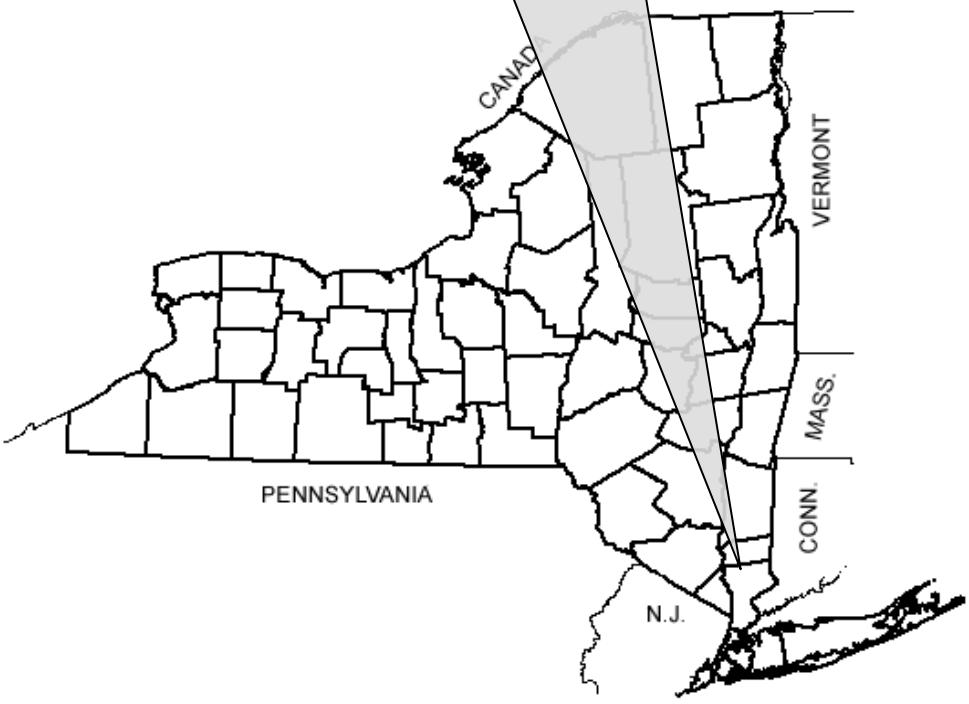
TRANSPORTATION

PROJECT REPORT

DESIGN REPORT

July 2013

Highway Project
P.I.N. 8780.41 BIN: N/A
Croton-on-Hudson Parking Facility
and Bicycle Enhancements
Westchester County
Village of Croton-on-Hudson



U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
ANDREW M. CUOMO, Governor JOAN MCDONALD, Commissioner

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PLACE P.E. STAMP

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TABLE OF CONTENTS

Appendices

CHAPTER 1 - EXECUTIVE SUMMARY

1.1. Introduction

This transportation project proposes to provide appropriate traffic control along Croton Point Avenue improve existing infrastructure, and provide pedestrian facilities and bicycle accommodations to better balance the needs of all users. Project objectives will focus on sidewalks and bicycle facility improvements along Croton Point Avenue in the Village of Croton-on-Hudson, Westchester County, New York.

This report presents design alternatives and documents the improvements that will result from completion of the project and the potential consequences and impacts associated with the proposed work. The intent of this report is to provide information to all interested parties and serve as a decision making tool and a means of documenting decisions, ultimately leading to Design Approval of a proposed improvement.

The project is assumed to be classified as a National Environmental Policy Act (NEPA) Class II action (CE/CE with documentation) in accordance with 23 CFR 771. The actual determination will come after state and federal agencies have had an opportunity to comment. The project is also classified as an Unlisted Action in accordance with the State Environmental Quality Review Act (SEQRA). The Federal Highway Administration (FHWA) is the Lead Agency for NEPA, while the Village of Croton-on-Hudson is the Lead Agency for SEQRA.

This report was prepared in accordance with the New York State Department of Transportation (NYSDOT) Project Development Manual (PDM), 6 NYCRR (New York Codes, Rules and Regulations) Part 617, and 23 CFR (Code of Federal Regulations) 771. Transportation needs have been identified (section 1.2.2), objectives established (1.2.3) to address the needs, and cost-effective alternatives developed (1.3). This project is federally funded.

1.2. Purpose and Need

1.2.1. Where is the Project Located?

(1) Route number — NA
(2) Route name — Croton Point Avenue
(3) SH number and official highway description — None
(4) BIN number and feature crosses — 1004989 US Route 9 over Croton Point Avenue
(5) City/Village/Township — Village of Croton-on-Hudson
(6) County — Westchester County
(7) Length — 1,740 ft. (0.35 miles)
(8) From RM NA To RM NA
(9) Any other description information which is pertinent: The project begins at the intersection of Croton Point Avenue and Veterans Plaza and continues easterly for approximately 1,240 feet to the intersection of Croton Point Avenue and S. Riverside Avenue. From this intersection, the project proceeds northerly on S. Riverside Avenue for approximately 500 feet to the intersection of S. Riverside Avenue and Benedict Boulevard. The project includes the US Route 9 southbound on/off ramps and the US Route 9 northbound on/off ramps.

See Project Location Map (Figure 1) and Site Location Map (Figure 2) in Appendix A.

1.2.2. Why is the Project Needed?

Croton Point Avenue provides access to the Croton-Harmon train station located at the westerly end of the project limits, via Veterans Plaza. Vehicular volumes are high and very directional with approximately 75% of the traffic traveling to the train station during the AM peak period and 75% traveling from the train station during the PM peak period. Croton Point Avenue is free-flowing since there are no traffic signals or stop control for the vehicles between S. Riverside Avenue and Veterans Plaza. Given the highly directional vehicular flows and few gaps in Croton Point Avenue free flowing traffic, there are few opportunities for pedestrians or bicyclists to cross Croton Point Avenue and for side street traffic from the US Route 9 southbound and the US Route 9 northbound off ramps to access Croton Point Avenue. With limited gaps to access Croton Point Avenue, queues extend along the US Route 9 southbound off ramp potentially impacting US Route 9 mainline traffic. Lengthy US Route 9 southbound off ramp queues exacerbate the situation, as there is a constant stream of traffic wishing to exit US Route 9.

The Village of Croton-on-Hudson provides personnel at Veterans Plaza during 1 hour of both the AM and PM peak periods and at the US Route 9 southbound ramp for 1-hour during the AM peak period to help facilitate pedestrian and bicyclist crossings. The use of personnel at these intersections during the peak periods is a measure implemented by the Village to accommodate pedestrian and bicycle crossings, while also attempting to facilitate vehicular flow on these side streets to reduce the long delays, queues (including traffic backups to the US Route 9 mainline) and poor levels of service that would otherwise exist without active traffic control.

While this method is effective during the peak hour, it does not accommodate the conditions during non-peak periods and the shoulder hours of the peak period where vehicular, pedestrian and bicycle volumes are high. In addition, this manual control requires a significant local cost and allocation of resources to manage operations at Veterans Plaza and the state highway ramps and poses an inherent safety risk to the personnel providing manual control.

Therefore, this project is necessary to provide safer accommodations that better balance the needs of all users (vehicular, bicyclists and pedestrians) and provide effective vehicular mobility through the corridor during all periods of the day with appropriate traffic control measures.

1.2.3. What are the Objectives/Purposes of the Project?

The project objectives are to:

(1) Improve intersection operations and traffic flow by upgrading key intersections and providing appropriate traffic control that will facilitate bicycle and pedestrian crossings and effectively accommodate mobility through the corridor.
(2) Improve and upgrade pedestrian accommodations and amenities to be American with Disabilities Act (ADA) compliant.
(3) Provide bicycling facilities along Croton Point Avenue that are conducive for all types and skill levels of bicyclists.
(4) Improve drainage deficiencies along Croton Point Avenue.
(5) Improve pavement conditions on Croton Point Avenue and S. Riverside Avenue.

1.3. What Alternative(s) Are Being Considered?

One Build alternative in addition to the No-Build (null) alternative has been developed and evaluated based upon the project objectives. The alternatives that are considered are listed below.

Alternative 1: No-Build (Null) Alternative

The No-Build (Null) Alternative will provide for the continued maintenance of the existing roadway by the Village of Croton-on-Hudson maintenance forces with no capital funds being expended. The Null Alternative does not address existing deficiencies associated with bicycle and pedestrian accommodations and intersection geometrics and operations.

Alternative 2: Bike Lane Alternative

The Bike Lane Alternative will provide continuous pedestrian and bicycle accommodations along both the north and south sides of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue. This alternative consists of 5 ft. wide designated bike lanes between the travel lane and the sidewalk. It also consists of 4 ft. and 5 ft. wide concrete sidewalks on both sides of Croton Point Avenue. Roadway improvements include the realigning of the US Route 9 northbound on-ramp to eliminate the eastbound channelized free-flow right turn movement from Croton Point Avenue, widening the US Route 9 southbound off-ramp to provide an exclusive right turn lane, traffic signal installations at Veterans Plaza, the US Route 9 southbound on/off ramps and the US Route 9 northbound on/off ramps, widening of approximately 100 ft. of Veterans Plaza to accommodate four-lanes for reversible traffic flow operations, pavement and drainage improvements. Roadway resurfacing is proposed on Croton Point Avenue and S. Riverside Avenue within the project limits.

For a more in-depth discussion of the design criteria and nonstandard features see Section 3.2.3. Design Criteria for Feasible Alternative.

1.4 How will the Alternative(s) Affect the Environment?

Exhibit 1.4-A
Environmental Summary

NEPA Classification	Class II w/ Doc	BY	Federal Highway Administration
SEQR Type:	Unlisted	BY	Village of Croton-on-Hudson

Anticipated Permits/ Certifications / Coordination:

Permits

NYSDOT
- Highway Work Permit

NYSDOS

- Coastal Zone Consistency Certification Statement
- Coastal Zone Local Waterfront Revitalization Certification

Coordination
- Coordination with Federal Highway Administration
- Coordination with New York State Historic Preservation Officer (SHPO)
- Coordination with the US Fish and Wildlife Service
- Coordination with the New York Natural Heritage Program

1.5. What Are The Costs & Schedules?

Design Approval is scheduled for Fall of 2013 with construction scheduled to last 8 months beginning in Spring of 2014.

Exhibit 1.5A Project Schedule	
Activity	**Date Occurred/Tentative**
Design Approval	Fall 2013
ROW Acquisition	Winter 2013
Construction Start	Spring 2014
Construction Complete	Fall / Winter 2014

Exhibit 1.5B Comparison of Alternatives Project Construction Costs

Activities	Null Alternative	Alternative 2 Bike Lane
Highway	$0.0	$1,800,000
Incidentals 10%	$0.0	$180,000
Subtotal ($)	$0.0	$1,980,000
Contingency (15% at Design Approval)	$0.0	$297,000
Subtotal ($)	$0.0	$2,277,000
Field Change Payment	$0.0	$114,000
Subtotal ($)	$0.0	$2,391,000
Mobilization (4%)	$0.0	$96,000
Subtotal ($)	$0.0	$2,487,000
Expected Award Amount (inflated at 3%/yr. to midpoint of construction)	$0.0	$112,000
Construction Inspection (9%)	$0.0	$224,000
ROW Costs (2013 Dollars)	$0.0	$30,000
Total Project Costs	**$0.0**	**$2,853,000**

1.6. Which Alternative is Preferred?

Alternative 2, Bike Lane, has been identified as the alternative that best meets the project objectives. See Section 3.2.2 for a discussion of this alternative. The preferred alternative has been selected by the Village of Croton-on-Hudson with input from stakeholders and the public.

1.7. What are the Opportunities for Public Involvement?

Exhibit 1.7
Public Involvement Plan Schedule of Milestone Dates

Activity	Date Occurred/Tentative
Stakeholder Meeting	November 18, 2011
Bicycle and Pedestrian Committee Meeting	December 1, 2011
Village Board Meeting	January 23, 2012
Public Informational Meeting	September 18, 2012
Village Board Meeting	December 10, 2012
Current Project Letting date	January, 2014

Refer to Appendix E for the Public Involvement and Input from Stakeholders including Public.

You may offer your comments by contacting:

Mr. Ambraham Zambrano
Village Manager
Village of Croton-on-Hudson
One Van Wyck Street
Croton-on-Hudson, NY 10520-2501
email: azambrano@crotononhudson-ny.gov
telephone: (914) 271-4848

Please include the six digit Project Identification Number (PIN) 8780.41

The remainder of this report is a detailed technical evaluation of the existing conditions, the proposed alternatives, the impacts of the alternatives, copies of technical reports and plans and other supporting information.

CHAPTER 2 - PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

This chapter addresses the history and existing context of the project site, including the existing conditions, deficiencies, and needs for Croton Point Avenue from Veterans Plaza to S. Riverside Avenue and S. Riverside Avenue from Croton Point Avenue to Benedict Boulevard.

2.1. Project History

In 2008, the Village of Croton-on-Hudson commissioned a study of the Croton Point Avenue and S. Riverside Avenue corridors between Veterans Plaza and Benedict Boulevard. The purpose of the study was to provide a vision for the corridor and to propose improvements for vehicular, pedestrian and bicycle access to the Croton-Harmon Train Station. It is listed on the Transportation Improvement Plan (TIP) as Transportation Enhancement Project (TEP) ID No. 8704.

2.2. Transportation Plans and Land Use

2.2.1. Local Plans for the Project Area

2.2.1.1. Local Comprehensive Plans ("Master Plan") -

The Village of Croton-on-Hudson adopted the "*Village of Croton-on-Hudson Comprehensive Plan*", in January 2003. Goals of the plan include enhancing the pedestrian connections within the Village by providing new and / or improved sidewalks, crosswalks, and connections to trails, and improve traffic flow and parking while maintaining access and safety of pedestrians.

The Village of Croton-on-Hudson adopted the "*Bicycle / Pedestrian Master Plan*" in April 2009. The plan recommends an emphasis on pedestrian and cyclist opportunities while streamlining vehicle corridors to make the town center a destination rather than a travel corridor.

This project is consistent with the local comprehensive and master plans.

2.2.1.2. Local Private Development Plans –

There are no approved developments planned within the project area that will impact traffic operations.

2.2.2. Transportation Corridor

2.2.2.1. Importance of the Project Route Segment –

Croton Point Avenue is a vital link in the transportation corridor that provides access from US Route 9 and S. Riverside Avenue to the Croton-Harmon Train Station, located on Veterans Plaza, south of Croton Point Avenue and west of US Route 9. Due to its close proximity to New York City, the station is a commuter hub, as well as a major transfer point between local and express trains and the Westchester County Bee-Line Bus Service.

2.2.2.2. Alternate Routes –

There are no alternative routes that would be suitable as a permanent detour.

2.2.2.3. Corridor Deficiencies and Needs –

The primary deficiencies for the project corridor are the lack of safe and adequate bicycle and pedestrian facilities and appropriate traffic control to facilitate vehicular and non-vehicular traffic. There are currently no bicycle facilities on Croton Point Avenue and the existing pedestrian facilities are discontinuous and do not meet current Americans with Disabilities Act (ADA) guidelines.

Croton Point Avenue provides access to the Croton-Harmon train station located at the westerly end of the project limits. Vehicular volumes are high and very directional with approximately 75% of the traffic traveling to the train station during the AM peak period and 75% from the train station during the PM peak period. Croton Point Avenue is free-flowing since there are no traffic signals or stop control for the vehicles between S. Riverside Avenue and Veterans Plaza. Given the highly directional vehicular flows and few gaps in Croton Point Avenue free flowing traffic, there are few opportunities for pedestrians or bicyclists to cross Croton Point Avenue and for side street traffic from the US Route 9 northbound and the US Route 9 southbound off ramps to access Croton Point Avenue. With limited gaps to access Croton Point Avenue, queues extend along the US Route 9 southbound off ramp potentially impacting US Route 9 traffic. Lengthy US Route 9 southbound off ramp queues exacerbate the situation, as there is a constant stream of traffic wishing to exit US Route 9.

The Village of Croton-on-Hudson provides personnel at Veterans Plaza during 1 hour of both the AM and PM peak periods and at the US Route 9 southbound ramp for 1-hour during the AM peak period to help facilitate pedestrian and bicyclist crossings. The use of personnel at these intersections during the peak periods is a measure implemented by the Village to accommodate pedestrian and bicycle crossings, while also attempting to facilitate vehicular flow on these side streets to reduce the long delays, queues (including traffic backups to the US Route 9 mainline) and poor levels of service that would otherwise exist without manual traffic control.

While this method helps facilitate operations during 1 hour of the peak periods, it does not accommodate the conditions during non-peak periods and the shoulder hours of the peak period where vehicular, pedestrian and bicycle volumes are high. In addition, this manual control requires a significant local cost and allocation of resources to manage operations at Veterans Plaza and the state highway ramps and poses an inherent safety risk to the personnel providing manual control.

Therefore, this project is necessary to provide safer accommodations that better balance the needs of all users (vehicular, bicyclists and pedestrians) and provide effective vehicular mobility through the corridor during all periods of the day with appropriate traffic control measures.

2.2.2.4. Transportation Plans -

This project is on the approved Transportation Improvement Program (TIP) as Transportation Enhancement Project (TEP) ID 8704.

2.2.2.5. Abutting Highway Segments and Future Plans for Abutting Highway Segments -

The Village of Croton-on-Hudson has confirmed that there are no plans to reconstruct or widen these highway segments, or the adjoining segments, within the next 20 years.

Croton Point Avenue continues westerly of the project limits as an overpass to the Metro North/Amtrak rail lines. It consists of a two-lane section, with lane widths of approximately 12 ft. with curbing and a 5 ft. wide sidewalk on both sides of Croton Point Avenue.

South Riverside Avenue continues northerly and southerly of the project limits and is generally consistent with the abutting sections.

2.3. Transportation Conditions, Deficiencies and Engineering Considerations

2.3.1. Operations (Traffic and Safety) & Maintenance

2.3.1.1. Functional Classification and National Highway System (NHS) –

Exhibit - 2.3.1.1 Classification Data			
Route(s)	**Croton Point Avenue** (Veterans Plaza to US Route 9 southbound ramps)	**Croton Point Avenue** (US Route 9 southbound ramps to S. Riverside Avenue)	**S. Riverside Ave (NY9A)** (Croton Point Avenue to Benedict Boulevard)
Functional Classification	Urban Collector	Urban Minor Arterial	Urban Minor Arterial
National Highway System (NHS)	Yes	Yes	Yes
Designated Truck Access Route	No	No	No
Qualifying Highway	No	No	No
Within 1.0 mi of a Qualifying Highway	Yes	Yes	Yes
Within the 16 ft. vertical clearance network	No	No	No

2.3.1.2. Control of Access –

There is control of access along Croton Point Avenue at the intersection of the US Route 9 southbound ramps and the US Route 9 northbound ramps. There is no control of access on S. Riverside Avenue.

2.3.1.3. Traffic Control Devices –

Traffic control devices within the project limits include pavement markings, traffic signs, and traffic signals. The existing pavement markings and traffic signs are generally in fair condition. The pavement markings and traffic signs in the corridor generally appear to comply with the Manual of Uniform Traffic Control Devices (MUTCD), except for Veterans Plaza, as noted below.

Veterans Plaza is a three lane roadway with one lane in the northbound direction, one lane in the southbound direction and a reversible center lane that is used as an inbound (southbound direction) lane during the AM peak period and an outbound lane (northbound direction) during the PM peak period. The pavement markings and signage do not currently conform to the MUTCD.

The project limits include two existing signalized intersections and three unsignalized intersections. The two existing signalized intersections within the project limits are:

- Croton Point Avenue and S. Riverside Avenue
- S. Riverside Avenue and Benedict Boulevard

Both of these signalized intersections are actuated. The Croton Point Avenue and S. Riverside Avenue intersection is controlled by a multi-phase, actuated traffic signal. All movements operate by permitted phasing with the exception of the S. Riverside Avenue southbound right turn movement, which operates as a permitted phase and also overlaps with the Croton Point Avenue eastbound approach. Pedestrian pushbuttons and signals are provided to cross the south leg of S. Riverside Avenue and the west leg of Croton Point Avenue. Some of the existing pedestrian signal buttons and signs, and their placement do not meet current MUTCD standards.

At the S. Riverside Avenue and Benedict Boulevard intersection, all movements have permitted operation, which is when a circular green signal indication is displayed and both left and right turns are permitted to be made after yielding to pedestrians, if any, and/or opposing traffic, unless otherwise prohibited by another traffic control device. Pedestrian pushbuttons and signals are provided to cross the north leg of S. Riverside Avenue and the west leg of Benedict Boulevard, although there is no marked crosswalk across this west leg of the intersection. There is a marked crosswalk to cross the south leg of S. Riverside Avenue but no pedestrian pushbutton or signal to accommodate the crossing. The existing pedestrian signals at this location do not appear to meet current MUTCD standards. Some of the existing pedestrian signal buttons and signs, and their placement do not meet current MUTCD standards.

There are 3 major existing unsignalized intersections within the project limits:

- Croton Point Avenue with Veterans Plaza
- Croton Point Avenue with the US Route 9 southbound on / off ramps
- Croton Point Avenue with the US Route 9 northbound on / off ramps

Stop control exists on the US Route 9 northbound off ramp, the US Route 9 southbound off ramp, Veterans Plaza, and the southbound access drive and eastbound approach to the Croton Point Avenue and Veterans Plaza intersection. The Croton Point Avenue westbound approach is the only uncontrolled approach, making the Croton Point Avenue and Veterans Plaza a non-typical controlled intersection as most unsignalized intersections are either two-way or all-way stopped controlled intersections. This 3-way stop control is used to accommodate the high traffic volumes to the station during the AM peak periods.

The Village of Croton-on-Hudson currently assigns personnel to the Croton Point Avenue and Veterans Plaza intersection during 1 hour of the AM and PM peak period and personnel at the Croton Point Avenue and US Route 9 southbound on / off ramps during 1 hour of the AM peak period to facilitate pedestrian and bicycle crossings at these locations. In addition, they monitor the traffic along the southbound off ramp, and help facilitate traffic flow at Veterans Plaza to manage queuing along the ramp and onto the US Route 9 mainline.

2.3.1.4. Intelligent Transportation Systems (ITS) –

There are no ITS systems in operation or planned for the project area

2.3.1.5. Speeds and Delay –

The posted speed limit on Croton Point Avenue and S. Riverside Avenue within the project limits is 30 mph. Speed data was not collected to record actual vehicle operating speeds as this is not a major capacity improvement project. However, vehicles were observed as part of traffic data collection and speeds appeared to be low and appropriate for the context and design of the roadways.

2.3.1.6. Traffic Volumes –

Refer to Appendix C of this report for traffic flow diagrams.

2.3.1.6. (1) Existing traffic volumes –

The existing volumes are a culmination of turning movement counts obtained by CHA in July 2011 and April 2008 turning movement counts and volumes included in the RBA study entitled, *Croton Harmon Parking Facility Vehicular Pedestrian and Bicycle Study*, dated July 2008.

This data was used as the basis for the intersection capacity analysis and the signal warrant analyses for the study intersections.

Refer to Exhibits 2.3.1.6-1 and 2.3.1.6-2 for a general summary of the traffic data. A discussion of the traffic count methodology, peak hour, and turning movement volumes for major intersections & major traffic generator driveways/entrances are included in Appendix C.

Exhibit - 2.3.1.6-1
Traffic Data

Route	**Croton Point Avenue** (Veterans Plaza to US Route 9 southbound ramps)	**Croton Point Avenue** (Veterans Plaza to S. Riverside Avenue)	**S. Riverside Avenue (NY 9A)** (Croton Point Avenue to Benedict Boulevard)
Directional Distribution	EB / WB 25% / 75% AM, 75% / 25% PM	EB / WB 25% / 75% AM, 70% / 30% PM	NB/ SB 25% / 75% AM 73% / 27% PM
Peak Hour Factor	0.87 AM, 0.80 PM	0.84 AM, 0.89 PM	0.92 AM, 0.96 PM
% Peak Hour Trucks	2% AM, 1% PM	5% AM, 1% PM	4% AM, 1% PM
% Daily Trucks	3%	3%	3%

Exhibit - 2.3.1.6-2
Existing and Forecast Traffic Volumes

Route	**Croton Point Avenue** (Veterans Plaza to US Route 9 southbound ramps)		**Croton Point Avenue** (Veterans Plaza to S. Riverside Avenue)		**S. Riverside Avenue (NY 9A)** (Croton Point Avenue to Benedict Boulevard)	
Year	ADT	DHV	ADT	DHV	ADT	DHV
Existing (2011)	9,400	1,500	11,200	980	7,650	720
ETC (2013)	9,500	1,520	11,350	995	7,750	730
ETC+10 (2023)	10,100	1,615	12,075	1055	8,240	775

Note: ETC is the Estimated Time of Completion

2.3.1.6. (2) Future no-build design year traffic volume forecasts –

The Estimated Time of Completion (ETC)+10 design year was selected per PDM Appendix 5. An ETC+30 year projection was not completed as the project does not involve bridge or large culvert work. Peak hour turning movement volumes for major intersections & major traffic generator driveways/entrances are included for the design year(s) in Appendix C.

2.3.1.7. Level of Service and Mobility -

2.3.1.7. (1) Existing level of service and capacity analysis –

Capacity analyses were performed using the procedures outlined in the 2000 *Highway Capacity Manual,* Special Report 209, published by the Transportation Research Board, to determine the levels of service (LOS) for the 2011 (existing), 2013 (ETC) and 2023 (ETC+10) No-Build design year conditions.

Level of service is presented as a letter from A to F with A representing free flowing, unimpeded traffic with little or no delay and F representing highly congested traffic flow with long delays.

The standard design objective for urban street systems is to achieve a minimum LOS D on all intersection approaches during peak hours (NYSDOT HDM, Chapter 5.9.2). However, it is recognized that there are many competing objectives and considerations, especially in urban areas, that may affect the desirability

and feasibility of achieving this goal for peak hours. In these cases, peak-hour LOS E or F may be acceptable.

Summaries of the Levels of Service for the Existing and future year No-Build are presented in Exhibit 2.3.1.7-1 and Exhibit 2.3.1.7-2, respectively.

Exhibit 2.3.1.7-1
Level of Service Summary
Existing Condition

Intersection & Approach	Control[1]	Existing			
		AM		PM	
		LOS	Delay	LOS	Delay
Croton Point Ave & Veterans Plaza					
Eastbound		A	1.0	A	0.0
Westbound	U	B	10.0	A	5.8
Northbound		F	138.0	C	15.3
Southbound		F	NA	F	NA
Overall		E	38.3	NA	NA
Croton Point Ave & Route 9 southbound ramps					
Eastbound		A	0.0	A	0.0
Westbound	U	A	2.3	A	6.7
Southbound		F	166.8	C	18.2
Overall		E	49.0	A	3.1
Croton Point Ave & Route 9 northbound ramps					
Eastbound		A	0.0	A	0.0
Westbound	U	A	0.2	A	1.4
Northbound		F	66.8	F	83.4
Overall		C	20.2	C	23.8
Croton Point Ave & S. Riverside Avenue					
Eastbound		B	11.4	B	11.6
Northbound	S	A	7.0	B	12.3
Southbound		A	3.3	A	5.6
Overall		A	5.6	B	10.5
S. Riverside Ave & Benedict Boulevard					
Eastbound		B	15.2	B	19.2
Westbound	S	C	23.5	C	22.7
Northbound		B	10.8	A	9.5
Southbound		B	16.0	A	8.2
Overall		B	16.8	B	11.7

[1] U= unsignalized, S = signalized
NA = Delay excessive or not reportable / Level of Service not reportable

As shown in these analyses, the three unsignalized intersections currently experience LOS F on one or more intersection approaches during the existing studied peak hours.

2.3.1.7. (2) Future No-Build design year level of service

The predicted future No-Build design year level of service and capacity analysis for the AM and PM peak hours for all approaches to the five study area intersections area shown in Exhibit 2.3.1.7-2.

Exhibit 2.3.1.7-2
Level of Service Summary
No-Build Condition

Intersection & Approach	Control[1]	ETC (2013)				ETC+10 (2023)			
		AM		PM		AM		PM	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Croton Point Ave & Veterans Plaza									
Eastbound	U	A	1.0	A	0.0	A	1.0	A	0.0
Westbound		B	10.2	A	5.8	B	11.4	A	5.8
Northbound		F	161.3	C	15.6	F	333.7	C	17.3
Southbound		F	NA	F	NA	F	NA	F	NA
Overall		E	43.4	NA	NA	F	80.3	NA	NA
Croton Point Ave & Route 9 southbound ramps									
Eastbound	U	A	0.0	A	0.0	A	0.0	A	0.0
Westbound		A	2.3	A	6.8	A	2.4	A	7.3
Southbound		F	180.1	C	18.6	F	264.5	C	21.1
Overall		F	52.7	A	3.2	F	77.0	A	3.5
Croton Point Ave & Route 9 northbound ramps									
Eastbound	U	A	0.0	A	0.0	A	0.0	A	0.0
Westbound		A	0.2	A	1.4	A	0.2	A	1.5
Northbound		F	72.5	F	92.0	F	111.1	F	142.7
Overall		C	21.8	D	26.2	D	33.4	E	40.5
Croton Point Ave & S. Riverside Ave									
Eastbound	S	B	11.4	B	11.6	B	11.7	B	11.8
Northbound		A	6.9	B	12.4	A	7.1	B	13.1
Southbound		A	3.3	A	5.6	A	3.3	A	5.8
Overall		A	5.7	B	10.6	A	5.8	B	10.9
S. Riverside Ave & Benedict Blvd									
Eastbound	S	B	15.2	B	19.2	B	15.2	B	19.3
Westbound		C	23.7	C	22.7	C	24.8	C	23.1
Northbound		B	10.8	A	9.6	B	10.9	A	9.8
Southbound		B	16.1	A	8.2	B	17.0	A	8.3
Overall		B	16.9	B	11.7	B	17.6	B	11.9

[1] U= unsignalized, S = signalized
NA = Delay excessive or not reportable / Level of Service not reportable

As shown in these analyses, the three unsignalized intersections are expected to experience LOS F on one or more intersection approaches with overall intersection operations at LOS E or worse during the studied peak hours.

LOS E and F conditions at the unsignalized intersections are primarily associated with delay on the minor street approaches due to the current Stop intersection control and the inability for the side street traffic to enter the Croton Point Avenue free flowing through traffic.

2.3.1.8. Safety Considerations, Accident History and Analysis –

An accident analysis was performed in accordance with the Highway Design Manual Chapter 5 using police accident reports compiled from the Village of Croton-on-Hudson Police Department for the three-year period of June 2008 to June 2011. These accident records documented 55 accidents occurring within the project limits.

Of the 55 documented accidents in the study area, approximately 13% of the accidents were personal injury accidents, and the remaining 87% were property damage only accidents. There were no fatalities.

The predominant crash type within the project limits are rear end accidents (31%). Following those are overtaking (16%) and left turn (13%) accidents, which account for 29% of the total crashes. There were six reported crashes (11%) involving pedestrians or bicyclists, of which 2 of these types of accidents occurred at each of the three intersections of Croton Point Avenue and Veterans Plaza, Croton Point Avenue and US Route 9 southbound ramps and at Croton Point Avenue and S. Riverside Avenue.

Summary of accident severity for project area intersections are provided in Exhibit 2.3.1.8-1. Exhibit 2.3.1.8-2 summarizes the accident types for intersections within the project limits.

Exhibit 2.3.1.8-1
Intersection Accident Summary by Severity

Location	Fatal	Injury	Property Damage Only (PDO)	Total
Croton Point Avenue & Veterans Plaza	0	1	9	10
Croton Point Avenue & US Route 9 southbound ramps	0	1	9	10
Croton Point Avenue & US Route 9 northbound ramps	0	0	10	10
Croton Point Avenue & S. Riverside Avenue	0	3	16	19
S. Riverside Avenue & Benedict Boulevard	0	2	4	6
Total	**0**	**7**	**48**	**55**
% of Total	**0**	**13%**	**87%**	**100%**

The predominate accident types are:

Exhibit 2.3.1.8-2
Intersection Accident Summary by Type

Location	Angle	Rear End	Fixed Object	Over-take	Side-swipe	Left-Turn	Ped./ Bike	Head -On	Other	Total	% of Total
Croton Point Avenue & Veterans Plaza	2	1	1	4	0	0	2	0	0	10	18%
Croton Point Avenue & US Route 9 southbound ramps	0	6	0	0	0	0	2	0	2	10	18%
Croton Point Avenue & US Route 9 northbound Ramps	3	1	1	2	0	2	0	1	0	10	18%
Croton Point Avenue & S. Riverside Avenue	0	5	0	3	3	5	2	0	1	19	35%
S. Riverside Avenue & Benedict Boulevard	0	4	0	0	0	0	0	0	2	6	11%
Total	**5**	**17**	**2**	**9**	**3**	**7**	**6**	**1**	**5**	**55**	**100%**
% of Total	**9%**	**31%**	**4%**	**16%**	**5%**	**13%**	**11%**	**2%**	**9%**	**55**	**100%**

The accident rates for intersections are expressed as accidents per million entering vehicles (ACC/MEV). For intersections on the State facilities (US Route 9 ramps), the statewide average accident rate for similar facilities is provided for comparison purposes. Accident rates for the project area intersections are summarized in Exhibit 2.3.1.8-3.

Exhibit 2.3.1.8-3 Intersection Accident Rates		
Location	**Accident Rate ACC/MEV**	**Statewide Average ACC/MEV**
Croton Point Avenue & Veterans Plaza	0.67	-
Croton Point Avenue & US Route 9 northbound ramps	0.64	0.19
Croton Point Avenue & US Route 9 southbound ramps	0.72	0.11
Croton Point Avenue & S. Riverside Avenue	1.50	-
S. Riverside Avenue & Benedict Boulevard	0.57	-

Only the intersections on State routes are applicable to be compared to the Statewide Average Accident Rates published by NYSDOT. This would include the intersections of Croton Point Avenue with the US Route 9 southbound ramps and the US Route 9 northbound ramps; each of which exceed the statewide average rate.

A review of the accident types at Croton Point Avenue and the US Route 9 southbound ramps shows that there is a pattern of rear end accidents on the US Route 9 southbound off ramp. This pattern may be attributed to the queues on the ramp and the congestion at the intersection. The 2 pedestrian/bicyclist accidents could be attributed to the fact that at two-way stop controlled intersections, right-turning motorists often look only to the left in order to check for vehicular conflicts, endangering or inconveniencing pedestrians crossing from the right or on the right. This situation is exacerbated by the fact that many of these drivers do not come to a complete stop if they do not perceive any conflicts.

A review of the accident types at Croton Point Avenue and the US Route 9 northbound ramps shows that there were a few angle (3), turn (2) and overtaking (2) accidents. There was not a pattern to these accidents. However, contributing factors included driver inattention/distraction, failure to yield right-of-way and turning improperly.

The accident data showed that 35% of the total accidents (19) in the project area occurred at the Croton Point Avenue and S. Riverside Avenue intersection for the three year period. The accident rate was not compared to the statewide average rate, since it is not on the State highway system. Predominate accident types were rear-end (5) and left-turn (5) accidents. Wet pavement / snow contributed to four of the nineteen accidents. Of the remaining nineteen accidents, five had contributing factors of failing to yield right-of-way, traffic control disregarded and turning improperly and six had contributing factors of driver inattention and following too closely.

Section 3.3.1.8 discusses how the alternatives make improvements in this area.

A detailed accident analysis including an accident summary, collision diagrams, and recommendations for improvements are included in Appendix C.

2.3.1.9. Existing Police, Fire Protection and Ambulance Access -

There are no police or fire departments located within the project limits. The Harmon Firehouse is located on Benedict Boulevard, approximately 200 feet west of the S. Riverside Avenue and Benedict Boulevard intersection. Emergency vehicles routinely use Croton Point Avenue and S. Riverside Avenue. Emergency access will be maintained throughout construction.

2.3.1.10. Parking Regulations and Parking Related Conditions –

On street parking is prohibited on Croton Point Avenue and S. Riverside Avenue within the project limits.

Parking on Interstate highways is restricted by law within the project limits.

2.3.1.11. Lighting –

There is street lighting at the intersection of Croton Point Avenue and Veterans Plaza and along the south side of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue and generally consists of overhead aluminum mast arm lighting fixtures. There is no street lighting along S. Riverside Avenue within the project limits. The project will include relocation of the existing lighting at locations impacted by the construction of this project.

2.3.1.12. Ownership and Maintenance Jurisdiction –

Exhibit - 2.3.1.11
Existing Maintenance Jurisdiction

Part No.	Highway	Limits	Feature(s) being Maintained	Centerline (miles)	Lane (miles)	Agency	Authority
1	Croton Point Avenue	Veterans Plaza to S. Riverside Avenue	Entire roadway, shoulders, sidewalk, drainage, landscaping, and lighting	0.20	0.80	Village of Croton-on-Hudson	Highway Law Sect. 10 Subdivision 25
2	S. Riverside Avenue	Croton Point Avenue to Benedict Boulevard	Entire roadway, shoulders, sidewalk, drainage,, landscaping, and lighting	0.12	0.48	Village of Croton-on-Hudson	Highway Law Sect. 10 Subdivision 25
3	Veterans Plaza	Croton Point Avenue to end	Entire roadway, shoulders, sidewalk, drainage, landscaping, and lighting	0.03	0.09	Village of Croton-on-Hudson	Highway Law Sect. 10 Subdivision 25
4	Benedict Boulevard	Intersection	Entire roadway, shoulders, sidewalk, drainage, landscaping, lighting, and traffic signal	0.07	0.14	Village of Croton-on-Hudson	Highway Law Sect. 10 Subdivision 25
4	US Route 9 southbound off ramp	US Route 9 to Croton Point Avenue	Entire roadway and shoulders	0.07	0.13	NYSDOT	Highway Law Section 349-c
5	US Route 9 southbound on ramp	Croton Point Avenue to US Route 9	Entire roadway and shoulders	0.05	0.09	NYSDOT	Highway Law Section 349-c
6	US Route 9 northbound on ramps	Croton Point Avenue to US	Entire roadway and	0.03	0.03	NYSDOT	Highway Law

		Route 9	shoulders				Section 349-c
7	US Route 9 northbound off ramp	US Route 9 to Croton Point Avenue	Entire roadway and shoulders	0.03	0.03	NYSDOT	Highway Law Section 349-c

2.3.2. Multimodal

2.3.2.1. Pedestrians –

Existing pedestrian facilities exist within the project area. The concrete sidewalks vary in width from ± 4.0 ft. to 5.0 ft. and are generally in fair to poor condition. The concrete sidewalks within the project limits are located as follows:

- Veterans Plaza along the east side.
- Croton Point Avenue along the south side beginning at the US Route 9 southbound on ramp and extending west beyond Veterans Plaza.
- Croton Point Avenue along the north side between S. Riverside Avenue and extending west of Veterans Plaza.
- S. Riverside Avenue along both the east and west sides beginning north of Benedict Boulevard and extending south to Croton Point Avenue.

There are marked crosswalks at the following intersection locations:

- Croton Point Avenue & Veterans Plaza – north, south, and west legs.
- Croton Point Avenue & US Route 9 southbound on / off ramps - north and west legs.
- Croton Point Avenue & US Route 9 northbound on/off ramps – south legs.
- Croton Point Avenue & S. Riverside Avenue - south and west legs.
- S. Riverside Avenue and Benedict Boulevard – north and south legs.

Pedestrians are prohibited on Interstate Highways by State law.

Many of the sidewalks, ramps, and crosswalks do not fully comply with current Americans with Disabilities Act Accessibility Guidelines (ADAAG) requirements with respect to ramp slopes, detectable warnings, and sidewalk surface conditions. In areas where there are no sidewalks, pedestrians use the paved shoulder.

A pedestrian generator checklist is included in Appendix C.

2.3.2.2. Bicyclists –

There are no separate provisions for bicyclists. Bicyclists currently share the roadway along S. Riverside Avenue. Bicyclists may legally use the paved shoulder.

There is an existing designated bike route called Riverwalk that runs along the west of the US Route 9 southbound on ramp / southbound US Route 9 and along Croton Point Avenue west of Veterans Plaza. This section of Riverwalk is part of a planned 51.5 mile pathway paralleling the Hudson River in Westchester County. The Village of Croton-on-Hudson Bicycle / Pedestrian Master Plan, 2009 recommends the following roadways in the project area be designated as bike routes:

- Croton Point Avenue to existing Riverwalk bike route.
- S. Riverside Avenue.
- Benedict Boulevard to the east of S. Riverside Avenue.

A bicycle survey was conducted in September 2011 at the Croton-Harmon Train Station. Concerns raised by survey participants include lack of bike lanes and connections to Croton Point Park and Riverwalk, and vehicles on the US Route 9 southbound ramp not stopping for bicyclists.

Of the 9 people surveyed, sixty-seven percent (6) preferred a bike lane while thirty-three percent (3) preferred a separate path. All 9 surveyed commute within 5 miles of the station.

2.3.2.3. Transit –

The Westchester County Bee-Line operates bus service along the project corridor. There are 3 stops along the project corridor; one on Croton Point Avenue on the north side in the westbound direction located under the US Route 9 overpass, one on the US Route 9 northbound off ramp, and one on S. Riverside Avenue on the east side of the road in the northbound direction, just north of Croton Point Avenue.

2.3.2.4. Airports, Railroad Stations, and Ports –

There are no airports or port entrances within or in the vicinity of the project limits.

The Croton-Harmon railroad station is located on Veterans Plaza, south of Croton Point Avenue and west of US Route 9. Due to its close proximity to New York City, the station is a commuter hub, with both Metro-North and Amtrak utilizing the station. It is also a major transfer point between local and express trains and Westchester County Bee-Line Bus Service.

2.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, State Lands) –

Croton Point Avenue provides access to Croton Point Park and the Croton Point Nature Center, located approximately 0.75 miles west of the project area, along the Hudson River. A section of the Riverwalk Pathway is also located in this area.

2.3.3. Infrastructure

2.3.3.1. Existing Highway Section –

Croton Point Avenue typically consists of a four lane section with two 11.5 - 12 ft. wide eastbound travel lanes and two 11 - 13 ft. wide westbound travel lanes. The existing pavement is a portland cement concrete pavement. Concrete curbs abut both sides of the roadway. The condition of the existing concrete curb ranges from good to severely deteriorated, with many areas exhibiting inadequate curb reveal. The remaining uncurbed section of roadway has a paved shoulder that varies in width from 0 to 8 ft. and functions as a gutter in many locations.

The existing horizontal alignment of Croton Point Avenue within the project limits is generally straight and consists of long tangent sections connected by flat horizontal curves. The existing vertical alignment within the project limits is generally flat, with grades varying between 1% and 5%.

A few commercial driveways are located along the northern side of Croton Point Avenue. These driveways vary in type and width. Many of these driveways do not conform to the NYSDOT Policy and Standards for Entrances to State Highways in width and cross slope of the sidewalk through the driveway.

S. Riverside Avenue typically consists of a four lane section with two 10 ft. wide northbound travel lanes and two 10 ft. wide southbound travel lanes. The existing pavement is a portland cement concrete pavement. Non-mountable concrete curbs abut both sides of the roadway. Maintenance strips of varying

widths exist between the curb and sidewalks. Sidewalks of varying width exist along both sides of the roadway within the project limits.

The existing horizontal alignment is generally straight and the existing vertical alignment exhibits grades between 0.58% and 7.3%. Commercial driveways exist within the project limits.

Parking is restricted on Croton Point Avenue and S. Riverside Avenue within the project limits.

The existing Right-Of-Way (ROW) on Croton Point Avenue varies from 65 ft. to >200 ft. and varies from 50 ft. to 60 ft. in width on S. Riverside Avenue.

Veterans Plaza consists of a three lane section with one 10 ft. wide northbound travel lane, one 10 ft. wide southbound travel lane and a 10 ft. wide center lane, used as a reversible travel lane. During the AM peak hours, it is used as an inbound lane (southbound direction) and during the PM peak hours, it is used as an outbound lane (northbound direction). The existing pavement is an asphalt concrete surface. Non-mountable concrete curbs abut both sides of the roadway. A 9 ft. wide asphalt path exists on the west side and provides pedestrian and bicycle access to the Croton-Harmon Train Station. A 5 ft. wide concrete sidewalk exists along the east side of the roadway within the project limits. The existing horizontal alignment is generally straight and the existing vertical alignment exhibits grades between 8% and 12%.

The US Route 9 southbound and northbound off ramps consist of a single 13 ft. wide travel lane and a 4 ft. wide shoulder along the west side and a 10 ft. wide shoulder along the east side. The existing pavement surface has an asphalt concrete surface. There are no curbs along the off ramps.

The US Route 9 southbound on ramp consists of a single 15 ft. wide travel lane, an 8 ft. wide shoulder along the west side, a 4 ft. wide shoulder along the east side, and the 10 ft. wide Riverwalk bicycle path, which is separated from vehicular traffic via concrete jersey barrier. The existing pavement surface has an asphalt concrete surface. There are no curbs along the on ramp. The existing horizontal alignment is generally straight and the existing vertical alignment within the project area is generally flat, with grades between 2% and 9%.

The US Route 9 northbound on ramp consists of a single 15 ft. wide travel lane, a 6 ft. wide shoulder along the west side and a 4 ft. wide shoulder along the east side. West of the northbound ramp, access from Croton Point Avenue is provided via a channelized right turn lane which merges with the Croton Point Avenue eastbound traffic approximately 60 feet south of the Croton Point Avenue and northbound on ramp intersection. The existing pavement surface has an asphalt concrete surface. There are no curbs along the on ramp. The existing horizontal alignment is generally straight and the existing vertical alignment within the project area is generally flat, with grades between 1% and 2%.

See Plans and Typical Sections in Appendix A.

2.3.3.2. Geometric Design Elements Not Meeting Minimum Standards –

2.3.3.2.(1) Critical Design Elements –

Pedestrian Accommodations:
The existing pedestrian facilities on Croton Point Avenue and S. Riverside Avenue consist of 4.0 to 4.5 ft. wide sidewalks which do not meet the minimum design standard of 5 ft., or 4 ft. wide for 200 ft. with a 5 ft. by 5 ft. landing on either side of the sidewalk.

Travel Lane / Turn Lane width:
The existing travel lanes / turn lanes on S. Riverside Avenue consist of two 10 ft. wide lanes. This does not meet the minimum design standard of 11 ft. travel lanes.

Grade
The existing grade on Veterans Plaza is approximately 12% which exceeds the maximum design standard grade of 8%.

US Route 9 ramps
The existing superelevation on the US Route 9 northbound on-ramp is 6.0% which exceeds the maximum superelevation of 4.0%. The existing stopping sight distance on the US Route 9 northbound on-ramp is 240 ft. which is below the minimum stopping sight distance of 305 ft.

2.3.3.2.(2) Other Design Parameters –

There are no existing nonconforming features.

2.3.3.3. Pavement and Shoulder –

The pavement surface, based on field visits, is in fair condition with some visible cracking on both Croton Point Avenue and S. Riverside Avenue. Minor longitudinal and block cracking are also visible on the shoulders due to lack of back-up material.

2.3.3.4. Drainage Systems –

The existing drainage system on Croton Point Avenue and S. Riverside Avenue within the project limits generally consists of a closed system of catch basins along the curb lines interconnected with drainage pipes. The existing drainage system appears to generally be operating as intended.

2.3.3.5. Geotechnical –

There are no special geotechnical concerns with the soils or rock slopes within the project area.

2.3.3.6. Structure –

BIN 1004989 carries US Route 9 over Croton Point Avenue within the project limits. Westerly of the project, Croton Point Avenue continues over the Metro North / Amtrak rail lines. No work is proposed on either of the bridges.

2.3.3.7. Hydraulics of Bridges and Culverts –

There are no bridges or culverts over waterways within the project limits.

2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators –

There is existing guide railing in 7 locations within the project corridor. The type, location, and condition of this existing guide rail are shown in Exhibit 2.3.3.8. There are no median barriers or impact attenuators within the project limits.

Exhibit - 2.3.3.8 Existing Guide Railing			
Type	**Location/Side**	**Length**	**Condition**
W-Beam	Croton Point Avenue (south side)	420 feet	Fair
W-Beam	Veterans Plaza (west side) at intersection with Croton Point Avenue	150 feet	Fair
W-Beam	Route 9 northbound on-ramp (east side)	340 feet	Fair
W-Beam	Route 9 northbound off-ramp (west side)	180 feet	Fair
W-Beam	Route 9 northbound off-ramp (east side)	700 feet	Fair
W-Beam	Croton Point Avenue (south side) between US Route 9 northbound off-ramp and S. Riverside Avenue	430 feet	Fair
W-Beam	S. Riverside Avenue (west side) south of intersection with Croton Point Avenue	300 feet	Fair

2.3.3.9. Utilities –

Overhead utility lines within the project limits include electric, telephone, and cable.

Underground utilities within the project limits include Con Edison gas, Verizon, AT&T, the Village of Croton-on-Hudson sanitary sewer, storm sewer and water lines, and Westchester County Department of Environmental Facilities (WCDEF) underground gravity sewer and sewer force main.

Exhibit 2.3.3.9 summarizes the existing utilities within the project area.

Exhibit - 2.3.3.9 Existing Utilities				
Owner	**Type**	**Location/Side[1]**	**Length**	**Condition/Conflict**
ConEdison	OH Electric	south side of CPA and east side of SRA with service connections on opposite sides of street	925 ft.	Relocation Required
Cablevision	OH Cable	south side of CPA and east side of SRA with service connections on opposite sides of street	925 ft.	Relocation Required
Verizon	OH Telephone	south side of CPA and east side of SRA with service connections on opposite sides of street	925 ft.	Relocation Required
AT&T	UG Telephone	south side of CPA and west side of SRA	615 ft.	condition unknown
ConEdison	UG Gas	north side of CPA with service connections to property on south side and both sides of SRA	1180 ft.	condition unknown
Village of Croton-on-Hudson	UG Storm Line	both sides of CPA and SRA	871 ft.	condition unknown
Village of Croton-on-Hudson	UG Sanitary Line	south side of CPA, west side of SRA, and at Benedict Blvd	1526 ft.	condition unknown
ConEdison	UG Electric	south side of CPA at Bridge	100 ft.	condition unknown
Westchester County	UG Sanitary Line	south side of CPA, west side of SRA, and at Benedict Blvd		condition unknown
Village of Croton-on-Hudson	UG Water Line/Water Main	north side of CPA, west side of SRA, and at Benedict Blvd	1330 ft.	condition unknown

[1] CPA = Croton Point Avenue, SRA = S. Riverside Avenue

2.3.3.10. Railroad Facilities –

The Croton-Harmon Train Station is located on Veterans Plaza south of Croton Point Avenue and west of US Route 9. This station serves both Metro-North and Amtrak passengers and due to its proximity to New York City, is a commuter hub as well as a major transfer point between local and express trains and the Westchester County Bee-Line Bus Service. Access to the train station is via the unsignalized intersection of Croton Point Avenue and Veterans Plaza.

The Metro-North / Amtrak Railroad line runs under and perpendicular to Croton Point Avenue, approximately 250 feet west of the project's westerly limit of Croton Point Avenue with Veterans Plaza. The existing railroad is outside of the project. There are no at-grade crossings within 0.62 miles that could impact traffic conditions.

2.3.4. Potential Enhancement Opportunities

This section focuses on the existing areas to identify potential enhancement opportunities related to the project and to help avoid and minimize impacts. Chapter 4 focuses on the impacts, enhancements, and mitigation.

2.3.4.1. Landscape –

There are no significant landscaping features along S. Riverside Avenue or Croton Point Avenue within the project limits.

2.3.4.1. (1) Terrain –

The general terrain within the project limits is rolling.

2.3.4.1. (2) Unusual Weather Conditions-

There are no unusual weather conditions within the project area.

2.3.4.1. (3) Visual Resources –

The predominate viewer groups are motorists, bicyclists and pedestrians commuting to and from, Veterans Plaza or Croton Point Park. Since the buildings within the project area are for commercial purposes, and not for residential use, there will be no impacts to the residential viewer group.

The project area is visually bisected by the US Highway 9 (Route 9) overpass and it's related on and off ramps running in a north/south direction.

The overall existing visual quality is moderate with no significant or dominant views. There are numerous utility poles, light poles and highway signage, which in some cases is erected over the existing sidewalk, which impair the visual quality. Generally, the area is lacking in any substantive landscaping other than indigenous vegetation which has grown on both sides of the Route 9 access ramps. Several of the office buildings have small planting areas in the front yard and the retail area, at the southwest corner of Croton Point Avenue and S. Riverside Avenue has an embankment sloping down from Croton Point Avenue with 25'-30' high evergreens planted as a buffer. The gas station at the northwest corner of Croton Point Avenue and S. Riverside Avenue has extensive flower beds along both street fronts and a specimen London Plane tree, which provides visual relief in the form of color, texture and shade.

S. Riverside Avenue is a four lane road section with sidewalks on both sides, with a paved utility strip between the walk and curb on the east side and a grass utility strip on the west side. The east side is primarily a small scale commercial area with buildings set close to the street, and parking areas and curb

cuts between each building offering no visual relief from the existing hardscape. The west side has a gas station on each corner and a vacant lot in between.

2.3.4.2. Opportunities for Environmental Enhancements –

There are no practical opportunities for environmental enhancements in the project limits.

2.3.5. Miscellaneous

There are no other relevant features or conditions not already mentioned in Section 2.3.

CHAPTER 3 – ALTERNATIVES

This chapter discusses the alternatives considered and examines the engineering aspects for all feasible alternatives to address project objectives in Chapter 1 of this report.

3.1. Alternatives Considered and Eliminated from Further Study

Project alternatives were developed to meet the project objectives. The alternatives were developed using the engineering design criteria in Section 3.2.3 of this report. All reasonable alternatives were considered.

The following alternatives were considered and dismissed from further study:

Alternative 1 – Null or No-Build (no-action)

The No-Build (Null) Alternative provides for the continued maintenance of the existing roadway by the Village of Croton-on-Hudson maintenance forces with no capital funds being expended. The Null Alternative does not address the need for pedestrian and bicycle facilities or vehicular mobility through the corridor during all periods of the day with appropriate traffic control measures. Because this alternative does not attain any of the project objectives, it will not be considered for further discussion. This alternative will, however, be used as a baseline for comparison of feasible alternatives and the relative project benefits.

Alternative 3: Shared Use Path Alternative

This alternative provides a 10 ft. wide one-way shared use path on both the north and south side of Croton Point Avenue from the US Route 9 southbound ramps to S. Riverside Avenue. Between Veterans Plaza and the US Route 9 southbound ramps, 5 ft. sidewalks will be provided on both sides of the roadway, and bicyclists will be accommodated in the travel lane.

The roadway improvements for Alternative 3 include the realignment of the US Route 9 northbound on-ramp to eliminate the eastbound channelized free-flow right turn movement, widening of the US Route 9 southbound off-ramp to provide an exclusive right turn lane, traffic signal installations at Veterans Plaza, the US Route 9 southbound on/off ramps and the US Route 9 northbound on/off ramps, widening of approximately 100 ft. of Veterans Plaza to accommodate four-lanes, pavement and drainage improvements. Roadway resurfacing on Croton Point Avenue and S. Riverside Avenue are proposed within the project limits.

Alternative 4 - Hybrid Alternative

This alternative provides for a 5 ft. wide bike lane and a 5 ft. wide sidewalk on the south side of Croton Point Avenue, and a 10 ft. wide one-way shared use path on the north side of Croton Point Avenue. This alternative provides inconsistent accommodations for bicyclists and may result in riders travelling in the wrong direction on the shared use path. Therefore, this alternative will not be considered further.

Alternative 5 - Shared Use Path on One-Side of Croton Point Avenue

This alternative provides for one 10 ft. wide shared use path and a 5 ft. wide buffer zone on the south side of Croton Point Avenue, from Veterans Plaza to S. Riverside Avenue. This alternative would require significant ROW acquisitions and would require widening of the US Route 9 overpass. Therefore, given the extensive environmental impacts and costs associated with this alternative, it will not be considered further.

Alternative 6 – Shared Roadway

This alternative provides for an 11 ft. wide inner lane, a 14 ft. wide outer lane and a 5 ft. wide sidewalk on both sides of Croton Point Avenue, from Veterans Plaza to S. Riverside Avenue. Bicyclists would utilize the outer lane and share the roadway with vehicular traffic. While this alternative would meet several of the project objectives, it would not meet all of the objectives of this project as this alternative is not conducive for all types and skill levels of bicyclists. Therefore, since this alternative does not meet all of the project objectives, it will not be considered further.

3.2. Feasible Build Alternatives

3.2.1. Description of Feasible Alternatives

Alternative 2 – Bike Lane Alternative

This alternative consists of minor roadway widening of Croton Point Avenue to accommodate 5 ft. bike lanes and 4 to 5 ft. sidewalks on both sides of Croton Point Avenue. It includes widening the US Route 9 southbound off ramp to accommodate an exclusive right turn lane, realignment of the Route 9 northbound on ramp at Croton Point Avenue, and widening Veterans Plaza to accommodate reversible lane operations. An overlay is proposed on both Croton Point Avenue and S. Riverside Avenue, with drainage improvements and three new traffic signals on Croton Point Avenue. Key elements of this alternative include:

Geometry	• Box widening on Croton Point Avenue between Veterans Plaza and S. Riverside Avenue to accommodate 5 ft. bike lanes and 4 to 5 ft. sidewalks on both sides of the roadway. • Reducing the existing travel lanes on Croton Point Avenue from 12 ft. to 11 ft. through re-striping to minimize ROW impacts. • Widening approximately 100 ft. of Veterans Plaza to accommodate two northbound and two southbound lanes that transition to the existing three lane section. • Constructing an exclusive right turn lane on the US Route 9 southbound off ramp. • Realigning the US Route 9 northbound on ramp at Croton Point Avenue to eliminate the eastbound channelized right turn movement.
Operational	• Signalizing three intersections along Croton Point Avenue at Veterans Plaza, US Route 9 southbound ramps and US Route 9 northbound ramps, which will eliminate the use of the existing manual control during 1 hour of the peak periods at Veterans Plaza and the US Route 9 southbound ramps. • Changing the Croton Point Avenue shared through/ right turn lane on the westbound approach to Veterans Plaza to a shared left /through /right turn movement to permit double left turns. • Split phasing for the Croton Point Avenue eastbound and westbound approaches at Veterans Plaza is proposed to accommodate the eastbound double left turn movements.
Control of Access	• Control of access for this alternative will meet the Highway Design Manual criteria.
Right of Way	• This alternative will require one ROW strip acquisition totaling 0.02 acre and one temporary ROW easement of 0.01 acre.

Environmental
- There are no significant air, noise or visual impacts associated with the construction of the proposed project.

Cost
- Total estimated construction cost of this alternative is $2.853 M.

Project Goals
- The proposed alternative meets the project objectives.

Exhibit 3.2.1 Summary of Alternative Costs – Project Construction Costs (Calculated Year)

Activities	Null Alternative	Bike Lane Alternative
Highway Construction	$0.0	$1,800,000
Incidentals[1] (2013) 5%	$0.0	$180,000
Subtotal (2013)	$0.0	$1,980,000
Contingencies[2](15% @ Design Approval)	$0.0	$297,000
Subtotal (2013)	$0.0	$2,277,000
Potential Field Change Payment	$0.0	$114,000
Subtotal (2013)	$0.0	$2,391,000
Mobilization (4%)	$0.0	$96,000
Subtotal (2013)	$0.0	$2,487,000
Expected Award Amount – Inflated[3] @ 3%/yr. to midpoint of Construction (2014)	$0.0	$112,000
Construction Inspection (9%)	$0.0	$224,000
ROW Costs (2014)	$0.0	$30,000
Total **Cost**	**$0.0**	**$2,853,000**

3.2.2 Preferred Alternative

While Alternative 2 is identified as the preferred alternative, all feasible alternatives are under consideration. The selection of the preferred alternative will not be finalized until the alternatives' impacts and comments on the draft design approval document have been fully evaluated.

3.2.3. Design Criteria for Feasible Alternative(s)

3.2.3.1. Design Standards –

NYSDOT "*Highway Design Manual"* Chapter 2.

3.2.3.2. Critical Design Elements -

There are three functional classifications within the project corridor; Urban Collector, Urban Minor Arterial and Urban Local. Croton Point Avenue, between Veterans Plaza and the US Route 9 southbound ramps is classified as an Urban Collector and from the US Route 9 southbound ramps to S. Riverside Avenue it is classified as an Urban Minor Arterial. Veterans Plaza is classified as an Urban Local Collector. The US Route 9 northbound and southbound on/off ramps and Veterans Plaza are classified as Urban Minor Arterials. The critical design elements for these roads are summarized in Exhibits 3.2.3.2-1 through 3.2.3.2-6.

Exhibit 3.2.3.2-1
Critical Design Elements for Croton Point Avenue
(between Veterans Plaza and US Route 9 southbound ramps)

PIN:	8780.41	NHS (Y/N):	Yes
Route No. & Name:	Croton Point Avenue	Functional Class:	Urban Collector
Project Type:	Reconstruction	Design Classification	Urban Collector
% Trucks:	3%	Terrain:	Level
ADT:	10,100 (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed	35 mph	§2.7.3.2.A.	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	10.0 ft. (min) 12.0 ft. (desirable)[1]	§2.7.3.2.B. (Exhibit 2-6)	12 ft. ±	11.0 ft.
3	Turn Lane Width	11.0 ft. (min)	§2.7.3.2.B. (Exhibit 2-6)	12 ft. ±	11.0 ft.
4	Shldr width (Curbed)	0 ft. (min.) 1.0-2.0 ft. (desirable)[2]	§2.7.3.2.C. (Exhibit 2-6)	0.0 ft.	0.0 ft.
5	Bridge Roadway Width	N/A	N/A	N/A	N/A
6	Max. Grade	9%	§2.7.3.2.E. (Exhibit 2-6)	3.9%	3.9%
7	Min. Horizontal Radius	371 ft. @ e = 4.0%	§2.7.3.2.F. (Exhibit 2-6)	1,000 ft.	1,000 ft.
8	Max. Superelevation	4.0% (max)	§2.7.3.2.G.	N/A	N/A
9	Stopping Sight Distance	250 ft. (min)	§2.7.3.2.H. (Exhibit 2-6)	435 ft.	435 ft.
10	Horizontal Clearance				
	with Barrier =	0.0 ft. (min)	§2.7.3.2.I.	0.0 ft. (min)	0.0 ft. (min)
	w/o Barrier =	1.5 ft. (min)	§2.7.3.2.I.	1.5 ft. (min)	1.5 ft. (min)
	Intersections =	3.0 ft. (min)	§2.7.3.2.I.	3.0 ft. (min)	3.0 ft. (min)
11	Vertical Clearance	14.0 ft. Minimum 14.5 ft. Desirable	Bridge Manual §2.4.1 (Table 2-2)	N/A	N/A
12	Pavement Cross Slope	1.5% (min) to 2.0% (max)	§2.7.3.2.K.	2.0%±	2.0%±
13	Rollover Between Travel Lanes	4.0% (max.)	§2.7.3.2.L.	4.0%	4.0%
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.3.2.L.	N/A	N/A
15	Min. Structural Capacity	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	5 ft. (min)[3]	§2.7.3.2.M. HDM Section 18.6.5.1	4 ft.±	4 ft.[3]

[1]The design criteria when providing bicycle accommodations in wide travel lanes is 12 ft. minimum; 14 ft. desirable. A 0 to 4 ft. minimum shoulder may be used where a wide outside travel lane (12' min.) or separate provisions (multi-use path) are provided.
[2]The design criteria when the shoulder is intended to accommodate bicyclists is 5.0 ft. minimum.
[3] A 4 ft. wide sidewalk for 200 ft. is acceptable when a 5 ft. by 5 ft. landing pad is provided on either side of the sidewalk.

Exhibit 3.2.3.2-2
Critical Design Elements for Croton Point Avenue
(between US Route 9 southbound ramps and S. Riverside Avenue)

PIN:	8780.41	NHS (Y/N):	Yes[1]
Route No. & Name:	Croton Point Avenue	Functional Class:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification	Urban Arterial
% Trucks:	3% [2]	Terrain:	Level
ADT:	12,075 (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed	35 mph	§2.7.2.2.A.	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	11.0 ft. (min) [2]	§2.7.2.2.B. (Exhibit 2-4)	12 ft. ±	11.0 ft.
3	Turn Lane Width	11.0 ft. (min)	§2.7.2.2.B. (Exhibit 2-4)	12 ft.±	11.0 ft.
4	Shldr width (Curbed)	0 ft. (min.) [2,3] 1.0-2.0 ft. (desirable)	§2.7.2.2.C. (Exhibit 2-4)	8 ft. ±	0.0 ft.
5	Bridge Roadway Width	N/A	N/A	N/A	N/A
6	Max. Grade	7%	§2.7.2.2.E. (Exhibit 2-4)	5.4%	5.4%
7	Min. Horizontal Radius	371 ft. @ e = 4.0%	§2.7.2.2.F. (Exhibit 2-4)	870 ft.	870 ft.
8	Max. Superelevation	4.0% (max)	§2.7.2.2.G.	N/A	N/A
9	Stopping Sight Distance	250 ft. (min)	§2.7.2.2.H. (Exhibit 2-4)	280 ft.	280 ft.
10	Horizontal Clearance				
	with Barrier =	0.0 ft. (min)	§2.7.2.2.I.	0.0 ft. (min)	0.0 ft. (min)
	w/o Barrier =	1.5 ft. (min)	§2.7.2.2.I.	1.5 ft. (min)	1.5 ft. (min)
	Intersections =	3.0 ft (min)	§2.7.2.2.I.	3.0 ft. (min)	3.0 ft. (min)
11	Vertical Clearance	14.0 ft. Minimum 14.5 ft. Desirable	Bridge Manual §2.4.1 (Table 2-2)	Match Existing	Match Existing
12	Pavement Cross Slope	1.5% (min) to 2.0% (max)	§2.7.2.2.K.	Approx. 2%	Approx. 2%
13	Rollover Between Travel Lanes	4.0% (max.)	§2.7.2.2.L.	4.0%	4.0%
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.2.2.L.	6.0%	6.0%
15	Min. Structural Capacity	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	5 ft. (min)	§2.7.2.2.M. HDM Section 18.6.5.1	4 ft.±	5 ft.

[1] Croton Point Avenue between the US Route 9 northbound ramps westerly is on the NHS.
[2] The design criteria when providing bicycle accommodations in wide travel lanes is 12 ft. min.; 14 ft. desirable. A 0 to 4 ft. min. shoulder may be used where a wide outside travel lane (12' min) or separate provisions (multi-path) are intended.
[3] The design criteria when a shoulder is intended to accommodate bicyclists is 5.0 ft. minimum.

Exhibit 3.2.3.2-3
Critical Design Elements for US Route 9 Southbound and Northbound Off Ramps

PIN:	8780.41	NHS (Y/N):	Yes
Route No. & Name:	US Route 9 Ramps	Functional Class:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification	Urban Arterial
% Trucks:	3% [2]	Terrain:	Level
ADT:	2,700 SB off ramp (ETC+10) 5,100 NB off ramp (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions: Southbound (SB) off	Proposed Conditions: Northbound (NB) off ramp
1	Design Speed	40 mph min. 50 mph desirable	§2.7.5.2.A.	30 mph (posted)	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	12.0 ft.	§2.7.5.2.B. (Exhibit 2-9)	13.0 ft.(SB off) 14.0 ft. (NB off)	12.0 ft.	15.0 ft.
3	Turn Lane Width	11.0 ft. (min)	§2.7.2.2.B. (Exhibit 2-4)	N/A	12.0 ft.	N/A
4	Shldr width	3 ft. left, 6 ft. right (min.)	§2.7.5.2.C. (Exhibit 2-10)	5± ft. left Right: 8± (SB off)) 10± ft. (NB off)	3.0 ft. left 6.0 ft. right	3.0 ft. left 8.0 ft. right
5	Bridge Roadway Width	N/A	N/A	N/A	N/A	N/A
6	Max. Grade	6.0%	§2.7.5.2.E. (Exhibit 2-10)	5.1% (SB off) 2.0% (NB off)	5.2%	5.2%
7	Min. Horizontal Radius	444 ft. @ e = 8.0%, 40 mph 758 ft. (e=8.0%), 50 mph	§2.7.5.2.F. (Exhibit 2-10)	1,500 ft. (SB off) 500 ft. (NB off)	1,500 ft.	500 ft.
8	Max. Superelevation	4.0% (max)	§2.7.5.4.G.	3.0% (SB off) 4.0% (NB off)	3.0%	4.0%
9	Stopping Sight Distance	305 ft. (min), 40 mph 425 ft. (min), 50 mph	§2.7.5.2.H. (Exhibit 2-10)	N/A	N/A[2]	N/A[2]
10	Horizontal Clearance	3 ft. (min), left side 8 ft., right side	§2.7.5.2.I.	3 ft. (min), left side 8 ft., right side	3 ft. (min), left side 8 ft., right side	3 ft. (min), left side 8 ft., right side
11	Vertical Clearance	N/A	N/A	N/A	N/A	N/A
12	Pavement Cross Slope	1.5% (min) to 2.0% (max)	§2.7.5.2.K.	2.0%	2.0%	2.0%
13	Rollover Between Travel Lanes	4.0% (max.)[1]	§2.7.5.2.L.	N/A	2.0%	N/A
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.5.2.L.	8.0%	8.0%	8.0%
15	Min. Structural Capacity	N/A	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	N/A	HDM Section 18.6.5.1	N/A	N/A	N/A

[1] When the superelevation rate exceeds 6%, a maximum rollover rate of 10% may be permitted.
[2] No vertical curves exist within the project limits.

Exhibit 3.2.3.2-4
Critical Design Elements for US Route 9 Southbound and Northbound On Ramps

PIN:	8780.41	NHS (Y/N):	Yes
Route No. & Name:	US Route 9 Ramps	Functional Class:	Urban Minor Arterial
Project Type:	Reconstruction	Design Classification	Urban Arterial
% Trucks:	3% [2]	Terrain:	Level
ADT:	SB on ramp (ETC+10) NB on ramp (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions: Southbound (SB) on ramp	Proposed Conditions: Northbound (NB) on ramp
1	Design Speed	40 mph min. 50 mph desirable	§2.7.5.2.A.	30 mph (posted)	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	12.0 ft.	§2.7.5.2.B. (Exhibit 2-9)	15.0 ft.	15.0 ft.	15.0 ft.
3	Turn Lane Width	11.0 ft. (min)	§2.7.2.2.B. (Exhibit 2-4)	N/A	N/A	N/A
4	Shldr width	3 ft. left, 6 ft. right (min.)	§2.7.5.2.C. (Exhibit 2-10)	3± ft. left 6± to 8± ft. right	3.0 ft. left 6.0 to 8.0 ft. right	3.0 ft. left 6.0 to 8.0 ft. right
5	Bridge Roadway Width	N/A	N/A	N/A	N/A	N/A
6	Max. Grade	6.0%	§2.7.5.2.E. (Exhibit 2-10)	5.2%	5.2%	1.0%
7	Min. Horizontal Radius	444 ft. @ e = 8.0%, 40 mph 758 ft. (e=8.0%), 50 mph	§2.7.5.2.F. (Exhibit 2-10)	N/A	N/A	N/A
8	Max. Superelevation	4.0% (max)	§2.7.5.4.G.	4.0% (SB on) 6.0%% (NB on)	Match Existing	Match Existing
9	Stopping Sight Distance	305 ft. (min), 40 mph 425 ft. (min), 50 mph	§2.7.5.2.H. (Exhibit 2-10)	N/A (SB on) 240 ft. (NB on)*	Match Existing	Match Existing
10	Horizontal Clearance	3 ft. (min), left side 8 ft., right side	§2.7.5.2.I.	3 ft. (min), left side 8 ft., right side	3 ft. (min), left side 8 ft., right side	3 ft. (min), left side 8 ft., right side
11	Vertical Clearance	N/A	N/A	N/A	N/A	N/A
12	Pavement Cross Slope	1.5% (min) to 2.0% (max)	§2.7.5.2.K.	2.0%	2.0%	2.0%
13	Rollover Between Travel Lanes	4.0% (max.)[1]	§2.7.5.2.L.	N/A	N/A	N/A
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.5.2.L.	8.0%	8.0%	8.0%
15	Min. Structural Capacity	N/A	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	N/A	HDM Section 18.6.5.1	N/A	N/A	N/A

[1] When the superelevation rate exceeds 6%, a maximum rollover rate of 10% may be permitted.
*Non-Standard Feature

Exhibit 3.2.3.2-5
Critical Design Elements for S. Riverside Avenue

PIN:	8780.41	NHS (Y/N):	Yes
Route No. & Name:	S. Riverside Avenue	Functional Class:	Urban Minor Arterial
Project Type:	Reconstruction (Pavement Overlay only)	Design Classification	Urban Arterial
% Trucks:	3% [2]	Terrain:	Level
ADT:	8,240 (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed	35 mph	§2.7.2.2.A.	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	11.0 ft. (min) [1]	§2.7.2.2.B. (Exhibit 2-4)	10.0 ft.*	10.0 ft.
3	Turn Lane Width	11.0 ft. (min)	§2.7.2.2.B. (Exhibit 2-4)	10.0 ft.*	10.0 ft. (Retain Existing)
4	Shldr width (Curbed)	0 ft. (min.) [1, 2]	§2.7.2.2.C. (Exhibit 2-4)	0 ft.	0 ft.
5	Bridge Roadway Width	N/A	N/A	N/A	N/A
6	Max. Grade	7.0%	§2.7.2.2.E. (Exhibit 2-4)	7.0%	(Retain Existing)
7	Min. Horizontal Radius	371 ft. @ e = 4.0%	§2.7.2.2.F. (Exhibit 2-6)	1,100 ft.	(Retain Existing)
8	Max. Superelevation	4.0% (max)	§2.7.2.2.G.	N/A	(Retain Existing)
9	Stopping Sight Distance	250 ft. (min)	§2.7.2.2.H. (Exhibit 2-4)	285 ft.	285 ft.
10	Horizontal Clearance				
	with Barrier =	0.0 ft. (min)	§2.7.2.2.I.	0.0 ft. (min)	(Retain Existing)
	w/o Barrier =	1.5 ft. (min)	§2.7.2.2.I.	1.5 ft. (min)	(Retain Existing)
	Intersections =	3.0 ft. (min)	§2.7.2.2.I.	3.0 ft. (min)	(Retain Existing)
11	Vertical Clearance	N/A	Bridge Manual §2.4.1 (Table 2-2)	N/A	N/A
12	Pavement Cross Slope	1.5% (min) to 3.0% (max) 2% (min) to 8% (max)	§2.7.2.2.K.	Approx. 3%	Approx. 3%
13	Rollover Between Travel Lanes	4.0% (max.)	§2.7.2.2.L.	4%	4%
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.2.2.L.	4%	4%
15	Min. Structural Capacity	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	5 ft. (min)[3]	§2.7.2.2.M. HDM Section 18.6.5.1	4 ft.±	(Retain Existing)

[1] The design criteria when providing bicycle accommodations in wide travel lanes is 12 ft. minimum; 14 ft. desirable.
[2] The design criteria when the shoulder is intended to accommodate bicyclists is 5.0 ft. minimum.
[3] A 4 ft. wide sidewalk for 200 ft. is acceptable when a 5 ft. by 5 ft. landing pad is provided on either side of the sidewalk.
*Non-Standard Feature

Exhibit 3.2.3.2-6
Critical Design Elements for Veterans Plaza

PIN:	8780.41	NHS (Y/N):	No
Route No. & Name:	Veterans Plaza	Functional Class:	Urban Local
Project Type:	Reconstruction	Design Classification	Local Urban Street
% Trucks:	3.6%	Terrain:	Level
ADT:	6,000 (ETC+10)	Truck Access/Qualifying Hwy:	Neither

	Element	Standard Criteria	HDM § Reference	Existing Conditions	Proposed Conditions
1	Design Speed	35 mph	§2.7.2.2.A.	30 mph (posted)	30 mph (posted)
2	Travel Lane Width	10.0 ft. (min),11.0 ft. Desirable [1]	§2.7.2.2.B. (Exhibit 2-4)	10.0 ft.±	10.0 ft.
3	Turn Lane Width	9.0 ft.(min), 12.0 ft. Desirable	§2.7.2.2.B. (Exhibit 2-4)	N/A	10.0 ft.
4	Shldr width (Curbed)	0 ft. (min.), 2.0 ft. Desirable [1, 2]	§2.7.2.2.C. (Exhibit 2-4)	0 ft.	0 ft.
5	Bridge Roadway Width	N/A	N/A	N/A	N/A
6	Max. Grade	8.0%	§2.7.2.2.E. (Exhibit 2-4)	12.0%	12.0%*
7	Min. Horizontal Radius	250 ft. @ e = 4.0%	§2.7.2.2.F. (Exhibit 2-6)	N/A	N/A
8	Max. Superelevation	4.0% (max)	§2.7.2.2.G.	N/A	N/A
9	Stopping Sight Distance	200 ft. (min)	§2.7.2.2.H. (Exhibit 2-4)	286 ft.	286 ft.
10	Horizontal Clearance				
	with Barrier =	0.0 ft. (min)	§2.7.2.2.I.	0.0 ft (min)	0.0 ft. (min)
	w/o Barrier =	1.5 ft. (min)	§2.7.2.2.I.	1.5 ft (min)	1.5 ft. (min)
	Intersections =	3.0 ft. (min)	§2.7.2.2.I.	3.0 ft (min)	3.0 ft. (min)
11	Vertical Clearance	N/A	Bridge Manual §2.4.1 (Table 2-2)	N/A	N/A
12	Pavement Cross Slope	1.5% (min) to 2.0% (max)	§2.7.2.2.K.	Approx. 2%	Approx. 2%
13	Rollover Between Travel Lanes	4.0% (max.)	§2.7.2.2.L.	4%	4%
14	Rollover At Pavement Edge	8.0% (max.)	§2.7.2.2.L.	N/A	N/A
15	Min. Structural Capacity	N/A	N/A	N/A	N/A
16	Pedestrian Accommodations	5 ft. (min)[1]	§2.7.2.2.M. HDM Section 18.6.5.1	5 ft.	4 ft.[1]

[1] A 4 ft. wide sidewalk for 200 ft. is acceptable when a 5 ft. by 5 ft. landing pad is provided on either side of the sidewalk.
*Non-Standard Feature

3.2.3.3. Other Design Parameters -

Exhibit 3.2.3.3 a Other Design Parameters		
Highway or Feature		
Element	Criteria	Proposed Condition
1 Level of Service	LOS D Minimum LOS C Desirable	LOS D Minimum LOS C Desirable
2 Bike accommodations	Bike Lane – 4 ft. min., 5 ft. min. w/curb Bike Path (two-way) – 10 ft. w/o pedestrians, 12 ft. w/ pedestrians	5 ft.
4 Closed Drainage System	10 year frequency	10 year frequency

3.3. Engineering Considerations

3.3.1. Operations (Traffic and Safety) & Maintenance

3.3.1.1. Functional Classification and National Highway System –

This project will not change the functional classification of the highway.

3.3.1.2. Control of Access -

Access to the US Route 9 ramps will be unchanged and remain fully controlled. Croton Point Avenue will not change and remain uncontrolled.

3.3.1.3. Traffic Control Devices -

3.3.1.3. (1) Traffic Signals –

Three new traffic signals are proposed at the following intersections:

- Croton Point Avenue with Veterans Plaza
- Croton Point Avenue with the US Route 9 southbound on / off ramps
- Croton Point Avenue with the US Route 9 northbound on / off ramps

Signal modifications to the existing traffic signals at the two signalized intersections of Croton Point Avenue and S. Riverside Avenue and S. Riverside Avenue and Benedict Boulevard are proposed to allow these existing signals to be coordinated with the new signals. New pedestrian signals will be installed at these two existing intersections. Complete replacement of these existing traffic signals is not proposed.

Overhead lane signals will be added to Veterans Plaza for the reversible lane operations.

3.3.1.3. (2) Signs –

Existing signs will be replaced and updated as necessary. New signs will be added where required in accordance with the MUTCD.

3.3.1.4. Intelligent Transportation Systems (ITS) –

No ITS measures are proposed.

3.3.1.5. Speeds and Delay -

3.3.1.5. (1) Proposed Speed Limit –

The existing posted speed limit of 30 mph will be retained upon completion of the project.

3.3.1.5. (2) Travel Time Estimates –

Travel time estimates are not included as the feasible alternatives will not change the capacity.

3.3.1.6. Traffic Volumes –

There are no anticipated changes in traffic volumes. Refer to Exhibits 2.3.1.6-1 and 2.3.1.6-2 for a summary of the traffic data and Appendix C for traffic flow diagrams.

3.3.1.7. Level of Service and Mobility –

3.3.1.7 (1) At Project Completion & Design Year –

Traffic Control / operational improvements are necessary to accommodate the high directional traffic flow and pedestrian and bicycle crossings, and minimize queues to the US Route 9 mainline without the need for continued manual traffic control operations during the peak periods.

A traffic signal warrant analysis was performed for the three Croton Point Avenue intersections (at Veterans Plaza, US Route 9 southbound ramps and US Route 9 northbound ramps) and it was determined that the volumes met the warranting criteria of Warrant 3 (the peak hour warrant) for all three intersections as well as Warrants 1 and 2 for the intersections of Croton Point Avenue with the US Route 9 southbound ramps and the US Route 9 northbound ramps, as outlined in Chapter 4C of Manual on Uniform Traffic Control Devices (MUTCD), 2009.

As noted above, traffic control improvements are necessary and given that the volumes meet the warrant criteria, a traffic signal is proposed to be installed at these intersections. In addition, the southbound off ramp will be widened to provide an exclusive right-turn lane and there will be narrowing of the Croton Point Avenue and US Route 9 northbound on ramp intersection such that the eastbound free-flowing channelized right-turn on Croton Point Avenue would be eliminated and right-turns would be made from the signalized intersection proper would improve the pedestrian and bicycle crossings.

The capacity analyses, with the proposed improvements, indicate that an overall intersection LOS C or better may be achieved for all the intersections through the ETC+10 design horizon.

Exhibit 3.3.1.7-1 provides a summary of operations, expressed as level of service, for this intersection with the improvements described above.

Exhibit 3.3.1.7-1
Level of Service Summary
Build Condition

Intersection & Approach	Control	ETC (2013)				ETC+10 (2023)			
		AM		PM		AM		PM	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Croton Point Ave & Veterans Plaza									
Eastbound	S	E	70.3	D	51.9	E	71.2	D	52.3
Westbound		B	12.9	B	16.5	B	13.7	B	17.2
Northbound		C	31.4	C	22.5	C	31.2	C	22.4
Southbound		E	57.0	E	58.4	E	56.6	E	64.4
Overall		C	21.5	C	24.6	C	22.0	C	24.9
Croton Point Ave & Route 9 southbound ramps									
Eastbound	S	C	22.8	C	20.4	C	23.9	C	21.1
Westbound		B	18.1	B	11.2	B	18.6	B	10.7
Southbound		E	68.6	D	41.8	E	72.0	D	41.9
Overall		C	33.5	B	19.8	C	34.9	B	20.1
Croton Point Ave & Route 9 northbound ramps									
Eastbound	S	A	8.5	C	21.1	A	9.0	C	22.6
Westbound		B	16.5	A	6.4	B	17.5	A	9.5
Northbound		D	37.3	C	23.2	D	37.3	C	23.0
Overall		C	21.2	B	18.7	C	21.9	B	20.0
Croton Point Ave & S. Riverside Ave									
Eastbound	S	A	3.7	A	5.8	A	1.7	A	5.6
Northbound		E	57.2	D	50.8	E	57.5	D	50.4
Southbound		A	5.0	B	12.3	A	6.6	B	11.6
Overall		A	8.9	B	18.3	A	9.5	B	17.9
S. Riverside Ave & Benedict Blvd									
Eastbound	S	D	39.8	D	45.3	D	38.4	D	44.7
Westbound		E	63.9	E	57.8	E	63.3	E	58.1
Northbound		B	10.8	A	3.2	B	11.4	A	4.3
Southbound		B	12.1	A	4.2	B	13.5	A	4.5
Overall		C	26.6	B	13.2	C	27.2	B	14.0

3.3.1.7 (2) – Work Zone Safety & Mobility –

A. Work Zone Traffic Control Plan -

Traffic will be maintained throughout the project area during construction operations through the use of staged construction methods established in accordance with the MUTCD.

Two-way traffic will be maintained at all times via lane shifts and short duration lane closures. No off site detours will be required. Routes for emergency vehicles will be maintained and open during construction. Access to the commercial establishments will be maintained at all times during construction. The details for the work zone traffic control will be prepared and evaluated during final design.

B. Special Provisions –

The use of time related provisions will be evaluated during final design. The work zone traffic control will be coordinated with local officials, emergency response agencies and business owners during the final design stages.

C. Significant Projects (per 23 CFR 630.1010) -

The proposed project is not considered to be significant per 23 CFR 630.1010, nor are there any known significant projects in the project vicinity.

3.3.1.8. Safety Considerations, Accident History and Analysis –

The preferred Build Alternative includes the addition of three traffic signals on Croton Point Avenue at Veterans Plaza, the US Route 9 southbound on /off ramps, and the US Route 9 northbound on/off ramps. In addition, the preferred Build Alternative includes construction of a southbound right turn lane on the US Route 9 southbound off ramp and realigning the US Route 9 northbound on ramp that will be controlled by the signal.

Signal control provides vehicles exiting the minor street approaches (Veterans Plaza, the southbound off ramp and the northbound off ramp) with an exclusive phase to enter Croton Point Avenue and provides phasing for pedestrians and bicyclists to cross each of the roadways. Signalization also eliminates the need for manual control and the inherent safety risk to the personnel associated with this control.

Constructing an exclusive southbound right turn lane provides both operational and safety benefits by providing an additional lane for right turning vehicles to move through the intersection during the minor street phase, which can reduce the queue of traffic along the ramp and reduce the potential for rear-end crashes. In addition, advance detection is proposed for the off ramps so that queues do not extend to the US Route 9 mainline.

In addition, realigning the US Route 9 northbound on ramp at Croton Point Avenue will improve the overall navigation of the road, which can reduce the potential for accidents from the east to northbound channelized right turn and the west to northbound left turn movements. Narrowing of the Croton Point Avenue and US Route 9 northbound on ramp intersection such that the eastbound free-flowing channelized right-turn on Croton Point Avenue would be eliminated and right-turns would be made from the signalized intersection proper would improve the pedestrian crossing.

The proposed improvements can reduce the likelihood of some vehicle conflicts that involved failure to yield right of way and turning improperly.

3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access –

Access for emergency vehicles will be maintained and open during construction.

3.3.1.10. Parking Regulations and Parking Related Issues –

No changes are proposed.

3.3.1.11. Lighting –

The existing street lighting within the project limits will be maintained and relocated if necessary. No additional lighting changes are proposed.

3.3.1.12. Ownership and Maintenance Jurisdiction –

The Village of Croton-on-Hudson will continue ownership and maintenance responsibilities for Croton Point Avenue, S. Riverside Avenue and Veterans Plaza, including the new traffic signal at Croton Point Avenue and Veterans Plaza.

NYSDOT will continue ownership and maintenance responsibilities for the US Route 9 southbound ramps and the US Route 9 northbound ramps as well as the new traffic signals at these intersections with Croton Point Avenue.

3.3.1.13. Constructability Review –

A formal constructability review will not be completed for this project.

3.3.2. Multimodal

3.3.2.1. Pedestrians –

Four-foot wide concrete sidewalks, for less than 200 ft., will be constructed on both sides of Croton Point Avenue between Veterans Plaza and the US Route 9 southbound ramps and along the east side of Veterans Plaza to minimize ROW impacts to adjacent properties. In accordance with current ADAAG requirements, 4 ft. wide sidewalks may be constructed provided a 5 ft. by 5 ft. wide pad is provided every 200 ft.

Five-foot wide concrete sidewalks will be constructed on both sides of Croton Point Avenue between the US Route 9 southbound ramps and S. Riverside Avenue. Pedestrian facilities will be accessible and usable by people with disabilities in accordance with current ADAAG requirements.

Pedestrians can continue to use the existing concrete sidewalks on both sides of S. Riverside Avenue from Croton Point Avenue to Benedict Boulevard.

A Pedestrian Generator Checklist is included in Appendix C.

Pedestrians are prohibited on Interstate Highways by State law.

Crosswalks will be delineated with new pavement markings and pedestrian facilities, including pushbuttons and countdown timers provided at each of the new traffic signals on Croton Point Avenue.

3.3.2.2. Bicyclists –

Bicyclists will be accommodated through the use of 5 ft. wide bike lanes along both sides of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue. On S. Riverside Avenue, between Croton Point Avenue and Benedict Boulevard, bicyclists can continue to utilize the existing travel lanes. Since bicyclists will be riding adjacent to the curb line, all surface collection inlet structures will use bicycle safe grates.

Bicyclists are prohibited on Interstate Highways by State law.

3.3.2.3. Transit –

No changes are proposed.

3.3.2.4. Airports, Railroad Stations, and Ports –

No changes are proposed; no conflicts are expected.

3.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, and State Lands) –

No changes are proposed.

3.3.3. Infrastructure

3.3.3.1. Proposed Highway Section –

The proposed project includes box widening on Croton Point Avenue between Veterans Plaza and S. Riverside Avenue and restriping Croton Point Avenue to provide two 11 ft. lanes, a 5 ft. bicycle lane in each direction and 4 ft. to 5 ft. sidewalks on both sides of the roadway. The existing pavement will remain an asphalt concrete surface. No changes to the horizontal or vertical alignment are proposed as part of the project.

The project includes an asphalt overlay on S. Riverside Avenue between Croton Point Avenue and Benedict Boulevard to provide two 10 ft. travel lanes in both directions. Existing curbs, maintenance/utility strips and sidewalks will be retained.

The US Route 9 southbound off ramp and Veterans Plaza will be widened. A 12 ft. wide exclusive right turn lane and 6 ft. shoulder will be constructed on the US Route 9 southbound off ramp. Veterans Plaza will be box widened to accommodate four 10 ft. wide travel lanes (two for the northbound and two for the southbound direction) with a 4 ft. wide sidewalk on the east side and an 8 ft. wide shared path on the west side that will transition back to the three 10 ft. lane section.

Refer to Appendix A for plans and typical sections.

3.3.3.1. (1) Right of Way -ROW

Strip acquisitions will be required to accommodate the bicycle and pedestrian accommodations, the traffic signal and driveway grading. One permanent easement area on the north side of Croton Point Avenue between Veterans Plaza and the US southbound ramps of approximately 750 sf. (0.0171 acres), and one temporary easement on the north side of Croton Point Avenue, just west of the northbound ramps of approximately 280 sf. (0.0065 acres) are anticipated.

3.3.3.1. (2) Curb –

Six inch vertical faced concrete curb will be provided on both sides of Croton Point Avenue and Veterans Plaza within the project limits. The existing concrete curbs on S. Riverside Avenue will be retained. No concrete curbs are proposed on the US Route 9 northbound ramps or the US Route 9 southbound ramps.

3.3.3.1. (3) Grades –

The proposed work will not revise the existing vertical alignment of the roadways in the project area.

3.3.3.1. (4) Intersection Geometry and Conditions –

Veterans Plaza is being widened to accommodate two inbound (southbound) and two outbound (northbound) travel lanes. Double left turn movements from the westbound approach will be accommodated inbound by the exclusive left turn lane and the shared left/through / right turn lane approach. The outbound lanes will consist of a shared left/through / right turn lane and an exclusive right turn lane.

An exclusive right turn lane will be constructed on the US Route 9 southbound ramp; the existing shared left/through/ right turn lane will be retained, such that double right turns will be accommodated from the southbound off ramp.

The eastbound channelized right turn lane to the northbound on ramp will be removed such that right turns will go through the intersection proper.

The existing intersection geometry will be retained at S. Riverside Avenue and Benedict Boulevard.

3.3.3.1. (5) Roadside Elements:

(a) Snow Storage, Sidewalks, Utility Strips, Bikeways, Bus Stops – Four-foot and five-foot wide sidewalks are proposed on both sides of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue. Four foot wide sidewalks are proposed on the west side of Veterans Plaza. Existing sidewalks will be retained on S. Riverside Avenue.

A 1.5 ft. maintenance strip is proposed on the north side of Croton Point Avenue between the US Route 9 southbound ramps and S. Riverside Avenue. The existing maintenance strips on S. Riverside Avenue will be retained.

Five foot bike lanes are proposed on both sides of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue.

There are three existing bus stop locations within the project limits that will be retained.

(b) Driveways - The driveways will be modified to comply with the current NYSDOT "Policy and Standards for Design of Entrances to State Highways."
(c) Clear Zone - The clear zone will be approximately 3.0 ft. wide in accordance with Section 10.2.7 of the NYSDOT HDM and will be refined during final design to adjust for slopes, roadway curvature, etc.

3.3.3.2. Special Geometric Design Elements –

3.3.3.2. (1)Non-Standard Features –

US Route 9 northbound ramps
The proposed project will retain the nonstandard stopping sight distance of 240 ft. and the nonstandard superelevation of 6% on the US Route 9 northbound on ramp. Modifications to the roadway to correct the nonstandard feature would be beyond the scope of this project.

Veterans Plaza
The proposed project will retain the nonstandard grade of 12% which exceeds the maximum grade of 8%. Modifications to the roadway profile to correct the grade to meet the standard would result in significant impacts to the adjacent properties and require right-of-way which would be beyond the scope of this project. Therefore, the existing non-standard grade will be retained.

S. Riverside Ave
The proposed project will retain the travel lane and turn lane widths of 10 ft. on S. Riverside Avenue. The minimum standard width is 11 ft. This feature has been retained because widening of the roadway and reconstruction of the roadway is not within the scope of this bicycle and pedestrian improvement project. No safety concerns associated with the non-standard lane width have been identified. Widening of the existing travel lanes would involve significant cost to box widen the pavement, replace the existing curb, and replace the existing drainage infrastructure which would also impact the right-of-way. Therefore, it is proposed that the existing non-standard travel lane width be retained.

The proposed project will also retain the existing 4 ft. wide sidewalks along both sides of S. Riverside Avenue. The minimum standard is 5 ft. This feature is being retained Widening the sidewalk would require right-of-way and would involve a significant cost that is beyond the scope of this project. Therefore, it is proposed that the existing non-standard sidewalk width be retained.

A copy of the non-standard feature justification forms are in Appendix D.

3.3.3.2. (2) Non-Conforming Features –

There will be no non-conforming features within the project limits.

3.3.3.3. Pavement and Shoulder –

No pavement evaluation has or will be completed for this project. Croton Point Avenue and S. Riverside Avenue consist of concrete pavement while Veterans Plaza, the US Route 9 southbound and northbound on and off ramps and Benedict Boulevard consist of asphalt pavement.

Cold milling with an asphalt concrete inlay is proposed along Croton Point Avenue, S. Riverside Avenue, Veterans Plaza and the US Route 9 northbound and southbound on and off ramps within the project limits, with the exception of the box widening and the construction of the southbound off ramp turn lane.

The proposed pavement section will be composed of 1.5-inch thick asphalt top course, 2-inch asphalt binder course, 5-inch asphalt base course and 12-inch subbase on the US Route 9 southbound off ramp.

Croton Point Avenue will include (2) 11-ft. travel lanes, a 5 ft. bike lane and a concrete curb in both the eastbound and westbound directions. No shoulders along Croton Point Avenue, within the project limits are proposed. S. Riverside Avenue will consist of (2) 10-ft travel lanes with curbing along both sides of the roadway. Shoulders on both sides of S. Riverside Avenue will be retained. Veterans Plaza will consist of (2) 10-ft. travel lanes and concrete curbing in both the northbound and southbound directions which transitions to a 3-lane section with 10-ft wide travel lanes. No shoulders are proposed along Veterans Plaza. Refer to Appendix A for typical sections for the proposed pavement section.

3.3.3.4. Drainage Systems –

The existing storm water is controlled via a combination of open and closed drainage systems along the project corridor. The existing drainage system is adequate and functioning properly.

In general the existing drainage systems will be cleaned and maintained, with the following exceptions:

- New closed drainage systems will be required at locations where an existing open-drainage system is replaced by a proposed curb section (see Section 3.3.3.1, for proposed curb locations).
- Existing frame and grate elevations will need to be modified to match proposed elevations.
- The need for additional drainage structures and/or modifications to the existing systems will be evaluated in final design.

3.3.3.5. Geotechnical –

No special techniques or considerations are needed.

3.3.3.6. Structures –

There are no proposed bridges within the project limits and no improvements to the existing overpass of US Route 9 over Croton Point Avenue.

3.3.3.7. Hydraulics of Bridges and Culverts –

There are no bridges of culverts over waterways included in the project.

3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators –

It is anticipated that approximately 100 ft. of box beam guiderail will be required along the west side of Veterans Plaza and tie into the existing guide rail for the existing path to the train station and at the parking lot. In addition, all existing guiderail within the project limits will be evaluated during final design for conformance to design standards and replaced or repaired, if necessary.

3.3.3.9. Utilities –

The utility providers within the project limits are summarized below. The proposed project will require relocation of overhead electric, telephone, and cable facilities. There will be minor modifications to underground utilities, including raising frames and covers and/or valve adjustments due to change in roadway elevation or grading. As the design progresses and the extent of the utility conflicts are determined, there will be correspondence and coordination with utility owners regarding this work.

Exhibit 3.3.3.9 Location of Potential Utility Impacts				
Owner	Type (Denote OH/UG)	Location	Side	Impact
	Utility Pole	12+03	RT	Relocation
	Utility Pole	12+91	LT	Relocation
	Utility Pole	12+52	LT	Relocation
	Utility Pole	17+22	RT	Relocation
	Utility Pole	19+29	RT	Relocation
	Utility Pole	20+26	RT	Relocation

3.3.3.10. Railroad Facilities –

The Croton-Harmon Train Station is located on Veterans Plaza south of Croton Point Avenue and immediately west of US Route 9. This station serves both Metro-North and Amtrak passengers and due to its proximity to New York City, is a commuter hub as well as a major transfer point between local and express trains and the Westchester County Bee-Line Bus Service.

The proposed widening of Veterans Plaza to provide two northbound and two southbound travel lanes, which permits double left turn movements from Croton Point Avenue, as well as double right turns exiting Veterans Plaza and the installation of the traffic signal control with pedestrian accommodations will improve access to the train station.

The Metro-North / Amtrak Railroad line runs under and perpendicular to Croton Point Avenue, approximately 250 feet west of the project's westerly limit of Croton Point Avenue with Veterans Plaza. The existing railroad is outside of the project. The preferred alternative will not impact any at-grade crossings.

3.3.4. Landscape and Environmental Enhancements –

Refer to Chapter 4 for complete discussion.

3.3.4.1. Landscape Development and Other Aesthetics Improvements –

Refer to Chapter 4 for a more detailed discussion.

3.3.4.2. Environmental Enhancements –

Environmental enhancements are limited due to the nature of the project area.

3.3.5. Miscellaneous

NYS Smart Growth Public Infrastructure Policy Act (SGPIPA)

Pursuant to ECL Article 6, this project is compliant with the New York State Smart Growth Public Infrastructure Policy Act (SGPIPA).

To the extent practicable this project has met the relevant criteria as described in ECL § 6-0107. The Smart Growth Screening Tool was used to assess the project's consistency and alignment with relevant Smart Growth criteria; the tool was completed by the Region's Planning and Program Management group on _____ and reflects the current project scope. A copy of the Smart Growth Screening Tool is included in Appendix B.

CHAPTER 4 - SOCIAL, ECONOMIC and ENVIRONMENTAL CONDITIONS and CONSEQUENCES

4.1 Introduction

The purpose of this chapter is to identify and evaluate the potential social, economic, and environmental consequences of the preferred alternative presented in Chapter 3; identify feasible avoidance or mitigation measures, satisfy the applicable social, economic and environmental regulations; and identify anticipated permits and approvals needed for the project.

4.1.1 Environmental Classification

4.1.1.1 NEPA Classification -

This project is classified as a NEPA Class II action (Categorical Exclusion with Documentation) in accordance with 23 CFR 771.117(d). This project meets the description of #1 from 23 CFR 771.117(d): "Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, and climbing)". This determination requires FHWA's concurrence. Refer to Appendix B.

4.1.1.2 SEQR Classification -

In accordance with 6 NYCRR, Part 617, this project is classified as a SEQR Unlisted Action. The Village of Croton-on-Hudson is the SEQR Lead Agency. Refer to Appendix B for the Full Environmental Assessment Form (EAF).

4.1.2 Coordination with Agencies

4.1.2.1 NEPA Cooperating and Participating Agencies -

The following agencies are Cooperating Agencies in accordance with 23 CFR 771.111(d):

- Federal Highway Administration (FHWA)
- NYS Department of Transportation (NYSDOT)
- NYS Department of Environmental Conservation (NYSDEC)
- U.S. Army Corps of Engineers (ACOE)
- State Historic Preservation Office (SHPO)

4.2 Social

The purpose of this section is to discuss the social environment of the site. The project involves the construction of pedestrian and bicycle enhancements along Croton Point Avenue and S. Riverside Avenue, drainage system improvements, traffic signal installation at three locations along Croton Point Avenue, and geometric improvements at the Route 9 northbound and southbound on / off ramps. This section will address impacts on minority or disadvantaged populations, how the proposed alternative relates to any local and/or regional comprehensive planning initiative, and how the alternative will affect the social environment of the existing community.

4.2.1 Land Use

4.2.1.1 Demographics and Affected Population -

The project is not within an Environmental Justice Area. The project area is suburban and lightly developed; with a few commercial businesses along the north side of Croton Point Avenue and along both sides of S. Riverside Avenue.

This project is compatible with the Town and county comprehensive plans.

4.2.1.2 Comprehensive Plans and Zoning -

The project will not change the zoning or land use within the corridor.

The project objectives are consistent with the Village of Croton-on-Hudson Comprehensive Plan and their Bicycle / Pedestrian Master Plan. Several of the recommendations in these Plans have been incorporated into the proposed project including the new sidewalks and crosswalks, addition of bicycle accommodations in the corridor and improving capacity. These proposed improvements will improve the mobility of all users within the project area. All of the proposed improvements will be designed to minimize impacts to the existing environment.

4.2.2 Neighborhoods and Community Cohesion

4.2.2.1 Community Cohesion -

The project will not divide neighborhoods, isolate part of a neighborhood, generate new development or otherwise affect community cohesion. The age and ethnic background of the affected population is of a similar composition as the rest of the Village of Croton-on-Hudson. Community cohesion is likely to benefit from the proposed improvements to pedestrian and bicyclist facilities. These facilities will provide an improved link for pedestrians and bicyclists between residences, neighborhoods, subdivisions, and the Croton-Harmon Train Station on Croton Point Avenue.

4.2.2.2 Home and Business Relocations -

Since this project involves construction of bicyclist facilities, expanding and improving pedestrian accommodations and an overlay of the existing roadway on predominately the existing alignment, and does not require the acquisition of occupied dwellings/businesses, it will not cause adverse impacts upon neighborhood character and stability. The proposed alternative will not result in displacement of residences or businesses and there will be no relocation impacts. Overall, the effects of this project will not cause adverse impacts upon neighborhood character and stability.

4.2.3 Social Groups Benefited or Harmed

4.2.3.1 Elderly and/or Disabled Persons or Groups -

A review of US Census data for Westchester County indicates that there is no significant concentration of elderly or disabled persons in the project area. The existing highway is deficient in infrastructure accommodations for handicapped and elderly, due to the lack of existing sidewalks and crosswalks. This project proposes new sidewalks and crosswalks and will improve accessibility accommodations for these user groups.

4.2.3.2 Transit Dependent, Pedestrians, and Bicyclists -

There are three existing Westchester Bee-Line bus stops along the project corridor. There are no proposed transit improvements within the project limits. The inclusion of pedestrian and bicycle accommodations will improve circulation and access to Croton-Harmon Train Station for transit dependent pedestrians and bicyclists.

Four-foot wide concrete sidewalks, for less than 200 ft., will be constructed on both sides of Croton Point Avenue between Veterans Plaza and the US Route 9 southbound ramps and along the east side of Veterans Plaza to minimize ROW impacts to adjacent properties, in accordance with ADAAG requirements. Five-foot wide sidewalks will be constructed along both sides of Croton Point Avenue from the US Route 9 southbound ramps to S. Riverside Avenue which will be accessible and usable by people with disabilities in accordance with ADAAG requirements. Crosswalks will be delineated and pedestrian facilities installed at the three proposed signalized intersections to facilitate pedestrian crossings.

Bicyclists will be accommodated through the use of 5 ft. wide striped bike lanes on both the north and south sides of Croton Point Avenue from Veterans Plaza to S. Riverside Avenue. On S. Riverside Avenue between Benedict Boulevard and Croton Point Avenue, bicyclists will continue to share the road with vehicular traffic.

The inclusion of pedestrian and bicycle accommodations in the project corridor will be a benefit to transit dependent, pedestrians and bicyclists.

4.2.3.3 Low Income, Minority and Ethnic Groups (Environmental Justice) –

The project is not located in or near an environmental justice area. Consistent with Executive Order 12898 and FHWA Guidance on Environmental Justice, the project has not directly or indirectly used criteria, methods or practices that discriminate on the basis of race, color, national origin or income level.

4.2.4 School Districts, Recreational Areas, and Places of Worship

4.2.4.1 School Districts-

The proposed project is within the Croton-Harmon School District. There are no schools or school properties within or near the project corridor.

4.2.4.2 Recreational Areas -

Croton Point Avenue provides access to Croton Point Park and the Croton Point Nature Center, located approximately 0.75 miles west of the project area, along the Hudson River. A section of the Riverwalk Pathway is also located in this area. A basketball court is located on Benedict Boulevard approximately 200 ft. east of the intersection of Benedict Boulevard and S. Riverside Avenue. It is not expected that there will be any long term adverse impacts to the recreational areas. During construction there may be delays for some motorists traveling through the corridor, and temporary on-site sidewalk detours will be used during construction. These would be a temporary and relatively minor impact. In the long-term, effects will be positive with improved road conditions, traffic flow, new sidewalks and bike lanes.

4.2.4.3 Places of Worship –

There are no places of worship within the project limits. There is the Chapel of the Good Shepherd at intersection of Benedict Boulevard and Young Avenue. The proposed project is not expected to have any direct negative impacts to places of worship.

4.3 Economic

The purpose of this section is to evaluate and analyze the economic effects of design alternatives as well as construction activities. The proposed project is not expected to have any negative economic impacts on the project area or the surrounding community. There are no detours associated with construction for this project; therefore, traffic patterns will remain the same but traffic flow may decrease at times during construction. The project area is commercial and access to such businesses will be maintained during construction activities.

4.3.1 Regional and Local Economies

The proposed project will not require the acquisition or relocation of any business. A strip ROW taking will be required for construction of the bike lane and sidewalk. Acquisition of this land will not result in the loss of available parking for the business with frontage along Croton Point Avenue. Consequently, no long-term negative impacts will occur to the local development, tax revenues, public expenditures, employment opportunities, retail sales, or property values of the project area.

The proposed project will not have any other impacts on the local development, tax revenues, expenditures, employment opportunities, retail sales or property values of the project area.

4.3.2 Business Districts

4.3.2.1 Established Business Districts -

There are no established business districts within the project limits or surrounding area.

4.3.2.2 Effects on Business Districts -

Correspondence with local officials has indicated that no established business districts exist in the project area.

4.3.3 Specific Business Impacts

4.3.3.1 Established Businesses -

As described in Section 3.3.3.1 in Chapter 3, the preferred alternative will not require the displacement of any existing businesses. The existing businesses are predominately small retail businesses which are located along each side of S. Riverside Avenue and Croton Point Avenue.

4.3.3.2 Effects Assessment -

Access to all businesses will be maintained during the construction phase of the project. Other than these minor inconveniences, the business climate along Croton Point Avenue should not have any appreciable changes.

4.4 Environmental

4.4.1 Wetlands

4.4.1.1 State Freshwater Wetlands -

There are no NYSDEC regulated freshwater wetlands or regulated adjacent areas (100ft) within the project area, as per the NYSDEC Freshwater Wetlands Maps for Westchester County, United States Geological Service quadrangle for Haverstraw, NY (1967). A NYSDEC wetland check zone overlaps the Project Area however there are no wetlands within this check zone. A site visit verified this. No further investigation is required and Environmental Conservation Law, Article 24 is satisfied.

A Section 401 Water Quality Certification is not required for the proposed project, since it does not involve work within the waters of the United States, including wetlands (Section 10 or Section 404).

4.4.1.2 State Tidal Wetlands -

A review of the NYSDEC GIS wetland data files indicates that there are no NYSDEC jurisdictional tidal wetlands or regulated adjacent areas within or near the project limits, and ECL Article 25 does not apply.

4.4.1.3 Federal Jurisdiction Wetlands -

The project site has been reviewed for wetlands in accordance with the criteria defined in the 1987 US Army Corps of Engineers Wetland Delineation Manual. It has been determined the project will not impact areas that meet this criteria.

A Section 401 Water Quality Certification is not required for the proposed project, since it does not involve work within the waters of the United States, including wetlands (Section 10 or Section 404).

4.4.1.4 Executive Order 11990 -

Based on a site visit and database research, there are no wetlands located within the project's area of potential effect. Executive Order 11990 does not apply to this project.

4.4.1.5 Mitigation Summary –

No wetland mitigation/monitoring plan is required for this project, since no wetlands are impacted.

4.4.2 Surface Waterbodies and Watercourses

4.4.2.1 Surface Waters -

The project activities do not involve excavation in or the discharge of dredged or fill material into, Waters of the U.S. No permits under this Section are anticipated.

4.4.2.2 Surface Water Classification and Standards -

Based upon a review of the NYSDEC GIS data maps for regulated streams, there are no surface waterways within the proposed project limits.

The project is not located within or adjacent to a TMDL Watershed.

4.4.2.3 Stream Bed and Bank Protection -

Based upon a review of the NYSDEC GIS database, and as verified by a site visit, there are no protected streams, nor 50-foot regulated stream banks (on either side of a regulated stream) in the project area.

4.4.2.4 Airport and Airway Improvement -

There is no airport or airway improvement work associated with this project.

4.4.2.5 Mitigation Summary -

There are no surface waterbodies present within the area, and therefore mitigation for these types of features is not necessary.

4.4.3 Wild, Scenic, and Recreational Rivers

4.4.3.1 State Wild, Scenic and Recreational Rivers -

There are no NYSDEC Designated, Study or Inventory State Wild, Scenic or Recreational Rivers within or adjacent to the proposed project site. No further review is required.

4.4.3.2 National Wild and Scenic Rivers -

The project does not involve a National Wild and Scenic River as shown by the Nationwide Rivers Inventory List of National Wild and Scenic Rivers. No further review is required.

4.4.3.3 Section 4(f) Involvement -

The proposed project does not involve work in or adjacent to a wildlife or waterfowl refuge. No further consideration is required.

4.4.3.4 Mitigation Summary -

The proposed project does not involve work in or adjacent to State- or Federal-designated wild, scenic, or recreational rivers, or in or adjacent to a wildlife or wildfowl refuge. Since no impacts are proposed, no mitigation is required.

4.4.4 Navigable Waters

4.4.4.1 State Regulated Waters -

There are no state regulated navigable waters located within the project's area of potential effect that will be impacted by the work.

4.4.4.2 Office of General Services Lands and Navigable Waters -

There are no OGS underwater holdings located within the project's area of potential effect that will be impacted by the work.

4.4.4.3 Rivers and Harbors Act – Section 9 -

Since the project does not involve the construction or modification of any bridge, dam, dike, or causeway over any navigable water of the United States, Section 9 is not applicable.

4.4.4.4 Rivers and Harbors Act – Section 10 -

Since the project does not involve the creation of any obstruction to the navigable capacity of any of the waters of the United States, or in any manner alter or modify the course, location, condition, or capacity of any navigable water of the United States, Section 10 is not applicable.

4.4.5 Floodplains

4.4.5.1 State Flood Insurance Compliance Program -

As shown on the GIS data base, the project corridor is not located within the 100-year regulated floodplains.

4.4.5.2 Executive Order 11988 -

The project will not impact any floodplains. EO 11988 does not apply.

4.4.6 Coastal Resources

4.4.6.1 State Coastal Zone Management Program -

This SEQR Non-Type II project is located in a State Coastal Zone Management area, New York State Coastal Area, Hudson River Estuary, and is federally funded, but does not require any federal permits. Additionally, the Village of Croton-on-Hudson has an approved Local Waterfront Revitalization Program (LWRP). Coordination with the Village of Croton-on-Hudson will be required, including a notification that the project will occur within the boundaries of its LWRP, and requesting the municipality's coastal consistency determination. Additionally, a State Consistency Review will be required.

The project is not located in a Significant Coastal Fish and Wildlife Habitat, as defined by the NYSDOS Division of Coastal Resources and Waterfront Revitalization. No further action is required.

4.4.6.2 State Coastal Erosion Hazard Area -

The proposed project is not located in or near a Coastal Erosion Hazard Area.

4.4.6.3 Waterfront Revitalization and Coastal Resources Program -

According to NYS DOS "List of Approved Coastal Local Waterfront Revitalization Programs (LWRPs)," dated March 2007, the proposed project is located in a Local Waterfront Revitalization Area. The Village of Croton-on-Hudson has an approved Local Waterfront Revitalization Program (LWRP). Coordination with the Village of Croton-on-Hudson will be required, including a notification that the project will occur within the boundaries of its LWRP, and requesting the municipality's coastal consistency determination.

4.4.6.4 Federal Coastal Barrier Resources Act (CBRA) and Coastal Barrier Improvement Act (CBIA) -

The proposed project is not located in, or near a coastal area under the jurisdiction of the Coastal Barrier Resources Act (CBRA) or the Coastal Barrier Improvement Act (CBIA).

4.4.7 Groundwater Resources, Aquifers, and Reservoirs

4.4.7.1 Aquifers -

United State Geological Service (USGS) and NYSDEC aquifer GIS data files have been reviewed and it has been determined that the proposed project is located in the Croton-Ossining Area primary aquifer. This project will take measures in design and construction to avoid, minimize or mitigate any possible adverse impacts to the aquifer. These measures are intended to minimize contamination from highway runoff and construction activities. Project activities will comply with the applicable standards in 6 NYCRR Part 703.

A review of the EPA-designated Sole Source Aquifer Areas Federal Register Notices, Maps, and Fact Sheets indicates that the project is not located in a Sole Source Aquifer Project Review Area. No federal review and/or approvals are required pursuant to Section 1424(e) of the Safe Drinking Water Act.

4.4.7.2 Drinking Water Supply Wells (Public and Private Wells) and Reservoirs -

There are no municipal drinking water wells, wellhead influence zones, or reservoirs within or near the project area, according to the Public Health Engineer, Bureau of Water Supply, NYS Department of Health.

4.4.8 Stormwater Management

This project will disturb less than one acre and will not require a SPDES permit. While this project is not required to assess the requirements for stormwater management practices, they will be considered where reasonable and feasible.

Currently, Croton Point Avenue, S. Riverside Avenue and Veterans plaza have a closed drainage system with the exception of the south side of Croton Point Avenue from the US Route 9 Bridge to S. Riverside Avenue where stormwater sheet flows off the pavement. The proposed curbing and sidewalk will incorporate the south side of Croton Point Avenue from the US Route 9 ramp into the current closed drainage system. The remainder of the drainage system will function much as it does today.

The project will employ effective erosion and sediment control practices during construction, as set forth in NYSDOT's statewide stormwater and erosion and sedimentation control specifications, standard construction details, and design and construction guidance procedures. Based on the proposed design, there will be a minimal increase in the impervious area.

4.4.9 General Ecology and Wildlife Resources

4.4.9.1 Fish, Wildlife, and Waterfowl -

A cursory review of the projects area of potential effect indicates that there is not suitable habitat for federally- or State-protected species of plants or animals.

4.4.9.2 Habitat Areas, Wildlife Refuges, and Wildfowl Refuges -

The proposed project does not involve work in, or adjacent to, a wildlife or waterfowl refuge. No further consideration is required.

4.4.9.3 Endangered and Threatened Species -

The NYSDEC Natural Heritage Program (NHP) was contacted regarding the presence of State listed endangered and threatened species within the project corridor. The NHP responded on August 12, 2011 (See Appendix B) with a report of rare or state-listed animals and plants that their database indicates occur, or may occur, within the project corridor or in the immediate vicinity of the project corridor. These include:

Species
- Short-eared Owl *(Asio flammeus)* – Endangered (NYS)
- Northern Harrier *(Circus cyaneus)* – Threatened (NYS)
- Bald Eagle *(Haliaeetus leucocephalus)* – Threatened (NYS)
- Shortnose Sturgeon *(Acipenser brevirostrum)* – Endangered (NYS)

Others
- Anadromous Fish Concentration Area – Unlisted (NYS)
- Raptor Winter Concentration Area – Unlisted (NYS)

The USFWS website was reviewed for federally listed threatened and endangered species for Westchester County (See Appendix B). The species identified for Westchester County are:

- Atlantic Sturgeon *(Acipenser oxyrinchus oxyrinchus)* - Proposed
- Bald eagle – Delisted
- Bog Turtle *(Clemmys muhlenbergii)* - Threatened
- Indiana bat *(Myotis sodalis)* – Endangered
- New England Cottontail *(Sylvilagus transitionalis)* – Candidate
- Shortnose sturgeon – Endangered

A field investigation to identify the habitats of the project corridor was completed on June 22, 2011. This information was used to determine if the habitats for the above listed species occur within the project corridor. The project impacts include modifications or improvements to already developed, paved, or maintained surfaces. Therefore the project will not displace vegetative communities, impact water quality or create new wildlife hazards. Therefore, none of the listed species, ecological communities, or wildlife congregation areas will be impacted by the proposed project.

A threatened and endangered species impact assessment report was prepared and submitted to the NYSDEC and USFWS on November 25, 2011. This report concludes that “Based on results of literature reviews and the site visit, suitable habitat is not present in the Project Area for any of the eight listed species, and therefore it is considered unlikely for these species to occur in the Project Area. No sensitive species or sensitive natural communities were observed during the site visit. Based on this environmental review, it is unlikely that any State or federally-listed endangered, threatened or candidate plant or animal species or sensitive natural communities would occur in the Project Area.” The USFWS was contacted during the week of March 25, 2013, and the weeks of April 1, April 22, and April 30, 2013. Correspondence is included in Appendix B.

4.4.9.4 Invasive Species -

A review of the existing corridor indicates that there are several invasive species including the Tree-of-Heaven, Garlic Mustard, Mugwort, Oriental Bittersweet, Spotted Knapweed, Japanese Knotweed, Non-native Common Reed, Black Locust and Multiflora Rose that are located within the right-of-way.

Removal or other treatments will be considered for these species. Precautions will be taken to prevent the introduction of additional invasive species during project design and construction.

4.4.9.5 Roadside Vegetation Management -

The project corridor consists primarily of existing roadway with sidewalk on the north side of Croton Point Avenue and on both sides of S. Riverside Avenue. Roadside vegetation is limited. Efforts will be made to replace wildlife-supporting vegetation that is removed in the course of construction.

4.4.10 Critical Environmental Areas

4.4.10.1 State Critical Environmental Areas -

According to information obtained from NYSDEC, a portion of the proposed project is located within the adjacent area of the Croton Point Park Critical Environmental Area (CEA). The project is not expected to significantly, adversely affect the CEA. No further investigation is required.

4.4.10.2 State Forest Preserve Lands -

According to information obtained from NYSDEC, the proposed project does not involve work in or near state forest preserve lands.

4.4.11 Historic and Cultural Resources

4.4.11.1 National Heritage Areas Program -

The proposed project is located within the Hudson River Valley National Heritage Area. The Hudson River Valley Greenway Board has been contacted to ensure that the project is consistent with the Heritage Area Management Plan and they stated they have no comment or objection to the project. See Appendix B. This proposed project will not significantly alter the roadway or roadway corridor. Therefore, the National Heritage Corridor will not be affected by the proposed project or related construction.

4.4.11.2 National Historic Preservation Act – Section 106 / State Historic Preservation Act – Section 14.09 –

According to the National Register (NR) of Historic Places, there are no historic properties eligible, or listed, within the project's area of potential effect. Because the project is a federally funded action, involves a federal permit, or is state funded with the possibility of becoming federally funded, this project will be following the Section 106 Process of the National Historic Preservation Act. This ensures compliance with the NYSHPA Section 14.09 process.

4.4.11.3 Architectural Resources -

The proposed project does not involve federally owned, jurisdictional or controlled property that is eligible for inclusion in the National Register of Historic Places. Therefore, Section 110 does not apply.

4.4.11.4 Archaeological Resources -

The proposed project will not require project activities within previously undisturbed areas that have the potential to contain archeological resources. Thus, a 4(f) evaluation will not be required for archaeological resources.

4.4.11.5 Historic Bridges -

There are no bridges over 50 years old or listed on NYSDOT's Historic Bridge Inventory that are located within the project's area of potential effect.

4.4.11.6 Historic Parkways -

This project does not have the potential to impact any Historic Parkways.

4.4.11.7 Native American Involvement -

This project will be following the Section 106 Process of the National Historic Preservation Act (36 CFR 800). This ensures compliance with this Act. In addition, places or artifacts of religious importance to Native Americans were not found within the project impact area.

Tribal coordination is not required; however both the Delaware Nation and the Mohican Nation were sent copies of the Project Review Cover Form A including project location maps, project description, and site photographs. Both the Delaware Nation and Mohican Nation responded in April 2012 that they concurred that there are no National Register eligible or listed properties within the Federal undertaking's area of potential effect and to proceed with the project as planned. See correspondence in Appendix B.

4.4.11.8 Section 4(f) Involvement -

The proposed project will not require project activities that will impact any historic properties or previously undisturbed areas that have the potential to contain archeological resources. A 4(f) evaluation will not be required for historic or archaeological resources.

4.4.12 Parks and Recreational Resources

4.4.12.1 State Heritage Area Program -

The proposed project will not impact areas identified as State Heritage Areas.

4.4.12.2 National Heritage Areas Program -

The proposed project is located in the Hudson River Valley National Heritage Area. Refer to 4.4.11 Historic and Cultural Resources – "National Heritage Area Program," for detailed information on the Heritage Area, potential impacts, and coordination with the management entity.

4.4.12.3 National Registry of Natural Landmarks -

There are no listed nationally significant natural areas within, or adjacent to, the project area.

4.4.12.4 Section 4(f) Involvement -

There are no publicly owned parks or recreational facilities, protected under Section 4(f) of the USDOT Act, in or adjacent to the project area. No further action is required under this section.

4.4.12.5 Section 6(f) Involvement -

The project does not impact parklands or facilities that have been partially or fully federally funded through the Land and Water Conservation Act. No further consideration under Section 6(f) is required.

4.4.12.6 Section 1010 Involvement -

This project does not involve the use of land from a park to which Urban Park and Recreation Recovery Program funds have been applied.

4.4.13 Visual Resources

4.4.13.1 Introduction -

The project corridor consists primarily of an Urban Minor Arterial and an Urban Collector. Croton Point Avenue is a vital link in the transportation corridor and is the primary commuter route that provides access from US Route 9 and S. Riverside Avenue to the Croton-Harmon Train Station, located on Veterans Plaza, south of Croton Point Avenue and west of US Route 9. There are a few commercial buildings within the project area. However, as a commuter route, the primary viewer groups are motorists, pedestrians, and bicyclists. The general appearance and character of the roadway corridor will be maintained.

The overall existing visual quality is moderate with no significant or dominant views. There are numerous utility poles, light poles and highway signage, which in some cases is erected over the existing sidewalk, which impair the visual quality. Generally, the area is lacking in any substantive landscaping other than indigenous vegetation which has grown on both sides of the Route 9 access ramps.

4.4.13.2 Effects Assessment –

The area will continue to have strong visual elements created by manmade structures such as utility poles, utility lines, highway signage and the Route 9 overpass. Impacts to the visual environment include the designated bike lanes, new sidewalks with accessible curb ramps, the realignment of the US Route 9 northbound on ramp and the inclusion of the traffic signals on Croton Point Avenue at Veterans Plaza, US Route 9 southbound ramps and US route 9 northbound ramps. The project includes an overlay with new pavement markings and signage, as needed, which will provide enhanced delineation and guidance through the corridor.

These improvements will provide a significant positive visual experience from what presently exists.

4.4.14 Farmlands

4.4.14.1 State Farmland and Agricultural Districts -

Based on a review of the NYS Agricultural District Maps for Westchester County, the proposed project is not located in or adjacent to an Agricultural District.

4.4.14.2 Federal Prime and Unique Farmland -

The proposed project activities will not convert any prime or unique farmland, or farmland of state or local importance, as defined by the USDA Natural Resources Conservation Service, to a nonagricultural use.

4.4.15 Air Quality

4.4.15.1 Regulatory Framework –

To assess air quality impacts related to traffic generation, procedures outlined in the NYSDOT Environmental Procedures Manual (EPM) were used. The procedures address the CAA and guidance from the U.S. EPA. The NYSDOT EPM procedures involve a screening of traffic volume and level of service to determine the need for a detailed microscale air quality analysis.

4.4.15.2 Transportation Conformity –

The project site is located in Westchester County, which is considered a marginal non-attainment area for the 2008 8-hr Ozone NAAQS and a non-attainment area for the 2006 PM 2.5 NAAQS. The project is designated as an exempt project on the Transportation Plan and the 2011-2015 Transportation Improvement Program (TIP) for the Mid-Hudson South Planning Area. This TIP has been found to conform by the New York Metropolitan Transportation Council (NYMTC) and Federal Highway Administration (FHWA), approved by amendment to the May 1999 TIP on September 6, 2000, by NYMTC and adopted on August 4, 2011. The project's design scope and concept have not changed since the TIP amendment determination was made.

4.4.15.3 Carbon Monoxide (CO) Microscale Analysis –

The NYSDOT EPM outlines a three-step screening process to determine if a microscale air quality analysis is necessary. The process is as follows: if the first screening threshold is exceeded, the second screening is performed; if any one of the second screening thresholds is exceeded, the third screening is performed; if the third screening threshold is exceeded, a detailed microscale analysis is warranted. If the thresholds are satisfied for any step, the screening process is stopped and no further analysis is necessary.

Level of Service Screening, Capture Screening and Volume Screening were performed on the proposed project. The project would not exceed the volume threshold in any build scenario. Level of Service Screening, Capture Screening and Volume Screening were performed on the proposed project. An air quality analysis for CO is not required since this project will not increase traffic volumes, reduce source-receptor distances by 10% or more, or change other existing conditions to such a degree as to jeopardize attainment of the National Ambient Air Quality Standards. The project does not require a project-level conformity determination. See Appendix B – Air Quality Screening, for additional information.

4.4.15.4 Mesoscale Analysis -

The proposed project would not increase traffic volumes in the immediate and surrounding areas, nor would it affect vehicle mix. A Mesoscale Analysis is not required for this project since it does not significantly affect air quality conditions over a large area and is not a regionally significant project.

4.4.15.5 Mobile Source Air Toxics (MSATs) Analysis -

For any alternative, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. As noted, the proposed project would not increase traffic volumes, and would not significantly alter the alignment of the existing roadways. Therefore, the VMT would not increase and no MSAT impacts would be projected.

4.4.15.6 Particulate Matter (PM) Analysis -

The proposed project would not affect vehicle mix, nor does it currently experience significant levels of diesel traffic, and would not increase traffic volumes. Per the criteria provided above, the project is not projected to be of local air quality concern. As such, the project actions do not individually or cumulatively have a significant effect on PM emissions. It can therefore be concluded that the project will have no significant adverse impact on ambient PM levels.

4.4.15.7 Greenhouse Gas Analysis –

The project is not expected to affect GHG production since no additional traffic volume will result from the construction of the proposed project.

4.4.16 Energy

The proposed project is classified as a categorical exclusion and will not require an energy analysis since, by definition; it will not significantly impact energy utilization.

4.4.17 Noise

The project will not significantly change either the horizontal or vertical alignment, or increase the number of through-traffic lanes. Therefore, this project is not a Type I project and does not require a traffic noise analysis as per 23 CFR 772.

4.4.18 Asbestos

4.4.18.1 Screening -

An asbestos screening has been performed for this project and it has been determined that there are five areas suspect asbestos-containing materials associated with the surface features on the sidewalks and roadway. These following suspect asbestos-containing materials were identified:

- Pre-molded bituminous joint filler at the concrete joints on Croton Point Avenue.
- Tar/sealant applied over the pre-molded bituminous joint filler at the concrete joints on Croton Point Avenue.
- Grey Sidewalk Edge Sealant.

- Pre-molded bituminous joint filler at sidewalk joints.
- Vertical pre-molded bituminous joint filler at jersey barrier lining the southbound entrance to Route 9.

In addition, there were no suspect asbestos-containing materials identified in the sub-grade based on the review of the record drawings.

4.4.18.2 Assessment and Quantification -

On April 11, 2013, CHA staff visited the site to sample the above mentioned materials for suspect asbestos-containing materials (ACMs). During this visit, CHA observed the following additional suspect ACMs:

- Pre-molded bituminous joint filler at the concrete joints on South Riverside Avenue.
- Tar/sealant applied over the pre-molded bituminous joint filler at the concrete joints on South Riverside Avenue.
- Black Sidewalk Edge Sealant at the intersection of South Riverside Avenue and Benedict Avenue.

A total of seven materials were quantified and the bulk samples were transmitted under chain of custody to EMSL Laboratories of New York, a New York State Department of Health Environmental Laboratory Approval Program (ELAP) accredited laboratory for asbestos analysis. See Appendix B for the Asbestos Assessment report. Based on the laboratory analysis, less than 1% chrysotile was detected in the black sidewalk edge sealant, however, based on the fact that an ACM is defined as any material containing greater than 1% of asbestos, the black sidewalk edge sealant is not considered an ACM. The remaining materials sampled were found to have no asbestos detected.

As a result, the joint filler and sealants on the sidewalks and roadway were found to be non-asbestos.

4.4.18.3 Mitigation Summary -

No asbestos abatement will be necessary, based on the fact that the suspect materials sampled were found to be non-asbestos.

4.4.19 Hazardous Waste and Contaminated Materials

4.4.19.1 Screening and Site Assessment -

A Hazardous Waste/Contaminated Materials Site Screening has been conducted in accordance with NYSDOT Environmental Procedures Manual, Chapter 5, in order to document the likely presence or absence of hazardous/contaminated environmental conditions. A hazardous/contaminated environmental condition is the presence or likely presence of any hazardous substances or petroleum products (including products currently in compliance with applicable regulations) on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property.

The Hazardous Waste/Contaminated Materials Site Screening included a review of NYSDEC regulatory data files and a site ‘walkover’ on March 6, 2012.

The Hazardous Waste/Contaminated Materials Site Screening identified a Hazardous Waste/Contaminated Materials Site adjacent to the project corridor, at the northwest corner of Croton Point Avenue and S. Riverside Avenue. The regulatory review indicates that this Hazardous

Waste/Contaminated Materials Site involves the presence of underground storage tanks (USTs), records indicating that facilities are listed as non-generators of ignitable hazardous waste (including benzene) (which indicates that the facilities may transport, store, treat and/or dispose of hazardous waste), records indicating the presence of leaking underground storage tanks (LUSTs), and spills of petroleum products.

No other hazardous waste/contaminated materials were identified during the course of the Hazardous Waste/Contaminated Materials Site Screening. The potential risk for involvement with documented or undocumented inactive hazardous waste materials is low.

4.4.19.2 Mitigation Summary -

NYSDOT Special Specifications for petroleum identification and potential disposal will be included in the contract documents. A copy of the Hazardous Materials Screening Form is included in Appendix B.

4.5 Construction Effects

4.5.1 Construction Impacts

The potential construction impacts from the proposed project include minor visual, noise, air, and traffic disruptions during construction operations. Provisions will be included in the final contract documents to maintain vehicular and pedestrian access to all adjacent properties during construction. There are no long-term negative impacts to the project area anticipated as a result of the proposed construction operations.

4.5.2 Mitigation Measures

The details for the work zone traffic control measures will be developed during final design. Two-way traffic will maintained during AM and PM peak hours through the duration of construction. Nighttime work will be restricted from this project as a means to abate potential noise disturbances to the surrounding residences. Erosion control measures will be developed during final design.

4.6 Indirect and Secondary Effects

4.6.1 Indirect Socioeconomic Effects

The proposed project will not change the existing land use or community character within or adjacent to the project area. In addition, the project will not change the highway classifications of Croton Point Avenue or S. Riverside Avenue. No significant secondary impacts are anticipated.

4.6.2 Social Consequences

There are no social consequences anticipated with this project.

4.6.3 Economic Consequences

There are no negative economic consequences anticipated with the proposed project.

4.7 Cumulative Effects

Cumulative impacts occur when the effects of an individual project or action are added to or interact with other effects within a given time and place. A cumulative impact analysis considers the compounding

effects of an action on a resource, community or ecosystem, and takes into account additional activities within the area which potentially impact the same resources.

There are no anticipated cumulative effects to be caused by this project.