps, vernal pools w/ undisturbed upland woods
Spotted Salamander	*Ambystoma maculatum*	Mesic woods w/ fish-free waters
Eastern American Toad*	*Bufo americanus*	Moist upland woods
Common Snapping Turtle	*Chelydra serpentine*	Bottom dweller, diverse waters
Painted Turtle	*Chrysemys picta*	Muddy-bottom ponds, slow stream
Spotted Turtle[1]	*Clemmys guttata*	Unpolluted shallow waters near forest
Northern Black Racer*	*Coluber constrictor*	Old fields, clearings
Black Rat Snake	*Elaphe alleganiensis*	Forested steep rock outcropping
Northern Two-Lined Salamander	*Eurycea bislineata*	Alkaline streams
Wood Turtle[1]	*Glyptemys insculpta*	Slow sandy streams
Bog Turtle[2]	*Glyptemys muhlenbergii*	Calcareous wet meadows
Four-Toed Salamander	*Hemidactylium scutatum*	Acidic wet woodlands w/ sphag
Gray Treefrog	*Hyla versicolor*	Small trees/shrubs near shallow water
Eastern Milksnake	*Lampropeltis triangulum*	Woody brushy cover
Northern Watersnake	*Nerodia sipedon*	Rocky shores of waterbodies
Red-Spotted Newt	*Notophthalmus viridescnes*	Water w/ aquatic vegetation
Northern Slimy Salamander	*Plethedon glutinosus*	Moist woods, rock outcroppings
Northern Redback Salamander	*Plethodon cinereus*	Terrestrial, woods w/ logs stumps
Spring Peeper	*Pseudacris crucifer*	Marshy or wet woods, wetlands
Bullfrog	*Rana catesbiana*	Deep permanent water
Green Frog	*Rana clamitans*	Riparian or shallow water
Pickerel Frog	*Rana palustris*	Varity of cold, clear waters
Southern Leopard Frog[1]	*Rana sphenocephala*	Shallow, freshwater ponds
Wood Frog	*Rana sylvatica*	Mesic woods, temporary waters for breeding
Eastern Box Turtle[1]	*Terrapene carolina*	Woodlands, field edges
Common Garter Snake*	*Thamnophis sirtalis*	Ubiquitous, terrestrial
Fish		
Black Bullhead	*Ameiurus melas*	Slow current of creeks/rivers
Bluegill	*Lepomis macrochirus*	Lakes and slow-moving rocky streams
Brook Trout	*Salvelinus fontinalis*	Clear, cool, well-oxygenated streams and lakes
Brown Bullhead	*Ameiurus nebulosus*	Weedy streams, rivers. Also impoundments, lakes, ponds
Triploid Grass Carp	*Ctenopharyngodon idella*	Small lakes, backwaters, invasive
Largemouth Bass	*Micropterus salmoides*	Quiet, clear waters with abundant vegetation
Pickerel	*Esox americanus*	Clear lakes and slow streams
Shiner Species	*Cyprinidae family*	Small streams
Smallmouth Bass	*Micropterus dolomieui*	Cooler rivers and lakes, rocky or sandy substrates
Redbreast	*Lepomis auritus*	Vegetated pools and lake margins
Rock Bass	*Ambloplites rupestris*	Rocky areas in lake shallows
Black Crappie	*Pomoxis nigromaculatus*	Clear, warm, highly vegetated waters of lakes and rivers
Yellow Perch	*Perca flavescens*	Lakes, river impoundments
Birds		
Cooper's Hawk[1]	*Accipiter cooperii*	Mature forest in semi-open country
Spotted Sandpiper	*Actitis macularia*	Margins of fresh waterbodies
Red-Winged Blackbird	*Agelaius phoeniceus*	Emergent vegetation in open areas
Wood Duck	*Aix sponsa*	Woodlands near shallow inland waters
Mallard	*Anas platyrhynchos*	Shallow water, ponds streams
Ruby-Throated Hummingbird	*Archilochus colubris*	Woodlands near streams, feeds in a variety of habitats w/ tubular flowers
Great Blue Heron	*Ardea herodias*	Marshes, lake margins, forested wetlands w/ tall trees for nesting
Tufted Titmouse*	*Baeolophus bicolor*	Deciduous, mixed woods, parks

Table 9-2 (cont'd)
Wildlife Species Potentially Present on the WEC Property and Vicinity

Common Name	Scientific Name	Habitat Requirements
Birds (cont'd)		
Cedar Waxwing*	*Bombycilla cedrorum*	Berry-producing vegetation of fields, edges
Canada Goose	*Branta canadensis*	Marshes, lake shores, grassy areas
Red-Tailed Hawk*	*Buteo jamaicensis*	Open habits w/ large trees
Green Heron	*Butoridea viscens*	Shrub or forested wetlands, ponds
Northern Cardinal	*Cardinalis cardinalis*	Thick underbrush, shrubs
American Goldfinch*	*Carduelis tristis*	Open weedy fields, farmland, marches
House Finch*	*Carpodacus mexicanus*	Developed areas with open ground
Turkey Vulture	*Cathartes aura*	Mixed farmland and forest, variable
Veery	*Catharus fuscescnes*	Moist woods w/ thick understory
Brown Creeper	*Certhia americana*	Dense forest and forested wetlands w/ loose bark
Belted Kingfisher	*Ceryle alcyon*	Small waterbodies, nests in sandy bank
Chimney Swift	*Chaetura pelagica*	Nests in chimneys, hollow trees
Killdeer*	*Charadrius vociferus*	Open fields, waste areas
Yellow-Billed Cuckoo	*Coccyzus americanus*	Low dense shrubby vegetation
Black-Billed Cuckoo	*Coccyzus enthrpthalmus*	Low dense shrubby vegetation
Northern Flicker	*Colaptes auratus*	Large trees in forests, edges
Rock Pigeon	*Columba livia*	Open country, cities
Eastern Wood-Pewee	*Contopus virens*	Deciduous woods open understory
Black Vulture	*Coragyps atratus*	Open land w/ woods/brush, northern range of more southern species
American Crow*	*Corvus brachyrhynchos*	Open country, suburbia
Common Raven	*Corvus corax*	Montane forests, coastal
Blue Jay*	*Cyanocitta cristata*	Mixed woodlands, suburbia
Mute Swan	*Cygnus olor*	Shallow waters, marshes, ponds
Black-Throated Blue Warbler	*Dendroica caerulescens*	Large hardwood tracts
Prairie Warbler	*Dendroica discolor*	Dry areas w/ low trees and shrubs
Chestnut-Sided Warbler	*Dendroica pensylvanica*	Edges and second growth woods
Yellow Warbler*	*Dendroica petechia*	Wooded borders, prefers water sites
Pine Warbler	*Dendroica pinus*	Open pine forests, tall trees
Pileated Woodpecker	*Dryocopus pileatus*	Mature forest, large old trees
Gray Catbird*	*Dumetella carolinensis*	Low shrubby vegetation, borders
Alder Flycatcher	*Empidonax alnorum*	Alder swamps, shrub wetlands
Least Flycatcher	*Empidonax minimus*	Forests and clearings
Acadian Flycatcher	*Empidonax virescens*	Mature deciduous forest
Willow Flycatcher	*Empinonax trailii*	Open areas w/ shrubs
Common Yellowthroat	*Geothlypis trichas*	Moist brushy habitat w/ small trees
Worm-Eating Warbler	*Helmitheros vermivorus*	Wooded ravines w/ dense understory
Barn Swallow*	*Hirundo rustica*	Farmland, suburban
Wood Thrush	*Hylocichla mustelina*	Mature, moist forests
Baltimore Oriole*	*Icterus galbula*	Open areas, tall trees, urban tolerant
Red-Bellied Woodpecker	*Melanerpes carolinus*	Mature woodlands, dead trees
Wild Turkey	*Meleagris gallopavo*	Mast-producing forests, variable
Swamp Sparrow	*Melospiza georgiana*	Variety of open wetland types
Song Sparrow	*Melospiza melodia*	Moist areas w/ brushy vegetation
Northern Mockingbird*	*Mimus polyglottos*	Variety of open habitats
Black-and-White Warbler	*Mniotilta varia*	Deciduous and mixed forests
Brown-Headed Cowbird*	*Molothrus ater*	Open fields, mowed areas
Great Crested Flycatcher	*Myiarchus crinitus*	Woodland edge, tree cavity nesting
House Sparrow*	*Passer domesticus*	Villages, farms, cavity nester
Indigo Bunting	*Passerina cyanea*	Wood edges, brushy fields, tall trees
Rose-Breasted Grosbeak	*Pheucticus ludovicianus*	Edge of mature deciduous forest
Downy Woodpecker*	*Picoides pubescens*	Mixed and urban forests
Hairy Woodpecker*	*Picoides villosus*	Extensive forest, many types
Eastern Towhee	*Pipilo erthrophthalmus*	Dense brushy fields and edges, pine/oak
Scarlet Tanager	*Piranga olivacea*	Prefers mature forest
Black-Capped Chickadee*	*Poecile atricapillus*	Mixed woodlands, thickets, parks
Blue-Gray Gnatcatcher	*Polioptila caerulea*	Open, moist woodlands, insect gleaner
Common Grackle*	*Quiscalus quiscula*	Open areas near forest, urban tolerant
Eastern Phoebe*	*Sayornis phoebe*	Woodland, edges, agricultural
American Woodcock	*Scolopax minor*	Young forest, fields with moist soil

Table 9-2 (cont'd)
Wildlife Species Potentially Present on the WEC Property and Vicinity

Common Name	Scientific Name	Habitat Requirements
Birds (cont'd)		
Ovenbird	*Seiurus aurocapilla*	Large contiguous mature forests
Louisiana Waterthrush	*Seiurus motacilla*	Woodlands w/ flowing water
Northern Waterthrush	*Seiurus noveboracensis*	Cool, wet brushy areas near water
American Redstart	*Setophaga ruticilla*	Early successional deciduous
Eastern Bluebird	*Sialia sialis*	Fields orchards clearings, nest cavities
White-Breasted Nuthatch*	*Sitta carolinensis*	Mature forests, edges by open areas
Yellow-Bellied Sapsucker	*Sphyrapicus varius*	Mixed forests, hemlock/aspen/beech
Chipping Sparrow*	*Spizella passerina*	Open or forested, human tolerant
Field Sparrow*	*Spizella pusilla*	Grassy fields, low shrubs
Northern Rough-Winged Swallow	*Stelgidopterx serripennis*	Open country near water, nests in rocky embankments
European Starling*	*Sturnus vulgaris*	Farms, cities, hayfields
Tree Swallow*	*Tachycineta bicolor*	Open areas near water, tree cavity nester
Carolina Wren*	*Thryothorus ludovicianus*	Brushy vegetation, common
Brown Thrasher*	*Toxostoma rufum*	Dry thickets in wooded areas
House Wren*	*Trogodytes aedon*	Thickets, suburbia, cavity nester
American Robin*	*Turdus migratorius*	Ubiquitous-mixed woodlands, edges
Eastern Kingbird*	*Tyrannus tyrannus*	Open habitats w/ perches
Blue-Winged Warbler	*Vermivora pinus*	Old field w/ scattered shrubs
Yellow-Throated Vireo	*Vireo flavifrons*	Extensive mature moist forest
Warbling Vireo	*Vireo gilvus*	Riparian forest, bottomland
White-Eyed Vireo	*Vireo griseus*	Second growth w/ shrubs
Red-Eyed Vireo	*Vireo olivaceus*	Open deciduous forest, variable
Canada Warbler	*Wilsonia canadensis*	Favors deciduous forest swamps
Hooded Warbler	*Wilsonia citrina*	Dense deciduous in larger forest tracts
Mourning Dove*	*Zenaida macroura*	Open country, seed vegetation

Notes:
[1] NYS: *Special Concern*
[2] NYS: *Endangered*; Federal: *Threatened*
(*) indicates species that may frequent the footprint of the Proposed Project (orchard, lawn, wooded edge).
Sources: New York State Breeding Bird Atlas Project (2000-2005 Survey Period for Census Block containing project site); New York State Herp Atlas Project; American Society of Mammalogists' New York List; R.M. DeGraaf *New England Wildlife*, 2001.

Most wildlife species are directly dependent on the plant communities located on-site and will use an area only if a particular vegetative cover type or habitat is present. The overall 691-acre WEC property's combination of forest, streams, wetlands, and open fields/orchards provides diverse habitat able to support a variety of wildlife species. In addition, the size of the undeveloped portions of the WEC property creates opportunities for certain species that have larger home ranges or require less fragmented habitats, such as black bear, red fox, and forest-interior nesting birds. Emergent wetlands and ponded areas may provide habitat for such species as muskrat, raccoon, several different fish species, ducks, wading birds, and green frogs. Upland forest, field, and transitional zones may provide habitat for white-tailed deer, gray squirrels, meadow vole, and woodland bird species, such as warblers, woodpeckers, and owls. The orchards on-site may be used by white-tailed deer, perching or grassland birds, such small mammals as eastern moles, and American toads. Wood turtles, northern two-lined salamanders, water thrushes, and water shrews may inhabit the streams and surrounding riparian zones.

In contrast to the overall WEC property, and to other forested and undeveloped lands in the Town of Patterson, the project site itself contains limited resources for wildlife due to its current condition as mowed lawn with an interior roadway network and its use as an actively maintained orchard. Although transient individuals likely pass through the footprint of the proposed project or use it for brief periods of foraging, the diversity of animals that may make more permanent

use of the project site is comparatively small and limited to those tolerant of developed conditions.

Wildlife observed directly or through sign in the orchard area included barn swallow (*Hirundo rustica*), American goldfinch (*Carduelis tristis*), mourning dove (*Zenaida macroura*), and house sparrow (*Passer domesticus*). Wildlife noted in the open meadows and transitional zones includes eastern phoebe (*Sayornis phoebe*), blue jay (*Cyanocitta cristata*), gray catbird (*Dumetella carolinensis*), hairy woodpecker (*Picoides villosus*), wild turkey (*Meleagris gallopavo*), white-tailed deer (*Odecoileus virginianus*), northern short-tailed shrew (*Blarina brevicauda*), and eastern cottontail (*Sylvilagus floridanus*).

Table 9-2 provides a comprehensive list of mammalian species expected to frequent the overall WEC property based on available habitat. It also lists each species primary habitat requirement. Those species that may use the lawn, orchard, or wooded edge habitats and be directly displaced by the proposed project are noted with an asterisk (*).

THREATENED AND ENDANGERED SPECIES

The New York Natural Heritage Program (NYNHP), in a response dated August 14, 2008, has documented two rare species within 1 mile of the project site: the bog turtle (*Glyptemys muhlenbergii*) and the New England cottontail (*Sylvilagus transitionalis*). The bog turtle is listed as endangered by New York and as threatened by the U.S Fish and Wildlife Service. The New England cottontail is listed as a species of special concern by the NYSDEC.

BOG TURTLE (GLYPTEMYS MUHLENBERGII)

Bog turtles inhabit early successional wet meadows and calcareous fens characterized by shallow, slow-moving water, deep mucky soils, and tussock-forming herbaceous vegetation. Such habitat is not present on the project site, but may be present west of Route 22 in portions of the Great Swamp (DP-22). Bog turtle populations have been depressed by a number of factors, including habitat loss through human development, illegal collection, natural habitat succession, and habitat degradation via invasive species and contamination. If present on the WEC property, bog turtle would be strictly limited to areas west of Route 22 within and immediately adjacent to the Great Swamp (NYSDEC Wetland DP-22). The steeply sloped, wooded riparian wetlands on the eastern portions of the WEC property are not suitable habitat for the bog turtle.

NEW ENGLAND COTTONTAIL (SYLVILAGUS TRANSITIONALIS)

The New England cottontail has been documented within 1 mile of the project site. The New England cottontail is a small rabbit, and because it looks similar to the eastern cottontail (*Sylvilagus floridanus*) it can only be identified through genetic analysis and minor phenotypic differences. The New England cottontail inhabits early successional forests. Documented home ranges of the New England cottontail vary from 0.5 to 8 acres. The New England cottontail has experienced severe population declines due to habitat loss through invasive species, natural succession, and development as well as direct competition with introduced eastern cottontails and white-tailed deer. It is presumed that the *Sylvilagus transitionalis* populations in the region do not use the project site and that the rabbit species on-site is limited to eastern cottontail. The mapped location of the designated NHP habitat for *S. transitionalis* is not located on the project site.

RARE ECOLOGICAL COMMUNITIES

The NYNHP has identified three rare ecological communities located within 1 mile of the project site: (1) pitch pine-oak-heath-rocky summit, (2) red maple-hardwood swamp, and (3) floodplain forest. These ecological communities are considered significant due to their rarity or their high quality condition.

The pitch pine-oak-heath-rocky summit community is located on Cranberry Mountain, upslope to the east approximately 1,700 feet from the closest site disturbance within the project site parcel. A portion of this NHP-designated habitat is mapped within the northeast corner of the Valley Farms Corporation Property. This unique community is described by the NYNHP as a small community of savanna graduating to a woodland oak-heath forest with blueberry (*Vaccinium species*) shrubland and seasonally wet *Nyssa* woodland exclusions surrounded by oak-hickory and chestnut oak (*Quercus montana*) forest. The woodland is primarily composed of scrub oak (*Q. ilicifolia)* thicket with an overstory of red maple (*Acer rubrum*), white oak (*Q. alba*), chestnut oak, scarlet oak (*Q. coccinea*), shadbush (*Amelanchier arborea*), and understory of low heaths, with mountain laurel (*Kalmia latofolia*) scattered or locally dense throughout. The community is situated on a north to south running ridge.

The red maple-hardwood swamp community is located within the Great Swamp ecosystem, west of Route 22. The Great Swamp is described as a large swamp with a high level of species diversity. The NHP-mapped red maple-hardwood swamp community comprises 1,858 acres within the larger Great Swamp wetland system. The community contains some invasive species at the edges and the interior. The dominant tree, red maple (*A. rubrum*), is mature growth. The swamp is a fragmented landscape with forest, successional community, agricultural, residential, and commercial intrusions. The red maple-hardwood swamp community grades into a floodplain forest community. As this NHP-identified community is within the Great Swamp (Wetland DP-22), it is located 2,000 feet or more from the project site.

The floodplain forest community is also located within the Great Swamp ecosystem. The community is described by the NYNHP as a large area of floodplain forest that follows the East Branch Croton River, which flows south into the East Branch Reservoir. Small, scattered patches of shallow and deep emergent marsh and purple loosestrife marsh occur at the edge of and in the river. The floodplain forest grades into red maple hardwood swamp. The hills on the west and east sides are predominately forested with recovering hardwood forest. As this NHP-identified community is within the Great Swamp (Wetland DP-22), it is located 2,000 feet or more from the project site.

BREEDING BIRD ATLAS PROGRAM

Field surveys conducted by the New York State Breeding Bird Atlas (BBA) Project during the period of 2000-2005 identified one species of special concern within the atlas blocks containing the project site. The Cooper's hawk (*Accipiter cooperii*) has been designated as a species of special concern by NYSDEC due to population declines resulting from past illegal hunting pressures and pesticide contamination. Cooper's hawks typically inhabit coniferous, deciduous, or mixed forests and streamside groves. They have been shown to be relatively tolerant of forest fragmentation and human disturbance. Cooper's hawks breed in mature woodlands in otherwise open or semi-open country.

NHP-LISTED PLANT SPECIES

Of the plants identified onsite, several are listed as "exploitably vulnerable" by New York Natural Heritage Program, indicating that they are classified as "protected native plants" pursuant to 6NYCRR Part 193. Exploitably vulnerable plants are likely to become threatened in the near future throughout all or a significant portion of their ranges within the state if causal factors continue unchecked. It is a violation to remove protected native plants without consent of the property owner. The presence of protected native plants on a property subject to SEQRA must also be considered in the environmental impact review.

The exploitably vulnerable plants found on the project site include:

Christmas Fern (*Polystichum acrostichoides*)
Cinnamon Fern (*Osmunda cinnamomea*)
Mountain Laurel (*Kalmia latifolia*)
Marginal Wood Fern (*Dryopteris marginalis*)
Striped Wintergreen (*Chimaphila maculata*)
Flowering Dogwood (*Cornus florida*)

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the proposed project, vegetative composition and wildlife population density and diversity are expected to remain relatively unchanged from existing conditions. The orchard, pasture lands, and mowed lawns are expected to be maintained in their current condition. The upland forest areas are in a predominately advanced successional stage; therefore, forest succession would not alter the site appreciably. Little change is expected to occur to the ecological communities present on the project site. Should future land uses remain essentially the same, the project site's riparian and ponded areas would continue to receive consistent surface and groundwater inputs to retain these areas in their current condition. Without the land use changes proposed, the project site would continue to accommodate the wildlife species and species density that it does today.

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

As shown in Figure 9-1, the footprint of a majority of the proposed project would displace land that is currently cleared and actively used for orchard, pasture, and facilities related to the existing WEC. The orchard and lawn areas comprising the bulk of the project site have remained heavily maintained (mowed/cleared) for many years for field crops as a farm, and additionally since the time of the initial planting of the orchard in 1987 and subsequent construction of the WEC beginning in 1989. As a result, they are floristically depauperate, containing low species diversity, as evidenced during site inspection.

The site of the proposed buildings and impervious surfaces is separated from more valuable forest and stream habitats nearby by the existing loop roadway and other facilities (i.e., wastewater treatment and recycling buildings, and detention basins). It does not offer valuable nesting or foraging opportunities for terrestrial animals. No threatened, endangered, or rare species of plants or animals were identified within the areas proposed to be disturbed for the proposed project nor are any expected to use the project site as critical habitat. At present,

wildlife use of the project site is largely limited to common perching birds of open, agricultural habitats and mammals adapted to human-altered environments. As discussed previously, such animals include woodchuck, northern short-tailed shrew, meadow vole, striped skunk, eastern mole, eastern cottontail, northern black racer, American goldfinch, red-tailed hawk, gray catbird, barn swallow, mockingbird, eastern kingbird, field sparrow, and others.

The project site's ecological value lies not only in its current state, but in its potential if left fallow for a period of years or if improved via habitat restoration. Grassland birds that are adapted to fields maintained on an infrequent basis, such as eastern bluebird (*Sialia sialis*) or willow flycatcher (*Empinonax trailii*) or the wider array of species that frequent shrubby, early successional habitats and woodlands, would only frequent the project site if it was further in the successional stage (grassland or shrubland or forest). Such loss of potential future land values fall in the category of "irretrievable commitment of resources," discussed in Chapter 18, rather than in the assessment of direct impacts of the proposed project. The existing habitat (orchard/lawn) comprising the vast majority of the proposed project site has low value at present. Therefore, the loss of a portion of these habitats is not significant or adverse.

Whether maintained in its current state, developed as proposed by the amended site plan, or left fallow (not an alternative considered by this environmental assessment), the footprint of the proposed project does not constitute unique habitat rare in the region. It contains no natural wetland or surface water resources and therefore presents fewer opportunities for harboring rare plant or animal species. The more valuable forest and wetland habitats on-site would be preserved by the proposed project's chosen location and compact layout of proposed buildings. Thus, all potentially significant impacts to plants and animals would be avoided by careful project siting and design. By choosing a previously cleared and highly used area, the project would not induce further habitat fragmentation, a phenomenon shown to be detrimental to regional biological diversity.

Cut/fill calculations have determined that excess earth material to be excavated from the construction site cannot be fully accommodated as part of regrading within the primary area of construction and would require deposition elsewhere on the project site parcel (Lot #53 - 362.50-acre lot). The proposed site for this is the land area in and around the existing excess soil deposition area located upslope from the existing WEC campus. This would require the clearing of a portion of Appalachian oak-hickory forest, as shown in Figure 9-1. This location for deposition of excess earth material has been included in the overall 49-acre limit-of-disturbance footprint for the overall project. Several "exploitably vulnerable" plants are located within the footprint of disturbance of the forest located at the excess soil deposition area, including Christmas fern (*Polystichum acrostichoides*), mountain laurel (*Kalmia latifolia*), marginal wood fern (*Dryopteris marginalis*), and striped wintergreen (*Chimaphila maculata*). These are not endangered, threatened, or rare plants, but are less common due to pressure from collectors or other factors. These plants can be successfully relocated to undisturbed regions of the Watchtower property prior to construction to avoid impacts to these plants.

Project designers have also considered the north pasture area as an alternate location to receive excess soil material. This is the open field area located north of the on-site reservoir. Although no forest clearing would be required at the north pasture area because it is actively used for cow grazing, this alternative would require the construction of a new stream crossing (bridge) of Mountain Brook to access the site from the construction area.

The vegetative communities of both alternative locations for excess soil deposition – the "excess soil deposition area" and the "north pasture area" – have been examined in the field and the vegetation observed at each location is included in Table 9-1. On December 8, 2009, the

applicant met with the Town's Environmental Conservation Inspector (ECI) onsite to examine these two alternative locations. A wetland was identified adjacent to the wooded, "excess soil deposition" alternative. As a result, use of this alternative for excess soil disposal would require a permit from the Town for disturbance/fill within the Town's 100-foot wetland buffer. The Town's ECI has submitted a preliminary analysis of both alternative soil deposition locations (Kozlowski, 12.8.09) which can be found in Appendix A. The applicant is open to either option. However, only one, the "excess soil deposition area", is chosen for consideration in this DEIS so that the total impacts of the overall project can be calculated and assessed.

Of the 49 acres within the limit of disturbance for the proposed project, **Table 9-3** indicates the approximate amount of acreage in each of the habitat categories identified on-site. Of this acreage of habitat displacement, only 11.2 acres would consist of built surfaces (buildings, roads, and pavers[1]) resulting in permanent loss of vegetative cover. The remaining 37.9 acres would be revegetated with a mix of maintained lawn and landscape plantings.

Table 9-3
Disturbance by Habitat Cover Type

Habitat Cover Type	Acreage of Disturbance
Mowed Lawn and Mowed Lawn with Trees	17 acres
Pastureland	10 acres
Orchard	12 acres
Successional Old Field*	2 acres
Hemlock-Northern Hardwood Forest	0.1 acres
Appalachian Oak-Hickory Forest	3 acres
Successional Southern Hardwoods	1 acres
Successional Red Cedar Woodland	0 acres
Existing Buildings and Hard Surfaces	4 acres
Total	**49.1 acres**

Notes: *Includes successional field habitat within the existing excess soil deposition area.

In summary, by locating the majority of the proposed project in areas of existing lawn and orchard in close proximity to the existing WEC buildings, further habitat fragmentation would be avoided and impacts to on-site flora and fauna would be minimized. Furthermore, aside from the orchard, which would be removed, and the forest adjacent to the existing excess soil deposition area, other areas of existing trees and all vegetated stream buffers are avoided by the proposed site plan.

As shown in the detailed Landscaping Plans that accompany this DEIS (Drawings LD-101 to LD-107), a comprehensive planting plan has been prepared for the amended site plan and for portions of the existing campus. Native and ornamental woody species are proposed at a high density throughout to add habitat value and species diversity. The selection of species will avoid those that are exotic or invasive. A more detailed planting schedule will be developed later in the environmental review process. In addition, significant portions of the proposed project area, and portions of the existing campus, that are currently maintained as mowed lawn are proposed to be converted back to field habitat with a northeastern native wildflower mix. Not only will this decrease mowing requirements, but it will also significantly enhance the habitat value of these areas for field-dependent birds, mammals and insects on a large scale. Both proposed detention

[1] The 11.2-acre "built surfaces" includes 44,295 square feet (approx. 1.0 acre) of pervious pavers, which would allow stormwater infiltration.

ponds will be vegetated with shallow water bench habitat, including such wetland plant species as *Acorus calamus*, *Iris versicolor*, *Juncus effusus*, *Saururus cernuus*, and *Sagittaria latifolia*. Additional native plant species would be installed within a shoreline fringe and facultative pond buffer upslope from the permanent pool. In sum, for both wetland pond and upland habitats, the landscaping plan is intended to enhance onsite floristic diversity and habitat complexity beyond that which currently exists and result in a decrease in irrigation/fertilization requirements as compared to the fruit tree orchard now located on much of the project site. Therefore, despite the installation of new buildings/roadways as part of the proposed project, a net enhancement over existing conditions is expected in the area of natural resource benefits onsite. ✴

Chapter 10: Traffic, Parking, and Public Transportation

A. INTRODUCTION

This chapter examines the potential impacts of the proposed project on traffic, parking, and public transportation in the study area. The analysis methodology and existing conditions in the study area, including the roadway network, are described first. The chapter then discusses future conditions in the study area assuming the proposed project is not built (also referred to as the No Build condition in this chapter). Finally, project-generated increments and the potential impacts that could result on traffic conditions, parking, and transit with the proposed project are assessed (the Build condition).

PRINCIPAL CONCLUSIONS

As detailed below, the proposed construction of an additional 186,000 square feet (sf) of building coverage comprising 904,000 square feet of building space and an additional 500 residents at the existing Watchtower Educational Center (WEC) would not result in any significant traffic impacts requiring mitigation at any study area intersections. Likewise, there would also be adequate parking supply on the project site to accommodate the projected parking demand, and no significant adverse parking impacts would result. Further, there would be no impacts on buses or trains serving the study area, and all public transit systems would have available capacity to handle the project's demand.

Finally, it is recommended that the New York State (NYS) Route 22/WEC Main and South Driveways be monitored shortly after completion of the project to determine if signalization of the intersection is required.

B. METHODOLOGY

ROADWAY NETWORK

To assess the potential traffic impacts that could result from the proposed project, five key study area intersections that would most likely be affected by the site-generated traffic were identified (see **Figure 10-1**). The intersections are:

- NYS Route 22 at County Road 68/Patterson Automotive Driveway (signalized);
- NYS Route 22 at NYS Route 311 (signalized);
- NYS Route 22 at WEC Main Driveway/WEC South Driveway (unsignalized);
- NYS Route 22 at WEC North Driveway (unsignalized); and
- NYS Route 22 at NYS Route 164 (unsignalized).

Following is a brief description of the major roadways within the study area:

- **NYS Route 22** is a major two-way north-south road in Patterson that ranges in width from approximately 50 to 60 feet within the study area. NYS Route 22 generally provides one moving lane in each direction within the study area. Parking along NYS Route 22 is prohibited within the study area.
- **County Road 68**, also known as Haviland Hollow Road, is a major two-way east-west road in Patterson. County Road 68 provides one lane in each direction within the study area. Parking along County Road 68 is prohibited within the study area.
- **NYS Route 164** is a major two-way east-west road in Patterson. NYS Route 164 provides one moving lane in each direction within the study area. Parking is prohibited along NYS Route 164 in study area.
- **NYS Route 311** is a two-way east-west road in Patterson. NYS Route 311 provides one travel lane in each direction within the study area and access to the Metro-North Railroad station in Patterson via Front Street. Parking is prohibited along NYS Route 311 in the study area.
- The **WEC Main Driveway** is a private two-way divided entrance driveway on the east side of Route 22 that provides access to the WEC facilities and the Patterson Inn. Parking is prohibited along the WEC driveway.
- The **Watchtower North Driveway** is the west farm private entrance. The **South Driveway** is the west farm private entrance for utility vehicles. Parking is prohibited along these driveways.

SIGNALIZED INTERSECTION CAPACITY ANALYSIS METHODOLOGY

The operation of signalized intersections in the study area was analyzed applying the methodologies presented in the 2000 *Highway Capacity Manual (HCM)*. This procedure evaluates signalized intersections for average control delay per vehicle and level of service (LOS).

LOS for the signalized intersections is based on the average control delay per vehicle for the various lane group movements within the intersection. Control delay is equal to stopped delay times 1.3. This delay is the basis for a LOS determination for individual lane groups, each approach as a whole, and the overall intersection.

The control delay criteria for the range of service levels for signalized intersections are shown in **Table 10-1**.

Table 10-1
LOS Criteria for Signalized Intersections

Level-of-Service (LOS)	Control Delay Per Vehicle
A	≤ 10.0 seconds
B	>10.0 and ≤ 20.0 seconds
C	>20.0 and ≤ 35.0 seconds
D	>35.0 and ≤ 55.0 seconds
E	>55.0 and ≤ 80.0 seconds
F	>80.0 seconds

Source: Transportation Research Board. *Highway Capacity Manual*, 2000.

Although the *HCM* methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the *HCM*. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay indicates an optimization of traffic flow—when an approach, or the whole

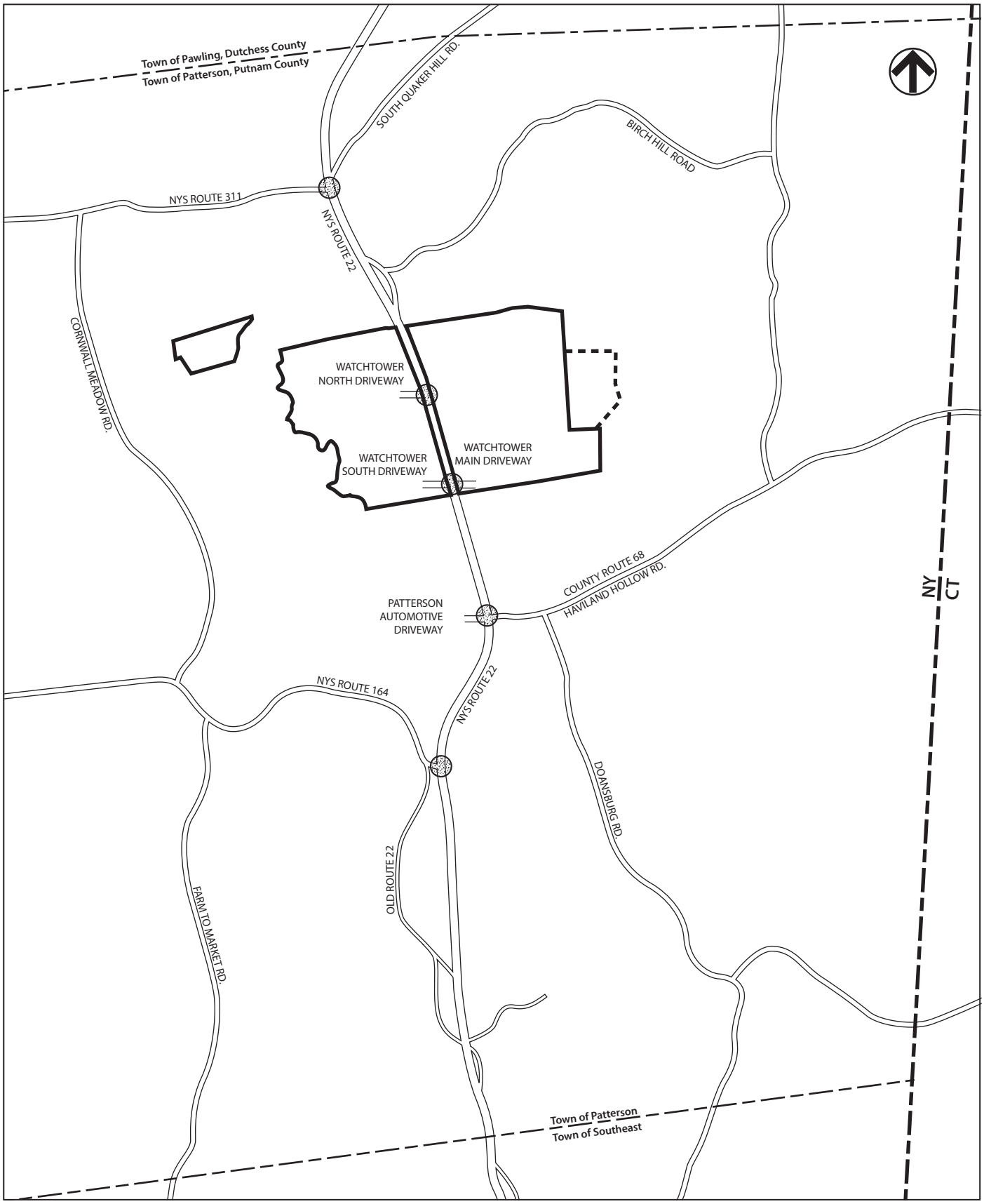

Figure 10-1
Traffic Study Area

intersection, processes traffic close to its theoretical maximum with a minimum amount of delay. However, very high v/c ratios—especially those greater than 1.0—are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. Conditions at LOS E and F reflect poor service levels, and cycle breakdowns are frequent. The *HCM* methodology provides for a summary of the total intersection operating conditions. The analysis chooses the two critical movements (the worst case from each roadway) and calculates a summary critical v/c ratio, delay, and LOS.

UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS METHODOLOGY

The LOS criteria for unsignalized intersections are summarized in **Table 10-2**. For the purposes of this analysis, control delay is defined as the total elapsed time that includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Table 10-2
LOS Criteria for Unsignalized Intersections

Level-of-Service (LOS)	Control Delay Per Vehicle
A	≤ 10.0 seconds
B	>10.0 and ≤ 15.0 seconds
C	>15.0 and ≤ 25.0 seconds
D	>25.0 and ≤ 35.0 seconds
E	>35.0 and ≤ 50.0 seconds
F	>50.0 seconds

Source: Transportation Research Board. *Highway Capacity Manual*, 2000.

Note that the LOS criteria for unsignalized intersections are somewhat different from the criteria used in signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. In addition, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, whereas drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than at signalized intersections. For these reasons, the average control delay threshold for any given LOS is considered less for an unsignalized than for a signalized intersection. The LOS for a two-way stop control intersection is determined by the control delay and defined for each minor movement.

C. EXISTING CONDITIONS

To assess existing traffic conditions near the project site, manual traffic counts as well as a physical inventory of the roadways were conducted during the weekday morning, weekday

evening, weekday late evening, and Saturday midday peak hours at the five study area intersections mentioned earlier (see Figure 10-1).

Specifically, manual turning movement counts were conducted during the following time periods:

- Wednesday, May 28, 2008, from 7:00 AM to 10:00 AM;
- Wednesday, May 28, 2008, from 4:00 PM to 7:00 PM;
- Thursday, May 29, 2008, from 7:00 AM to 10:00 AM;
- Thursday, May 29, 2008, from 4:00 PM to 7:00 PM; and
- Saturday, May 31, 2008, from 1:00 PM to 6:00 PM.

In addition, automatic traffic recorders (ATRs) were installed along Route 22, directly north of the WEC Main Driveway and along the WEC Main Driveway, east of Route 22, from April 8 to 22, 2008. The traffic counts were conducted while the school district was in session.

Based on the collected traffic data, there are certain hours during the weekday and Saturday when traffic is at its highest levels. The peak hours are:

- Weekday morning peak hour—8:15 AM to 9:15 AM;
- Weekday evening peak hour—5:00 PM to 6:00 PM;
- Weekday late evening peak hour—6:00 PM to 7:00 PM (this peak hour was selected for analysis because some of the WEC residents exit the project site for religious activities during this time period); and
- Saturday midday peak hour—1:15 PM to 2:15 PM.

TRAFFIC VOLUMES

The existing traffic volumes are summarized on **Figures 10-2 to 10-5** for the weekday morning, weekday evening, weekday late evening, and Saturday midday peak hours, respectively.

The data was then analyzed using the *HCM* methodology (see Appendix H for Highway Capacity Software [HCS] outputs for all study area intersections) to compute delays, v/c ratios, and LOS, as described above.

As shown in **Table 10-3**, the study intersections generally operate at LOS D or better (for developed areas, LOS D or better generally indicates acceptable operating conditions) during the analyzed peak hours with the following exceptions:

SIGNALIZED INTERSECTION

- The westbound County Road 68 shared left-turn/through movement at NYS Route 22 operates at LOS E during the weekday morning peak hour.

UNSIGNALIZED INTERSECTIONS

- The eastbound Watchtower South Driveway approach at NYS Route 22 operates at LOS F during both the weekday evening and weekday late evening peak periods.
- The westbound WEC Main Driveway shared left-turn/through movement at NYS Route 22 operates at LOS F during the weekday evening, weekday late evening, and Saturday Midday peak hours.

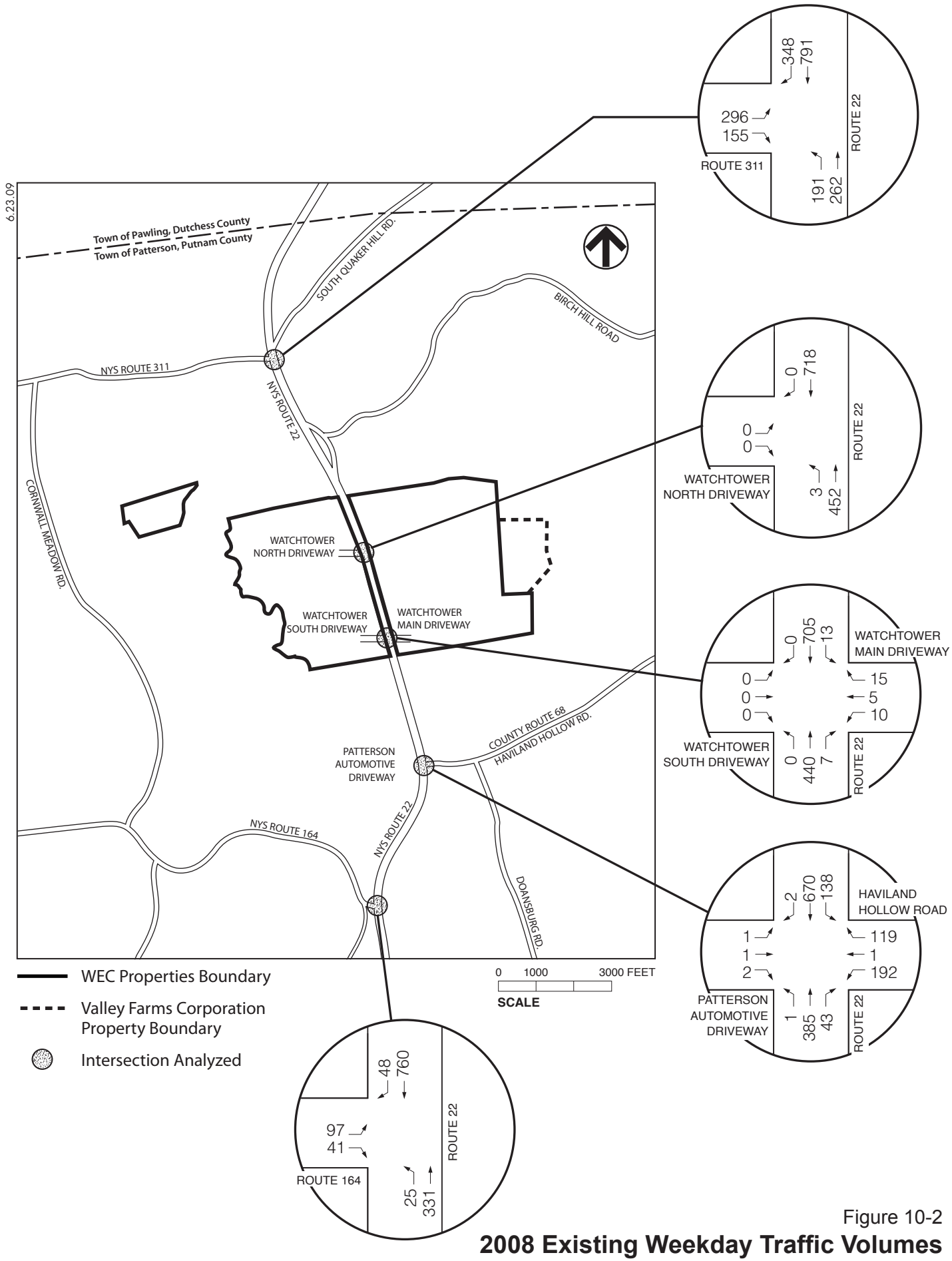

Figure 10-2

2008 Existing Weekday Traffic Volumes Morning Peak Hour (8:15 - 9:15 AM)

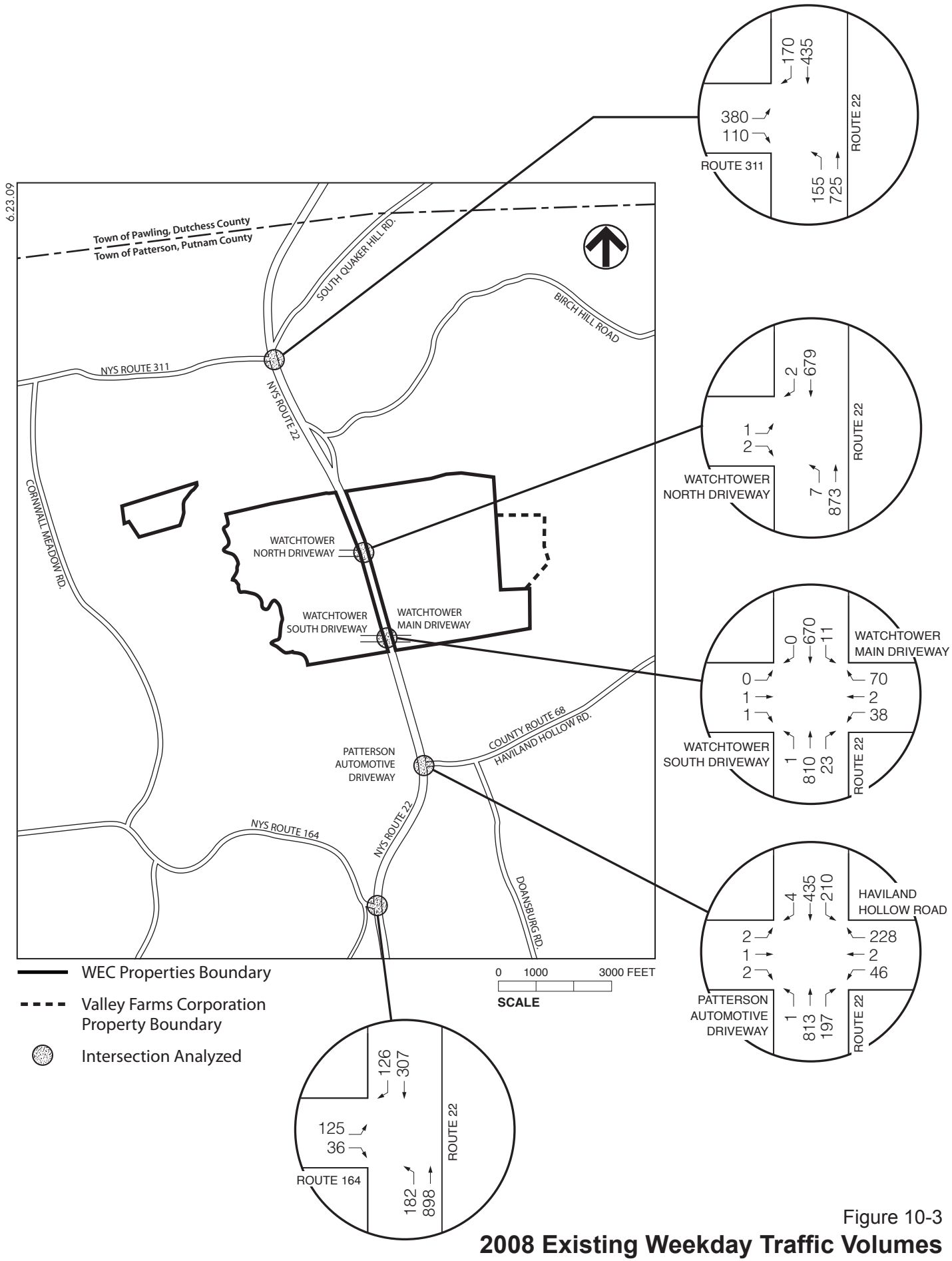

Figure 10-3

2008 Existing Weekday Traffic Volumes Evening Peak Hour (5:00 - 6:00 PM)

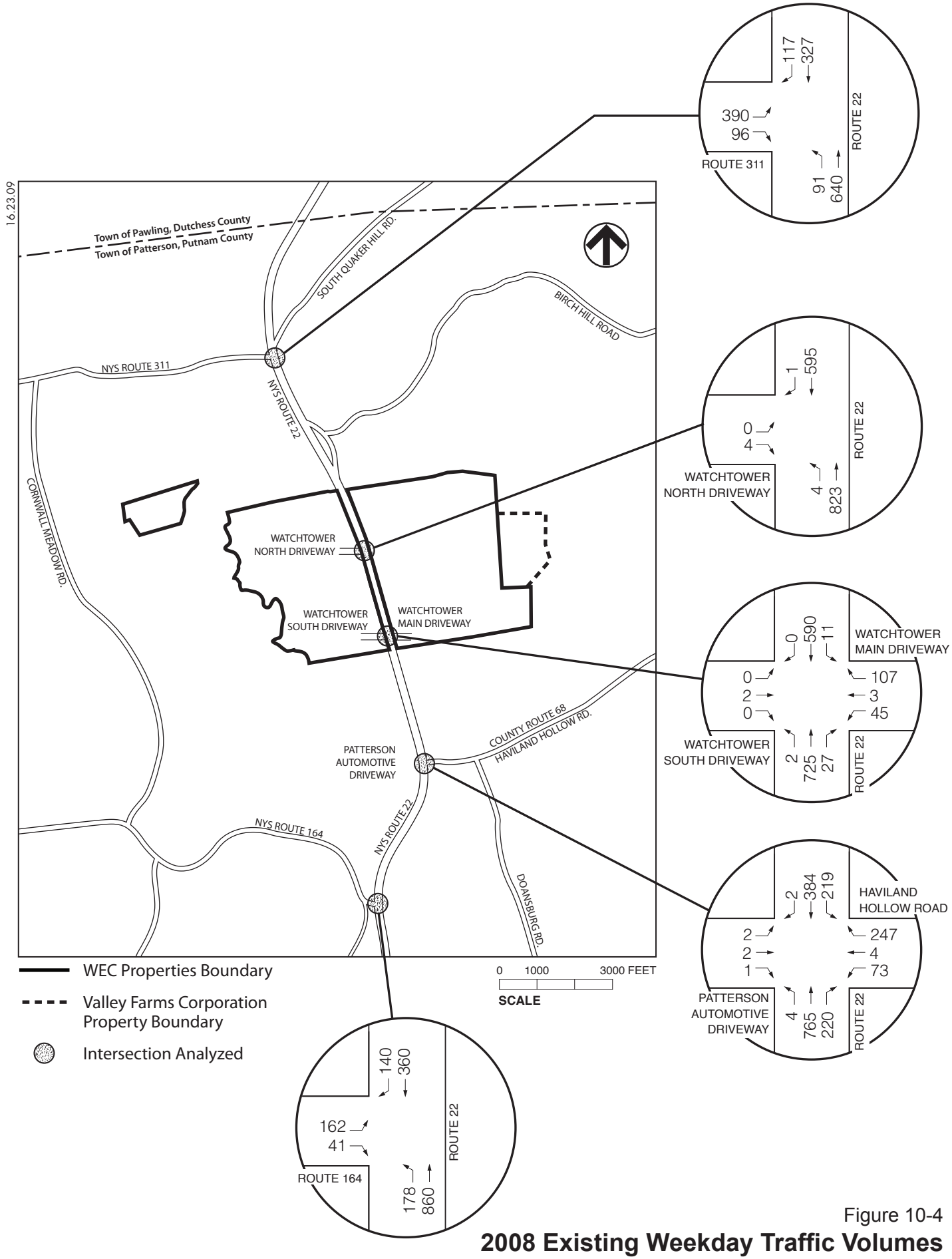

Figure 10-4

2008 Existing Weekday Traffic Volumes
Late Evening Peak Hour (6:00 - 7:00 PM)

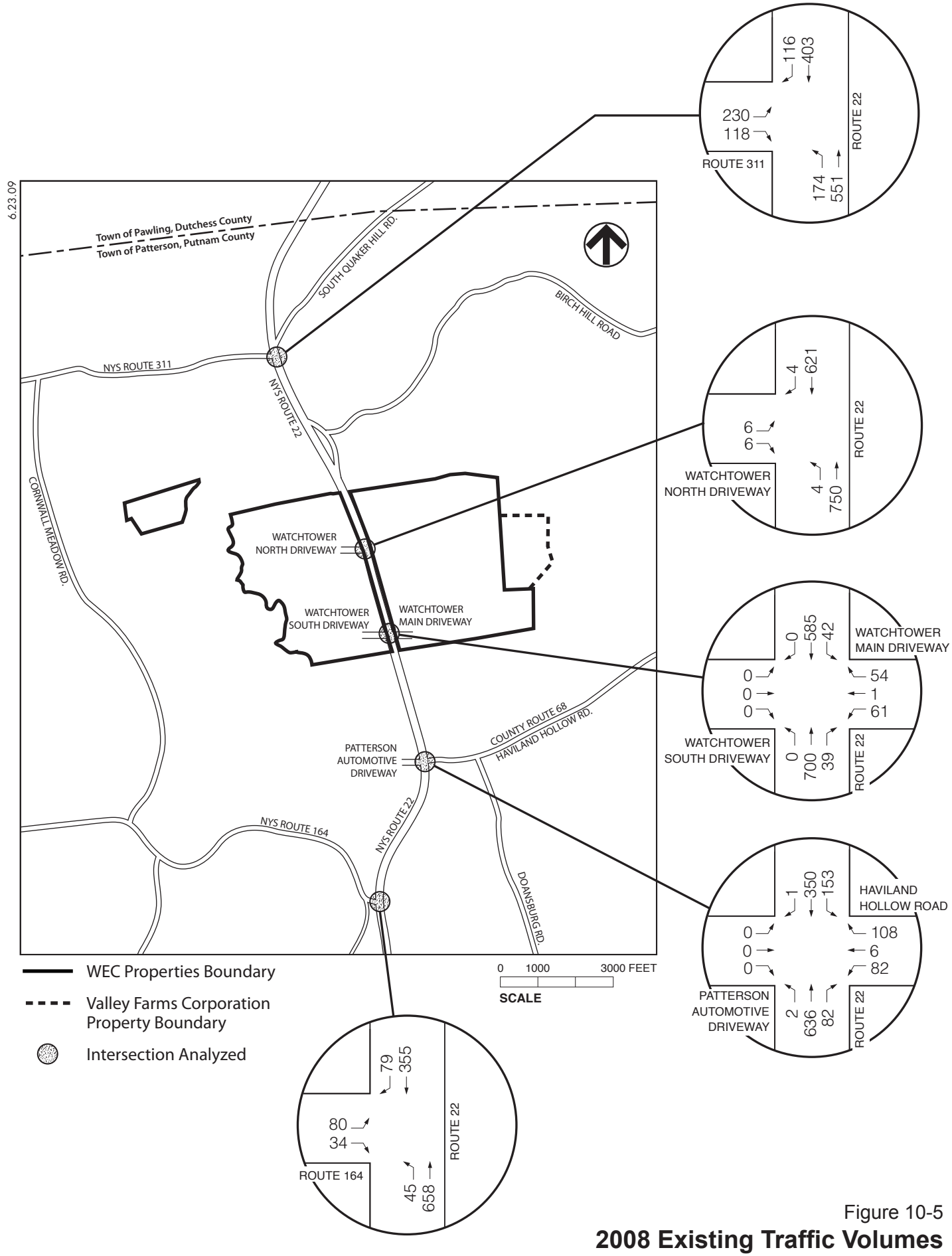

Figure 10-5

2008 Existing Traffic Volumes
Saturday Midday Peak Hour (1:15 - 2:15 PM)

- The eastbound NYS Route 164 left-turn movement at NYS Route 22 operates at LOS F during the weekday morning, weekday evening, and weekday late evening peak hours and at LOS E during the Saturday Midday peak hour.

Table 10-3
2008 Existing Conditions Level of Service Analysis
Study Area Intersections

Intersection	Weekday Peak Hours												Weekend Peak Hours			
	Morning				Evening				Late Evening				Midday			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections																
NYS Route 22 and County Road 68																
Eastbound	LTR	0.02	31.8	C	LTR	0.04	39.0	D	LTR	0.04	39.1	D	LTR	0.01	38.7	D
Westbound	LT	0.85	62.3	E	LT	0.30	41.3	D	LT	0.50	43.9	D	LT	0.57	46.6	D
	R	0.16	18.8	B	R	0.42	30.4	C	R	0.47	31.1	C	R	0.21	28.0	C
Northbound	LTR	0.53	18.1	B	LTR	0.92	31.7	C	LTR	0.89	27.3	C	LTR	0.66	15.3	B
Southbound	L	0.17	8.0	A	L	0.38	13.4	B	L	0.39	13.1	B	L	0.25	9.7	A
	TR	0.57	8.3	A	TR	0.35	4.9	A	TR	0.30	4.6	A	TR	0.27	4.5	A
	Intersection		18.4	B	Intersection		23.2	C	Intersection		21.9	C	Intersection		14.8	B
NYS Route 22 and NYS Route 311																
Eastbound	L	0.68	37.3	D	L	0.86	49.8	D	L	0.87	51.7	D	L	0.53	32.7	C
	R	0.20	21.4	C	R	0.14	20.8	C	R	0.12	20.6	C	R	0.16	20.9	C
Northbound	L	0.61	40.1	D	L	0.28	15.1	B	L	0.14	11.1	B	L	0.32	15.1	B
	T	0.25	10.5	B	T	0.68	17.6	B	T	0.60	15.4	B	T	0.55	14.6	B
Southbound	T	0.91	38.2	D	T	0.53	19.9	B	T	0.41	17.6	B	T	0.49	19.0	B
	TR	0.19	1.8	A	TR	0.10	1.5	A	TR	0.07	1.4	A	TR	0.07	1.4	A
	Intersection		28.8	C	Intersection		23.6	C	Intersection		24.0	C	Intersection		18.1	B
Unsignalized Intersections																
NYS Route 22 and Main Entrance / South Driveway																
Eastbound	LTR	0.02	23.5	C	LTR	0.51	58.6	F	LTR	0.10	56.4	F	LTR	0.02	34.3	D
Westbound	LT	0.13	30.9	D	LT	0.91	185.3	F	LT	0.88	168.8	F	LT	0.66	93.4	F
	R	0.03	11.1	B	R	0.32	20.2	C	R	0.39	21.1	C	R	0.14	15.5	C
Northbound	LT	0.00	9.3	A	LT	0.00	9.4	A	LT	0.00	9.4	A	LT	0.00	8.8	A
Southbound	L	0.01	8.3	A	L	0.02	10.0	B	L	0.02	9.9	A	L	0.05	9.7	A
Route 22 and Watchtower North Driveway																
Eastbound	LR	0.01	19.1	C	LR	0.03	22.3	C	LR	0.04	18.4	C	LR	0.22	26.6	D
Northbound	LT	0.00	9.4	A	LT	0.02	9.2	A	LT	0.00	8.9	A	LT	0.00	9.0	A
NYS Route 22 and NYS Route 164																
Eastbound	L	0.74	75.6	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	0.52	46.9	E
	R	0.09	12.0	B	R	0.06	10.1	B	R	0.07	10.5	B	R	0.05	10.0	A
Northbound	L	0.04	10.2	B	L	0.20	9.3	A	L	0.22	9.7	A	L	0.04	8.5	A

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service, - Denotes no vehicle in the lane group. HCS printouts are located in Appendix H.

It is important to note that it is not uncommon for the minor approaches at unsignalized intersections to operate at LOS E and F due to the high opposing volumes along the major roadway. However, based on field observations, the Applicant's driveways operate with lower delay and better LOS than what was computed by HCM.

The HCM results for the unsignalized minor approaches are typically conservative and show traffic operating conditions that are sometimes worse than what is observed in the field. For example, the eastbound Watchtower South Driveway approach volume and queue length typically ranges from 0 to 2. This is a very low volume and queue, and field observations show LOS ranging from A to B (HCM shows it operating at LOS F for two of the peaks hours studied). Again, the HCM LOS F is based on the high opposing volumes on NYS Route 22 and insufficient gaps in the NYS Route 22

traffic stream for minor approaches to execute movements. To provide a conservative analysis, the HCM results are presented without adjustments.

ACCIDENT DATA

Table 10-4 provides a summary of accident data sorted by type for each studied intersection and along each corridor location during the November 2004 to October 2007 time period. The information was obtained via a FOIL (Freedom of Information Law) request from the New York State Department of Transportation (NYSDOT).

OVERALL STUDY AREA

As shown in Table 10-4, a total of 109 accidents have occurred in the study area during the selected analysis period. Approximately 3 percent of the accidents involved a pedestrian/bicyclist, 45 percent involved a collision with another motor vehicle, and approximately 52 percent of the accidents were noted to be type "other" (which includes accidents not involving another motor vehicle, accidents with fixed objects, etc.).

STUDY AREA INTERSECTIONS

The NYS Route 22/NYS Route 311 intersection was reported to have the greatest number of accidents during the analysis period (14 accidents), an average of 4.7 accidents per year.

NON-INTERSECTIONS (ROADWAY SEGMENTS)

The roadway segment along NYS Route 22 between Birch Hill Road and NYS Route Old Route 22 was reported to have the highest number of accidents (33). It should be noted that approximately 17 of the 33 accidents were categorized as "other." This translates to an average of 11 accidents per year.

Overall, the examination of the accident data revealed that 39 percent involved an injury and that one accident involved a fatality. The type "other" accident was the most common types of accidents. Most of the accidents were not due to any roadway or intersection operation deficiencies, suggesting that a significant portion of the accidents were caused by driver error.

PUBLIC TRANSPORTATION

Commuter rail transportation is available north of the project site at the Metro-North Railroad station (the Patterson Rail Station). The station's parking lot is located at the intersection of Front Street and Center Street in the Town of Patterson. The train operates on the Harlem Line and provides access to and from Grand Central Station and other nearby stations in Dutchess County (Pawling Rail Station), Putnam County (the Southeast and Brewster Rail Stations) and Westchester County (the Croton Falls and White Plains Rail Stations) throughout the weekdays and weekends.

In addition, the No. 3 bus route—a Putnam County bus line that operates in the study area from 8 AM to 6 PM, Monday through Friday—provides service along Fair Street in the Town of Carmel and NYS Route 22 in the Town of Patterson and provides access to the following intersections near the project site: NYS Route 22 and WEC Main Driveway; NYS Route 22 and NYS Route 311; and NYS Route 311 and Front Street (Metro-North station).

Table 10-4
Study Area Accident Summary
Accident Rates[1]

Intersection	Number of Accidents		Accident Trend															
	Avg/Yr	Period	Fatalities	Personal Injury	Non Reported	Reported	Overtaking	Rear End	Right Angle	Left Turn (with other car)	Left Turn (against other car)	Right Turn (with other car)	Right Turn (against other car)	Sideswipe	Ped/ Bike	Head On	Other[2]	Not Reported
Single location																		
NYS Route 22 and NYS Route 164	2.7	8 Period: 11/01/04-10/31/07	0	6	2	6	1	0	2	0	3	0	1	0	0	1	1	0
NYS Route 22 and County Road 68 (Haviland H Road)	3.7	11 Period: 11/01/04-10/31/07	0	5	2	9	0	3	0	1	1	0	0	0	0	0	6	0
NYS Route 22 and NYS Old Route 22	0.3	1 Period: 11/01/04-10/31/07	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
NYS Route 22 and Birch Hill Road	0.3	1 Period: 11/01/04-10/31/07	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
NYS Route 22 and NYS Route 311	4.7	14 Period: 11/01/04-10/31/07	0	5	4	10	0	5	0	0	0	0	0	1	1	0	6	1
Corridor locations																		
NYS Route 22 between NYS Route 164 and County Road 68 (Haviland H Road)	7.0	21 Period: 11/01/04-10/31/07	0	7	3	18	0	1	1	0	0	0	0	1	0	2	16	0
NYS Route 22 between County Road 68 (Haviland H Road) and NYS Old Route 22	1.0	3 Period: 11/01/04-10/31/07	0	1	0	3	0	1	0	0	0	0	0	0	0	0	2	0
NYS Route 22 between NYS Old Route 22 and Birch Hill Road	11.0	33 Period: 11/01/04-10/31/07	1	11	8	25	2	7	3	0	0	0	0	2	1	1	17	0
NYS Route 22 between Birch Hill Road and NYS Route 311	5.7	17 Period: 11/01/04-10/31/07	0	6	4	13	0	6	1	0	1	0	0	0	0	0	8	1

Notes:
1. Accident data obtained from New York State Department of Transportation (November 2004 - October 2007)
2. Denoted accidents not involving other motor vehicles (i.e. fixed objects, animals, etc)

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

NO BUILD TRAFFIC BASELINE CONDITIONS

The No Build condition represents a future baseline condition that assumes the proposed project is not developed. A number of factors are included in the traffic analysis to establish future No Build conditions: (1) any roadway improvements in the study corridor that are either currently under construction or proposed; (2) traffic from general population growth in the local area (i.e., "background growth"); and (3) traffic generated from other development projects in the study area.

ROADWAY IMPROVEMENTS

The NYSDOT and the Putnam County Engineering Department were contacted to determine if any significant roadway improvements have recently been proposed or approved to be constructed in the adjacent roadway network. According to NYSDOT and Putnam County, no such projects are approved or proposed for construction by 2014.

BACKGROUND GROWTH

It is recognized that traffic routinely fluctuates along various state and county roadways, as well as on local streets, and varies on a day-to-day, monthly, and yearly basis. As future development occurs near the project site, traffic is also expected to increase. To account for these future changes, the existing traffic volumes on the study roadway system were increased by a 1.5 percent annual growth rate (resulting in a total growth factor of 9 percent) to develop the 2014 future base traffic volumes.

OTHER DEVELOPMENT PROJECTS

The planning departments in adjacent municipalities (Town of Patterson, Town of Southeast, and Town and Village of Pawling) were contacted to determine if there are any recent development approvals that would contribute to traffic growth along the subject roadway network. According to the planning departments (the Town and Village of Pawling did not identify any projects to be included in the study), the following projects have either been approved for development or are currently proposed (note that each project is expected to be completed before 2014):

TOWN OF PATTERSON

- The proposed **Patterson Crossing** retail center is a 382,560-sf development, including shops and a County Sheriff substation, with a 28,000-sf garden center. This project is proposed to be located along NYS Route 311 in the Towns of Kent and Patterson.
- The **Barjac Equestrian Center**, which proposes a 6,978-sf foot barn and 20,000-sf indoor riding ring, is currently approved. The center is expected to be located at the northeast corner of the Route 311 and Maple Avenue intersection.
- The **Burdick Farms** subdivision project, located along Bullet Hole Road between McManus Road and Ice Pond Road, would be a 36-lot single-family residence subdivision. The approval for this project has expired. The inclusion of the traffic from this project in the study is conservative, since it would increase volume and delay on study area roadways.

- In the **Cipriano** site plan development proposal, a 27,908-sf building, including a nursery and various retail uses, is proposed along Route 22 at Ballyhack Road.
- The **Frantell** site plan application includes the development of 22,500-sf of retail along Route 22, north of Route 311.
- The **Genovese** site plan application, located at 2160 Route 22, calls for the construction of a 51,400-sf building for light manufacturing and warehouse uses.
- The application for the **Ice Pond View** subdivision, located along Ice Pond Road, proposes a 30-lot single-family residence subdivision, inclusive of two newly constructed roadways for access.
- The **Paddock View Estates** development proposal includes a 10-lot single-family subdivision that will be serviced by a newly constructed access road along Route 292, adjacent to Route 311.
- The residential **Pondview** subdivision application, located along Fair Street between Towners Road and Bullet Hole Road in the Towns of Patterson Kent, includes the construction of 50 townhouses.
- A subdivision is proposed at **17 Couch Road**, which proposes a six-lot single-family residence subdivision. This project has received conditional final approval.
- **Tractor Supply** proposes a commercial/retail building along Route 311, west of Route 22, and includes the construction of 22,670 sf of retail space and 20,000 sf of storage area. The store opened in November of 2009. Since existing conditions data was collected prior to the opening in 2008 the traffic from this project was included and accounted for in the No Build Conditions.

TOWN OF SOUTHEAST

- The **Stateline** retail center is proposed along Route 6/202 between I-84 exits 20 and 21. The development is pending approval and would include 184,800 sf of retail, 14,800 sf of office space, and 11,000 sf to be determined.
- The **Orchard Hill** development will include the construction of a golf course and conference center, directly adjacent to NYS Route 22.

CITY OF DANBURY, CONN.

- A mixed-use development, known as **The Reserve**, is proposed at the former Union Carbide site, south of U.S. Route 6. The development proposal includes over 2,000 residential units and over a 1 million sf of nonresidential uses (including office space, hotel, light industrial, retail, and a Minor League Stadium.

TRAFFIC VOLUMES

Trip generation rates for the above-mentioned developments were either obtained from their respective traffic impact studies or, if a report was not available, the trips generated by these projects were calculated using the *Institute of Transportation Engineers (ITE) Trip Generation Manual 7th Edition*. The traffic generated by these proposed developments was assigned to the roadway network based on the existing travel patterns in the area. **Table 10-5** provides the trip generation for each development with its associated source.

Table 10-5
Area Development Trip Generation—Peak Hours
2014 No Build Conditions

Land Use	Total Size	Weekday Morning			Weekday Evening			Saturday Midday		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Barjac Equestrian Center[1]	26,978 sf	0	0	0	6	4	10	7	6	13
Burdick Farms Subdivision[2]	36 sfr (actually approved for less units, 34 units)	7	21	28	24	10	34	18	16	34
Cipriano Site Plan[3]	27,908 sf	18	11	29	50	55	105	72	67	139
Frantell Site Plan[4]	22,500 sf	14	9	23	40	44	84	58	54	112
Genovese Site Plan[5]	51,400 sf	47	5	52	8	48	56	3	4	7
Ice Pond View Subdivision[6]	30 sfr	6	17	23	20	11	31	15	13	28
Paddock View Estates[7]	10 sfr	2	6	8	6	4	10	5	5	10
Pondview Subdivision[8]	50 townhouses	4	18	22	17	9	26	13	11	24
17 Couch Road Corp. Subdivision[9]	6 sfr	1	4	5	4	2	6	3	3	6
Tractor Supply Site Plan[10]	42,670 sf	140	152	292	120	94	214	120	94	214
	Total	**239**	**243**	**482**	**295**	**281**	**576**	**314**	**273**	**587**

Notes:
1. Trip generation rates calculated utilizing counts conducted by AKRF at the Old Brookville Equestrian Center in June 2005.
2. Trip generation calculated utilizing ITE Land Use Code 210 "Single-Family Detached Housing" - Peak Hour of Generator Average Rates. The approval for this project has expired. The inclusion of the traffic from this project is conservative.
3. Trip generation calculated utilizing ITE Land Use Code 820 "Shopping Center" - Peak Hour of Adjacent Street Average Rates.
4. Trip generation calculated utilizing ITE Land Use Code 820 "Shopping Center" - Peak Hour of Adjacent Street Average Rates.
5. Trip generation calculated utilizing ITE Land Use Code 110 "General Light Industrial" - Peak Hour of Generator Average Rates.
6. Trip generation calculated utilizing ITE Land Use Code 210 "Single-Family Detached Housing" - Peak Hour of Generator Average Rates.
7. Trip generation calculated utilizing ITE Land Use Code 210 "Single-Family Detached Housing" - Peak Hour of Generator Average Rates.
8. Trip generation calculated utilizing ITE Land Use Code 230 "Residential Condominium/Townhouse" - Peak Hour of Generator Average Rates.
9. Trip generation calculated utilizing ITE Land Use Code 210 "Single-Family Detached Housing" - Peak Hour of Generator Average Rates.
10. Trip generation calculated utilizing ITE Land Use Code 814 "Specialty Retail Center" - Peak Hour of Generator Average Rates.

The growth factor and the site-generated traffic for the developments were added to the 2008 existing traffic volumes to develop the 2014 No Build traffic volumes for the weekday morning, weekday evening, weekday late evening, and Saturday midday peak periods. The results are shown on **Figures 10-6 through 10-9**.

The No Build data was then analyzed using the *HCM* methodology to compute delays, v/c ratios, and LOS, as described previously. **Table 10-6** compares the 2008 existing and 2014 No Build LOS conditions for each study intersection.

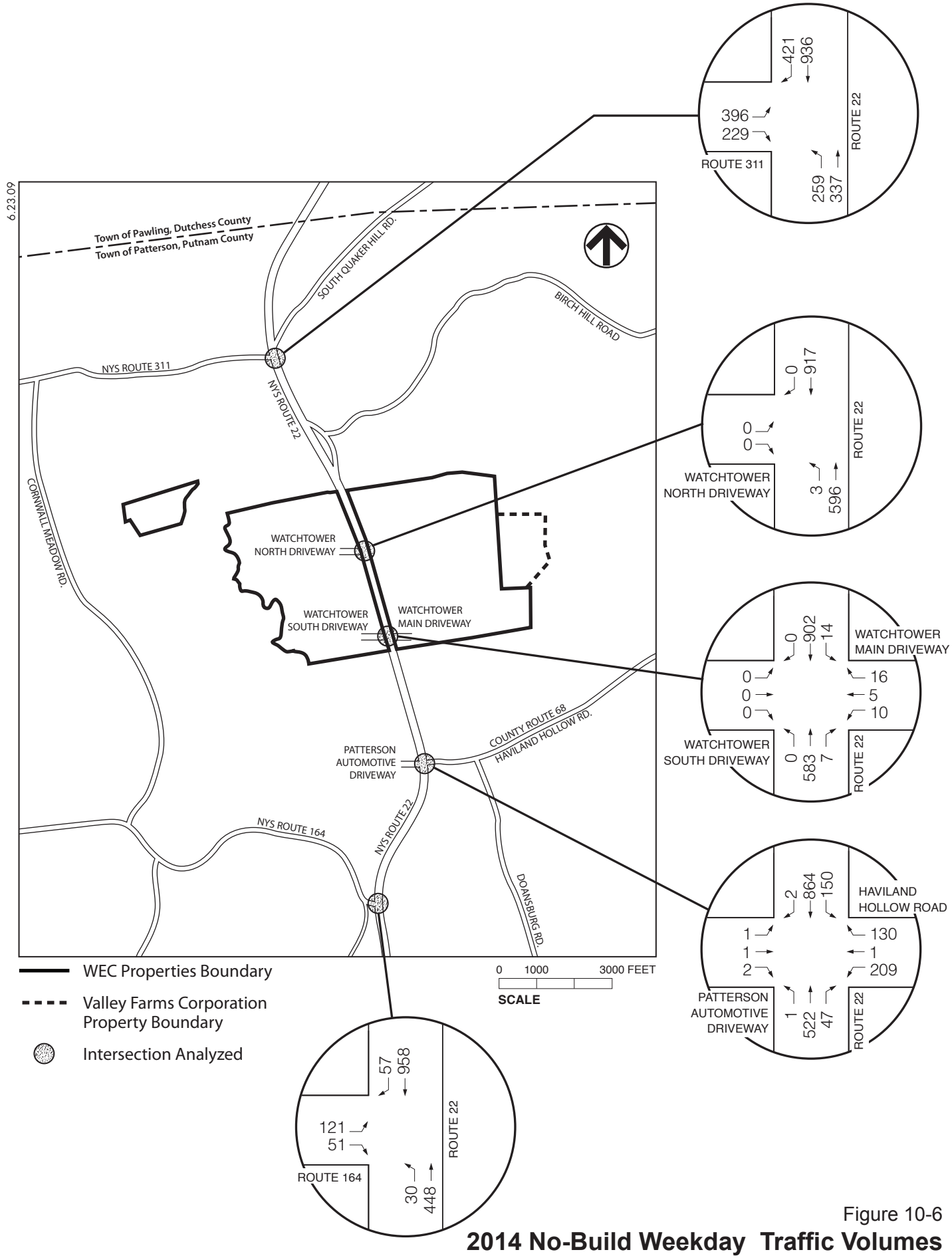

Figure 10-6

2014 No-Build Weekday Traffic Volumes Morning Peak Hour (8:15 - 9:15 AM)

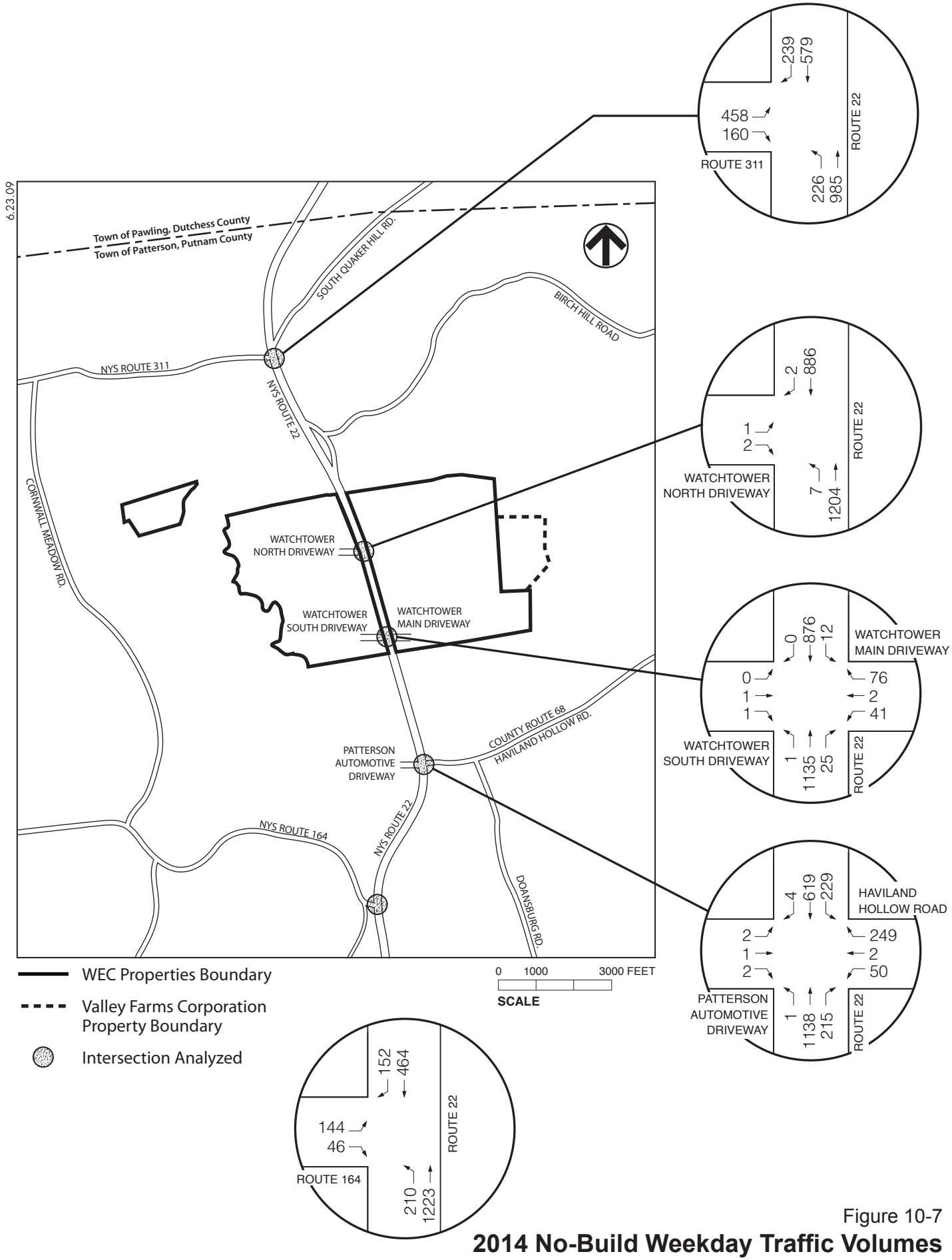

Figure 10-7

2014 No-Build Weekday Traffic Volumes Evening Peak Hour (5:00 - 6:00 PM)

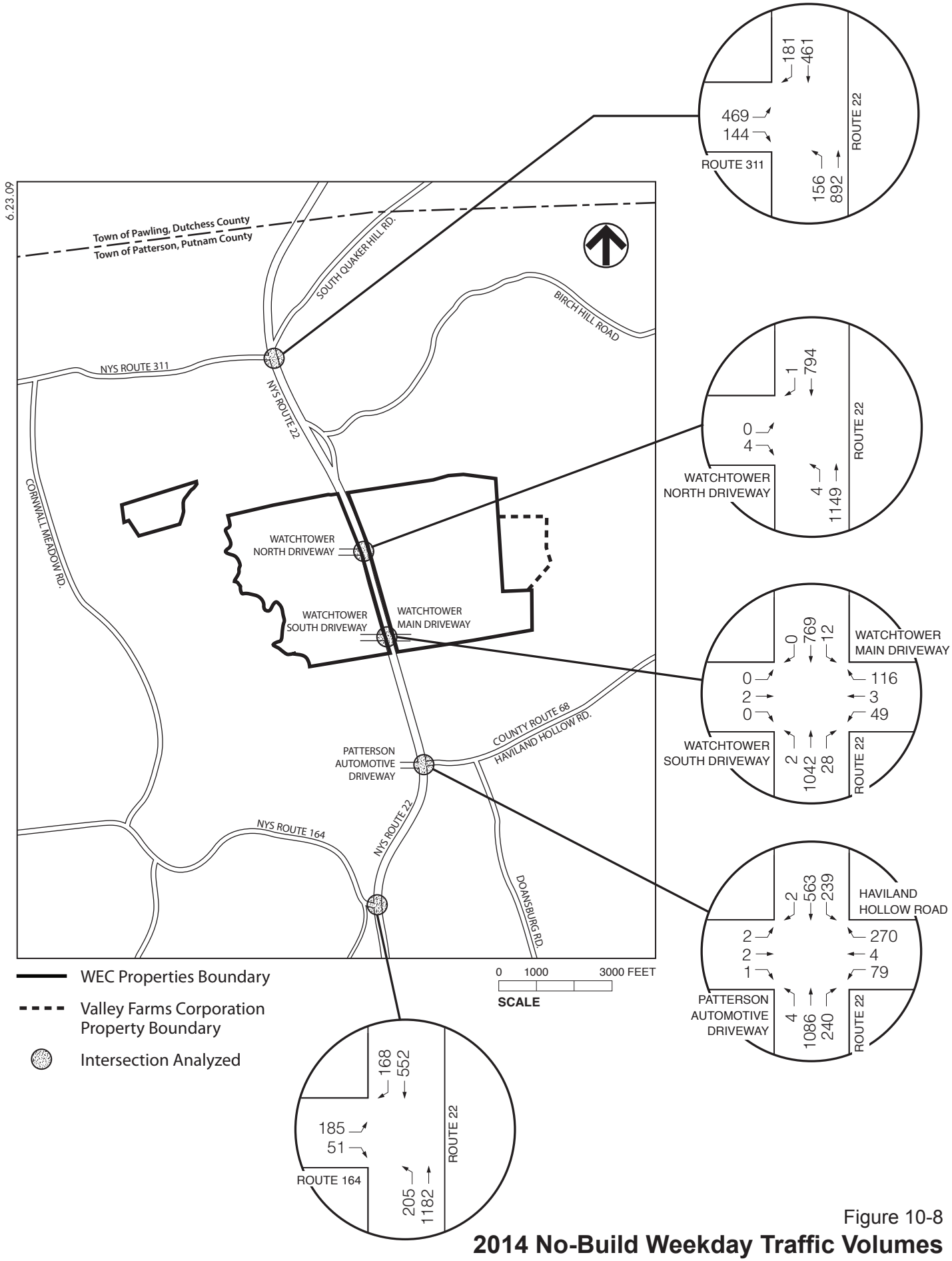

Figure 10-8

2014 No-Build Weekday Traffic Volumes
Late Evening Peak Hour (6:00 - 7:00 PM)

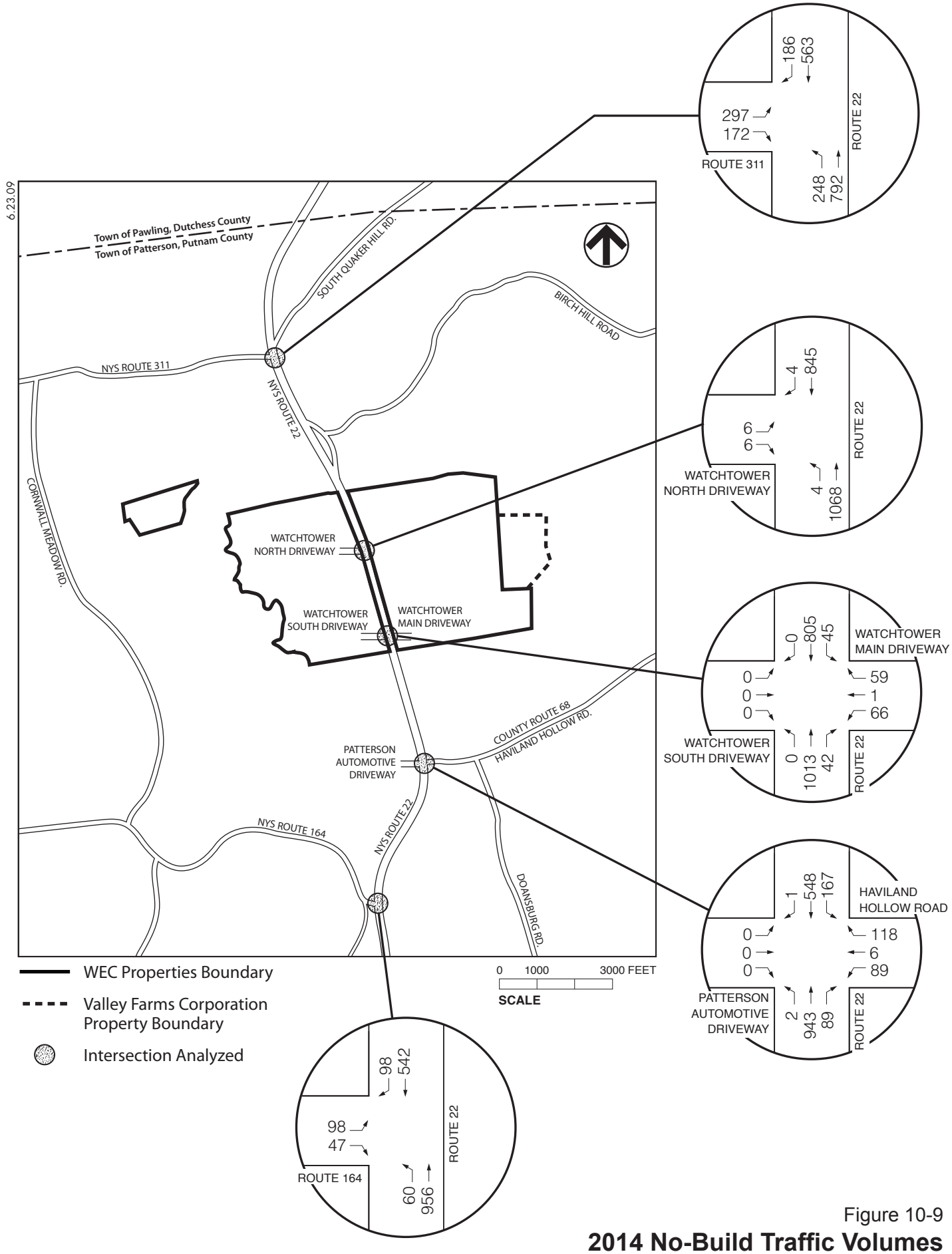

Figure 10-9

2014 No-Build Traffic Volumes
Saturday Midday Peak Hour (1:15 - 2:15 PM)

Table 10-6
2008 Existing and 2014 No Build Conditions Level of Service Analysis
Study Intersections

Intersection	Weekday Morning								Weekday Evening								Weekday Late Evening								Saturday Midday							
	Existing				No Build				Existing				No Build				Existing				No Build				Existing				No Build			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections																																
NYS Route 22 and County Road68																																
Eastbound	LTR	0.02	31.8	C	LTR	0.02	31.8	C	LTR	0.04	39.0	D	LTR	0.04	39.0	D	LTR	0.04	39.1	D	LTR	0.04	39.1	D	LTR	0.01	38.7	D	LTR	0.01	38.7	D
Westbound	LT	0.85	62.3	E	LT	0.93	77.7	E	LT	0.30	41.3	D	LT	0.33	41.6	D	LT	0.50	43.9	D	LT	0.54	45.4	D	LT	0.57	46.6	D	LT	0.62	49.2	D
	R	0.16	18.8	B	R	0.18	19.0	B	R	0.42	30.4	C	R	0.47	31.2	C	R	0.47	31.1	C	R	0.53	32.3	C	R	0.21	28.0	C	R	0.24	28.3	C
Northbound	LTR	0.53	18.1	B	LTR	0.71	22.5	C	LTR	0.92	31.7	C	LTR	1.25	141.9	F	LTR	0.89	27.3	C	LTR	1.21	125.5	F	LTR	0.66	15.3	B	LTR	0.95	35.7	D
Southbound	L	0.17	8.0	A	L	0.21	10.2	B	L	0.38	13.4	B	L	0.49	22.4	C	L	0.39	13.1	B	L	0.50	22.2	C	L	0.25	9.7	A	L	0.33	14.4	B
	TR	0.57	8.3	A	TR	0.73	11.7	B	TR	0.35	4.9	A	TR	0.50	5.8	A	TR	0.30	4.6	A	TR	0.45	5.4	A	TR	0.27	4.5	A	TR	0.43	5.3	A
	Intersection		18.4	B	Intersection		22.5	C	Intersection		23.2	C	Intersection		83.6	F	Intersection		21.9	C	Intersection		74.7	E	Intersection		14.8	B	Intersection		25.4	C
NYS Route 22 and NYS Route 311																																
Eastbound	L	0.68	37.3	D	L	0.85	49.1	D	L	0.86	49.8	D	L	1.03	87.3	F	L	0.87	51.7	D	L	1.05	91.6	F	L	0.53	32.7	C	L	0.68	37.4	D
	R	0.20	21.4	C	R	0.34	22.9	C	R	0.14	20.8	C	R	0.23	21.7	C	R	0.12	20.6	C	R	0.21	21.4	C	R	0.16	20.9	C	R	0.26	21.9	C
Northbound	L	0.61	40.1	D	L	0.90	72.1	E	L	0.28	15.1	B	L	0.50	24.8	C	L	0.14	11.1	B	L	0.29	16.7	B	L	0.32	15.1	B	L	0.59	27.9	C
	T	0.25	10.5	B	T	0.33	11.3	B	T	0.68	17.6	B	T	0.93	33.3	C	T	0.60	15.4	B	T	0.83	24.1	C	T	0.55	14.6	B	T	0.79	22.0	C
Southbound	T	0.91	38.2	D	T	1.07	77.3	E	T	0.53	19.9	B	T	0.70	24.7	C	T	0.41	17.6	B	T	0.57	20.8	C	T	0.49	19.0	B	T	0.68	23.7	C
	TR	0.19	1.8	A	TR	0.24	2.0	A	TR	0.10	1.5	A	TR	0.15	1.6	A	TR	0.07	1.4	A	TR	0.12	1.5	A	TR	0.07	1.4	A	TR	0.12	1.5	A
	Intersection		28.8	C	Intersection		49.0	D	Intersection		24.0	C	Intersection		37.5	D	Intersection		24.0	C	Intersection		35.4	D	Intersection		18.1	B	Intersection		23.8	C
Unsignalized Intersections																																
NYS Route 22 and Main Entrance / South Driveway																																
Eastbound	LTR	0.02	23.5	C	LTR	0.03	36.6	E	LTR	0.51	58.6	F	LTR	0.52	>240.0	F	LTR	0.10	56.4	F	LTR	0.44	>240.0	F	LTR	0.02	34.3	D	LTR	0.01	84.9	F
Westbound	LT	0.13	30.9	D	LT	0.23	55.3	F	LT	0.91	185.3	F	LT	>1.50	>240.0	F	LT	0.88	168.8	F	LT	>1.50	>240.0	F	LT	0.66	93.4	F	LT	>1.50	>240.0	F
	R	0.03	11.1	B	R	0.04	12.5	B	R	0.32	20.2	C	R	0.56	40.7	E	R	0.39	21.1	C	R	0.69	51.4	F	R	0.14	15.5	C	R	0.14	23.7	C
Northbound	LT	0.00	9.3	A	LT	0.00	10.2	B	LT	0.00	9.4	A	LT	0.00	10.5	B	LT	0.00	9.4	A	LT	0.00	10.6	B	LT	0.00	8.8	A	LT	0.00	9.6	A
Southbound	L	0.01	8.3	A	L	0.01	8.8	A	L	0.02	10.0	B	L	0.03	11.9	B	L	0.02	9.9	A	L	0.03	11.8	B	L	0.05	9.7	A	L	0.05	11.5	B
Route 22 and Watchtower North Driveway																																
Eastbound	LR	0.01	19.1	C	LR	0.04	27.1	D	LR	0.03	22.3	C	LR	0.06	39.9	E	LR	0.04	18.4	C	LR	0.07	31.5	D	LR	0.22	26.6	D	LR	0.46	65.4	F
Northbound	LT	0.00	9.4	A	LT	0.01	10.3	B	LT	0.02	9.2	A	LT	0.01	10.2	B	LT	0.00	8.9	A	LT	0.01	9.7	A	LT	0.00	9.0	A	LT	0.01	9.9	A
NYS Route 22 and NYS Route 164																																
Eastbound	L	0.74	75.6	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	0.52	46.9	E	L	>1.50	>240.0	F
	R	0.09	12.0	B	R	0.13	13.7	B	R	0.06	10.1	B	R	0.09	11.1	B	R	0.07	10.5	B	R	0.11	11.7	B	R	0.05	10.0	A	R	0.08	11.1	B
Northbound	L	0.04	10.2	B	L	0.05	11.5	B	L	0.20	9.3	A	L	0.28	10.7	B	L	0.22	9.7	A	L	0.31	11.4	B	L	0.04	8.5	A	L	0.07	9.4	A

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service, - Denotes no vehicle in the lane group.
HCS printouts are located in Appendix H.

Under the 2014 No Build conditions, most study area intersections are expected to operate at acceptable LOS with the following notable changes in LOS:

SIGNALIZED INTERSECTIONS

- The northbound approach at the NYS Route 22/County Road 68 intersection would drop from LOS E to LOS F during the weekday evening and weekday late evening peak periods.
- The eastbound left-turn movement at the NYS Route 22/NYS Route 311 intersection would drop from LOS D to LOS F during the weekday evening and weekday late evening peak periods.
- The northbound left-turn and southbound through movements at the NYS Route 22/NYS Route 311 intersection would drop from LOS D to LOS E during the weekday morning peak period.

UNSIGNALIZED INTERSECTIONS

- The NYS Route 22/WEC South Driveway eastbound approach would drop from LOS C to LOS E during the weekday morning peak hour and from LOS D to LOS F during the Saturday midday peak period.
- The NYS Route 22/WEC Main Driveway westbound left-turn/through movement would drop from LOS D to LOS E during the weekday morning peak hour.
- The NYS Route 22/WEC Main Driveway westbound right-turn movement would drop from LOS C to LOS E during the weekday evening peak hour and from LOS C to LOS F during the weekday late evening peak period.
- The NYS Route 22/WEC North Driveway eastbound approach would drop from LOS C to LOS E during the weekday evening peak hour and from LOS D to LOS F during the Saturday midday peak period.
- The NYS Route 22/ NYS Route 164 eastbound left-turn movement would drop from LOS E to LOS F during the Saturday midday peak period.

LOS E and F generally indicate congested conditions and notable delays. The increases in delay and LOS changes from existing operations to No Build conditions are expected to result from the traffic generated by the adjacent area developments (No Build projects). It is important to note that it is not uncommon for the minor approaches at unsignalized intersections to operate at LOS E and F due to the high opposing volumes along the major roadway.

ACCIDENT DATA

No significant changes are expected in the study area's accident rates by 2014 without the proposed project.

PUBLIC TRANSPORTATION

No significant changes are expected in the study area's public transit conditions by 2014 without the proposed project. It is the policy of public transportation agencies to make adjustments, if necessary, to the transportation schedules to accommodate changing ridership demand patterns.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

PROJECT TRIP GENERATION

It is important to note that only construction of the proposed project's two new residential buildings on the project site would generate additional traffic. All other proposed construction on-site (such as the new Maintenance and North Office Building, and the addition to the Audio/Video Building) would provide expanded space to improve internal operations and would not generate any additional visitor or school related traffic.

Table 10-7 shows the trip generation rates used to compute the vehicle trips generated by the proposed project. These rates were developed based on the turning movement and ATR data collected at the WEC Main Driveway for the existing 1,550 population currently on-site. It should be noted that the ITE does not provide data for any land use comparable to the WEC. As such, surveying the existing facility to establish the trip generation characteristics is an acceptable method by ITE to calculate the additional number of trips generated by the proposed amended site plan.

Table 10-7
Trip Generation—Peak Hours
2014 Build Conditions

Land Use	Size (Total Population)	Traffic Direction	Weekday Morning (8:15-9:15 AM)		Weekday Evening (5:00-6:00 PM)		Weekday Late Evening (6:00-7:00 PM)		Saturday Midday (1:15-2:15 PM)	
			Vehicle Trips Ends[2]	Trip Rates[2]	Vehicle Trips Ends[2]	Trip Rates[2]	Vehicle Trips Ends[2]	Trip Rates[2]	Vehicle Trips Ends[2]	Trip Rates[2]
		Enter	20	0.013	36	0.023	40	0.026	81	0.052
		Exit	30	0.019	110	0.071	155	0.100	116	0.075
2008 Conditions	1,550	**Total**	**50**	**0.032**	**146**	**0.094**	**195**	**0.126**	**197**	**0.127**
		Enter	27	0.013	47	0.023	53	0.026	107	0.052
		Exit	39	0.019	146	0.071	205	0.100	154	0.075
2014 Future Conditions	2,050	**Total**	**66**	**0.032**	**193**	**0.094**	**258**	**0.126**	**261**	**0.127**
		Enter	7	0.013	11	0.023	13	0.026	26	0.052
		Exit	9	0.019	36	0.071	50	0.100	38	0.075
Net Increase (Site Generated Traffic)		**Total**	**16**	**0.032**	**47**	**0.094**	**63**	**0.126**	**64**	**0.127**

Sources:
1. Information provided by Watchtower Bible and Tract Society of New York, Inc.
2. Trip rates based on turning movement and ATR counts conducted by AKRF in April and May 2008.

For each peak hour analyzed (based on turning movement and ATR data), the number of vehicle trips entering and exiting the site driveway for the existing 1,550 population were recorded. These trips were converted to an average vehicle trip rate per person for entering and exiting traffic for each peak hour. The future vehicle trips for the proposed 2,050 population (an increase of 500 residents) were computed using the average vehicle trip rates generated from the existing site survey. The difference in vehicle trips between the two population sizes is calculated to be the new site-generated vehicle trips generated by the proposed amended site plan and are shown in Table 10-7. It should be noted that the existing site is not a significant traffic generator considering its overall size. This is because most of the activity is confined to inside the campus, limiting the number of external vehicles trips throughout the day.

The proposed expansion from a population of 1,550 to 2,050 is expected to generate 16 new trips during the weekday morning peak hour (seven entering, nine exiting), 47 trips during the

weekday evening peak hour (11 entering, 36 exiting), 63 trips during the weekday late evening peak hour (13 entering, 50 exiting), and 64 trips during the Saturday midday peak hour (26 entering, 38 exiting).

PROJECT VEHICLE DISTRIBUTION AND ASSIGNMENT

To estimate the distribution of project-generated trips to and from the project site, a directional distribution of vehicle trips was created for weekday and Saturday midday peak hours using information obtained from the applicant on its residents' trip patterns. **Figures 10-10 through 10-13** show the weekday morning, weekday evening, weekday late evening, and Saturday midday peak hour trip distribution. Based on the projected distribution, **Figures 10-14 though 10-17** illustrate the new vehicle trips generated by the proposed amended site plan for the four peak hours.

As shown on the Existing and No Build graphics, there is some minor cross traffic as Watchtower related vehicles traverse Route 22 (east to west and west to east). This is a result of occupants of the farm houses coming and going to their work at the WEC and the applicant's on-site shuttle and other residents accessing the ball fields and gardens west of Route 22. As shown in Figures 10-10 through 10-13 this activity is expected to continue and increase slightly. The applicant intends to continue providing on-site shuttle service for WEC residents, which lessens cross traffic.

The estimated distribution of vehicle trips and assignments takes into consideration a number of features unique to those living at the WEC. These include the fact that directly after 5:00 PM on weeknights, a few WEC occupants typically go shopping in either Danbury, Patterson/Pawling, or Fishkill via Routes 164, 311, and Haviland Hollow Road. Additionally, all occupants of the WEC attend one weeknight meeting in association with a congregation of Jehovah's Witnesses within approximately an hour drive in all directions. Most departures for these meetings occur from 6:00 PM to 7:00 PM, Tuesday through Friday evenings due to the fixed congregation meeting schedules. Approximately 25% of the WEC residents with vehicles attend these congregation meetings to the north and west, typically accessed via Route 22 north and Route 311. Another 20% of WEC residents with vehicles attend these meetings to the east, which is typically via Haviland Hollow Road. Another 45% attend these meetings to the south, traveling via Route 22 south. The remaining 10% are internal trips traveling within the WEC. Also, on Saturday mornings, an average of approximately 450 WEC residents engage in ministerial activity in association with their respective congregations, located as noted above. These individuals typically depart the WEC in the morning and those attending nearby congregations often return to the WEC during the Midday Peak Hour (1:15-2:15 PM) from all directions. WEC residents are strongly encouraged to carpool as they engage in their ministerial activities, and it is expected that they would continue to carpool where possible in the future.

TRAFFIC VOLUMES

The 2014 Build traffic volumes were projected by adding the site-generated traffic volumes that would result from the proposed expansion to the 2014 No Build traffic volumes. The resulting 2014 Build traffic volumes are shown on **Figures 10-18 through 10-21** for the weekday morning, weekday evening, weekday late evening, and Saturday midday peak hours. **Table 10-8** compares the No Build and Build conditions for the study area intersections.

In the 2014 Build conditions, the study intersections are expected to operate at No Build LOS during the respective peak periods with the one following exception:

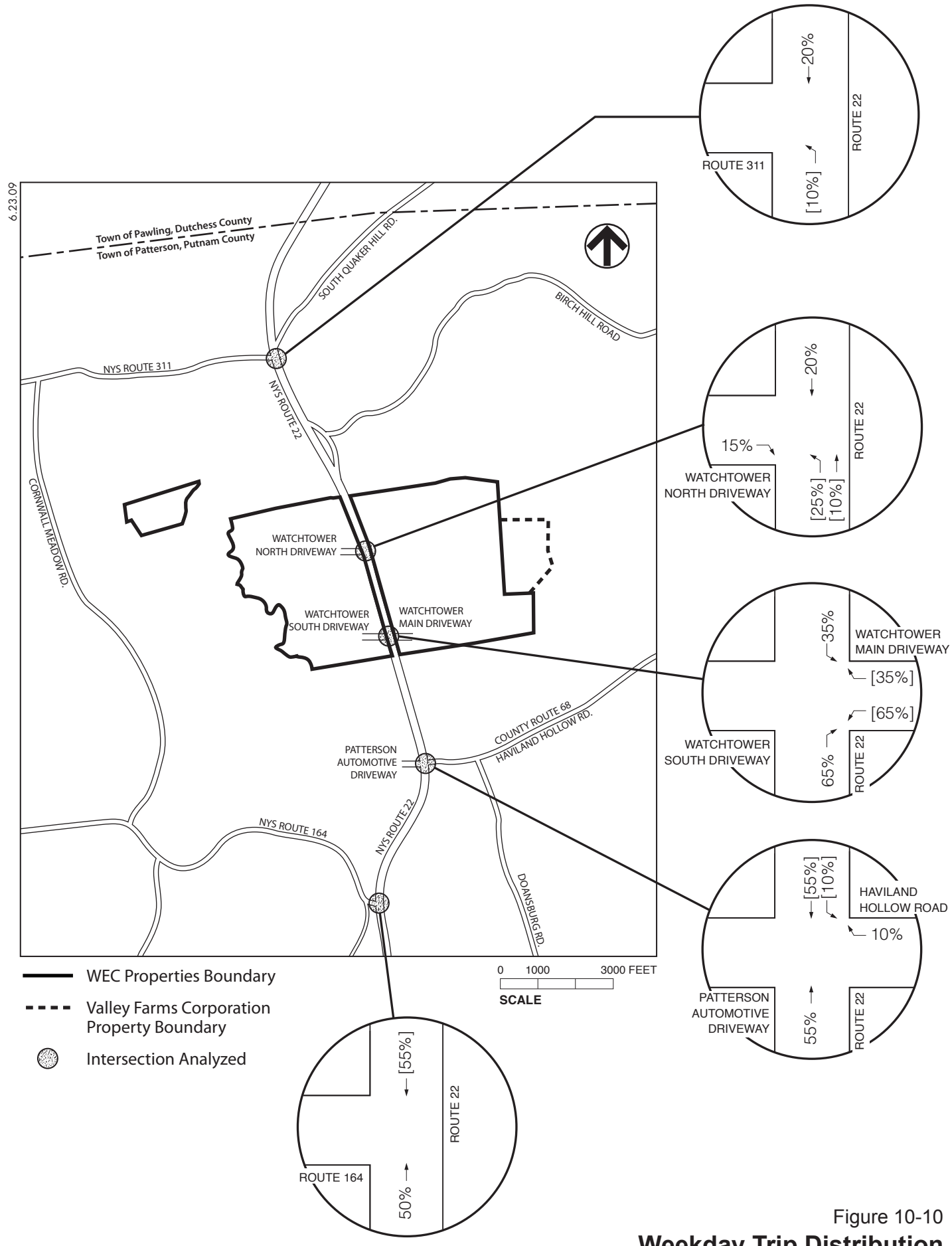

Figure 10-10

Weekday Trip Distribution
Morning Peak Hour (8:15 - 9:15 AM)

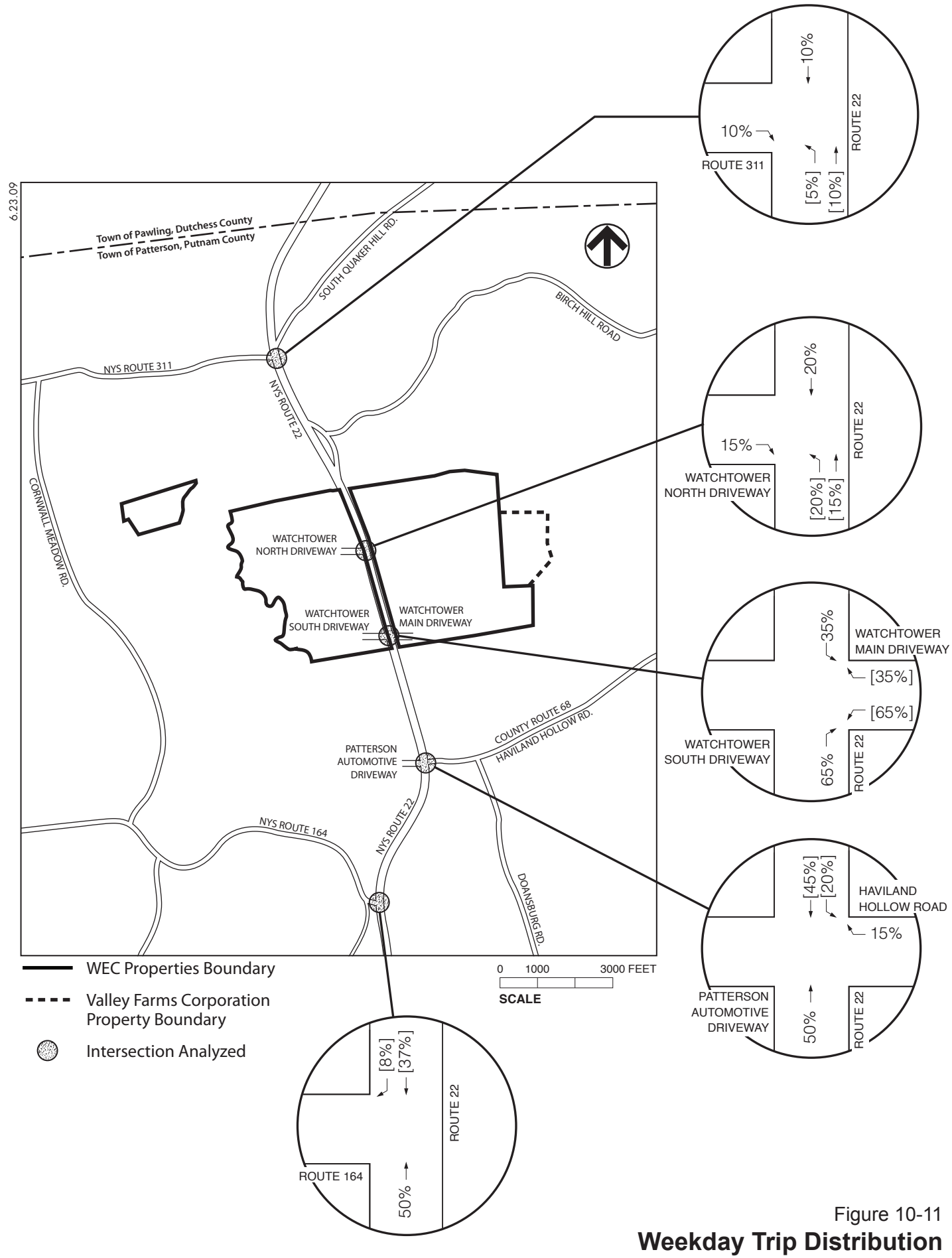

Figure 10-11

Weekday Trip Distribution
Evening Peak Hour (5:00 - 6:00 PM)

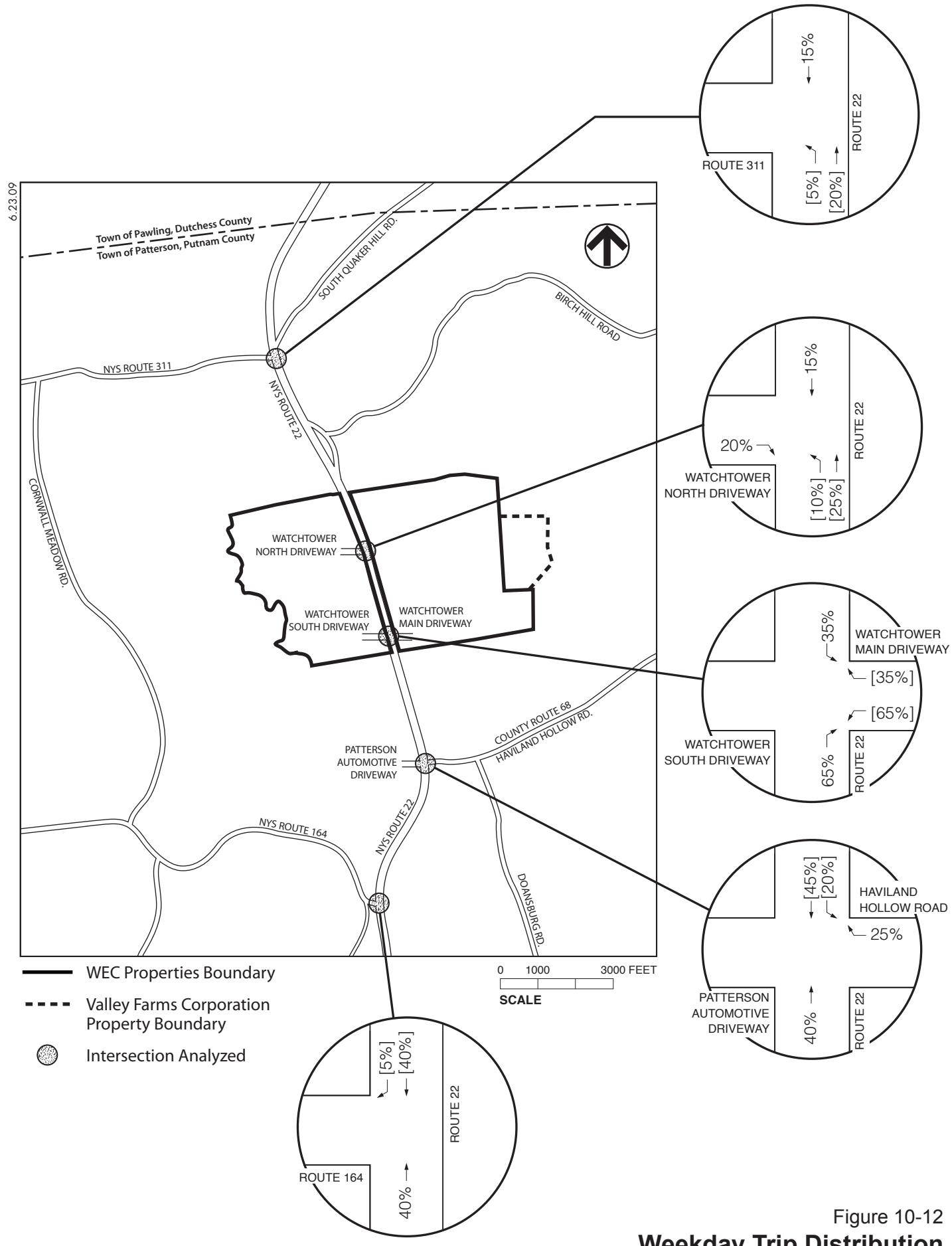

Figure 10-12

Weekday Trip Distribution
Late Evening Peak Hour (6:00 - 7:00 PM)

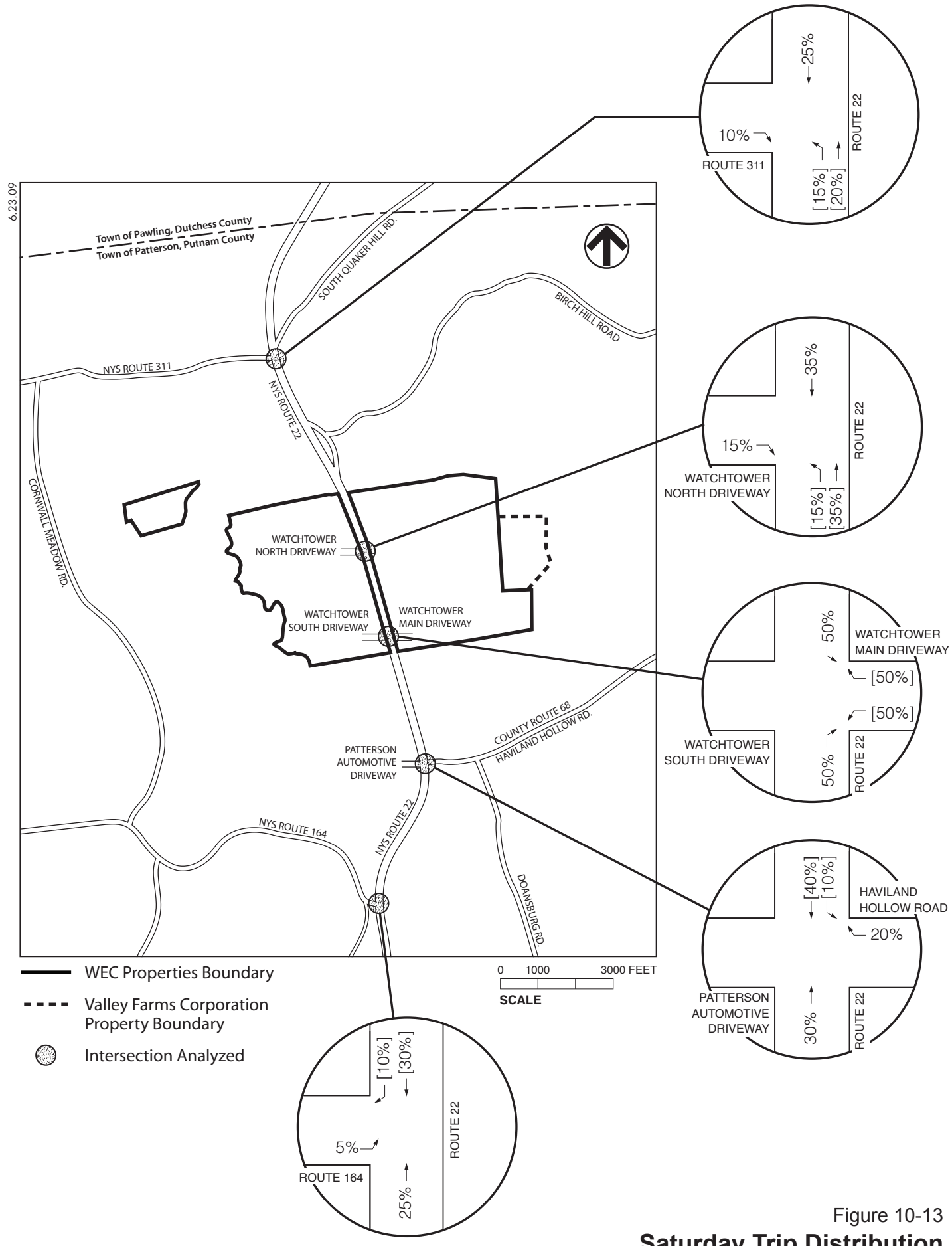

Figure 10-13

Saturday Trip Distribution
Saturday Midday Peak Hour (1:15 - 2:15 PM)

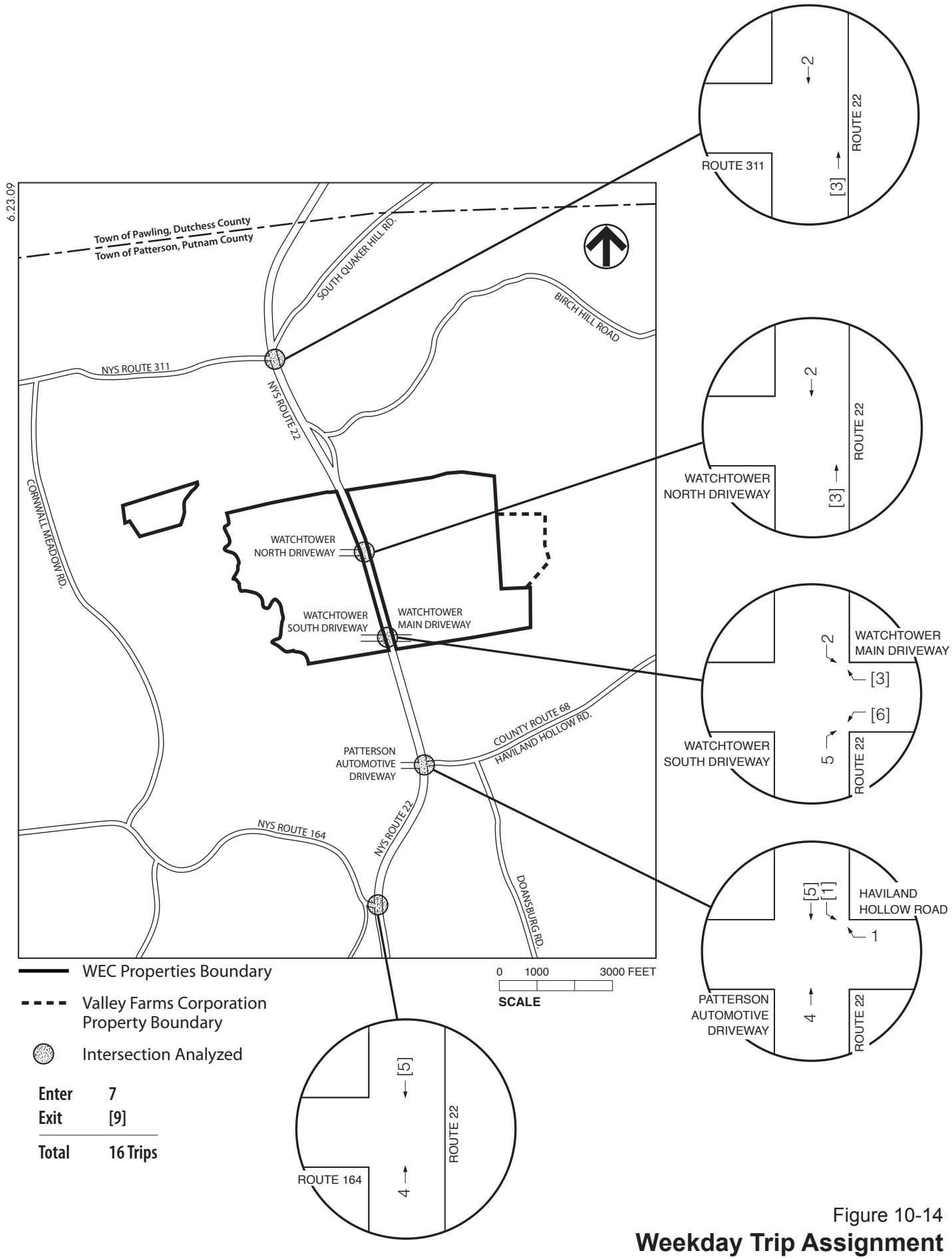

Figure 10-14

Weekday Trip Assignment
Morning Peak Hour (8:15 - 9:15 AM)

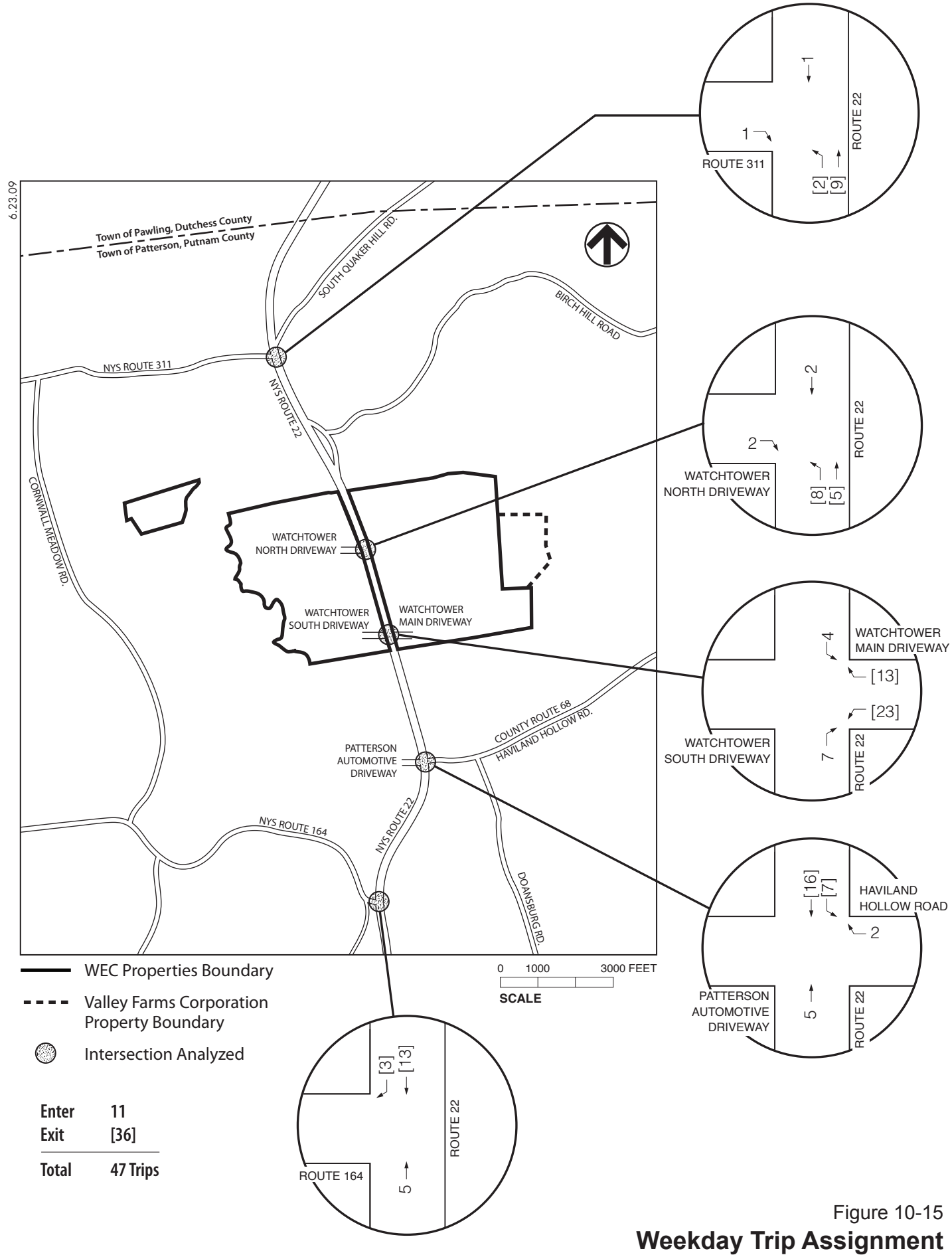

Figure 10-15

Weekday Trip Assignment
Evening Peak Hour (5:00 - 6:00 PM)

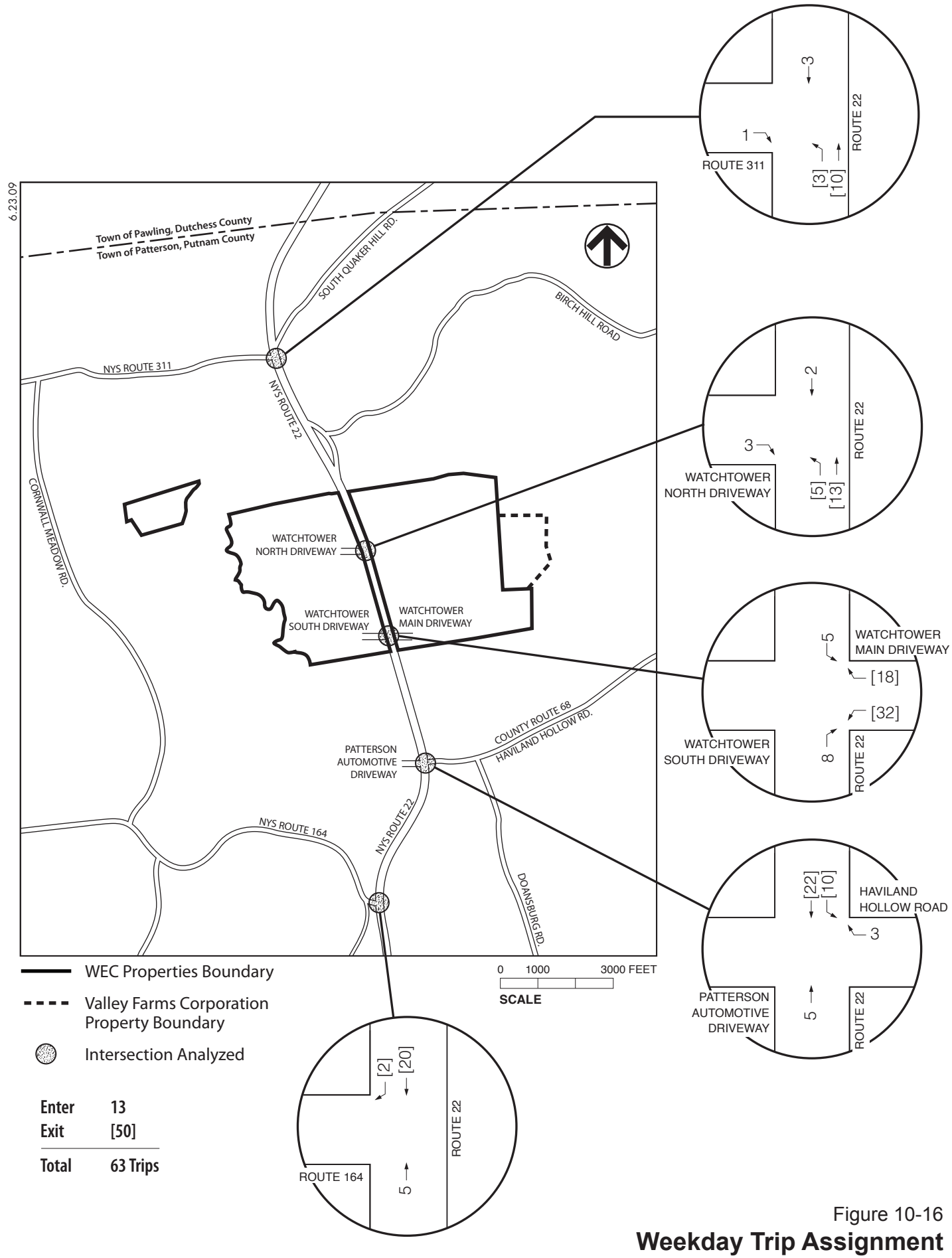

Figure 10-16

Weekday Trip Assignment
Late Evening Peak Hour (6:00 - 7:00 PM)

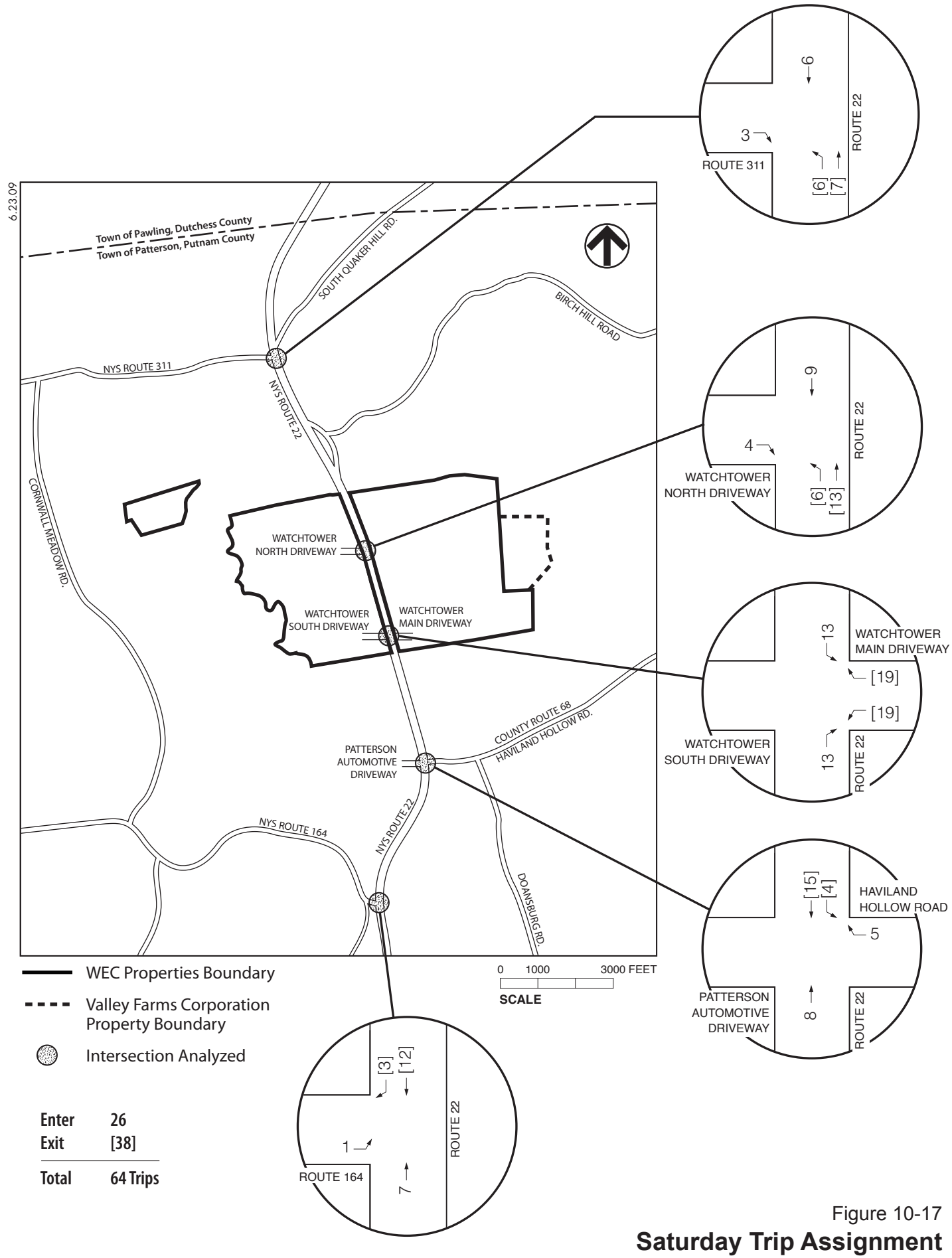

Figure 10-17

Saturday Trip Assignment
Saturday Midday Peak Hour (1:15 - 2:15 PM)

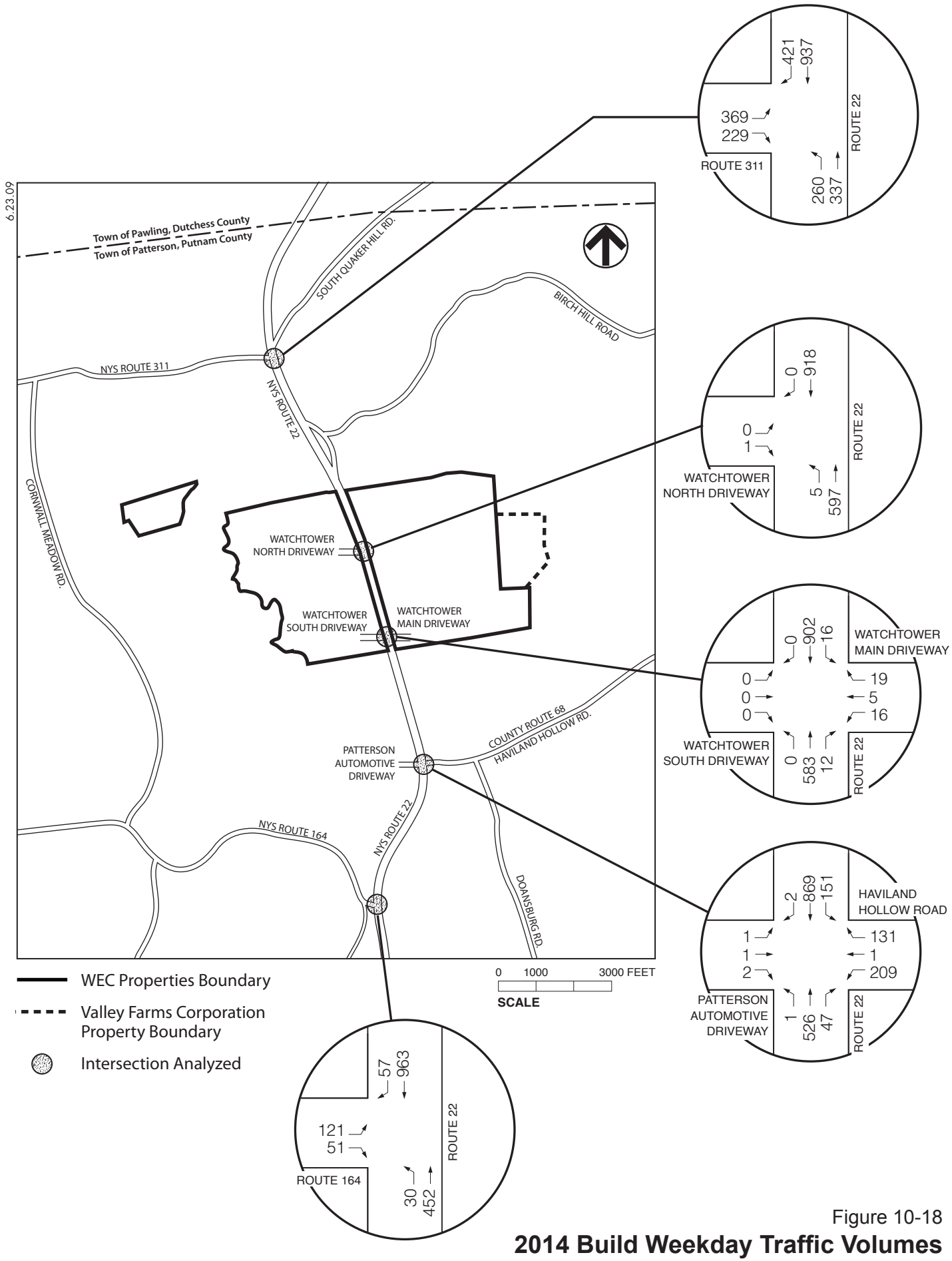

Figure 10-18

2014 Build Weekday Traffic Volumes Morning Peak Hour (8:15 - 9:15 AM)

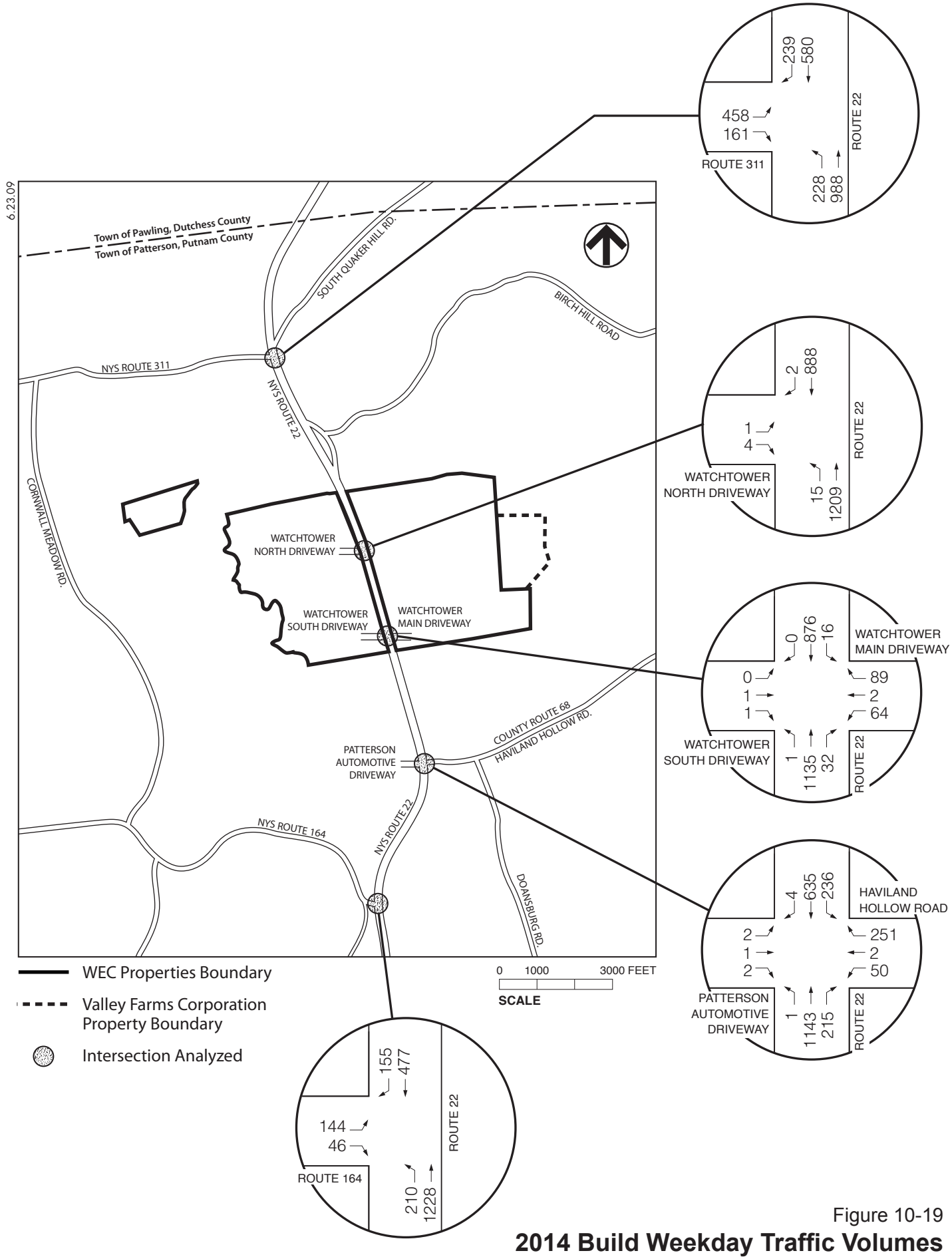

Figure 10-19

2014 Build Weekday Traffic Volumes Evening Peak Hour (5:00 - 6:00 PM)

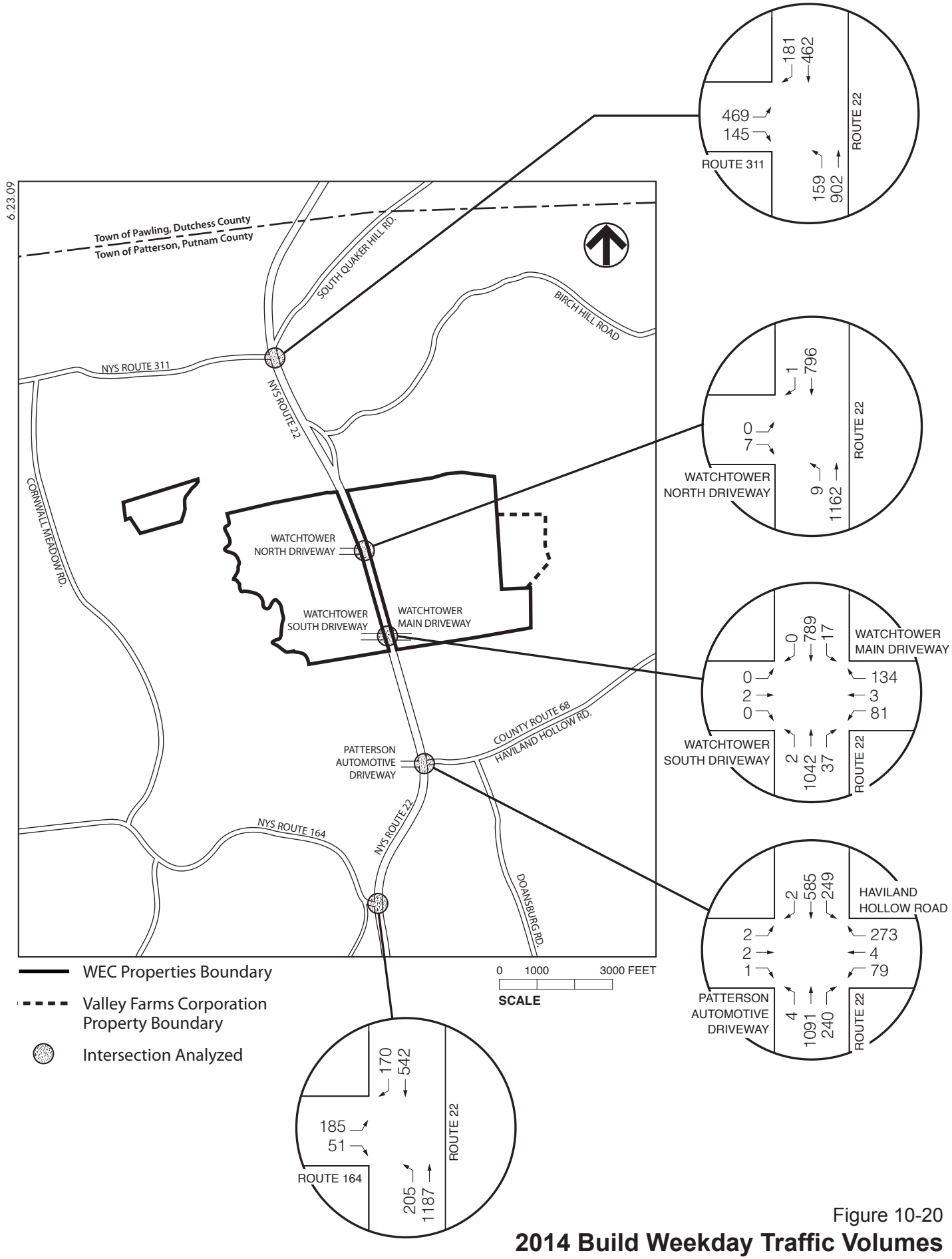

Figure 10-20

2014 Build Weekday Traffic Volumes
Late Evening Peak Hour (6:00 - 7:00 PM)

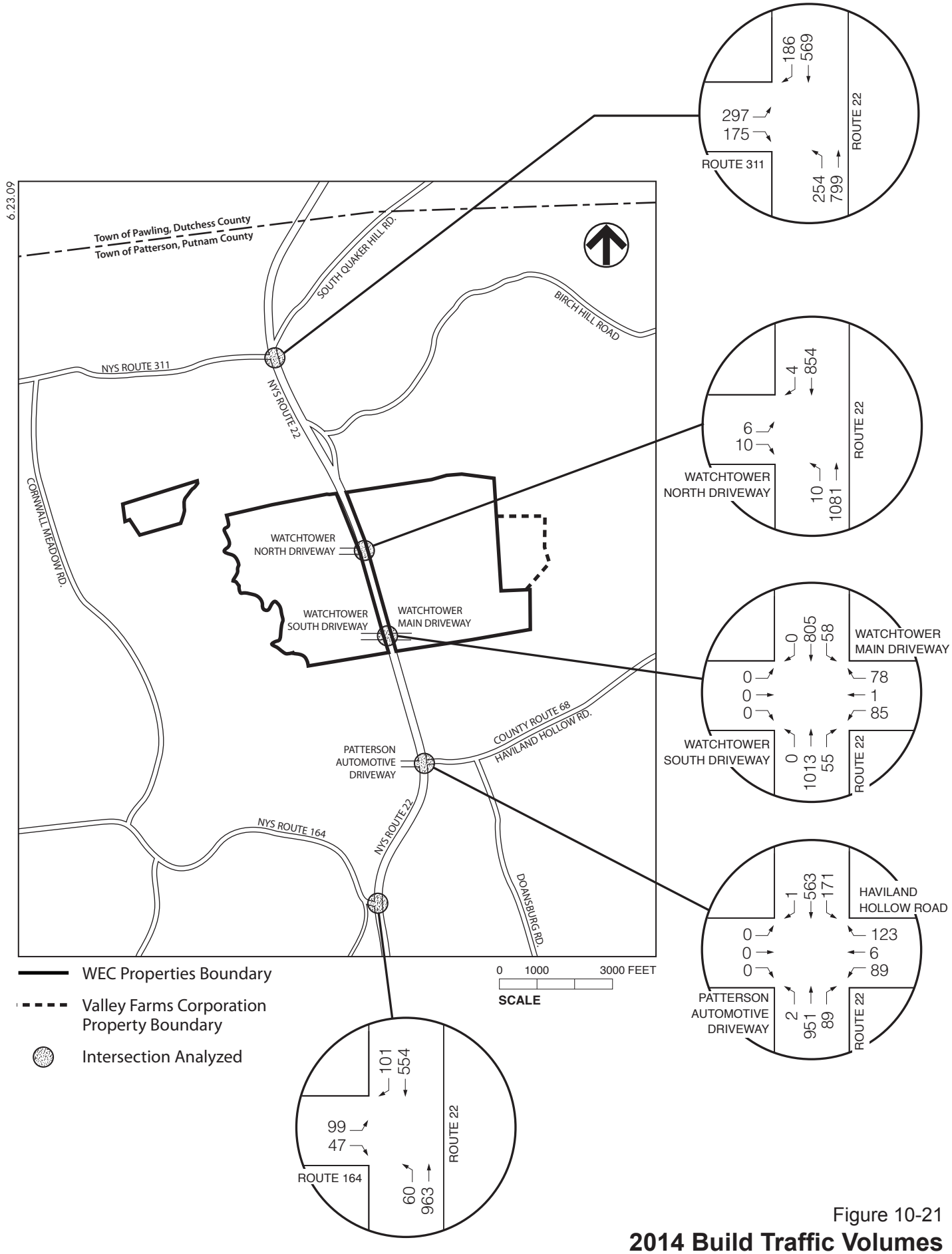

Figure 10-21

2014 Build Traffic Volumes
Saturday Midday Peak Hour (1:15 - 2:15 PM)

UNSIGNALIZED INTERSECTION

- The westbound right-turn movement at the Route 22/WEC Main Driveway intersection would decline from LOS C to LOS D during the Saturday midday peak period. This represents a minor decrease in LOS.

As shown in Table 10-8, the overall intersection delay at the study area signalized intersections would increase by a maximum of only 0.8 seconds during the respective peak hours analyzed. The unsignalized intersections are expected to operate at No Build LOS (with the exception noted above) during the analyzed peak hours. There would be no change/deterioration in LOS from No Build to Build due to the proposed amended site plan. A significant change/deterioration in LOS would typically indicate a potential impact from a proposed development. However, this is not the case with the proposed amended site plan. Therefore, the proposed amended site plan would have only a minimal effect on traffic on the surrounding roadway network and would not cause any significant impacts requiring mitigation.

ACCIDENT DATA

No significant changes are expected in the study area's accident rates under 2014 Build conditions.

PUBLIC TRANSPORTATION

No significant changes are expected in the study area's public transit conditions under 2014 Build conditions. It is the policy of public transportation agencies to make adjustments, if necessary, to the transportation schedules to accommodate changing ridership demand patterns.

Table 10-8
2014 No Build and Build Conditions Level of Service Analysis - Study Intersections

Intersection	Weekday Morning								Weekday Evening								Weekday Late Evening								Saturday Midday							
	No Build				Build				No Build				Build				No Build				Build				No Build				Build			
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Signalized Intersections																																
NYS Route 22 and County Road 68																																
Eastbound	LTR	0.02	31.8	C	LTR	0.02	31.8	C	LTR	0.04	39.0	D	LTR	0.04	39.0	D	LTR	0.04	39.1	D	LTR	0.04	39.1	D	LTR	0.01	38.7	D	LTR	0.01	38.7	D
Westbound	LT	0.93	77.7	E	LT	0.33	77.7	E	LT	0.33	41.6	D	LT	0.33	41.6	D	LT	0.54	45.4	D	LT	0.54	45.4	D	LT	0.62	49.2	D	LT	0.62	49.2	D
	R	0.18	19.0	B	R	0.18	19.0	B	R	0.47	31.2	C	R	0.48	31.2	C	R	0.53	32.3	C	R	0.54	32.5	C	R	0.24	28.3	C	R	0.25	28.5	C
Northbound	LTR	0.71	22.5	C	LTR	0.73	23.3	C	LTR	1.25	141.9	F	LTR	1.26	144.3	F	LTR	1.21	125.5	F	LTR	1.22	127.4	F	LTR	0.95	35.7	D	LTR	0.96	37.1	D
Southbound	L	0.21	10.2	B	L	0.21	10.5	B	L	0.49	22.4	C	L	0.51	23.1	C	L	0.50	22.2	C	L	0.50	22.3	C	L	0.33	14.4	B	L	0.34	14.7	B
	TR	0.73	11.7	B	TR	0.74	11.9	B	TR	0.50	5.8	A	TR	0.51	5.9	A	TR	0.45	5.4	A	TR	0.46	5.6	A	TR	0.43	5.3	A	TR	0.44	5.4	A
	Intersection		22.5	C	Intersection		22.7	C	Intersection		83.6	F	Intersection		84.4	F	Intersection		74.7	E	Intersection		75.2	E	Intersection		25.4	C	Intersection		26.0	C
NYS Route 22 and NYS Route 311																																
Eastbound	L	0.85	49.1	D	L	0.85	49.1	D	L	1.03	87.3	F	L	1.03	87.3	F	L	1.05	91.6	F	L	1.05	91.6	F	L	0.68	37.4	D	L	0.68	37.4	D
	R	0.34	22.9	C	R	0.34	22.9	C	R	0.23	21.7	C	R	0.24	21.7	C	R	0.21	21.4	C	R	0.21	21.4	C	R	0.26	21.9	C	R	0.26	22.0	C
Northbound	L	0.90	72.1	E	L	0.91	72.8	E	L	0.50	24.8	C	L	0.50	25.0	C	L	0.29	16.7	B	L	0.30	16.8	B	L	0.59	27.9	C	L	0.60	28.9	C
	T	0.33	11.3	B	T	0.33	11.3	B	T	0.93	33.3	C	T	0.93	33.8	C	T	0.83	24.1	C	T	0.84	24.7	C	T	0.79	22.0	C	T	0.80	22.4	C
Southbound	T	1.07	77.3	E	T	1.07	77.7	E	T	0.70	24.7	C	T	0.70	24.8	C	T	0.57	20.8	C	T	0.57	20.9	C	T	0.68	23.7	C	T	0.69	24.0	C
	TR	0.24	2.0	A	TR	0.24	2.0	A	TR	0.15	1.6	A	TR	0.15	1.6	A	TR	0.12	1.5	A	TR	0.12	1.5	A	TR	0.12	1.5	A	TR	0.12	1.5	A
	Intersection		49.0	D	Intersection		49.2	D	Intersection		37.5	D	Intersection		37.7	D	Intersection		35.4	D	Intersection		35.5	D	Intersection		23.8	C	Intersection		23.8	C
Unsignalized Intersections																																
NYS Route 22 and Main Entrance / South Driveway																																
Eastbound	LTR	0.03	36.6	E	LTR	0.03	37.1	E	LTR	0.52	>240.0	F	LTR	0.71	>240.0	F	LTR	0.44	>240.0	F	LTR	0.62	>240.0	F	LTR	0.01	84.9	F	LTR	0.07	99.6	F
Westbound	LT	0.23	55.3	F	LT	0.32	63.0	F	LT	>1.50	>240.0	F	LT	>1.50	>240.0	F	LT	>1.50	>240.0	F	LT	>1.50	>240.0	F	LT	>1.50	>240.0	F	LT	>1.50	>240.0	F
	R	0.04	12.5	B	R	0.05	12.6	B	R	0.56	40.7	E	R	0.65	48.4	E	R	0.69	51.4	F	R	0.80	65.2	F	R	0.14	23.7	C	R	0.32	25.8	D
Northbound	LT	0.00	10.2	B	LT	0.00	10.2	B	LT	0.00	10.5	B	LT	0.00	10.5	B	LT	0.00	10.6	B	LT	0.00	10.6	B	LT	0.00	9.6	A	LT	0.00	9.6	A
Southbound	L	0.01	8.8	A	L	0.05	8.8	A	L	0.03	11.9	B	L	0.04	12.0	B	L	0.03	11.8	B	L	0.04	11.9	B	L	0.05	11.5	B	L	0.10	11.8	B
Route 22 and Watchtower Driveway (north)																																
Eastbound	LR	0.04	27.1	D	LR	0.04	27.4	D	LR	0.06	39.9	E	LR	0.08	39.9	E	LR	0.07	31.5	D	LR	0.09	27.1	D	LR	0.46	65.4	F	LR	0.54	65.9	F
Northbound	LT	0.01	10.3	B	LT	0.01	10.3	B	LT	0.01	10.2	B	LT	0.02	10.2	B	LT	0.01	9.7	A	LT	0.01	9.8	A	LT	0.01	9.9	A	LT	0.01	10.0	A
NYS Route 22 and NYS Route 164																																
Eastbound	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F	L	>1.50	>240.0	F
	R	0.13	13.7	B	R	0.13	13.7	B	R	0.09	11.1	B	R	0.09	11.2	B	R	0.11	11.7	B	R	0.11	11.9	B	R	0.08	11.1	B	R	0.08	11.2	B
Northbound	L	0.05	11.5	B	L	0.05	11.5	B	L	0.28	10.7	B	L	0.28	10.8	B	L	0.31	11.4	B	L	0.32	11.6	B	L	0.07	9.4	A	L	0.07	9.5	A

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn; LOS = Level of Service, - Denotes no vehicle in the lane group.
HCS printouts are located in Appendix H.

INTERNAL TRAFFIC CIRCULATION

The existing main access road to the project site (WEC Main Driveway) at NYS Route 22 and most of the existing internal roadways on the campus would remain unchanged in the Build condition.

Other proposed changes would provide for effective circulation and flow throughout the campus. Traffic circulation would be improved with the widening of the roadway (used primarily for special events) near the proposed Recycling Building. This would allow vehicles to be parked on a permeable surface and outside the travel lanes, so as not to impede circulation and emergency vehicles. Additional roads would be constructed to the new buildings where the expansion is proposed (see Figure 2-1, Proposed Site Plan). Signage, speed tables, and striping would be provided to maintain low speeds (traffic calming) throughout the WEC.

A separate area for bus parking is proposed adjacent to the Visitor Services building. On average, the applicant receives no buses 210 days out of the year. On 150 days out of the year, between one to ten buses arrive at the Watchtower Educational Center. On the remaining five days each year an average of 11 to 20 buses arrive. On two days during the past five years, a peak of 30 and 36 buses arrived relative to special events. Buses are scheduled to arrive between 8:00 AM and 4:30 PM, Monday through Friday. A maximum of six buses have arrived within any half-hour period. Efforts are made to coordinate bus arrivals between the applicant's other complexes to minimize on-site impacts. In the future, the applicant anticipates the same number of buses (up to 20 per day). Nevertheless, no more than five to six buses arriving within a half-hour period are anticipated. The applicant expects to continue coordinating bus arrival times to spread them out. The proposed parking layout has been designed to accommodate these parameters. This improvement would provide a separate area for buses to park and allow better separation of bus traffic from auto and pedestrian traffic. In the rare event there are more than 20 buses in a given day, the applicant intends to provide additional attendants to facilitate the smooth and safe flow of bus and other traffic on-site.

Additional pedestrian improvements (i.e., crosswalks, etc.) would be added on-site to ensure safe and effective pedestrian travel from the proposed car and bus parking areas to their destinations. Signage would be provided to ensure pedestrian and vehicle traffic do not conflict.

ON-SITE PARKING

The proposed amended site plan would include an additional 434 parking spaces on-site, of which 351 would be located in garages. The existing site currently provides approximately 1,317 parking spaces, which are located in parking garages and lots throughout the site. Thus, the future parking supply would be approximately 1,751 parking spaces and all parking would be accommodated on-site.

The additional parking that would be provided by the proposed project would accommodate passenger vehicles, vans, passenger pickups and drop-offs, work vans, trucks/large shuttles, utility carts, and visitor vehicles and buses. Additional spaces would be located adjacent to the residence buildings to alleviate safety issues with picking up car-pooling passengers in an active roadway.

F. POTENTIAL TRAFFIC SIGNAL AT THE NYS ROUTE 22/ WEC MAIN DRIVEWAY

As previously mentioned, most of the future increase in traffic volumes on NYS Route 22 would come from other area developments (No Build projects). This traffic increase would directly affect the WEC Main Driveway operations even though the net traffic increase from the proposed expansion itself would be minor. The WEC Main Driveway and WEC South Driveway at NYS Route 22 are projected to operate at LOS E and F in the future with and without the proposed expansion.

Because of the poor future LOS predicted by HCM, a preliminary Traffic Signal Warrant was conducted for the NYS Route 22/WEC Main Driveway for the No Build and Build conditions. The purpose of the Traffic Signal Warrant is to determine if the installation of a traffic signal at the NYS Route 22/WEC Main Driveway intersection would be necessary in the future in order to provide acceptable and safe operating conditions. The latest *Manual on Uniform Traffic Control Devices (MUTCD)* and most recent NYSDOT Supplement (last revised March 19, 2008) to the *MUTCD* was reviewed to determine which warrants could be met in 2014 with or without the proposed amended site plan. It was concluded that the NYS Route 22/WEC Main Driveway would satisfy the Warrant 3 (Peak Hour Warrant) criteria under the 2014 No Build and Build conditions.

The *MUTCD* specifically states that a traffic signal should not be considered for installation unless one or more of the warrants are met (Warrant #3 is met, as discussed above). However, it is important to note that the satisfaction of a warrant is the minimum criteria necessary to consider signalizing an intersection. Therefore, an engineering study should be conducted to determine if a traffic signal is justified at the subject intersection. It is recommended that a warrant study be conducted for this intersection one to six months after the completion of the proposed WEC amended site plan to determine if a traffic signal is needed. Since warrants are satisfied with or without the proposed amended site plan, NYSDOT should consider conducting the warrant study. The potential need for signalization (signal warrant study) of the NYS Route 22/WEC Main Driveway intersection will be determined based on the NYSDOT review of this traffic study and will be addressed between the DEIS and FEIS. ✷

A. INTRODUCTION

This chapter examines the potential for air quality impacts that could result from the proposed project. Air quality impacts can be either direct or indirect. Direct impacts stem from emissions generated by stationary sources at a development site, such as emissions from fuel burned on-site for heating, ventilation, and air conditioning (HVAC) systems. Indirect impacts are caused by potential emissions due to mobile sources/vehicles generated by the proposed project.

PRINCIPAL CONCLUSIONS

The air quality screening analysis performed for the proposed project concludes that no significant adverse mobile or stationary source impacts would result with the amended site plan of the Watchtower Educational Center (WEC) campus.

B. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act (CAA), primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, respirable particulate matter (PM), sulfur dioxide (SO_2), and lead. The primary standards protect public health and represent levels at which there are no known significant effects on human health. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary and secondary standards are the same for NO_2, ozone, lead, and PM, and there is no secondary standard for CO.

The NAAQS are presented in **Table 11-1**. The NAAQS for CO, NO_2, and SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particulate matter (TSP), settleable particles, non-methane hydrocarbons (NMHC), and ozone that correspond to federal standards that have since been revoked or replaced; the state also has standards for beryllium, fluoride, and hydrogen sulfide (H_2S).

The Environmental Protection Agency (EPA) has revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and retaining the level of the annual standard at 15 $\mu g/m^3$. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked. The EPA has also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective in May 2008.

Table 11-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m^3	ppm	µg/m^3
Carbon Monoxide (CO)				
8-Hour Average [1]	9	10,000	None	
1-Hour Average [1]	35	40,000		
Lead				
Rolling 3-Month Average [5]	NA	0.15	NA	0.15
Quarterly Average [5]	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average [2]	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average [1]	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of 3 Annual Means	NA	15	NA	15
24-Hour Average [3,4]	NA	35	NA	35
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24-Hour Average [1]	0.14	365	NA	NA
Maximum 3-Hour Average [1]	NA	NA	0.50	1,300

Notes:
ppm – parts per million
µg/m^3 – micrograms per cubic meter
NA – not applicable
All annual periods refer to calendar year.
PM concentrations (including lead) are in µg/m^3
Concentrations of all gaseous pollutants are defined in ppm and approximately equivalent concentrations in µg/m^3 are presented.
(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual fourth highest daily maximum 8-hr average concentration. EPA has reduced these standards down from 0.08 ppm, effective May 27, 2008.
(3) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(4) EPA has reduced these standards down from 65 µg/m^3, effective December 18, 2006.
(5) EPA has lowered these standards from 1.5 µg/m^3, effective October 15, 2008.
Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

On May 20, 2008, the EPA proposed to revise the primary and secondary standards for lead within the range of 0.10 to 0.30 µg/m^3. With regard to the averaging time and form of the standard, EPA proposed two options: to retain the current averaging time of a calendar quarter and the current not-to-be exceeded form, revised to apply across a 3-year span; or to revise the averaging time to a calendar month and the form to the second-highest monthly average across a 3-year span. EPA is proposing that the current lead NAAQS remain in place for 1 year following the effective date of attainment designations for any new or revised NAAQS before being revoked, except in current non-attainment areas, where the existing NAAQS will not be revoked until the affected area submits, and EPA approves, an attainment demonstration for the revised lead NAAQS. The revised standards were finalized on October 15, 2008.

STATE IMPLEMENTATION PLAN (SIP)

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by the EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA.

Putnam and Dutchess Counties and part of Orange County had been designated as a moderate non-attainment area for ozone (1-hour average standard). In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by the EPA effective March 6, 2002, addressing attainment of the 1-hour ozone NAAQS by 2007. These SIP revisions included additional emission reductions that the EPA requested to demonstrate attainment of the standard, and an update of the SIP estimates using the latest versions of the mobile source emissions model, MOBILE6.2, and the nonroad emissions model, NONROAD—which have been updated to reflect current knowledge of engine emissions and the latest mobile and nonroad engine emissions regulations.

On April 15, 2004, the EPA designated these same counties as moderate non-attainment for the new 8-hour average ozone standard, which became effective as of June 15, 2004. (The lower Orange County metropolitan area was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone.) The EPA revoked the 1-hour standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP are required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. On February 8, 2008, the New York State Department of Environmental Conservation (NYSDEC) submitted final revisions to a new SIP for ozone to the EPA. NYSDEC has determined that achieving attainment for ozone would occur by 2009, before the statutory deadline of June 15, 2010.

In March 2008, the EPA strengthened the 8-hour ozone standards. The EPA expects designations to take effect no later than March 2010 unless there is insufficient information to make these designation decisions. In that case, the EPA will issue designations no later than March 2011. SIPs would be due 3 years after the final designations are made.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

The State Environmental Quality Review Act (SEQRA) regulations state that the significance of a likely consequence (i.e., whether it is material, substantial, large, or important) should be assessed in connection with:

- Its setting (e.g., urban or rural);
- Its probability of occurrence;
- Its duration;
- Its irreversibility;
- Its geographic scope;
- Its magnitude; and
- The number of people affected.

In terms of the magnitude of air quality impacts (the second to last bullet above), any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the

concentrations defined by the NAAQS (see Table 11-1) would be deemed to have a potential significant adverse impact. In addition, to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants. Any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

C. POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of CO are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (NO and NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and sources using non-road diesel, such as diesel trains, marine engines, and non-road vehicles (e.g., construction engines). On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. Since CO is a reactive gas that does not persist in the atmosphere, CO concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be predicted on a local, or microscale, basis.

The proposed project could increase traffic volumes on streets near the project site and result in localized increases in CO levels. Therefore, a mobile source screening analysis was performed to determine the locations where a more detailed mobile source analysis may be required.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x are of principal concern because of their role, together with VOCs as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis, together with the emission of these pollutants from stationary sources. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle trips and the vehicle miles traveled throughout the New York metropolitan area. The proposed project would not have a significant adverse effect on the overall volume of vehicular travel in the area. It would not, therefore, have any measurable

impact on regional NO_x emissions or on ozone levels. An analysis of project-related impacts from mobile sources for these pollutants was therefore not warranted.

The proposed project would not involve the addition of any major new stationary sources of emissions. Therefore, an analysis of potential impacts due to NO_x emissions was not warranted.

LEAD

Airborne lead emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor vehicle related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, the EPA announced new rules that drastically reduced the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead concentrations. Effective January 1, 1996, the CAA banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles, concluding the 25-year effort to phase out lead in gasoline. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the 3-month average national standard of 0.15 micrograms per cubic meter ($\mu g/m^3$), and are likely to be lower than the proposed monthly standard of 0.1 to 0.3 $\mu g/m^3$.

No significant sources of lead are associated with the proposed project, and, therefore, analysis of lead was not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption of other pollutants, often toxic and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$) and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$

is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from an exhaust pipe or stack) or from precursor gases reacting in the atmosphere to form secondary PM.

Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel powered vehicles

The proposed project would not result in any significant increases in truck traffic near the project site or in the region, and would not involve the addition of any major new stationary sources of emissions. Therefore, an analysis of potential impacts from respirable particulate matter was not warranted.

SULFUR DIOXIDE

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal. Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant, and, therefore, an analysis of this pollutant from mobile sources was not warranted.

In addition, the proposed project would not involve the addition of any major new stationary sources of emissions. Therefore, an analysis of potential impacts due to SO_2 emissions was not warranted.

D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

An assessment of the potential air quality effects of the proposed project on CO concentrations that would result from vehicles coming to and departing from the project site was performed following the procedures outlined in the New York State Department of Transportation (NYSDOT) *Environmental Procedures Manual (EPM)*, January 2001. The study area corresponds to that of the traffic analysis (described in Chapter 10), including two signalized and three unsignalized intersections for the CO microscale analysis. The screening criteria described below were applied to the traffic analysis results for the 2014 analysis year.

CO SCREENING CRITERIA

Screening criteria described in the *EPM* were employed to determine whether the proposed project requires a detailed air quality analysis at the intersections in the study area. Before undertaking a detailed microscale modeling analysis of CO concentrations at the study area intersections, the screening criteria first determines whether the information from the traffic capacity analysis demonstrates that there is the potential for either significant adverse impacts from incremental traffic or from elevated air quality concentrations. The following multi-step procedure is suggested in the *EPM* to determine if there is the potential for CO impacts from the proposed project:

- **Level-of-Service (LOS) Screening**: If the Build condition LOS is A, B, or C, no air quality analysis is required. For intersections operating at LOS D or worse, proceed to "Capture Criteria."

- **Capture Criteria**: If the Build condition LOS is at D, E, or F, then the following capture criteria should be applied at each intersection or corridor to determine if an air quality analysis may be warranted:
  - A 10 percent or more reduction in the source-to-receptor distance (e.g., street or highway widening); or
  - A 10 percent or more increase in traffic volume on affected roadways for the Build year; or
  - A 10 percent or more increase in vehicle emissions for the Build year using emission factors provided in the *EPM*; or
  - Any increase in the number of queued lanes for the Build year (this applies to intersections). It is not expected that intersections in the Build condition controlled by stop signs would require an air quality analysis; or
  - A 20 percent reduction in speed when Build average speeds are below 30 miles per hour (mph).

If the project does not meet any of the above criteria, a microscale analysis is not required. Should any one of the above capture criteria be met in addition to the LOS screening, then a volume threshold screening is performed, using traffic volume and emission factor data to compare with specific volume thresholds established in the *EPM*.

Both the above capture criteria and volume threshold screening were developed by the NYSDOT to be very conservative air quality estimates based on worst-case assumptions. The *EPM* states that if the project-related traffic volumes are below the volume threshold criteria, then a microscale air quality analysis is unnecessary even if the other capture criteria are met for a LOS D or worse location, since a violation of the NAAQS would be extremely unlikely.

E. EXISTING CONDITIONS

Monitored ambient concentrations of SO_2, particulate matter (PM_{10} and $PM_{2.5}$), ozone, and lead for the study area are shown in **Table 11-2**. These values represent the most recent monitored data available that have been published by NYSDEC for these locations.

Table 11-2
Representative Monitored Ambient Air Quality Data Monitoring Stations

Pollutant	Monitoring Station	Units	Averaging Period	Concentration
CO	Bronx Botanical Gardens	ppm	8-hour	1.9
			1-hour	2.7
SO_2	Mt. Ninham	µg/m^3	Annual	3.9
			24-hour	23.5
			3-hour	49.7
PM_{10}	Belleayre Mtn.	µg/m^3	24-hour[1]	37
$PM_{2.5}$	Newburgh	µg/m^3	Annual	10.7
			24-hour	30.6
NO_2	Botanical Gardens	µg/m^3	Annual	45.1
Lead	Wallkill	µg/m^3	3-month	0.06
Ozone	Mt. Ninham	ppm	8-hour	0.086
			1-hour[2]	0.126

Notes:
[1] The annual PM_{10} standard was revoked by the EPA.
[2] The 1-hour ozone NAAQS has been replaced with the 8-hour standard; however, the maximum monitored concentration is provided for informational purposes. The EPA has reduced the 8-hour standard to 0.075 down from 0.08 ppm, effective May 2008.
Source: NYSDEC, 2007 New York State Ambient Air Quality Data.

F. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the proposed project (No Build 2014 conditions), no significant changes in air quality are expected to occur.

G. PROBABLE IMPACTS OF THE PROPOSED PROJECT

MOBILE SOURCES

The area roadway intersections were reviewed based on NYSDOT's *EPM* criteria for determining locations that may warrant a CO microscale air quality analysis. The screening analysis examined the LOS and projected volume increases by intersection approach. As described below, the results of the screening analysis show that none of the two project-affected signalized intersections would require a detailed microscale air quality analysis.

LOS SCREENING ANALYSIS

Results of the traffic capacity analysis performed for the 2014 Build year condition in the weekday morning, weekday evening, weekday late evening and Saturday midday peak periods were reviewed at each of the study area intersections to determine the potential need for a microscale air quality analysis.

The LOS screening criteria were first applied to identify those signalized intersections with approach LOS D or worse. Based on the review of the five intersections analyzed, two intersections were projected to operate at a LOS D or worse on approaches during any of the peak traffic periods analyzed: NYS Route 22 and County Road 68; and NYS Route 22 and NYS Route 311.

CAPTURE CRITERIA SCREENING ANALYSIS

Further screening on the intersections identified in the LOS screening analysis was conducted using the capture criteria outlined above. This screening indicated that none of the listed capture criteria would be met. Therefore, a detailed CO microscale air quality analysis was not warranted at these intersections.

The results of screening analysis as discussed above, based on NYSDOT's *EPM* employed to determine whether the proposed project requires an air quality analysis, show that none of the five project-affected intersections would require detailed microscale air quality analysis. Therefore, no significant adverse air quality impacts would occur as a result of the proposed project's mobile sources.

STATIONARY SOURCES

The only stationary source of air pollutants associated with the proposed project would be the modifications to the fossil fuel-fired heating and hot water systems in the central plant which serves the existing and proposed new buildings. The primary pollutants of concern when burning fuel oil are SO_2 and particulate matter, while NO_x is of concern when natural gas is used.

Since monitored concentrations of these pollutants indicate that levels are well below the standards in the study area, and the proposed project would not be a major source of stationary source emissions, the proposed project would not result in significant adverse air quality impacts due to stationary sources.

CONSISTENCY WITH THE NEW YORK STATE AIR QUALITY IMPLEMENTATION PLAN

The proposed project is not expected to cause any new violations of air quality standards or exacerbate any existing violations for the projected 2014 Build conditions. Therefore, the proposed project would not have a significant adverse impact on local air quality and would be considered consistent with the requirements of the New York SIP. ✷

Chapter 12: Historic and Visual Resources

A. INTRODUCTION

This chapter considers the potential of the proposed project to affect historic and visual resources. Historic resources include both architectural and archaeological resources.

As described in Chapter 2, "Project Description," the applicant has submitted a request to the Patterson Planning Board to amend the site plan for its facility located along New York State (NYS) Route 22, in the Town of Patterson, Putnam County (see **Figure 12-1**). The applicant owns parcels on both the east and west sides of Route 22 (collectively referred to as the Watchtower Educational Center [WEC] properties). However, the proposed project would occur on the east side of Route 22 primarily on the 362.5-acre project site parcel. Some additional work would be conducted on an adjacent 12.2-acre parcel at the Patterson Inn. Watchtower Drive, the main entry to the project site parcel, is located on Route 22 approximately a half mile north of Haviland Hollow Road (CR #68) and approximately one and one-half miles south of Route 311.

PRINCIPAL CONCLUSIONS

VISUAL RESOURCES

Some of the proposed project elements, particularly the five-story plus basement buildings that would be constructed in what is now the orchard area, would be visible from the limited vantage points from which the WEC properties are currently visible. However, the visual impact of these new elements would be minimal. The proposed project would not result in a substantial change in the existing overall visual character of the area or the visual resources identified in the study area and would not block or meaningfully alter views to and from these visual resources. Thus, the project would not result in an adverse impact on visual resources.

Furthermore, on the whole, the new lighting that would be installed as part of the proposed project would be similar to existing conditions. New lighting would not result in spillover on locations outside of the project site. The proposed scheme would incorporate measures to minimize glare and sky-glow. The perceived brightness of the proposed lighting scheme from locations outside of the project site would be comparable to the existing scheme, and would not impact visual resources. Furthermore, the proposed lighting would be in compliance with the Lighting Standards of the Town of Patterson Zoning Regulation (154-22.1).

HISTORIC RESOURCES

Architectural Resources

There are no known or potential architectural resources on the project site. One potential architectural resource is located in the study area, the former diner located at 2908 Route 22, now Rocco's Family Restaurant and Pizza. However, no project-related construction would

occur in close proximity to the resource, and views between the potential resource and the project site are extremely limited. The proposed new structures would not be visible from the potential architectural resource, and no existing views of the potential resource would be blocked or altered. Therefore, no adverse effects on architectural resources are anticipated as a result of the proposed project.

Archaeological Resources

A Phase 1A archaeological documentary study (see Appendix G) prepared for this project determined that most of the archaeological study area has low sensitivity for prehistoric and historic period archaeological resources. However, four areas that may be impacted by the proposed project do possess archaeological sensitivity. These include a small section of the recreation area, where a temporary sediment trap would be constructed; and the existing excess soil deposition area, which is under consideration as a possible excess soil deposition area for the proposed project. In addition to these three areas, the north pasture area and locations immediately flanking Mountain Brook are considered potentially archaeologically sensitive; however, they are not expected to be impacted as part of the proposed project. As project planning progresses, if impacts to these potentially sensitive areas are planned, archaeological field testing and/or monitoring (and if necessary, additional mitigation) would be required prior to construction.

B. METHODOLOGY

VISUAL RESOURCES

The chapter's visual resources section considers the effects of the proposed project on visual resources and aesthetic conditions in locations where the proposed project could be visible. The analysis of visual impacts is based on a field survey and application of the State Environmental Quality Review Act (SEQRA) guidelines and NYSDEC Visual Impact Assessment Methodology, "Assessing and Mitigating Visual Impacts," (DEP-00-2).

To prepare this analysis, information was collected through field visits. A study area for visual resources was delineated to include areas within visual range of the WEC properties. The visual resources study area extends a half mile to the north, south, and east of the WEC properties, and 1 mile to the west of the WEC properties. The study area to the west extends to a greater distance because the topography of the area allows for longer views toward the project site parcel (see Figure 12-1).

The overall aesthetic character of the study area was assessed, and visual resources and visually sensitive locations were identified. To determine the visual effects of the proposed project on the study area from the identified visual resources and visually sensitive locations, photographs were taken to demonstrate existing views in the surrounding area.

HISTORIC RESOURCES

To assess the potential effects of the project on historic resources, study areas for the project components were identified. In general, potential impacts to architectural resources can include both direct physical impacts (e.g., demolition, alteration, or damage from construction on nearby sites) and indirect contextual impacts, such as the isolation of a property from its surrounding environment, or the introduction of visual, audible, or atmospheric elements that are out of character with a property or that alter its setting. The study area for archaeological resources

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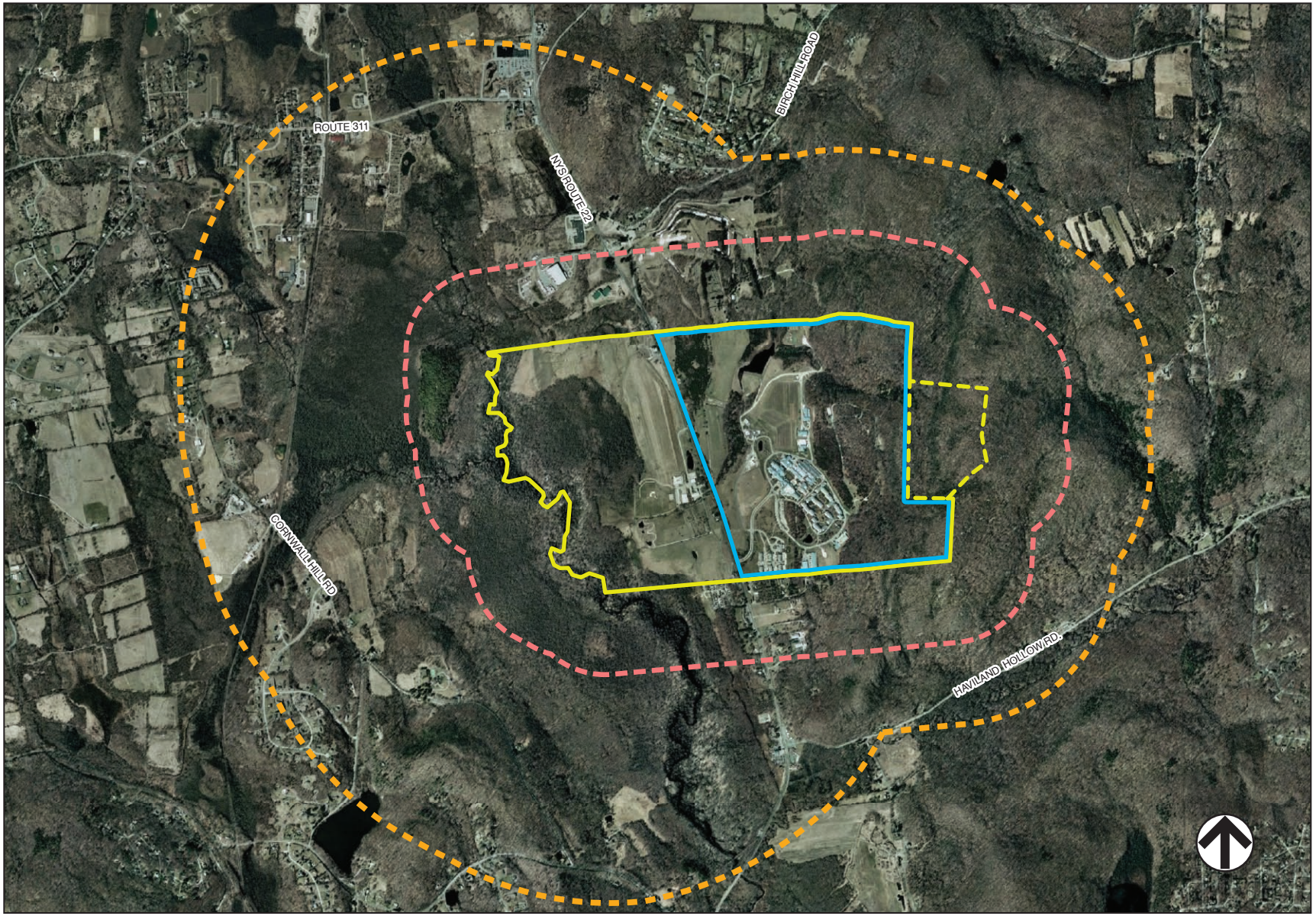

SOURCE:Aerial Imagery Source: 2008 i-cubed

WEC Properties Boundary

Valley Farms Corporation Property Boundary

Project Site Parcel

Architectural Resources Study Area

Visual Resources Study Area

0 1 MILE

SCALE

Figure 12-1

Project Site and Architectural and Visual Study Area

(also known as the archaeological area of potential effect [APE]) is generally limited to locations that could be physically impacted by the proposed project.

The study area for architectural resources extends a half mile from the WEC properties to account for potential construction-related impacts and indirect contextual impacts, such as visual impacts (see Figure 12-1). The APE for archaeological resources was delineated to include only those areas in which physical impacts (such as excavation, soil piling, landscaping, or construction staging) could occur (see **Figure 12-2**). The archaeological APE consists of four non-contiguous segments. The largest segment, referred to here as "Segment 1," has an irregular boundary encompassing a large area within the unforested portion of the project site parcel, including the current orchard area and the loop road. Within this area, new structures, road improvements, and grading are proposed. "Segment 2" is in the northern portion of the project site parcel in an area known as the north pasture. This area is being considered as a possible excess soil deposition area. "Segment 3" of the APE is also located in the northern portion of the project site parcel, east of Segment 2, in the current WEC recreation area; this area would be used for rock crushing, and gravel storage. Lastly, an eastern segment of APE, "Segment 4," also known as the existing excess soil deposition area, is located in the largely wooded area east of the developed portions of the parcel. This area would potentially be used as an excess soil deposition area.

Once the study areas were determined, an inventory of officially recognized historic resources within the study areas was compiled based on the files of the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP). This inventory includes properties or districts listed on the National Register of Historic Places (NR) and/or the New York State Register (SR), or determined eligible for such listing; National Historic Landmarks (NHL); and archaeological sites on file at the OPRHP and New York State Museum (NYSM).

A survey was also conducted to identify any potential architectural resources (properties that may be eligible for listing on the State or National Registers [S/NR]) within the architectural study area. According to National Park Service guidelines, historic buildings, structures, sites, objects and districts that are over 50 years old are eligible for listing in the National Register if they possess historic significance as defined by the National Register criteria and possess architectural integrity (36 CFR 60.4). In accordance with the methodology described in *National Register Bulletin 24: Guidelines for Local Surveys* (United States Department of Interior, 1985), a reconnaissance-level architectural resources survey, including field survey and archival research, was conducted by an architectural historian. Each building, structure, and site within the study area was analyzed according to the National Register criteria.

An archaeological documentary study area (Phase 1A study) was completed to assess the potential for the study area to contain archaeological resources that would be impacted by the proposed project. As part of the Phase 1A study, documentary research, including a review of previous archaeological investigations in the study area and vicinity, was conducted to identify areas where prehistoric or historic period activities may have occurred and resulted in archaeological resources. Recent ground disturbance in the study area that might have damaged or destroyed any archaeological resources that may have been present, was also assessed.

Once the historic resources in the study areas were identified, the potential of the proposed project to impact those resources was assessed.

C. EXISTING CONDITIONS

VISUAL RESOURCES

EXISTING VISUAL CHARACTER

The existing visual character of the project site and study area is described below. Photographs illustrating select views are cited below. Keys to the photograph locations and angles are provided in Figure 12-2 and **Figure 12-3**.

Project Site Parcel

The project site parcel is located in the Town of Patterson, approximately 1.5 miles south of the Hamlet of Patterson, on the west slope of Cranberry Mountain.

The project site parcel is located on the east side of Route 22 and is characterized by upward sloping topography, covered by large open fields, an orchard, roads and plantings, parking lots, and clusters of buildings (see **Figure 12-4**). The structures that make up the WEC complex are principally clustered toward the central and southern portions of the project site parcel. The buildings range from one to five stories in height; most were constructed contemporaneously in the late 1980s and early 1990s and are relatively uniform in design, with rectangular, round-arch, and ribbon windows, peaked roofs, and large chimneys which are typically clad in painted precast concrete.

The main driveway to the site, Watchtower Drive, runs northeast from the southern end of the property on the east side of Route 22 and terminates to the east in a large loop road. A high concentration of structures are encompassed within this loop, including the Main Lobby building, offices, Auditorium, religious school, residence buildings, and a parking lot (see **Figure 12-5**). A short roadway diverges from the south side of the base of Watchtower Drive, leading southeast to an accommodation complex for guests of the facility, known as the Patterson Inn (see **Figure 12-6, Photo 5**).

Another roadway diverges from the north side of Watchtower Drive and runs in a roughly north-south orientation. Toward the northern end of this roadway, on the east side, there is a temporary concrete batch plant and recycling facility (see **Figure 12-6, Photo 6**). Beyond this facility to the north, the roadway becomes an additional loop road, which connects to the first. Contained within the southwestern portion of this northern loop is a wastewater treatment facility (see **Figure 12-7, Photo 7**). Along the eastern edge of the northern loop road there are three additional buildings: an audio/video building, a water-softening facility, and a powerhouse (see **Figure 12-7, Photo 8**). Most of the remaining area within the northern loop road is occupied by a large orchard (see **Figure 12-8**).

Just northwest of the northern loop road there is a large "reservoir," including an earthen dam and concrete spillway (see **Figure 12-9**, **Photo 11**). The area east of the northern and southern loop roads is forested, with two exceptions: a recreation area is located northeast of the reservoir, accessed via a short winding road. This area contains tennis and basketball courts, a gravel parking lot, and two small pavilions. A small water storage tank is located east of the Audio/Video Building, accessed via a short east-west road linking to the northern loop road and a long north-south road linking to the southern loop road. One building that pre-dates the construction of the WEC facility stands on the project site parcel (but outside of the archaeological APE). This is a former farmhouse which, based

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Figure 12-2

Key to Photographs of Project Site and Archaeological Study Area

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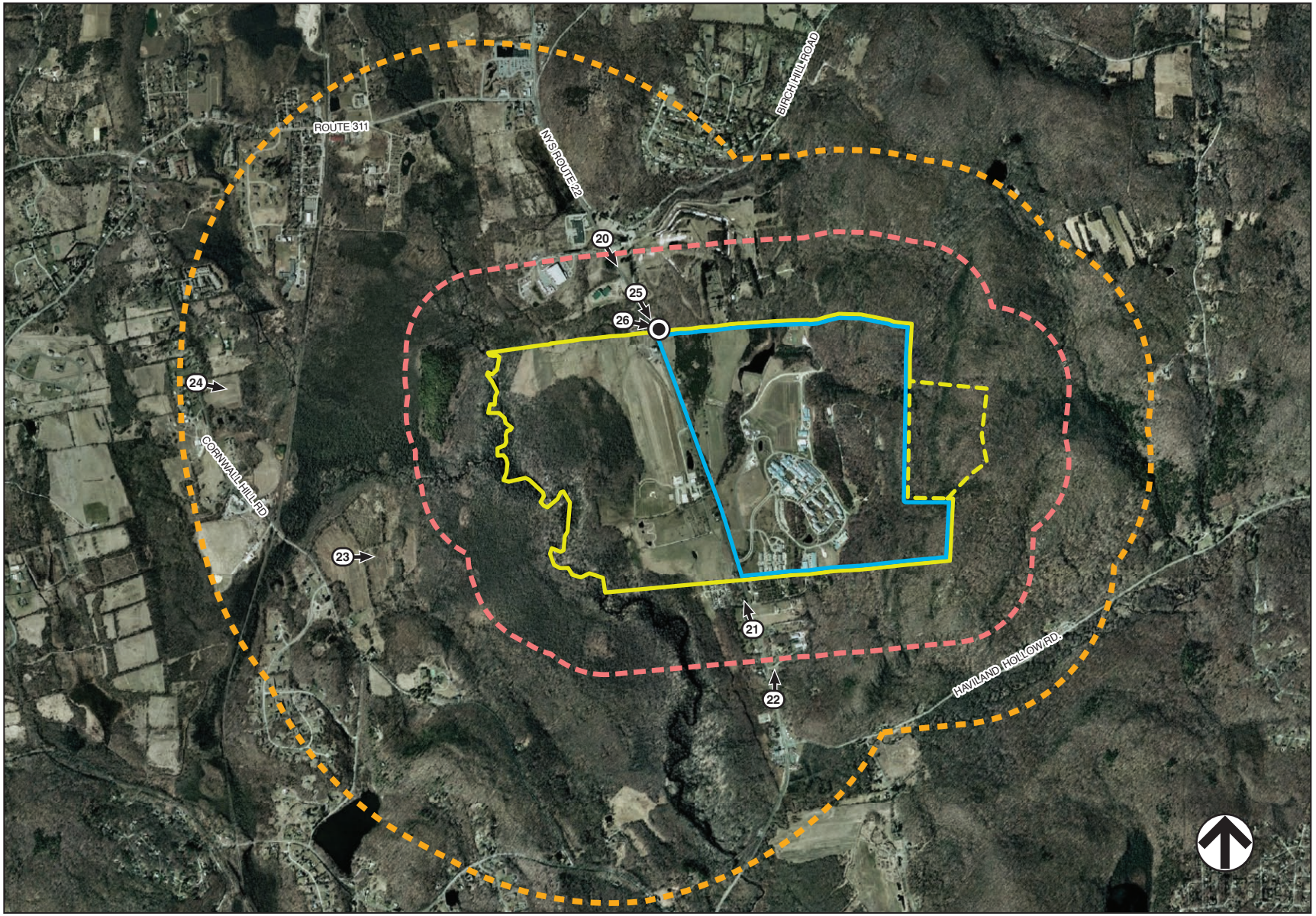

SOURCE:Aerial Imagery Source: 2008 i-cubed

WEC Properties Boundary

Valley Farms Corporation Property Boundary

Project Site Parcel

Potential Architectural Resource

26 Photo Location

Architectural Resources Study Area

Visual Resources Study Area

0 1 MILE

SCALE

Figure 12-3

Key to Photographs in Architectural and Visual Study Areas

WATCHTOWER PATTERSON, NY

From Route 22, just north of Watchtower Drive, a view looking northeast towards the Project Site Parcel. Note the relatively steeply sloping topography. The orchard is visible in the background (center); some of the WEC buildings are visible in the background on the right **1**

Looking northeast from Route 22 just south of Watchtower Drive. The southern portion of the Project Site Parcel is shown, including one of the buildings associated with the Patterson Inn, an accommodation for guests of the Watchtower **2**

Photographs of the Project Site

Figure 12-4

A short distance south of the Main Lobby Building, a view of a large parking lot contained within the south-western portion of the loop road **3**

From the northeastern terminus of Watchtower Drive, a view looking north towards the entrance of the Main Lobby Building, contained within the loop road **4**

Photographs of the Project Site

Figure 12-5

Looking south towards the Patterson Inn, a guest accommodation complex at the south end of the project site **5**

Looking northeast towards the concrete batch and recycling facility, from the northern portion of the road that diverges from the north side of Watchtower Drive. The orchard can be seen in the distance (left), as can several buildings within the northern portion of the south loop road (right) **6**

Photographs of the Project Site

Figure 12-6

From the southwestern portion of the northern loop road, a view looking northwest towards the wastewater treatment facility. A small man-made pond is located just out of view at the bottom of the steep slope visible on the left. The western edge of the orchard is visible above the steep grassy slope pictured on the right **7**

Looking south along the eastern portion of the northern loop road. The Audio-Video Building, the water softening facility, and the power house, are visible in the distance. The eastern edge of the orchard is pictured on the right **8**

Photographs of the Project Site

Figure 12-7

A view of the west side of the orchard from the west side of the northern loop road, illustrating the extensive grading and landscaping in this area **9**

The south edge of the orchard, looking north from the junction of the north and south loop roads. This view shows the steep slope on which the orchard is situated. The wastewater treatment plant is visible on the left. Beyond it, on the far left, Pine Island, within the Great Swamp can be discerned as small rise of pines **10**

Photographs of the Project Site

Figure 12-8

The 'Reservoir,' a large containment of water which includes a dam and spillway, located in the northern portion of the property, as seen from the northern portion of the north loop road **11**

A view looking east towards a house on the Project Site Parcel located on the east side of Route 22. Formerly part of the Mabie Farm, this front-gable dwelling with overhanging eaves, and hip-roofed porch, appears to date to the late 19th century **12**

Photographs of the Project Site

Figure 12-9

on its architectural characteristics, appears to date to the late 19th century (see **Figure 12-9, Photo 12**).

Visual Resources Study Area

The WEC properties on the west side of Route 22 are generally characterized by fields with more moderate slopes, and are bounded by the Great Swamp and Croton River on the west (see **Figure 12-10, Photo 13**). The majority of the structures currently standing on the WEC properties on the west side of Route 22, pre-date the development of the WEC. These include (from south to north):

- A mid-20th century residence, located immediately north of the south edge of the properties' boundary;
- A cross-gable vertical plank-sided carriage barn dating to the late 19th century (see **Figure 12-10, Photo 14**);
- An early 19th century former farmhouse (the Judge Stone House), located approximately in the center of the WEC properties along the west side of Route 22 (see **Figure 12-11, Photo 15**);
- A late 19th century carriage barn with a slate roof and cupola (converted and altered for use as offices and residences), and several other agricultural outbuildings, including a corrugated metal barn and a large early 20th century dairy barn (see **Figure 12-11, Photo 16**);
- Two early 20th century residences (see **Figure 12-12**); and
- An early 19th century former farmhouse (the Mabie House), now a residence, located at the northern edge of the parcel along Route 22 (see **Figure 12-13, Photo 19**).

Beyond the WEC properties, the visual resources study area includes portions of the downtown village of Patterson as well as the more sparsely developed areas immediately south of it. NYS Route 22 runs through the center of the study area. It intersects with Route 311, the main thoroughfare of downtown Patterson in the northeastern portion of the study area. Cornwall Hill Road (County Road 64) also intersects with Route 311, running approximately north-south along the western edge of the study area. The Metro-North Railroad runs on a roughly north-south orientation through the study area, with a station stop in downtown Patterson.

NYS Route 22, New York's longest north-south route, runs almost the entire length of New York State, from New York City to the Canadian border, and is a well trafficked road. In the study area and its vicinity, it is a two-lane highway bordered by agricultural and residential uses, interspersed with clusters of commercial development and stretches of undeveloped forested land (see **Figure 12-14**). It runs along the base of the western slope of Cranberry Mountain, at an elevation of roughly 500 feet above sea level.

Patterson is located in the portion of the Appalachians where two mountain ranges meet, the Hudson Highlands (to the west) and the Taconic Mountains (to the north). The area is characterized by relatively low mountains with wide sweeping valleys. The eastern portion of the project site and study area is located on the west slope of Cranberry Mountain. The highest point of Cranberry Mountain, located at the eastern edge of the study area, is 1,232 feet above sea level. Cornwall Hill, which is located along the western edge of the study area, reaches its peak at 827 feet above sea level, at the southwestern edge of the study area.

The Great Swamp, a large wetland covering thousands of acres in Putnam County, is located in the valley between Cranberry Mountain and Cornwall Hill in the study area. Pine Island, a

roughly 30-acre outcrop in the Great Swamp, is also located in the study area. The East Branch of the Croton River, which is oriented roughly northwest-southeast in the study area, runs through the Great Swamp. A portion of the Great Swamp and associated upland in the visual resources study area is part of a NYSDEC Wildlife Management Area (WMA), located on Cornwall Hill Road in the western portion of the study area (see **Figure 12-15, Photo 23**).

Several brooks and tributaries of the Croton River, all oriented roughly northeast-southwest, run through the project site and study area. These include (from north to south) Stephens Brook, on the east side of the Croton River north of the project site and south of Patterson Village, following the general course of Birch Hill Road; Muddy Brook, on the west side of the Croton River, immediately south of Stephens Brook and west of the project site; Mountain Brook, running approximately through the center of the project site, on both sides of Route 22; an unnamed creek that crosses Route 22 just south of the WEC properties and curves northward to run along the south edge of the project site parcel; and Haviland Hollow Brook, at the southern edge of the study area, running along the south side of Haviland Hollow Road, east of Route 22 and the Croton River.

The Cranberry Mountain WMA is a 467-acre[1] preserve located between Thunder Ridge Ski Area and Stage Coach Road, just north of the project site. The Cranberry Mountain WMA offers public hiking trails and can be accessed from two locations on Stage Coach Road.[2]

The Michael Ciaiola Conservation Area is the largest in Putnam County, consisting of over 800 acres. The conservation area is located just east of the project site near the Connecticut border. Access to the park is provided by an entrance off Haviland Hollow Road near Connecticut Route 37, and another entrance off Stage Coach Road south of Birch Hill Road. Attractions to the site include abundant wildlife and the great gorge waterfall. Trails are available for public use.

Thunder Ridge Ski Area is located north of the project site parcel on the east side of Route 22. It is a small ski center with 90 acres of skiable area on 30 trails. The mountain has a 600-foot vertical drop. It is forested with the exception of 30 ski trails, which collectively occupy 90 acres.

Cornwall Hill Road runs along Cornwall Hill at an elevation of approximately 570 feet above sea level. Residential and agricultural properties and a small amount of industry characterize both the east and west sides of the roadway (see **Figure 12-15, Photo 24**). Substantial swaths of forested land also flank the roadway. The Cornwall Hill Ball Field is located off the western side of the road, but is not visible from the road. The residential development along Cornwall Hill Road includes a range of 19th century homes and modern houses and cul-de-sac developments, such as Cornwall Meadows, which is located on the east side of the road just south of where Cornwall Hill Road intersects with Route 311.

A small trailer park is located along the southern boundary of the WEC properties on the west side of Route 22. This is composed of small single-story late 20th century residences arranged around a series of short streets. Bordering the project site parcel to the east is a large expanse of forested land, including the Cranberry Mountain WMA.

[1] http://www.dec.ny.gov/outdoor/8297.html. August 4, 2008.

[2] http://www.pattersonny.org/. Accessed July 22, 2008.

The southern portion of the Watchtower property on the west side of Route 22, looking northwest from the north-south-oriented roadway within the WEC Properties, just west of Route 22. Note the more level topography that characterizes much of the west side of Route 22 in this area. The Great Swamp and the East Branch of the Croton River are located just beyond the tree line **13**

Looking southeast towards a former horse barn (now a garage on the west side of Route 22) **14**

Photographs of the Study Area

Figure 12-10

Looking south at the east and north facades of the former Judge Stone House. While this dwelling dates to the first half of the 19th century it has been altered with vinyl siding, new windows and air conditioners **15**

To the rear (west) of the former Judge Stone House, a former carriage barn which has been substantially altered for use as offices and residences. A corrugated metal barn (left) and a mid 20th century dairy barn (right) are pictured in the background **16**

Photographs of the Study Area

Figure 12-11

The front facade of a former dwelling on the property at 2825 Route 22. Built in the mid 20th century, it has vinyl siding and picture windows **17**

A small former dwelling on the property with an address at 2823 Route 22. Likely built in the early 20th century, the structure has been altered with new siding and windows **18**

Photographs of the Study Area

Figure 12-12

The west and south facades of the early 19th century Mabie House, formerly associated with the Mabie farm, now functioning as a Watchtower residence. This residence is located at the northern edge of the WEC Properties on the west side of Route 22. A small paved parking lot is located in the foreground **19**

Looking south towards the Watchtower property along Route 22 from the junction of Birch Hill Road. The cleared area pictured on the distant left is the area in front of Thunder Ridge Ski Area. The WEC Properties beyond it are obscured by topography and vegetation **20**

Photographs of the Study Area

Figure 12-13

Looking northeast towards the WEC Properties along Route 22 from a point roughly one-eighth of a mile south of the property. The WEC Properties are almost completely obscured by vegetation, including the pine trees located beyond the garden center on the right **21**

From further south on Route 22 (over a quarter mile from the project site), a view looking northeast towards the WEC Properties. The Project Site is not visible, due to the hill in the foreground, and the intervention of vegetation. The garden center pictured in Photo 21 is just visible in the distance **22**

Photographs of the Study Area

23 The New York State Department of Environmental Conservation's Great Swamp Wildlife Management Area (WMA) is located on the east side of Cornwall Hill Road, roughly a quarter-mile north of Couch Road, and roughly a mile west of the project site. From the meadow within the WMA, looking east, the Watchtower property is visible in the distance

24 From the northernmost point of Cornwall Hill Road in the study area, roughly one mile west of the project site, a view from the roadside, looking east towards the Watchtower property. The Thunder Ridge Ski Area is visible on the left. The Watchtower property can just be discerned on the right

Photographs of the Study Area

Figure 12-15

VISUALLY SENSITIVE RESOURCES

Visual resources include those physical features that make up the visible landscape, including land, water, vegetation, and man-made elements to which viewers attach visual value. Visual resources may include historic buildings, open spaces (such as parks and landscaped plazas), and views to natural resources (such as water features and natural vegetation).

Within the visual resources study area, visual resources identified include the following:

- The NYS Route 22 view corridor, including the forests, meadows, wetlands, and agricultural lands that flank NYS Route 22 throughout the project site parcel and other WEC properties, and study area, and are visible to viewers traveling on the roadway (see Figures 12-2, 12-3, 12-4, and 12-14);
- The Cornwall Hill view corridor, including Cornwall Hill Road where it passes through the visual resources study area, and the forests, meadows, wetlands, and agricultural lands that flank it and are visible to viewers traveling along it (see Figure 12-3 and Figure 12-15, Photo 24);
- The Great Swamp and the East Branch of the Croton River, located west of the project site parcel, and their associated uplands, including Pine Island, and the NYSDEC Great Swamp WMA (see Figure 12-3 and Figure 12-15, Photo 23);
- The Hamlet of Patterson's historic core where it is located in the visual resources study area, including Route 311 west of Route 22 and east of the study area boundary. It should be noted that while a portion of the Hamlet of Patterson's historic core is located within the visual resources study area, the project site parcel is not visible from this visual resource, and therefore no further analysis of the impacts of the project on downtown historic Patterson is provided in this chapter.

EXISTING VIEWS

Despite the large size of the project site parcel, and the clusters of buildings ranging between one and five stories in height currently standing on the property, views to the property are relatively limited, due largely to the hilly topography and the dense vegetation that characterizes the area.

Clear views of the property from Route 22 are afforded only in the immediate vicinity of the complex (see Figures 12-3 and 12-4). From Route 22 a short distance (approximately 500 feet) south of the project site parcel, views to the complex are extremely limited, due to the intervention of a hill and dense evergreen and deciduous tree growth (see Figures 12-3 and 12-14). From a short distance north of the project site parcel on Route 22, views are also limited due to the curve of the roadway, the intervention of a hill, and dense vegetation (see Figure 12-3; **Figure 12-13, Photo 20; and Figure 12-16, Photo 25**).

From Cornwall Hill Road, located over three-quarters of a mile west of the project site, there are some views to the project site parcel, since Cornwall Hill Road and the WEC complex are located on facing hill slopes with a valley containing the Great Swamp between them. Views to the project site from Cornwall Hill Road are limited, however, by roadside vegetation. From only a few vantage points, where agricultural fields or other clearings immediately border the eastern side of the road, are the WEC properties visible from Cornwall Hill Road, and from these locations, views to the project site parcel are distant and are largely screened by more distant intervening vegetation (see Figure 12-3 and Figure 12-15, Photo 24).

The Great Swamp, which is also considered a visual resource, largely consists of forested lowlands, and there are no views of the project site parcel available from much of this resource.

From the uplands associated with the Great Swamp WMA, located immediately east of Cornwall Hill Road, however, there are relatively clear, though distant, views of the WEC properties (see Figure 12-3 and Figure 12-15, Photo 23). In this view, the WEC properties stand out as one of the few densely developed areas visible in a viewshed dominated by forested hills and mountains and agricultural fields.

The project site parcel is not visible from the downtown portion of the Hamlet of Patterson, or from any of the other roads in the visual resources study area, including Birch Hill Road, Thunder Ridge Road, Couch Road, or Haviland Hollow Road.

NIGHTTIME LIGHTING

The driveways, sidewalks, and parking areas within the WEC properties are currently furnished with high-pressure sodium lighting limited to a height of 25 feet. The WEC light fixtures utilize reflectors to direct lighting down to reduce sky-glow. Uplighting of building facades is avoided. In addition, the on-site outdoor walkways contain high-pressure sodium lighting at a height of 4 feet in the form of bollards.

As shown in the Site Lighting Plans that accompany this DEIS (Drawings ES101 and ES102), some typical areas of existing site lighting were analyzed to determine the average lighting levels. The typical driveway (note that there are no public roadways on site) shown has an average of 0.6 footcandles (fc). Two parking areas have averages of 0.3 and 0.8 fc. The pedestrian walkway adjacent to the driveway has an average of 0.8 fc and the pedestrian walkway distant from the driveway has an average of 0.1 fc. The Illuminating Engineering Society of North America (IESNA) *Lighting Handbook*, 9th Edition, 2000, provides recommendations for exterior lighting in public areas. It recommends an average maintained illuminance level for local residential roadways of 0.3 fc, sidewalks in residential areas of 0.2 fc, 0.5 fc for walkways distant from roadways, and 1.0 fc for parking lots (per footnote #3 in Figure 22-21). Although the actual lighting levels for parking areas and walkways on the existing project site are lower than the IESNA recommendations for public areas, they have not proven to be a safety concern on the private property, based on 17 years of on-site operational experience. The exterior parking areas are used primarily by visitors who typically are arriving and leaving during daylight hours. Security has not been a problem with the existing lighting level on the walkways, partially due to the watchman program.

SIGNAGE

Two WEC entrance signs are currently in place along the east edge of Route 22 on the project site parcel (see Figure 12-4, Photo 2). These are 4-feet-1-inch and 5-feet-2-inches high, respectively, and are each 8 feet 6 inches wide. They are painted with muted gray colors and are visually unobtrusive.

HISTORIC RESOURCES

ARCHITECTURAL RESOURCES

Project Site Parcel

Previously Identified Architectural Resources

The project site is not located in an S/NR Historic District, nor does it contain structures that have been listed on or determined eligible for listing on the S/NR.

Looking south towards the WEC Properties from Route 22, immediately north of the Project Site Parcel and adjacent to the former diner now known as Rocco's Restaurant **25**

Photographs of the Study Area
Figure 12-16

Potential Architectural Resources

No potential architectural resources have been identified on the project site. One building that meets the age criterion for S/NR eligibility is located on the project site parcel: the small front-gable farmhouse that stands on the east side of Route 22 (see Figure 12-9, Photo 12). However, this structure lacks sufficient historic significance, architectural distinction, and historic integrity to qualify for S/NR eligibility. The house is clad in vinyl siding and has retrofitted one-over-one-light double-hung sash windows.

Study Area

Previously Identified Architectural Resources

No architectural resources that have been listed on or determined eligible for listing on the S/NR are located within the study area.

Potential Architectural Resources

There are several buildings located on the WEC properties on the west side of Route 22 that meet the age criterion for S/NR eligibility; however, these structures lack the historic significance, architectural distinction, and/or historic integrity that would qualify them for S/NR eligibility. These buildings are described in detail above in the discussion of the visual character of the project site. Photographs of these buildings are also provided (see Figure 12-2 and Figures 12-9 through 12-13). It is recognized that some of these buildings, in particular the former Judge Stone House and the former Mabie House, while lacking in historic integrity, do possess historic interest and value, and a more detailed investigation of the physical fabric of these structures could yield further insight into the history of the structures. Such an investigation is outside of the scope of the current project, however.

One architectural resource in the study area has been identified as being potentially S/NR-eligible.

The former diner at 2908 Route 22, now Rocco's Family Restaurant and Pizza, is located on the east side of Route 22 immediately north of the project site parcel (see **Figure 12-17**). The one-story structure is designed in the Art Moderne style. It has a rectangular plan with a projecting entry porch. It is faced in stainless steel and has large ribbon windows across the front and side facades. Blue horizontal stripes are painted on the patterned stainless-steel facing. Doorways containing glass doors are located on the side facades of the front entry porch, accessed via steps with metal railings on either side. A sign consisting of a stainless steel frame with rounded corners is attached to the roof of the porch. This sign contains plastic panels on each side bearing the name of Rocco's Restaurant. A concrete-block rear section has no steel facing.

Diners are considered a uniquely American institution and are said to have their origins in horse-drawn mobile lunch and dinner wagons operated in New England in the late 19th century. Eventually, the type evolved to include stationary restaurants, often housed in obsolete street cars or trolleys, known for speedy and inexpensive hot meals. In the 1930s and 40s, the "Golden Age of Diners," the type developed their typical streamline Moderne style, which often mimicked railroad dining cars in design. Diners were most often prefabricated structures and made use of modern materials, such as stainless steel and Formica. While the advent of fast food cut into the market that diners once enjoyed, diners are still appreciated as an American institution and design icon.

The diner at 2908 Route 22 became Rocco's within the last decade; prior to that it operated as the Route 22 Diner. Its original name is not known; however, the current owners and local historians indicate that it has stood on the site for approximately 50 years. On land immediately

neighboring the diner property, the Birch Hill Game Farm (a children's zoo and amusement park) was established in 1956 and the Birch Hill Ski Area (now Thunder Ridge Ski Center) in 1967. It is likely that the diner was established during the same period, possibly drawing on visitors to those attractions.

ARCHAEOLOGICAL RESOURCES

To assess the potential for the proposed project to impact archaeological resources, a Phase 1A archaeological documentary study was completed by AKRF in June 2009 (included as Appendix G).

The recent Phase 1A study synthesizes, updates, and augments information presented in previous archaeological studies conducted on the project site in 1988-1989 by Historical Perspectives, Inc. (HPI). A brief summary of both the previous archaeological studies and the recent Phase 1A study is provided below.

Previous Archaeological Investigations on the Project Site

The previous archaeological studies included both documentary research and Phase 1B and Phase 2 field testing, the results of which were presented in a *Stage 1 Study of Archaeological Potential, Watchtower Educational Center, Patterson, Putnam County, New York* (HPI November 1988) and *Watchtower Educational Center: Archaeological Survey: Stage 2* (HPI January 1989). The studies identified four loci of precontact and historic period archaeological artifact concentrations; each was given a unique site number and site inventory forms were completed and filed with OPRHP.

Locus 1, which contained prehistoric artifacts, and Locus 4, which contained a historic-period feature and both historic and prehistoric artifacts, were located in close proximity and share the Site Number A079-03-0041. These loci were avoided by the previous project due to the realignment of a proposed sludge line. They were considered potentially significant, and further archaeological testing was recommended in these areas if construction was planned within them in the future. Locus 2 (A079-03-0042), on the west side of Route 22, and Locus 3 (A079-03-0043), identified in the southeastern portion of the property during Phase 1B testing, contained both historic and precontact period deposits. After these sites were more thoroughly investigated during Phase 2 testing, however, they were determined to lack additional research value. No further testing was recommended in the areas of Loci 2 and 3. Thus, with the exception of Loci 1 and 4, the areas tested during the Phase 1 and 2 archaeological studies were determined to warrant no further archaeological study.

Phase 1A Study for this Project

The Phase 1A study for this project reviews the results of the previous archaeological investigations and newly assesses the portions of the present archaeological study area not included in the former archaeological study area. The Phase 1A also presents the results of new research on archaeological sites identified in the vicinity of the study area, and evaluates ground disturbance that occurred on the project site after the previous archaeological studies were undertaken.

The loci of prehistoric and historic period sensitivity identified during the previous archaeological investigations are located outside the current archaeological study area. Locations that were previously studied and/or field tested within the current archaeological study area were determined to have no further research potential.

The front and west facades of Rocco's Restaurant, a former diner, located immediately north of the Project Site Parcel. This structure is considered a potential architectural resource **26**

Potential Architectural Resource

Figure 12-17

Locations that were not previously studied and/or field tested were reviewed for archaeological potential in the Phase 1A. Sensitivity was evaluated based on previously identified archaeological sites, topographical features, and historic map research. Information on the Revolutionary War period history of the area additional to that included in the previous archaeological studies, is also provided, based in large part on historical documents recommended by the Patterson Historical Society. The potential for recent ground disturbance that might have damaged or destroyed archaeological resources in these areas was also assessed, based on historic and current photographs, topographic maps, site walkover surveys, building plans, utility maps, and other sources.

As described in the Phase 1A study, most of the buildings that now make up the WEC were constructed after the 1988-1989 archaeological studies were prepared. In addition, utilities were installed, roads and parking lots were constructed, and extensive landscaping, including substantial cutting and filling and construction of water features, was undertaken. In the process of this construction, significant ground disturbance occurred throughout the vast majority of the current archaeological study area.

The Phase 1A study concludes that much of the archaeological study area experienced extensive ground disturbance since the time of the previous archaeological investigations, and therefore has low potential for containing intact buried archaeological resources. However, portions of the APE are considered sensitive for precontact period resources and/or for historic period resources. Historic period sensitivity in the APE relates to two periods: (1) the Revolutionary War period, when a Continental Army encampment is believed to have been located in or near the APE; and (2) domestic habitation and agricultural activities dating the late 18th century and the 19th century. Four portions of the archaeological APE, however, were determined potentially sensitive. These include:

- APE segment 1: northwestern portion of segment 1 only: locations flanking Mountain Brook in the northwestern portion of APE segment 1 (in close proximity to Loci 1 and 4) are considered to possess *moderate to high sensitivity* for historic period resources relating to the former Judge Stone house and farm, and for prehistoric period resources. The area is considered to possess *moderate* sensitivity for resources relating to the Revolutionary War period. However, no direct impacts to the Mountain Brook location are currently planned as part of the proposed project.
- APE segment 2: the north pasture. This area possesses low sensitivity for historic period archaeological resources relating to the late 18th and 19th century domestic and agriculture use of the site. However, it is considered *moderately* sensitive for prehistoric period archaeological resources and for historic period resources relating to the Revolutionary War. However, no direct impacts to the north pasture area are currently planned as part of the proposed project;
- APE segment 3: the southern portion of the recreation area. Archaeological monitoring is recommended during potential excavation for a temporary sediment trap due to the possibility that Revolutionary War period burials associated with a Continental army encampment could be located in the vicinity-; and
- APE segment 4: the existing excess soil deposition area. This area possesses low sensitivity for historic period archaeological resources relating to the late 18th and 19th century domestic and agriculture use of the site, but is considered *moderately* sensitive for prehistoric period archaeological resources and for resources relating to the Revolutionary War period.

If refined project plans indicate that project-related construction would occur in any of the four areas listed above, archaeological field testing would be required to determine the presence or absence of archaeological resources in these areas. Archaeological testing is not considered necessary for any other portions of the archaeological APE.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

Without the proposed project, land use and zoning designations in the vicinity of WEC properties would remain unchanged. No proposed development applications in the immediate vicinity of the project site parcel have been submitted to the Town of Patterson Planning Board. Several applications for small commercial developments and small residential subdivisions have been submitted for areas along Route 311 and Route 22 north of Route 311, outside of the architectural resources study area, and along the northern edge of the visual resources study area. These projects are not expected to adversely impact visual or architectural resources in the WEC study areas. Furthermore, in the future without the proposed project, lighting conditions on the project site, and in the surrounding area, are not expected to change substantially from existing conditions.

It is possible that in a future without the proposed project, the potential architectural resource within the study area, Rocco's Family Restaurant and Pizza, may be determined eligible for listing on the State or National Registers. Architectural resources that are listed on the National Register or that have been found eligible for listing are given a measure of protection from the effects of federally sponsored or assisted projects under Section 106 of the National Historic Preservation Act. Although preservation is not mandated, federal agencies must attempt to avoid adverse impacts on such resources through a notice, review, and construction process. Properties listed on the State Register are similarly protected against impacts resulting from state-sponsored or state-assisted projects under the State Historic Preservation Act. Private property owners using private funds can, however, alter or demolish their properties without such a review process.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

As described in Chapter 2, the applicant proposes to add approximately 186,000 square feet of building coverage comprising 904,000 square feet of new building space and 434 new parking spaces to the existing WEC, of which 351 are located in garages. **Figure 12-18** shows the layout of the proposed site plan. The proposed project's potential to impact visual and historic resources is described below.

VISUAL RESOURCES

VISUAL CHARACTER

The majority of proposed project-related elements, including new buildings, building expansions, and other improvements would be lower or similar in scale and nature to surrounding infrastructure elements and would not result in substantial changes to the visual character of the complex. The additions to the Audio/Video Building, immediately east of the orchard, would range from 31 to 45 feet tall and have a roof elevation three feet taller than the existing two-story structure. The proposed one-story Recycling Building (29 feet tall) would be constructed immediately south of the existing one-story concrete Batch Plant and Recycling Building, which would be demolished as part of the proposed project. The new structure would

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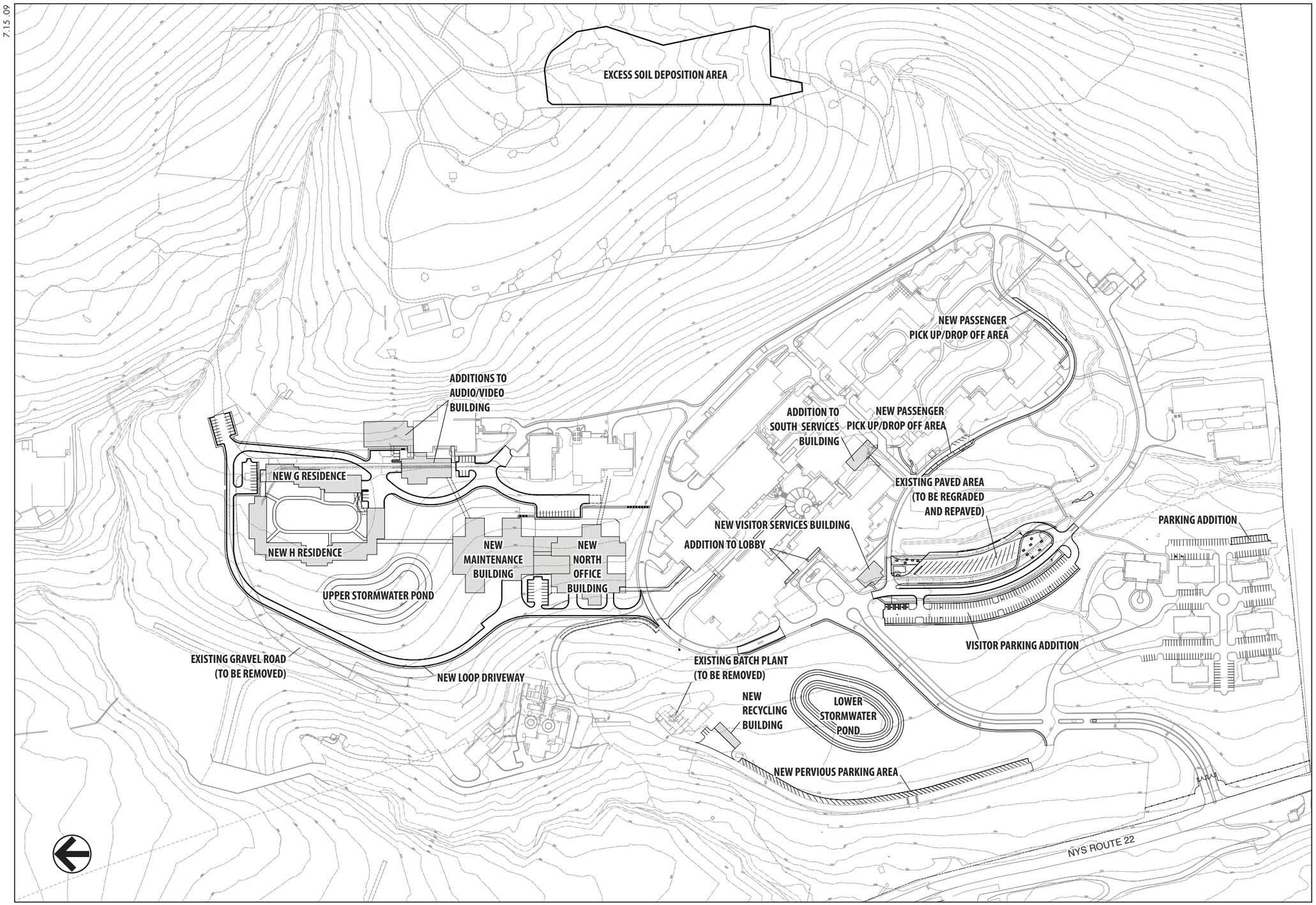

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SCALE

Figure 12-18

Proposed Site Plan

have a smaller footprint than the existing concrete Batch Plant and Recycling Building and would not exceed the height of the existing facility. Therefore, it would result in a structure with a visibility smaller than or equivalent to the current conditions.

Expansions to the South Services Building and the Main Lobby Building and the construction of a new single-story (33-foot-tall) Visitor Services Center would be located adjacent to the south loop road, which is already densely built with structures exceeding the heights of the proposed expansion structures. Therefore, these elements are not expected to be substantially visible from outside of the immediate loop road area. Road widening and parking area expansions represent relatively minor divergences from the existing visual character and would not be substantially visible from outside of the WEC properties. The two new ponds that would be created in the current orchard area and the grassy area south of the existing concrete Batch Plant and Recycling facility would likewise not be substantially visible from outside of the complex. These features would not rise above surrounding grade level and would be located in areas where slopes and berms intervene between the proposed features and the road, screening them from most vantage points.

At the far southern end of the project site, a new fence would be constructed along Route 22 immediately flanking the main entrance. A metal gate would also be constructed at the main entry in this location. The style of the fence would be similar to other recently constructed fences along Route 22. It would consist of square masonry posts placed at regular intervals and connected with black metal picket fencing, approximately six feet high. The fence would not substantially change the overall visual character of the property, nor would it block or screen existing views.

While the features described above would not result in substantial changes in visual character, the structures proposed for the orchard area (the Maintenance and North Office Building, G Residence, and H Residence) would represent a more substantial change from the current visual character of their proposed location. These structures would be the tallest buildings that would be constructed as part of the proposed project and would be located in what is now the orchard area, which is currently a hillside planted with apple trees and devoid of buildings, with the exception of the Audio/Video Building, Water Softening Facility, and Powerhouse (all two or three stories in height) located along the east edge of the orchard. The structures proposed for this area include the Maintenance and North Office building (sections 76 feet tall and 67 feet tall, respectively), the G Residence building (69 feet tall), and the (H Residence building (69 feet tall) (see Figure 12-18).

As described above in "Existing Conditions," existing views to the project site parcel are limited to Route 22 in the immediate vicinity of the project site parcel and to limited locations along Cornwall Hill Road, including the uplands of the Great Swamp WMA on the east side of Cornwall Hill Road.

From Route 22, the clearest view of the area where new buildings are proposed on the project site is from a location adjacent to the south end of the project site parcel, looking northeast. **Figure 12-19** presents the existing view from this location compared to a photosimulation of the same view with the proposed improvements. The comparison shows that the green swath comprising the orchard area would be replaced with additional buildings. However, the visual impact of this change would be minimized by the proposed landscaping, which would include a variety of evergreen trees and shrubs along the crest of the hill. The proposed buildings would stand on a relative plateau and would be substantially screened by the plantings. While the proposed building in the orchard area would be visible from the main entrance, and limited

additional locations on Route 22 in the immediate vicinity of the project site parcel, the change in visual character of the view corridor would be minimal and would not constitute an adverse impact on visual resources.

The view from the upland meadow that is part of the Great Swamp WMA, which represents the clearest view to the project site parcel from the vicinity of Cornwall Hill Road, has also been compared with a photosimulation of the same view with the proposed project, as presented in **Figure 12-20**. As described above, views from this location are generally characterized by forested hills and mountains and agricultural fields. The WEC campus represents one of the few properties visible from the location that is developed with dense clusters of buildings. The photosimulation illustrates that the cluster of buildings proposed in the current location of the orchard would be visible from this location. However, because the property is already so densely developed with structures of a similar height and design, the addition of the new structures in this area would not represent a substantial change in the overall character of this view and would not result in adverse visual impact.

Special care would be taken to design the facades and select colors to complement the adjacent existing buildings, thereby minimizing the change in the visual character of the site. Furthermore, a muted color palette was selected to harmonize as much as possible the natural surroundings. Other treatments are under consideration by the applicant for select locations, including approximately 10,800 square feet of green roof for the area between the upper portions of the Maintenance and North Office building, and also 4,800 square feet of a green vegetated wall system for the west wall of the Audio/Video Building expansion. This treatment would also serve to minimize the visibility of the proposed new buildings and achieve a design that blends as much as possible with the surrounding natural environment.

To further minimize the visual impact of the proposed project, the buildings would be clustered together to limit changes to the existing landscape. Detailed landscape plans prepared by the applicant in April 2009 illustrate that many new plantings, including maple, spruce, dogwood, and crabapple trees, etc., would be put in place throughout the project site. Plantings would be positioned with a particular emphasis on screening proposed WEC buildings from view in order to maintain the verdant vegetated character of the project site parcel.

Therefore, some of the proposed project elements, particularly the buildings that would be constructed in what is now the orchard area, would be visible from the limited vantage points from which the WEC properties are currently visible. However, the visual impact of these new elements would be minimal. The proposed project would not result a substantial change in the existing overall visual character of the area or the visual resources identified in the study area and would not block or meaningfully alter views to and from these visual resources. Thus, the project would not result in an adverse impact on visual resources.

NIGHTTIME LIGHTING

Detailed photometric plans have been prepared for the proposed project and are included for reference. These plans aim to minimize spillover and sky-glow while maintaining safe conditions on the site. Proposed new and expanded roadways and sidewalks would be furnished with the same type of high-pressure sodium lighting as is currently used on the facility. The high-pressure sodium lighting requires the minimum number of light fixtures compared to other lighting types such as metal halide or low-pressure sodium lighting. Light fixtures would consist of a 16,000-lumens single fixture mounted at 18 feet above ground surface, with full cut-off, on four-inch-square metal poles. Additional exterior pedestrian lighting would be provided using

Existing view **1**

Photosimulation of Proposed Conditions **2**

Existing and Proposed Conditions,
Looking Northeast from Route 22, at Watchtower Drive

Existing View **1**

Photosimulation of Proposed Conditions **2**

Existing and Proposed Conditions
Looking East from the Great Swamp WMA on Cornwall Hill Road

four-foot-high bollards with 2,250-lumens single fixtures. It is anticipated that 32 new 18-foot-tall lights, and 37 new bollard lights, would be added as part of the proposed project.

Site lighting in the residential zoning district is typically limited to 12 feet above ground surface. However, since the current application designates the facility as an "Educational Center" and the educational function is the primary site activity, the applicant intends to use the exemption for schools which allows the 18-foot tall mounting height. This 18-foot tall mounting height is already a reduction in height compared to the existing light fixtures mounted at 25 feet above ground surface.

The proposed lighting would be arranged in the same basic configuration and spacing as in the existing scheme, and would be on the same schedule of illumination as the existing. The timing of the proposed lighting would be controlled by photocells set to activate at 6:00 p.m., or when darkness occurs. Seventy-five percent of the lights would be shut off at 11:00 p.m. The remaining lighting after this time would provide for safety on the project site. The proposed system would utilize reflectors to direct lighting down to reduce sky-glow. Uplighting of building facades would be avoided. Lighting would be shielded to the extent practicable.

On the whole, the new lighting that would be installed as part of the proposed project would be similar to existing conditions. New lighting would be installed in areas where lighting is currently minimal or lacking, including the vicinities of new buildings, including the Maintenance and North Office Building, G Residence, and H Residence. However, this new lighting would not result in spillover on locations outside of the project site. The proposed scheme would incorporate measures to minimize glare and sky-glow. The perceived brightness of the proposed lighting scheme from locations outside of the project site would be comparable to the existing scheme, and would not impact visual resources. Furthermore, the proposed lighting would be in compliance with the Lighting Standards of the Town of Patterson Zoning Regulation (154-22.1).

As shown in the Site Lighting Plans that accompany this DEIS (Drawings ES101 and ES102), some typical areas of proposed site lighting on the applicant's private property were analyzed to determine the average lighting levels. The typical driveway shown has an average of 1.2 fc. The bus parking area has an average of 0.5 fc. The pedestrian walkway adjacent to the driveway has an average of 1.0 fc and the pedestrian walkway distant from the driveway has an average of 0.1 fc. These illuminance levels are similar to the level of the existing site lighting. As noted above in the Existing Conditions heading, these levels have proven to be adequate, even though the illuminance levels in the parking and walkway areas are less than the IESNA recommendations for those functions on public property. In order to provide the illuminance levels recommended by IESNA for public areas, additional luminaires would need to be added to the parking areas and walkways. Changing the luminaire type from bollards to pole-mounted lights may be needed for the walkways. The proposed driveway lighting already exceeds the IESNA recommendation for average maintained illuminance levels. Once the Planning Board confirms the target illuminance levels during the site plan review, the proposed site lighting can be reassessed and luminaire types and counts can be reconfirmed.

SIGNAGE

As discussed above in section C, "Existing Conditions," two entrance signs are currently in place along the east side of Route 22 on the project site parcel. The signs would not be modified as part of this project. Therefore, no visual impacts relating to signage would occur with the proposed project.

HISTORIC RESOURCES

ARCHITECTURAL RESOURCES

Project Site Parcel

As described above, there are no known or potential architectural resources on the project site parcel. Therefore, the proposed project would have no adverse impact on architectural resources on the project site parcel.

Study Area

There is one potential architectural resource in the study area, the former diner located at 2908 Route 22, now Rocco's Family Restaurant and Pizza. This structure is located relatively close to the project site parcel (approximately 90 feet North) along the east side of Route 22. However, no project-related construction would occur in close proximity to the resource. Therefore, no direct physical impacts on architectural resources are anticipated as a result of the proposed project.

Furthermore, although the potential historic resource is located close to the project site parcel, views between the potential resource and the project site are extremely limited (see Figures 12-2 and 12-16). The portions of the project site for which new above-ground elements, such as buildings, are proposed are located more than 2,000 feet southeast of the potential architectural resource, and these areas are screened from view by topography and vegetation. Therefore, the proposed new structures would not be visible from the potential architectural resource, and no existing views of the potential resource would be blocked or altered. Therefore, no adverse effects on architectural resources are anticipated as a result of the proposed project.

ARCHAEOLOGICAL RESOURCES

The Phase 1A study for this project determined that while most of the archaeological APE has low sensitivity for prehistoric and historic period archaeological resources, four locations within the APE that may be impacted by the proposed project do possess archaeological sensitivity for prehistoric and/or historic period archaeological resources. The potential for impacts to these sensitive areas will depend on the final location of excess soil excavation material. As project plans progress, if it is confirmed that these locations would be impacted by the proposed project, archaeological field testing and/or monitoring would be conducted in consultation with OPRHP. If significant archaeological resources are encountered that cannot be avoided by the proposed project, additional mitigation, such as archaeological data recovery, may be warranted.

In addition to the archaeological field testing described above, an Unanticipated Discoveries Plan for Archaeological Resources will be prepared and implemented in consultation with NYSOPRHP prior to the commencement of project-related construction. This Unanticipated Discoveries Plan will present a protocol for the proper treatment of any archaeological resources or human remains that may be encountered during construction. ✷

A. INTRODUCTION

This analysis addresses the potential socioeconomic impacts of the proposed project. The socioeconomic evaluation also assesses the fiscal revenues and expenses of constructing and operating the proposed project. In addition, construction and operation of the proposed facility would have an indirect beneficial effect on the regional economy. Such effects were estimated using the Regional Input-Output Modeling System (RIMS II), developed by the U.S. Department of Commerce. The indirect effects on employment, wages and salaries, and economic output or demand for regional industries were evaluated for the construction period.

PRINCIPAL CONCLUSIONS

Based on the history of the Watchtower Educational Center (WEC) and the existing and projected demand for services from the Town of Patterson, no significant adverse fiscal impacts are anticipated as a result of the construction and operation of the proposed amended site plan. On the whole, the proposed project is anticipated to result in net benefits to the Town of Patterson. The overall socioeconomic impacts of the proposed project to the Town of Patterson and Putnam County are expected to be positive.

B. EXISTING CONDITIONS

This section establishes an existing baseline from which impacts of the proposed project can be assessed. It includes a property tax analysis that provides information on the current taxes generated by the site. The most recent taxes paid, equalization rate, and tax rates were collected from the Tax Assessor and Tax Collector of the Town of Patterson, Putnam County. This section also discusses the Town of Patterson budget and the existing demand placed by the WEC site on the Town of Patterson services.

WATCHTOWER EDUCATIONAL CENTER

The Watchtower Bible and Tract Society of New York, Inc., (the "applicant") is a New York not-for-profit corporation that is operated exclusively for religious, educational, and charitable purposes and recognized as exempt from federal income taxes under Internal Revenue Code section 501(c)(3). To accomplish the applicant's purposes (as set out more fully in Chapter 2, section D) the WEC assists with the creation and translating of religious printed material, the creation of artwork for religious publications, the creation of audio and video publications that directly effect the dissemination of Bible truths, and the training of designated Jehovah's Witnesses as missionaries, special ministers, and religious administrators. According to the applicant, during the next decade, there will likely be continued increase in the number of Jehovah's Witnesses worldwide. To keep up with the corresponding increase in demand for Bibles and Jehovah's Witnesses' publications and the related need for enhanced capacity for religious and administrative training, the applicant requires additions to the WEC facility.

The WEC is located in the Town of Patterson on Route 22, south of Route 311 and north of Haviland Hollow Road (CR #68). The WEC includes six parcels both east and west of NYS Route 22. These parcels are described in **Table 13-1**.

Table 13-1
Watchtower Educational Center Parcel Identifications

Tax ID Number	Area (acres)	Lot Description	Relation to Project
14.-1-37	34.00	Woodland	No new development
14.-1-15	282.15	Agricultural	No new development
14.-1.53	362.50	Main facilities	New buildings
14.-1-54	12.23	Patterson Inn	Parking expansion
14.-1-61	52.19	Woodland (owned by Valley Farms Corporation)	No new development
14.19-1-14	0.25	H-House	No new development

Note: The two italicized parcels are those on which the expansion of the facility is proposed.
Source: Watchtower Bible and Tract Society of New York, Inc.

Five of the six WEC parcels are contiguous. The 34-acre parcel (Lot #37) is a non-adjacent wooded lot west of NYS Route 22, as shown in Figure 2-4. Lot #53 (362.50 acres) houses the main residential, educational, and office facilities of the site. Lot #54 (12.23 acres) contains the Patterson Inn, which comprises 300 beds in several buildings used to accommodate overnight guests. Lots #53 and #54 are east of NYS Route 22. Lot #61 is woodlands located to the east of Lot #53. The remaining parcels are west of NYS Route 22. Lot #15 (282.15 acres) is used for agricultural and recreational purposes. This lot consists mainly of farm structures, residences, ball fields, and open pastures. Lot #14 (0.25 acres) is a small lot containing another residence, referred to as the H-House.

The existing WEC has a capacity of approximately 1,550 persons. Residents and students are housed in residence buildings at the facility, and eat their meals in the common dining room. Maintenance and cleaning staff, as well as other personnel who support the office and school functions, also live at the facility. Thousands of guests and visitors arrive annually to tour the facilities and see family or friends. Some of these guests stay overnight in the Patterson Inn, mentioned above.

According to the applicant, the WEC is a largely self-sustaining community that is operated by on-site residents. The facility provides water and wastewater treatment service from its plants on-site.

PATTERSON TAX REVENUES FROM WATCHTOWER EDUCATIONAL CENTER

The property tax revenues generated from the WEC are summarized in this section. As shown in Table 13-1 above, the proposed expansion would be located on tax parcels 14-1-53 and 14-1-54. The bulk of the proposed project would occur on the 362.5-acre parcel (14-1-53) where 186,000 square feet of building coverage comprising 904,000 square feet of new building space is proposed along with 421 new parking spaces. An additional 13 new parking spaces would be located at the Patterson Inn (parcel 14-1-54).

The WEC is exempt from federal, state, and local taxes due to the applicant's status as a tax exempt organization. The combined assessed value for all six Watchtower parcels was $177,181,900 in 2008.[1]

Despite the tax exempt status, for the Patterson Inn—a 300-bed temporary residence facility originally constructed to support volunteer workers who participated in the construction of the WEC and now provides lodging for visitors and guests — the applicant continues to voluntarily pay taxes to the various taxing jurisdictions in the Town of Patterson. The 2008 assessed value of Patterson Inn located in Section 14, Block 1, Lot 54 is $14,850,300. **Table 13-2** is a summary of taxes paid by Patterson Inn in 2008.

Table 13-2
Patterson Inn -2008 Tax Payments

Taxing Jurisdiction	Taxes paid
Putnam County	$30,413
Town of Patterson	$46,429
Patterson Library	$4,180
Patterson Fire District No. 1	$10,942
Park District	$1,301
Carmel Central School District	$251,298
Total	**$344,563**

Sources: Town of Patterson Tax Receiver's Office, 2008 County and Town Tax Bill, and 2008-2009 Carmel Central School District Tax Bill.

Valley Farms Corporation is a domestic not-for-profit corporation recognized as exempt from federal taxes under Internal Revenue Code, Section 501(c)(25) as a title-holding corporation for the exclusive purpose of acquiring, holding title to, and collecting income from real property, and turning over the entire amount less expenses to member organizations exempt from income tax, in this case, the applicant. Lands owned by Valley Farms Corporation, whether agricultural fields, dwellings, or otherwise, are devoted to the same religious use as land owned by the applicant. Valley Farms Corporation does not conduct for-profit activity on any of its lands; however, at its inception, the applicant decided that land held by this corporation would not be removed from the property tax roll. Valley Farms Corporation owns Parcel #14.-1-61 that is adjacent to the proposed project site. The 2008 assessed value of Parcel #14.-1-61 is $354,200. **Table 13-3** is a summary of taxes paid by Valley Farms Corporation on Parcel #14.-1-61.

TOWN OF PATTERSON BUDGET

The total adopted budget for the Town of Patterson in 2008 was $10,377,533. Of this total, approximately 81 percent ($8,401,783) was raised by property tax revenues. The remaining 19 percent of the budget was funded with state aid and general fund revenues.

[1] *Source*: Town of Patterson Assessor and Tax Receiver, 2008 Tax Bills. The individual assessed value of the Watchtower parcels is as follows: Parcel 14.-1-14 – AV $271,900; Parcel 14.-1-15 – AV $ 5,027,100; Parcel 14.-1-37 – AV $ 7,100; Parcel 14.-1-53 – AV $ 156,225,100; Parcel 14.-1-54 – AV $ 15,295,800; Parcel 14.-1-61 – AV$ 354,200.

Table 13-3
Valley Farms Corporation- 2008 Tax Payments

Taxing Jurisdiction	Taxes Paid
Putnam County	$6.95
Town of Patterson	$10.61
Patterson Library	$0.95
Patterson Fire District No. 1	$253.40
Park District	$30.12
Carmel Central School District	$112.93
Total	**$414.93**

Sources: Town of Patterson Tax, Receiver's Office, 2008 County and Town Tax Bill, and 2008-2009 Carmel Central School District Tax Bill.

TOWN OF PATTERSON HIGHWAY DEPARTMENT

The Town of Patterson Highway Department maintains the town roads. The 2008 total budget for Town Highway was $2,715,966. Property taxes contributed approximately 93 percent ($2,516,966) of the total budget, while Consolidated Highway Aid (a grant to municipalities under the New York State Consolidated Highway Improvement Program) provided approximately 2 percent ($60,000). The remainder was contributed by Interfund Revenues.

PATTERSON PARK DISTRICT

The Town of Patterson owns and operates its own recreational lands and programs, including: the Veteran's Memorial District Park on Maple Avenue; the Patterson Recreation Center on Front Street in the Hamlet of Patterson; the Cornwall Hill ball field on Cornwall Hill Road; the Michael Ciaiola Conservation Area, and the H.T. Baumann Park. The Town Recreation Department also operates programs on weekdays, weekday evenings, and weekends.

The total budget for the Patterson Park District is $94,850 in 2008. This amount is almost entirely raised by property taxes.

PATTERSON FIRE PROTECTION

The Patterson Fire Department (PFD) would be the first responder to fire emergencies at the WEC site. The Patterson Fire District encompasses an area home to over 7,000 residents. In addition to fire protection services, the PFD also provides emergency medical services. The total 2008 budget for the Patterson Fire Protection is $791,481, of which $781,481 is raised by tax revenues alone.

PUBLIC SAFETY

The total budget for public safety in the Town of Patterson is $255,297 for the year 2008, of which $4,000, $52,192, $152,864, and $46,241 are allocated for traffic control, animal control, safety inspection, and code enforcement, respectively.

Police protection in the Town of Patterson is provided by the Putnam County Sheriff's Office and New York State Police.

PATTERSON LIBRARY

The Patterson Library, located at 1167 Route 311, serves over 60,000 visitors a year. The total budget for the library in 2008 is $434,000, which is entirely raised by property taxes.

PATTERSON REFUSE DISTRICT NO.2

The WEC site is located within the Patterson Refuse District No. 2, which has a budget of $1,003,320. More than 99 percent of the district's budget is expected to be raised by property taxes in the year 2008. The applicant contracts with a private refuse vendor for solid waste disposal from the WEC site.

CARMEL CENTRAL SCHOOL DISTRICT

The Carmel Central School district encompasses five towns: Carmel, Patterson, Kent, and Putnam Valley in Putnam County, and East Fishkill in Dutchess County. The budgeted spending for the 2008-2009 tax year for Carmel Central School District is $102,554,842, of which 72 percent ($74,212,786) was raised by tax levy. The school enrollment in the 2008-2009 school year was 4,900 students, which amounts to a total cost of $20,930 per pupil in the school district.

WATCHTOWER EDUCATIONAL CENTER DEMAND ON TOWN SERVICES

An EIS was completed for the construction of the existing WEC in May 1987, which projected the economic and fiscal effects of the complex on the community. The 1987 EIS concluded that the originally proposed Watchtower facility would not have any impacts to the services of the Town of Patterson under its tax-exempt status. Similarly, the proposed project would not have any significant adverse impacts on services of the Town of Patterson.

SECURITY

The applicant maintains an on-site private security arrangement for the WEC properties that includes: 24-hour physical and camera surveillance; an overnight watchman program; a watchman stationed at the gated driveway entrance to the WEC; personnel on duty 24/7 at the Main Lobby desk to screen visitors and monitor security cameras installed throughout the site, including at the site entrance and at the Main Lobby; and a security response team made up of residents who are administrative personnel on call at all times. All persons entering the WEC properties are screened. All WEC residents go through a strict pre-admission evaluation process in order to verify, to the extent possible, that they are law-abiding and honest. The applicant maintains emergency response procedures for its residents at the WEC, including the provision of back-up power generation in the event of an outage. All emergency 911 calls that originate at the WEC are handled by the Putnam County Sheriff's Office.

FIRE PROTECTION

A fire hydrant system exists throughout the WEC site with maximum spacing of 500 feet between hydrants, as requested by the Patterson Fire Department. Hydrants are connected to a 405,000-gallon high-level water storage tank. The high-level water storage tank meets National Fire Protection Association (NFPA) volume requirements for this size facility to provide a flow of at least 2,000 gallons per minute (gpm) for 2 hours (i.e., 240,000 gallons). Additional water storage for fire protection is provided by a 13-million-gallon reservoir on-site, allowing direct connection for fire departments. Sprinklers are provided in residential hallways and below-grade parking garages. A fire

suppression system is also installed in the central kitchen. Standpipes are provided in all exit stairways. The structures are constructed of non-combustible and fire-resistant materials, such as concrete and steel. Each building is equipped with alarms and smoke detectors. These alarms and detectors are tied into the central monitoring system for the WEC as required.

The WEC is located in the Patterson Fire District and receives fire protection services from the Patterson Fire Department.

Table 13-4 summarizes the number of instances from 2002 to 2007 when Watchtower's temporary or permanent residents have used the Town of Patterson's fire, emergency, and police services. Police protection in the Town of Patterson is provided by the County police and New York State police. Table 13-4 includes both County and State police in the average number of calls per year.

Table 13-4
Average Monthly Responses to 911 Calls

Service Type	Community[1]	Watchtower Center[2]
Fire/Emergency*	72.5	0.18
Police	2,117.28	0.25

Notes: *Mandatory by Putnam County for every emergency call to have a police or sheriff accomplice.

Sources: [1] Putnam County Bureau of Emergency Services Annual Report. The referenced "community" for Fire/Emergency services is the Town of Patterson; the "community" for Police services is Putnam County.
[2] Watchtower Bible and Tract Society of New York, Inc.

MEDICAL SERVICE

The applicant is able to provide primary emergency medical response services to emergencies at the WEC through the use of a privately owned basic life support (BLS) ambulance operated by a staff of approximately 14 emergency medical technicians (EMTs). The on-site ambulance provides service to the on-site residents. If the on-site ambulance is unavailable, the applicant relies on the Patterson Fire Department to provide back-up services. Advanced life support (ALS) ambulance services are available through the TransCare Ambulance Corp.

In addition to ambulatory services, the WEC provides basic in-house medical services at its on-site Infirmary, comprising two full- and one part-time physician, 16 registered nurses, and additional administrative and support staff persons. The WEC Infirmary is capable of providing day-to-day medical services as well as limited emergency medical treatment. Patients with more serious injuries and medical conditions are taken to Putnam Hospital Center in Carmel and other area hospitals.

WEC residents also obtain health care services from Putnam and Danbury hospitals as well as Vassar Brothers Medical Center. A review of WEC records for the period of 2002 through 2007 demonstrates an average monthly visit to the aforementioned facilities to be 3.1.

RECREATIONAL FACILITIES

Recreational activity facilities are provided on-site for seasonal outdoor and indoor sports and exercise activities are provided for senior residents. The various outdoor facilities include: five miles of hiking and jogging trails, one baseball field, one soccer field, one full and one half basketball courts, three tennis courts, two volleyball courts, 250 garden plots for members to use, over 20 picnic tables, fishing in the reservoir (seasonally), and two outdoor pavilions. The various indoor facilities

include three racquetball courts, one basketball court, table games, exercise rooms, saunas, and swimming pool.

WEC residents typically use facilities on-site more frequently than they use municipal recreational facilities. Off-site recreational activities are usually limited to hiking and picnicking. The impact on community recreational facilities is projected to be mostly limited to occasional use of nature parks and outdoor trails.

LIBRARY FACILITIES

The applicant provides four libraries on the WEC site that are available to all residents. These libraries are open 24 hours a day and have many of the resources required by residents. As a result, residents typically use the four libraries rather than the public library, although some residents also use the Town of Patterson Library.

WATCHTOWER EDUCATIONAL CENTER'S EXISTING DEMAND ON CARMEL CENTRAL SCHOOL DISTRICT

The WEC is located within the Carmel Central School District but currently places no demand on local school districts services based on the following factors:

- All residents permanently serving at the WEC either do not have children or have adult children not living with them. There are no school-aged children currently residing at the WEC.
- All temporary and permanent residents that attend the various schools and training seminars at the WEC are adults who have satisfied their secular education obligations and thus do not place a demand on local school districts.

Because there are no children residing at the WEC, there is no existing demand on the Carmel Central School District.

APPLICANT'S COMMUNITY CONTRIBUTIONS

In addition to the ongoing voluntary payment of taxes (for example, $344,977 in 2008), as mentioned above, the applicant has made contributions to its local community in the Town of Patterson. The applicant has contributed to a number of community projects in the past, such as erecting lighting at the Town Ballpark, site work and assisting with maintenance at the Little League ball field, and pouring concrete at the Firehouse. The applicant has also made the WEC properties available to the PFD on several occasions for fire training drills and use as a landing zone for a Stat Flight helicopter.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

Since the proposed project is to be on property that is already tax exempt, no future additional taxes would be generated by the project site if the project is not undertaken.

Over the past three to four decades, the Town of Patterson has been one of the fastest-growing municipalities in Putnam County and is expected to continue to grow at a moderate pace. As residential and commercial development increases, tax revenues to the Town of Patterson may increase along with the demand on town services from a larger population. As noted earlier in Chapter 3, "Land Use and Zoning," several retail, office, and residential projects are proposed or approved throughout the Town of Patterson. However, no proposed development applications in the immediate vicinity of the project site have been submitted to the Town of Patterson Planning

Board. Most of the commercial and residential development applications are located along NYS Route 311 and NYS Route 22 north of NYS Route 311. **Table 13-5** shows all the projects proposed in the Town of Patterson that are likely to be complete by the 2014 build year. The Town of Patterson will see new tax revenues from these proposed projects.

Table 13-5
Town of Patterson Planned and Projected Projects

Name	Location	Description	Size	Status	Build-Year	Other Notes
Town of Patterson						
Patterson Crossing Retail Center	Rt. 311, near I-84 (Patterson and Kent border)	Retail; County Sheriff substation	382,560 SF (plus 28,000-SF garden center)	Approved	2010	SEQRA completed with adoption of findings statement by Lead Agency.
Barjac Equestrian Center	Rt. 311, between West St. and Maple Ave.	Two-story barn with apt.; indoor and outdoor riding ring.	6,978 SF barn; 20,000 SF indoor riding ring	Approved	2010	
Cipriano Site Plan	Rt. 22 at Ballyhack Rd.	Retail	27,908 SF Nursery and Retail stores	Pending	2010	Under review.
Frantell Site Plan	Rt. 22 (~1,500 ft. north or Rt. 311)	Retail	22,500 SF	Conditional Approval	2010	Received all necessary permits.
Genovese Site Plan	2160 Rt. 22	Light Man-ufacturing and Ware-housing	51,400 SF	Conceptual Review	Un-known	Existing commercial building.
Ice Pond View Subdivision	Ice Pond Rd.	Residential	30-lot SFR sub-division	Pending	Un-known	Preliminary Subdivision application submitted; Will create two new roads: one 1,500 LF, the other 1,100 LF
Paddock View Estates	Rt. 292 at Rt. 311	Residential	10-lot SFR sub-division	Conditional Final Approval	2010	Will be serviced by new 1,230 LF road.
Pondview Subdivision	Fair St. between Towners Rd. and Bullet Hold Rd.	Residential	50 Town-houses	Approved (1992); Stormwater and wetlands permits issued 2008.	2009	Patterson/Kent Border (39 units in Patterson, 11 in Kent)
17 Couch Road Corp. Subdivision	Couch Road	Residential	6-lot SFR Sub-division	Conditional Approval	Un-known	
Tractor Supply Site Plan	Rt. 311 (900 ft. west of Rt. 22)	Comm./ Retail	22,670 SF (retail); 20,000 SF (storage area)	Approved	2009	Opened 2009.

Sources: Town of Patterson, Planning Department

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

The applicant proposes to add 186,000 square feet of building coverage comprising 904,000 square feet of new building space and 434 new parking spaces to the existing WEC to support its growing needs. The proposed project would accommodate approximately 500 new residents, which would increase the site's maximum population to about 2,050 residents.

New office space would be utilized by residents and would not provide jobs for persons outside the campus. New building space would include the 524,000 square feet Maintenance and North Office Building and underground parking; G Residence, which would comprise 113,000 square feet of residential units, storage areas, and common areas; H Residence, which would comprise 205,000 square feet of residential units, storage areas, and common areas; a 46,000-square-foot

Audio/Video Building; a 3,000-square-foot Recycling Building; an approximately 4,000-square-foot Visitor Services Center; approximately 8,000 square feet of new space would be added to the existing South Services Building; and approximately 1,000 square feet of new space would be added to the existing Main Lobby Building.

The following section summarizes the potential impacts of the proposed project. The economic and fiscal benefits analysis considers short-term construction and long-term operation of the proposed project. Possible fiscal impacts are addressed for each of the various taxing jurisdictions potentially affected.

CONSTRUCTION IMPACTS

OVERVIEW

The construction of the proposed project would have a short-term economic effect during the construction period. The regional economic benefits include direct expenditure on construction goods and services and induced economic activity within the region.

The induced growth can be calculated using a regional economic multiplier analysis. A regional multiplier analysis is a method for calculating the overall induced economic activity within a region. For example, when purchasing construction material from a local supplier, some money spent goes toward local wages. A portion of those wages are spent within the region to purchase other goods and services. Subsequently, a portion of wages to produce these other goods and services are also spent within the region. If the construction goods were manufactured within the region, a series of additional expenditures reimburse the employees working for the manufacturer and also reimburse the suppliers of the material to the processor, and so forth. These employees, in turn, use a portion of their incomes to purchase regional goods and services.

In sum, all of these purchases occurring within a region can be quantified using what is called a regional multiplier analysis. To perform such an analysis, a regional Input-Output (I-O) model must be used. A regional I-O model quantifies all of the output of one industry within a region that was used as input to another industry within the region.

The principal model used to estimate the effect of constructing the proposed project on the regional economy is the Regional Input-Output Modeling System (RIMS II), developed by the U.S. Department of Commerce, Bureau of Economic Analysis. The model contains data for the region on 490 economic sectors, showing how each sector affects every other sector as a result of the change in the quantity of its product or service. The model has been adjusted to reflect the most recent changes in the metropolitan area price level. Using the model and the specific characteristics of the project, the total effect has been projected for the region from constructing the project.

RIMS II regionalizes the I-O multiplier for a defined region of influence. For the proposed project, the region specified to the Department of Commerce was the Hudson Valley region as defined by the New York State Department of Labor (Putnam County, as well as Dutchess, Orange, Rockland, Sullivan, Ulster, and Westchester Counties) plus Fairfield and Litchfield Counties in Connecticut.

The total budget for the proposed facilities is estimated to be approximately $120 million, with annual expenditures ranging from $20 to $40 million per year. RIMS II, like all I-O economic models, does not have a specific time dimension. Therefore, the economic stimulation that

results from applying the RIMS II multiplier is assumed to apply to the year in which construction expenditures occur.

Table 13-6 summarizes the employment and economic benefits in the region from construction of the proposed project. The table shows the estimated cumulative effects of the project's investments over the 4-year construction period, and models the projected benefits on an annual basis.

Table 13-6
Employment and Economic Benefits from Construction of the Proposed Project

	Total During the Construction Period	Average Amount per Year
Employment (Person-Years)*		
Direct (Construction)	664	166
Indirect (Secondary and Induced)	509	127
Total	*1,173*	*293*
Wages and Salaries		
(Millions of Constant 2007 dollars)		
Direct (Construction)	$36.21	$9.05
Indirect (Secondary and Induced)	$24.13	$6.03
Total	*$60.34*	*$15.08*
Total Economic Output or Demand**		
(Millions of Constant 2007 dollars)		
Direct (Construction)	$120.00	$30.00
Indirect (Secondary and Induced)	$109.32	$27.33
Total	*$229.32*	*$57.33*

Notes: The extent to which volunteers can be used for construction depends on future market conditions. To the extent volunteers are used, the paid direct employment and direct wages and salaries would be reduced.
* A person-year is the equivalent of one person working full-time for a year.
** The economic output or total effect on the local economy derived from the direct construction
Source: The characteristics and construction cost of the proposed development; the U.S. Department of Commerce, 2002 Census of Construction, New York, issued August 2005; and the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis.

EMPLOYMENT

Jobs during the construction period would include many different specialty contractors, some employed for only a brief period and others, such as those employed by the general contractors, employed for most of the 4-year construction period. For this reason, jobs during the construction period are measured in "person-years." A person-year is the equivalent of one person working full-time for a year.

Based on the direct construction expenditures, it is estimated that the project's capital program would generate demand for 664 person-years of employees over the 4-year construction period. As shown on Table 13-6, on average during the period the project would directly support approximately 166 person-years of employment annually.

In addition to the direct employment resulting from construction activities, the total employment resulting from construction expenditures includes jobs in businesses providing goods and services to contractors and workers, thereby resulting in the creation of indirect, or generated, employment. As shown in Table 13-6, based on the RIMS II economic multipliers for the region's industrial sectors, construction would indirectly generate another 509 person-years of

employment, or an average of 127 jobs annually. In total, the project's construction would create an estimated 1,173 person-years of employment, or an average of 293 jobs annually.

While the applicant has historically performed construction with a number of skilled volunteer workers, the extent of construction work provided by volunteers as compared to contract personnel for the proposed project depends on future market conditions. It is currently anticipated that 75 percent of the construction labor demand would be met through volunteers, with the remaining 25 percent through contracted personnel.

According to the New York Department of Labor, in 2007 there was an average of 2,722 construction jobs in Putnam County. The introduction of an average of 166 new construction jobs during the estimated 4-year construction period would be an increase of approximately 6 percent in the construction industry in Putnam County.

WAGES AND SALARIES

The directly and indirectly generated employment attributed to the construction activities would result in the creation of wages and salaries earned by the workers. Direct wages and salaries generated by the capital improvement expenditures over the 4 years of construction activities are estimated at $36.21 million, an average of $9.05 million per year. In total, including indirectly generated wages and salaries, construction of the proposed project is projected to have wages and salaries equaling approximately $60.34 million, or an average of $15.08 million per year.

TOTAL EFFECT ON THE REGIONAL ECONOMY

Based on the RIMS II model for the region, the total economic activity, including indirect expenditures, is estimated at $229.32 million. This figure is a measure of the estimated output, or demand, for state industries, and expresses the amount of total effect of the proposed project on the economy in constant 2007 dollars.

SUMMARY OF CONSTRUCTION IMPACTS

Construction impacts are expected to be comparable to that of any other similarly sized construction project, although the amount of directly generated construction wages and salaries will be less to the extent that volunteer workers are used for construction. Local expenditures are expected for goods and services, such as meals, fuel and vehicle maintenance, and other miscellaneous expenditures.

It is expected that secondary employees would be generated by the construction project throughout the region of influence. The induced economic growth in this region would create the demand for local labor in businesses providing services noted above or other support services. This local economic growth would continue for an estimated 4 years and benefit local restaurants, food suppliers, lodging, automobile services, building supply stores, and other services.

Volunteer construction workers are expected to be housed on-site at the WEC, at the Patterson Inn, or off-site. Contract workers would be expected to commute from Putnam and surrounding counties depending on the type of contracts and needed skill levels.

No negative economic impacts related to construction are anticipated.

OPERATIONAL IMPACTS

Operational impacts are associated with the impact on services offered by the Town of Patterson and Carmel Central School District due to an increase in the total number of residents and school-aged children, respectively. **Table 13-7** summarizes the 2008 Town of Patterson budget for various services offered in the Town.

Table 13-7
2008 Town of Patterson Budget

Town of Patterson Services	Amount Allocated
Patterson Fire Protection District	$789,481
Patterson Library	$434,000
Patterson Sewer	$351,106
Patterson Lighting	$29,000
Patterson Refuse	$994,320
Patterson Park	$94,850
Sources: 2008 Town of Patterson Budget, Town of Patterson.	

The following are the demographics and functions of the approximately 500 residents proposed on the WEC campus:

- Temporary and permanent residents would be over 19 years of age with almost all having a minimum of high school education.
- Residents would be pre- or post-family and would not have school-aged children residing at the WEC.
- Residents would have access to all recreational opportunities on-site and would primarily use those facilities.
- Residents would primarily access work locations, residences, meals, and recreation facilities on-site by foot.
- Residents would be provided with a level of on-site medical services, first-response and emergency care, and fire response.
- Residents would continue to travel off-site for a variety of local goods and services, including restaurants, electronics, major automotive needs, personal household goods, clothing, and major medical services, and to attend meetings for religious worship.

PROJECTED IMPACTS ON TOWN OF PATTERSON SERVICES

According to the Town's Comprehensive Plan of 2000, the Town of Patterson grew from 4,124 to 7,247 people between 1970 and 1980, before the construction of the WEC facility. By 1990, the town's population was 8,679. The 2000 U.S. Census reported Patterson's population at 11,306 people, which represents a 30 percent increase over the 1990 population.

The proposed project would add approximately 500 new residents to the WEC facility, increasing the WEC's maximum population to 2,050. The proposed addition would represent an approximately 4.4 percent increase to the Town's population. As detailed below, this increase in population on the WEC site would not have a substantial impact on the various services provided by the Town of Patterson.

Security

As described earlier, the applicant employs an on-site security system comprising security cameras, an entrance guard, and a main lobby check-in point managed by the facility's watchman program. The applicant would continue with its watchman program after construction of the proposed project to ensure the security of the site. In addition, the applicant plans to construct a new security fence with an access along Route 22 at the site's main entrance that would be closed at night and only accessible to authorized residents. A letter received from Sheriff Donald B. Smith, dated October 2, 2008, stated that the proposed project would not affect police protection services of the Putnam County Sheriff's Office.

Fire

Although a significant amount of new building space would be added to the WEC by the proposed project, the applicant would implement all necessary measures to ensure adequate fire protection on-site. Proposed structures would be primarily constructed of non-combustible and fire-resistant materials, such as concrete and steel. These buildings are not expected to create additional burden to fire protection services. Each building would be equipped with alarms and smoke detectors, as needed. These alarms and detectors would be tied into the central monitoring system for the WEC as required. All buildings would have enclosed stairways exiting outdoors in compliance with the NYS Building Code and be equipped with standpipe systems and/or sprinkler systems where required by the Fire Code of New York State. Design would emphasize life safety. In addition, site design would include emergency access lanes that are in compliance with the Fire Code of New York State. As mentioned earlier, fire hydrants would be installed in the vicinity of the new buildings, following criteria requested by the Patterson Fire Department during the original construction of the campus. A strict no-smoking policy would also be enforced in the proposed buildings.

Emergency Medical Services and Hospitals

The applicant provides routine and limited emergency medical services to residents on-site. The additional 500 residents are expected to use on-site services for basic medical needs. However, patients with more serious injuries and medical conditions would likely use the services available through the Putnam Hospital Center in Carmel.

As shown in **Table 13-8**, the proposed population increase of 500 persons at the WEC is projected to use less than one-fourth of a percent of the Town's fire, emergency and police services.

Table 13-8
Existing and Projected Off-Site Demand for Town Emergency Services
WEC Average and Proposed Monthly Amount of Calls to 911

	Existing	Proposed	Total
WEC Population	1,550	500	2,050
Fire/Emergency	0.18	0.06	0.24
Police	0.25	0.08	0.33

Sources: Watchtower Bible and Tract Society of New York, Inc.

Recreational Facilities

Additional recreational facilities for Watchtower residents and staff would be provided as part of the proposed project. These include a new game room, exercise rooms, saunas and steam rooms.

These facilities in addition to the existing recreational facilities, which are currently underutilized, would provide significant on-site recreational facilities for the WEC residents. Additional libraries would be included in the proposed buildings.

Based on the above, and as explained in detail in Chapter 4, "Community Services and Facilities," the WEC would place a low level of demand for off-site services. It is therefore anticipated that there would be no significant adverse impacts to the services provided by the Town of Patterson as a result of the additional 500 residents on the WEC site.

PROJECTED IMPACTS ON CARMEL CENTRAL SCHOOL DISTRICT

The additional 500 residents of the proposed project would have similar demographics as the existing population on the WEC and would not include any school-aged children. Therefore, there would be no increase in demand for public school services associated with the new residents.

PROJECTED IMPACTS ON THE REGIONAL ECONOMY

The proposed project would contribute to the regional economy in two primary ways: 1) direct expenditures for goods and services and 2) tourism expenditures by visitors.

Good and Services

The extent of regional economic benefit to a community cannot be specifically quantified. The overall economic contributions to a local community or a region would depend upon the size of the region and the portion of economic activity which is captured within the region, as well as the availability of goods and services in that community. For example, if a certain amount was spent monthly on clothing for WEC residents within a region, but a local community provided no clothing stores, there would not be an expected direct economic benefit to that community.

Visitors and Tourism

The secondary source of regional economic activity would be increased tourism associated with the WEC. Between 2001 and 2007, the WEC attracted approximately 53,000 to 63,000 tourists per year from throughout the United States and around the world. Adult students are expected to continue to come to Patterson to attend classes in the various schools identified elsewhere in this document. Other tourists visit friends, attend graduations, and tour the facilities.

E. CONCLUSION

The overall socioeconomic impacts of the proposed project to the Town of Patterson and Putnam County are expected to be positive.

The 4-year construction period of the proposed project could create up to an estimated 664 jobs in the tri-state region and indirectly generate another 509 person-years of employment, or an average of 127 jobs annually. In total, the proposed project's construction could create up to an estimated 1,173 person-years of employment, or an average of 293 jobs annually. Therefore, the short-term construction would create local and regional economic growth and would not result in any adverse impacts on community services within the Town of Patterson.

The proposed project could add approximately 500 new residents to the WEC, which represents a 4.4 percent increase over the Town of Patterson's year 2000 population. The long-term impacts on the community have been projected based on the historic demand of community

services by the existing residents of the WEC. As explained in detail in Chapter 4, the WEC is a largely self-contained community and generates a low level of demand for off-site services. Therefore, there would be no significant adverse impacts to the services provided by the Town of Patterson as a result of the additional 500 residents on the WEC site.

Based on the history of the WEC and the existing and projected demand for town services, no significant adverse fiscal impacts are anticipated as a result of the proposed construction and operation of the expanded facilities. ✷

Chapter 14: Construction

A. INTRODUCTION

This chapter discusses the construction procedures that would be implemented to develop the proposed project. The proposed mitigation measures, such as sequencing of construction that would minimize adverse environmental effects to neighboring properties, are also discussed in this chapter.

PRINCIPAL CONCLUSIONS

As described below, construction of the proposed project would not have any significant adverse effects on surrounding areas. Construction activities would occur from Monday through Saturday, 7:00 AM to 6:00 PM and only result in temporary impacts from construction traffic, generation of dust (air quality), and ambient noise levels. Further, much of the construction would occur at substantial distances from neighboring properties. In addition, numerous measures (e.g., phasing, a stormwater pollution prevention plan, an erosion and sediment control plan, etc.) would be implemented to minimize potential impacts.

B. CONSTRUCTION PROGRAM

OVERVIEW

Construction of the proposed project would include six new buildings, roadways, sidewalks, parking areas, and stormwater detention basins. Infrastructure and utility improvements would also be incorporated. These activities would occur on the east side of Route 22. On completion, stabilization of this work area would be in conformance with a landscape plan.

In total, approximately 904,000 square feet of new building space would be added to the WEC property, with a building coverage of approximately 186,000 square feet. New construction would include two residential buildings to accommodate 500 additional residents, an office and maintenance building, additions to the Audio/Video Building, a Recycling Building, a Visitor Services Building, and additions to the South Services Building and Main Lobby Building. For further details on operations of the expanded facility, see Chapter 2, “Project Description.”

An existing on-site concrete Batch Plant would be used to provide construction materials but would be removed after completion of the proposed project. Temporary construction sheds and trailers would include offices, lockers, storage, materials receiving and workshop space. The future Recycling Building would be temporarily used as an eating area for the construction workers and for other construction support uses. Rock crushing equipment and a shed for construction equipment repair would temporarily be set up and operated in the existing recreation area north of the project site. The G Residence would be occupied prior to the construction of the utility pathways connecting to the central heating and cooling plants in the Powerhouse. Therefore, a temporary boiler and air-cooled chiller would be provided for that

building. A temporary diesel fueling station for the construction vehicles would be located near the proposed Recycling Building.

GREEN INITIATIVES

As part of the proposed project, the applicant would incorporate a number of environmentally sustainable components to new construction. In the interest of designing and constructing new facilities in an environmentally sensitive manner, the applicant would utilize the Green Globes program, which was developed by the Green Building Initiative (GBI™). Green Globes was developed in Canada and was brought to the United States in 2004. This building rating system is similar in scope and intent to the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ from the U.S. Green Building Council. The intent of the Green Globes program is to incorporate the best "green" practices for building design, construction, and/or ongoing operation after construction is completed that conserve energy and water resources and reduce the potential for pollutants. These environmental benefits are also beneficial to the users, by creating a more enjoyable place to work or live. Long-term cost benefits can also be achieved by the reduced operating costs for energy, water, and waste disposal. The applicant has voluntarily adopted the sustainable design target of 3 Green Globes which is comparable to the Gold LEED®-New Construction certification. The implementation of the Green Globes program for this project demonstrates the applicant's commitment to reducing or minimizing adverse environmental impacts.

The applicant is working with the following GBI programs or tools to best evaluate the potential for various sustainable building techniques that could be implemented at the site:

- Green Globes New Construction software tool is a tracking tool used to assist the design team to determine which sustainable building techniques and the corresponding number of points that may be achieved in the design and construction phases of the project.
- Athena Eco Calculator is a life cycle analysis (LCA) tool that the design team uses to fully evaluate the effect each of the building material choices has on the environment and ecology.
- Qualified third-party assessors would work with the applicant to provide technical and program guidance, review progress, and validate environmental achievements for building projects.

The Green Globes program awards buildings one to four green globes, depending on the level of achievement in sustainable design as determined by an independent third party assessment. For further description of some of the green initiatives being implemented as part of the proposed project, see Chapter 6.

SCHEDULE AND CONSTRUCTION STAGES AND PHASING

Construction would occur over a 48-month period between February 2010 and February 2014. The construction of new buildings would be started in the following order:

- Recycling Building
- G Residence – The applicant would request approval for early occupancy.
- H Residence – The applicant would request approval for early occupancy.
- Maintenance/North Office Building – The applicant would request approval for early occupancy.

- Audio/Video Expansion
- Bridge from North Services Building to Maintenance/North Office
- Bridge from H Residence to Maintenance/North Office Building.
- South Services Building addition
- Visitor Services Building
- Main Lobby addition

Site work would be divided into 10 phases, as outlined in **Table 14-1** below and shown in **Figure 14-1**, "Construction Phasing Plan." A total of 49.1 acres of land would be disturbed throughout construction of the proposed project. Some of the boundaries for the phases overlap and therefore the sum of the areas of disturbance for the individual phases is greater than the total actual area of disturbance for the project which is 49.1 acres. Phasing has been scheduled so that no area greater than 10 acres would be disturbed at any given time. This acreage of disturbance is larger than the typical 5 acres used per phase. However, phases larger than 5 acres each are not unusual where road construction is involved, which is the case with this project. A waiver would be sought from the Town of Patterson, as a regulated traditional land use control MS4, for disturbances greater than 5 acres. All measures necessary to obtain a waiver, pursuant to the SPDES General Permit GP-0-10-001, would be proposed. In addition to creating a phasing plan that takes the cut and fill balance into consideration, erosion and sediment control practices would be implemented above and beyond standard requirements. The following GP-0-10-001 requirements are incorporated in the SPPP (see Appendix F):

- A qualified inspector must conduct at least two site inspections every seven calendar days—each visit separated by a minimum of two calendar days—for as long as greater than five acres of soil remain disturbed.
- In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

Table 14-1
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 1 (45 Days)	9.2 Acres	Recycling Building, Construction Entrances, Lower Pond, Temporary Construction Facilities – Construction entrances off of Route 22 and installation of road to connect to existing road by Recycling Building – Construction entrances for new Loop Road and existing road to area of new Recycling Building – Excavation, installation of foundation and stabilization of area of new Recycling Building – Excavate/fill and grade for overflow event parking – Establish construction storage area by G Residence – Install construction trailers and temporary parking area – Establish temporary rock crushing and top soil storage area. – Construct Lower Pond sediment basin. Basin to be converted to permanent detention pond following completion of construction activities. – Establish Lower Pond berm area. – Stabilize all areas
Phase 2 (40 Days)	8.7 Acres	Loop Road, Audio/Video Building, Staging Area – Blast, excavate and install temporary surface from station 50+00 to 55+00 on loop road – Blast, excavate and install temporary surface for staging materials at location of future North Audio/Video Building – Install haul road from new Loop Road to Lower Pond berm area. – Preparing staging area and road for stockpiling of excavated materials. – Stockpile Lower Pond Berm – Stabilize all areas.
Phase 3 (70 Days)	3.8 Acres	G Residence, Courtyard between G Residence and H Residence, North Bridge from G to H Residence – Excavation, installation of foundation and stabilization of area of new G Residence – Level and install temporary surface for staging materials at location of new residence courtyard – Stockpile Lower Pond Berm – Stabilize all areas
Phase 4 (120 Days)	4.5 Acres	H Residence, South Bridge from H to G Residence – Excavation, installation of foundation and stabilization of area of new H Residence – Stockpile Lower Pond Berm – Stabilize all areas
Phase 5 (120 Days)	9.3 Acres	Maintenance/North Office Building, Loop Road, Tunnel from H Residence to Maintenance/North Office Building, Upper Pond – Excavation of Maintenance/North Office Buildings to bedrock – Use excavated soils to construct Loop Road from station 0+00 to 11+00 – Construct Upper Pond sediment basin. Basin to be converted to permanent detention pond following completion of construction activities. – Excavation and installation of utility tunnel between H Residence and Maintenance/North Office Building – Stabilize all areas
Phase 6 (140 Days)	7.5 Acres	Maintenance/North Office Building, Loop Road, Cart Path – Blast, excavation, installation of foundation and stabilization of area of Maintenance/North Office Building. – Establish backfill storage berm in location of new West A/V Building – Construct Loop Road from station 11+00 to 20+00 – Construct Cart Path – Stockpile materials in upper storage area berm – Stabilize all areas
Phase 7 (60 Days)	2.4 Acres	Visitor Parking Lot – Construct new Visitor Parking Lot and stabilize surrounding area – Stabilize all areas

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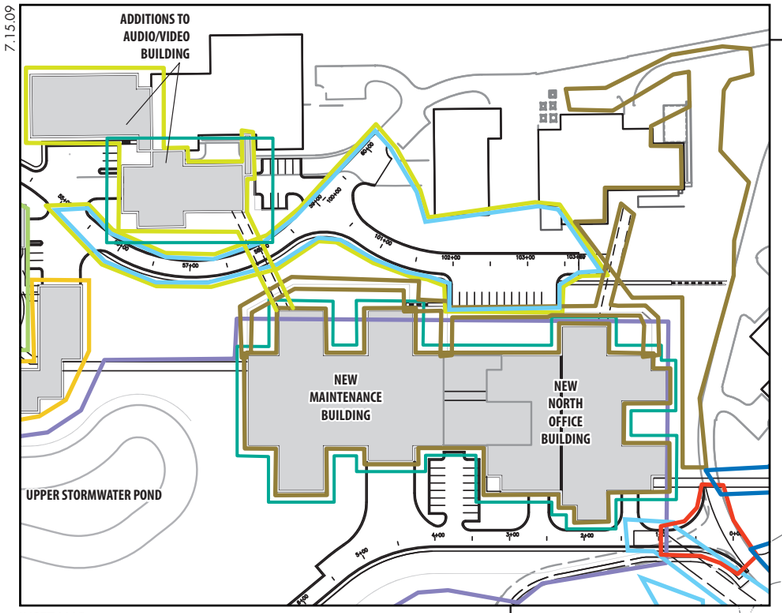
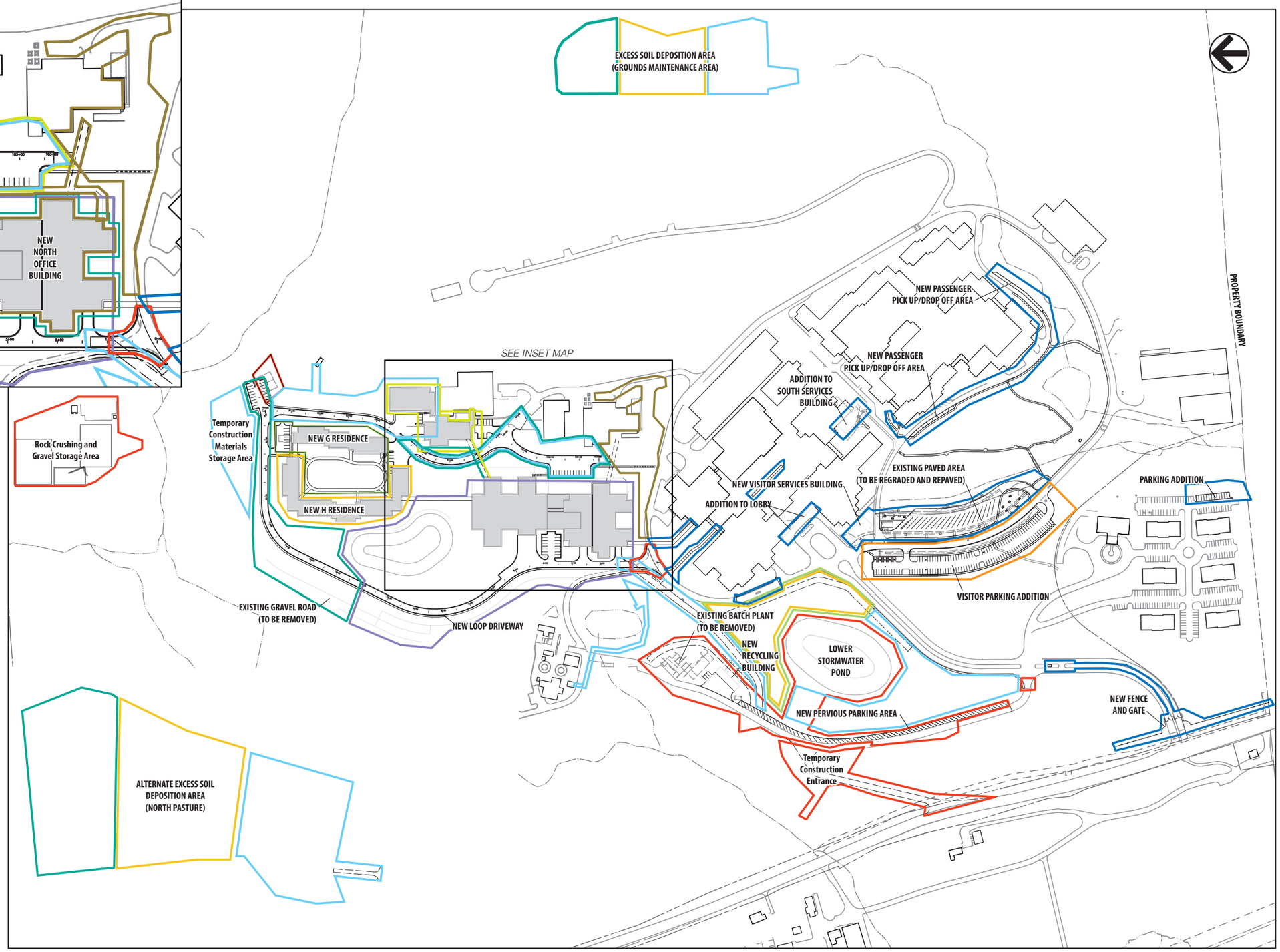


INSET MAP

- **Phase 1** - Recycling Building, Construction Entrances, Lower Pond and rock crushing facility.
  Phase 1 would have an area of disturbance of approximate 9.2 acres.
- **Phase 2** - Loop road, Audio/Video Building, Staging Area
  Phase 2 would have an area of disturbance of approximately 8.7 acres. The new loop road would provide access to the majority of proposed structures, tying into existing roads on-site. Two additions (north and west) totaling approximately 46,000 square feet are proposed to the Audio/Video Building.
- **Phase 3** - G Residence, Courtyards between G Residence and H Residence, North Bridge from G to H Residence
  Phase 3 would have an area of disturbance of approximately 3.8 acres
- **Phase 4** - H Residence, South Bridge from H to G Residence
  Phase 4 would have an area of disturbance of approximately 4.5 acres.
- **Phase 5** - Maintenance/North Office Building, Loop Road, Tunnel from H Residence to Maintenance/North Office Building, Upper Pond
  Phase 5 would have an area of disturbance of approximately 9.3 acres.
- **Phase 6 -** Maintenance/North Office Building, Loop Road
  Phase 6 would have an area of disturbance of approximately 7.5 acres
- **Phase 7 -** Visitor Parking Lot
  Phase 7 would have an area of disturbance of approximate 2.4 acres.
- **Phase 8 -** Tunnel from Powerhouse to Maintenance/North Office Building retaining walls
  Phase 8 would have an area of disturbance of approximate 3.9 acres.
- **Phase 9 -** Loop Road, Audio/Video Building, Tunnel from A/V Building to Maintenance/North Office Building
  Phase 9 would have an area of disturbance of approximate 2.4 acres.
- **Phase 10** - Bus Parking Lot, Lobby expansion, Services Building expansion, Visitor Services Building, passenger pick-up/drop-off addition at E Residence, F Residence and parking addition at Patterson Inn
  Phase 10 would have an area of disturbance of approximate 5.4 acres.



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SCALE

Figure 14-1

Construction Phases

Table 14-1 (cont'd)
Proposed Phasing for Areas of Disturbance

Phase and Duration	Area of Disturbance	Construction Activity
Phase 8 (40 Days)	3.9 Acres	Tunnel from Powerhouse to Maintenance/North Office Building, Maintenance/North Office Building retaining walls – Excavation, installation of foundation and stabilization of area tunnel connected to North Office Building – Backfill Maintenance/North Office Building foundation – Install Maintenance/North Office Building retaining walls and backfill – Stabilize all areas
Phase 9 (90 Days)	2.4 Acres	Loop Road, Audio/Video Building, Tunnel from A/V Building to Maintenance/North Office Building – Construct Loop Road from station 55+00 to 60+00 and adjacent parking areas. – Blast, excavation, installation of foundation and stabilization of area of West Audio/Video Building. – Blast, excavation, installation of foundation and stabilization of area of tunnel from West Audio/Video Building to Maintenance Building – Excavation, installation of foundation and stabilization of area of North Audio/Video Building – Stabilize all areas
Phase 10 (90 Days)	5.4 Acres	Bus Parking Lot, Main Lobby Addition, South Services Building Addition, Visitor Services Building, Passenger Pick-up/Drop-off Addition at E Residence, F Residence and Parking at Patterson Inn – Remove existing parking lot and construct new Bus Parking Lot – Excavation, installation of foundation and stabilization of area of Lobby Addition. – Excavation, installation of foundation and stabilization of area of South Services Building Addition. – Excavation, installation of foundation and stabilization of area of new Visitor Services Building. – Construct passenger pick-up/drop-off areas at E Residence, F Residence and parking at Patterson Inn – Finalize site landscaping.
Total 815 Days	**57.1 Acres**	

The erosion and sediment control practices that would be implemented within each construction phase are listed below. A detailed description of each type of practice is described in Chapter 7, "Stormwater Management" and also in the Stormwater Pollution Prevention Plan (SPPP) provided in Appendix F. The large-scale erosion and sediment control plans that accompany this DEIS indicate the locations of the various practices.

As shown on Figure 14-1, the existing recreation area along the northern edge of the project site parcel would be temporarily used as a rock crushing and gravel storage area during construction of the proposed project. This is an existing cleared, flat area comprising one full and one half basketball court, tennis courts, and mowed lawn. Therefore, no disturbance to environmentally sensitive features would result from temporary usage during construction.

Just south of the recreation area, a temporary construction materials storage area would be set up. Only existing flat grassy areas would be used, thereby avoiding disturbance to any steep slopes, native forest, and wildlife habitat in this area.

A spoils area, shown as the excess soil deposition area on Figure 14-1, would be established on the eastern portion of the project site parcel to contain excess excavated material from construction. A portion of this area is an existing excess soil deposition and grounds maintenance work area, which is previously disturbed, although additional wooded area would need to be cleared. As detailed below, approximately 196,100 cubic yards of earth material, of

which 42,910 cubic yards is expected to be rock, would be excavated during construction of the proposed project. Approximately 110,600 cubic yards of excavated material would be used as fill to re-grade construction areas. The net excess material of 85,500 cubic yards would be stored in the existing excess soil deposition area.

An alternate spoils area has been considered by the applicant in an area referred to as the north pasture area, as shown on Figure 14-1. This is an existing cleared grazing area that would not require removal of trees, but it would require a stream crossing to be constructed over Mountain Brook to gain access from the construction area. If this alternate spoils area is selected, the bridge would remain permanently and be used for ongoing grounds maintenance and livestock care.

WINTER OPERATIONS

Snow accumulation would be removed from active work sites and hauled to a snow dump located on-site. This snow dump would be located in an area where run-off from melting snow would be handled according to the SPPP.

EXCAVATION AND BLASTING OPERATIONS

Excavation of rock and soil would be required during construction to prepare new building sites and road improvements. Soil and rock would be stockpiled on-site. The weathered bedrock would be removed though ripping or other mechanical methods. However, in areas where the rock is not weathered, drill and blast operations would be necessary.

The proposed project would require total cut and fill volumes of approximately 196,100 cubic yards and 110,600 cubic yards, respectively. Net excavation would therefore be about 85,500 cubic yards. See Figure 5-4 in Chapter 5, "Geography, Soils, and Topography," for the cut and fill plan.

The applicant proposes to stockpile excess excavated material in the existing excess soil deposition area, shown on Figure 14-1 in the eastern section of the project site parcel. A portion of this area has been previously disturbed and is used as a grounds maintenance work area. However, additional clearing would be required during construction of the proposed project.

Alternatively, the applicant has considered using the north pasture area to deposit excess material. This area is an existing cleared grazing area, which would require a stream crossing over Mountain Brook to gain access from the construction area. As stated above, this bridge would be permanent. Bridge abutments would require approximately 72 cubic yards of fill in the stream buffer area. In addition, approximately 680 cubic yards of fill within the stream buffer area would be needed in an average 2-foot-wide swath along the approach road. Permanent disturbance within the buffer would total approximately 9,100 square feet, with an additional 11,849 square feet of temporary disturbance (for construction of the span and approach road). No disturbance would take place to the stream itself.

When blasting is required to remove rock during construction, a comprehensive plan would be developed based on site-specific information and submitted for approval by the appropriate agencies. All blasting operations would be carried out in conformance with New York State regulations governing the storage and use of explosives and the certification/licensing of blasting personnel. (12 NYCRR Chapter 1, Subchapter A, Part 39. Stat. Auth. at: Labor Law§21, 27-a, 27, 29, 462, art.16, General Business Law §483). The applicant would retain an engineer

authorized to conduct blasting operations. The engineer would ensure that blasting design and monitoring adheres to the defined standards to prevent any damage or disruption.

A controlled blast follows the following procedures:

- Drilling holes into bedrock to design depth, diameter, and spacing;
- Placement of a charge, carefully designed to optimal breakage, into the drilled holes; and
- Timed detonation of the charges in an optimal sequence to fragment the rock while minimizing vibration and noise.

Several impacts from blasting that could occur include:

- Flyrock, or rock fragments propelled into the air;
- Ground motion as a result of vibrations from blasting; and
- Air blast, or air pressure created by the blast.

Preventative measures, monitoring, and proper design would be employed by a qualified engineer to ensure that these impacts do not compromise anyone's safety. Existing conditions of structures would be assessed prior to blasting through a combination of background vibration monitoring and pre-blast site surveys. During blasting, ground vibrations and air blast pressures would be monitored and recorded at various intervals from the blast site and at nearby structures. Flyrock would be contained by the use of blast mats.

Excavated rock would serve several functions on-site, as needed. These functions include use as rip-rap, slope reinforcement, pavement and under slab base course and erosion control.

C. POTENTIAL IMPACTS OF CONSTRUCTION AND MITIGATION

TEMPORARY EFFECTS

The proposed project would involve clearing, grading, and excavation of soil and rock to prepare building sites. Potential temporary impacts from these processes include exposure of soil to natural forces, which could lead to erosion and creation of dust. To minimize or avoid temporary adverse effects from construction, a SPPP would be implemented that would incorporate an erosion and sediment control plan (see Appendix F).

TRAFFIC AND TRANSPORTATION

Construction of the proposed project would create daily construction-related traffic to and from the project site, including workers, delivery of materials and equipment. Construction vehicles would access the project site via Watchtower Drive off Route 22, which is an existing truck route, or via a temporary construction entrance. The temporary construction entrance would be located over 780 feet to the north of Watchtower Drive, and would be re-vegetated after construction. This temporary construction entrance location was successfully used previously during the construction of the WEC. The sight distance observations and measurements conducted at the temporary construction driveway indicate that sight distance is approximately 1,000 feet to the right and left of the driveway (more than sufficient distance to safely accommodate ingress and egress at the driveway). Specific routes would be planned, in coordination with relevant authorities, to ensure truck traffic has minimum impact on the surrounding area. In addition, flagmen would be used and signs would be installed where

necessary to ensure traffic safety during construction. This type of activity, if necessary, will be coordinated with the New York State Department of Transportation (NYSDOT) and the Town.

On-site, existing roads would be able to accommodate most construction traffic. Any temporary roads created for the proposed project would be removed when no longer needed and returned to their original state. Crushed rock would be applied where necessary to serve as an erosion control measure. Temporary access roads would be kept free from deposits to prevent silt, oil, or other materials from entering drains and watercourses.

To prevent the transport of mud and dust to public roadways, several measures would be put in place:

- Use of hard core surfaces on access roads;
- Provision of an easily cleaned hard standing area within the construction base for vehicles entering, parking, and leaving;
- Provision of vehicle washing facilities adjacent to egress points;
- Appointment of site personnel to clean the construction base hard standing area and mud or debris deposited on public roadways; and
- Fully sheeting all work vehicles carrying materials that could potentially result in deposition of dust or loose debris on public highways.

Construction activities would primarily occur from Monday through Saturday, 7:00 AM to 6:00 PM. Delivery of materials on-site would generally occur on off-peak traffic hours, whenever possible.

Construction traffic and transportation conditions of the proposed project would be temporary and therefore not result in a significant adverse impact.

AIR QUALITY

The principal air quality impact associated with construction activities is the generation of fugitive dust, which can vary widely in terms of volume and size of particulate matter generated. Fugitive dust is associated with earth moving, such as site grading, filling, and excavation for foundations. A large proportion of the fugitive dust generated by construction activities would be of relatively large particle size, which would settle to the ground within a short distance from the construction site and not significantly affect nearby buildings or people.

To minimize these problems, the following dust suppression measures would be followed during construction:

- Areas of disturbance would primarily be limited to 5 acres at any given time.
- Wetting the ground surface before and after excavation or soil disturbance.
- Using vegetative covers to reduce wind erosion.
- Mulching disturbed areas and stockpiles to reduce wind erosion.
- Using wind breaks and barriers (natural or manmade) to reduce suspension of airborne materials. Trees and shrubs left in place during site clearing can be a natural barrier. Man-made barriers can include a wind fence, snow fence, tarp curtain, hay bale, crate wall, or sediment wall.
- Using stone surfacing on access roads to minimize dust creation.

- Enforcing traffic control measures, such as restricting traffic on-site and limiting vehicle speeds, to reduce generation of dust.

Most of the new construction would occur on the northern portion of the WEC property east of Route 22. The nearest residences to this area, other than those located on-site as part of WEC, are approximately 2,000 feet away along Lopane Drive. Construction activities occurring closer to these residences, such as an expanded parking area near the proposed Visitor Services Building, would be about 700 feet away. A small parking expansion at the Patterson Inn would be adjacent to residential properties, although this component would create only 13 new parking spaces.

Due to the distance between construction and neighboring residences, as well as the small size of the Patterson Inn parking improvements, no significant effects on the local community from fugitive dust are expected.

NOISE

Construction of the proposed action would typically generate noise and vibration from construction equipment, construction vehicles, worker traffic, and delivery vehicles traveling to and from the project site. Noise levels caused by construction activities would vary widely, depending on the phase of construction—demolition, excavations, foundation, construction of the structures, etc.—and the specific task being undertaken. All construction activities would be conducted in full compliance with existing regulations, including local day and hour construction limitations.

Local, state, and federal requirements mandate that certain classifications of construction equipment and motor vehicles be used to minimize adverse impacts. Thus, construction equipment would meet specific noise emission standards. Usually, noise levels associated with construction and equipment are identified for a reference distance of 50 feet, as shown in **Table 14-2**.

As stated above, most construction activities would occur more than 2,000 feet from any neighboring residential properties. Smaller construction activities, such as parking expansions, would occur at distances of 700 feet from neighboring residential properties. Parking improvements slated for the Patterson Inn would occur adjacent to residential properties; however, this component of the proposed project would add just 13 new parking spaces and is expected to be completed in less than 2 months during Phase 10.

Table 14-2
Typical Noise Emission Levels For Construction Equipment

Equipment Item	Noise Level at 50 Feet (dBA)
Air Compressor	81
Asphalt Spreader (paver)	89
Asphalt Truck	88
Backhoe & Excavator	85
Bulldozer	87
Compactor	80
Concrete Plant	83(1)
Concrete Spreader Screed	89
Concrete Mixer	85
Concrete Vibrator	76
Crane (derrick)	76
Delivery Truck	88
Diamond Saw (concrete)	90(2)
Dredge	88
Dump Truck	88
Front End Loader	84
Gas-driven Vibro-compactor	76
Hoist	76
Jack Hammer (Paving Breaker)	88
Line Drill Rock drill for blasting	98
Motor Crane	93
Pump	76
Rock Crusher	76
Roller	80
Scraper	83
Shovel	82
Off Road Truck	88

Notes:

[1] Wood, E.W., and A.R. Thompson, Sound Level Survey, Concrete Batch Plant; Limerick Generating Station, Bolt Beranek and Newman Inc., Report 2825, Cambridge, MA, May 1974.

[2] New York State Department of Environmental Conservation, *Construction Noise Survey, Report No. NC-P2*, Albany, NY, April 1974.

[3] F.B. Foster Company, Foster *Vibro Driver/Extractors, Electric Series Brochure*, W-925-10-75-5M.

Sources: Patterson, W.N., R.A. Ely, And S.M. Swanson, *Regulation of Construction Activity Noise*, Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974, except for notated items.

Although construction activities would increase ambient noise levels at the project site, neighboring residential properties are at a great enough distance to have minimal effect. Therefore, no significant adverse effects regarding noise levels are expected from construction.

CONSTRUCTION OF BUILDING FOUNDATIONS

The geotechnical investigation (CHA, May 23, 2008, see Appendix B) performed for the proposed project determined that the existing on-site sand and glacial till subsurface deposits are suitable to support proposed structures on shallow spread foundations and would also be suitable for the placement of floor slabs. The use of existing fill soils, found in portions of the proposed project footprint, may be considered suitable for floor slab placement based on the results of a final geotechnical investigation to be completed subsequent to final project approvals. The existing sand subsurface material does not meet the requirements for structural fill material

based on laboratory results. Therefore, it would not be used for this purpose. Instead, fill material would be obtained from crushed, excavated rock from the project site.

Design components to facilitate the proper structural and subsurface stability include:

- Exterior footings would be founded at a minimum depth of 4.0 feet below finished grade to provide frost protection.
- Interior footings in heated areas may be founded at a minimum of 2.0 feet below the bottom of the floor slab.
- Isolated footings would be a minimum of 36 inches in least dimension and continuous footings would be a minimum of 18 inches wide.
- Structural backfill would extend behind retaining walls at least half the wall height. The structural backfill would be capped with a layer of relatively impervious material to minimize percolation of surface water behind the walls.
- A minimum of 6 inches of clean, compacted crushed stone would be placed beneath the floor slabs to enhance support and provide a working base above the soil subgrade.
- A polyethylene vapor barrier would be used between the crushed stone and concrete floor slab to eliminate vapor transmission into buildings spaces.
- Proposed foundations located partly on bedrock and partly on soil may need additional design components.
- The subgrade beneath the proposed structures and backfill behind their foundations would be maintained in dry conditions at all times. Drain tiles with crushed stone or gravel backfill would be placed adjacent to exterior footings at an elevation below floor slabs.
- A geotechnical licensed engineer would be retained to observe proof rolling of the subgrade, foundation excavations, and review subgrade conditions prior to slab and foundation construction and make recommendations for any unsuitable conditions encountered.
- Dewatering would likely be required during the construction of the proposed project. Perched groundwater was encountered in test borings at depths as shallow as 6.75 feet. Groundwater would be maintained at a minimum depth of 2.0 feet below the excavation bottom at all times to maintain stable conditions. Dewatering methods suitable for this site would include the use of pumps, diversion and drainage ditches, and toe drains to divert water from construction excavation into temporary pits designed for water filtering.

By employing the above-mentioned construction measures, significant impacts related to building foundation construction would be avoided. ✷

Chapter 15: Unavoidable Adverse Impacts

As discussed in each of the technical chapters throughout this DEIS, the proposed project would create a number of physical changes to the project site. Several environmental impacts would result that cannot be avoided. None of these impacts are considered significant. The proposed project would develop a large area of undeveloped, though previously disturbed land. It should be noted that this developed area proposed is a small portion of the overall Watchtower Educational Center (WEC) properties; of the 743.3 acres comprising the overall WEC properties, only 49.1 acres would be disturbed by the proposed project, of which only 10.2 acres, or 1.37 percent, would be new impervious surface.

Construction of new buildings, roadways, and parking areas would require excavation and grading, and create additional impervious surfaces on-site. This increase in impervious surfaces would require detention, treatment, and eventual release of stormwater runoff that would formerly have been absorbed by pervious lawns, orchards, and woodland soils. A Stormwater Pollution Prevention Plan (SPPP) would be implemented to ensure proper management of stormwater runoff.

As described in Chapter 5, "Geology, Soils, and Topography," disturbance to soils and steep slopes would be unavoidable for the proposed project. Site design has been developed to limit excavation and grading to the extent practicable, although removal of soil and bedrock would be required for foundations and construction of new buildings and access roads. A large portion of excavated materials would be used for re-grading surface areas. Excavated rock has the potential to be reused for rip-rap, slope reinforcement, paving and under slab base course, landscaping and erosion control.

As described in Chapter 9, "Natural Resources," the proposed project would result in a loss of some vegetated land on-site. New construction would occur on land primarily occupied by existing lawns and an orchard. These areas are maintained and located within the existing WEC project site at the present time. As such, conversion of these areas (primarily lawn and orchard) to a mix of impervious surfaces and new lawn/landscaped areas would not induce habitat fragmentation or destroy important wildlife habitats, and is not considered a significant adverse impact.

Several unavoidable temporary impacts would result from construction of the proposed project, as discussed in Chapter 14, "Construction." Construction activities would generate traffic to and from the site, noise from construction equipment, and potential erosion concerns. To minimize these impacts, a phasing plan, a SPPP, an erosion and sediment control plan, and traffic safety measures would be implemented. These impacts would be temporary and are not considered significant. ✷