3.4 Traffic and Transportation

3.4.1 Introduction

This section examines existing transportation operations in the vicinity of the project site and estimates future traffic conditions without and with the project completed. The description of the network's present day operations is referred to as the Existing Condition. Future transportation operations are examined for the No Build Condition (without the project) and Build Condition (with the project). The No Build Condition represents future traffic conditions without the project. The Build Condition is the No Build Condition plus the traffic that is anticipated from occupancy of the residential development. The No Build and Build conditions are analyzed for the year 2017 when the project is expected to be fully completed and occupied.

3.4.2 Existing Traffic Conditions

The Regional Network

The subject site is located in the Town of Marlborough, Ulster County, New York. The property lies west of the Hudson River and east of U.S. Route 9W. The Regional Road Network is shown in Figure 3.4-1.

Marlborough is positioned between the Newburgh-Beacon and the Mid-Hudson bridges along the west bank of the Hudson River. The major thoroughfare serving the Town is U.S. Route 9W, a north-south arterial. To the north, U.S. Route 9W connects to NYS Route 55 and 44 which travels across the Mid-Hudson Bridge, providing access to the City of Poughkeepsie. To the south, U.S. Route 9W provides access to Interstate 84 in the City of Newburgh. Interstate 84 is also a primary commuter route to Interstate 87 (The New York State Thruway) which provides access to the Greater New York metropolitan area south of Ulster County.

U.S. Route 9W is the north-south "minor arterial (other street)[1]" nearest to the project site. To the south of the site and Marlboro hamlet, U.S. Route 9W is 55 miles per hour (mph). The speed transitions to 40 mph and then 30 mph traveling north into the center of the Marlboro hamlet. The speed limit increases back to 40 mph just before U.S. Route 9W's intersection with Dock Road although there is a 30 mph limit during school times. Traveling south on U.S. Route 9W, the speed limit is 30 mph starts north of Dock Road. Farther north of the hamlet center, the 55 mph speed limit resumes. U.S. Route 9W is a two lane road in the project vicinity.

In terms of pedestrian facilities, a sidewalk along U.S. Route 9W starts on the west side of the road at the South Street Extension. There is a pedestrian crossing at St. Mary's Church to a parking lot. Another pedestrian crossing is located at Dubois Street and a third at King Street. North of King Street, a short sidewalk is located on the east side of U.S. Route 9W as well as the west side. At the Middle School egress, a crosswalk across U.S. Route 9W shifts the sidewalk to the east side of U.S. Route 9W. The easterly sidewalk adjoins the Elementary/Intermediate school property and then follows to the main entrance of the schools.

U.S. Route 9W is shown as a a bike route on the Ulster County Non-Motorized Transportation Plan[2].

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[1] Ulster County Transportation Council, Functional Classification of Roadways as of 2010, map.

[2] Alta planning + Design, *Ulster County Non-Motorized Transportation Plan*, Ulster County Transportation Council, Kingston, NY, December 2008, page 21.

The U.S. Route 9W is also served by Ulster County Area Transit (UCAT) Route G[3].

The Local Road Network

Figure 3.4-2 illustrates the local road network and lanes at key intersections on U.S. Route 9W in the project vicinity. Roads in the vicinity of the project site include:

- Dock Road
- North Young Avenue
- Young Avenue (Marlboro Central School District)
- Purdy Avenue
- Birdsall Avenue
- Western Avenue (CR 14)
- King Street

A major driveway within the project vicinity is the driveway to the Marlboro Middle School which exits to U.S. Route 9W. Vehicles enter the Middle School at Birdsall Avenue. A traffic control officer assists traffic exiting from Marlboro Middle School driveway onto U.S. Route 9W in the morning before moving to the U.S. Route 9W and Young Avenue intersection. This is repeated in the afternoon.

Dock Road

Dock Road is a two lane dead end street primarily serving the wastewater treatment plant and a marina. The project site fronts on Dock Road. In this location, project residents will be well situated to obtain access to U.S. Route 9W, existing transit service, and the commercial center in the Marlboro hamlet.

Young Avenue

Young Avenue is immediately north of Dock Road, providing access to properties on the east side of U.S. Route 9W. The Marlboro School District took full ownership of Young Avenue when the Marlboro Elementary School was improved and Marlboro Intermediate School was constructed. A cul-de-sac at the end of Young Avenue was also constructed at that time. Young Avenue provides access to private residences and is a public road. Young Avenue is a single lane in each direction. A large shoulder on the south side near U.S. Route 9W is used for stacking buses.

North Young Avenue

North Young Avenue is a short dead end street serving eight single family homes. North Young Avenue is two lanes. North Young Avenue is on the east side of U.S. Route 9W and one block north of Young Avenue.

Purdy Avenue

Purdy Avenue is a two lane dead end street located on the west side of U.S. Route 9W with a steep incline near its intersection with that road. It would provide access to the Bayside development discussed under the No Build condition.

[3] http://www.ulstercountyny.gov/ucat/schedules/UCAT%20System%20Map%20Version%202.6.pdf UCAT Bus routes, viewed June 20, 2011.

Birdsall Avenue

Birdsall Avenue is a two lane road located on the west side of U.S. Route 9W. Its access to U.S. Route 9 is steep and geometry is such that vehicles sometimes bottom out entering or exiting the intersection with U.S. Route 9W. Access to the Marlboro Middle School is from Birdsall Avenue.

Western Avenue (CR 14)

Western Avenue (CR 14) is a two lane road except for the block immediately west of its intersection with U.S. Route 9W. This block has angled parking along the westbound side of the road. King Street provides the eastbound movement to U.S. Route 9W. CR 14 becomes Plattekill Road past the High School to an all-way stop at Lattintown Road (CR 11). Lattintown Road is a north-south road in the Town of Marlborough. Western Avenue turns at Plattekill Road becoming CR 14A and heading over Manion Hill toward Lattintown Road (CR 11). Western Avenue is referred herein as Western Avenue (CR 14) as this is the section of Western Avenue under study. Western Avenue is a "collector street[4]".

King Street

King Street is one block long providing access from Western Avenue (CR 14) to U.S. Route 9W as U.S. Route 9W is only westbound in this area. King Street has recently been striped for left and right turn lanes onto U.S. Route 9W. There is a flashing light at the intersection of U.S. Route 9W, providing emergency vehicle priority.

Intersection Analysis

As required by the Scope, the following intersections were investigated in this traffic study:

1. U.S. Route 9W and Dock Road
2. U.S. Route 9W and Western Avenue (CR14)
3. U.S. Route 9W and King Street
4. U.S. Route 9W and Young Avenue

Photos of each intersection that illustrate lane geometrics and pavement markings are provided in Appendix D Attachment 1, Figures. Descriptions of the study intersections are as follows.

1. U.S. Route 9W and Dock Road: As shown in Appendix D Figure D-1, U.S. Route 9W and Dock Road is a three way intersection. This intersection is stop controlled. The Falcon, a restaurant/musical entertainment venue (http://www.liveatthefalcon.com/), is on the southeast corner. The project site is located north and east of the intersection and the development will obtain its access from this intersection.

2. U.S. Route 9W and Western Avenue (CR 14): As shown in Appendix D Figure D-2, U.S. Route 9W and Western Avenue (CR 14) is a three way intersection. This intersection is uncontrolled as Western Avenue (CR 14) is westbound (out of the intersection) only.

[4] Ulster County Transportation Council, Functional Classification of Roadways as of 2010, map.

3. U.S. Route 9W and King Street: As shown in Appendix D Figure D-3, U.S. Route 9W and King Street is a three way intersection. This intersection is stop-controlled highlighted by a flashing signal. It has been observed that turning left directly from King Street onto U.S. Route 9W can be difficult during peak traffic hours. Some northbound U.S. Route 9W drivers provide a courtesy gap stopping short of King Street when northbound traffic queues develop from left turns at Western Avenue. Actual left turn delays from King Street can be shorter than modeled due to the courtesy gaps provided.

4. U.S. Route 9W and Young Avenue: As shown in Appendix D Figure D-4, U.S. Route 9W and Young Avenue is a three way intersection. This intersection is stop-controlled with Young Avenue westbound into U.S. Route 9W. There is a two way channel to/from the north.

Traffic Counts

The Existing Conditions (2011) evaluation is based on 2008, 2010, and 2011 traffic counts. The Existing Conditions data form the basis of the year 2017 No Build and Build conditions.

Figures 3.4-3 and 3.4-4 provide existing a.m. and p.m. peak hour traffic, respectively, at the study intersections. Manual counts for the weekday a.m. peak hour and p.m. peak hour reflect study intersections while schools were in session. Because the school day ends regularly in the early afternoon, the schools' traffic primarily influence the a.m. peak hour and not the late p.m. peak hour traffic.

Traffic counts as indicated in Table 3.4-1 demonstrate that there is a slightly higher percentage of traffic traveling north on U.S. Route 9W during the existing peak hours. The Marlboro Hamlet transportation study[5] indicates there is a slightly higher percentage of traffic commuting south (49% northbound to 51% southbound). In this study, traffic distribution is that used in the Marlboro Hamlet transportation study[6].

The relatively even traffic distribution reflects the site's central location to major areas of shopping and employment to the north and south of the site.

Table 3.4-1
Existing Traffic Directional Distribution

Location *	A.M. Peak Hour			P.M. Peak Hour		
	Northbound	**Southbound**	Ratio	**Northbound**	**Southbound**	Ratio
U.S. Route 9W approaching Dock Road	771	774	50% - 50%	802	764	51% - 49%
King Street turning onto U.S. Route 9W	133	102	57% - 43%	103	85	55% - 45%
Dock Road turning onto U.S. Route 9W	2	1		8	5	
See Figures 3.4-3 and 3.4-4.						

[5] *Marlboro Hamlet Area Transportation Plan: Final Report*, Creighton Manning Engineering, LLP, and Behan Planning Associates, LLC, December 2008, page 10.
[6] Ibid.

Parking

The Marlboro Hamlet Transportation Study[7] included the results of a parking accumulation and duration study on April 10, 2008, a 70 degree sunny day, covering from 10:00 a.m. to 2:30 p.m. This study indicated on-street parking occupancy at 0 to 50 percent for U.S. Route 9W between Western Avenue (CR 14) and Dock Road. It should be noted the parking counts were done prior to the evening dining hours. The low occupancy compared to other areas covered in the Marlboro transportation study might be different in the late afternoon due to eateries being in operation such as the nearby Raccoon Saloon. More recently, the Falcon opened at the corner of Dock Road and U.S. Route 9W increasing demand for Thursday to Sunday evening parking. Thus, the section of U.S. Route 9W north of Western Avenue (CR 14) likely sees peak parking on weekdays and weekends later in the afternoon. A potential parking area was indicated at the northeast corner of Dock Road and U.S. Route 9W in the Marlboro transportation study[8]. A gravel parking lot on the Dockside property has been constructed for the Falcon - access to the lot is provided via Hudson Way.

The discussion of existing traffic operations (level of service) is contained in Section 3.4.6.

3.4.3 No Build Condition

No Build Traffic

Traffic impact is typically determined by comparing the projected future traffic conditions without the project's traffic in the Build Year to the projected traffic conditions with project-generated traffic in the Build Year. In this case, it is expected that construction will be completed within six years - the No Build and Build conditions evaluate the anticipated traffic conditions in 2017.

The No-Build Condition is a scenario that establishes a future baseline traffic condition. The No-Build Condition is determined based on the following 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.

Roadway Improvements

The Ulster County Transportation Council's Transportation Improvement Program (TIP)[9] lists several projects within the Town of Marlborough. These projects are included in the draft 2011-2015 project listings for the Ulster County Transportation Council (June 6, 2011) covering traffic improvement projects to be initiated and or completed during the period between October 2, 2011 and September 30, 2016. These projects are:

a) U.S. Route 9W at Young Avenue Intersection Improvements.
b) Route 9W at Western Avenue Intersection Reconstruction (Signalize and geometric changes at the intersections of U.S. Route 9W with Western Avenue (CR 14) and King Street).

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[7] *Marlboro Hamlet Area Transportation Plan: Final Report*, Creighton Manning Engineering, LLP, and Behan Planning Associates, LLC, December 2008., Page 14.

[8] Ibid, Figure III-3.

[9] Ulster County Transportation Council, *Final Federal Fiscal Year 2011-2015 Transportation Improvement Program*, March 1, 2011, Kingston, NY.

The intersection of U.S. Route 9W and Young Avenue is proposed to be signalized in the summer of 2012. Stop signs have been added to Young Avenue and right-of-way acquisition is in process. For this traffic analysis, the U.S. Route 9W and Young Avenue improvements are assumed to be completed. The improvements include signalization, addition of a southbound left turn lane, addition of a westbound left turn lane and removal of the existing two-way channel. The crossing guard would no longer be required at this intersection. The speed limit would be reduced permanently from 40 mph to 30 mph.

The Bayside development is a No Build project as the DEIS for the project is based on a completion year of 2015 assumed to be completed and occupied. Any traffic improvements required in connection with the Bayside development are included in the analysis.

The site plan for Bayside indicates a connection to the Marlboro Middle School would be made to allow Middle School traffic to enter U.S. Route 9W at the Young Avenue signal. The use of the existing Marlboro Middle School egress is anticipated to be limited to right turn out (southbound on U.S. Route 9W), requiring left turning traffic (northbound) to use the newly signalized intersection.

Early sketch plans also showed that Purdy Avenue would be connected to the Bayside development to permit Purdy Avenue residents to also access the traffic signal at Young Avenue. This would also be consistent with rerouting traffic off of the steep grades (including 15 percent plus grades) on Purdy Avenue. It is not clear if the Purdy Avenue intersection with U.S. Route 9W would remain unchanged, or would be restricted or eliminated in favor of the available Young Avenue signal. The most recent plans show no such connection.

Recent Bayside plans also show on-street parking on U.S. Route 9W southbound - this would eliminate the shoulder for use as part of the existing U.S. Route 9W bicycle route. The Bayside Traffic Impact Study[10] did not include a description of the U.S. Route 9W southbound on-street parking north of Young Avenue. This traffic study incorporates the following improvements proposed to implement the Bayside development[11] :

- Connection to Middle School,
- Emergency only connection to Purdy Avenue,
- No on-street U.S. Route 9W southbound north of Young Avenue (consistent with Traffic Impact Study description, inconsistent with plan),
- A northbound left turn lane into Bayside,
- Two lanes eastbound from Bayside, and
- Five[12] percent distributions to Young Avenue for the p.m. peak hours.

For this study, the distribution of Bayside traffic reflects the Marlboro transportation study[13] distribution modified with distributions to Young Avenue for the a.m. and p.m. peak hours, respectively.

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[10]John Collins Engineers, P.C. "Traffic Impact Study, Bayside Development, U.S. Route 9W @ Young Avenue, Town of Marlborough, New York", Hawthorne, NY, May 3, 2011, page 14.

[11]Ibid.

[12]John Collins Engineers, P.C. "Traffic Impact Study, Bayside Development, U.S. Route 9W @ Young Avenue, Town of Marlborough, New York", Hawthorne, NY, May 3, 2011, Figures 10 and 11.

[13]*Marlboro Hamlet Area Transportation Plan: Final Report*, Creighton Manning Engineering, LLP, and Behan Planning Associates, LLC, December 2008 page 10.

Signalizing the intersections of U.S. Route 9W with Western Avenue (CR 14) and King Street, the primary improvement contained in the Marlboro transportation study, is not anticipated until after 2015. The intersections are examined both with and without this improvement. As part of the improvements approximately 20 parking spaces would be eliminated. Several locations were noted for potentially replacing lost parking. Intersection improvements would improve pedestrian movements as well.

The intersections of U.S. Route 9W with King Street and Western Avenue were investigated in the Marlboro transportation study[14]. Eight alternative improvements were investigated. Alternatives 2 and 6 were identified as preferred alternatives.

Alternative 2 retains the existing roadway one-way configuration except a left turn lane into Western Avenue from U.S. Route 9W is added. Signals are added at both King Street and Western Avenue as shown in Appendix D Figure D-5. This alternative would eliminate approximately 20 parking spaces mostly along U.S. Route 9W. Since the Alternative 2 configuration was identified as having the worst level of service of the two alternatives, Alternative 2 is used in the future analyses with signal improvements to be conservative.

Alternative 6 changes the two one-way street sections to two two-way streets and adding signals at each location and a left turn lane into King Street as shown in Appendix D Figure D-6. This alternative would eliminate approximately 20 parking spaces mostly along U.S. Route 9W.

The study also discusses creating a southbound transition zone reducing vehicle speeds into the Marlboro hamlet.

Background Growth

To evaluate the impact of the proposed development, traffic projections were prepared for the year when the Project would be completed (2017). The Ulster County Transportation Council (UCTC) map[15] of change in Average Annual Daily Traffic (AADT) from 2005 to 2008 showed Western Avenue traffic increasing by one percent and U.S. Route 9W traffic reduced by 17 percent.

In determining future traffic volumes, existing traffic volumes are projected forward using a generalized growth factor that accounts for area-wide growth. Traffic generated by developments in the vicinity of the project site are then added to existing traffic volumes and background growth. The No-Build traffic volumes represent future traffic operating conditions without the development of the project and are a benchmark against which potential project-related traffic impacts can be measured.

For the No Build and Build conditions, the project listed in Table 3.5-3 is assumed to be completed and occupied by 2017, the build year. A growth rate of one percent (1.5%) per year cumulative over six years was used. A one percent growth rate is typically used for urban areas. Existing traffic volumes were increased from to 2017 for the build-out by an annual rate of one and a half (1.5) percent.

[14]*Marlboro Hamlet Area Transportation Plan: Final Report*, Creighton Manning Engineering, LLP, and Behan Planning Associates, LLC, December 2008.

[15]Ulster County Transportation Council, *Map 4 Percent change in AADT from 2008-2005,* January 30, 2009.

The 1.5 percent per year growth rate is slightly higher the projected growth rates. UCTC's Ulster County Transportation Traffic Simulation Model[16] indicates short term growth rate of 1.4 percent per year (2007 to 2020) or 1.3 percent long term (2007 to 2030) growth rate. A 1.3 percent grow rate was projected for U.S. Route 9W to the south in the Town of Newburgh by the Orange County Transportation Council[17].

Other Area Projects

Planned, pending, or approved projects in the area that might add a significant volume of traffic to the intersections in the study area were identified. The projects included in this traffic analysis are those currently under review (pending) in the Town of Marlborough that have not yet been built. The Bayside No Build project is listed in Table 3.4-2, Approved or Pending Projects in Site Vicinity. Trip generation was estimated using the Institute of Transportation Engineers' (ITE) trip generation rates. The trip rates and trips are provided in Appendix D Attachment 2 Tables D-1 and D-2 .

The vicinity development traffic volumes were added to the 2017 background, resulting in the No-Build traffic volumes. The No Build peak hour traffic volumes are presented graphically in Figures 3.4-5 and 3.4-6.

Table 3.4-2
Approved or Pending Projects in Site Vicinity

Project *	Size and Type **	Location
Bayside	12,600 square feet retail 73 townhouses units 18 duplexes units 10 apartments units	U.S. Route 9W opposite Young Avenue

Source: *Town of Marlborough Board Notice of Determination of Significance: Bayside /Amodeo Change of Zone: Bayside Development Plan*, Town of Marlborough Town Board, October 25, 2010.

The Amodeo parcel is not included as a No Build condition project. The five single lots on the parcel would be replacing two single family houses and a mobile home. The net addition of two single family houses and the loss of one house on the Bayside property are considered part of traffic background growth.

The discussion of No Build traffic operations (level of service) is contained in Section 3.4.6.

3.4.4 Build Condition

Residential Trip Generation

The trip rates for Dockside are summarized in Table 3.4-3. No reduction was taken for proximity to the transit stop on U.S. Route 9W at Western Avenue (CR 14) or pedestrian connection to U.S. Route 9W as a traditional neighborhood development in proximity to the hamlet center.

[16]Mark Sargent of Creighton Manning Engineering, LLP, "Traffic Growth Estimate" *Marlboro Hamlet Area Transportation Plan,* Memo April 24, 2008 to Dennis Doyle.
[17]Ibid.

Table 3.4-3 Project Site Trip Rate Summary				
Land Uses {ITE Code}	Trip Rates			
	A.M. Weekday Peak Hour		P.M. Weekday Peak Hour	
	IN (Trips/ Units)	OUT (Trips/ Units)	IN (Trips/ Units)	OUT (Trips/ Units)
Townhouse 137 Dwelling units {230}	0.082	0.402	0.381	0.187
Trip Generation, Institute of Transportation Engineers, 8th edition, Washington, DC, 2008.				

Table 3.4-4 Projected Residential Site Trips						
Land Uses (ITE Code)	Trips					
	A.M. Weekday Peak Hour			P.M. Weekday Peak Hour		
	IN (Trips)	OUT (Trips)	Total Trips	IN (Trips)	OUT (Trips)	Total Trips
Townhouse 137 Dwelling units {230}	11	55	66	52	26	78
Trip Generation, Institute of Transportation Engineers, 8th edition, Washington, DC, 2008.						
See trip rate Table 3.4-3.						

The Project is expected to generate a total of 66 new vehicle trips during the weekday a.m. peak hour and 78 trips new vehicle trips during the p.m. peak hour. The trips exiting and entering the project site are shown in Table 3.4-4.

Site Trip Distribution

Trip distribution for Dockside is shown in Figures 3.4-7 and 3.4-8 for the weekday a.m. and weekday p.m. time periods. The more conservative 51 percent of traffic to and from the south used in Marlboro transportation study[18] was used although more recent counts suggest the volumes are shifted slightly toward the north. The site generated trips (Table 3.4-4) during these periods are shown in Figures 3.4-9 and 3.4-10. Project trips are added to No Build volumes (Figures 3.4-5 and 3.4-6) to obtain the Build Condition traffic volumes (Figure 3.4-11 and 3.4-12).

The discussion of Build traffic operations (level of service) is contained in Section 3.4.6.

3.4.5 Levels of Service - Performance Measure

"Level of service" is used as a performance measure of effectiveness for traffic flow. Peak hour average vehicle delays are calculated to establish the quality of operation (level of service). Level of service is identified on a scale of level of service "A" representing the most efficient conditions to level of service "F" representing the least efficient conditions. A volume to capacity ratio of one means the volume is equal to the theoretical capacity. A volume to capacity ratio of one or greater results in level of service F for lane groups. A volume to capacity ratio of less

[18] *Marlboro Hamlet Area Transportation Plan: Final Report*, Creighton Manning Engineering, LLP, and Behan Planning Associates, LLC, December 2008.

than one indicates there is available capacity to handle additional traffic at the intersection. Detailed information concerning performance measures (delay, level of service, and volume to capacity ratios) are provided in Appendix D Attachment 3.

A level of service D or better is generally consider acceptable for signalized intersections lane groups. The acceptability of operations at unsignalized intersections is not determined solely on level of service, especially with two way stopped controlled intersections as the majority of traffic, in this case U.S. Route 9W traffic, is typically free flowing without delay.

3.4.6 Levels of Service

Levels of Service

The results of the level of service analyses for the study intersections showing individual groups of lanes or "lane groups" are summarized in Table 3.4-5. Level of service calculations are provided in Appendix D Attachment 4. The level of service criteria based on delay is slightly different for signalized and unsignalized intersections as described in Appendix D Attachment 3. The Highway Capacity Manual 2010[19] has revised level of service criteria to trigger a level of service F when volume to capacity ratio reaches one or more for unsignalized intersection approaches or for signalized lane groups.

Table 3.4-5 shows average vehicle delays, volume to capacity ratios, and level of service by lane group.

Existing Condition Levels of Service

Levels of service for all intersections studied are shown in Table 3.4-5. The U.S. Route 9W intersections with Western Avenue (CR 14) and with Dock Road operate with all movements at level of service D or better. The King Street left turn into U.S. Route 9W functions at level of service F in both the a.m. and p.m. peak hours. The actual average delay may be shorter as northbound drivers will sometimes stop to allow the left turns from King Street to occur. The Young Avenue left turn operates at level of service F in the a.m. peak hour and level of service E in the p.m. peak hour. During the worst portion of the a.m. peak hour, a traffic control officer halts U.S. Route 9W traffic to allow Young Avenue traffic to exit and for left turns from U.S. Route 9W. The level of service analysis reflects conditions in the absence of the traffic control officer.

No Build Level of Service

Table 3.4-5 summarizes the level of service for the No Build Condition (without the Dockside Development). In addition, the levels of service are shown for the U.S. Route 9W intersections with King Street and Western Avenue (CR 14), both with the signal and associated improvements and without such improvements. Young Avenue at U.S. Route 9W is anticipated to be signalized by 2012 and thus is shown with improvements only, with all lane groups at level of service D or better.

All intersections will operate with lane groups at a level of service D or better, except the Dock Road approach to U.S. Route 9W will be at a level of service E and the King Street unsignalized left turn onto U.S. Route 9W will be at a level of service F in both the a.m. and p.m. peak hours.

[19]Transportation Research Board of the National Academies, Highway Capacity Manual, Volume 3, Washington, D.C., 2010.

Build Condition Level of Service

With the Project, delays will increase at most intersections. However, all intersection lane groups will retain their No Build Condition level of service except the Dock Road approach to U.S. Route 9W which declines from level of service E to F in both the a.m. and p.m. peak hours, despite improvements to Dock Road. This essentially delays the site traffic. The site's access onto Dock Road will have a level of service A for all lane groups.

Table 3.4-5
Level of Service Summary All Conditions

Intersection Road	Lane Group Approach Direction - Movement	Levels of Service (Delay in seconds per vehicle) Volume to Capacity Ratio					
		Weekday A.M. Peak Hour			Weekday PM Peak Hour		
		Existing	No Build	Build	Existing	No Build	Build
U.S. Route 9W and Dock Road (unsignalized) **							
U.S. Route 9W	SB - L, T	A (9.5) 0.01	A (9.9) 0.01	A (10.0) 0.02	A (9.6) 0.00	B (10.2) 0.00	B (10.5) 0.04
Dock Road	WB - L, R	D (28.0) 0.01	E (35.2) 0.02	F (61.8) 0.50	D (32.0) 0.07	E (42.3) 0.10	F (55.3) 0.37
U.S. Route 9W and Western Avenue (CR 14) (unsignalized)							
U.S. Route 9W	NB - L, T	A (9.9) 0.08	B (10.4) 0.10	B (10.6) 0.10	B (10.2) 0.14	B (10.9) 0.17	B (11.0) 0.17
U.S. Route 9W and Western Avenue (CR 14) (signalized) *							
U.S. Route 9W	NB - L	---*	C (30.4) 0.33	C (30.4) 0.33	---*	C (30.6) 0.56	C (30.6) 0.56
	NB - T	---*	A (1.4) 0.57	A (1.4) 0.57	---*	A (1.3) 0.63	A (1.4) 0.65
U.S. Route 9W	SB - T	---*	A (7.7) 0.74	A (8.4) 0.77	---*	A (8.1) 0.76	A (8.5) 0.77
	Overall	---*	A (5.5)	A (5.9)	---*	A (6.1)	A (6.3)
U.S. Route 9W and King Street (unsignalized)							
King Street	EB - L	F (104.3) 0.90	F (228.5) 1.25	F (257.4) 1.32	F (97.8) 0.81	F (279.7) 1.33	F (348.8) 1.49
King Street	EB - R	C (15.0) 0.23	C (16.9) 0.28	C (17.3) 0.29	B (14.2) 0.19	C (15.9) 0.23	C (16.1) 0.23
U.S. Route 9W and King Street (signalized) *							
King Street	EB - L	---*	C (24.1) 0.43	C (24.1) 0.43	---*	C (23.6) 0.36	C (23.8) 0.39
King Street	EB - R	---*	C (23.7) 0.36	C (23.7) 0.36	---*	C (23.3) 0.30	C (23.3) 0.30
U.S. Route 9W	NB - T	---*	B (11.7) 0.70	B (11.8) 0.71	---*	B (17.6) 0.85	B (18.8) 0.87
U.S. Route 9W	SB - T	---*	A (9.0) 0.63	A (9.1) 0.64	---*	A (8.7) 0.61	A (8.8) 0.62
	Overall	---*	B (12.4)	B (12.5)	---*	B (15.0)	B (15.7)
U.S. Route 9W and Young Avenue (unsignalized)							
U.S. Route 9W	SB - L, T	B (10.5) 0.12	---*	---*	A (9.9) 0.00	---*	---*
Young Avenue	WB - L	F (106.0) 0.59	---*	---*	E (46.4) 0.04	---*	---*
	WB - R	C (16.5) 0.12	---*	---*	C (16.1) 0.01	---*	---*
U.S. Route 9W and Young Avenue (signalized)							
Bayside	EB - L	---*	D (35.5) 0.47	D (35.5) 0.47	---*	C (33.6) 0.34	C (33.6) 0.34
	EB - T, R	---*	C (30.6) 0.17	C (30.6) 0.17	---*	C (32.7) 0.35	C (32.7) 0.35
Young Avenue	WB - L	---*	C (32.6) 0.19	C (32.6) 0.19	---*	C (33.8) 0.02	C (33.8) 0.03
	WB - T, R	---*	C (30.9) 0.22	C (30.9) 0.22	---*	C (31.2) 0.03	C (31.2) 0.03
U.S. Route 9W	NB - L	---*	B (10.8) 0.06	B (10.9) 0.06	---*	B (12.8) 0.22	B (14.0) 0.23
	NB - T, R	---*	C (22.2) 0.86	C (24.6) 0.89	---*	B (18.9) 0.84	B (19.7) 0.85
U.S. Route 9W	SB - L	---*	B (14.9) 0.32	B (15.4) 0.34	---*	B (10.5) 0.01	B (11.0) 0.01
	SB - T, R	---*	B (19.0) 0.81	B (19.3) 0.81	---*	C (20.7) 0.87	C (22.8) 0.89
	Overall	---*	C (21.7)	C (22.9)	---*	C (20.5)	C (21.8)
Dock Road and Site Access							
Dock Road	EB - L	---***	---***	A (7.3) 0.01	---***	---***	A (7.4) 0.03
site Access	SB - L, R	---***	---***	A (8.5) 0.05	---***	---***	A (8.5) 0.03

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound. L = left, R= right, T = through,.
See Appendix D Attachment 3 for level of service criteria.

* Subject intersection is not signalized in the Existing Condition and shown in No Build and Build conditions as signalized.

** Build Condition shown with wider curb radius on Dock Road at U.S. Route 9W.

*** Intersection does not exist except in build condition.

3.4.7 Improvements and Mitigation Measures

No significant adverse impacts to traffic operating conditions are anticipated to result from the No-Build to Build Condition.

Level of service F at unsignalized approaches to major routes is not uncommon. The Applicant has proposed improving the Dock Road approach to U.S. Route 9W by improving the grade along the Dock Road approach. Also as part of this work, the Applicant will correct any parking or other signs where the road is improved. Highway work permits will be required from the New York State Department of Transportation (NYSDOT) to allow for improvements to Dock Road that occur in the State right-of-way. The increase in traffic volume along Dock Road that results from construction of Dockside will not result in volumes that would warrant a traffic signal. Thus, a traffic signal is not proposed as mitigation.

A path to the lower field of the Elementary School allowing site residents to get to the lower school field is proposed to be constructed by the Applicant. This could reduce auto traffic to the school.

The Applicant will also construct a sidewalk from Dockside to U.S. Route 9W along the existing private road serving the site, Hudson Way. This will encourage residents to walk into the Marlboro hamlet for local convenience needs, e.g., banking, having lunch, rather than use a vehicle. This also provides access to the gravel parking lot used by the Falcon which is being offered by the Applicant to the Town for its use.

The project will have sidewalks throughout connecting units, the gazebo, and club house. A emergency access is also provided to Dock Road.

It is suggested that the intersection of King Street and U.S. Route 9W be boxed consistent with DO NOT BLOCK INTERSECTION markings and signage[20] to formalize the courtesy pattern at least until such time as a signal can be installed. It is suggested the Town initiate and implement the process with the NYSDOT rather than wait for a development to be constructed or the intersection to be signalized. The Applicant's portion of this mitigation is the concept put forth herein. A portion of the safety and delay benefits are also already occurring due to courtesy of drivers on U.S. Route 9W northbound. This improvement would require a highway work permit from the NYSDOT if not done by the NYSDOT. Appendix D Figure D-7 shows an example of this type of improvement used effectively on NYS Route 9D in the City of Beacon, New York.

[20]U.S. Department of Transportation, Federal Highway Administration, Manual on Traffic Control Devices for Streets and Highways, Washington D.C., 2009, Sections 2B.53 and 3B.17.

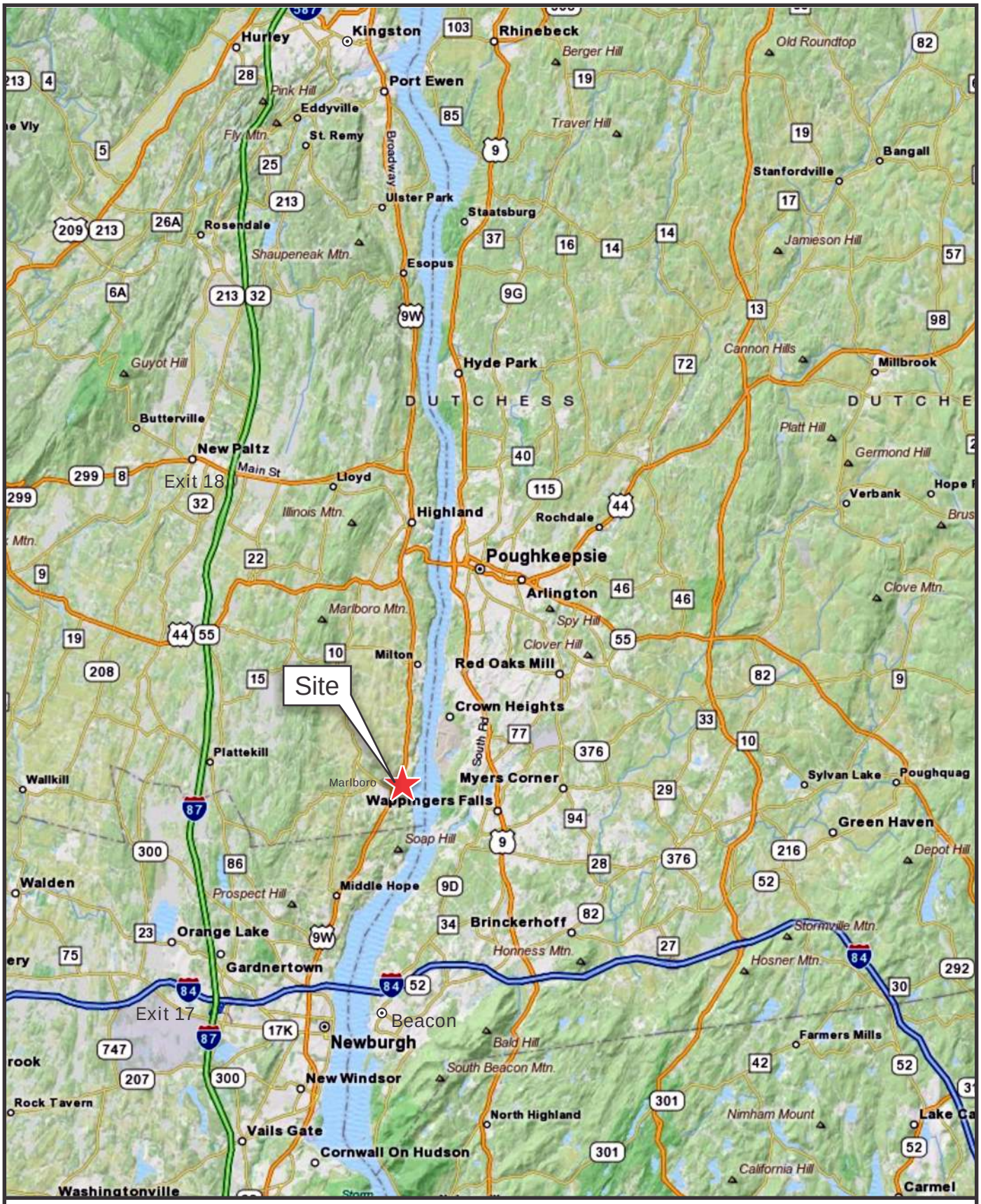

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Figure 3.4-1: Regional Transportation Network

Dockside at Marlborough

Town of Marlborough, Orange County, New York

Map Source: Mapquest.com

Approx. Scale: 1 inch = 3.5 mi.

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Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418

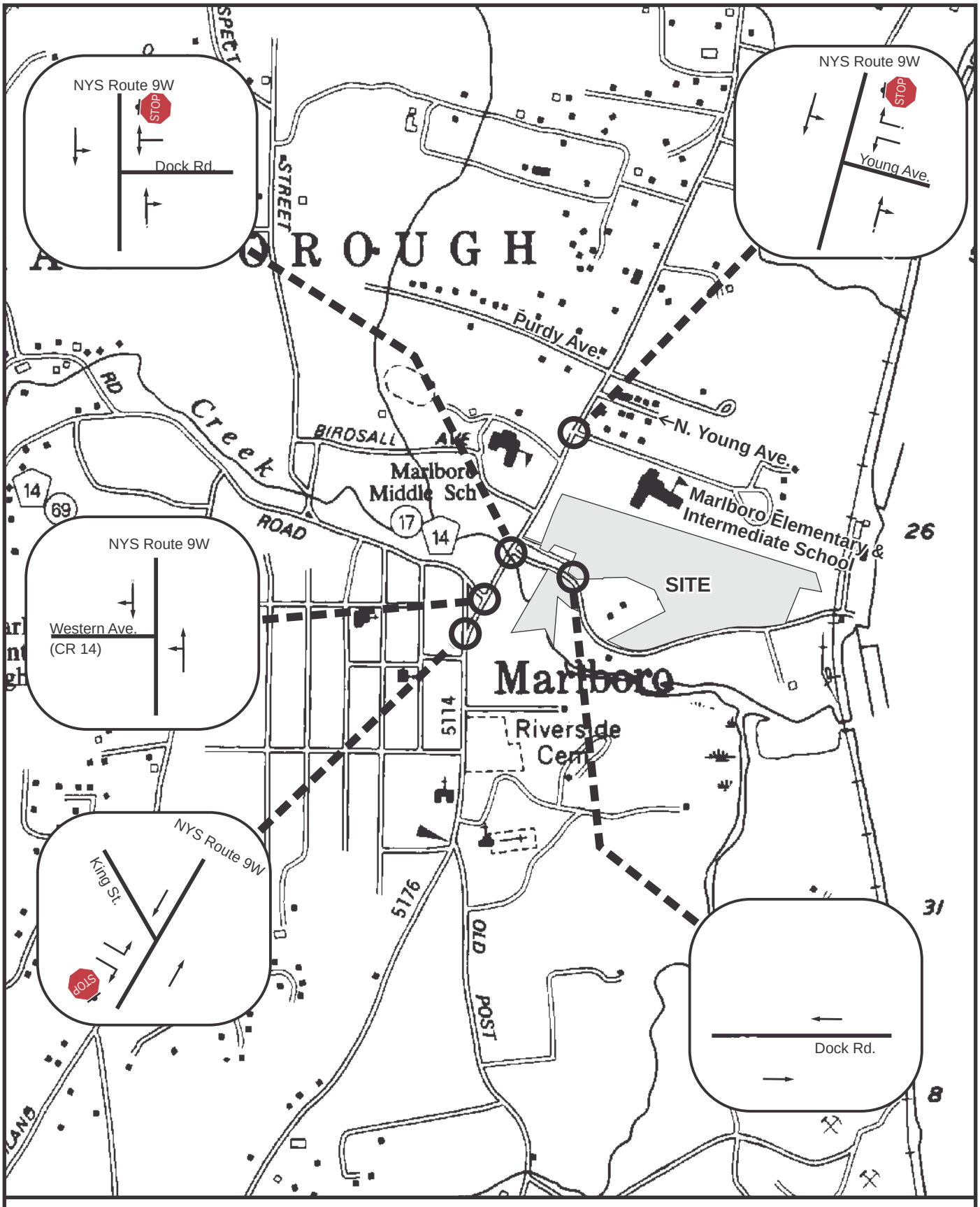

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Figure 3.4-2: Existing Local Transportation

Dockside at Marlborough

Town of Marlborough, Orange County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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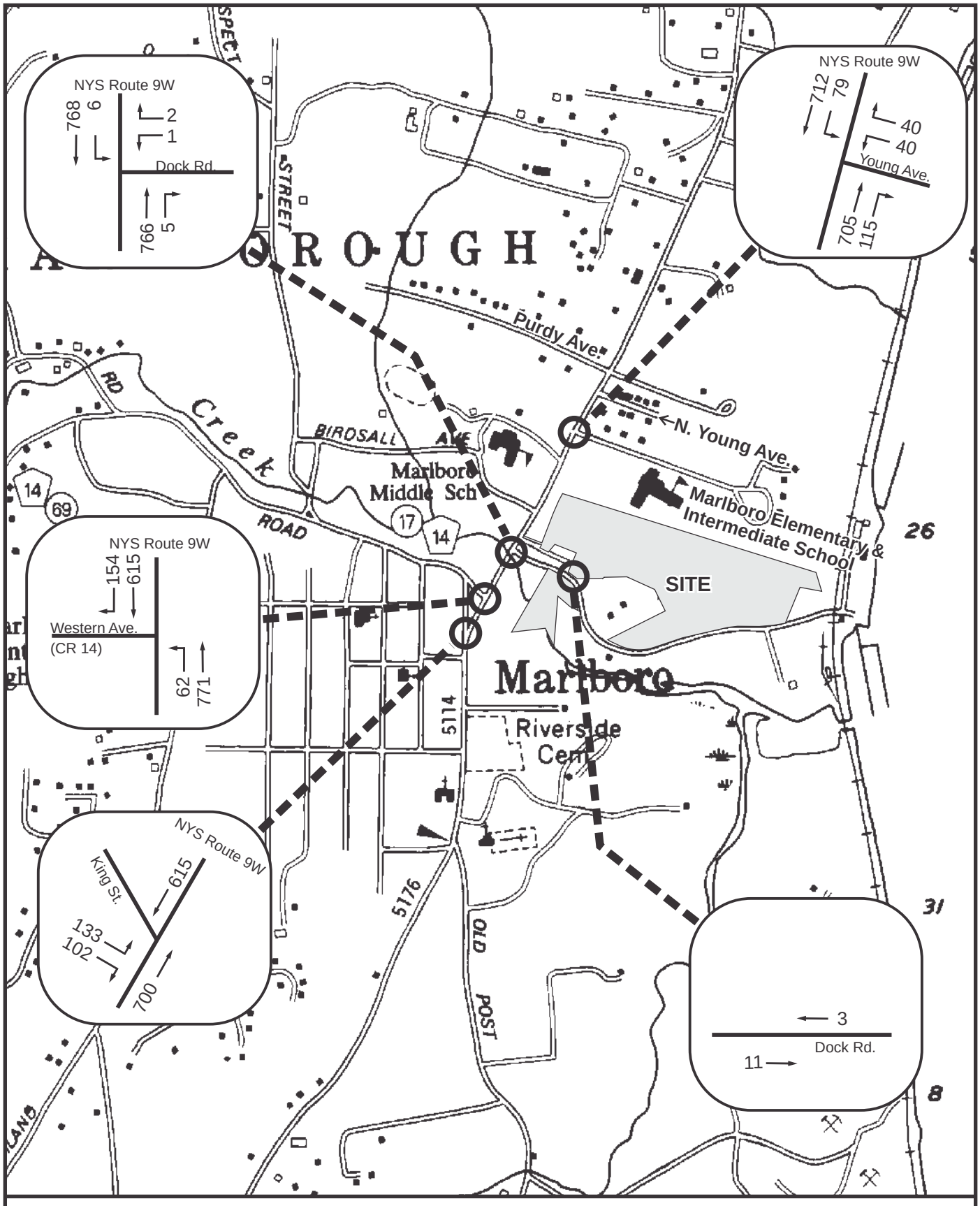

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Figure 3.4-3: Existing AM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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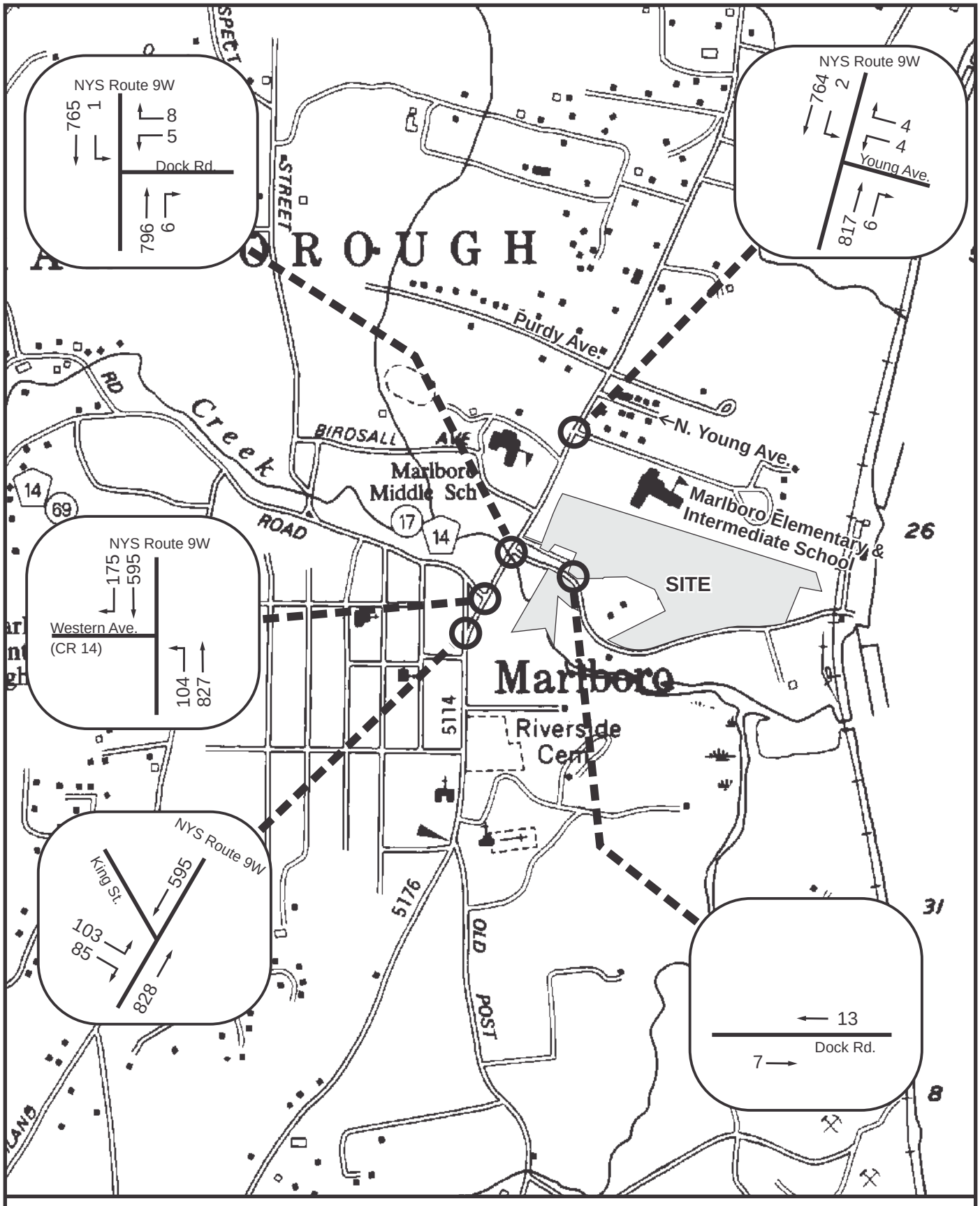

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Figure 3.4-4: Existing PM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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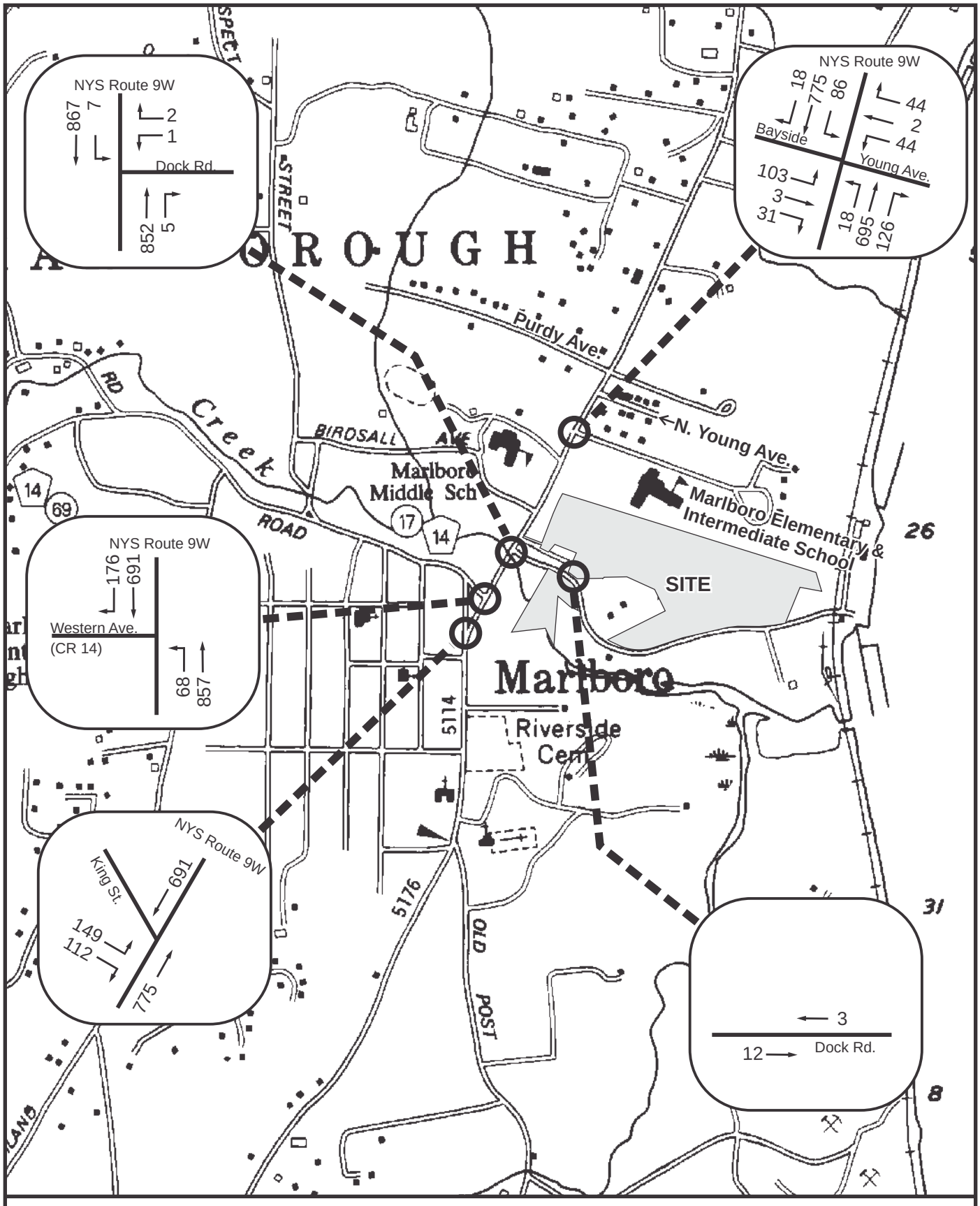

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Figure 3.4-5: No Build AM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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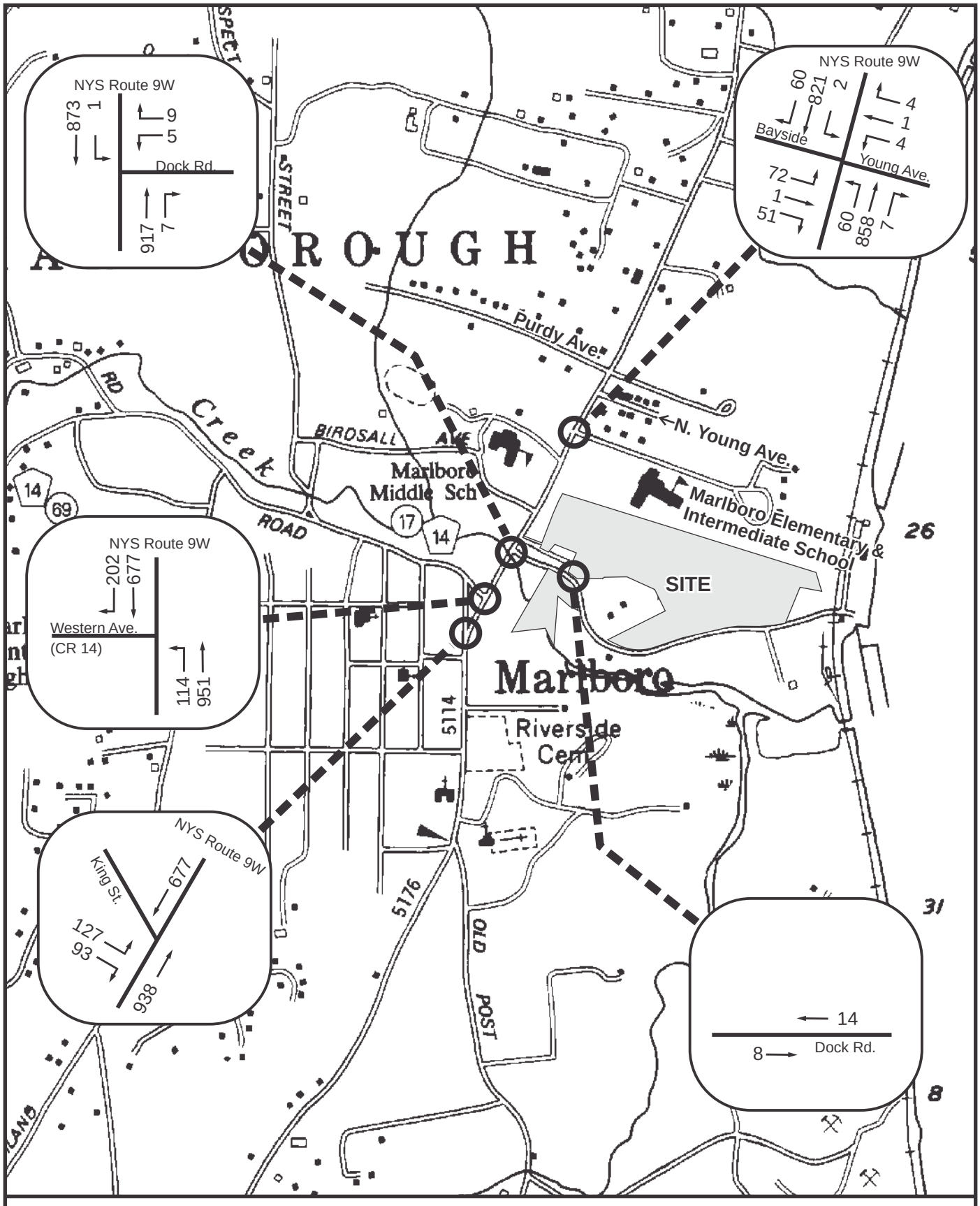

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Figure 3.4-6: No Build PM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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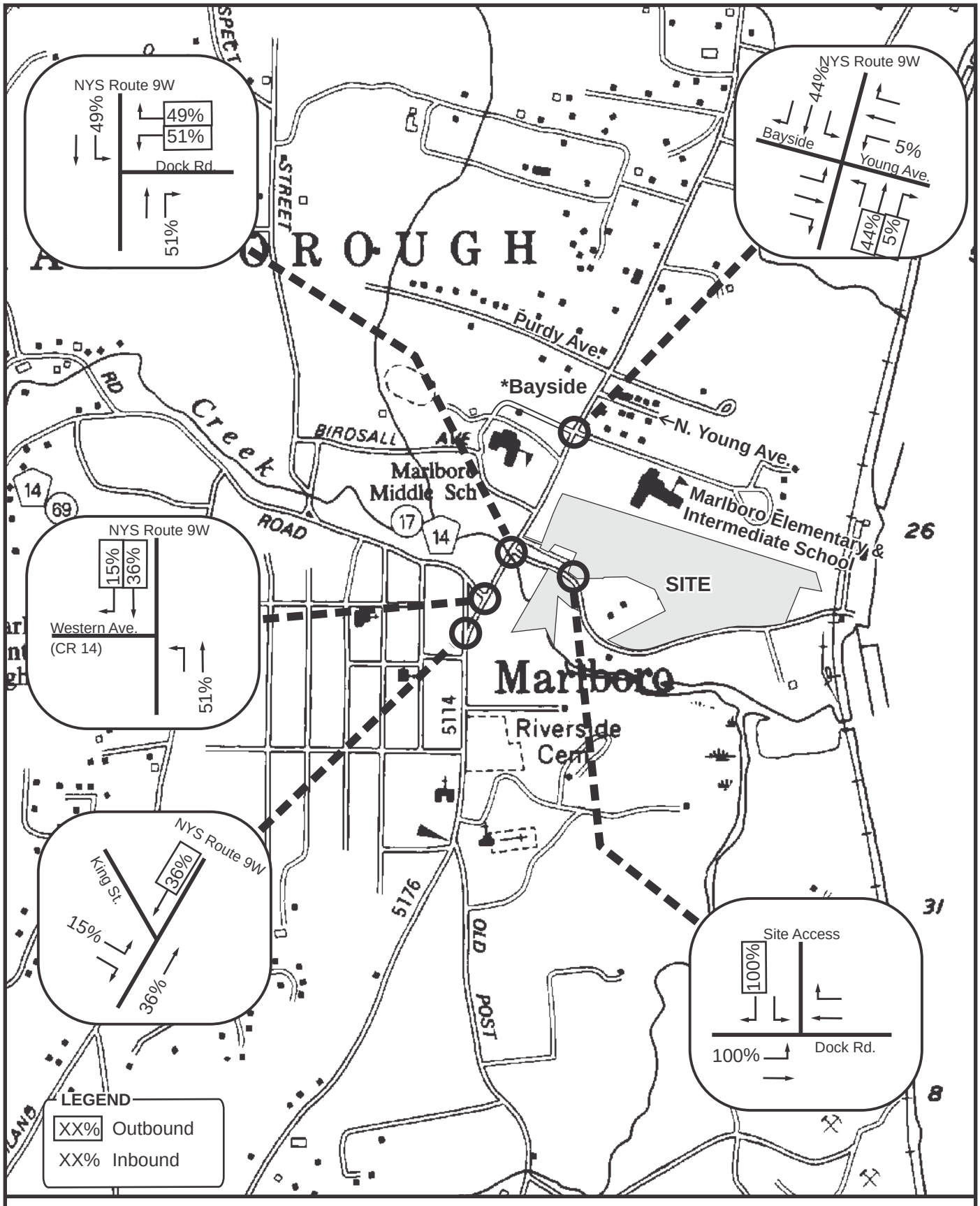

Figure 3.4-7: Distribution Site AM Peak Hour Traffic
Dockside at Marlborough
Town of Marlborough, Ulster County, New York
Map Source: NYS DOT Planimetric Map, Wappingers Quad
Scale: 1" = 1,000'

*Only Bayside connection Middle School to US Route 9W shown

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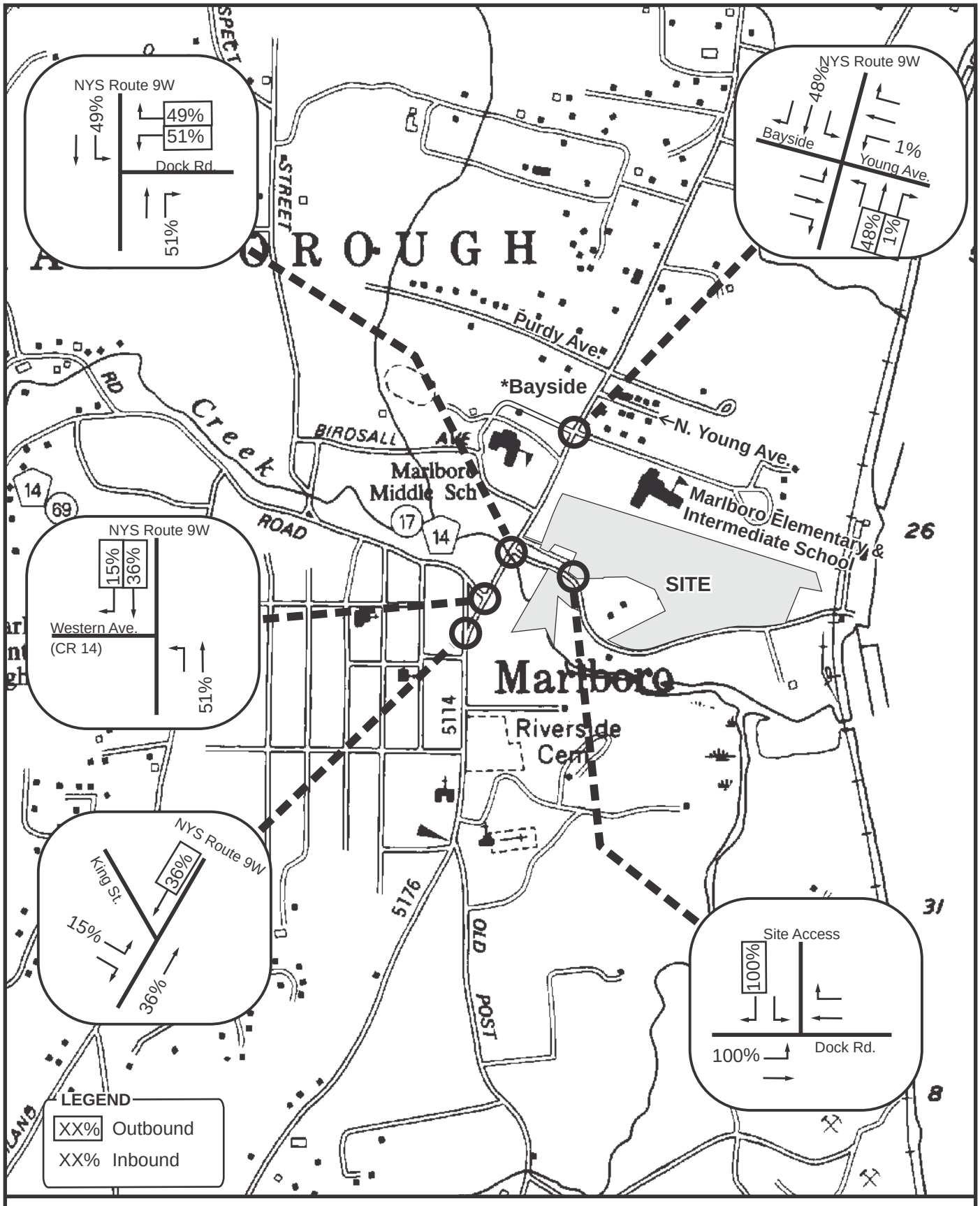

Figure 3.4-8: Distribution Site PM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

*Only Bayside connection Middle School to US Route 9W shown

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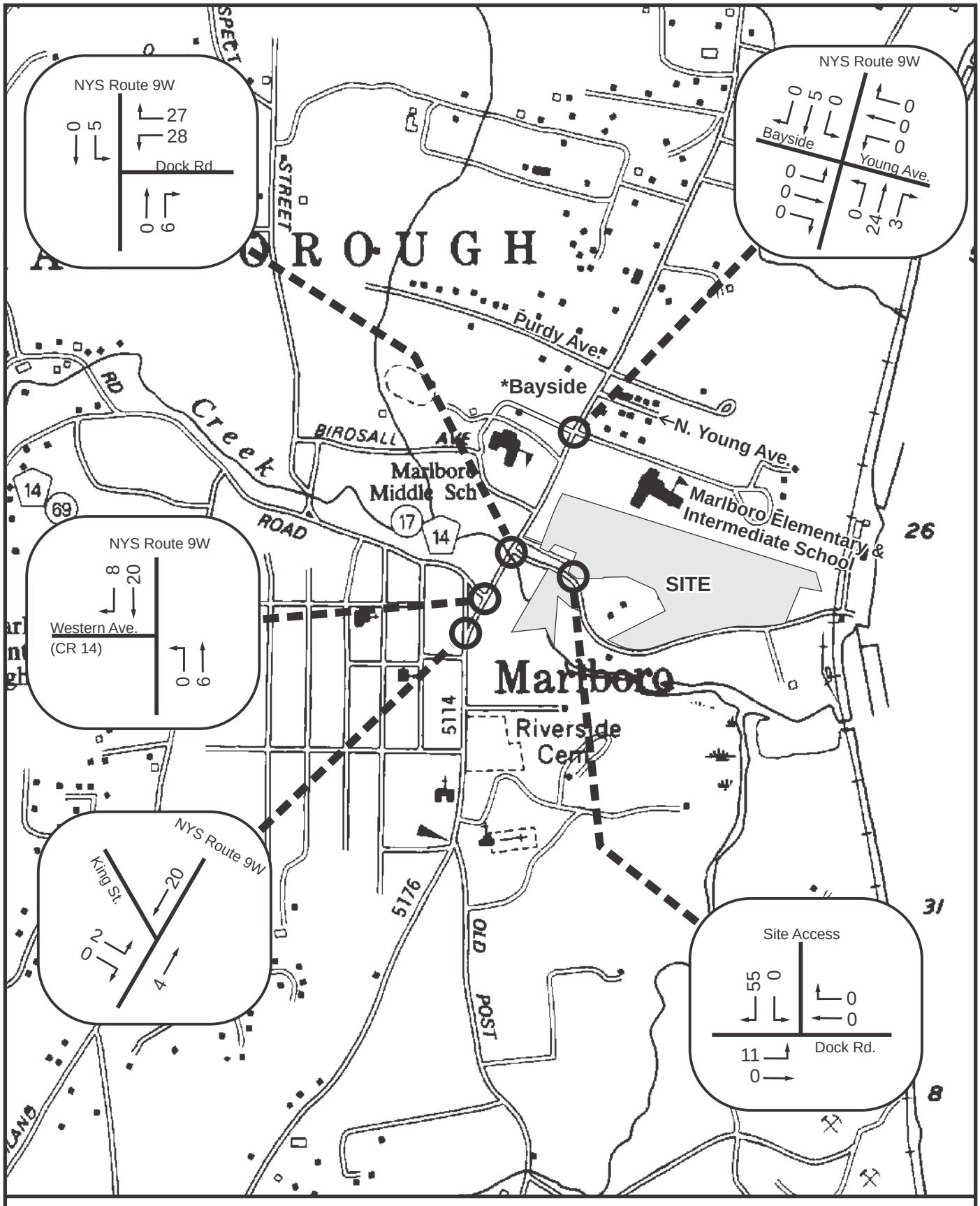

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*Only Bayside connection Middle School to US Route 9W shown

Figure 3.4-9: Site Generated AM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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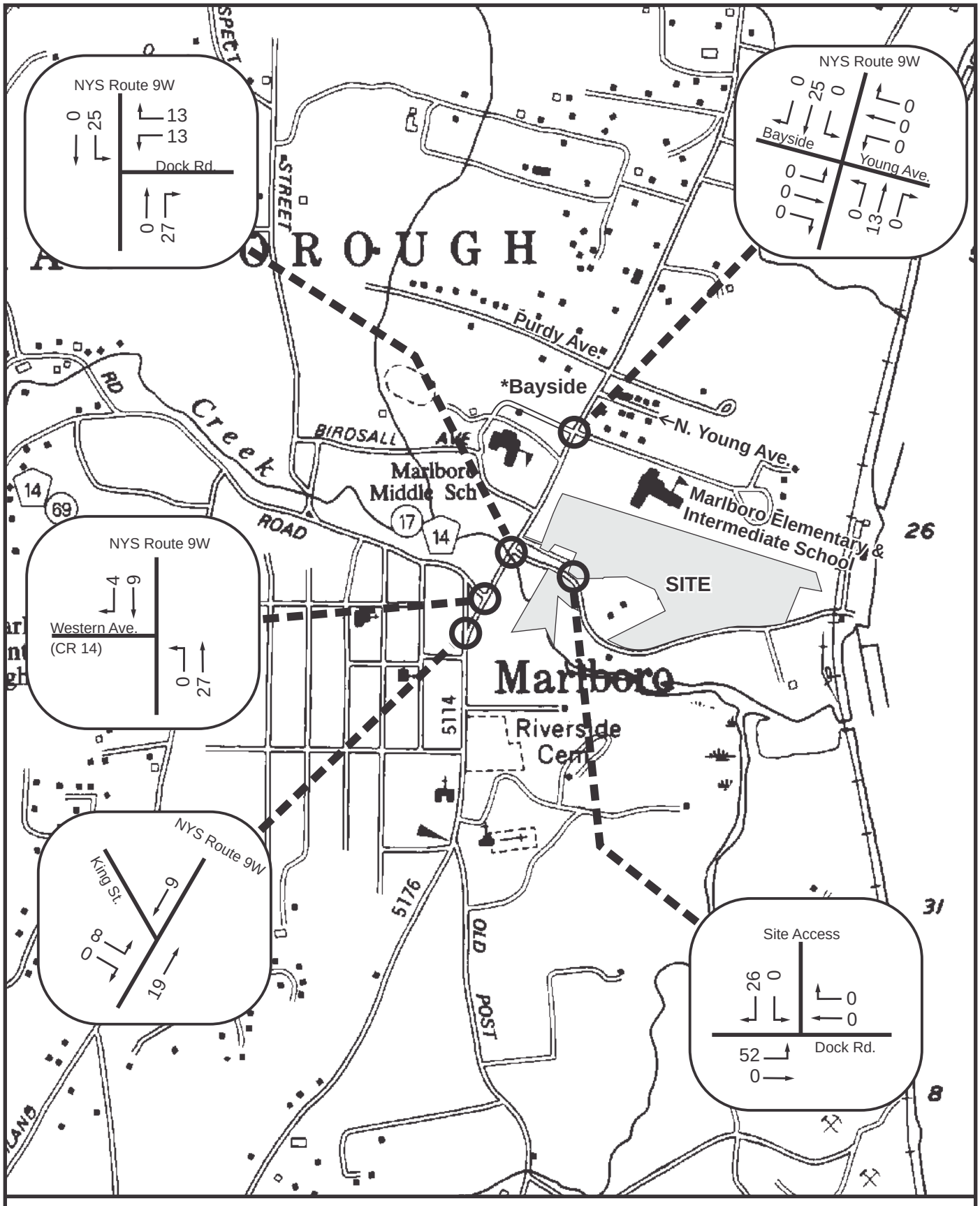

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*Only Bayside connection Middle School to US Route 9W shown

Figure 3.4-10: Site Generated PM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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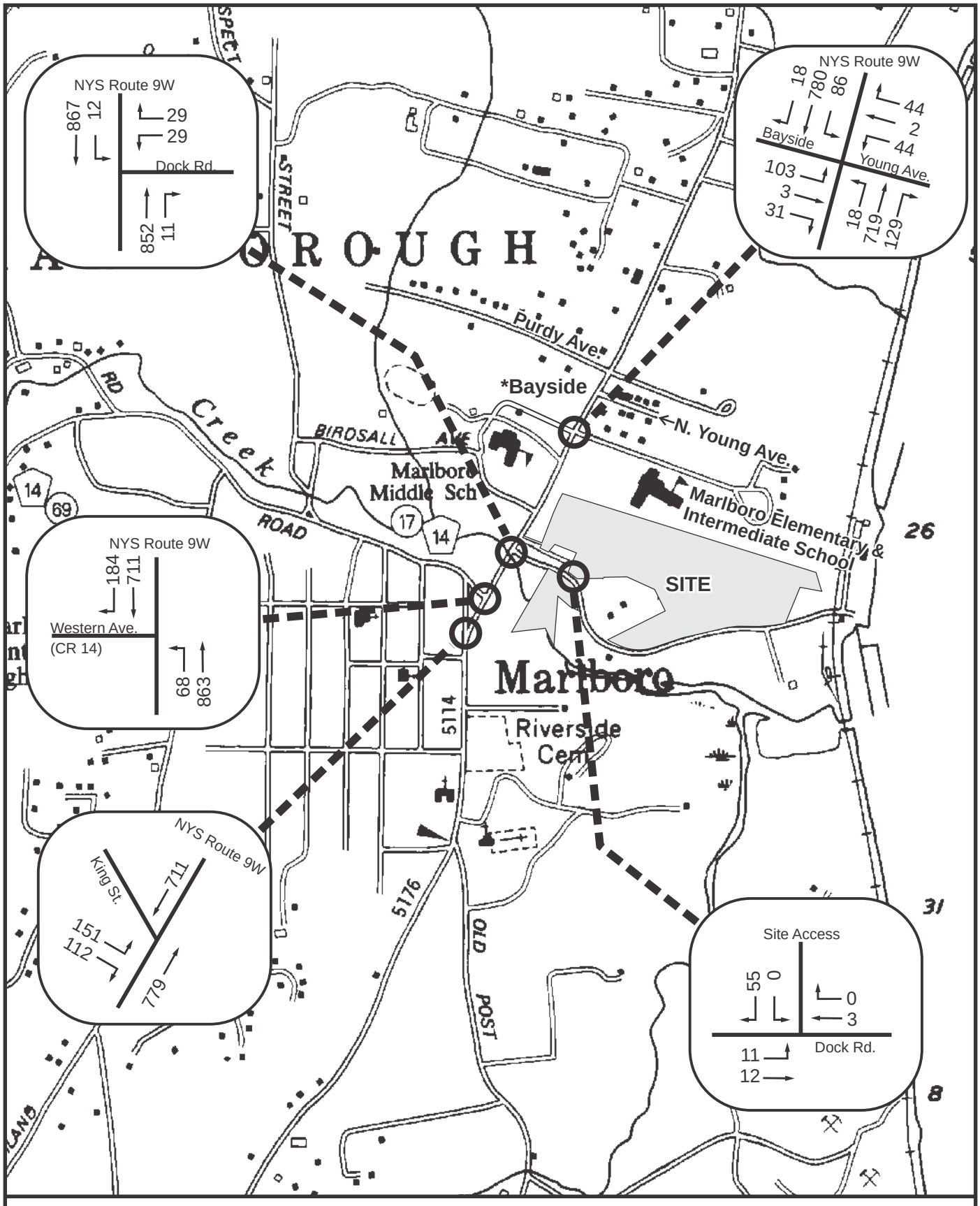

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*Only Bayside connection Middle School to US Route 9W shown

Figure 3.4-11: Build AM Peak Hour Traffic

Dockside at Marlborough

Town of Marlborough, Ulster County, New York

Map Source: NYS DOT Planimetric Map, Wappingers Quad

Scale: 1" = 1,000'

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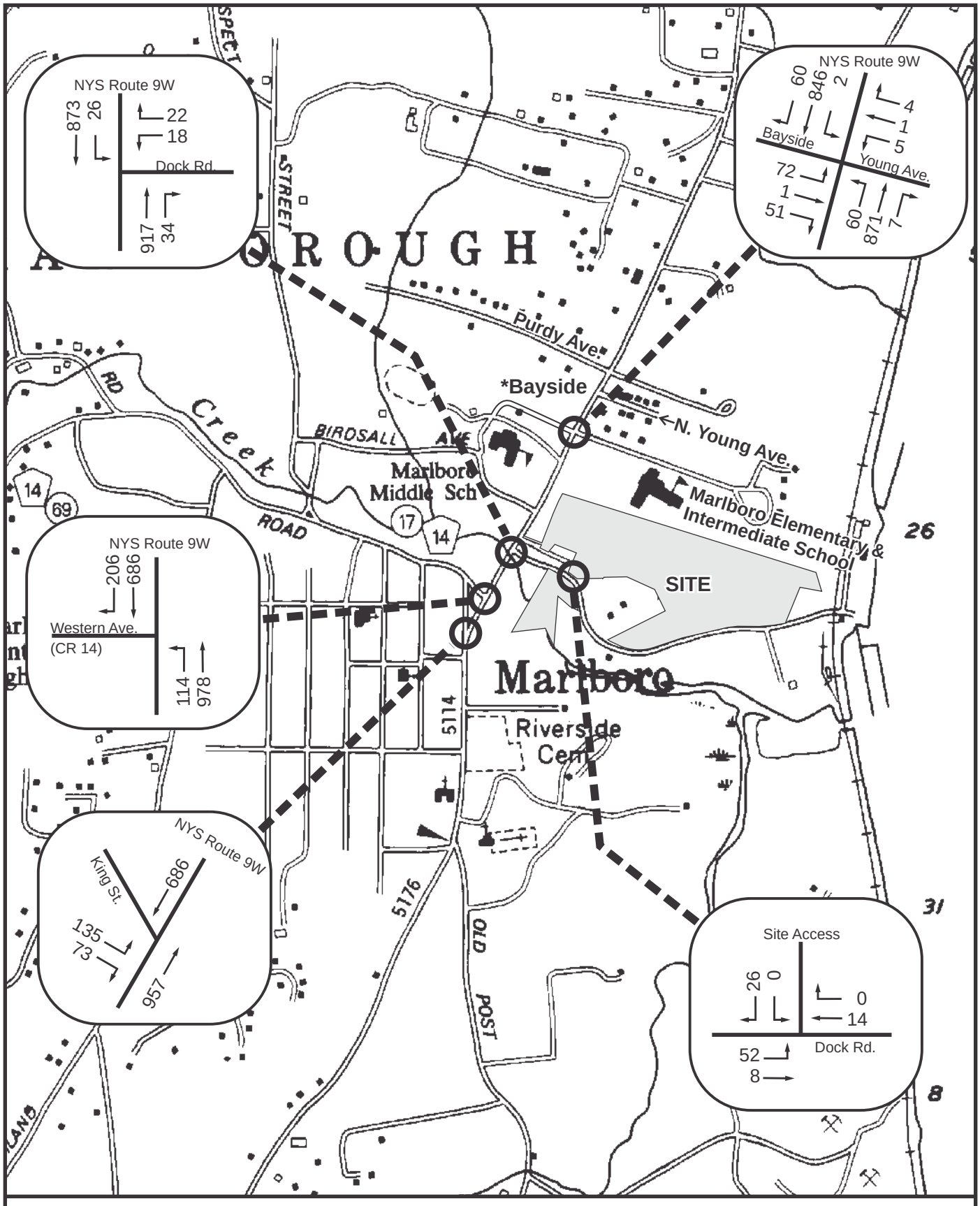

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*Only Bayside connection Middle School to US Route 9W shown

Figure 3.4-12: Build PM Peak Hour Traffic
Dockside at Marlborough
Town of Marlborough, Ulster County, New York
Map Source: NYS DOT Planimetric Map, Wappingers Quad
Scale: 1" = 1,000'

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