

3.5 Traffic and Transportation

This traffic study assesses the traffic impacts of the preferred Conservation site plan. Previously, a Traffic Impact Analysis was conducted for the 19 lot Conventional Plan, and this study is included in its entirety as Appendix F. The traffic analyses for the two alternative plans have been conducted separately, due to the difference in trip generation and access locations, which resulted in differing traffic distribution patterns. This study reviews the 2010 Existing Condition, based upon recent traffic counts. The existing data forms the basis of the 2017 No Build Condition (the future scenario without the proposed action) and the 2017 Conservation Plan Build Condition (future scenario with the proposed Preferred Alternative).

3.5.1 Existing Conditions

Regional Transportation Network

The Tripi Subdivision project site is situated west of NYS Route 117, South Bedford Road, between Huntville Road and Harris Road in the Town of Bedford, Westchester County, NY. The primary regional transportation routes in the area are the Saw Mill River Parkway and Interstate 684. The project site location is shown in Figure 3.5-1. The Saw Mill Parkway is a four lane limited access parkway which extends from the junction with Interstate-684 to the north, to the junction with NYS Route 9A in Yonkers to the south. Interstate-684 is a six lane limited access interstate roadway which extends from its terminus at Interstate-84 in Brewster to the north connecting with Interstate-287 in White Plains to the south.

Existing Public Transportation

The project site is located approximately one mile from the Katonah Railroad Station to the north and approximately one mile to the Bedford Hills Railroad Station to the south. Both stations are on Metro North's Harlem Line, which provides service from the Brewster railroad station to New York City's Grand Central Terminal.

Commuter parking facilities are located at both railroad stations. Station parking capacity at Bedford Hills is 357 spaces. Station parking capacity at the Katonah station is 654 spaces.

The Westchester County Bee-Line bus system provides transit service along NYS Route 117 with connections to the Metro North train stations. Bee-Line Route 19 provides hourly commuter bus service from Ossining to Katonah, via Pleasantville, Chappaqua, and Mount Kisco.

Local Transportation Network

The primary local roads which provide access to the project location are NYS Route 117, also known as South Bedford Road and NYS Route 35. Figure 3.5-1 depicts the local road network in the vicinity of the project site. Development of the proposed Conservation plan will have a connection to New Street to the north and will have an emergency only access providing a connection to Harris Road to the south. There is an existing house with access to Harris Road.

The following intersections were evaluated:

- Huntville Road and New Street and
- Harris Road and NYS Route 117, (South Bedford Road).

New Street is STOP sign controlled at it's intersection with Huntville Road. The intersection of Harris Road and NYS Route 117 is controlled by a traffic signal.

Key local roads are described below:

Harris Road - Harris Road provides east-west travel on a two lane roadway with a single travel lane in each direction characterized by its steep, narrow, and winding nature. Harris Road is maintained by the Town of Bedford. Harris Road is 20 feet in width in the vicinity of the project site. The posted speed limit is 30 miles per hour (mph). Harris Road connects Cherry Street with the Saw Mill River Parkway, continuing east past Interstate-684.

New Street - New Street is currently a dead-end two lane roadway with a single travel lane in each direction. New Street is 20 feet in width in the vicinity of the project site. It intersects with and extends south from Huntville Road. There are ten homes on this road segment. New Street is a town maintained roadway that provides residential access to the houses along its length. The Town speed limit is 30 miles per hour. New Street is stop sign controlled at Huntville Road.

Huntville Road - Huntville Road provides east-west travel on a two-lane roadway with a single travel lane in each direction. Huntville Road is maintained by the Town of Bedford. The posted speed limit is 30 miles per hour. Huntville Road connects Cherry Street to the west with NYS Route 117 to the east. Huntville Road is stop sign controlled at both Cherry Street and NYS Route 117. There are several stop signs along Huntville Road. Access to the Katonah Elementary School is from Huntville Road as shown in Figure 3.5-1. There is a 20 mile per hour speed zone during school hours on either side of the school access drive.

Existing Roadway Conditions

A survey was conducted of existing road conditions for roads likely to be used by the majority of traffic generated by the Tripi Subdivision. Table 3.5-1 shows the lane width, shoulder width, and surface condition of the roads within the project vicinity.

The local roads were rated for pavement condition on a scale of one to three with a "1" being poor condition (1 to 5 on the New York State rating system), a "2" being a fair to good rating (6 to 8 on the New York State rating system) and a "3" being excellent (9 to 10 on the New York State rating system). Thus, a rating of 1 indicates that work is needed, and a rating of three is typical of newly paved roads.

Table 3.5-1 Local Roadway Conditions					
Road	Speed Limit	Pavement Width	Number of Lanes	Shoulder Width	Pavement Condition
Harris Road	30 mph	22 feet	2	none	2
New Street	30 mph	20 feet	2	none	2
Huntville Road	30 mph	24 feet	2	1 foot	2
Source: Tim Miller Associates 2010.					

Existing Traffic

Traffic counts were taken on Tuesday, September 14, 2010, between 7:30 a.m. and 10:30 a.m., and between 2:00 p.m. and 6:00 p.m. at the Huntville Road and New Street Intersection. Traffic

counts were taken on Wednesday, September 15, 2010, between 7:30 a.m. and 10:30 a.m., and between 3:30 p.m. and 6:30 p.m. at the Intersection of Harris Road and NYS Route 117 (Bedford Road). Counts were taken on a typical day while school was in session.

These counts identify weekday morning and afternoon peak hour levels of traffic. Commuter traffic is heaviest on the local roadway network during these time periods. The p.m. time period analyzed in this traffic studied is longer than the typical p.m. peak hour to account for the location of the Katonah Elementary School located on Huntville Road. Figures 3.5-2 and 3.5-3 show the existing a.m. and p.m. weekday peak hour traffic volumes at the studied intersections.

The current peak a.m. traffic volumes are 8:15 a.m. to 9:15 a.m. at the Huntville Road and New Street intersection. The a.m. peak hour at the NYS Route 117 and Harris Road intersection occurs between 8:30 a.m. and 9:30 a.m. The 2010 p.m. peak hour at the Huntville Road and New Street intersection occurs between 3:30 p.m. and 4:30 p.m. This is directly related to the dismissal of the Katonah Elementary School which dismisses at 3:40 p.m. The p.m. peak hour for the NYS Route 117 and Harris Road intersection occurs between 3:45 p.m. and 4:45 p.m. based upon regional commuter activity and capturing exiting school traffic.

Level of Service Criteria

The Highway Capacity Manual¹ and the Highway Capacity Software² procedures document the methodology used for modeling levels of service, and average vehicle delay at both signalized and unsignalized intersections. Level of service is a measure of the operational quality of an intersection; level of service A is the highest, most efficient level, and level of service F is the lowest level. The operational quality of an intersection is based on the average amount of time a vehicle is delayed. Levels of service are examined by lane group, the set of lanes allowing common movement(s) on an approach.

Delay definitions account for all delay types including those related to startup, deceleration, and acceleration. The New York State Department of Transportation (NYSDOT) prefers the use of the Highway Capacity Manual methodologies over other traffic capacity methodologies.

Table 3.5-2, Unsignalized Intersections Level of Service Criteria, presents the levels of service criteria for unsignalized intersections.

¹ Highway Capacity Manual, National Academy of Sciences, Transportation Research Board, National Research Council, Washington, DC, 2000.

² Highway Capacity Software, Computer software, Version 5.4, Mctrans, Gainesville, Florida, 2008.

Table 3.5-2 Unsignalized Intersections Level of Service Criteria	
Level of Service	Average Control Delay (Seconds Per Vehicle)
<i>A</i>	<i>less than or equal to 10</i>
<i>B</i>	<i>greater than 10 and less than or equal to 15</i>
<i>C</i>	<i>greater than 15 and less than or equal to 25</i>
<i>D</i>	<i>greater than 25 and less than or equal to 35</i>
<i>E</i>	<i>greater than 35 and less than or equal to 50</i>
<i>F</i>	<i>greater than 50</i>

Source: Highway Capacity Manual, National Academy of Sciences, Transportation Research Board, National Research Council, Washington, DC, 2000.

Table 3.5-3, Signalized Intersections Level of Service Criteria, presents the levels of service criteria for signalized intersections. The NYSDOT generally seeks a minimum level of service D (delay of 55 seconds or less for a signalized intersection) for all lane groups (The NYSDOT Highway Design Manual page 5-92). The NYSDOT Highway Design Manual (page 5-92) notes, "In some cases, it may be necessary to accept level of service E or F on individual lane groups due to unreasonable costs or impacts associated with improving the level of service."

Table 3.5-3 Signalized Intersections Level of Service Criteria	
Level of Service	Average Control Delay (Seconds Per Vehicle)
<i>A</i>	<i>less than or equal to 10</i>
<i>B</i>	<i>greater than 10 and less than or equal to 20</i>
<i>C</i>	<i>greater than 20 and less than or equal to 35</i>
<i>D</i>	<i>greater than 35 and less than or equal to 55</i>
<i>E</i>	<i>greater than 55 and less than or equal to 80</i>
<i>F</i>	<i>greater than 80</i>

Source: Highway Capacity Manual, National Academy of Sciences, Transportation Research Board, National Research Council, Washington, DC, 2000.

The Highway Capacity Software model results apply to peak hour periods only and do not represent every minute of traffic operations. During off peak periods, which constitutes the majority of the time, drivers typically will find operations adequate and much better than the modeled peak hour results. During peak periods the experience of individual drivers can vary as the model calculates average delay.

Peak 15 minute traffic flows typically do not all occur in the same 15 minute period in the peak hour for the studied intersections. The traffic model does not always account for the ability of the

traffic signal to compensate for shifting traffic volumes and thus may overestimate delay. For unsignalized intersections, the model conservatively assumes peak approach volumes occur simultaneously.

Existing Levels of Service

The results of the existing level of service analyses for the Conservation Plan study area intersections are summarized in Table 3.5-4. Capacity analysis calculations are provided in Appendix E. All movements at both of the studied intersections operated at level of service C or better. The Existing conditions at the study intersections would be the same for both the preferred Conservation Plan and the previously studied Conventional Plan.

Table 3.5-4 Existing Conditions Level of Service Summary							
Intersection Roads	Lane Group (Approach Direction -Movement)	A.M. Weekday Peak Hour			P.M. Weekday Peak Hour		
		Volume to Capacity Ratio	Delay (seconds/vehicle)	Level of Service	Volume to Capacity Ratio	Delay (seconds/vehicle)	Level of Service
<i>Huntville Road and New Street - Unsignalized</i>							
<i>Huntville Road</i>	<i>EB - L, T, R</i>	<i>0.01</i>	<i>7.7</i>	<i>A</i>	<i>0.00</i>	<i>7.7</i>	<i>A</i>
	<i>WB - L, T, R</i>	<i>0.00</i>	<i>7.6</i>	<i>A</i>	<i>0.00</i>	<i>7.5</i>	<i>A</i>
<i>New Street</i>	<i>NB - L, T, R</i>	<i>0.02</i>	<i>9.2</i>	<i>A</i>	<i>0.02</i>	<i>10.2</i>	<i>B</i>
	<i>SB - L, T, R</i>	<i>0.10</i>	<i>10.6</i>	<i>B</i>	<i>0.09</i>	<i>11.0</i>	<i>B</i>
NYS Route 117 and Harris Road - Signalized							
Harris Road	EB - L, T, R	0.19	31.7	C	0.16	31.6	C
	WB - L, T	0.26	24.9	C	0.34	21.6	C
	WB - R	0.44	26.7	C	0.49	23.2	C
NYS Route 117	NB - L	0.03	8.5	A	0.00	11.8	B
	NB - T	0.12	14.2	B	0.26	18.9	B
	NB - R	0.10	14.0	B	0.17	18.1	B
	SB - L	0.16	7.3	A	0.19	11.5	B
	SB - T, R	0.31	15.7	B	0.38	20.0	C
	Overall		18.3	B		20.1	C
Level of Service (see Table 3.5-2 and Table 3.5-3 for level of service criteria). NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound. L = left, R = right, T = through, TR = through and right, (e.g. WB - L = Westbound left). <i>Italics denotes unsignalized intersections.</i>							

Existing School Bus Service

The entire Tripi project site is in the Katonah Lewisboro School district. Student school assignments are based upon geographical proximity. The students attending public schools residing at the Tripi project will attend the Katonah Elementary School, located on Huntville Road, and the John Jay Middle School, and the John Jay High School, both of which are located on NYS Route 121. According to the Director of Transportation Services³, the School district provides bus transportation to elementary school students who live more than ½ mile away from the school they attend, and to middle and high school students who live more than 1 mile from the school they attend.

³ Phone Conversation with Jim Minihan, Director of Transportation Services, Katonah-Lewisboro School District, October 8, 2010.

Existing Pedestrian Access

Since the project site is located near the hamlet of Katonah, pedestrian facilities such as bikepaths and sidewalks are located in the vicinity of the site. Existing Sidewalks in the vicinity of the site, near the hamlet of Katonah, and a local bike path are shown in Figure 3.5-12 Pedestrian Access Plan. Sidewalks are located on portions Cherry Street, west of the site, Huntville Road, north of the site, and on Bedford Road, east and south of the site. Sidewalks are provided on nearly all streets in the hamlet of Katonah, in the vicinity of the rail station and the Village Green. A sidewalk is located on the portion of New Street, north of Huntville Road, but not on New Street, between Huntville Road and the project site. There are no existing sidewalks along Harris Road.

A designated bike path is located on Bedford Road, between Cherry Street and the Village of Katonah, near the Tripi subdivision site. Between the two entrances/exits for the Sawmill Parkway, the bikepath is a dedicated path separated from Bedford Road by landscaping. The portion of the path east and north of Harris Road is located on the shoulder of Bedford Road and is indicated by signs (see Figure 3.5-12 Pedestrian Access Plan).

3.5.2 No Build Traffic Conditions

Typically a project's traffic impact is determined by comparing future traffic conditions without the project's traffic (2017 No Build Condition) to traffic conditions with project-generated traffic (2017 Build Condition).

The No Build traffic condition is an interim scenario that establishes a future baseline condition upon which the project generated traffic can be compared. No Build traffic conditions are ascertained based on a number of factors: (1) improvements in the local road network that are planned or underway; (2) traffic from general population growth in the local area; and (3) traffic from identified development projects in the project site vicinity.

The NYSDOT lists area projects in the Statewide Transportation Improvement Program (TIP) (October 1, 2008 to September 30, 2011). There are no major projects planned by the NYS DOT in the vicinity of the studied intersections which would directly affect traffic operating conditions. Funding for a sidewalk on Valley Road, north of the project site, from Cherry Street to Huntville Road is included on the NYSDOT TIP. Once completed this sidewalk will improve pedestrian connectivity in the project vicinity.

The Town of Bedford Planning Director was contacted with regard to pending development projects. In a phone conversation on October 8, 2010,⁴ Mr. Jeffrey Osterman indicated there were no other development projects in the project vicinity which would be likely to have an impact on traffic conditions. A factor of two percent annually over a seven year period was used to project future conditions. This extended time frame provides a conservative analysis of future traffic impacts.

Peak hour traffic volumes for the weekday a.m. and p.m. Conservation Plan No-Build Conditions are provided in Figures 3.5-4 and 3.5-5. These figures reflect the existing traffic volumes plus a background traffic growth of two percent annually over seven years for the study intersections.

⁴ Phone conversation with Town of Bedford Director of Planning, Jeffrey Osterman, October 8, 2010.

No Build Level of Service

Table 3.5-5 represents level of service for the studied intersections in the Conservation Plan No-Build Condition. There is minimal change to the operating level of service as a result of background traffic growth in the area. All movements continue to operate at level of service C or better. The No-Build conditions at the study intersections would be the same for both the preferred Conservation Plan and the previously studied Conventional Plan.

Table 3.5-5 No-Build Conditions Level of Service Summary							
Intersection Roads	Lane Group (Approach Direction -Movement)	AM Weekday Peak Hour			PM Weekday Peak Hour		
		Volume to Capacity Ratio	Delay (seconds/ vehicle)	Level of Service	Volume to Capacity Ratio	Delay (seconds/ vehicle)	Level of Service
Huntville Road and New Street - Unsignalized							
<i>Huntville Road</i>	<i>EB - L, T, R</i>	<i>0.02</i>	<i>7.8</i>	<i>A</i>	<i>0.00</i>	<i>7.8</i>	<i>A</i>
	<i>WB - L, T, R</i>	<i>0.00</i>	<i>7.7</i>	<i>A</i>	<i>0.00</i>	<i>7.6</i>	<i>A</i>
<i>New Street</i>	<i>NB - L, T, R</i>	<i>0.03</i>	<i>9.4</i>	<i>A</i>	<i>0.03</i>	<i>10.6</i>	<i>B</i>
	<i>SB - L, T, R</i>	<i>0.12</i>	<i>11.0</i>	<i>B</i>	<i>0.11</i>	<i>11.4</i>	<i>B</i>
NYS Route 117 and Harris Road - Signalized							
Harris Road	EB - L, T, R	0.22	32.0	C	0.21	32.1	C
	WB - L, T	0.30	25.3	C	0.39	22.1	C
	WB - R	0.50	27.5	C	0.56	24.6	C
NYS Route 117	NB - L	0.04	9.2	A	0.00	12.8	B
	NB - T	0.14	14.3	B	0.30	19.3	B
	NB - R	0.11	14.1	B	0.19	18.3	B
	SB - L	0.19	7.5	A	0.22	12.5	B
	SB - T, R	0.36	16.2	B	0.44	20.7	C
	Overall		18.7	B		20.8	C
Level of Service (see Table 3.5-2 and Table 3.5-3 for level of service criteria). NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound. L = left, R = right, T = through, TR = through and right, (e.g., WB - L = Westbound left). <i>Italics denotes unsignalized intersection.</i>							

3.5.3 Potential Impacts - Build Condition Traffic

Based upon comments from the Town of Bedford Planning Board, the project has been modified from a 19 lot Conventional Plan to a 23 lot preferred Conservation Plan including a public looped access road with a single connection onto New Street.

In the Conventional Plan, a through road would be provided between Harris Road and New Street. The Planning Board expressed concern about the potential overuse of this through road as a short-cut by local drivers. The Conservation Plan proposes a single entrance and egress via New Street. The traffic analyses for the two alternative plans have been conducted separately, due to the difference in trip generation and access locations, which resulted in differing traffic distribution patterns. As stated previously, the Traffic Impact Analysis previously conducted for the Conventional Plan is included in its entirety as Appendix F.

The benefit of the Conservation Plan over the Conventional Plan is elimination of the proposed through road between Harris Road and New Street, avoiding a potential cut through from New Street to Bedford Road (NYS Route 117). Nearly all project traffic will now enter and exit the site via a connection to New Street. One new home and the existing home on Harris drive

will use the existing driveway on Harris Road for access. Sight Distance considerations are also improved in the Conservation plan as sight distance is better from New Street at Huntville Road than at Harris Road and Bedford Road. The Conservation Plan design proposes a reduction of 190 feet in road length and also eliminates the steep grade from Harris Road to the interior of the project included in the Conventional Design.

Conservation Plan Site Access

The proposed Conservation plan project would result in the construction of 23 single family residential units. The proposed Conservation Plan eliminates concerns about vehicles using the roads in this development as a short cut from Huntville Road to Bedford Road (NYS Route 117). The majority of the site (21 dwelling units) will have a single access point and an emergency access. The main access will be provided via a connection to New Street which intersects with Huntville Road. The Applicant proposes to offer the roadway, water mains, and drainage and stormwater facilities for dedication to the Town, which would become the responsible entity for the maintenance of said appurtenances. The remaining new unit and one existing unit would have driveway access to Harris Road. The proposed Conservation site plan is shown in Figure 3.5-6.

The Conservation plan will include a public looped access road, approximately 2,230 feet in length. Access to the development will be limited to New Street at the north side of the property. A 12 foot wide emergency access road will be provided from Harris Road, to the loop road. The looped roadway is proposed to be offered for dedication to the Town (no proposed private roads). The internal road would be constructed with 30 feet in pavement width, within a 50-foot right-of-way, per Town of Bedford roadway regulations. The 30 foot width would allow on-street parking in the event of private parties or gatherings at individual residences. The roads would be constructed with 6 inches asphaltic concrete and 8 inches gravel subbase. Access to nineteen residences will be off of the internal access road.

Conservation Plan Project Trip Generation and Distribution

The proposed Tripi Subdivision Conservation plan is anticipated to generate 25 trips during the a.m. peak hour and 27 trips during the p.m. peak hour. Tables 3.5-6 and 3.5-7 show the projected trip generation rates and total trips generated by the proposed residential development using the Institute of Transportation Engineers' Trip Generation. The anticipated trip distribution of the Tripi Subdivision Conservation Plan is shown in Figure 3.5-7. The trip distribution as shown refers only to the lots around the loop access road. Figures 3.5-8 and 3.5-9, show peak hour trips distributed to the roadway network resulting from the proposed residential development. The trip distribution considers existing traffic flows, access to the Saw Mill River Parkway and Interstate-684, in addition to the local road network in the Town of Bedford and surrounding area. The US Census indicates 18.5 percent of the Town's population travel to work via mass transportation. The close proximity of the site to both the Bedford Hills and the Katonah train stations on the Metro North Commuter Rail Line was also considered in the traffic distribution.

Figures 3.5-8 and 3.5-9, show the traffic to be generated by the proposed Conservation Plan. In order to provide a maximum impact analysis, no reduction in traffic was calculated for the close proximity to mass transit. The project as proposed would add six inbound and eighteen outbound trips at the New Street and Huntville Road intersection in the a.m. peak hour; and would add sixteen inbound and ten outbound trips during the p.m. peak hour.

The project site includes an existing residence in the southern portion of the site who intends to subdivide their lot, and construct one additional single family home, refer to Figure 3.5-6 Conservation Site Plan. The traffic from the existing residence and the traffic from the new residence as a result of the subdivision, will have access via Harris Road. For the purpose of this analysis, one outbound trip has been added to the Harris Road intersection during the a.m. peak hour and one inbound trip has been similarly added during the p.m. peak hour.

Table 3.5-6 Conservation Plan Project Site Trip Generation Rates				
Land Uses {ITE Code}	Trips			
	A.M. Weekday Peak Hour		P.M. Weekday Peak Hour	
	IN (Trips/ Unit*)	OUT (Trips/ Unit*)	IN (Trips/ Unit*)	OUT (Trips/ Unit*)
Tripi Residential Subdivision 21 residential units** (210)	0.291	0.873	0.774	0.454

*Unit is in numbers of dwelling units.
 ** Unit off of Harris Road considered separately see Table 3.5-7.
 Reference: Trip Generation, Institute of Transportation Engineers, 8th edition, Washington, DC, 2008.

Table 3.5-7 Conservation Plan Project Site Total New Trips Generated						
Land Uses	Trips					
	A.M. Weekday Peak Hour			P.M. Weekday Peak Hour		
	IN (Trips)	OUT (Trips)	Total (Trips)	IN (Trips)	OUT (Trips)	Total (Trips)
Tripi Conservation Subdivision 21 residential units on Loop Road from Table 3.5-6	6	18	24	16	10	26
1 new residential unit off Harris Road	0	1	1	0	1	1
22 total new residential units	6	19	25	16	11	27

Reference: Trip Generation, Institute of Transportation Engineers, 8th edition, Washington, DC, 2008.

Conventional Plan Project Trip Generation

As previously mentioned, the complete Traffic Impact Analysis for the Conventional Plan is included as Appendix F. For comparison purposes, Table 3.5-8 shows the site generated trips for the Conventional Plan. Due to the increase in the number of total units shown on the Preferred Conservation Plan, the Conventional Plan results in one less a.m. peak hour trip and four less p.m. peak hour trips than the Preferred Conservation Plan.

Table 3.5-8 Conventional Plan Project Site Total New Trips Generated						
Land Uses	Trips					
	A.M. Weekday Peak Hour			P.M. Weekday Peak Hour		
	IN (Trips)	OUT (Trips)	Total (Trips)	IN (Trips)	OUT (Trips)	Total (Trips)
Tripi Residential Subdivision 19 residential units	15	9	24	6	17	23
Reference: Trip Generation, Institute of Transportation Engineers, 8th edition, Washington, DC, 2008.						

Build Condition Traffic Volumes

Total a.m. and p.m. peak hour site generated trips for the preferred Conservation Plan are shown in Figures 3.5-8 and 3.5-9. These trips are added to the No Build Condition (Figures 3.5-4 and 3.5-5) traffic to obtain Conservation Plan Build Condition traffic, as shown in Figures 3.5-10 and 3.5-11.

Build Condition Level of Service

Table 3.5-9 presents levels of service for the 2017 Conservation Plan Build Condition for the studied intersections. Construction of the Tripi Conservation Plan project will result in no changes to the operating level of service at any of the approaches for the intersections studied. All movements will continue to operate at level of service C or better upon completion of the project. As shown in Table 3.5-9, there is no degradation in the Levels of Service at the affected intersections with the addition of trips generated by the Tripi Conservation Plan.

Table 3.5-9 Build Conditions Preferred Conservation Plan Level of Service Summary							
Intersection Roads	Lane Group (Approach Direction -Movement)	AM Weekday Peak Hour			PM Weekday Peak Hour		
		Volume to Capacity Ratio	Delay (seconds/vehicle)	Level of Service	Volume to Capacity Ratio	Delay (seconds/vehicle)	Level of Service
<i>Huntville Road and New Street - Unsignalized</i>							
<i>Huntville Road</i>	<i>EB - L, T, R</i>	<i>0.02</i>	<i>7.8</i>	<i>A</i>	<i>0.00</i>	<i>7.8</i>	<i>A</i>
	<i>WB - L, T, R</i>	<i>0.01</i>	<i>7.7</i>	<i>A</i>	<i>0.01</i>	<i>7.6</i>	<i>A</i>
<i>New Street</i>	<i>NB - L, T, R</i>	<i>0.06</i>	<i>9.7</i>	<i>A</i>	<i>0.06</i>	<i>10.8</i>	<i>B</i>
	<i>SB - L, T, R</i>	<i>0.13</i>	<i>11.4</i>	<i>B</i>	<i>0.13</i>	<i>12.3</i>	<i>B</i>
<i>NYS Route 117 and Harris Road - Signalized</i>							
<i>Harris Road</i>	<i>EB - L, T, R</i>	<i>0.22</i>	<i>32.0</i>	<i>C</i>	<i>0.21</i>	<i>32.1</i>	<i>C</i>
	<i>WB - L, T</i>	<i>0.30</i>	<i>25.3</i>	<i>C</i>	<i>0.39</i>	<i>22.1</i>	<i>C</i>
	<i>WB - R</i>	<i>0.50</i>	<i>27.5</i>	<i>C</i>	<i>0.56</i>	<i>24.6</i>	<i>C</i>
<i>NYS Route 117</i>	<i>NB - L</i>	<i>0.04</i>	<i>9.2</i>	<i>A</i>	<i>0.01</i>	<i>12.8</i>	<i>B</i>
	<i>NB - T</i>	<i>0.14</i>	<i>14.3</i>	<i>B</i>	<i>0.30</i>	<i>19.3</i>	<i>B</i>
	<i>NB - R</i>	<i>0.11</i>	<i>14.1</i>	<i>B</i>	<i>0.19</i>	<i>18.3</i>	<i>B</i>
	<i>SB - L</i>	<i>0.19</i>	<i>7.5</i>	<i>A</i>	<i>0.22</i>	<i>12.5</i>	<i>B</i>
	<i>SB - T, R</i>	<i>0.36</i>	<i>16.2</i>	<i>B</i>	<i>0.44</i>	<i>20.7</i>	<i>C</i>
	<i>Overall</i>		<i>18.8</i>	<i>B</i>		<i>20.8</i>	<i>C</i>
Level of Service (see Table 3.5-2 and Table 3.5-3 for level of service criteria). NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound/ L = left, R = right, T = through, TR = through and right, (e.g., WB - L = Westbound left). <i>Italics denotes unsignalized intersection.</i> No Change in level of service compared to No-Build Conditon.							

A summary of Levels of Service at the study intersections in the Build Condition for the Conventional Plan is provided for comparison in Table 3.5-10. The complete Traffic Impact Analysis for the Conventional Plan is provided in Appendix F.

Table 3.5-10 Build Conditions Conventional Plan Level of Service Summary							
	Lane Group (Approach Direction -Movement)	AM Weekday Peak Hour			PM Weekday Peak Hour		
		Volume to Capacity Ratio	Delay (seconds/ vehicle)	Level of Service	Volume to Capacity Ratio	Delay (seconds/ vehicle)	Level of Service
<i>Huntville Road and New Street - Unsignalized</i>							
<i>Huntville Road</i>	<i>EB - L, T, R</i>	<i>0.05</i>	<i>7.6</i>	<i>A</i>	<i>0.04</i>	<i>7.6</i>	<i>A</i>
	<i>WB - L, T, R</i>	<i>0.00</i>	<i>7.7</i>	<i>A</i>	<i>0.01</i>	<i>7.6</i>	<i>A</i>
<i>New Street</i>	<i>NB - L, T, R</i>	<i>0.04</i>	<i>12.1</i>	<i>A</i>	<i>0.04</i>	<i>10.8</i>	<i>B</i>
	<i>SB - L, T, R</i>	<i>0.14</i>	<i>10.7</i>	<i>B</i>	<i>0.09</i>	<i>10.2</i>	<i>B</i>
<i>NYS Route 117 and Harris Road - Signalized</i>							
<i>Harris Road</i>	<i>EB - L, T, R</i>	<i>0.33</i>	<i>33.2</i>	<i>C</i>	<i>0.20</i>	<i>32.0</i>	<i>C</i>
	<i>WB - L, T</i>	<i>0.51</i>	<i>27.7</i>	<i>C</i>	<i>0.48</i>	<i>23.2</i>	<i>C</i>
	<i>WB - R</i>	<i>0.59</i>	<i>29.4</i>	<i>C</i>	<i>0.79</i>	<i>33.7</i>	<i>C</i>
<i>NYS Route 117</i>	<i>NB - L</i>	<i>0.09</i>	<i>9.3</i>	<i>A</i>	<i>0.01</i>	<i>13.1</i>	<i>B</i>
	<i>NB - T</i>	<i>0.19</i>	<i>0.19</i>	<i>B</i>	<i>0.37</i>	<i>19.9</i>	<i>B</i>
	<i>NB - R</i>	<i>0.19</i>	<i>0.19</i>	<i>B</i>	<i>0.25</i>	<i>18.8</i>	<i>B</i>
	<i>SB - L</i>	<i>0.18</i>	<i>7.0</i>	<i>A</i>	<i>0.21</i>	<i>12.4</i>	<i>B</i>
	<i>SB - T, R</i>	<i>0.40</i>	<i>16.6</i>	<i>B</i>	<i>0.51</i>	<i>21.5</i>	<i>C</i>
	<i>Overall</i>		<i>19.9</i>	<i>B</i>		<i>23.9</i>	<i>C</i>
Level of Service (see Table 3.5-2 and Table 3.5-3 for level of service criteria). NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound/ L = left, R = right, T = through, TR = through and right, (e.g., WB - L = Westbound left). <i>Italics denotes unsignalized intersection.</i> No Change in level of service compared to No-Build Conditon.							

A comparison of Tables 3.5-9 and 3.5-10 shows that the preferred Conservation Plan generally results in a decrease in delays at the approaches in the study intersections. The overall delay at the signalized intersection of Harris Road and NYS Route 117 decreases by 1.6 seconds in the a.m. peak hour and 3.1 seconds in the p.m. peak hour as a result of the Conservation Plan. The level of service for Huntville Road passing the New Street intersection continues to operate at the most efficient level of service A. Delays on New Street marginally increase by two seconds or less, due to all the site generated traffic using this access.

Sight Distance at New Street

Stopping sight distance is the distance a vehicle would require to be able to stop on wet pavement to avoid a collision with a vehicle entering the traffic stream. Intersection sight distance provides an additional margin of safety above stopping sight distance.

Intersection sight distance is defined as the sight distance that is necessary for a vehicle to safely enter the traffic stream requiring only minor speed adjustments by vehicles in the traffic stream. The posted speed limit on Huntville Road is 30 miles per hour.

Table 3.5-11 shows the Stopping Sight Distance and Intersection Sight Distance recommended by the American Association of State Highway and Transportation Officials (AASHTO) at various control speeds. The posted speed limit on Huntville Road is 30 miles per hour. As shown on the site plan, the available sight distance measurements for New Street at Huntville Road is 500 feet on each side of New Street. There is sufficient stopping sight distance in both

directions to meet the AASHTO recommendations for an operating speed of up to 30 miles per hour.

Table 3.5-11 Sight Distance		
Speed (in miles/hour)	Stopping Sight Distance	Intersection Sight Distance
30	200 Feet	335 Feet
35	250 Feet	390 Feet
40	305 Feet	445 Feet
45	360 Feet	500 Feet

A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 5th ed., 2004.

Traffic from Construction Activity

The proposed project will result in on-site construction activity, and the addition of construction traffic to local roads. The applicant proposes to utilize both Harris Road and New Street as construction access points for both the Conventional Plan and for the Conservation Plan. While Harris Road provides the shortest distance to Route 117, the required entrance road and utility construction at New Street will necessitate using it as a construction entrance. The construction entrance at Harris Road will have the same site distance as the final emergency access; greater than 500 feet in both directions. Construction vehicles and employees will park on-site at all times. Materials and equipment storage will be located on site.

The designated construction traffic route will be Harris Road, eastbound to Bedford Road / NYS Route 117, and then will utilize designated NYS Route 117, both westbound (south) and eastbound (north). A construction traffic routing plan is provided as Figure 3.5-13. At the Harris Road Bedford Road intersection, Route 117 follows Harris Road across the Sawmill Parkway then travels eastbound onto Interstate 684. Formerly, NYS Route 117 was mapped through the hamlet of Katonah, but now this route utilizes Harris Road, Adams Street and a portion of the Saw Mill Parkway to access Interstate 684. Trucks over 20 tons are not permitted on Bedford Road, east of Harris Street, in the hamlet of Katonah, or on Cherry Street, except for local deliveries. Construction vehicles traveling to and from the Tripi subdivision site will be limited to that portion of Harris Road, east of the site, and NYS Route 117.

Construction traffic will consist primarily of construction equipment arriving at the beginning of the construction period, trucks periodically delivering materials, and daily trips of construction workers. Construction workers typically arrive and depart the work site prior to peak hours of traffic as will the initial construction equipment. Projects of this nature would be likely visited by excavators, bulldozers, dump and cement trucks, backhoes, rollers, graders, pavers, material delivery trucks and an assortment of smaller pieces of equipment for residential home construction for intermittent periods of time over the course of construction. Should any oversized vehicles be needed to transport equipment or materials to the site, escort vehicles would accompany the oversize vehicle to enable safe transport and minimize any potential temporary traffic impacts.

The preliminary grading plan for the Conventional site plan would result in approximately 15,436 cubic yards of earthwork cut and approximately 19,863 cubic yards of earthwork fill resulting in approximately 4,427 cubic yards of needed material. The Conservation Plan project will be a balanced fill project with no material required to be imported or exported from the site.

The estimated 4,427 cubic yards of material for the Conventional Plan would equate to approximately 6,640 tons of material (using a multiplier of 1.5 tons per yard). While larger tri-axle trucks can accommodate more material, it is anticipated that smaller trucks would deliver material to the site, given the residential streets. If 20 tons per truckload is used, the 6,640 tons would require 332 truckloads of material. Over a six month period of major grading and site-work the 332 truckloads would equate to approximately 2 to 3 truckloads per day (assuming 20 working days per month). The preferred Conservation Plan would eliminate the need for construction traffic relating to cut and fill operations.

Erosion and sediment control, dust control and traffic safety controls at the project entrance will be the responsibility of the construction manager. The Town Building Inspector has the ability to modify maintenance activities at the construction entrance.

School Bus Traffic

As detailed in the Community Services section, the Tripi Subdivision is located in the Katonah Lewisboro School District. It is anticipated that up to 18 school age children will reside at the Tripi development if constructed under the Conservation Plan. The Project is located less than ½ mile south of the Katonah Elementary School and about 3 miles away from the Junior High/High School Campus. The school district policy is to bus all elementary students who reside more than ½ mile from their school and all other students who live more than 1 mile from the school. The Katonah Elementary school is located on Huntville Road within ½ mile of the project site, thus the elementary school students will either walk or be driven to school. Transportation for the public middle school and high school students and private school students is anticipated to be accommodated by the existing bus transportation routes⁵.

Due to the low estimated volume of construction traffic under the Conservation Plan, project construction traffic would not be expected to affect school bus safety. If conditions warrant, such as utility work in the existing roadways, a flagman will be provided on Harris Road, New Street or Huntville Road to allow safe traffic flow. Flagmen would be utilized anytime construction would necessitate the closing of an existing shoulder or travel lane. It is anticipated that with appropriate flagmen and signage, construction traffic would not interfere with any existing pedestrian traffic to Katonah Elementary School or to the Montfort Academy located on Valley Road north of Huntville Road.

Pedestrian Access following Development

As described above, local roads that adjoin the site do not have sidewalks, including a portion of New Street and Harris Road. Future residents of the Tripi subdivision would be able to walk or bicycle to the Katonah Elementary School using the edge of New Street for approximately 900 feet and then utilize the existing sidewalk along Huntville Road (see Figure 3.5-12 Pedestrian Access Plan).

⁵ Phone Conversation with Jim Minihan Director of Transportation Services, October 8, 2010.

Future project residents who wanted to walk into the commercial hamlet of Katonah would utilize the portion of New Street with no sidewalks, cross Huntville Road using the sidewalk on the west side of New Street and then use the sidewalk along Valley Road to the Village Green. This route is approximately three-quarters of a mile in length and the majority has sidewalks.

Future residents who wanted to walk to the A&P supermarket could utilize the following route:

1) New Street to Huntville Road, eastbound to Bedford Road and then southbound to the A&P. As described above, pedestrians would have to walk along the edge of New Street to Huntville Road and then could use a sidewalk for the majority of Huntville Road and along Bedford Road to the A&P.

The NYSDOT has allocated funding to construct sidewalks along Valley Road to connect new and existing sidewalks from Cherry Street to Huntville Road. This will add to the overall pedestrian connectivity in the project vicinity.

3.5.4 Mitigation Measures

The project is expected to generate 25 vehicular trips in the a.m. peak hour and 27 trips in the p.m. peak hour. The Tripi Conservation Plan project is not expected to result in a decline in traffic operations on the local road network thus, no external transportation mitigation measures are proposed.

3.5.5 Conventional vs. Preferred Conservation Plan

Under either the Conventional Plan or the Conservation Plan there is no change to the operating level of service for any approach at either of the studied intersections. All movements will operate at Level of service C or better upon completion of the project.

The benefit of the Conservation Plan over the Conventional Plan is elimination of the potential cut through from New Street to NYS Route 117. Sight Distance considerations are also improved in the Conservation Plan as sight distance is better from New Street at Huntville Road than at Harris Road and Bedford Road. The Conservation Plan design also eliminates the steep grade from Harris Road to the interior of the project included in the Conventional Design.

The Conservation Plan will also be able to be built as a balanced site, requiring no cut or fill materials being transported to or from the site. This results in the elimination of approximately 332 truckloads of fill material which equates to approximately 2 to 3 truckloads per day over a six month period of initial grading.

Based upon the projected levels of service, and the potential improvements as a result of the preferred Conservation Plan, no off-site mitigation measures are proposed.

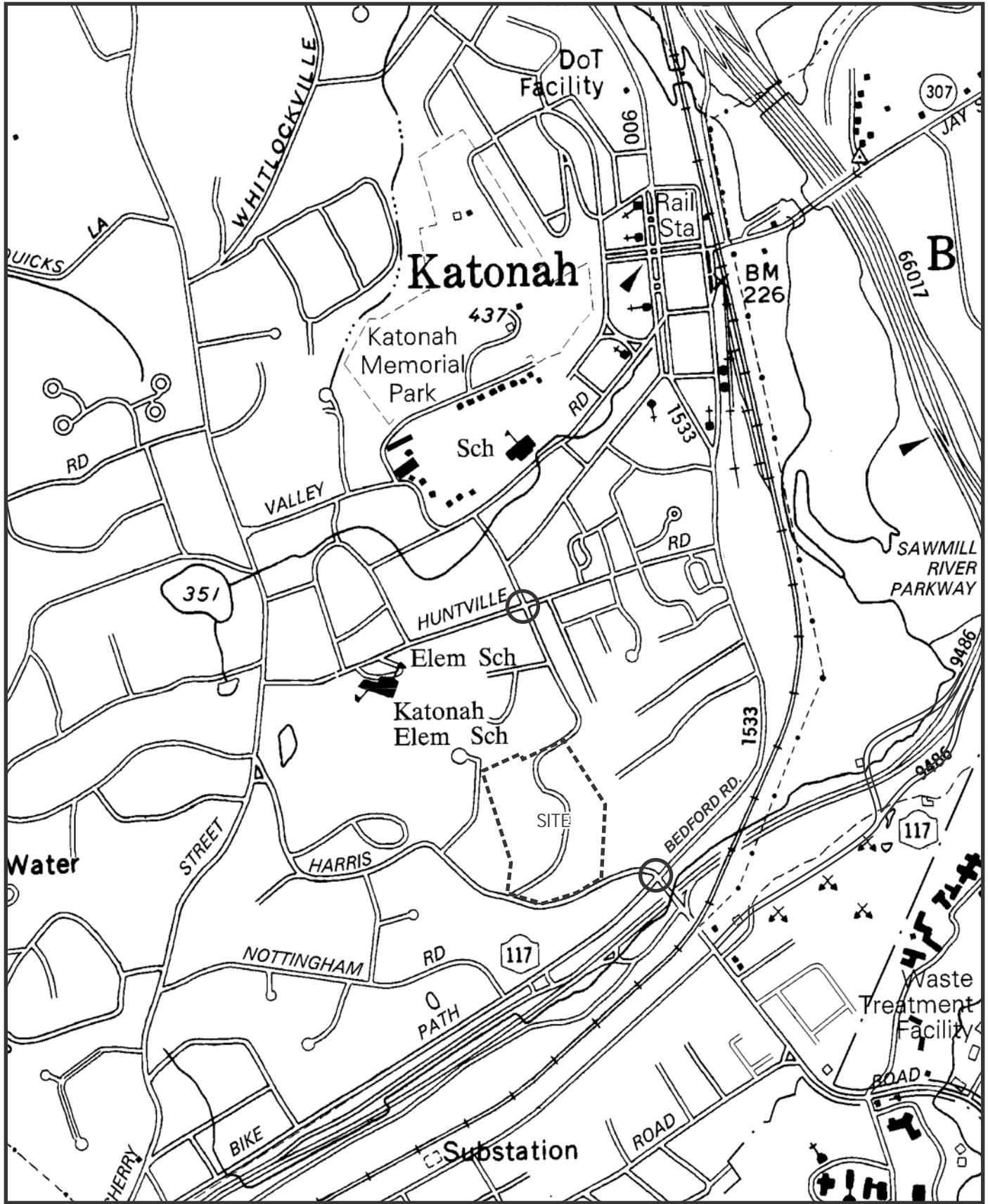
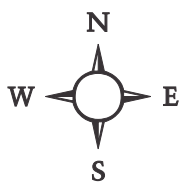


Figure 3.5-1: Project Site Location
 Tripi Subdivision
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND
 ○ Intersections Studied

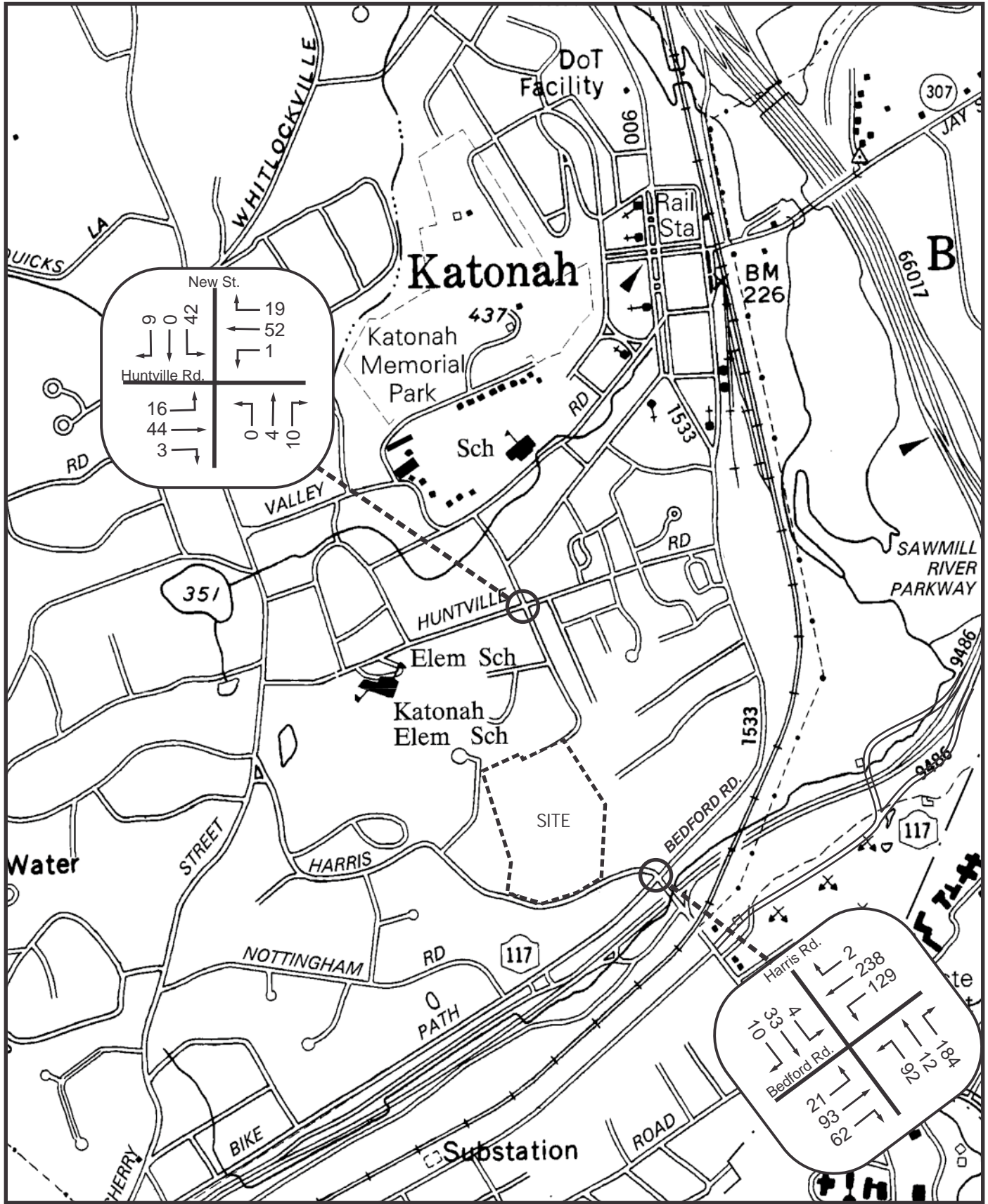
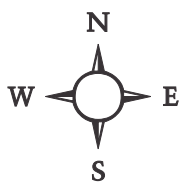
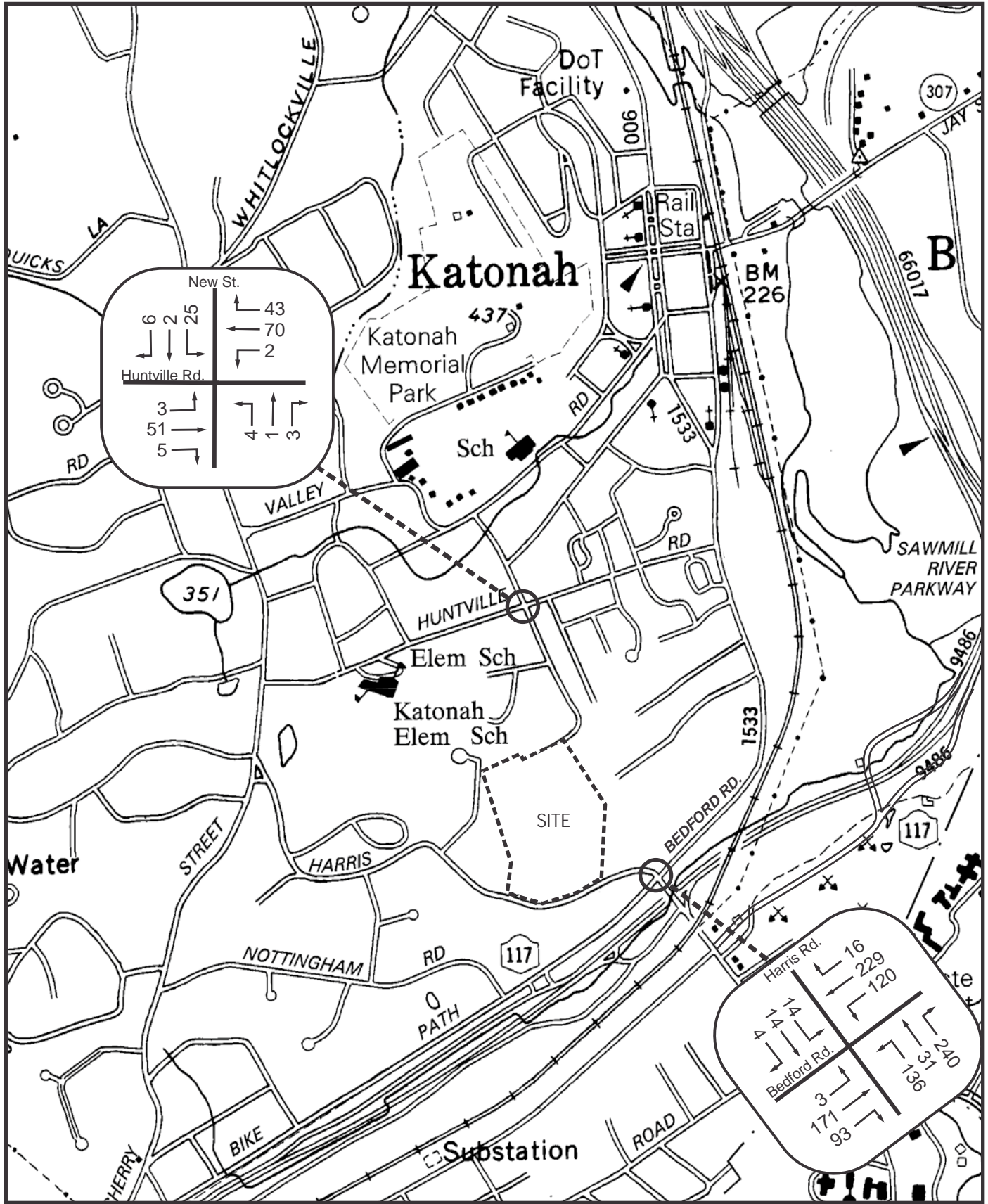


Figure: 3.5-2: 2010 Existing AM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND

○ Intersections Studied



LEGEND
 ○ Intersections Studied

Figure: 3.5-3: 2010 Existing PM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'

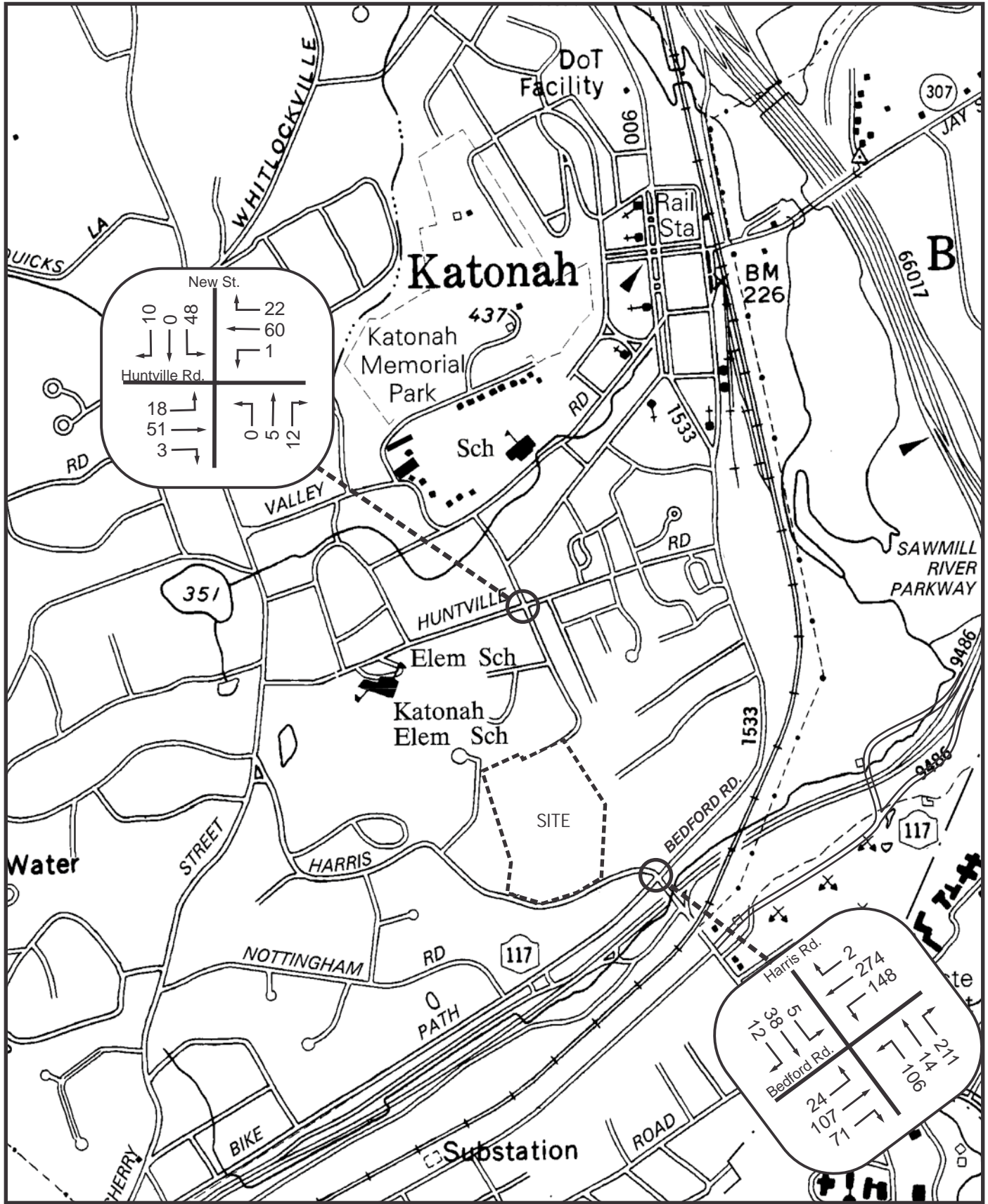
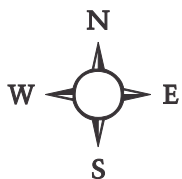


Figure: 3.5-4: 2017 No Build AM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND

○ Intersections Studied

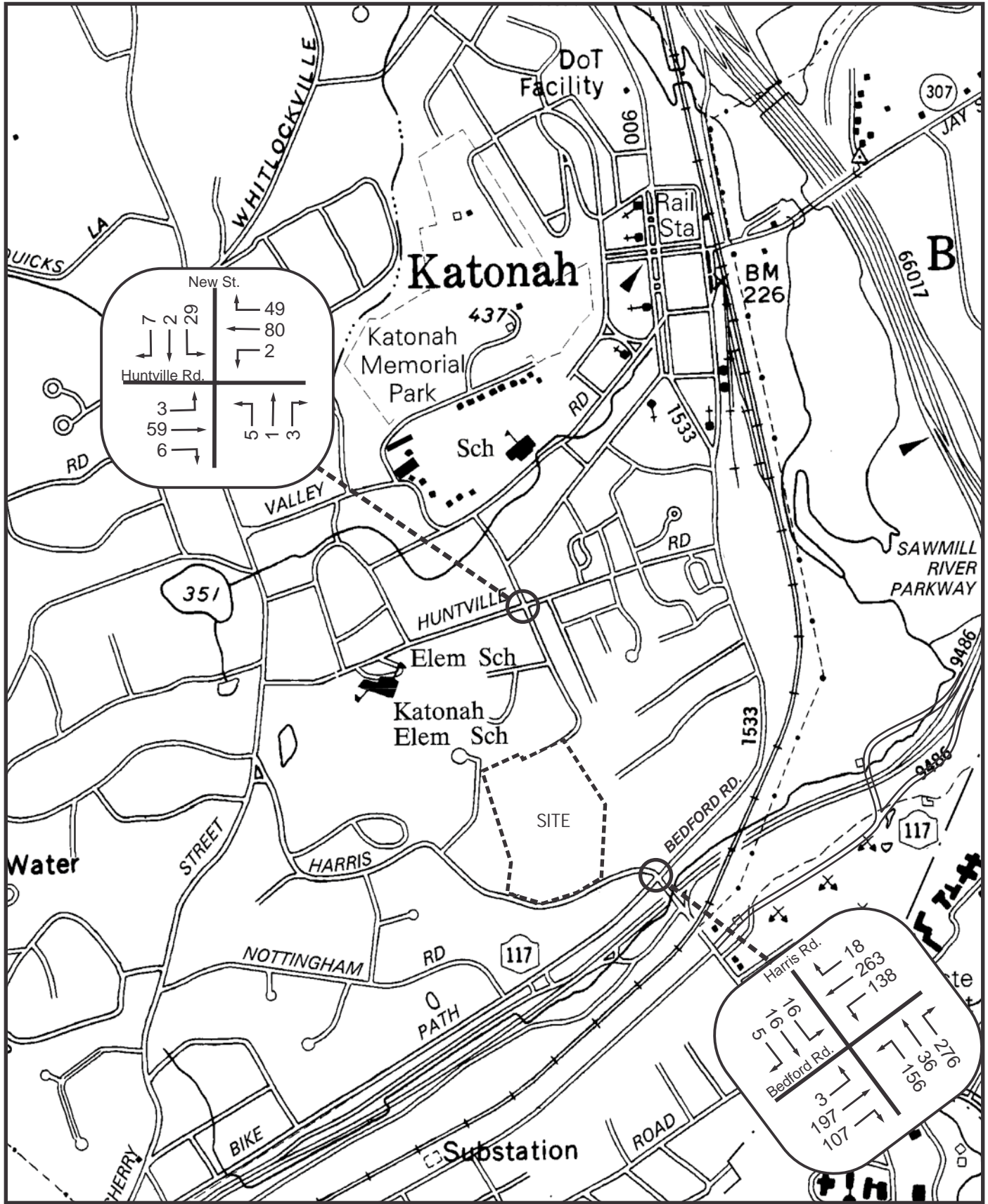
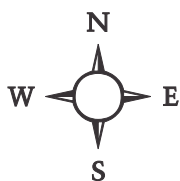


Figure: 3.5-5: 2010 No Build PM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND
 ○ Intersections Studied

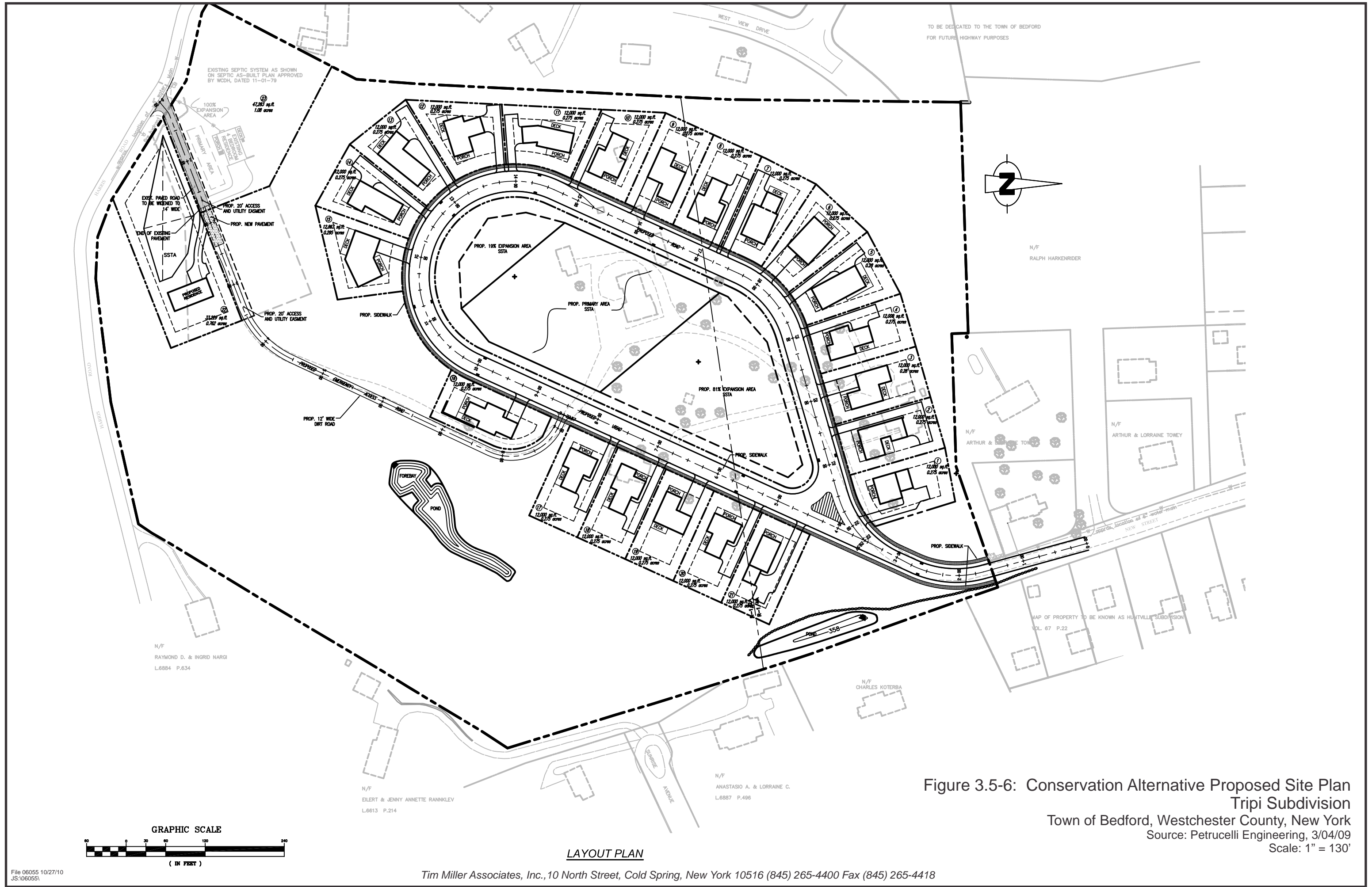


Figure 3.5-6: Conservation Alternative Proposed Site Plan
 Tripi Subdivision
 Town of Bedford, Westchester County, New York
 Source: Petrucelli Engineering, 3/04/09
 Scale: 1" = 130'

LAYOUT PLAN

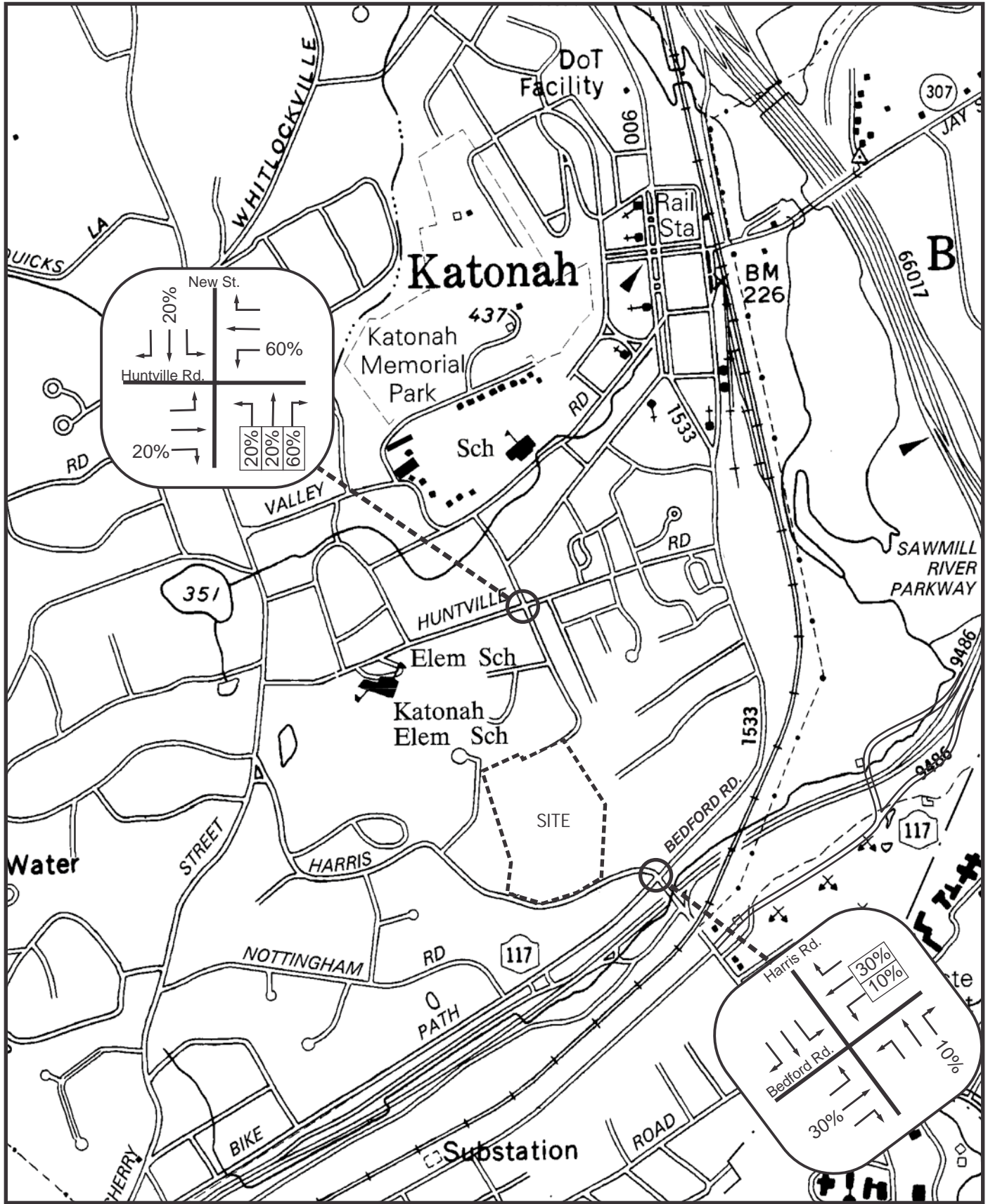
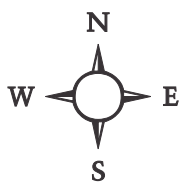


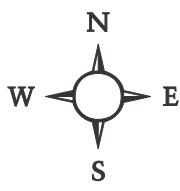
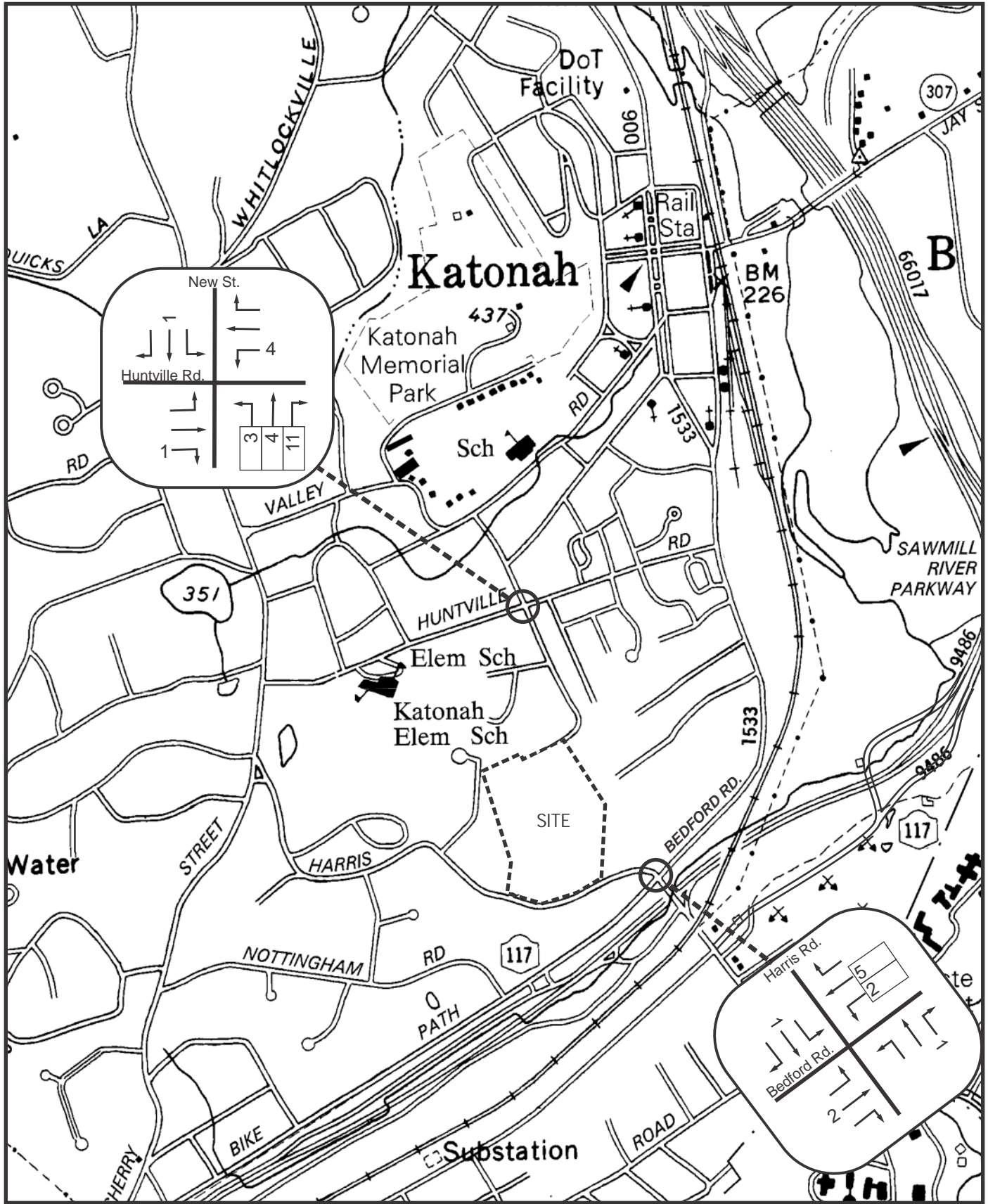
Figure: 3.5-7: Percent Distribution* Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'

*Distribution refers to units along loop road only



LEGEND

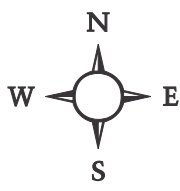
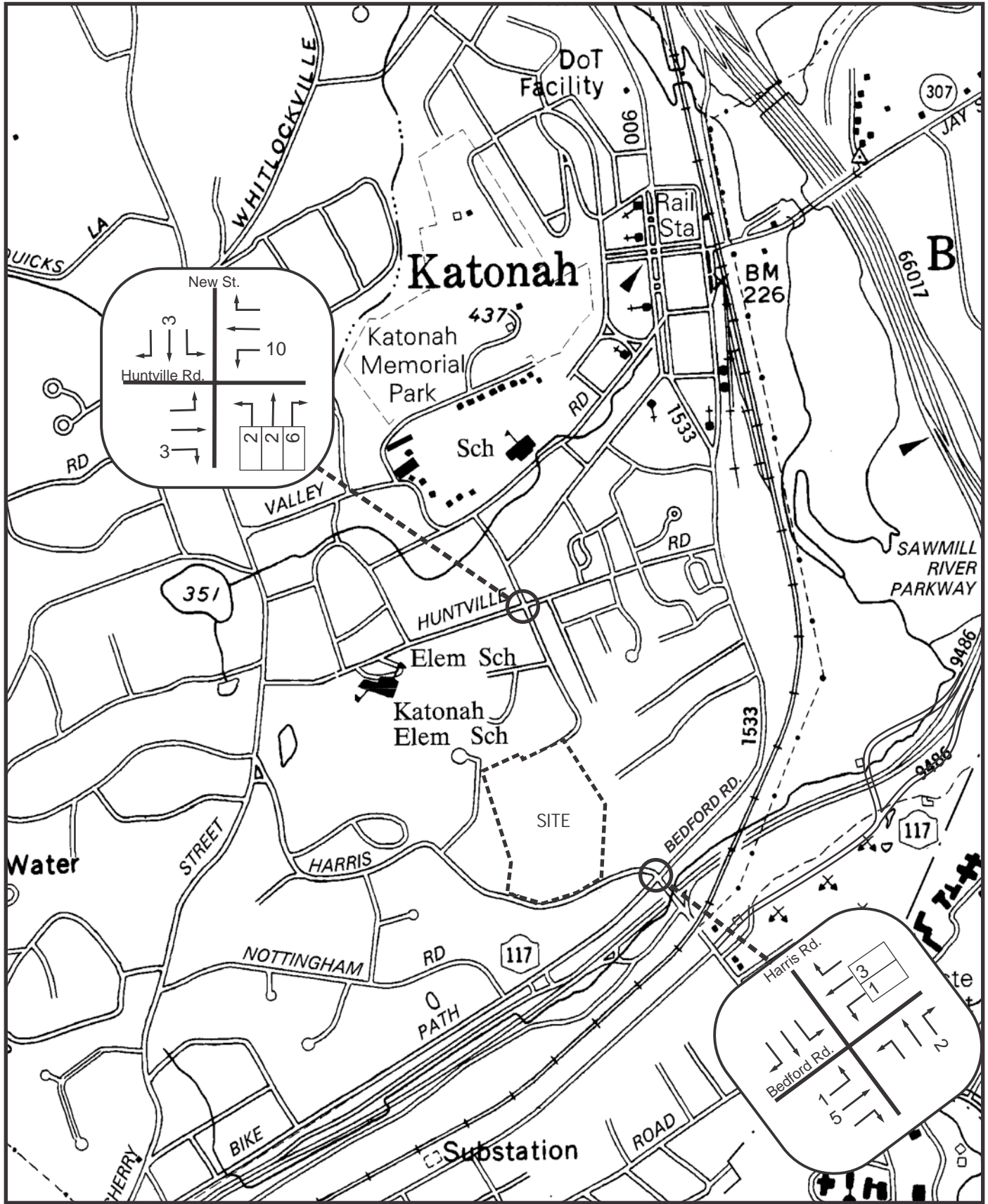
XX%	Outbound
XX%	Inbound



LEGEND	
XX	Outbound
XX	Inbound

Figure: 3.5-8: Site Generated AM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'

*Distribution refers to units along loop road only



LEGEND	
XX	Outbound
XX	Inbound

Figure: 3.5-9: Site Generated PM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'

*Distribution refers to units along loop road only

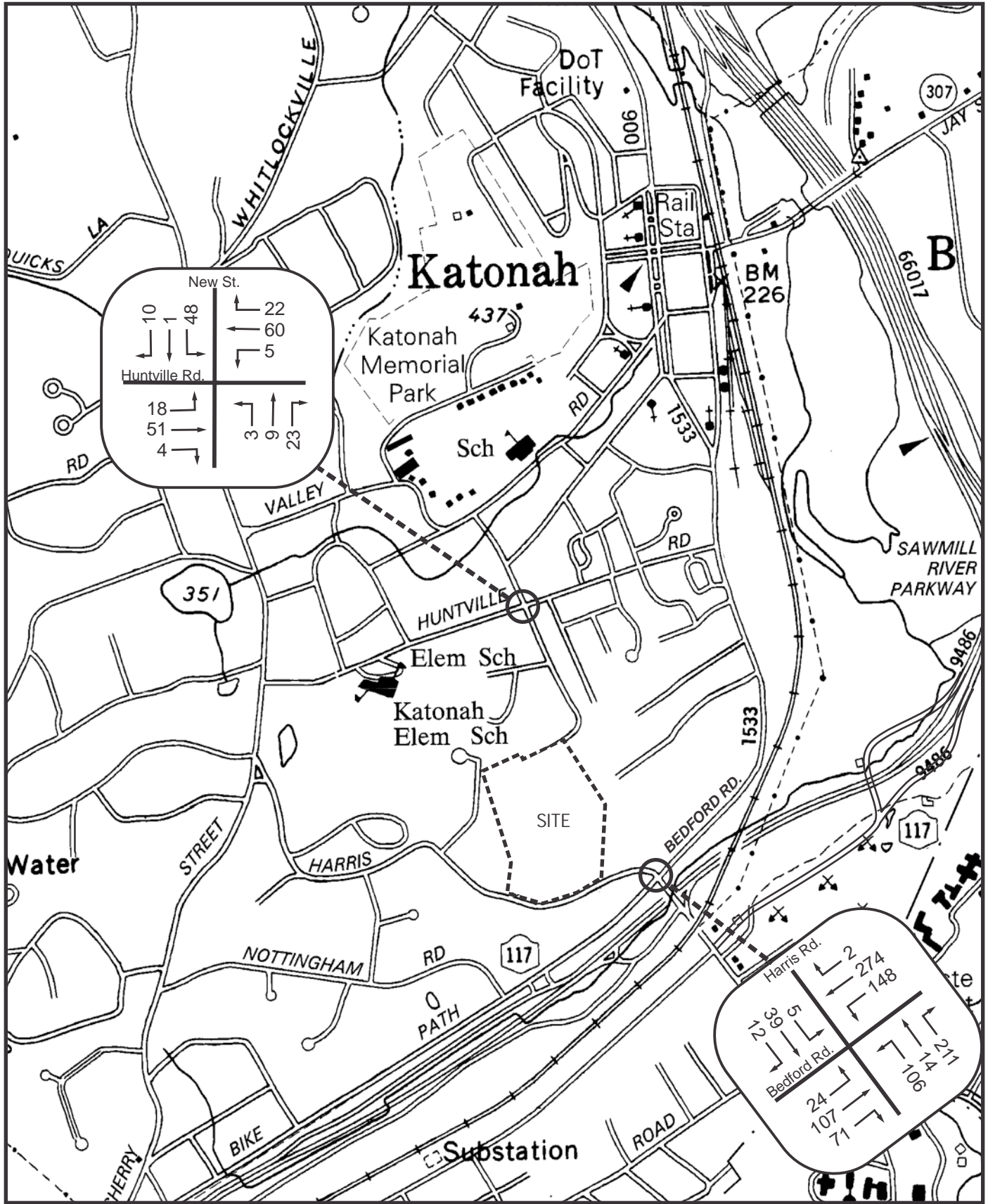
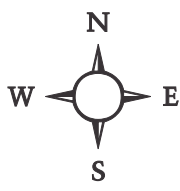


Figure: 3.5-10: 2017 Build AM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND
 ○ Intersections Studied

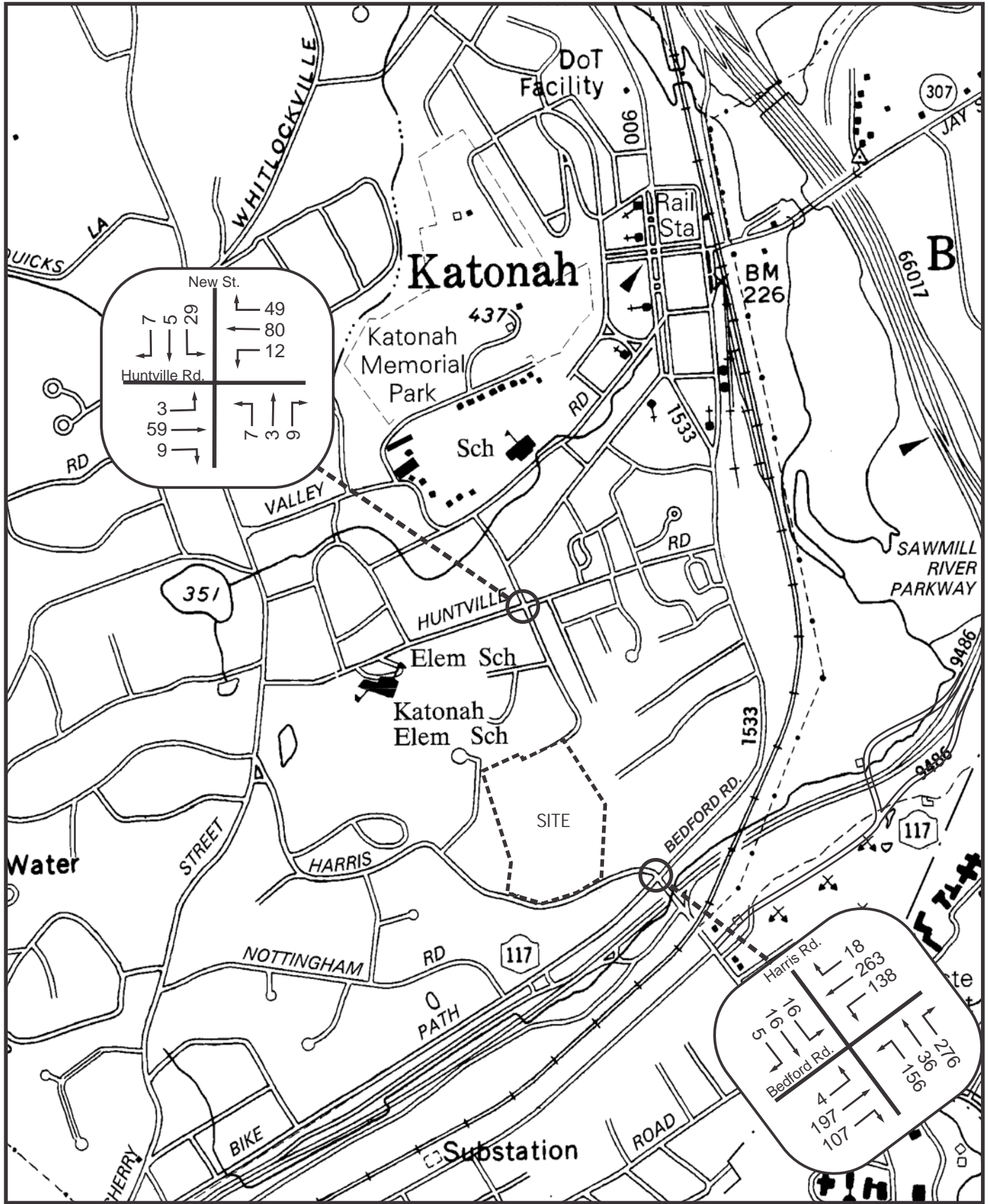
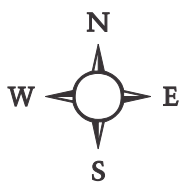
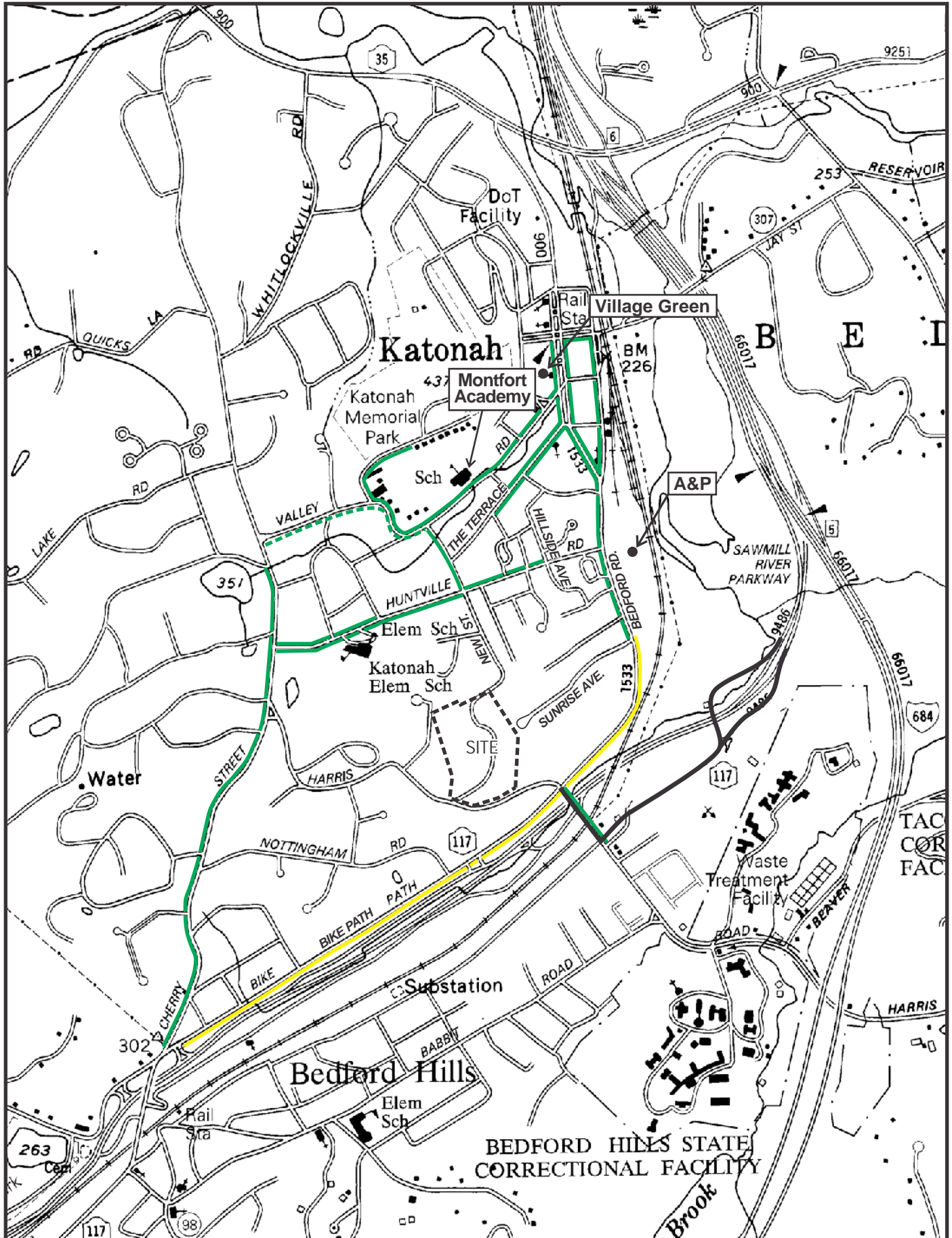


Figure: 3.5-11: 2017 Build PM Peak Hour Traffic
 Tripi Subdivision Conservation Plan
 Town of Bedford, Westchester County, New York
 Base Map: U.S. D.O.T. Planimetric Map
 Scale: 1" = 1,000'



LEGEND
 ○ Intersections Studied



- - - - Proposed Sidewalk
- Sidewalk
- Bike Path

Figure 3.5-12: Pedestrian Access Plan
 Tripi Subdivision
 Town of Bedford, Westchester County, New York
 Base: US DOT Planimetric Map
 Scale: 1" = 1,400'

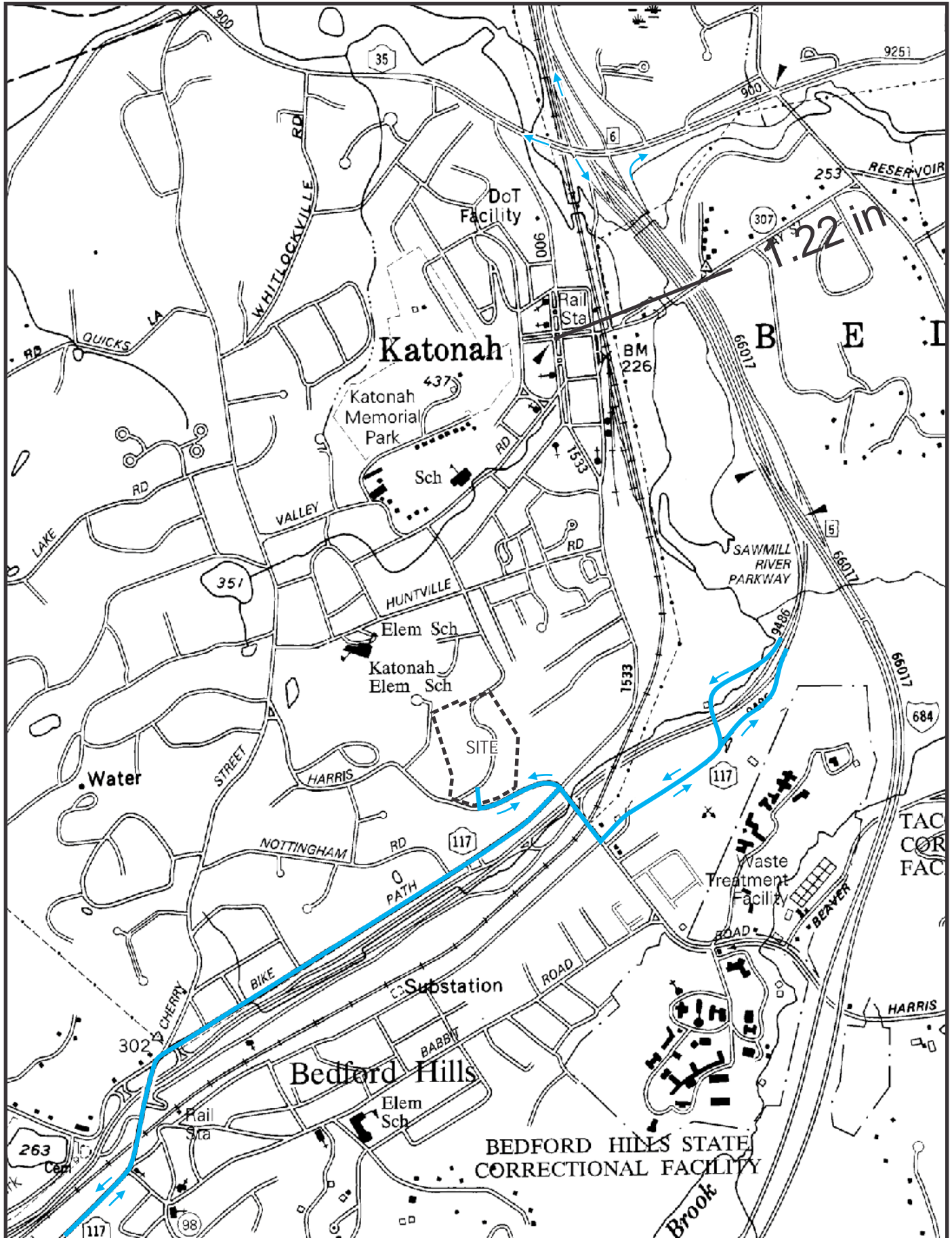


Figure 3.5-13: Construction Traffic Routing Plan
 Tripi Subdivision
 Town of Bedford, Westchester County, New York
 Base: US DOT Planimetric Map
 Scale: 1" = 1,400'

