2.19-1 INTRODUCTION

The preceding sections of Chapter 2 evaluate the potential for significant adverse impacts to result from Project 1, Shaft and Bypass Tunnel Construction. This section provides a summary of measures that are already incorporated into Project 1 and additional mitigation measures that have been identified as feasible for implementation to fully mitigate or lessen the remaining predicted temporary significant adverse impacts Project 1 construction. DEP staff and a construction management firm contracted by DEP for oversight of contractors will enforce contract stipulations and project requirements and mitigation (within the control of DEP) as included in the FEIS.

This section is organized as follows:

- Section 2.19-2, "Measures Incorporated into Project 1," describes the aspects of Project 1 that have been designed specifically to reduce potential impacts on the surrounding communities.
- Section 2.19-3, "Summary of Predicted Temporary Significant Adverse Impacts from Construction of Project 1," discusses the potential impacts that would likely result with Project 1 construction.
- Section 2.19-4, "Additional Transportation Mitigation Measures for the Construction of Project 1," gives detail about the various methods that could be implemented to eliminate all but one of Project 1's predicted temporary significant adverse traffic impacts in the study areas.

2.19-2 MEASURES INCORPORATED INTO PROJECT 1

Since DEP is concurrently undertaking design of the proposed bypass tunnel construction and connection while the EIS was under preparation, many measures have been incorporated into the Project 1 design that would substantially reduce the potential for additional temporary significant adverse impacts to result from the construction of Project 1. These include the decision to employ inundation plugs at both connection sites instead of constructing additional shafts at each site; limiting work hours at the east connection site for phases of work that do not delay completion of

Project 1; limiting the inundation plug installation at the east connection site to one 12-hour shift from 7 AM to 7 PM; limiting truck traffic to and from the east connection site between 11 PM and 7 AM; committing to tree clearing at both connection sites during seasonal periods that would not disturb potential Indiana bat populations; and utilizing connection sites already under DEP ownership or sold to DEP by willing sellers.

In addition, within technical study areas, initial evaluations of potential impacts from the construction of Project 1 were developed, and where potential temporary significant adverse impacts were identified, measures to reduce such impacts were evaluated.

2.19-3 SUMMARY OF PREDICTED TEMPORARY SIGNIFICANT ADVERSE IMPACTS FROM CONSTRUCTION OF PROJECT 1

Construction of Project 1 is expected to result in temporary significant adverse impacts on neighborhood character (near the east connection site in the east of Hudson study area), traffic (in both the west and east of Hudson study areas), and noise (in both east and west of Hudson study areas). A summary of potential additional mitigation measures is provided below.

2.19-3.1 NEIGHBORHOOD CHARACTER

During Project 1 construction, as described in detail in Section 2.3, "Neighborhood Character," activities would temporarily adversely affect the neighborhood character near the east connection site. In particular, changes to the visual character of the east connection site and the increases in traffic, lighting, and noise during construction of Project 1 would temporarily adversely affect the neighborhood character for those residences near the east connection site. However, this impact to neighborhood character would be temporary and would not be expected to result in disruptions to neighborhood character once construction is complete. Since this temporary adverse impact could not be fully mitigated, the impact on neighborhood character in the east of Hudson study area near the east connection site from the construction of Project 1 is also identified as an unavoidable temporary significant adverse impact in Chapter 8, "Unavoidable Adverse Impacts."

2.19-3.2 TRANSPORTATION

The results of the traffic analysis in Section 2.10 indicate that there would be potential temporary significant adverse impacts at certain study area intersections in both the west of Hudson and east of Hudson study areas. These impacts and their proposed mitigation measures are described and analyzed later in section 2.19-4, "Additional Transportation Mitigation Measures for the Construction of Project 1." Suggested traffic mitigation measures would consist of signal timing changes, upgrading traffic signal controller and detectors at some intersections, a Traffic Management Plan (which would include an outreach/ communication plan with the towns, schools, police, and other area agencies) for the connection sites and west of Hudson and east of

Hudson study areas, roadway pavement monitoring on local roads accessed by trucks for the east connection site, and clearing some vegetation in the right-of-way near a few intersections in the east of Hudson study area.

The mitigation measures suggested below (for both the west and east of Hudson study areas) would generally eliminate these predicted temporary significant adverse traffic impacts, except at the intersection of Route 9W and Fostertown Road during the AM and PM peak hours, where the proposed mitigation would reduce temporary impacts from Project 1 construction traffic. This remaining temporary significant adverse traffic impact could not be fully mitigated, and is identified as an unavoidable temporary significant adverse impact in Chapter 8, "Unavoidable Adverse Impacts." If the traffic mitigation measures identified are not implemented for the predicted temporary significant adverse impacts, these predicted temporary significant adverse traffic impacts from Project 1 construction traffic would remain un-mitigated.

2.19-3.3 NOISE

As described in Section 2.13, "Noise," in the assessment of noise impacts, DEP examined the potential off-site noise impacts from the expected construction activities in each phase, and undertook evaluations of a range of potential measures to eliminate or reduce those impacts. As a result, for both the west of Hudson and east of Hudson study areas, all practical noise control methods would be incorporated into DEP's contract specifications. The remaining temporary significant adverse noise impacts near the connection sites could not be fully mitigated, and are identified as unavoidable temporary significant adverse impacts in Chapter 8, "Unavoidable Adverse Impacts." However, these noise impacts would be temporary and would not occur once construction is complete. As noted in Section 2.13, DEP has committed to an extensive series of noise control measures, which are outlined in the Conceptual Noise Mitigation Plan (CNMP) in Appendix 2.19-2. The CNMP presents from a conceptual standpoint the noise control measures that would be implemented by DEP, its construction management staff, and its contractors as part of Project 1 and Project 2B, RWBT Connection and Repair, including Wawarsing of the proposed program. A goal of the CNMP is to ensure that the proposed program's noise during construction is decreased to the maximum extent practicable.

The CNMP includes conceptual guidelines for developing noise mitigation in the future when the construction program is formulated in detail, along with some specific noise control measures that can be committed to ahead of time, a performance-based commitment for noise generated by construction of the proposed program, as well as mechanisms for communication with the public about concerns relating to noise from the proposed program. Together, these measures are intended to reduce potential noise impacts resulting from the project to the extent feasible and practicable.

The proactive noise control commitments of the CNMP include source controls, such as quieter backup alarms (where practicable and feasible and as allowed by applicable laws and regulations), maximum noise emission limits for equipment, rubber-lined containers dump truck beds, and scheduling constraints for certain noisy activities. Also included are path controls, such

as noise barriers surrounding the east connection site and portable noise barriers surrounding loud stationary construction equipment. Receptor controls are also proposed for some areas in which residents would be eligible for upgrades to bedroom windows facing the construction as well as air-conditioning for such rooms.

In addition to the above measures, the CNMP would also require a continuous noise monitoring program to be performed throughout the construction period. The monitoring would be performed by DEP's construction management staff, not the contractor, at various locations along the property line of each connection site to determine and record the amount of noise generated by construction activities, compare these levels to the committed noise performance thresholds, determine the cause of exceeding such thresholds, and undertake measures to eliminate exceedances of noise performance thresholds from construction-related activities. Finally, the contractors and sub-contractors performing the construction work would be required to report to DEP and its construction managers monthly regarding noise control measures and planned changes in construction work, equipment, or schedule. DEP's construction managers will report the results of noise monitoring and document any noise complaints received and follow-ups/changes incorporated as a result of such.

2.19-4 ADDITIONAL TRANSPORTATION MITIGATION MEASURES FOR THE CONSTRUCTION OF PROJECT 1

In Section 2.10, "Transportation," the results of the traffic analysis indicate that there would be predicted temporary significant adverse impacts at certain intersections in both the west of Hudson and east of Hudson study areas. These impacts and their proposed mitigation measures are described and analyzed below. In addition, where such impacts are projected to continue with Project 2B, the mitigation measures applicable to Project 1 would also be expected to mitigate Project 2B's predicted impacts (see Section 4.2).

As described in Section 2.10, future conditions during peak construction conditions have been assessed in both west of Hudson and east of Hudson study areas, without and with Project 1, Shaft and Bypass Tunnel Construction.

Mitigation analyses have been prepared to develop measures that would restore traffic conditions (lane group and/or approach delays) and level of service (LOS) to future without Project 1 levels or better. These measures were developed for peak construction periods, and would address potential impacts not just for both peak but also the full duration of the construction of Project 1. Where it has not been practical to identify mitigation that would return service conditions to the future without Project 1 traffic conditions, measures have been identified that would reduce the predicted impacts from Project 1.

For some measures, such as signal timing changes, the various agencies responsible for maintaining traffic flow and roadways in the study areas could conduct field inspections of the various intersections while Project 1 construction is underway. The inspections would serve as

an opportunity to determine if the proposed mitigation measures are warranted (particularly because traffic from anticipated future without Project 1 projects or background growth may be less than analyzed in this report).

The following describes the predicted temporary significant adverse traffic impacts with Project 1 and the associated recommended traffic improvements/mitigation measures for these impacts at intersections in both west and east of the Hudson study areas.

WEST OF HUDSON

As discussed in Section 2.10, it was determined that predicted temporary significant adverse impacts would occur with Project 1 at nine signalized approaches at five intersections in the west of Hudson study area (if an approach to an intersection would be impacted during the AM and PM, then two approaches are considered to be impacted). These impacts are anticipated to occur at five intersections, with six of these predicted temporary significant adverse impacts occurring during the AM peak hour and three during the PM peak hour. The following section describes the benefits of mitigation in returning an impacted approach to the predicted level of service in the future without Project 1.

Tables 2.19-1 and **2.19-2** list the recommended mitigation measures and show the results of applying them for the AM and PM peak hours at each location, respectively. The assessment presented here relies on a combination of traffic signal retiming changes as the recommended measures for the signalized intersections. A retiming consists of shortening the length of a green light and giving that extra time to lengthen the green light at an impacted approach. This means that mitigation would improve the approaches with predicted temporary adverse impacts, but other approaches may experience additional delays. However, any new delays resulting from signal retiming would not cause an exceedance of the *New York City Environmental Quality Review (CEQR) Technical Manual* (January 2012) guidelines.

At some locations, traffic signal controller and detectors could be upgraded, which the DEP would discuss funding as part of Project 1(if agreements can be reached with New York State Department of Transportation (NYSDOT) and the local transportation representatives). Subsequent to the issuance of the DEIS, DEP met with NYSDOT representatives to discuss the proposed mitigation measures, such as those presented for the west of Hudson study area. DEP has reached general agreements with NYSDOT on the types of upgrades at the impacted intersections that DEP will fund, and gained concurrence from NYSDOT that these measures will mitigate the temporary significant adverse impacts from Project 1 construction traffic. However, while the intersection of Route 9W and Fostertown Road would benefit from upgraded controllers and detectors funded by DEP, this intersection would still have an unmitigated predicted temporary significant adverse impact from Project 1, as discussed further below. Once Project 1 construction is underway, the various agencies responsible for maintaining traffic flow and roadways in the study area could conduct field inspections of the various intersections to determine if the proposed mitigation measures are warranted (particularly because traffic from anticipated No Build projects or background growth may be less than analyzed in this report).

Table 2.19-1
2015 Future Without Project 1, Future with Project 1, and Future with Project 1 with Mitigation Conditions
LOS Summary—West of Hudson Study Area, AM Peak Hour (7:15 AM - 8:15 AM)

No.	Intersection	Approach	AM Peak Hour (7:15 AM - 8:15 AM)												Mitigation Measures
			2015 Future w/o Project 1				2015 Future with Project 1				2015 Future with Project 1 with Mitigation.				
			Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	
1	Route 9W (N-S) & I-84 EB Ramps	EB	L	0.63	40.4	D	L	0.67	42.5	D	L	0.67	42.5	D	Shift 5 seconds of green time from the NB phase to the SB left-turn phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			LT	0.61	39.5	D	LT	0.65	41.4	D	LT	0.65	41.4	D	
			R	1.12	113.8	F	R	1.12	113.8	F	R	1.12	113.8	F	
		NB	T	0.44	25.0	C	T	0.45	25.1	C	T	0.54	30.2	C	
			R	0.65	8.2	A	R	0.65	8.2	A	R	0.73	13.3	B	
		SB	L	1.21	128.3	F	L	1.26	147.2	F+	L	1.05	101.3	F	
			T	0.67	13.3	B	T	0.68	14.3	B	T	0.68	16.7	B	
		INT			54.9	D			60.7	E			51.0	D	
2	Route 9W (N-S) & N. Plank Rd./I-84 WB Off Ramp	EB	L	0.15	25.6	C	L	0.15	25.6	C	L	0.15	25.6	C	Mitigated with signal retiming at Route 9W & I-84 EB Ramps intersection (see mitigation measures for intersection 1) Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			R	1.10	**	F	R	1.10	**	F+	R	1.10	**	F	
		WB	R	0.22	0.7	A	R	0.31	1.2	A	R	0.31	1.2	A	
		NB	L	0.40	34.7	C	L	0.40	34.0	C	L	0.40	36.8	D	
			T	0.23	9.4	A	T	0.25	9.6	A	T	0.25	11.0	B	
		SB	T	0.79	37.0	D	T	0.84	38.3	D	T	0.84	38.3	D	
			R	0.52	5.5	A	R	0.55	5.6	A	R	0.55	5.6	A	
		INT			160.6	F			182.2	F			123.4	F	
3	N. Plank Road (E-W) & I-84 WB Ramps	EB	T	1.23	141.4	F	T	1.25	146.9	F+	T	1.23	140.7	F	Shift 1 second of green time from the WB left-turn phase to the EB phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			R	0.21	11.7	B	R	0.21	12.0	B	R	0.21	11.8	B	
		WB	L	0.75	39.5	D	L	0.76	39.7	D	L	0.76	40.6	D	
			T	0.16	4.6	A	T	0.16	4.6	A	T	0.16	4.6	A	
		NB	L	0.62	46.3	D	L	0.63	46.9	D	L	0.63	47.6	D	
			R	0.48	0.9	A	R	0.48	0.9	A	R	0.48	0.9	A	
		INT			62.5	E			64.4	E			62.4	E	
4	Route 9W (N-S) & Fostertown Road	EB	LTR	1.47	**	F	LTR	1.47	**	F	LTR	1.45	**	F	Shift 2 seconds of green time from the NB/SB left-turn phase to the NB/SB phase(1) Shift 1 second of green time from the NB/SB left-turn phase to the EB/WB phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
		WB	LTR	0.29	28.4	C	LTR	0.29	28.4	C	LTR	0.28	28.8	C	
		NB	L	0.43	41.9	D	L	0.43	41.9	D	L	0.45	44.5	D	
			TR	0.93	39.5	D	TR	1.03	61.4	E+	TR	1.02	59.5	E+	
		SB	L	0.29	40.5	D	L	0.29	40.5	D	L	0.30	41.9	D	
			TR	1.31	172.7	F	TR	1.41	216.3	F+	TR	1.39	206.2	F+	
		INT			140.8	F			162.0	F			156.2	F	
8	Route 9W (N-S) & Carter Avenue	EB	LR	0.93	47.7	D	LR	1.00	66.6	E+	LR	0.92	46.2	D	Shift 4 seconds of green time from the NB/SB phase to the EB Phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
		NB	L	0.50	13.9	B	L	0.52	16.6	B	L	0.55	18.5	B	
			T	0.67	8.2	A	T	0.72	9.3	A	T	0.75	12.1	B	
		SB	TR	0.90	25.6	C	TR	0.94	30.5	C	TR	0.98	41.5	D	
		INT			22.2	C			27.3	C			30.0	C	

Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; INT = Intersection. L = Left-Turn; T = Through; R = Right-Turn. V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service. WZTCP = Work Zone Traffic Control Plan

** Indicates a calculated delay greater than 240.0 seconds. Delay values are not shown, however the increase in delay is greater than 3.0 seconds at impacted locations (the CEQR impact threshold for signalized lane groups at LOS F) and mitigated to a delay less than Future without Project 1 conditions.

+ Predicted temporary significant adverse impact

(1) Intersection could not be fully mitigated to *2012 CEQR Technical Manual* guidance utilizing these measures. However, this intersection is slated for potential geometric improvements as part of the Newburgh Area Transportation and Land Use Study.

Table 2.19-2
2015 Future Without Project 1, Future with Project 1, and Future with Project 1 with Mitigation Conditions
LOS Summary—West of Hudson Study Area, PM Peak Hour (4:30 PM - 5:30 PM)

No.	Intersection	Approach	PM Peak Hour (4:30 PM - 5:30 PM)												Mitigation Measures
			2015 Future w/o Project 1				2015 Future with Project 1				2015 Future with Project 1 with Mitigation.				
			Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	
4	Route 9W (N-S) & Fostertown Road	EB	LTR	0.84	55.4	E	LTR	0.84	55.4	E	LTR	0.86	58.1	E	Adjust signal cycle length from 100 to 95 seconds: remove 4 seconds of green time from EB/WB phase and remove 1 second of green time from NB/SB left-turn phase (1) Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
		WB	LTR	0.49	35.8	D	LTR	0.49	35.8	D	LTR	0.50	36.1	D	
		NB	L	0.69	54.3	D	L	0.69	54.3	D	L	0.70	54.6	D	
			TR	1.15	100.9	F	TR	1.23	134.3	F+	TR	1.23	133.1	F+	
		SB	L	0.31	46.4	D	L	0.31	46.4	D	L	0.31	44.9	D	
			TR	0.95	46.9	D	TR	1.05	72.2	E+	TR	1.04	68.1	E+	
		INT			72.3	E			95.9	F			94.2	F	
8	Route 9W (N-S) & Carter Avenue	EB	LR	0.63	18.4	B	LR	0.65	19.7	B	LR	0.69	21.4	C	Shift 6 seconds of green time from the SB phase to the NB Protected Left-turn Phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
		NB	L	1.02	76.9	E	L	1.19	138.4	F+	L	0.82	38.3	D	
			T	0.83	13.0	B	T	0.87	15.5	B	T	0.84	13.4	B	
		SB	TR	0.85	20.8	C	TR	0.88	23.2	C	TR	0.93	33.7	C	
		INT			23.5	C			31.8	C			24.1	C	

Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; INT = Intersection. L = Left-Turn; T = Through; R = Right-Turn. V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service.
** Indicates a calculated delay greater than 240.0 seconds. Delay values are not shown, however the increase in delay is greater than 3.0 seconds at impacted locations (the CEQR impact threshold for signalized lane groups at LOS F) and mitigated to a delay less than Future without Project 1 conditions.
+ Predicted temporary significant adverse impact
(1) Intersection could not be fully mitigated to *2010 CEQR Technical Manual* guidance utilizing these measures. However, this intersection is slated for potential geometric improvements as part of the Newburgh Area Transportation and Land Use Study.

AM Peak

Route 9W and I-84 Eastbound Ramps

Predicted impacts to Route 9W and I-84 Eastbound ramps could be completely mitigated with signal retiming. In the future with the construction of Project 1, the southbound left-turn lane group would continue to operate at LOS F (LOS F is the poorest letter designation that can be assigned to level of service—in this case both future without Project 1 and future with Project 1 conditions operate at LOS F) with an 18.9-second increase in delay. This impact could be fully mitigated with the transfer of 5 seconds of green time from the northbound signal phase to the southbound left-turn signal phase.

Route 9W and North Plank Road/I-84 Westbound Off-Ramp

Predicted impacts to Route 9W and North Plank Road/I-84 Westbound Off-Ramp could be mitigated with signal retiming. In the future with the construction of Project 1, the eastbound right-turn lane group would continue to operate at LOS F with delays increased to well beyond 240 seconds and greater than the future without Project 1. This impact could be mitigated with the transfer of 5 seconds of green time from the northbound signal phase to the southbound left-turn signal phase of the Route 9W and I-84 Eastbound Ramps intersection (described above), as these two intersections operate under the same control system. While not shown in Table 2.19-1, the delays calculated for the impacted approach with the mitigation would be less than the calculated future without Project 1.

North Plank Road and I-84 Westbound Ramps

Predicted impacts to North Plank Road and I-84 Westbound Ramps could be completely mitigated with signal retiming. In the future with the construction of Project 1, the eastbound through lane group would continue to operate at LOS F with a 5.5-second increase in delay. This impact could be fully mitigated with the transfer of 1 second of green time from the westbound left-turn signal phase to the eastbound signal phase.

Route 9W and Fostertown Road

At Route 9W and Fostertown Road, it is not possible to mitigate the temporary significant adverse impacts from the construction of Project 1. However, measures to reduce the impact of Project 1 construction traffic impacts were identified through signal retiming.

In the future with the construction of Project 1, the northbound through/right-turn lane group would deteriorate from LOS D with 39.5 seconds of delay to LOS E with 61.4 seconds of delay. The southbound through/right-turn lane group would continue to operate at LOS F with a 43.6-second increase in delay. Mitigation measures could include the transfer of 2 seconds of green time from the northbound/southbound left-turn signal phase to the northbound/southbound through signal phase. It would also include moving 1 second of green time from the northbound/southbound left-turn signal phase to the eastbound/westbound through signal phase. While this would reduce delay at locations with predicted project-generated impacts closer to delays under the future without Project 1 conditions, these temporary significant adverse impacts

could not be fully mitigated back to future without Project 1 conditions or better; however, this intersection is slated for potential geometric improvements as part of the Newburgh Area Transportation and Land Use Study.

Route 9W and Carter Avenue
Predicted impacts to Route 9W and Carter Avenue could be completely mitigated with signal retiming. In the future with the construction of Project 1, the eastbound approach of this intersection would deteriorate from 47.7 seconds (above mid-LOS D) to 66.6 seconds (LOS E). This impact could be fully mitigated by shifting 4 seconds of green time from the northbound/southbound phase to the eastbound phase.

PM Peak

Route 9W and Fostertown Road
At Route 9W and Fostertown Road, it is not possible to mitigate the temporary significant adverse impacts from the construction of Project 1. However, measures to reduce the impact of Project 1 construction traffic impacts were identified through signal retiming.

In the future with the construction of Project 1, the northbound through/right-turn lane group would continue to operate at LOS F with a 33.4-second increase in delay. The southbound through/right-turn lane group would deteriorate from LOS D with 46.9 seconds of delay to LOS E with 72.2 seconds of delay, an increase in delay of 25.3 seconds. These impacts could be reduced by adjusting of the signal cycle length from 100 to 95 seconds by removing 4 seconds of green time from the eastbound/westbound signal phase, and removing 1 second of green time from the northbound/southbound left-turn signal phase. While this would reduce delay at locations with predicted project-generated impacts closer to delays under the future without Project 1 conditions, these temporary impacts could not be fully mitigated back to future without Project 1 conditions or better; however, as noted above, this intersection is slated for potential geometric improvements as part of the Newburgh Area Transportation and Land Use Study.

Route 9W and Carter Avenue
Predicted impacts to Route 9W and Carter Avenue could be completely mitigated with signal retiming. In the future with the construction of Project 1, the northbound left turn lane group of this intersection would deteriorate from 76.9 seconds (LOS E) to 138.4 seconds (LOS F). This impact could be fully mitigated by shifting 6 seconds of green time from the southbound phase to the northbound protected left-turn phase.

TRAFFIC MANAGEMENT PLAN

In addition to the mitigation measures presented in Tables 2.19-1 and 2.19-2, the following measures would be part of an overall Traffic Management Plan (TMP):

- DEP resident engineers and public liaison contacts would be assigned to Project 1 for its entire construction period. The contact information would be made available to all stakeholders in the area and posted on the construction signs in front.
- DEP would inform the pertinent stakeholders of the time and dates of any exceptional truck activity (oversized/weight transport of loads) and coordinate with the appropriate entities to ensure safe and efficient traffic operating conditions on the roadways in the area. Coordination typically would involve the following measures:
  - The development of Work Zone Traffic Control Plans (WZTCPs) to be implemented by the contractor with the approval of and in coordination with governing roadway agencies at locations where it may be necessary. This would include the temporary use of flagmen and various traffic control devices (standard signs, variable message signs, traffic cones, etc.).
  - Coordination with the Marlboro Central School District and Newburgh Enlarged City School District. DEP has met with school district officials and has obtained existing information regarding bus routes, bus stop locations, bus operating hours, and school locations. DEP has committed to coordinate with the district regularly as mentioned above, via the liaison contacts (on the phone, by e-mail, and in person whenever necessary), to inform them of any operations that would potentially require coordination with construction activity and school bus operations.
  - Coordination with the Town of Newburgh officials, the New York State Police, Orange County Sheriff's Office, and the Town of Newburgh Police would also be part of the TMP.

EAST OF HUDSON

Section 2.10, "Transportation," describes three alternative analyses of traffic assignments for the east connection site. The difference among the scenarios is the assumption of how construction workers and trucks would access the east connection site via local roads from Route 9D. DEP has agreed to require that all construction truck trips take Chelsea Road to and from Route 9D. Therefore, the traffic mitigation for Scenario 3 (100 percent of truck traffic assigned to Chelsea Road) would include the recommended mitigation measures for the east of Hudson study area predicted temporary significant adverse traffic impacts. This mitigation could have also been used to address predicted temporary significant adverse impacts on traffic under Scenarios 1 and 2.

As discussed in Section 2.10, it was determined for Scenario 3 that predicted temporary significant adverse impacts would occur with Project 1 at eight signalized approaches at four intersections in the study area (if an approach would be impacted during the AM and PM, then two approaches are considered to be impacted). These impacts are anticipated to occur at four intersections, with three of these predicted temporary significant adverse traffic impacts occurring during the AM peak hour and five during the PM peak hour. The following section

describes the benefits of mitigation in returning an impacted approach to the predicted level of service in the future without Project 1

Tables 2.19-3 and **2.19-4** list the recommended mitigation measures and show the results of applying them for the AM and PM peak hours at each location, respectively. The assessment presented here relies on a combination of traffic signal retiming changes as the recommended measures for the signalized intersections. A retiming consists of shortening the length of a green light and giving that extra time to lengthen the green light at an impacted approach. This means that mitigation would improve the approaches with predicted temporary adverse impacts, but other approaches may experience additional delays. However, any new delays resulting from signal retiming would not cause an exceedance of the *CEQR Technical Manual* guidelines.

Table 2.19-3
2015 Future Without Project 1, Future with Project 1, and Future with Project 1 with Mitigation Conditions LOS Summary—East of Hudson Study Area, AM Peak Hour (7:15 AM - 8:15 AM)

			AM Peak Hour (7:15 AM - 8:15 AM)												
			2015 Future w/o Project 1				2015 Future with Project 1				2015 Future with Project 1 with Improvements.				
No.[1]	Intersection	Approach	Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	Improvement Measures
1	Route 9D (N-S) & I-84 EB Ramps	EB	L	1.43	**	F	L	1.48	**	F+	L	1.37	236.9	F	Shift 3 seconds of green time from the SB lead phase to the EB phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			T	0.01	37.3	D	T	0.01	37.3	D	T	0.01	35.0	C	
			R	0.71	9.1	A	R	0.71	9.3	A	R	0.70	9.4	A	
		NB	TR	0.33	19.4	B	TR	0.33	19.6	B	TR	0.35	21.8	C	
		SB	L	0.47	18.4	B	L	0.50	19.7	B	L	0.50	21.0	C	
			T	0.34	12.2	B	T	0.35	11.9	B	T	0.35	12.9	B	
		INT			75.5	E			84.1	F			72.0	E	
5	Route 9D (N-S) & Chelsea Road/Baxtertown Road	EB	LTR	0.68	34.2	C	LTR	0.75	38.7	D	LTR	0.75	39.8	D	Shift 1 second of green time from the NB/SB left-turn phase to the NB/SB through phase. Traffic signal controller and detectors could be upgraded as part of proposed retiming/ rephasing (optimization)
		WB	LTR	0.38	25.2	C	LTR	0.40	27.2	C	LTR	0.41	28.0	C	
		NB	L	0.12	5.4	A	L	0.38	10.8	B	L	0.39	11.1	B	
			TR	0.82	22.8	C	TR	0.81	22.0	C	TR	0.80	21.4	C	
		SB	L	0.15	5.4	A	L	0.16	5.6	A	L	0.15	5.5	A	
			TR	0.87	25.3	C	TR	0.99	45.9	D+	TR	0.98	43.4	D	
		INT			24.5	C			33.5	C			32.1	C	
12	Route 9D (N-S) & New Hamburg Road/Old Hopewell Road (CR 28)	EB	LT	0.60	45.4	D	LT	0.60	45.4	D	LT	0.64	49.7	D	Shift 1 second of green time from NB/SB left-turn phase to the NB/SB through phase. Shift 1 second of green time from the EB phase to the WB phase. Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			R	0.36	12.1	B	R	0.36	12.1	B	R	0.38	12.7	B	
		WB	L	0.92	79.4	E	L	0.94	84.2	F+	L	0.86	67.0	E	
			TR	0.40	33.6	C	TR	0.40	33.7	C	TR	0.37	31.5	C	
		NB	L	0.28	9.8	A	L	0.28	9.8	A	L	0.29	10.1	B	
			TR	1.17	109.4	F	TR	1.17	110.0	F	TR	1.17	109.2	F	
		SB	L	0.14	8.4	A	L	0.14	8.4	A	L	0.14	8.6	A	
			TR	0.82	30.4	C	TR	0.83	30.8	C	TR	0.82	29.4	C	
		INT			68.6	E			69.4	E			67.2	E	

Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; INT = Intersection. L = Left-Turn; T = Through; R = Right-Turn. V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service.
** Indicates a calculated delay greater than 240.0 seconds. Delay values are not shown; however the increase in delay is greater than 3.0 seconds at impacted locations (the CEQR impact threshold for signalized lane groups at LOS F).
[1] Numbers in the left column correspond to the intersection references in Figure 2.10-20a
+ Predicted temporary significant adverse impact

Table 2.19-4
2015 Future Without Project 1, Future with Project 1, and Future with Project 1 with Mitigation Conditions LOS Summary—East of Hudson Study Area, PM Peak Hour (4:30 PM - 5:30 PM)

No.[1]	Intersection	Approach	PM Peak Hour (4:30 PM - 5:30 PM)												Improvement Measures
			2015 Future w/o Project 1				2015 Future with Project 1				2015 Future with Project 1 with Improvements.				
			Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	Movement	V/C Ratio	Delay (SPV)	LOS	
1	Route 9D (N-S) & I-84 EB Ramps	EB	L	1.33	**	F	L	1.39	**	F+	L	1.28	223.6	F	Shift 3 seconds of green time from the SB lead phase to the EB phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			T	0.01	37.2	D	T	0.01	37.2	D	T	0.01	35.0	C	
			R	0.80	22.2	C	R	0.80	23.0	C	R	0.79	22.4	C	
		NB	TR	0.45	26.7	C	TR	0.46	27.1	C	TR	0.48	29.3	C	
		SB	L	0.32	15.8	B	L	0.39	19.5	B	L	0.40	22.7	C	
			T	0.47	17.0	B	T	0.47	16.1	B	T	0.48	17.4	B	
		INT			70.4	E			77.5	E			67.9	E	
4	Route 9D (N-S) & Red Schoolhouse Road	WB	L	0.41	27.5	C	L	0.41	27.5	C	L	0.41	27.5	C	Shift 3 seconds of green time from the SB left-turn phase to the NB phase Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			R	0.34	11.8	B	R	0.34	12.5	B	R	0.37	12.9	B	
		NB	T	0.90	33.5	C	T	0.97	45.8	D+	T	0.91	32.1	C	
			R	0.10	3.8	A	R	0.10	3.8	A	R	0.09	3.2	A	
		SB	L	0.55	19.5	B	L	0.56	20.4	C	L	0.67	28.4	C	
			T	0.60	8.0	A	T	0.65	9.0	A	T	0.65	9.0	A	
		INT			19.6	B			24.8	C			20.4	C	
5	Route 9D (N-S) & Chelsea Road/Baxtertown Road	EB	LTR	0.38	20.9	C	LTR	0.62	25.2	C	LTR	0.62	25.1	C	Shift 2 seconds of green time from the NB/SB left-turn phase to the NB/SB through phase. Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
		WB	LTR	0.58	32.2	C	LTR	0.68	40.1	D	LTR	0.70	42.5	D	
		NB	L	0.20	5.8	A	L	0.42	12.3	B	L	0.43	13.1	B	
			TR	0.86	23.3	C	TR	0.84	22.3	C	TR	0.83	21.2	C	
		SB	L	0.12	5.1	A	L	0.12	5.4	A	L	0.12	5.3	A	
			TR	0.93	32.1	C	TR	0.99	47.7	D+	TR	0.98	43.0	D	
		INT			27.0	C			33.3	C			31.1	C	
12	Route 9D (N-S) & New Hamburg Road/Old Hopewell Road (CR 28)	EB	LT	0.64	45.1	D	LT	0.64	45.1	D	LT	0.68	49.0	D	Remove 2 seconds of green time from the EB phase, add 1 second of green time to the NB/SB phase, and add 1 second of green time to the WB phase. Traffic signal controller and detectors could be upgraded as part of proposed retiming/rephasing (optimization)
			R	0.48	9.6	A	R	0.48	9.6	A	R	0.49	10.2	B	
		WB	L	1.15	143.6	F	L	1.17	149.5	F+	L	1.09	122.7	F	
			TR	0.59	42.8	D	TR	0.59	42.8	D	TR	0.55	40.0	D	
		NB	L	0.49	19.2	B	L	0.49	19.2	B	L	0.50	19.8	B	
			TR	1.14	102.8	F	TR	1.15	107.5	F+	TR	1.15	104.5	F	
		SB	L	0.17	11.2	B	L	0.17	11.2	B	L	0.17	11.0	B	
			TR	1.06	75.9	E	TR	1.07	77.6	E	TR	1.06	74.6	E	
		INT			80.4	F			83.3	F			78.9	E	

Notes: EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; INT = Intersection. L = Left-Turn; T = Through; R = Right-Turn. V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service.
** Indicates a calculated delay greater than 240.0 seconds. Delay values are not shown; however the increase in delay is greater than 3.0 seconds at impacted locations (the CEQR impact threshold for signalized lane groups at LOS F).
[1] Numbers in the left column correspond to the intersection references in Figures 2.10-20b.
+ Predicted temporary significant adverse impact

At some locations, traffic signal controller and detectors could be upgraded, which the DEP would discuss funding as part of Project 1 (if agreements can be reached with NYSDOT and the local transportation representatives). Subsequent to the issuance of the DEIS, DEP met with NYSDOT representatives to discuss the proposed mitigation measures, such as those presented for the east of Hudson study area. DEP has reached general agreements with NYSDOT on the types of upgrades at the impacted intersections that DEP will fund, and gained concurrence from NYSDOT that these measures will mitigate the temporary significant adverse impacts from Project 1 construction traffic. Once Project 1 construction is underway, the various agencies responsible for maintaining traffic flow and roadways in the study area could conduct field inspections of the various intersections to determine if the proposed mitigation measures are warranted (particularly because traffic from anticipated future without Project 1 projects or background growth may be less than analyzed in this report).

AM Peak

Route 9D and I-84 Eastbound Ramps
Predicted impacts to Route 9D and I-84 Eastbound Ramps could be completely mitigated with signal retiming. In the future with the construction of Project 1, the eastbound left-turn lane group would continue to operate at LOS F with delays increased to well beyond 240 seconds. This impact could be fully mitigated with the transfer of 3 seconds of green time from the southbound lead signal phase to the eastbound signal phase. In addition to upgrading the traffic signal controller and detectors for the I-84 Eastbound Ramps, as part of the proposed mitigation, signal controller and detector upgrades would also be provided for the Route 9D and I-84 Westbound Ramps.

Route 9D and Chelsea Road/Baxtertown Road
Predicted impacts to Route 9D and Chelsea Road/Baxtertown Road could be completely mitigated with signal retiming. In the future with the construction of Project 1, the southbound through/right turn lane group would deteriorate from LOS C with 25.3 seconds of delay to worse than mid-LOS D with 45.9 seconds of delay. This impact could be fully mitigated with the transfer of 1 second of green time from the northbound/southbound left-turn signal phase to the northbound/southbound through signal phase.

Route 9D and New Hamburg Road/Old Hopewell Road (County Route 28)
Predicted impacts to Route 9D and New Hamburg Road/Old Hopewell Road could be completely mitigated with signal retiming. In the future with the construction of Project 1, the westbound left-turn lane group would continue to operate at LOS F with a 4.8-second increase in delay. This impact could be fully mitigated with the transfer of 1 second of green time from the northbound/southbound left-turn signal phase to the northbound/southbound through signal phase and the transfer of 1 second of green time from the eastbound signal phase to the westbound signal phase.

PM Peak

Route 9D and I-84 Eastbound Ramps
Predicted impacts to Route 9D and I-84 Eastbound Ramps could be completely mitigated with signal retiming. In the future with the construction of Project 1, the eastbound left-turn lane group would continue to operate at LOS F with delays increased to well beyond 240 seconds. This impact could be fully mitigated with the transfer of 3 seconds of green time from the southbound lead signal phase to the eastbound signal phase. In addition to upgrading the traffic signal controller and detectors for the I-84 Eastbound Ramps, as part of the proposed mitigation, signal controller and detector upgrades would also be provided for the Route 9D and I-84 Westbound Ramps.

Route 9D and Red School House Road
Predicted impacts to Route 9D and Red School House Road could be completely mitigated with signal retiming. In the future with the construction of Project 1, the northbound through lane group would deteriorate from LOS C with 33.5 seconds of delay to worse than mid-LOS D with 45.8 seconds of delay. This impact could be fully mitigated with the transfer of 3 seconds of green time from the southbound left-turn signal phase to the northbound signal phase.

Route 9D and Chelsea Road/Baxtertown Road
Predicted impacts to Route 9D and Chelsea Road/Baxtertown Road could be completely mitigated with signal retiming. In the future with the construction of Project 1, the southbound through/right-turn lane group would deteriorate from LOS C with 32.1 seconds of delay to worse than mid-LOS D with 47.7 seconds of delay. This impact could be fully mitigated with the transfer of 2 seconds of green time from the northbound/southbound left-turn signal phase to the northbound/southbound through signal phase.

Route 9D and New Hamburg Road/Old Hopewell Road (County Route 28)
Predicted impacts to Route 9D and New Hamburg Road/Old Hopewell Road could be completely mitigated with signal retiming. In the future with the construction of Project 1, the westbound left-turn lane group would continue to operate at LOS F with a 5.9-second increase in delay. The northbound through/right turn lane group would continue to operate at LOS F with a 4.7-second increase in delay. This impact could be fully mitigated by removing 2 seconds of green time from the eastbound signal phase, adding 1 second of green time to the northbound/southbound signal phase, and adding 1 second of green time to the westbound signal phase.

TRAFFIC MANAGEMENT PLAN

In addition to the mitigation measures presented in Tables 2.19-3 and 2.19-4, the following measures would be part of an overall TMP:

- DEP resident engineers and public liaison contacts would be assigned to Project 1 for its entire construction period. The contact information would be made available to all stakeholders in the area and posted on the construction signs in front.
- DEP would inform the pertinent stakeholders of the time and dates of any exceptional truck activity (oversized/weight transport of loads) and coordinate with the appropriate entities to ensure safe and efficient traffic operating conditions on the roadways in the area. Coordination typically would involve the following measures:
  - The development of WZTCPs to be implemented by the contractor with the approval of and in coordination with governing roadway agencies at locations where it may be necessary. This would include any type of constrained truck maneuvers as well as the temporary use of flagmen and various traffic control devices (standard signs, variable message signs, traffic cones, etc.). The

contractor's construction health and safety plans would be required to provide visual assistance for any off-site truck turnarounds in the east of Hudson study area.

- Coordination with the Beacon and Wappinger School Districts. DEP has met with school district officials and has obtained existing information regarding bus routes, bus stop locations, bus operating hours, and school locations. DEP has committed to coordinate with the district regularly as mentioned above, via the liaison contacts (on the phone, by e-mail, and in person whenever necessary), to inform them of any operations that would potentially require coordination with construction activity and school bus operations.
- Coordination with Dutchess Stadium. DEP has met with stadium officials and understands the typical seasonal baseball and event scheduling. The Town of Fishkill Police Department employs a TMP for all events held at the stadium. This includes all baseball games and special events (e.g., KFest, carnivals, etc.). DEP will coordinate with the Town of Fishkill police in the same manner as described above for the school districts.
- Coordination with Town of Wappinger and Town of Fishkill officials, the New York State Police, and the Dutchess Sheriff's Office would also be part of the TMP.

- In coordination with the Town of Wappinger, no parking signs would be installed at the intersection of River Road and Market Street to prevent vehicles from parking along the roadways near this intersection, to foster safer, turning movements, and to keep construction-related vehicles on pavement. At the time the FEIS was prepared, there were no signs posted near this intersection limiting parking.
- In coordination with the Town of Wappinger and Dutchess County, additional signage would be posted on roads used to access and depart the east connection site by the project's construction truck traffic. This could include signs related to speed limits and prohibiting the use of compression brakes.

ROADWAY PAVEMENT MONITORING

In consultation with local transportation representatives, DEP has agreed to roadway pavement monitoring on local roads accessed by trucks for the east connection site. DEP would require its contractor to video record and assess roadway pavement conditions on both River and Chelsea Roads before Project 1 construction, and would conduct annual meetings after the winter with town and county roadway representatives to determine the need and make necessary pavement repairs as a result of Project 1 traffic.

SIGHT DISTANCE MEASUREMENTS

At the request of the Town of Wappinger and NYSDOT, sight distance measurements (see Appendix 2.19) were performed at the intersections of:

- NYS Route 9D and Old State Road (Northern and Southern Intersections)
- Shaft 6 (6B) Driveway and River Road North
- River Road North and Old State Road

It may be prudent to clear some vegetation in the right-of-way near these intersections. If required, this would be determined, and work would be performed in coordination with the Town of Wappinger and NYSDOT.

2.19-5 CONCLUSIONS

In the planning of Project 1, many measures have been incorporated into the Project 1 design that would substantially reduce the potential for additional temporary significant adverse impacts resulting from the construction of Project 1. Construction of Project 1 is expected to result in temporary significant adverse impacts on neighborhood character (near the east connection site in the east of Hudson study area), traffic (in both the west and east of Hudson study areas), and noise (in both east and west of Hudson study areas).

2.19-5.1 NEIGHBORHOOD CHARACTER

EAST OF HUDSON

During construction, as described in detail in Section 2.3, "Neighborhood Character," activities would temporarily adversely affect the neighborhood character near the east connection site. In particular, changes to the visual character of the east connection site and the increases in traffic, lighting, and noise during construction of Project 1 would temporarily adversely affect the neighborhood character for those residences near the east connection site. However, this impact to neighborhood character would be temporary and would not be expected to result in disruptions to neighborhood character once construction is complete. Since this temporary adverse impact could not be fully mitigated, the impact on neighborhood character in the east of Hudson study area near the east connection site from the construction of Project 1 is also identified as an unavoidable temporary significant adverse impact in Chapter 8, "Unavoidable Adverse Impacts." However, this impact to neighborhood character would be temporary and would not be expected to result in disruptions to neighborhood character once construction is complete.

2.19-5.2 TRANSPORTATION

Suggested traffic mitigation measures would consist of signal timing changes, upgrading traffic signal controller and detectors at some intersections, a TMP (which would include an

outreach/communication plan with the towns, schools, police, and other area agencies) for the connection sites and west of Hudson and east of Hudson study areas, roadway pavement monitoring on local roads accessed by trucks for the east connection site, potential additional signage (including no parking signs) in the east of Hudson study area and clearing some vegetation in the right-of-way near a few intersections in the east of Hudson study area.

Recommended mitigation measures (for both the west and east of Hudson study areas) would generally eliminate these predicted temporary significant adverse traffic impacts, except at the intersection of Route 9W and Fostertown Road during the AM and PM peak hours, where the proposed mitigation would reduce temporary significant adverse traffic impacts from Project 1 construction traffic. This remaining temporary significant adverse traffic impact could not be fully mitigated, and is identified as an unavoidable temporary significant adverse impact in Chapter 8, "Unavoidable Adverse Impacts." If the traffic mitigation measures identified are not implemented for the predicted temporary significant adverse impacts, these predicted temporary significant adverse traffic impacts from Project 1 construction traffic would remain un-mitigated.

2.19-5.3 NOISE

As described in Section 2.13, "Noise," in the assessment of noise impacts, DEP examined the potential off-site noise impacts from each phase, and undertook evaluations of a range of potential measures to eliminate or reduce those impacts. As a result, for both the west of Hudson and east of Hudson study areas, all practical noise control methods would be incorporated into DEP's contract specifications, and a CNMP was developed for the FEIS to ensure that the proposed program's noise during construction is decreased to the maximum extent practicable (see Appendix 2.19-2). The remaining temporary significant adverse noise impacts could not be fully mitigated, and are identified as unavoidable temporary significant adverse impacts in Chapter 8, "Unavoidable Adverse Impacts." However, these noise impacts would be temporary and would not occur once construction is complete. ✷