FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CATSKILL/DELAWARE UV FACILITY METHODOLOGIES

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3.9. TRAFFIC AND TRANSPORTATION

3.9.1. Introduction

Guidelines from the *City Environmental Quality Review (CEQR) Technical Manual* (October 2001) were used for specific technical methodologies, databases, and procedures required to perform the traffic and transportation analyses for the proposed Catskill/Delaware Ultraviolet Light Disinfection Facility (UV Facility). This methodology was adopted because the established guidelines are recognized to be conservative and provide consistency in evaluating potential impacts at the Eastview Site and at the off-site facilities, discussed below. Based on previous trip-generation estimates and traffic assignment patterns for both construction period and operational traffic, geographic study areas were identified and intersections were selected for detailed study and analysis. The construction traffic governed the determination of the study areas and selected intersections, as the anticipated traffic volumes during construction at the Eastview Site would be substantially larger than when the proposed project is completed and in operation. With respect to the off-site facilities, no additional traffic would be generated after construction is completed and traffic generation would be limited to the construction period.

3.9.2. Baseline Conditions

3.9.2.1. Existing Conditions

3.9.2.1.1. Traffic

The collection of existing traffic volume data was performed for the Eastview Site. The traffic data collection program was developed to provide the necessary traffic information in the study area and to correspond to the time periods that both the construction and operation traffic would occur. It has been assumed that construction would typically commence no later than 7 AM (with workers arriving between 6:30 and 7 AM) and finish no later than 3:30 PM (with workers departing between 3:30 PM and 4:30 PM). This assumption falls within the time frame of the applicable local ordinances regulating construction hours. Since the release of the *Croton Water Treatment Plant Final Supplemental Environmental Impact Statement* by DEP in December 2003, the traffic network peak hours examined in the document have been updated to better reflect the hours when workers (both operation and construction) would travel (as stated above 6:30 AM to 7:30 AM and 3:30 PM to 4:30 PM).

Traffic counts for the primary study area were collected during school periods in June 2002, September/October 2002, September 2003, and March 2004. Because of the completion of Walker Road, additional traffic counts were taken in that area. The counts documented traffic conditions on key study area roadways and intersections. The data collection included manual turning movement counts (TMC), automatic traffic recorders (ATR), vehicle classification counts, and travel speed runs (for use in the air quality studies) along principal corridors. The following is a description of the traffic count types that were performed.

Turning movement counts (TMCs) were performed at the study area intersections during the morning (AM Peak) and evening (PM Peak) time periods to ensure that the peak hours were

captured, the TMCs conducted at the identified intersections were performed on mid-week days (Tuesday through Thursday) from 7 AM to 10 AM for morning peak-hour traffic, and from 2 PM to 6 PM for the afternoon peak-hour traffic periods. The counts were performed recording 15-minute increments. Based on the ATR data, the TMC count data was adjusted to create the construction (and operational) AM peak hour of 6:30 AM to 7:30 AM used for the primary study area existing condition analyses.

ATR counts were performed for continuous 24-hour periods for seven days. Vehicle classification counts were performed from 7 AM to 10 AM and 2 PM to 6 PM at selected ATR count locations to provide a representation of the vehicular mix on the various study area roadways. These hours, as well as the hours for which the TMCs were performed, were chosen as representative of the periods of heaviest traffic volumes during the potential construction period and facility operation. Vehicles have been classified into the following categories:

- Automobiles
- Taxis
- Motorcycles
- Buses
- Light-duty gas trucks
- Heavy-duty gas trucks
- Light-duty diesel vehicle
- Light-duty diesel truck
- Heavy-duty diesel vehicle
- Sports Utility Vehicles (SUV)

Note that the "light-duty" truck categories include vans, ambulances, pickup trucks and all trucks with four (4) wheels; whereas the "heavy-duty" truck categories include all vehicles with six (6) or more wheels (6 wheels can be on 2- or 3-axle vehicles).

Eastview Site. The Eastview Site is located in the Towns of Mount Pleasant and Greenburgh in Westchester County, New York. The study area for the Eastview Site was selected to encompass those roadways most likely to be used by the majority of vehicular traffic traveling to and from the site. The study area is bounded by Broadway, Bradhurst Avenue (Route 100), and the Sprain Brook Parkway to the north, Tarrytown-White Plains Road (Route 119) to the south, Bradhurst Avenue (Route 100) and Saw Mill River Parkway to the east, and Saw Mill River Road (Route 9A) to the west.

To develop the existing condition traffic volumes for the study intersections, the traffic volumes from the TMC were factored utilizing adjacent ATR counts. The resultant intersection turning movement volumes represent an average mid-weekday volume. Since the study intersections represent only a portion of the roadways in the study area, the turning movement volumes of adjacent intersections may not balance (i.e., the traffic exiting one study intersection may not equal the traffic entering the adjacent study intersection.) This is due to several possible factors, including other intersecting roads and residential and commercial entrances between study intersections, different count days, and counts performed in the spring versus the fall. Details of

the intersections analyzed, and where specific counts were undertaken, are described in detail in Section 4.9, Traffic and Transportation.

Off-Site Facilities. As described below the proposed project also involves off-site facilities, where the Catskill Aqueduct would be pressurized, the aerators at the Kensico Reservoir would be filled, a new screen chamber at Kensico would be constructed, and other construction-related work would take place. These include the Kensico Reservoir Work Sites and the Taconic State Parkway Work Sites. The study areas for the off-site facilities are all located in the Town of Mount Pleasant, Westchester County, New York and overlap with the primary study area for the Eastview Site.

2006 Kensico Off-Site Facility Work

The study area for the Kensico Reservoir Work Sites is bounded by Stevens Avenue to north, Grasslands Road (Route 100C)/Virginia Road to the south, Columbus Avenue to the east, and Walker Road to the west. For the FEIS, the study area was expanded northward—to Route 141/Commerce Street, and Kensico Road—to include several additional intersections that were examined as part of an additional potential truck route for fill activities. For this study area, additional counting programs were undertaken in March and October 2004, similar to that performed for the Eastview Site study area. They also included TMC, ATM, vehicle classification counts, and speed runs. For this off-site study area, "existing" conditions are an amalgamation of traffic volumes established between 2002 and 2004. The study also examined five truck route options for future trucking activity associated with the proposed filling the aerators in 2006 (peak year of truck activity). These routes could convey trucks traveling between the Eastview Site (source of the fill) and the existing aerators at Kensico Reservoir (where the fill would be placed). These routes were the basis for the selection of the intersections included in the Kensico study area, and are as follows:

- 100 percent of the trucks traveling on Lakeview Avenue (Option A).
- 100 percent of the trucks traveling on Route 100C/Commerce Street (Option B).
- An even 50/50 percent split between Lakeview Avenue and Route 100C/Commerce Street (Option C).
- A circular route, combining Options A and B, where 100 percent of the trucks travel northbound to the aerators on the Lakeview Avenue route, and return to the Eastview Site by traveling on Route 100C/Commerce Street (Option D).
- 100 percent of the trucks travel on a northerly route, on Saw Mill River Road (Route 9A), Broadway, Route 141, Commerce Street/, Kensico Road and Columbus Avenue (Option E).

The TMC at all of the Kensico study area intersections for Options A, B, C, and D, were conducted on mid-week days (Tuesday to Thursday) from 6:30 AM to 10 AM and from 2 PM to 6 PM to capture the AM, midday and PM peak hours. In addition, ATR data counts were

performed for 24-hour periods for seven days at two locations. The vehicle classification counts were performed from 6:30 AM to 10 AM and 2 PM to 6 PM. The count program (TMC and VCC) for the additional Option E intersections was conducted on a midweek day from 6 AM to 9 AM, noon to 2 PM, and 3 PM to 6 PM. The program for Option E also included four additional 24-hour/7 day ATR counts. These hours, as well as the hours for which the TMC were performed, were chosen as representative of the periods of heaviest traffic volumes during potential fill activity. It has been assumed that the fill operations would commerce at 8 AM and finish no later than 4:30 PM. Details of the activities to be undertaken, the intersections analyzed, and where specific counts were undertaken, are described in detail in Section 5.1, Kensico Reservoir Work Sites.

2010 Kensico Off-Site Facility Work

The intersections analyzed for this work (filling of the Catskill Aerator, the construction of new screen chamber and the pressurization of the Catskill aqueduct) include the following:

- Columbus Avenue and Lakeview Avenue
- Columbus Avenue and West Lake Drive
- Columbus Avenue and Stevens Avenue (northbound and southbound roadways)

TMC and ATR counts were conducted for the same hours as described above for the 2006 analysis. The peak hours analyzed for the 2010 off-site work include the following:

- 6:30 AM to 7:30 AM (early AM peak hour), this includes worker arrivals.
- 8:00 AM to 9:00 AM (late AM peak hour); this includes truck trips to and from the Eastview Site and the Kensico Reservoir campus.
- 3:30 AM to 4:30 PM, this includes worker departures and truck trips to and from the Eastview Site and the Kensico Reservoir campus.

Taconic State Parkway Work Sites

The Taconic State Parkway Work Sites would be used as construction staging areas and access points by workers and materials for this proposed pressurization work in the vicinity of the Taconic State Parkway, Gate of Heaven Cemetery and Mount Eden Cemetery. Details of the activities to be undertaken, and the various specific work sites, are described in detail in Section 5.2, Taconic State Parkway Work Sites. No impacts on traffic and transportation are anticipated as part of the work proposed at the Taconic State Parkway Work Sites. The work would generate a maximum of 2 truck trips per day and approximately 2 shuttle bus trips, transporting workers from/to the NYCDEP Kensico campus during the morning arrival (between 6:30 and 7:30 AM) and afternoon departure (between 3:30 and 4:30 PM). Therefore, a detailed analysis of traffic and transportation was not conducted for these off-site facilities.

3.9.2.1.2. Highway Capacity Manual Procedure

The *2000 Highway Capacity Manual (HCM-2000)* was used to analyze the study area intersections for the Eastview Site, as well as for the Kensico study area intersections. The

HCM-2000 model calculates the capacity and the level of service (LOS) at intersections. Capacity is evaluated in terms of the ratio of the demand flow rate to capacity (v/c ratio) whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle – sec/veh) for each approach. Control delay is the portion of the total delay attributed to the traffic signal operation for signalized intersections. The control delay includes initial deceleration delay, queue, move-up time, stopped delay, and final acceleration delay. Based upon these calculations the intersections are evaluated for an available LOS. Table 3.9-1 presents the LOS delay criteria for signalized intersections.

TABLE 3.9-1. LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (sec/veh)
A	<=10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

As part of the HCS analysis, a survey was conducted of the existing traffic volumes, intersection geometry, and intersection controls for the intersections potentially impacted. It was determined that a number of the intersections were being over utilized (i.e., vehicles were using the shoulder as an extra lane or were continuing through the intersection after the red signal). Because of this, the HCS model was adjusted to reflect the actual conditions in the intersection as opposed to the default values for the intersections.

The capacity analysis calculates the control delay (in seconds per vehicle), which are categorized in LOS A to LOS F. LOS A describes operation with very low delay. This occurs when signal progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. LOS B generally occurs with good progression and/or short cycle lengths, and most vehicles do not stop at the intersection. LOS C occurs when higher delays result from fair progression and or longer cycle lengths. The number of vehicles stopping at the intersection is significant at this level, although many pass through the intersection without stopping. LOS D occurs when the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths or high volume-to-capacity (v/c) ratio. Vehicles stop, and the proportion of vehicles not stopping declines. LOS E occurs when there are high delay values indicating poor progressions, long cycle lengths and high v/c ratio. This is considered to be a limit of acceptable delay. LOS F occurs with over-saturation, when arrival rates exceed the capacity of the intersection. LOS F may also occur at high v/c ratio with cycle failures. Poor progression and long cycle lengths may also be contributing to such delays. This condition is considered to be unacceptable to most drivers.

The LOS delay criteria for unsignalized intersections, as shown in Table 3.9-2, are slightly different than those for signalized intersections. These are based upon the type of control for the intersection, (e.g., Stop versus Yield controls), and the driver perceptions of delays at unsignalized intersections, which do not allow for as long average control delays as for signalized intersections.

TABLE 3.9-2. LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Average Control Delay (sec/veh)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

3.9.2.1.3. Safety

In order to perform the safety analysis at the project site, accident records were reviewed. The accident reports for the most recently available three-year period were collected from New York State Department of Traffic and Safety, New York State Department of Motor Vehicles (NYSDMV). The purpose of reviewing accident reports was to determine whether any location in the study area was a High Accident Location (HAL). The types of accidents involving property damage, injury, fatalities, and pedestrian-related accidents have been reviewed to determine whether any high-accident locations would be affected by the project. Accident rates per million entering vehicles (MEV) for intersections, and per million vehicle miles (MVM) for corridors, were calculated for the various intersections and corridors examined in the study area. These calculated accident rates were compared to the average State rates for similar intersection types (e.g., four-leg signalized, three-leg, unsignalized, etc.) or roadway corridor classifications (e.g., arterials, collectors, etc.), to identify any particular problem locations with accident rates above the State averages.

3.9.2.1.4. Parking

The analysis describes the existing parking regulations that apply to roadways bordering each site and general parking conditions in each study area.

In addition, the Eastview Site was examined to determine what staging area would be available for temporary construction worker parking in the case where the proposed UV Facility would be constructed on-site without the Croton Water Treatment Plant project (Croton project). Where both projects would be constructed on-site, there would be insufficient space for parking during construction. Therefore, several potential off-site parking locations were identified and their existing usage was determined. These locations include the Westchester Community College (WCC) campus, the Landmark at Eastview office park ("the Landmark property"), and a planned Home Depot that would be placed into operation before either the UV Facility or Croton project start construction.

3.9.2.1.5. Transit

For the purpose of transit facilities, the bus lines and stops within reasonable walking distance to the project site delineated the study area. Workers at the proposed UV Facility (during both construction and operation) have all been assumed to travel by private automobile; therefore, a bus transit analysis was not conducted, since there were no conditions anticipated where more than 100 bus trips would be generated. The annual and average weekday ridership of the Beeline bus routes that serve the study area were collected from the Westchester County Department of Transportation, and the various bus lines that serve the area were described.

3.9.2.2. Future Without the Project

3.9.2.2.1. Traffic Growth Assumptions and Analysis Conditions

The Future Without the Project (No Build) conditions were analyzed for the anticipated year of peak construction, and the anticipated year of operation. For the proposed UV Facility at the Eastview Site, the anticipated year of peak construction would be 2008, and the anticipated year of operation would be 2010. For the off-site facilities, construction activities would be the primary concern for the traffic analysis; the anticipated year of peak truck operations associated with filling the Delaware Aerator at the Kensico Reservoir Work Sites would be 2006. The filling of the Catskill Aerator, the construction of the new screen chamber, and the pressurization of the Catskill Aqueduct is anticipated to peak in the year 2010.

The future No Build (FNB) conditions account for general background traffic growth within the study area, and assume an annual growth rate of 1.5 percent. This Westchester County background growth factor was based upon a 1.3 percent average annual growth rate for Westchester County obtained from the New York Metropolitan Transportation Council's traffic model developed for the years 1997 and 2020. The use of a 1.5 percent per year growth factor is appropriate for this study because the future traffic operations are for distant analysis years (more than 5 years beyond 2002 existing conditions), and the future traffic projections also include discreet assignments for large known No Build projects, in addition to the background growth factors applied.

For both the Eastview Site and Kensico study areas, the FNB conditions also specifically quantify trips that are likely to be generated by major proposed projects that could be in place by the various future analysis years, including the proposed Home Depot in Mount Pleasant, additional development in Grasslands Reservation in Mount Pleasant, Avalon Green (a residential development) in Greenburgh, and additional development in the Landmark at Eastview property in Greenburgh. Given the magnitude of some of the FNB developments, there would be increased congestion in the vicinity along Route 119 and Route 9A. Assuming that these developments would be finished by the peak construction year (2008) of the proposed UV Facility (some of the developments would also be completed by the 2006 analysis year for the Kensico study area intersections), mitigation measures recommended within these development plans would be implemented as part of the FNB conditions. The various mitigation measures that have been proposed by FNB project sponsors are described in detail in Section 4.9, Traffic

and Transportation; any resulting changes to the roadway network anticipated by the analyses years have been also incorporated into the FNB analysis conditions.

As described in Section 3.1, Data Collection and Impact Methodologies, Introduction, each of the FNB analyses consider scenarios with and without the Croton project. In the scenario where the Croton project would be under construction (in the peak construction year, 2008), several off-site construction worker parking locations were considered. (Although the Eastview Site could accommodate the Croton project's parking demand if the project were built on the site without the UV Facility, the off-site locations were examined in order to allow for an assessment of the incremental impact associated with the proposed UV Facility's construction.)

Since the off-site facilities would not generate additional maintenance traffic beyond the current levels once construction is complete, a FNB analysis was not performed for these locations for the 2010 operational year.

3.9.2.2.2. Pavement Infrastructure

In general, highways can have design loads of 10,000,000 to 80,000,000 Equivalent Single Axle Loads (ESAL), arterials between 2,000,000 to 5,000,000 ESAL, and low-volume roadways from 50,000 to 500,000 ESAL. Depending on the types and functions, construction trucks generated by the proposed project over the entire construction period were represented by an equivalent 18,000-pound ESAL. Because trucks bringing in construction materials (e.g., concrete trucks) and those taking out excavated materials have different weights, they would generate different ESAL values. Those ESAL values were, therefore, calculated based on American Association of State Highway and Transportation Officials (AASHTO) guidelines for trucks entering and exiting a project site. Using the assignment pattern for construction trucks, the ESAL values were applied to the roadways in the study area. Total ESAL values along the roadways in the study area of the Eastview Site can be obtained by summing those inbound and outbound ESAL values on the same roadways.

3.9.3. Potential Project Impacts

Project impacts on the area traffic networks were evaluated under two impact conditions. The first condition was for traffic generated by the facility once complete and in full operation. The second was for traffic generated by the construction of the facility. Each of these impact conditions is described below.

3.9.3.1. Impact Criteria

3.9.3.1.1. Traffic

Criteria for potential significant traffic impacts at the different signalized locations throughout the network were determined according to the thresholds established in the *CEQR Technical Manual*.

Based on the thresholds established in the *CEQR Technical Manual*, if a FNB intersection LOS A, B, or C deteriorates to a marginally unacceptable mid-LOS D or an unacceptable LOS E or F

in the Future Build or Construction condition, then a significant traffic impact would occur. The *CEQR Technical Manual* further states that a lane group with a FNB LOS A, B, or C that becomes LOS D, requires mitigation to mid-LOS D. Therefore, any such Build or Construction Condition LOS change with a Build or Construction condition delay of mid-LOS D or less is not considered an impact for the purpose of this analysis. For a FNB lane group at mid-LOS D, the threshold is a five (5) second increase in Build or Construction condition delay. For a FNB lane group LOS E, the threshold is a four (4) second increase in Build or Construction condition delay. For a FNB lane group LOS F, the threshold is a three (3) second increase in Build or Construction condition delay. However, for a FNB LOS F condition that already has delays in excess of 120 seconds, an increase in Build or Construction condition delay of more than one (1) second is considered significant, unless the proposed project would generate fewer than five vehicles through that lane group in the peak hour.

These impact criteria are also applicable to unsignalized intersections. However, as a mid-LOS D equates to a delay of 30 seconds for an unsignalized intersection, any Build or Construction condition LOS change with a FNB delay of 30 seconds or less would not be considered a significant impact. In addition, for the minor street to trigger significant impacts, 90 passenger car equivalents must be identified in the Build or Construction condition in any peak hour.

3.9.3.1.2. Pavement Infrastructure

The Equivalent Single Axle Load (ESAL) calculated along roadways for construction at the Eastview Site was distributed according to the number of lanes of roadways and compared to estimate design loads of the roadways adjacent to the project site. When the calculated ESAL value along a roadway approaches 10 percent of the estimated design load of that roadway, then a significant pavement impact is identified.

3.9.3.2. Potential Project Impacts

3.9.3.2.1. Trip Generation

The travel demand for the operation of the proposed UV Facility was determined for the weekday AM, PM, and peak hours for 2010 at the Eastview Site. When fully constructed and operational, the future peak hour trips would almost entirely be employee-related. During a typical day, it is anticipated that there would be a small number of visitor trips as well as delivery trucks. At the off-site facilities, there would be negligible trip making, except for the periodic sampling and maintenance vehicles; therefore, no traffic analyses needed to be conducted at these sites.

According to standards for conducting traffic analyses in New York City, the need for a detailed traffic analysis would be unlikely if a proposed project is anticipated to result in fewer than 50 peak hour vehicle trips. For this analysis, all project sites would generate fewer than 50 peak hour vehicle trips when the proposed UV Facility becomes operational. However, a qualitative analysis was undertaken at each of the study area intersections to ensure that no significant impacts would occur as a result of the traffic generated for operation of the proposed UV Facility that were not properly identified.

3.9.3.2.2. Modes of Transportation

Based upon the availability of different modes of transportation on-site and off-site, each project site would have different traffic demands. Modal split information was obtained through studies performed for the New York Metropolitan Transportation Council. The reverse journey-to-work information would provide information on how people travel to a workplace in a location. The modal split percentages, shown in Table 3.9-3, were then applied to the trip generation estimates to determine the volume of persons traveling to and from the project site by each mode. To determine the volume of vehicles that the proposed project would generate, an average vehicle occupancy factor of 1.2 persons per vehicle for permanent employees was applied to the number of persons using autos.

TABLE 3.9-3. MODE CHOICE ASSUMPTIONS

Mode	Percentage of Workers Using Each Mode		
	Eastview Site (UV Facility)	**Kensico Reservoir Work Sites**	**Taconic State Parkway Work Sites**
Auto	100	100	100
Mass Transit	---	---	---
Walk/Other	---	---	---

3.9.3.2.3. Traffic Assignment

The assignment of traffic was based on the anticipated origin-destination patterns for employees. The patterns were determined according to the density of population in census tracts within a 5-mile radius as reported in the 2000 Census. The population percentages in the census tracts were obtained to determine the major trip origin and destination points of workers to and from the project sites. The major highway routes available to approach or depart the study area from each of the major trip origins or destinations were identified. This information was utilized to develop the anticipated percentages of the project's trip generation vehicles that would utilize the various study area roadways. These percentages constituted the anticipated trip generation roadway assignment patterns.

With the anticipated trip generation assignment patterns established, vehicular and construction/delivery truck trips were assigned to specific streets and through specific intersections. Vehicles were then assigned to the project sites via different travel corridors, using the most direct routes as determined. Project-generated truck trips were assigned to the site through designated truck routes and local routes adjacent to the project site as described below in Section 3.9.4.2. None of the trucks were assigned to the parkways where trucks are restricted.

Eastview Site. The primary routes for the Eastview Site are the Saw Mill River Parkway, Saw Mill River Road (Route 9A), Broadway (Route 9), Sprain Brook Parkway, Route 100C, Knollwood Road (Route 100A), and Old Saw Mill River Road. Because of the presence of the accesses for the project site on Route 100C, and off Saw Mill River Road (Route 9A) at Dana Road, these roads would be anticipated to serve as major connections between the project site and the major highways in the vicinity of the site. It was assumed that approximately 58 percent of the total vehicular trips would use a section of Route 100C to the east of Walker Road, and

approximately 42 percent of the total vehicular trips would be using a section of Route 100C to the west of Walker Road. Approximately 56 percent of the total vehicular trips would use Sprain Brook Parkway. Approximately 21 percent of traffic would utilize Old Saw Mill River Road traveling to and from the Saw Mill River Parkway and Neperan Road. Approximately 15 percent of the project's traffic would use Route 9A to the south of Route 100C. Only 5 percent of the total vehicular trips would use Route 9A north of Route 100C.

Off-Site Facilities. As discussed previously, the various off-site facilities would have negligible worker and maintenance traffic associated with operational conditions.

3.9.3.3. Potential Construction Impacts

3.9.3.3.1. Trip Generation

The construction of the proposed UV Facility would require a period of approximately five years. The construction associated with the pressurization work would be completed seasonally (from approximately October through April) over a period of three to four years; the pressurization work period would coincide with the construction period for the UV Facility. Work on the new screen chamber at Kensico Reservoir would occur year-round from 2008 through 2010. (Details of the schedules and numbers of worker anticipated at these various off-site work sites are found in Sections 5.1, Kensico Reservoir Work Sites, and 5.2, Taconic State Parkway Work Sites.) Because of the extended construction period of the project, the transportation demands at each project site were determined for the peak construction year, depending on the study areas and the types of construction activities being considered. This methodology is the same as that used for determining future long-term potential transportation demands.

To determine the volume of vehicles that the construction would generate, an average vehicle occupancy factor of 1.2 persons per vehicle was applied to the number of persons using autos. Construction workers would follow the same traffic assignments as those for the project workers as discussed above.

Because the construction period would generate a high number of construction trucks, the effect of these trucks on traffic operating conditions would be included in the analysis. Typically, a passenger car equivalent (PCE) factor is used for trucks to account for the lower speed and maneuverability. The passenger car equivalent is typically 1.5 for 2-axle trucks and 2.0 for 3-axle trucks. To obtain traffic analysis results that are conservative, it was assumed that all construction trucks would be 3-axle trucks, or equivalent to 2.0 passenger cars.

These construction/delivery trucks would be able to use only limited routes in the vicinity of the project sites, since these would be oversized vehicles. For the Eastview Site study area, these routes are described below, in the "Traffic Assignment" section. For the Kensico study area, the routes are those described previously in Section 3.9.2.1. These routes and intersections were analyzed to determine their existing and future period traffic conditions and capacities.

The typical construction day for employees is between 7 AM to 6 PM, with trucks arriving and departing throughout the day during peak construction periods. However, for construction of the

UV Facility, it has been assumed that the construction workforce would arrive either on-site or at the designated parking locations between 6:30 and 7 AM, and be on-site by about 7 AM, and that all workers would have departed the site by 4:00 PM. Therefore, the 6:30 AM to 7:30 AM and 3:30 to 4:30 PM peak hours are anticipated to account for all worker travel during the peak construction in 2008.

Construction activities in 2006 in the Kensico study area and at the various off-site facilities would be restricted to an 8 AM to 4:30 PM workday. During the peak year (2006) of truck operations associated with filling the Delaware Aerator, there would be approximately 24 trucks traveling from the Eastview Site to the Kensico Reservoir, and the same number traveling back to the Eastview Site from Kensico Reservoir every hour of the day from (8 AM to 4:30 PM). Therefore, the 8:00 AM to 9:00 AM and 3:30 to 4:30 PM peak hours are anticipated to account for all construction-related travel during these peak construction activities. In addition, because the truck activity would be continuous throughout the day, the area's midday peak (1 PM to 2 PM) was also included in the analyses for these activities in the Kensico study area to enable a determination of any additional impacts during the area's midday peak. In the Future With the Croton project at Eastview scenario, there would be some additional truck traffic that would travel through the Kensico study area in 2006. However, this traffic would be relatively minor, and would not be associated with the fill operations. Therefore, the impact analyses focused on the potential impacts of the proposed project in 2006 from the filling of the Delaware Aerator at the Kensico campus. It is important to note that the calculated impacts from the filling of the Delaware Aerator that are discussed below would occur over a relatively short time period (on the order of four months in 2006).

Construction activities in 2010 for the Kensico Study area were analyzed for the early AM peak hour (6:30 AM to 7:30 AM, to account for the 100 worker trips arriving at the facility), the late AM peak hour (8:00 AM to 9:00 AM, to account for the 25 truck trips to and from the Eastview Site to the Kensico Reservoir campus), and 3:30 PM to 4:30 PM (to account for the 100 departing worker trips and the 25 entering and 25 departing fill related truck trips).

During the AM peak hour, it was assumed that 95 percent of the trips generated by construction workers would be arriving and 5 percent departing the project site. During the PM peak hour, it was assumed that 5 percent of those trips would be arriving at the project site and 95 percent departing from it.

The year of peak construction activity for the UV Facility project site for the various construction and worker parking scenarios was compared with the baseline conditions modeled in 2008, the peak construction year, to determine potential adverse impacts. As mentioned above, the traffic generated during the peak construction period would be substantially greater than after the proposed project is built and fully operational. Similarly, 2006 construction activity in the Kensico study area was compared to 2006 baseline conditions. The traffic assignment methodology followed the same steps as presented above for the built facility.

3.9.3.3.2. Traffic Assignment

The traffic assignment for construction-generated traffic was based upon the two types of construction traffic. The first type of construction traffic is vehicles used by construction

personnel going to and from the work site. The second type of construction traffic is the truck traffic for the material deliveries and/or removals. Each of these construction traffic types has different origin-destination patterns and roadway restrictions that make for separate traffic assignment patterns.

The construction personnel traffic in 2008 would have similar traffic assignment patterns as the workers at the facility once they are in operation. Therefore, the traffic assignment utilized for this portion of the construction-generated traffic was the same as that described under Section 3.9.3.2, above, for the scenario without the Croton project concurrently under construction.

For the 2008 scenario with the Croton project under construction, four different construction worker parking Options are considered, resulting in four distinct 2008 Construction with Croton conditions (Options A, B, C, and D). This is because with both the Croton project and the proposed UV Facility under construction at the Eastview Site at the same time, there would not be enough space on-site for all of the workers for both projects to park, as most of the available land area would be under construction. Each of the four construction worker parking Options also includes an additional assignment for shuttle buses that would transport the workers between the Eastview Site and the parking areas. The four construction worker parking Options are described below:

- *Option A:* All of the construction workers for both the UV Facility and the Croton project would park at the Landmark property, west of the project site, and would be shuttled to the site in buses or vans.

- *Option B:* All of the construction workers for both the UV Facility and the Croton project would park at the Westchester Community College (WCC) Campus, east of the project site, and would be shuttled to the site in buses or vans.

- *Option C:* Parking for all of the construction workers for both the UV Facility and the Croton project would be split evenly between the Landmark property and WCC, and would be shuttled to the site in buses or vans.

- *Option D:* All of the construction workers for the Croton project would park at the Landmark property, west of the project site, while all of the construction workers for the UV Facility project would park in the Home Depot parking lot, located off Saw Mill River Road (Route 9A) and Dana Road, and would be shuttled to the site in buses or vans.

The construction truck traffic assignment patterns would differ from that of the construction personnel traffic. The first difference is the origins and destinations for the construction traffic were determined based upon the location of major industrial areas where construction supplies, equipment and material would be obtained. Secondly, the construction vehicle traffic would be limited by commercial vehicle bans on adjacent parkways in the vicinity of some of the project sites. Since construction trucks are banned from these parkways, the construction truck traffic was routed along different roadways than the construction personnel vehicles as applicable. These truck routes are described below:

Eastview Site. Route 100C and Dana Road via Walker Road would serve as the major access to the Eastview Site. It was assumed that 20 percent of the truck traffic would utilize Saw Mill River Road (Route 9A) from the north and 60 percent of the truck traffic would utilize Saw Mill River Road (Route 9A) from the south. Twenty percent of the truck traffic would utilize Knollwood Road (Route 100A) and Route 100C from the east.

Kensico Reservoir Work Sites. As discussed previously, there are five truck routing Options investigated for the 2006 construction activities analyzed for this study area. These five truck route options examine different routes that trucks could travel between the Eastview Site (source of the fill) and the Delaware Aerator at Kensico Reservoir (where the fill would be placed). These routes are as follows:

- 100 percent of the trucks traveling on Lakeview Avenue (Option A).
- 100 percent of the trucks traveling on Route 100C/Commerce Street (Option B).
- An even 50/50 percent split between Lakeview Avenue and Route 100C/Commerce Street (Option C).
- A circular route, combining Options A and B, where 100 percent of the trucks travel northbound to the aerators on the Lakeview Avenue route, and return to the Eastview Site by traveling on Route 100C/Commerce Street (Option D).
- 100 percent of the trucks travel on a northerly route, on Saw Mill River Road (Route 9A), Broadway, Route 141, Commerce Street/, Kensico Road and Columbus Avenue (Option E).

The 2010 construction activities (both auto and truck related) examined key intersections along Columbus Avenue near the Kensico Reservoir campus (e.g., Columbus Avenue at Lakeview Avenue, West Lake Drive, and Stevens Avenue).

3.9.4. Mitigation

The identification of significant impacts leads to the need to identify and evaluate suitable mitigation measures. Where necessary, these measures were developed to mitigate the impact or return Future With the Project (Build or Construction) conditions to the FNB condition, or to acceptable levels.

3.9.4.1. Traffic

For impacted locations with FNB LOS A, B or C, mitigation measures should return Build or Construction conditions to mid-LOS D, with a delay of 45 seconds or less. For potentially impacted locations with FNB LOS D, E, or F, mitigation measures should return projected Build or Construction conditions to the same level of service as FNB conditions. Traffic mitigation measures include low-cost, readily implementable measures; moderate-cost,

fairly readily implementable measures; higher capital cost measures; enforcement measures; and trip reduction or travel demand management measures.

Low-cost, readily implementable measures are signal phasing and timing modifications, parking regulation modifications, lane restriping and pavement marking changes; turn prohibitions, street direction changes, and other traffic-signage-oriented changes. Moderate-cost, fairly readily implementable measures are intersection channelization improvements and traffic signal installations. Higher-cost mitigation measures include street widening, reconstruction of existing streets, construction of new streets, construction of new highway ramps, and computerized traffic control systems. Enforcement measures include deployment of traffic enforcement agents or parking enforcement agents.

The traffic analyses have identified measures that could be used to mitigate the potential project-related construction-period impacts of the project. Between the Draft and Final EIS, discussions were held between NYCDEP and the relevant agencies (e.g., NYSDOT, Westchester County DOT) and town representatives, to determine what level of mitigation measure would be appropriate to address the anticipated construction-period impacts identified in 2006 and 2008. In some instances, although specific measures have been identified in the traffic mitigation analyses that could mitigate impacts, implementation of these measures were not deemed to be necessary or appropriate, either because of the short duration of impacts in some cases, or in deference to the coordinated long-term traffic management efforts/plans of other government agencies. Instead, a number of maintenance and protection of traffic (MPT) measures that would not involve physical improvements or changes have been investigated as measures to mitigate these short-term construction period impacts. At times the MPT measures chosen for a particular location and condition may not fully mitigate a project impact from an analytical perspective, but will serve to address the pedestrian and vehicular safety considerations at a location. A discussion of these alternative measures has been included in the FEIS mitigation analyses, identifying the measures that are anticipated to be used at the particular locations where impacts have been identified.

3.9.4.2. Parking

The range of measures that could generally be considered to mitigate significant parking impacts includes the following: Provision of additional parking spaces either on-site or off-site, modification of on-street parking regulations, or implementation of new transit services.

3.9.4.3. Roadway Pavement Conditions

Resurfacing the roadway to increase its useful life can generally mitigate significant impacts on pavement infrastructure due to heavy construction trucks. Some roadways that were designed for local traffic would experience a large amount of truck traffic resulting from construction of the proposed project and result in more severe damage. Depending on the initial condition of the wearing surface of some of these roadways (particularly at the outset of the construction periods), and the normal maintenance they receive not related to this project, those roadways would need reconstruction after the construction period.