TRANSPORTATION PROJECT REPORT

FINAL DESIGN REPORT

P.I.N. 8760.92

BRIDGE REHABILITATION
BIN 5348380
BIN 534838A

ASHFORD AVENUE OVER
THE SAW MILL RIVER PARKWAY AND
THE NEW YORK STATE THRUWAY
(INTERSTATE 87)

WESTCHESTER COUNTY
DEPARTMENT OF PUBLIC WORKS AND
TRANSPORTATION

VILLAGES OF ARDSLEY AND DOBBS FERRY, NY

August 2013

U.S. Department of Transportation
Federal Highway Administration

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

PREPARED BY: WSP · SELLS

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CHAPTER I – INTRODUCTION

This design report will be the engineering report, environmental documentation report, and the design approval documentation for the rehabilitation of the Ashford Avenue Bridge (BIN 5348380) over the Saw Mill River Parkway and New York State Thruway (Interstate 87), which includes the access ramp structure to the Saw Mill River Parkway, located within the Villages of Ardsley and Dobbs Ferry, NY. The east approach spans the Saw Mill River. The bridge was constructed in 1950 and rehabilitated in 1992. Its length is 405.5 feet and is split into a total of 6 spans.

Both BIN 5348380 and BIN 534838A were given a rating of "4" in the NYSDOT Biennial Bridge Inspection Reports from October 2011 and May 2011, respectively. These ratings are representative of a state of moderate overall deterioration and can be attributed to long-term effects of weather and road salt on concrete and steel elements. There are localized areas of serious deterioration as well, specifically at joint locations and to the paint system. Additionally, steel girders and piers exhibit advanced levels of deterioration particularly at joint locations. The March 2010 In-Depth Inspection Report confirms the biennial ratings and is found in Appendix M.

The project also intends to replace the elevated NB Saw Mill River Parkway access ramp structure (BIN 534838A) with a new fill ramp. This bridge was also constructed in 1950 and rehabilitated in 1992. Its length is 173 feet with a 100 foot filled abutment and it is split into 3 spans. Both structures are owned and maintained by the Westchester County Department of Public Works & Transportation (WCDPWT).

This report will evaluate alternative ways to correct identified deficiencies and recommend the preferred project alternative.

The WCDPWT has also studied the addition of a new NB entrance ramp to the Saw Mill River Parkway (SMRP) on the north side of Ashford Avenue. This ramp would allow for either the retention of the existing NB exit/entrance with right turn only access to the NB SMRP, or the conversion of the existing NB ramp to exit only. In addition, the installation of a pedestrian access ramp from Ashford Avenue to the South County Trailway multiuse recreational path below was also studied. While these studies are considered beyond the scope of this bridge rehabilitation, provisions will be made such that the project will not preclude them from being constructed at a later date.

This project also will not preclude a future Town of Greenburgh project to widen the west leg of the Ashford Avenue / Route 9A intersection. Special provisions will be included in the rehabilitation to allow the future construction of a future retaining wall structure along the south side of Ashford Avenue between the east bridge abutment and Route 9A, such that the pavement may be widened to accommodate additional dedicated lanes.

The project is on the Statewide Transportation Improvement Plan (STIP) for Federal Fiscal Years (FFY's) 2014-2015. The project is divided into several funding sources. Preliminary design, detailed design, ROW incidents and ROW acquisition are 100% County funded. Construction is partially funded from three sources (HBRR, STP-Urban, Earmark) which are 80% federally reimbursable with a 20% local share. The remaining construction fund sources are 100% County funded. The County is responsible for all costs above and beyond available Federal funds. The 20% local share is eligible for reimbursement by the State under the

Marchiselli program. See Appendix A for a copy of the Initial Project Proposal which includes the proposed cost breakdown.

This project is a Class II Action under the National Environmental Policy Act Regulations, 23 CFR 771. It will follow the procedures in the "Procedures for Locally Administered Federal Aid Projects." The NYSDOT/FHWA will act as the lead agency and design approval will be granted by WCDPWT.

This project is classified as SEQR Type II in accordance with Part 617, Subpart 5(c)(2) of Title 6 of the Implementing Regulations of the Official Compilation Codes, Rules and Regulations of New York State (NYCRR). The Westchester County Board of Legislators will act as the lead agency.

Ashford Avenue is approximately 40 ft wide curb to curb (52 feet – 8 inches out to out), including two travel lanes in each direction over the bridge. The roadway is curbed and sidewalks appear on both sides for the majority of the project length. The entrance/exit ramp is 24 feet wide curb to curb (27 feet – 11 inches out to out), carrying one lane in each direction. A traffic signal exists at the NB SMRP entrance/exit ramp intersection with Ashford Avenue on the structure.

Superstructure replacement is the preferred alternative. This includes removal and replacement of the existing steel framing, structural deck, bridge joints, railings, and bearings; replacement of the existing pier stems and cap beams; repair to existing abutments; replacement of the existing ramp with a new modular concrete fill-type ramp. Additionally the traffic signal at Ashford Avenue and the SMRP entrance/exit ramp will be replaced.

Also included will be travel lane approach pavement milling and resurfacing, sidewalk and curb replacement, drainage system improvements, minor guide rail replacement, new pavement markings and new signing.

Total project cost for the preferred alternative is estimated at $22.7 million including right-of-way and construction inspection costs. Construction is expected to have a duration of 30 months.

The report will be used as the documentation for design decisions for this project and may be distributed as public information as required.

For additional information or comments on this project contact:

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CHAPTER II - PROJECT IDENTIFICATION, EVOLUTION, CONDITIONS AND NEEDS, AND OBJECTIVES

II.A. Project Identification

II.A.1. **Project Type –** Major Bridge Rehabilitation

II.A.2. **Project Location/Description –** Refer to chapter II.A.2.b. for the regional map and chapter II.A.2.c. for the project map.

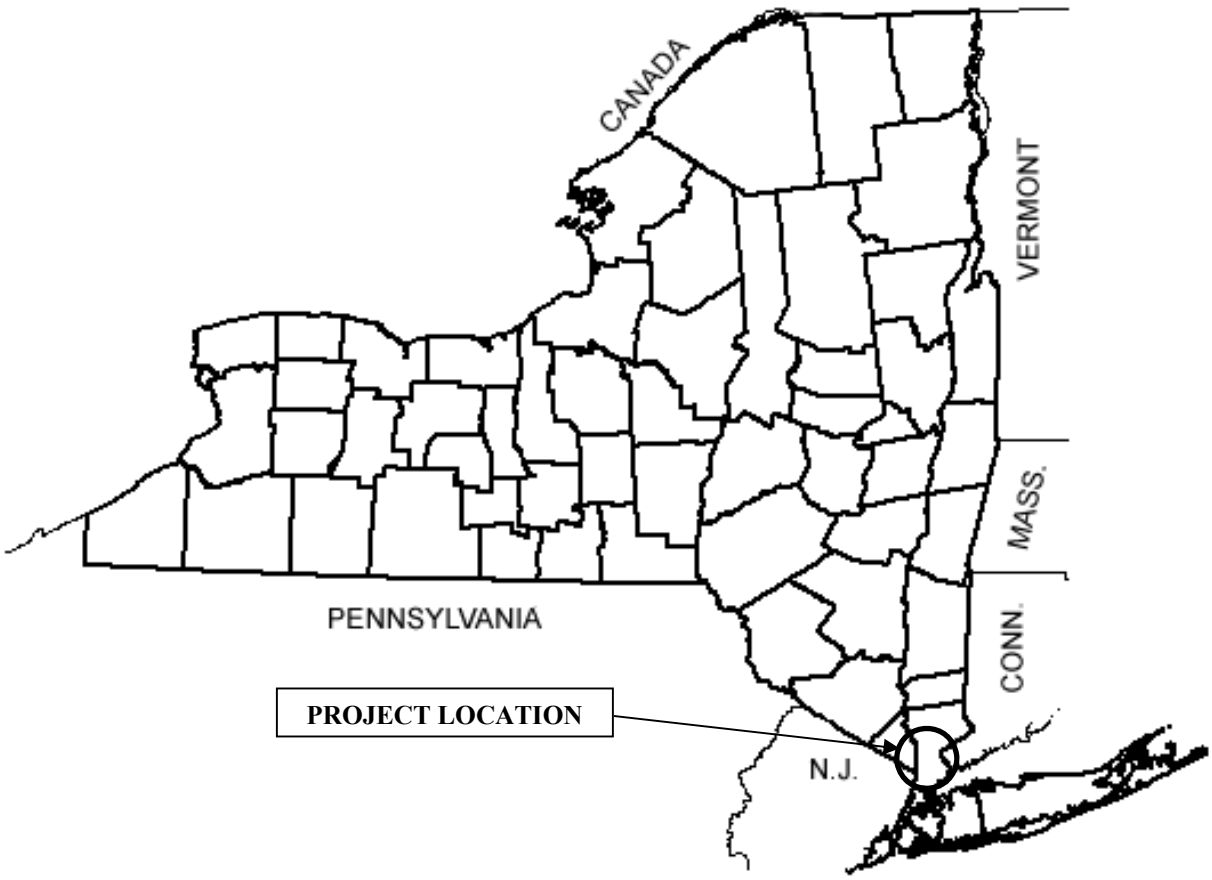
II.A.2.a. **Description –** Ashford Avenue (County Road 134) is located within the Villages of Ardsley and Dobbs Ferry, Westchester County. For convenience the corridor will be referred to as "east-west."

The project is approximately 625 feet (0.12 mi) in length along Ashford Avenue and extends from just west of the west abutment in Dobbs Ferry to the intersection of Ashford Avenue and NYS Route 9A in the east in the Village of Ardsley. Contained within this length is 405.5 feet of structure (BIN 5348380), crossing the Saw Mill River, the NYS Thruway (I-87), Elm Street, and the Saw Mill River Parkway. The roadway is a four-lane, undivided urban arterial. Dedicated turn lanes are present at the Northfield Avenue intersection in the eastbound direction and the Route 9A intersection in all directions. Access to the SB Saw Mill River Parkway is provided to EB Ashford Avenue traffic via Northfield Avenue and WB Ashford Avenue traffic via the Southfield Avenue right turn ramp. The project also includes the NB Saw Mill River Parkway entrance/exit ramp with a length of 400 feet, of which 173 feet is on structure (BIN 534838A).

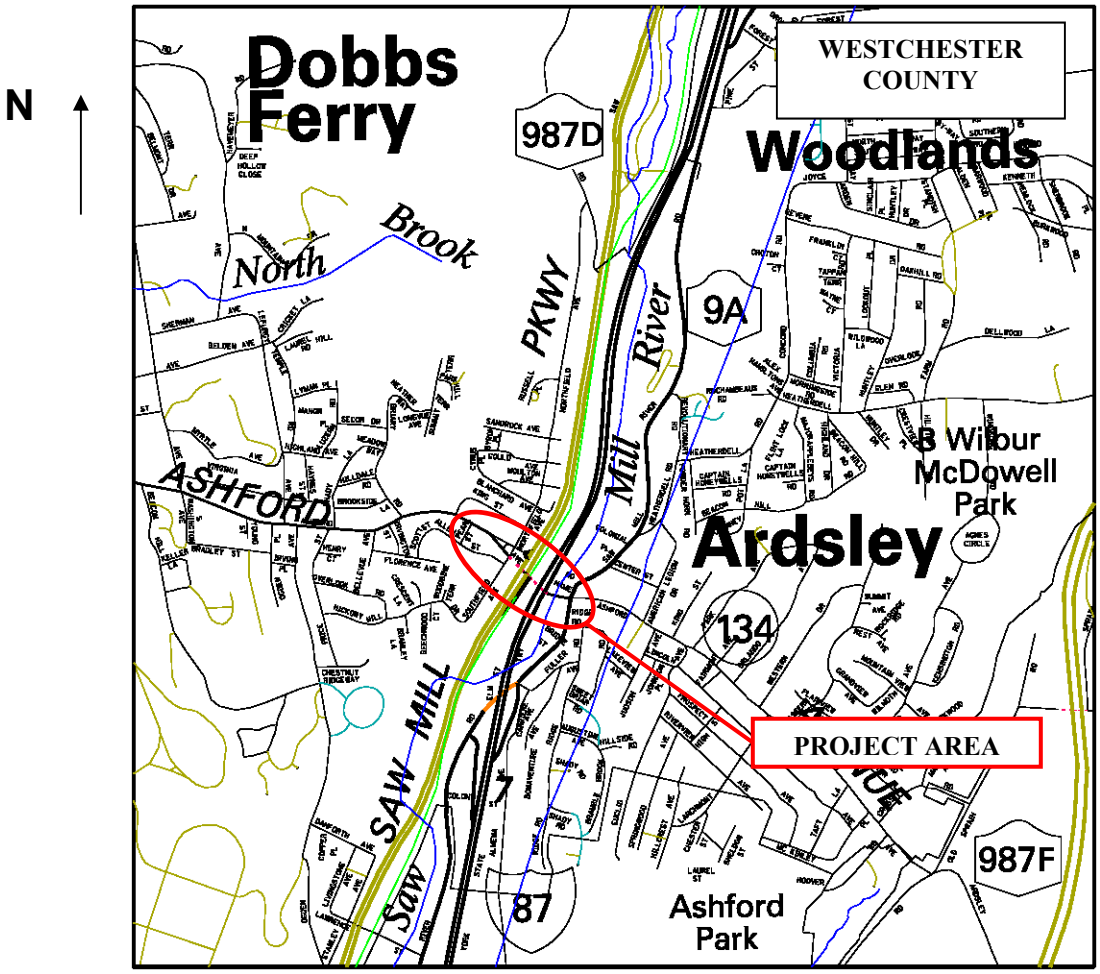
Refer to chapter II.C.1.b. for a description of ownership and maintenance responsibility within the project limits.

Project photographs are shown in Appendix A.

II.A.2.b. Regional Map



II.A.2.c. Project Map – Scale: 1" = 2000'



II.B. Project Evolution

The need for this project was identified by the WCDPWT based on the deteriorated condition of the bridge superstructure and substructure. The IPP notes structural failures on the deck slab, wing walls and piers. Structural steel is in need of repair. The County has issued repair contracts to remove spalled under-deck concrete. Yellow and safety flags have been issued in October 2011.

Both the bridge and access ramp last underwent major rehabilitation in 1992. Items of work at the time included superstructure repair to the deck, joints, railings, sidewalks, lighting, striping and approach slabs. Substructure repair included patching to the abutments and piers as well as bearing restoration.

The Ashford Avenue Bridge (BIN 5348380) was rated 4 according to the 2011 NYSDOT Biennial Bridge Inspection Report, indicating that the bridge suffers from between "minor and serious deterioration." The In-Depth Inspection Report, completed in March 2010, confirms this general recommendation. The ramp structure (BIN 534838A) also received a general recommendation rating of 4 in its 2011 Biennial Inspection Report. These ratings are indicative of the need for mitigation.

The installation of a new NB entrance ramp to the Saw Mill River Parkway (SMRP) on the north side of Ashford Avenue and converting the existing entrance/exit ramp to a NB exit-only ramp was also evaluated. Providing additional access to the South County Trailway bike path via an access ramp from Ashford Avenue was also being studied to provide an additional trail access point and enhance area pedestrian connectivity. Both of these options are not included in this bridge rehabilitation project; however they will not be precluded from being constructed at a later date.

The IPP was approved by the NYSDOT on 6/10/10. A copy is included in Appendix A. The project involves the Mid-Hudson South Transportation Coordinating Committee (MHSTCC).

The WCDPWT will design, let, award and inspect this project under the oversight and review of the NYSDOT Region 8 Local Projects Unit.

II.C. Conditions and Needs

II.C.1. Transportation Conditions, Deficiencies and Engineering Considerations

II.C.1.a. Functional Classification and National Highway System (NHS)

II.C.1.a.(1) Functional Class: Ashford Avenue is classified as an Urban Principal Arterial – Other (14). The entrance/exit ramp is classified according to the higher-type roadway (Saw Mill River Parkway), which follows the classification of Urban Principal Arterial – Expressway (12). For design, Urban Arterial criteria are followed.

II.C.1.a.(2) National Highway System: Ashford Avenue is not on the National Highway System. The SMRP entrance/exit ramp is not on the National Highway System.

II.C.1.a.(3) Qualifying or Access Highway: Ashford Avenue is not a qualifying or access highway, but traverses I-87 (New York State Thruway), a Qualifying Highway on

the National Network of Designated Truck Access Highways.

II.C.1.a.(4) Interstate System: Ashford Avenue and the SMRP entrance/exit ramp are not interstate highways and are not part of the 4.9 m (16 ft.) STRAHNET vertical clearance network. However, Ashford Avenue traverses I-87, which is an interstate highway and is part of the STRAHNET network.

II.C.1.b. Ownership and Maintenance Jurisdiction – Within the Village of Ardsley, the road is owned and maintained by the Westchester County Department of Public Works and Transportation (WCDPWT). Within the Village of Dobbs Ferry, the road is owned by Westchester County; however, all maintenance responsibility is borne by the Village of Dobbs Ferry per an Inter-Municipal Agreement, effective September 12, 2011 (a copy is included in Appendix E). This agreement also includes traffic signals at Ashford Avenue & Northfield Avenue and Ashford Avenue & the NB Saw Mill River Parkway entrance/exit ramp, as well as all other elements above the deck of the Ashford Avenue Bridge. All other superstructure and substructure elements of the bridge remain under the ownership of Westchester County.

The SMRP entrance/exit ramp structure is owned by the Westchester County Department of Public Works and Transportation (WCDPWT). NYSDOT, however, maintains the ramp pavement, signs, pavement markings and removes snow and ice.

II.C.1.c. Culture, Terrain and Climatic Conditions

II.C.1.c.(1) Area Type: The project area is primarily urban residential with light commercial properties. Commercial establishments include restaurants, service stations, retail shopping, and motels.

II.C.1.c.(2) Terrain: The terrain in the project area is rolling. The approaches to the bridge are at a 6.5% grade. The ramp is at a 6.0% grade.

II.C.1.c.(3) Unusual Weather Conditions: The project area has no unusual weather conditions.

II.C.1.d. Control of Access – Access on Ashford Avenue is uncontrolled.

II.C.1.e. Existing Highway Section

II.C.1.e.(1) Right of Way Width: The ROW width varies from 60 feet just west of the structure to almost 80 feet on the west approach to the Ashford Avenue / NYS Route 9A intersection.

II.C.1.e.(2) Lanes and Shoulders: Ashford Avenue has an approximate curb to curb width of 40 feet on the bridge with two 10-foot travel lanes in each direction over the structure length. However, two westbound lanes taper to one lane at the Ashford Avenue / Northfield Avenue intersection and two eastbound lanes become a dedicated left turn lane and a shared through-right turn lane at the Ashford Avenue / NYS Route 9A intersection. There are no shoulders. Sidewalks vary in width from 3 to 5 feet throughout the project.

The ramp structure has an approximate curb to curb width of 24 feet and carries two travel 12-foot travel lanes, one in each direction, with no shoulders. One lane is an exit from, while the other is an entrance to, the SMRP northbound. A 2-foot wide curbed safety walk is located along both edges of the roadway.

II.C.1.e.(3) Curb: Ashford Avenue is curbed throughout the length of this project, as is the SMRP entrance / exit ramp.

II.C.1.e.(4) Median: There are small striped medians on either side of the Northfield Avenue intersection with Ashford Avenue, as well as the north leg of the NYS Route 9A/Ashford Avenue intersection. There is a small concrete median separating the opposing traffic on the short length of Northfield Avenue. There are no other grade separated medians within the project limits and no medians on the structure.

II.C.1.e.(5) Grades and Curves: Within the project limits, Ashford Avenue has a tangent alignment beginning at the west limit, continuing over the structure, then curves to the left at a radius of 500 feet. The curve then reverses to the right at a radius of 300 feet through the NYS Route 9A intersection. The structure itself is on a 400 foot crest vertical curve with approach and exit grades of 6.5%.

The ramp structure is built on a tangent horizontal alignment at a 6.0% grade, connecting Ashford Avenue to the SMRP below.

II.C.1.e.(6) Intersection Geometry and Conditions: There are four (4) intersections along the project length. The intersection of Ashford Avenue and Southfield Avenue is unsignalized with stop-controlled side roads and no auxiliary lanes.

The remaining three (3) intersections are signalized:

- Ashford Avenue and Northfield Avenue
- Ashford Avenue and Northbound SMRP Ramp
- Ashford Avenue and NYS Route 9A

II.C.1.e.(7) Parking Regulations and Parking Related Conditions: There are no parking accommodations within the project limits.

II.C.1.e.(8) Roadside Elements:

- There are 5-foot curbed sidewalks on both sides over the length of the Ashford Avenue bridge adjacent to the pavement. There are some areas of 3 and 4-foot sidewalk located at the approaches to the bridge. The SMRP ramp contains a curbed 2-foot wide safety walk. Bridge railing or corrugated beam guide rail is located near the back of sidewalk / safety walk throughout the project limits. Snow storage is accommodated at the curbs. Light poles and traffic signals are located adjacent to the sidewalk on the structure.
- Residential and commercial driveways exist at the outer extremities of the project length.
- With the exception of the Ashford/SMRP Ramp signal pole at 4 feet, the minimum unobstructed clear zone from the edge of travel lane, bounded by bridge rail, trees and utility poles is typically 5 feet. Along the SMRP entrance/exit ramp, clearance is typically one foot.

II.C.1.f. Abutting Highway Segments and Future Plans for Abutting Highway Segments

Heading west, Ashford Avenue continues into in the Village of Dobbs Ferry. Heading east and south east, Ashford Avenue intersects Old Sprain Road and continues east as Ardsley Road toward Central Avenue (NYS Route 100) and points beyond. Ashford Avenue crosses two major Westchester thoroughfares within project limits – Saw Mill River Parkway, New York State Thruway (I-87); and NYS Route 9A just east of the project limits, and provides access to two of those three (SMRP and Route 9A). The Saw Mill River Parkway is a four-lane, north-south partially controlled access highway in good condition. NYS Route 9A is a predominantly two lane uncontrolled access arterial highway, also in good condition.

The Town of Greenburgh, under permit from NYSDOT will be rehabilitating NYS Route 9A from the Ashford Avenue intersection, northward. In a plan provided by Lublanecki Engineering, Inc., in conjunction with Michael Maris Associates, Inc., the north leg of the Ashford/Route 9A intersection will be restriped in the vicinity of the bridge project. Additional widening and lane reconfiguration is planned to the north. A copy of the intersection plan has been included in Appendix E.

The Town of Greenburgh, in conjunction with Michael Maris Associates, Inc. had previously studied a full build-out of the Ashford Avenue / Route 9A intersection; however, during coordination efforts with the Town, it was learned that the widening project has been deferred. The bridge rehabilitation will not preclude the Town's future project by including provisions for a future retaining wall to be constructed along the south side of the eastbound approach to the Ashford Avenue / Route 9A intersection. A copy of the concept plan for the full-build out of the intersection is also included in Appendix E. Improvements at this intersection are out of the scope and intent of this bridge rehabilitation project.

The project will also be constructed as not to preclude the future addition or replacement of an entrance ramp to the Saw Mill River Parkway or a pedestrian access ramp to the South County Trailway, both on the north side of Ashford Avenue.

Below is a figure of the conceptual addition of a new NB SMRP entrance ramp and pedestrian ramp to the South County Trailway (Figure II-I).

Figure II-I

II.C.1.g. Speeds and Delay

II.C.1.g.(1) Existing Speed Limit: The regulatory speed limit for the project is 30 mph.

II.C.1.g.(2) Actual Operating Speed: Speed Studies were performed in one location along Ashford Avenue on October 5, 2009. The maximum off-peak 85th percentile speed is 39 mph; thus, it is assumed that the actual operating speed is approximately 40 mph.

II.C.1.g.(3) Travel Speed and Delay: There is significant congestion throughout the project length during peak hours. All the intersections within the project area were counted and analyzed. The findings are summarized in section II.C.1.i. During off-peak hours, traffic conditions vary from congested to free flow.

II.C.1.h. Traffic Volumes

(1) Existing Traffic Volumes

- Mainline AADT – 19,727 vehicles per day
- Mainline Two-Way DHV – 1,966 vehicles
- Mainline DDHV – 1,150 vehicles
- Mainline Average two-way heavy vehicle percent – AM 6.5% PM 6.3%
- Ramp AADT – 4,589 vehicles per day
- Ramp Two-Way DHV – 725 vehicles
- Ramp DDHV – 406 vehicles
- Ramp Average two-way heavy vehicle percent – 0%

  (no heavy vehicles permitted on the SMRP)

AADT values were determined by ATR counts taken by the WCDPWT in June 2009 on Ashford Avenue west of the project site. A copy is included in Appendix B.

Refer to Appendix B for AM and PM peak hour counts and HCM analyses (using Synchro software, version 7). The AM peak was from 7:45 to 8:45 and the PM peak was from 4:45 to 5:45.

Due to the age of the manual turning movement counts, data was compared to available counts taken at the Ashford Avenue/NYS Route 9A and Ashford Avenue/NB SMRP Ramp by John Meyer Consulting, PC as part of the Riverstown Square DEIS (refer to II.C.1.w.). It was confirmed that June 2011 manual count data for these two intersections is for the most part, at or below 2009 levels. Therefore, it is felt that 2009 data is a representative sample of "existing" conditions. Copies of their June 2011 AM and PM Peak Manual Counts are provided in Appendix B.

School buses, emergency vehicles and delivery trucks use Ashford Avenue as local access with connection to Route 9A. School buses also use Ashford Avenue as a connection to Saw Mill River Parkway.

(2) Design Year (2047) Traffic Volume Forecasts

Traffic volume forecast design year for the project was determined using guidelines shown in Appendix 5 of the NYSDOT Project Development Manual, which states that bridge replacement projects should use a design year of ETC+30 (where ETC is the estimated time of completion). This project is currently scheduled for a construction start in 2015, with an anticipated completion in 2017. This yields a design traffic forecast year of 2047.

The design year traffic volumes are based on an annual linear growth rate of 0.5%. This rate was developed using counts taken in 2001, 2008 and 2009. The growth along the project length from 2001 to 2009 was calculated for mainline Ashford Avenue and a conservative growth rate of 0.5% was used for analyses.

Design year traffic volume

- Mainline AADT – 23,607 vehicles per day
- Mainline Two-Way DHV – 2,353 vehicles
- Mainline DDHV – 1,376 vehicles
- Mainline Average two-way heavy vehicle percent – AM 6.5% PM 6.3%
- Ramp AADT – 5,547 vehicles per day
- Ramp Two-Way DHV – 876 vehicles
- Ramp DDHV – 491 vehicles
- Ramp Average two-way heavy vehicle percent – 0%

Refer to Appendix B for design year traffic volumes and HCM analyses (using Synchro software, version 7).

II.C.1.i. Level of Service –

The intersection capacity and level of service (LOS) analyses were performed using Synchro (version 7) Software HCM Outputs, in accordance with the Basic freeway Segment and Signalized intersection analytical procedures prescribed in the “Highway Capacity Manual” (HCM) 2000 (Special Report 209, published by the Transportation Research Board, Washington, D.C).

The capacity of an intersection is evaluated in terms of Volume to capacity (V/C) ratio and the LOS is evaluated on the basis of average stopped delay per vehicle in seconds. While LOS D is considered the minimum acceptable level of operation, LOS E is a measure of theoretical capacity. At LOS F, the facility operates over

capacity and is susceptible to long traffic delays and break downs in traffic flow. For signalized intersections, level of service is stated in terms of the averaged stopped delay per vehicle for a 15-min analysis period. The LOS criteria for signalized intersections as defined in HCM 2000 are as follows:

LOS	Delay Per Vehicle Range (Seconds)
A	< = 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.0

LOS for Signalized Intersections

For unsignalized intersections, delay is defined as the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. The delay range for each LOS category is as follows:

LOS	Delay Per Vehicle Range (Seconds)
A	< = 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.0

LOS for Unsignalized Intersections

The signalized intersections of Ashford Avenue with Northfield Avenue, SMRP NB Exit Ramp and NYS Route 9A, and the unsignalized intersection with Southfield Avenue were analyzed for AM and PM peak hours for existing and future no-build conditions using HCM outputs from Synchro. An annual traffic growth rate of 0.5% was applied to existing volumes to forecast future demand in 2017 (ETC) and 2047 (ETC+30). Below is a summary of the existing and future no-build conditions for AM and PM peak periods:

SIGNALIZED INTERSECTIONS

Intersection	Movement	Control	Existing		2017 No Build (ETC)		2047 No Build (ETC+30)	
			AM	PM	AM	PM	AM	PM
Ashford Ave/Northfield Avenue		S						
Ashford Ave EB	L		D (48.8)	D (38.7)	D (52.2)	D (40.3)	D (45.8)	E (61.6)
	T		A (7.6)	A (6.6)	A (7.8)	A (6.8)	A (9.1)	A (7.8)
Ashford Ave WB	TR		B (17.2)	D (38.1)	C (18.4)	D (45.9)	D (41.7)	F (100.4)
Northfield Ave SB	L		D(36.1)	C (34.5)	D (36.8)	C (34.8)	D (39.2)	D (36.1)
Overall			B (17.2)	C (25.7)	B (18.0)	C (29.3)	D (27.6)	D (54.7)
Ashford Ave/SMRP NB Ramps		S						
Ashford Ave EB	TR		C (22.0)	B (18.2)	C (23.9)	B (19.0)	D (52.4)	C (25.8)
Ashford Ave WB	LT		B (12.9)	B (12.3)	B (13.8)	B (13.3)	C (21.6)	C (22.9)
SMRP NB Off Ramp	LR		D (42.5)	D (42.5)	D (44.4)	D (44.4)	D (53.2)	D (54.6)
Overall			C (22.0)	B (19.5)	C (23.5)	C (20.5)	D (42.4)	C (28.9)
Ashford Ave/Route 9A		S						
Ashford Ave EB	L		F (155.7)	F (91.1)	F (171.1)	F (100.2)	F (248.1)	F (185.0)
	TR		F (83.4)	E (68.1)	F (93.2)	E (75.7)	F (162.7)	F (158.0)
Ashford Ave WB	L		D (38.5)	D (40.0)	D (38.8)	D (40.5)	D (39.7)	D (47.9)
	T		E (76.4)	F (150.6)	F (82.6)	F (165.3)	F (121.9)	F (267.8)
	R		E (57.1)	E (59.1)	E (57.1)	E (59.2)	E (57.8)	E (63.6)
Route 9A NB	L		E (57.6)	E (61.9)	E (67.1)	E (73.5)	F (155.1)	F (215.5)
	T		D (41.7)	D (40.0)	D (42.5)	D (40.5)	D (48.3)	D (48.4)
	R		C (26.1)	C (26.9)	C (26.0)	C (26.9)	C (25.6)	C (29.4)
Route 9A SB	L		C (34.6)	D (35.2)	C (34.7)	D (35.3)	C (35.3)	D (38.7)
	T		E (59.7)	E (59.9)	E (62.6)	E (63.1)	F (89.1)	F (104.8)
	R		E (66.9)	F (147.7)	E (70.9)	F (158.9)	F (104.6)	F (259.9)
Driveway SE	LTR		E (67.5)	E (72.5)	E (67.5)	E (72.5)	E (67.5)	E (64.2)
Overall			F (80.3)	F (85.5)	F(87.4)	F (93.0)	F (134.1)	F (164.9)

Key: X (Y.Y) = Level of Service (Delay in seconds per vehicle)
NB, SB, WB, EB = Northbound, Southbound, Westbound, Eastbound approaches
S = Signalized intersections
LTR = Left Turn, Through, Right turn movements
ETC = Estimated Time of Completion
--- = Not Applicable

Table II-1

UNSIGNALIZED INTERSECTIONS

Intersection	Movement	Control	Existing		2017 No Build ETC		2047 No Build (ETC+30)	
			AM	PM	AM	PM	AM	PM
Ashford Ave/Southfield Ave		U						
Ashford Ave EB	T		0.00	0.00	0.00	0.00	0.00	0.00
Ashford Ave WB	L		A (4.2)	A (4.6)	A (4.4)	A (4.8)	A (5.8)	A (6.2)
	T		0.00	0.00	0.00	0.00	0.00	0.00
Southfield Ave NB	LR		E (49.5)	D (26.8)	E (59.7)	D (28.5)	F (187.2)	E (49.6)
Overall			(3.3)	(1.5)	(3.9)	(1.6)	(10.9)	(2.4)

Key: X (Y.Y) = Level of Service (Delay in seconds per vehicle)
NB, SB, WB, EB = Northbound, Southbound, Westbound, Eastbound approaches
U = Unsignalized intersection
LTR = Left Turn, Through, Right turn movements
ETC = Estimated Time of Completion

Table II-2

Existing Conditions

As previously mentioned, 2009 data was determined to be a representative sample of the existing condition when compared with available 2011 data. While two intersections; Ashford Avenue at Northfield Avenue and Ashford Avenue at NB SMRP ramp operate at an acceptable overall intersection LOS of C or better during both peak periods, the intersection of Ashford Avenue and Route 9A operates at LOS F. During the AM peak period the unsignalized intersection of Ashford Avenue and Southfield Avenue has an overall intersection LOS A. Refer to the above tables for specific information. Our analysis demonstrates that mainline Ashford Avenue corridor along the project length experiences considerable congestion during both the peak hours, predominantly due to the intersection of Ashford Avenue and Route 9A.

No-Build 2017 (ETC)

The 2017 no-build traffic volumes were generated using the existing traffic volumes and projecting them into the future, 2017, using an estimated growth factor based on previous traffic growth trends in the area. The intersections, Ashford Avenue at Northfield Avenue and Ashford Avenue at NB SMRP ramp continue to operate at an acceptable overall LOS of C or better during the peak hours with a slight increase in delay for all the movements. A similar trend is observed for the unsignalized intersection of Ashford Avenue and Southfield Avenue, with an increase in the overall intersection delay. The intersection of Ashford Avenue with Route 9A will continue to operate at LOS F during both peak periods.

No-Build 2047 (ETC+30)

The service levels for all the intersections will further deteriorate in 2047 no-build conditions during both the peak periods. Refer to the above tables for specific data.

- The intersection of Ashford Avenue and Northfield Avenue will operate at LOS C during AM peak hour and LOS D during the PM peak hour.

- Ashford Avenue and the NB SMRP ramp, which is coordinated with the upstream signal of Ashford Avenue and Northfield Avenue will operate at LOS D during the AM peak period and LOS C during the PM peak period. At this intersection the highest increase in delay is observed for Ashford Avenue EB shared through and right movement during the AM peak hour. The delay for the movement increases from 22.0 seconds (LOS C) in the existing conditions to 52.4 seconds (LOS D) in the no-build 2047 conditions.

- The signalized intersection of Ashford Avenue and Route 9A will continue to operate at LOS F, particularly in the PM peak period where delay is expected to double from the current condition. SimTraffic simulations show queues from this intersection extend all the way back through the two downstream intersections of Ashford Avenue with NB SMRP ramp and Northfield Avenue.

- The overall delay for Ashford Avenue and Southfield Avenue intersection increases to LOS B in 2047 no-build conditions. Even though the volume at the NB approach is comparatively low, the LOS for this approach is E or worse in 2047 no-build condition as mainline Ashford Avenue operates at capacity. This makes it hard for the vehicles at the Southfield NB approach, controlled by a stop sign to find gaps since Ashford Avenue mainline is backed up from the intersection of Ashford Avenue with Northfield Avenue to the intersection of Ashford Avenue at Route 9A.

II.C.1.j. Non-Standard Features and Other Non-Conforming Elements

II.C.1.j.(1) Non-Standard Features –

Horizontal Curvature – A horizontal curve on the east approach of the mainline structure has a non-standard radius of 500 feet. This is below the standard value of 533 feet for a design speed of 40 mph.

Stopping Sight Distance – The stopping sight distance on the crest vertical curve over the mainline structure is approximately 258 feet. Additionally, the ramp structure where it intersects Ashford Avenue (NB SMRP exit) has a crest vertical curve with a SSD of approximately 236 feet. These are all below the standard value of 305 feet for a design speed of 40 mph. It should be noted that headlight distance is approximately 107 feet on the west approach sag vertical curve and approximately 117 feet on the east approach sag vertical curve. However this condition is mitigated due to the presence of lighting.

Structural Capacity – Based on Section 2.6.2 of the NYSDOT Bridge Manual, the existing structure should be capable of carrying an HS-20 live load. Analysis revealed that based on an HS-20 loading, the rating factors for an existing fascia

girder and interior girder are 0.425 and 0.812, respectively. Consequently, the structural capacity of the superstructure is substandard.

II.C.1.j.(2) Non-Conforming Features –

Westbound Lane Drop – On the west side of the Ashford Avenue bridge just past Southfield Avenue two westbound travel lanes reduce to one lane, continuing west toward US Route 9. The required merge taper length for a lane drop with an 85th percentile speed of 39 mph and a shift of 10 feet is 254 feet. The existing length of the lane drop is approximately 200 feet, thus it is a non-conforming feature. While the computed accident rate for the short segment between Northfield Avenue and the SMRP is rather high (see Section II.C.1.k), there were only 4 accidents over a 3 year period, 3 of which were rear end accidents in the vicinity of the signal at Northfield Avenue. The lane drop does not contribute to an accident problem and extends out of the project limits and beyond the scope of work. Thus, the existing lane drop will remain.

Northbound SMRP Acceleration Lane – The northbound entrance to the Saw Mill River Parkway from Ashford Avenue enters south down the ramp to grade, then turns north by means of a 180 degree turn with an approximately 20 foot radius. This creates a near stop condition, controlled by a yield sign. To the advantage of the driver, there is an over 800 foot line of sight facing south before making the 180 turn to face north. For acceleration from a stop condition to a roadway with a 65 MPH design speed, AASHTO recommends a 1410 foot long acceleration lane and 300 foot taper. Currently, there is an approximately 275 foot long acceleration lane with a 155 foot taper, which is enough length to safely achieve 30-35 MPH.

While the accident rate for the merge is higher than the statewide average (see Section II.C.1.k.), a further breakdown of the accidents reveals that only two of eight accidents, both sideswipes, may be attributed to the acceleration lane and taper and in both cases, vehicles traveling NB on the SMRP entered the right travel lane as the accelerating vehicle attempted to merge into the same lane.

While the condition is noted, lengthening of the acceleration lane and taper would be beneficial but is not within the scope of this bridge rehabilitation project. The installation of a dedicated NB entrance ramp to the SMRP was also studied by the County. While provisions will be included for a future installation, it will not be a part of this project due to it being out-of-scope, as well as its additional cost.

II.C.1.k. Safety Considerations, Accident History and Analysis – A detailed accident analysis was conducted for a 36-month period between June 1, 2007 and May 31, 2010 to document the accident history throughout the project corridor and to identify any accident patterns or clusters. Data from the reports were combined and entered into Highway Safety Analysis (HSA) Software v.3.0, a database program which sorts and provides a summary and detailed report of accident data in various forms.

During the three year period, 120 reported accidents occurred on a 0.16 mile segment of Ashford Avenue from the Northfield Avenue intersection to the intersection of NYS Route 9A, resulting in a combined accident rate of 34.72 accidents/MVM for the entire corridor. This greatly exceeds the statewide average of 4.47 accidents/MVM for all types of accidents on an urban four-lane, undivided

highway with no access control for mainline and juncture accidents. Two major contributing factors to the high overall rate are the high frequency of accidents at Ashford Avenue and Route 9A and the high frequency of accidents overall over a relatively short segment of roadway.

Of the total 120 reported accidents, 109 accidents (90.8%) occurred at intersections. The remaining 11 accidents (9.2%) were mid-block accidents. There were **no fatalities** during the 3 year analysis period.

Detailed accident analyses were carried out for five (5) intersections, three (3) mid-block locations and the NB merge from the SMRP on-ramp. Table II-7 shows the computed average intersection accident rates compared with the corresponding statewide averages, while Table II-8 shows the comparison for non-intersection accidents. The average accident rate for four intersections, two non-intersection locations and the NB SMRP merge exceeded statewide accident rates (NYSDOT Rev. 5/12).

Accident history forms (TE 213) and collision diagrams are included in Appendix C.

Intersection Accident Summary

Intersection	Total Accidents	Computed Accident Rate (MEV)	Statewide Accident Rate (MEV)
Ashford @ Northfield Avenue	3	0.14	0.19
Ashford @ Southfield Avenue	19	**0.88**	0.11
Ashford (Extension) @ Northfield Avenue	8	**0.37**	0.11
Ashford @ SMRP NB Ramp	11	**0.51**	0.19
Ashford @ NYS Route 9A	68	**3.15**	0.15
SMRP On Ramp at SMRP (merge)	8*	**0.37**	0.10

Table II-7

(* - These 8 accidents were not factored into the total of 120 accidents in the corridor)

Non-Intersection (Mid-Block) Accident Summary

Intersection	Total Accidents	Computed Accident Rate (MVM)	Statewide Accident Rate (MVM)
Northfield Avenue to Southfield Avenue	4	**7.24**	2.59
Southfield Avenue to SMRP NB Ramp	6	**5.87**	2.92
SMRP NB Ramp to New York 9A	1	0.51	2.92

Table II-8

II.C.1.k.(1) Intersections with High Accident Rates - Intersections with accident rates above the statewide averages are described below. For intersections off the structure, please refer to Appendix C for specific accident data related to types and causes of the accidents.

- Ashford Avenue at Southfield Avenue
  There were 19 accidents at this location over a 3-year period, the predominant types of which were Right Angle (5 of 19, 26.3%) and Rear End.

- Ashford Avenue Extension at Northfield Avenue
  Of the eight (8) accidents that occurred here, the predominant type was Rear End (3 of 8, 37.5%).

- Ashford Avenue at SMRP NB On/Off Ramp
  There were 11 accidents in 3 years at this intersection. The predominant type was Rear End (7 of 11, 63.6%) with causes such as driver inattention, following too closely, pedestrian/bicyclist confusion, loss of consciousness and unsafe lane changing. There were 3 Head-On accidents, all attributed to slippery pavement. One Sideswipe accident was attributed to reacting to an uninvolved vehicle.

- Ashford Avenue at NYS Route 9A
  This intersection had the largest amount of accidents of any segment or intersection in the project limits, with 68 of 120 (56.7%). The predominant accident type was Rear End (23 of 68, 33.8%).

  While there is clearly a high rate of accidents at this intersection, this project is strictly limited to bridge rehabilitation.

- Saw Mill River Parkway On-Ramp Merge onto the NB SMRP
  The predominant accident type at this merge was Rear End (4 of 8, 50%).

II.C.1.k.(2) Non-Intersection (Mid-Block Sections) with High Accident Rates – Non-Intersections with accident rates above the statewide averages are described below:

- Northfield Avenue to Southfield Avenue
  There were four (4) accidents over three years in this short stretch of roadway, three of which were Rear End (3 of 4, 75%).

- Southfield Avenue to SMRP On/Off Ramp
  Over the three-year study periods there were six (6) accidents in this segment. The predominant accident type was Sideswipe (2 of 6, 33.3%). The only information provided was that one of the two occurred due to driver inattention. Right Angle and Rear End accidents occurred, though no details were provided. An Overtaking accident occurred due to failure to yield the right-of-way. Finally, a Head On accident occurred with slippery pavement as an attributing cause.

II.C.1.k.(3) Causes and Conditions of Predominant Accident Types - Accidents may be classified as “correctable” or “non-correctable”. An accident is defined as “correctable” if it can be correlated to a correctable non-standard or deficient physical feature found at the accident location such as a tight curve with poor sight distance, or poor pavement conditions. A “non-correctable” accident is mainly attributed to driver behavior factors, such as driver inattention (e.g., daydreaming and talking to passengers), alcohol involvement, and unsafe, aggressive driving

maneuvers. The causes of predominant accident types are examined below, as well as their ability to be "corrected" as a part of this project.

Rear-End Accidents

Rear-End accidents were the highest occurring accident type for the project corridor during the study period. Out of a total of 120 accidents, forty-three (43, 35.8%) were rear-end accidents. Driver inattention and following too closely were the most common contributing factors noted for rear-end accidents. Slippery pavement was cited in a few of the accidents. Other causes are noted in the accident details sheets in Appendix C.

A "correctable" cause of rear end accidents is slippery pavement due to low skid resistance. This is correctable by resurfacing the existing pavement or in the case of a structure, a new deck typically increases friction. A solution such as new asphalt or concrete may reduce the frequency of slippery pavement accidents; however, it will not entirely make up for the predominant non-correctable causes, such as following too closely and driver inattention. In most cases, drivers are impatient or inattentive to the car in front of them while approaching intersections. The corridor will be inspected for potential additional signage to assist in warning drivers of upcoming intersections. West of the mainline structure, Ashford Avenue was repaved in the fall of 2011.

Other Frequent Accident Types

Sideswipe accidents (22 of 120, 18.3%), accidents involving right angles (14 of 120, 11.7%), and left turns (13 of 120, 10.8%) were other frequent types of accidents noted during the three year study period.

The predominant causes of the above mentioned accidents were driver inattention, improper lane use, failure to yield the right-of-way and turning improperly. These causes are largely non-correctable.

The causes for sideswipe accidents can be considered correctable to some degree, particularly on this project as additional lane width is proposed on the new bridge superstructure. However, driver inattention is largely non-correctable. Right angle and left turn accidents are for the most part, "non-correctable" as they are mostly the fault of the driver.

II.C.1.l. Pavement and Shoulder Conditions – According to the In-Depth Inspection, performed in March 2010 by WSP ▪ SELLS bridge inspectors, the bridge deck wearing surface exhibits minor transverse cracking, but with some isolated areas of more severe deterioration. In all spans, with the exceptions of the localized areas, the ride quality was noted to be good.

The approach pavement is in similar condition with some large transverse cracking evident and scattered isolated areas of early pothole development, but is in otherwise fair condition.

II.C.1.m. Guide Railing, Median Barrier, Impact Attenuators – The bridge railing is in generally good physical condition, according to the In-Depth Inspection, but is out of

date and will be updated as part of this project. Corrugated beam guide rail is present at both approaches and exhibits minor to moderate impact damage, but with no loss of functionality. New guide rail and transition pieces will be installed according to NYSDOT standards as part of this project.

II.C.1.n. Traffic Control Devices – There are three signalized intersections within the project area along Ashford Avenue: Northfield Avenue, Northbound SMRP Ramp, and NYS Route 9A.

The two intersections, Ashford Avenue with Northfield Avenue and Ashford Avenue with the NB SMRP On/Off Ramp are semi-actuated co-coordinated signals with the actuation on all the movements excluding Ashford Avenue mainline through and right turn movements (EB and WB). The intersection of Ashford Avenue with Route 9A is fully actuated and uncoordinated, while the intersection of Ashford Avenue and Southfield Avenue is unsignalized with the NB Southfield Avenue approach controlled by a stop sign.

II.C.1.o. Structures –

(1) Description – The Ashford Avenue Bridge (BIN 5348380) is located in Westchester County, in the villages of Ardsley and Dobbs Ferry. It carries four 10'-0" travel lanes (two lanes in each directions) and two 5'-0" sidewalks over the Saw Mill River Parkway, the New York State Thruway (I-87), and the Saw Mill River. At the west approach, two westbound lanes taper to one lane at the Ashford Avenue / Northfield Avenue intersection. At the east approach, two eastbound lanes become a dedicated left turn and shared through-right lane at the Ashford Avenue / NYS Route 9A intersection. Sidewalks are predominantly 5 feet wide but do vary in width to 4 feet on the approaches within the project limits. The bridge is a multi-girder steel bridge with reinforced concrete deck, containing six simple supported spans, ranging in length from 33'-9" to 73'-6". The superstructure is supported by multi-column reinforced concrete piers and reinforced concrete gravity-type abutments. According to the as-built plans, foundations are all spread footings on soil.

The Saw Mill River Parkway Entrance/Exit ramp (BIN 5348380A) connects the SMRP NB to Ashford Avenue and carries two 12'-0" travel lanes (one lane in each direction). The ramp is of similar construction to the bridge, containing three simple supported spans, ranging in length from 27'-6" to 58'-0".

(2) Clearances – Horizontal clearance on the bridge is controlled by the traffic signal pole located at the Ashford Avenue intersection with the ramp. Clearance at this point is approximately 4 feet from the edge of travel lane; otherwise it is a minimum of 5 feet.

Horizontal clearance on the ramp is controlled by the location of the bridge railing, which is located approximately 14 inches from the edge of travel lane.

(3) History and Deficiencies – The original design drawings for the bridge and ramp indicate a "plans made" date of 1941 and a final approval date of 1944. NYSDOT inventory records indicate the "year built" as 1950. Rehabilitation measures, according to plans dated 1991, included new curbs, sidewalks, concrete overlay, and deck joints. Repairs in this same rehabilitation contract

included substructure and deck repair, bearing restoration, and bridge railing repair. Refer to Appendix K for plans, profiles, and typical sections of the existing bridge, ramp, and approaches.

(4) Inspection – According to the In-Depth Inspection report (March 2010), both bridges are in a state of moderate overall deterioration, with some localized areas of serious deterioration. The deterioration has been gradual and progressive in nature, and reflects typical long-term effects of weather and road salt on concrete and steel elements. The concrete decks exhibit extensive seepage, surface cracking, and delamination of concrete over the embedded reinforcing. In June 2012, concrete over the NYS thruway became dislodged from the north fascia over the Northbound lanes. Subsequently, County and Thruway forces inspected and removed additional loose concrete from the bridge.

Deck joints typically leak, contributing to the deterioration of the steel girders and the concrete substructures, especially beneath joint locations. In other locations, the majority of the steel is in generally good condition, although it exhibits widespread deterioration of the paint system. Piers have extensive moderate deterioration, with localized areas of serious deterioration. Areas of delaminated concrete on the piers have extended beyond the limits delineated during the 2010 in-depth inspection. This indicates that deterioration is accelerating.

The general recommendation for both the bridge and ramp given in the NYSDOT Biennial Bridge Inspection Reports from October 2011 and May 2011 respectively is “4”, indicating that the structures suffer from between “minor and serious deterioration.” The In-Depth Inspection Report, completed in February 2010, confirms these general recommendation values. Complete text of the 2011 Biennial Inspection Reports and the In-Depth Inspection Report can be found in Appendix M.

(5) Restrictions – There are currently no posted restrictions on the bridge or ramp.

(6) Future Conditions – The bridge currently provides for the safe support of vehicle loads, but, in the absence of rehabilitative re-construction, this is threatened in the long term by the increasing nature of its deteriorated condition. Based on a Level 1 load rating calculations, the mainline bridge superstructure live load capacity is HS 15.3 under inventory levels. Inventory rating levels, “generally correspond to the customary design level of “stressed” but reflects the existing bridge and material conditions with regard to deterioration and loss of section. Load ratings based on the inventory level allow comparisons with the capacity for new structures and, therefore, results in a live load which can safely utilize an existing structure for an indefinite period of time.” The mainline bridge capacity is HS 35.7 under operating levels, which generally describe the “maximum permissible live load to which the structure may be subjected.” Such rating levels indicate that bridge rehabilitation is necessary in the near future, or with continued deterioration, truck traffic on the bridge will eventually be restricted. As noted in the Manual for Condition Evaluation of Bridges, allowing an unlimited number of vehicles to use the bridge at operating level may shorten the life of the bridge. For the ramp, under inventory level the superstructure live load capacity is HS 22.5 and under operating level, it is HS 43.

(7) Waterway – Rehabilitation of the bridge and ramp are not expected to significantly change the appearance of the structure or in the clearances above the Saw Mill River.

II.C.1.p. Hydraulics of Bridges and Large Culverts – The bridge passes over the Saw Mill River; however, the river is not a cause for concern as it is over 20 feet below the bottom of the structure and the portion of the river under the structure passes through a concrete culvert.

II.C.1.q. Drainage System

II.C.1.q.(1) Type: Drainage on the structure is accommodated by gutter flow along the curbed edges of the roadway, from the high point located at the intersection of the entrance/exit ramp with Ashford Avenue. Catch basins located at both bridge approaches and the ramp approach capture flow from the structure. The existing drainage system at all approaches is closed drainage, consisting of curbside drainage structures and piping. Piping consists mainly of cast iron pipe (CIP). Pipes vary in diameter from 12“ to 24“.

II.C.1.q.(2) Condition/Deterioration: According the In-Depth Inspection findings, the drainage system appears to be functional for the removal of runoff. However, the catch basins at the bridge approaches exhibit areas of moderate to severe deterioration and catch basins at the ramp approach are completely plugged. The steep grade of the ramp prevents ponding in this area. The piping was not inspected, but the effectiveness of the drainage system did not appear to be impaired.

II.C.1.q.(3) Deficiencies/Needs: Structural drainage is adequate, consisting of gutter flow to the approaches. The collection and conveyance of roadside drainage at the approaches are also adequate. However, deteriorated drainage structures require replacement and plugged drainage structures require cleaning.

II.C.1.r. Soil and Foundation Conditions – No unusual soil or foundation conditions exist within the project limits.

II.C.1.s. Utilities – Utilities on the bridge and within the project vicinity have been documented in utility plates and bridge record plans. A summary of the utility locations are as follows:

- There are overhead utility lines along the old alignment of Ashford Avenue (which is now interrupted by the SMRP and I-87) and along Route 9A, but none along the Ashford Avenue Bridge.
- Con Edison electric lines supply power to light poles located along the north fascia of the bridge. All other Con Edison underground and overhead facilities (both gas and electric) are located along the old alignment of Ashford Avenue or on Elm Street below the structure.
- Signal cable feeds the traffic signals located at the intersection of the Ashford Avenue bridge with the SMRP entrance / exit ramp. The signal is owned and operated by the Village of Dobbs Ferry.
- Verizon communication lines are located within the north sidewalk and run along the length of the bridge.
- Cablevision will be contacted a second time for information on their service, however it is anticipated that they do not cross the structure.

II.C.1.t. Railroads – There are no railroads in the vicinity of the project. The nearest railroad is Metro North's Hudson Line, 1.5 miles to the west of the project.

II.C.1.u. Visual Environment – The project area is primarily urban/suburban residential on either side of the bridge along Ashford Avenue and its side streets. The immediate vicinity of the bridge is more commercial in nature with a service station, restaurants and convenience store.

The State Historic Preservation Office (SHPO) indicated, in their letter dated December 16, 2009, that this project will have "no impact upon cultural resources in or eligible for inclusion in the State and National Register of Historic Places."

SHPO was again contacted in August 2012 and indicated in their letter dated August 23, 2012, confirmed their December 2009 assessment of the project and further recommended a finding of "No Historic Properties Affected."

Refer to all correspondence in Appendix E.

II.C.1.v. Provisions for Pedestrians and Bicyclists – Pedestrians are accommodated by sidewalks running along either side of Ashford Avenue. Sidewalks and curbs are in satisfactory condition, showing some transverse cracking and differential settlement. Bicyclists share the roadway with vehicular traffic. The South County Trailway multi-use recreational path runs beneath the bridge, but no direct access from the bridge currently exists.

II.C.1.w. Planned Development for Area – As of this report, the Riverstown Square mixed-use development is proposed at the Lawrence Street exit on the SB SMRP in Dobbs Ferry. It will contain six buildings with both commercial and residential space and is currently planned for 2015. Additionally, a recreational sports complex named Sportime USA is planned for Fall 2012 on Elm Street in the Village of Ardsley in an existing facility, in close proximity to the Ashford Avenue Bridge.

II.C.1.x. Systems Elements and Conditions – Ashford Avenue serves as a link in a system of local roads that provide access to abutting property and connect neighborhoods to major roadways, including the Saw Mill River Parkway, NYS Route 9A, New York State Thruway (just south of Ashford Avenue on Route 9A) as well as NYS Route 9 to the west and NYS Route 100 to the east. It is one of few moderate to highly traveled east-west routes in southern Westchester County.

II.C.1.y. Environmental Integration – The majority of the work is the in kind replacement and upgrade of existing features. Disturbed areas will be restored to closely match the existing setting.

II.C.2. Needs

II.C.2.a. Project Level Needs

II.C.2.a.(1) Pavement Needs – As described in Section II.C.1.l., Pavement and Shoulder Conditions, the existing bridge wearing surface and approach pavement exhibit localized areas of significant deterioration, but is in otherwise fair condition.

II.C.2.a.(2) Safety Needs – Given the results of the in-depth and biennial inspections, continued deterioration of the structure is a safety concern. Additionally, areas within the project limits currently exhibit accident rates that exceed the statewide average.

II.C.2.a.(3) Capacity Needs – The bridge's capacity needs are dictated by the adjacent intersections of Ashford Avenue / Northfield Avenue and Ashford Avenue / Route 9A, as well as the single lane configuration of Ashford Avenue beyond the project limits. However, the capacity of the bridge itself has been determined to be satisfactory for both present day and ETC+30 conditions.

II.C.2.a.(4) Bridge Structural Needs – Load rating calculations indicate that the existing girders (both interior and fascia) are below the standard HS-20 truck loading due to current levels of deterioration. Thus there is a need to address deterioration of superstructure and pier elements. Note that the substructure needs no increase in capacity based on HS-20 Live Load but should be improved based on current seismic requirements.

II.C.2.a.(5) Drainage Needs – As described in Section II.C.1.q. Drainage System, the project area exhibits drainage needs. Although the system as a whole appears to function adequately, individual drainage structures exhibit moderate to severe deterioration or are clogged. Replacement and/or cleaning of the structures and inspection of the piping should be performed at a minimum.

II.C.2.a.(6) Environmental Needs – There are no environmental needs for this project.

II.C.2.b. Area or Corridor Needs –

II.C.2.b.(1) Modal Interrelationship – Proposed safety and operational improvements and lane widening would enhance travel to and from regional destinations and mass transit services.

II.C.2.b.(2) System Needs – There are currently no system needs as this project is a bridge rehabilitation.

II.C.2.b.(3) Mobility Needs – There are currently no mobility needs as this project is a bridge rehabilitation.

II.C.2.b.(4) Social Demands and Economic Development – There are no resounding concerns over social demand or economic development.

II.C.2.c. Transportation Plans – This project is anticipated to be a part of the Statewide Transportation Improvement Plan (STIP) for Federal Fiscal Years (FFY's) 2014-2015.

II.D. Project Objectives

Project objectives have been established to facilitate the visioning process. They will serve to analyze the feasible alternatives and guide the design process. The project objectives are as follows:

(1) Eliminate the structural deficiencies of the Ashford Avenue Bridge in a cost effective manner. Reduce potential seismic failure vulnerability and minimize future maintenance efforts in the rehabilitated structure.

(2) Improve vehicular safety conditions at identified locations using cost effective measures.

(3) Improve highway design features to maintain or restore acceptable operational characteristics, where appropriate, for the facility for a minimum of 30 years beyond completion of the project.

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CHAPTER III – ALTERNATIVES

III.A. Design Criteria

III.A.1. Design Standards

1. NYSDOT Highway Design Manual (HDM), Chapters 2 and 7 latest revisions dated 4/10/12 and 7/30/10, respectively.

2. NYSDOT U.S. Customary Bridge Manual, Section 2, 1st edition, latest revisions dated 5/2011

3. AASHTO Policy on Geometric Design of Highways and Streets, issued 2004

III.A.2. Critical Design Elements

See Tables III-1 and III-2.

Component:	Design Criteria for Ashford Avenue Bridge (BIN 5348380)		
PIN:	8760.92	NHS (Y/N):	No
Route No. & Name:	Ashford Avenue (CR 134)	Functional Class:	Urban Principal Arterial Other
Project Type:	Reconstruction	Design Class:	Urban Arterial
% Trucks:	6% AM; 2% PM	Terrain:	Rolling
ADT:	19,727	Truck Access/Qualifying Highway	Neither

	Element	Standard Criteria	Reference	Existing Conditions	Proposed Condition
1	Design Speed	40 mph	(HDM) 2.7.2.2 A	39 mph (85th percentile)	40 mph
2	Lane Width (Travel and Turning)	Match existing approach travel lane width	(HDM) 2.7.2.2 B (BM) Table 2-1	10 ft	11 ft
3	Shoulder Width	Match approach roadway	(HDM) 2.7.2.2 C (BM) Table 2-1	0 ft	0 ft
4	Bridge Roadway Width	Match approach roadway	(HDM) 2.7.2.2 D (BM) 2.3.1, Table 2-1	40 ft	44 ft
5	Maximum Grade	7%	(HDM) 2.7.2.2 E	6.5%	7.1%
6	Horizontal Curvature	533 ft @ e = 4.0%	(HDM) 2.7.2.2 F	500 ft	500 ft
7	Superelevation Rate	4%	(HDM) 2.7.2.2 G	N.C. (2%)	N.C. (2%)
8	Stopping Sight Dist.	305 ft	(HDM) 2.7.2.2 H	257 ft (SSD)	275 ft (SSD)
9	Horizontal Clearance	(from face of curb) 0.0 ft with barrier, 1.5 ft without, 3.0 ft at intersections	(HDM) 2.7.2.2 I	4 ft min.	4 ft min.
10	Vertical Clearance	16 ft Min. (16'-6" des.) over I-87 14 ft Min. (14'-6" des.) over SMRP	(HDM) 2.7.2.2 J (BM) 2.4.1, Table 2-2	15'-3" ft (Min.) over I-87 16 ft (Min.) over SMRP	16'-6" over I-87, Match Existing over SMRP
11	Pavement Cross Slope	1.5% to 2%	(HDM) 2.7.2.2 K	0 – 3%	2%
12	Rollover	4% between lanes; 8% at EOT	(HDM) 2.7.2.2 L	4% between lanes; 8% at EOT	4% between lanes; 8% at EOT
13	Structural Capacity	HL-93 (LRFD – Repl.) HS-20 (ASD – Rehab)	(HDM) 2.7.2.2 M	HS-15.3	HS-20 (ASD – Rehabilitation)
14	Level of Service	N.A.	N.A.	N.A.	N.A.
15	Control of Access	N.A.	N.A.	N.A.	N.A.
16	Pedestrian Accomm.	5 ft Sidewalks	(HDM) 2.7.2.2.N, Ch. 18, NY V&TL	4-5 ft Sidewalks	5 ft Sidewalks
17	Median Width	N.A.	N.A.	N.A.	N.A.

Table III-1

Component:	Design Criteria for Saw Mill River Parkway Entrance/Exit Ramp (BIN 534838A)		
PIN:	8760.92	NHS (Y/N):	Yes
Route No. & Name:	SMRP NB Entrance/Exit Ramp	Functional Class:	Urban Principal Arterial Other
Project Type:	Reconstruction	Design Class:	Urban Arterial
% Trucks:	0	Terrain:	Rolling
ADT:	4,589	Truck Access/Qualifying Highway	Neither

	Element	Standard Criteria	Reference	Existing Conditions	Proposed Condition
1	Design Speed	40 mph	(HDM) 2.7.5.2 A	n/a	40 mph
2	Lane Width	Match existing approach travel lane width	(HDM) 2.7.5.2 B (BM) Table 2-1	12 ft	12 ft
3	Shoulder Width	Left = 3 ft Right = 6 ft	(HDM) 2.7.5.2 C (BM) Table 2-1	0 ft	3 ft Right
4	Bridge Roadway Width	Match approach roadway	(HDM) 2.7.5.2 D (BM) 2.3.1, Table 2-1	24 ft	30 ft
5	Maximum Grade	6%	(HDM) 2.7.5.2 E	6%	6%
6	Horizontal Curvature	533 ft @ e = 4.0%	(HDM) 2.7.5.2 F	Tangent	Tangent
7	Superelevation Rate	8% max.	(HDM) 2.7.5.2 G	N.C. (2%)	N.C. (2%)
8	Stopping Sight Dist.	305 ft	(HDM) 2.7.5.2 H	236 ft (SSD)	305 ft (SSD)
9	Horizontal Clearance	Left = 3 ft min. Right = 6 ft min.	(HDM) 2.7.5.2 I	2 ft (safety walk)	3 ft
10	Vertical Clearance	Same as higher functional class roadway	(HDM) 2.7.5.2.J	N.A.	N.A.
11	Pavement Cross Slope	1.5% to 2%	(HDM) 2.7.5.2 K	0 – 3%	2%
12	Rollover	4% between lanes; 8% at EOT	(HDM) 2.7.5.2 L	4% between lanes; 8% at EOT	4% between lanes; 8% at EOT
13	Structural Capacity	HL-93 (LRFD – Replacement) HS-20 (ASD – Rehabilitation)	(HDM) 2.7.5.2 M	HS-22.46	HS-20 (ASD – Rehabilitation)
14	Level of Service	N.A.	N.A.	N.A.	N.A.
15	Control of Access	N.A.	N.A.	N.A.	N.A.
16	Pedestrian Accomm.	Not Permitted on SMRP	(HDM) 2.7.5.2.P, Ch. 18, NY V&TL	N.A.	N.A.
17	Median Width	N.A.	N.A.	N.A.	N.A.

Table III-2

III.B. Alternatives Considered

III.B.1. **No-Action/Continued Maintenance –** This alternative would provide no improvements to the roadway other than continued routine maintenance. As discussed in Chapter II, Ashford Avenue has structural, pavement, drainage, operational, and safety deficiencies that require corrective measures, which cannot be overcome through general maintenance.

The No-Action Alternative would not satisfy any of the project objectives and is therefore dismissed from further consideration.

III.B.2. **Bridge Rehabilitation – Superstructure Repairs with Widening and Fascia Girder Replacement –** This alternative includes the removal and replacement of a widened structural concrete deck of composite design, replacement of the bearings and fascia girders as well as miscellaneous steel repairs, steel painting and repairs to the concrete substructure.

The proposed composite concrete deck would be widened to extend 4'-0" over the existing fascia girders on each side of the structure. This results in a bridge section of four 11'-0" travel lanes with no curb offsets, new 7" curbs, two new 5'-0" concrete sidewalks and 10" concrete vertical parapets. Two 10" concrete vertical parapets would be installed in lieu of bridge rail.

The ramp concrete deck would also be removed, replaced and widened, extending 3'-10" over the existing fascia girders. This would allow for two 12'-0" lanes and two 3'-0" shoulders. Additionally, bearings would be replaced, miscellaneous steel repairs would be performed, steel would be painted and substructure repairs would be performed. Two 18" concrete barriers would also be installed in lieu of bridge rail.

Seismic retrofit measures including filling in the fixed piers (Piers 2 and 4 on the mainline) and increasing the pier cap width to satisfy minimum seat width requirements could be performed under this alternative, at an additional cost of $1.0M. These measures would be designed according the AASHTO and NYSDOT Downstate Zone seismic design requirements for an "essential bridge" and would improve the performance of the bridge under a seismic event to allow for repairable damage, but not collapse.

This alternative also includes ancillary improvements such as approach pavement replacement and drainage improvements, the replacement of the Ashford Avenue/SMRP On/Off Ramp traffic signal, lighting, guide rail, signing and striping for both structures.

This alternative would require 5 temporary easements on 4 properties in order to provide sufficient construction access to the site, areas for crane(s) and for material storage.

Maintenance and protection of traffic would be primarily through daily lane closures on Ashford Avenue, the NYS Thruway and the Saw Mill River Parkway. Other methods such as daily lane closures, overnight lane reductions and short duration (15-20 minute) full closures would also be required on the NYS Thruway and Saw Mill River Parkway for the removal and replacement of the fascia girders as well as substructure repairs.

The construction costs for this alternative range from an estimated $16.2M to $18.2M and would provide an anticipated 20-year service life.

This alternative would not satisfy any of the project objectives and is therefore dismissed from further consideration.

III.B.3.a. Bridge Rehabilitation – Conventional Superstructure Replacement with Widening – This alternative would include removal and replacement of the bearings, structural steel framing, concrete deck, bridge joints, and railings. The new bridge superstructure would consist of a steel multi-girder system and composite cast-in-place concrete deck, supporting four 11'-0" travel lanes with no curb offsets, 7" curbing and two 5'-0" sidewalks with 10" concrete vertical parapets. Similar to III.B.2, widening of the structure is maximized with a 4'-0" overhang of the deck, sidewalk, and barrier over the fascia girders.

The existing piers and abutments would be patched with the fixed piers filled to improve seismic performance. It should be noted that full seismic requirements would not be achieved under this alternative.

The ramp superstructure would similarly consist of a multi-girder system and conventional cast-in-place deck carrying two 12'-0" travel lanes, two 3'-0" right shoulders and 18" concrete barriers. Widening is achieved by providing a 3'-10" overhang beyond the fascia girders. Concrete patching would also be performed on the substructure.

All previously mentioned ancillary improvements are included in this alternative.

The new superstructure would be designed to carry the HS-25 truck loading and conform to the latest seismic requirements. The existing substructure live-load carrying capacity will not be increased as part of this alternative.

This alternative would require 5 temporary easements on 4 properties in order to provide sufficient construction access to the site, areas for crane(s) and for material storage.

Maintenance and protection of traffic would be accomplished in three primary stages with a minimum of one travel lane in each direction. Other methods such as daily lane closures, overnight lane reductions and short duration (15-20 minute) closures would also be required on the NYS Thruway and Saw Mill River Parkway for demolition and replacement of the superstructure as well as repairs to the substructure. Refer to Section III.C.2.h. for an in-depth description.

The construction cost for the superstructure replacement alternative is estimated to be $19.7M and would provide an anticipated 50-year service life. The construction duration is 36 months.

This alternative does not satisfy the project objectives as it will result in continued maintenance of the deteriorated piers. The design life of the patching is 10-years. Additionally full seismic compliance is not achieved. Therefore this alternative is dismissed from further consideration.

III.B.3.b. Bridge Rehabilitation – Precast Superstructure Replacement with Widening – This alternative is similar to III.B.3.a., except that the mainline superstructure will be

replaced with a Precast Concrete Steel Composite Superstructure (PCSCS) System rather than a conventional steel superstructure. Prefabricated bridge units will facilitate construction activities thus reducing overall duration and impact to the travelling public. This is particularly important for the spans over the New York State Thruway and Saw Mill River Parkway. The entrance/exit ramp structure will be completely replaced with a modular fill-type structure. Thus expediting construction and eliminating future maintenance costs.

Additionally, the existing piers will be replaced with solid wall piers that will satisfy current seismic requirements. The proposed bridge will be designed for HS-25 loading. Right-of-way impacts are the same as the conventional steel superstructure replacement alternative.

Maintenance and protection of traffic measures will be similar to that described in the conventional steel superstructure replacement alternative, except that only two primary stages will be required. One lane of traffic in each direction will be maintained at all times. The required lane closures, detour route and temporary traffic signal will be required; however, construction duration is anticipated to be significantly reduced.

The construction cost for the superstructure replacement alternative is estimated to be $20.3M and would provide an anticipated 50-year service life. The construction duration is 30 months.

This alternative satisfies the project objectives and will be advanced for further study.

III.B.4. **Bridge Replacement –** This alternative would completely replace both the Ashford Avenue Bridge and the SMRP entrance/exit ramp. The Ashford Avenue mainline structure would consist of a three-span steel multi-girder bridge with composite concrete structural deck, reinforced concrete piers, cantilever abutments, and wingwalls founded on spread footings. The bridge section would contain five 11’-0” travel / turn lanes, two 5’-0” shoulders, two 7” curbs and two 5’-0” sidewalks with 10” concrete vertical parapets. The ramp segment would be of similar construction, containing two spans. The ramp section would contain two 12’-0” travel lanes, two 6’-0” wide shoulders, and 18” concrete barriers.

Other incidental work includes the installation of new lighting and traffic signals, approach pavement widening and replacement, drainage improvements, and new signage and striping. The new bridge and ramp would be designed to carry the AASHTO HL-93 truck loading and to conform to the latest AASHTO seismic requirements.

The construction cost for the full replacement alternative is estimated to be $30-35M and would provide an anticipated 70-year service life.

While this alternative satisfies project objectives, the cost is not justified against the needs determined by WCDPWT. A large impact of the widening would also be impact to residential and commercial properties, including impacts to at least one residence and two commercial properties necessitating relocation.

The Bridge Replacement Alternative is not feasible and will therefore not be advanced for further study.

III.C. Feasible Alternatives

Alternative III.B.3.b., Bridge Rehabilitation – Precast Superstructure Replacement with Widening, is the preferred alternative.

III.C.1. **Description of Feasible Alternatives –** The preferred alternative (III.B.3.b.) will rehabilitate the structure with the removal and replacement of the superstructure. The superstructure replacement includes the following major items of work:

- Remove existing concrete deck, steel framing, bearings (including hazardous material containment / abatement), existing traffic signal
- Install new elastomeric bearings
- Install new Precast Concrete Steel Composite Superstructure (PCSCS) System
- Install new concrete sidewalks and concrete vertical parapets
- Replace existing mainline piers with new solid wall piers; patch existing abutments
- Replace/repair approach roadway pavement, approach drainage, guide rail / barrier
- Install new traffic signal equipment, signage, striping, and lighting
- Implement staged M&PT, daily lane closures as needed on Ashford Avenue, the NYS Thruway and the Saw Mill River Parkway
- Overnight lane closures and short duration (15-20 minute) stoppages on the NYS Thruway for select operations
- Overnight closures of the Saw Mill River Parkway for select operations
- Implement a semi-permanent detour route using Lawrence Street and Route 9A while the southern portion of Ashford Avenue and the SMRP entrance/exit ramp undergo rehabilitation
- Install a temporary traffic signal at Ashford Avenue and Ogden Avenue for the duration of the ramp closure

The proposed typical section on the bridge consists of four 11’-0” travel lanes, no curb offsets, two 5’-0” wide ADA compliant concrete sidewalks on both sides of the roadway, curbs, and 10” concrete parapets. On the ramp, the typical section consists of a 12’-0” opposing travel lanes with 3’-0” shoulders and 18” single slope concrete barriers. The turn radius onto the SMRP entrance ramp will be improved from 18 feet ± to 25 feet while the turn radius off of the ramp onto Ashford Avenue will be improved from 18 feet ± to 20 feet.

The existing traffic signal at Ashford Avenue and the SMRP entrance ramp will be replaced with new signal equipment.

The limits of work shall begin just west of the west abutment of the mainline structure and extend to just west of the intersection with NYS Route 9A.

This alternative will not preclude any future improvements considered during the preliminary engineering for this project, such as improvements at Ashford Avenue and NYS Route 9A, a dedicated pedestrian access point to the South County Trailway and a new NB SMRP entrance ramp on the north side of Ashford Avenue. Design will include structural provisions such that any of these considerations may be

incorporated at a later date. Refer also to II.C.1.f. and II.C.1.v. for additional discussion.

Typical sections, plans, and profiles of the superstructure replacement are included in Appendix K.

Right-of-way will be impacted in the form of five temporary easements on four properties. Three of the four properties are privately owned. The fourth is owned by the Village of Ardsley. As previously noted, temporary easements are required in order to provide sufficient construction access to the site, areas for crane(s) and for material storage. It will also be necessary to relocate personal property beneath the mainline structure as a part of this project. Refer to the preliminary plans in Appendix K to view the easement areas. See also, Appendix I for the corresponding ROW Acquisition Table and Appendix N for the Conceptual Stage Relocation Plan.

III.C.2. Engineering Consideration of Feasible Alternatives

III.C.2.a. Special Geometric Features

The feasible alternative will comply to the greatest possible degree with the geometric features and cross section elements detailed in III.A.2. As part of this project, one (1) non-standard feature will be corrected, one (1) non-standard feature will be improved upon and two (2) non-standard features will remain. A description is as follows:

III.C.2.a.(1) Non-Standard Features Corrected:

- Structural Capacity on Mainline and Ramp – The existing structural capacity is governed by the ratings of the existing fascia girders (HS-15). The proposed structure will satisfy minimum HS-20 live load requirements.

Non-Standard Features Improved:

- Stopping Sight Distance (SSD) on Ramp - Currently on the SMRP NB ramp at the crest of the curve where it intersects Ashford Avenue the SSD is approximately 236 feet. This value can be improved to the standard value of 305 feet in the preferred alternative.

Non-Standard Features Retained:

- Horizontal Curvature on Mainline - The left-hand 500 foot existing horizontal curve to the east of the structure will be retained. While this radius is only 33 feet below the standard value for the design speed, it would require additional reconstruction at the Ashford Avenue/NYS Route 9A intersection. While the Ashford Avenue/NYS Route 9A intersection has an accident rate in excess of the statewide average (see Table II-7), the approach segment from SMRP NB entrance/exit ramp to NYS Route 9A is well below the statewide average (see Table II-8). The predominant accident types at the intersection were determined to be rear end and sideswipe and were not attributed to horizontal curvature. Thus, it is felt that retaining the existing horizontal curve radius will not cause additional accidents at this location and is beneficial in avoiding impacts to the building on the north side of Ashford Avenue, as well as avoiding reconstruction of the right hand curve east side of NYS Route 9A.
- Stopping Sight Distance (SSD) on Mainline - The stopping sight distance at the crest of the Ashford Avenue Bridge is 258 feet, while the standard value for a 40 MPH design speed is 305 feet. This feature will be improved to 275 feet. It

is sufficient for a design speed of 35 MPH, which does exceed the regulatory speed limit of 30 MPH for the corridor. Additionally, there is no accident history attributed to this feature.

- Superelevation on Mainline – The existing roadway section carries a normal crown of 2% within the project limits - across the structure and up to the Ashford Avenue/Route 9A intersection. In order to correct the superelevation to the standard rate of 4%, the existing curb line on the westbound or north side of the structure would control and the structure at the eastbound curb line would need to be raised an additional 21" beyond that required to place precast units at a normal crown. The maximum speed to avoid skidding for the 500 foot curve radius on the structure at normal crown is 34 MPH, above the 30 MPH speed limit. Additionally, the current normal crown condition is not contributing to an accident history; as such, it will be retained.

Refer to Appendix J for Non-Standard Feature Justification Forms.

III.C.2.a.(2) Non-Conforming Features – The non-conforming features, as described in II.C.1.j.(2), will be incrementally improved where feasible.

III.C.2.b. Traffic Forecast, LOS and Safety Considerations

III.C.2.b.(1) Design Year Traffic Volume and Levels of Service – The AADT as shown in Section II.C.1.h is estimated at 23,607 vehicles per day for Ashford Avenue. An annual linear growth rate of 0.5% per year was used to forecast the future demand.

There are no proposed changes to operations at the three signalized intersections of Ashford Avenue with Northfield Avenue, NB SMRP On/Off Ramp and Route 9A; and the unsignalized intersection of Ashford Avenue and Southfield Avenue.

Refer to Section II.C.1.j. for existing LOS (2009) as well as projections for ETC (2017) and ETC+30 (2047). Refer also to Appendix B for HCM analyses (using Synchro software, version 7) of these conditions. As previously noted, the bridge will be rehabilitated as not to preclude all the future proposed improvements described in Chapter I and throughout the report.

III.C.2.b.(2) Safety and Traffic Control Considerations – The following improvements are proposed:

(a) Traffic Signals: A new signal will be installed at Ashford Avenue and SMRP NB Entrance/Exit ramp in conformance with NYSDOT standards to replace the current signal. The signal to be installed will consider the possibility of future improvements as discussed throughout the report. The signals at Ashford Avenue/Route 9A and Ashford/Northfield Avenue will remain.

(b) Signage and delineation: Existing signs will be replaced with new signs adhering to the FHWA's 2009 MUTCD for Streets and Highways and the NYS Supplement. Reflectorized pavement markings will be installed.

(c) Intersections: The lane configurations at the Ashford/Northfield, Ashford/NB SMRP Ramp and Ashford/NYS Route 9A intersections will remain the same as they are presently.

(d) Guide Rail: Existing bridge rail will be replaced with NYSDOT standard vertical faced concrete parapet with pedestrian fencing. Areas of guide rail on the approaches will be replaced with NYSDOT standard guide rail.

(e) Clear Zone: A minimum clear zone of 4 feet will be provided on Ashford Avenue and 3 feet on the NB SMRP Entrance/Exit Ramp.

(f) Access Management: Existing access management measures will remain following the completion of this project.

III.C.2.c. Pavement – The approach roadway pavement is in fair to good condition and will be replaced only as necessary to accomplish bridge replacement or geometric improvements. In the areas of pavement to remain, existing overlay will be milled and a new two-course asphalt concrete overlay of binder course and top course will be applied. Appropriate pre-overlay treatments will be provided if necessary, such as sealing cracks over 1/4" in width. In areas of new pavement, hot-mix asphalt pavement on well-graded sub-base will be installed. New approach slabs will be constructed at the abutments.

Although the existing bridge deck shows only minor amounts of deterioration (Section II.C.1.l), it will be removed along with the superstructure. A new precast concrete deck with asphalt overlay will be installed.

A pavement evaluation report is not required as the total project length is less than one mile.

III.C.2.d. Structures – The Ashford Avenue Bridge (BIN 5348380) and the SMRP NB Entrance/Exit Ramp (BIN 534838A) are the primary focus of this project. The preferred rehabilitation scheme is a precast superstructure replacement and pier replacement and is described in detail in Section III.C.1.

III.C.2.e. Hydraulics – The Saw Mill River is fully contained within a three-sided concrete channel. As such, it does not pose any significant scour risk to adjacent structures. The proposed rehabilitation will not affect hydraulic performance of the culvert structure.

III.C.2.f. Drainage – Drainage on the structure will be accommodated through gutter flow along the curbed edges of the bridge and along the front face of the concrete barrier on the ramp. The high point of the bridge at the intersection of the ramp with the Ashford Avenue Bridge will be maintained in the proposed condition to maintain adequate drainage paths. Drainage inlets at the approaches will be replaced or repaired as necessary, depending on the level of deterioration at each specific structure. Other proposed drainage improvements consist of improving the roadside collection and conveyance through the installation of new curb, replacing piping if warranted upon inspection, and cleaning any existing structures / piping to remain.

III.C.2.g. Maintenance Responsibility – All maintenance responsibility for Ashford Avenue (bridge and abutting roadway) and the ramp will remain as it presently does.

Within the Village of Ardsley, the road will continue to be owned and maintained by the Westchester County Department of Public Works and Transportation (WCDPWT). Within the Village of Dobbs Ferry, the road will continue to be owned by Westchester County; however, all maintenance responsibility will continue to be

borne by the Village of Dobbs Ferry, including traffic signals at Ashford Avenue & Northfield Avenue and Ashford Avenue & the NB Saw Mill River Parkway entrance/exit ramp, as well as all other elements above the deck of the Ashford Avenue Bridge. All other superstructure and substructure elements of the bridge will remain under the ownership of Westchester County.

The SMRP entrance/exit ramp structure will continue to be owned by the Westchester County Department of Public Works and Transportation (WCDPWT). NYSDOT, however, will continue to maintain the ramp pavement, signs, pavement markings and removes snow and ice.

III.C.2.h. Maintenance and Protection of Traffic – One lane of traffic will be maintained at all times on Ashford Avenue using two primary construction stages. In both stages, minimum travel lane widths will be 10'-0" and one sidewalk will be provided at all times with a minimum width of 4'-0".

Stage 1 will close the southern half of the mainline structure and the ramp structure in its entirety. Traffic will traverse the northern half of the structure. Stage 2 will then shift traffic to the newly constructed southern half of the mainline while the northern half is rehabilitated. The newly completed ramp will be re-opened during Stage 2 to SMRP exiting traffic only.

For those wishing to access Ashford Avenue during the period of ramp closure, a signed detour route will be provided with adequate notice using advance signage and VMS. The route will begin in the south at the Lawrence Street / SMRP Exit. Traffic will be directed to make a right turn onto eastbound Lawrence Street. Lawrence Street intersects NYS Route 9A. Traffic will then be directed to make a left turn onto Route 9A. The detour will proceed north to its end at the Ashford Avenue/Route 9A intersection. The length of the proposed route is approximately 1 mile and would be semi-permanent for the duration of the combined southern mainline/ramp rehabilitation. It is anticipated that those familiar with the area will seek to use Ogden Avenue to the west as an alternate detour route. As a pro-active measure to help alleviate highly anticipated congestion on both Ashford and Ogden Avenues in the Village of Dobbs Ferry, a temporary signal will be installed at the intersection of Ashford Avenue and Ogden Avenue.

Throughout the project duration, temporary daily lane closures will be required. They will not be permitted during peak traffic periods unless otherwise permitted by the WCDPWT, NYSTA, NYSDOT or HVTMC. Some items of work may necessitate nighttime operations, specifically superstructure demolition and replacement over the SMRP and NYS Thruway. As of the preparation of this document, the NYSTA, NYSDOT LPU, NYSDOT Residency 8-9 and the HVTMC have all been briefed on the project. They have all expressed their lane closure requirements, which will be strictly adhered to during construction.

MPT plans and sections for the preferred rehabilitation scheme are included in Appendix K.

III.C.2.i. Soils and Foundations – No proposed substructure modifications are included in the preferred rehabilitation scheme. Existing soil conditions and foundations will remain.

III.C.2.j. Utilities – The utilities on structure will be affected, including the following:

- Electric service lines and junction boxes supplying power to the street lighting will be replaced.
- Traffic signals and signal equipment will be replaced according to latest design specifications. Existing signals will be in operation until new signals are put in service.
- Further coordination with Verizon will determine the scope of work regarding communication lines. Their lines will be required to cross Ashford Avenue from the north (WB) side to the south (EB) side west of the structure, through the south fascia bay of the new structure, then cross the roadway back to the north side just east of the structure. It is anticipated that their facilities will be placed during Stage 1 following construction of the new portion of the structure, prior to demolition of the north (WB) side of the structure during Stage 2.
- Overhead utility lines and utility poles within the project limits are not expected to be affected by the proposed rehabilitation scheme. The Contractor will coordinate with the utilities in the area as necessary to protect their facilities.

III.C.2.k. Railroads – There are no railroads within the project limits.

III.C.2.l. Right of Way – Five (5) temporary easements will be required on four (4) properties. Additionally, Westchester County owns a Permanent Easement on a privately owned parcel in order to access and maintain the structure from below. As previously mentioned, these temporary easements are being taken in order to provide sufficient construction access to the site, areas for crane(s) and for material storage. Personal property relocations are also necessary in the area beneath the Ashford Avenue Mainline structure. Refer to the description of feasible alternatives in Section III.C.1, as well as the preliminary plans in Appendix K. See also Appendix I for the ROW Table and 353c Estimate and Appendix N for the Conceptual Stage Relocation Plan. In addition, a public EDPL hearing was held for the project on May 20, 2013 at the County Offices in White Plains, NY. Please refer to Appendix O for EDPL Hearing Correspondence, including all exhibits, the hearing transcript and a synopsis of the determinations and findings.

III.C.2.m. Landscaping – This project will not have significant impact on the general landscape environment. All disturbed areas will be restored, graded, and seeded. Affected plantings will be replaced and opportunities will be taken to beautify and enhance the area where possible.

III.C.2.n. Provisions for Pedestrians – Pedestrians will continue to be accommodated with ADA compliant sidewalks and crosswalks. Detectable warnings will be placed on all curb ramps within project limits where they do not currently exist.

III.C.2.o. Provisions for Bicycling – Bicyclists will continue to share the roadway with vehicular traffic. During construction operations, the South County Trailway will be temporarily re-routed

III.C.2.p. Lighting – Existing street lighting on the structure will be replaced. Lighting on the approaches will be retained. Existing lighting will remain in operation until new lights are put in service.

III.D. Project Cost and Schedule

III.D.1. **Costs –** The project is divided into several funding sources. Preliminary design, detailed design, ROW incidentals and ROW acquisition are 100% County funded. Construction is partially funded from three sources (HBRR, STP-Urban, Earmark) which are 80% Federally reimbursable with a 20% local match. Three-quarters of the local match for the HBRR and STP-Urban funding is eligible for reimbursement by the State under the Marchiselli program. The remaining construction fund sources are 100% County funded with no Federal or State reimbursement. The County will be responsible for any costs in excess of available Federal or State funding.

The costs are estimated below and show midpoint of construction dollars (2016):

Share 1: Mainline Highway	$3.958M
Share 2: Mainline Bridge	$13.562M
Share 3: Ramp Fill Structure Highway	$0.322M
Share 4: Ramp Fill Structure Bridge	$2.182M
Share 5: Verizon	$0.370M
Right-of-Way Acquisition	$0.310M
Construction Inspection	$2.000M
Total	**$22.704M**

III.D.2. **Schedule -** It is anticipated that Design Approval will be granted in the Fall of 2013 with Letting in the Fall of 2014 and construction during 2015-2017. Major milestones for the project are expected to be as follows:

ROW Incidentals	Fall/Winter 2012
Design Approval/ROWA Phase Authorization	Fall 2013
ROW Acquisition	Winter 2013/2014
Contract Documents	Summer 2014
Letting	Fall 2014
Construction Begins	Spring 2015
Construction Complete	Fall 2017

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CHAPTER IV - SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS

IV.A. Introduction

The purpose of this chapter is to (1) identify the social, economic and environmental consequences of the proposed project; (2) satisfy the applicable social, economic and environmental laws; and (3) identify all permits and approvals needed for the project.

IV.A.1. **SEQR -** This project is classified as SEQR Type II in accordance with Part 617, subpart 5(c)(2) of Title 6 of the Official Compilation Codes, Rules and Regulations of New York State (NYCRR). This project is consistent with the actions found on the Type II list under:

> "The replacement, rehabilitation or reconstruction of a structure or facility, in kind, on the same site."

The Westchester County Board of Legislators is the lead agency and no further action is necessary

IV.A.2. **NEPA -** Based on the criteria found in NEPA Regulations 23CFR771 and the NEPA Checklist, this is a Class II project classified as a Categorical Exclusion with Documentation. This project meets the criteria in 23CFR771, 115 (d). A copy of the NEPA Checklist is included in Appendix D.

IV.B.1 Social Consequences

IV.B.1.a. **Affected Population** – Aside from typical construction delays, the project would have no significant adverse effects on the surrounding population. Temporary easements will affect a few properties along the project corridor. No residential or commercial structures will be impacted.

IV.B.1.b. **Local Planning** – The project would have no adverse effects on Local Planning. In fact, the project incorporates provisions such that the local desires of Ardsley and Dobbs Ferry with regard to operational improvements at the Ashford Avenue/Route 9A intersection can be implemented in the future.

IV.B.1.c. **Community Cohesion** - The project would have no adverse effects on community cohesion. The project, in fact, has given surrounding communities a chance to provide input toward the preferred alternative(s).

IV.B.1.d. **Changes in Travel Patterns or Accessibility** – A temporary construction detour using Route 9A will be implemented as a result of closing the entrance and exit to the Saw Mill River Parkway in order to replace the ramp structure. No significant changes to travel patterns or accessibility would result from the proposed project.

IV.B.1.e. **Impacts on School Districts, Recreational Areas, Churches or Businesses** – The project would have no adverse effects on school districts, recreation areas, or churches. The project provides an opportunity to construct a pedestrian and bicycle access point to the South County Trailway on the north side of the Ashford Avenue bridge.

IV.B.1.f. Impacts on Police, Fire Protection and Ambulance Access - The project will not negatively affect emergency vehicle access. The project will be coordinated with officials of the local police departments (Villages of Ardsley and Dobbs Ferry) as well as County and State Police, local fire departments and other emergency service providers such that Ashford Avenue is passable at all times. Emergency pre-emption devices will be added to traffic signals in the project area to enhance response time during construction.

IV.B.1.g. Impacts on Highway Safety, Traffic Safety and Overall Public Safety - The project is expected to result in improved safety for all users of the corridor, predominantly due to its critical nature. Without a major rehabilitation, the bridge is at risk of eventual red flag conditions and emergency closures. Slightly widened lanes will also improve safety through the project corridor.

IV.B.1.h. General Social Groups Benefited or Harmed

IV.B.1.h.(1) Effects on Elderly & Disabled Persons - The project is not expected to result in adverse impacts to elderly or disabled persons.

IV.B.1.h.(2) Effects on Low Income, Minority and Ethnic Groups - The proposed project was evaluated in accordance with Presidential Executive Order 12898 requiring determination of whether it may have a disproportionate affect on a minority and/or low-income population. No impacts to these groups are expected to occur, and therefore no disproportionate effects on minority and/or low-income populations are predicted.

IV.B.2 Economic Consequences

IV.B.2.a. Impacts on Regional and Local Economies - The project would have no adverse effects on regional and local economies.

IV.B.2.b. Impacts on Existing Highway / Related Businesses - The project would have no adverse effects on existing highway-related businesses.

IV.B.2.c. Impacts on Established Business Districts - The project would have no adverse effects on established business districts.

IV.B.2.d. Relocation Impacts – There are no relocations of businesses or residences as a part of the project.

IV.B.3 Environmental Consequences

IV.B.3.a. Surface Waters / Wetlands – The Saw Mill River runs through the project limits and is contained within a concrete culvert approximately 20 feet below the bottom of the structure. There are no other surface waters or wetlands within project limits.

IV.B.3.b. Water Source Quality - The project will not significantly change the drainage of roadways. Slight increases in the volume of stormwater discharges based on increases in impervious surfaces associated with additional turning lanes, structure width and shoulders would not change drainage patterns.

IV.B.3.b.(1) Groundwater - The project will not adversely affect ground water quality.

IV.B.3.b.(2) Surface Water - The project would have no adverse effects on surface waters. The existing watershed drainage patterns will not be altered. Soil erosion and sediment control measures will be installed prior to and maintained throughout any construction activities. It is not anticipated that a SWPPP will be required for the project.

IV.B.3.b.(3) Point Sources - The project will not introduce additional point source discharges.

IV.B.3.b.(4) Storm Water Discharge - All stormwater will be directed to new or existing drainage features that will be modified, replaced or connected to existing features.

IV.B.3.b.(5) Reservoirs Supplying Water to NYC - The project is not located within the New York City watershed.

IV.B.3.b.(6) Sole Source Aquifers - The roadway does not traverse a sole source aquifer.

IV.B.3.c. General Ecology and Wildlife

IV.B.3.c.(1) Critical Environmental Areas - There are two critical environmental areas in the vicinity of the project. The 76-acre Juhring Estate Critical Environmental Area (CEA) is located approximately ½ mile north of the project site, on the west side of the Saw Mill River Parkway in the Village of Dobbs Ferry. Another unnamed CEA is located adjacent to the northbound New York State Thruway (I-87) on its east side in the Village of Ardsley. None of the work planned for this project will have any impact on either of these Critical Environmental Areas.

IV.B.3.c.(2) Fish and Wildlife - Fish and wildlife habitat is limited by the existing urban/suburban character of the project corridor. Since the project is largely structural with limited roadway widening at the NYS Route 9A intersection, impacts to fish and wildlife habitat are not anticipated. Refer to Appendix E for correspondence.

IV.B.3.c.(3) Forest Preserve Lands - There are no forest preserve lands in the project area.

IV.B.3.c.(4) Endangered or Threatened Species - The project area consists of urban and suburban development. The primary vegetative communities consist of lawns and landscaping, with a few individual mature trees. The project will not produce any significant impacts to general ecology and no adverse impacts are anticipated to threatened or endangered species.

IV.B.3.c.(5) Endangered Species (Federal) – After contacting the United States Department of the Interior Fish and Wildlife Service (USFWS), they indicated in a form letter of November 24, 2009 that information is provided on their website. A review of the USFWS website indicates that there is one endangered species (Indiana Bat), one threatened species (Bog Turtle) and one candidate species (New England Cottontail) within all of Westchester County.

Based on the nature of this project and the surrounding area, as well as NYSDEC's findings (in the section that follows) it has been determined that there will be no impacts to the habitats of the USFWS listed species. Refer to Appendix

E for correspondence letters and Appendix D for the NEPA Checklist and supporting documentation.

IV.B.3.c.(6) Endangered Species (State) - The New York State Department of Environmental Conservation (NYSDEC) indicated in a letter dated December 4, 2009, that there are no known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of the site. Refer to Appendix E for correspondence.

IV.B.3.c.(7) Wildlife and Waterfowl Refuges -There are no wildlife and waterfowl refuges in the project corridor.

IV.B.3.d. Historical and Cultural Resources – As previously noted, the State Historic Preservation Office (SHPO) provided a review of the project in a letter dated December 16, 2009. It was determined that the project will have No Impact upon properties in or eligible for inclusion in the state and National Registers of Historic Places.

SHPO was again contacted in August 2012 and indicated in their letter dated August 23, 2012, confirmed their December 2009 assessment of the project and further recommended a finding of "No Historic Properties Affected."

Per their direction, Native American Tribe consultation was initiated on September 7, 2012 with the Stockbridge-Munsee Community Band of Mohican Indians, Delaware Nation and Delaware Tribe requesting their review of historic, cultural and religious significance with regard to this project.

The Delaware Tribe responded with a September 12, 2012 letter stating "no religious or culturally significant sites in the project area." The Stockbridge-Munsee Tribal Historic Preservation Office provided a form stating "we are not aware of any cultural site within the project area." They noted in their response that they have no concerns "as long as you are staying within old footings/roadway and no new ground is being dug."

As of the date of this report, the Delaware Nation has not responded to WCDPWT's Second Request letter dated October 22, 2012. The second 45-day comment period window expired on December 6, 2012. It is assumed the Delaware Nation has no concerns with regard to this project.

Refer to all correspondence in Appendix E.

IV.B.3.e. Visual Resources - The project is not expected to result in adverse impacts to visual conditions or community character.

IV.B.3.f. Parks and Recreational Facilities – Ashford Avenue traverses the South County Trailway. During construction provisions will be made to maintain safe use of the facility.

IV.B.3.f.(1) Section 4(f) – The South County Trailway is a multi-use path that is considered parkland. This path will undergo a temporary occupation in the vicinity of the bridge and be temporarily detoured during construction. Any construction impacts will be restored at the completion of construction. A full 4(f)

evaluation is not required. Please refer to Appendix E for concurrence from the Westchester County Parks Department dated August 15, 2012.

IV.B.3.f.(2) Section 6(f) – No potential 6(f) sites have been identified within the project limits.

IV.B.3.g. Farmland Assessment – The project is not within a New York State Agricultural District. The project will have no effect on active farmlands.

IV.B.3.h. Air, Noise and Energy

Air

Westchester County is in a severe non-attainment area for ozone and a moderate non-attainment area for carbon monoxide. This project will not increase traffic flow and will not significantly reduce source-receptor distances. As a result, no microscale analysis is required.

Noise

The highway traffic noise studies are regulated and governed by the *Federal Highway Administration* (FHWA) directive 23, Part 772 of the Code of Federal Regulations (23 CFR 772). The FHWA classifies projects as Type I projects or Type II projects as follows:

Type I Projects – A proposed Federal or Federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

Type II Projects – A proposed Federal or Federal-aid highway for noise abatement on an existing highway.

This project is not classified as a Type I Project because it does not construct a highway on a new location, does not significantly change either the horizontal or vertical alignment, and does not increase the number of through-traffic lanes. Therefore a noise analysis is not required under 23 CFR 772.

Energy

Improvements to vehicular speeds and operating conditions that the project will facilitate are likely to increase the fuel efficiency with which vehicles travel the corridor. The net change in energy use is likely to decrease as a result.

IV.B.3.i. Contaminated Materials Assessment

IV.B.3.i.(1) Asbestos – An asbestos and lead containing paint survey was performed at the bridge and ramp. Record plans indicate that there are suspect asbestos containing materials present at the site, many of which could not be sampled for testing and confirmation. The suspect materials are assumed to contain asbestos until further testing can be performed during construction. Paint scrape samples from suspect lead-containing paint were collected and analyzed. All the samples were found to contain varying amounts of lead. The full text of the Asbestos and Lead Containing Paint Survey Report is included as a standalone Appendix L for reference.

IV.B.3.i.(2) Hazardous Waste – A hazardous waste screening was performed for this project and is included in Appendix E. A gasoline service station exists at the intersection of Ashford Avenue and NYS Route 9A near the eastern end of the project area, but there was no visual evidence of contamination in or around the service station. None of the associated work in the project is expected to impact any potential hazardous waste sites.

IV.B.3.j. Construction Impacts - There will be no significant impacts due to construction aside from typical inconveniencies during construction such as daily lane closures. There will be no borrow or spoil areas with this project.

IV.B.3.k. Anticipated Permits, Approvals and Coordination –

IV.B.3.k.(1) An NYSDOT Highway Work Permit will be required for work in order to implement any maintenance and protection of traffic measures on Route 9A and the Saw Mill River Parkway. NYSDOT and HVTMC lane closure requirements will be strictly adhered to. An NYSDOT Highway Work Permit will also be required for the future maintenance of the walls/fill structure that will replace the existing NB SMRP ramp structure.

IV.B.3.k.(2) Per correspondence with NYSDEC in April 2010, a protection of waters permit is required due to the project's proximity to the Saw Mill River.

IV.B.3.K.(3) A permit will be required from the NYS Thruway Authority to place M&PT measures and close/shift lanes on the New York State Thruway. NYSTA lane closure requirements will be strictly adhered to.

IV.B.3.K.(4) Coordination will be required with the Hudson Valley Traffic Management Center for any lane closures along the Saw Mill River Parkway or the New York State Thruway (I-87).

IV.B.3.K.(5) Coordination will be required with all private utility agencies in accomplishing relocations during appropriate construction stages. See also Section III.C.2.j.

IV.B.4 <u>Indirect/Secondary and Cumulative Impacts</u>

IV.B.4.a. Indirect/Secondary Impacts - No adverse indirect or secondary impacts are expected as a result of the project.

IV.B.4.b. Cumulative Impacts – No adverse cumulate impacts are anticipated due to this project.

CHAPTER V – EVALUATION AND COMPARISON OF ALTERNATIVES

Below is a matrix that was created in the comparison of the various alternatives for this project. It considers the scope of work, rating factors, estimated construction cost and any additional comments for each type of improvement.

	SCOPE OF WORK	RATING FACTOR[1]		CONSTRUCTION COST (Millions)[3]			COMMENTS
		Fascia	Interior[2]	Mainline	Ramp	Total	
	Alt 1: No-Build (Maintenance) Option	0.425	0.812	-	-	-	
REHABILITATION ALTERNATIVES (20-Year Service Life)	**Alt 2**: Deck Rehabilitation Alternative • Removal of existing deck, bearings • New concrete bridge deck and shear connectors (composite deck), bridge barrier and sidewalks • New elastomeric bearings • Steel superstructure repairs • Steel painting (including hazardous material containment / abatement) • Concrete substructure repairs • Approach work (minimal) • Signals, signage, striping, and lighting • Seismic Upgrade[4] • Staged Construction	1.226	1.681	$13.5	$2.7	$16.2	
	Alt 2: Widening Rehabilitation Alternatives (increase fascia overhang to 4'):						
	Alt 2: Retain existing fascia girder: • Includes base rehabilitation items • Additional deck width (43' curb to curb) • Staged Construction	1.043	1.681	$13.8	$3.0	$16.8	
	Alt 2: Replace fascia girder, install one sidewalk: • New Concrete deck installed with sidewalk only on one side Includes base rehabilitation items • Additional deck width (48' curb to curb) facilitates staged construction • Removal and replacement of fascia girder • Staged Construction	> 1.681	1.681	$14.9	$3.3	$18.2	• Minimal traffic operational improvement at Route 9A • Negative impact to pedestrian movement • Precludes future improvements to Route 9A by Town of Greenburgh
SUPERSTRUCTURE REPLACEMENT (50-Year Service Life)	**Alt 3A:** Complete Superstructure Replacement, Conventional Steel Girders and Concrete Deck • Removal of concrete deck, steel framing, bearings (including hazardous material containment / abatement) • New concrete bridge deck and shear connectors (composite deck), bridge barrier and sidewalks • New steel superstructure and elastomeric bearings • Concrete substructure repair • Replace approach roadways, approach drainage, guide rail / barrier • Signals, signage, striping, lighting • Staged Construction • Seismic Upgrade • New MSES wall at SE corner	> 1.200	> 1.200	$16.8	$2.9	$19.7	• (3) 2-span continuous arrangement on the mainline • Rolled beams • Existing substructure to remain • Does not preclude future improvements • Substructure Repair • Does not meet full seismic compliance
	Alt 3B: Complete Superstructure Replacement, Precast Concrete Modular Bridge System (Mainline) and Fill Type Retaining Wall System (Ramp) • Similar to Alternative 3A • New precast, pre-stressed concrete bridge deck • Composite steel and concrete system – girders cast into deck • Pier replacement with solid wall pier • Full seismic compliance	>1.200	>1.200	$17.9	$2.5	$20.4	• Reduces 4 main stages to 2 stages • Minimizes construction duration and disruption • Cost savings • Does not preclude from future improvements
COMPLETE REPLACEMENT (70-Year Service Life)	**Alt 4:** Complete Replacement • Complete removal and replacement of concrete deck, steel framing, bearings, concrete piers, concrete abutments and wingwalls (including hazardous material containment / abatement) • Replace approach roadways, approach drainage, guide rail / barrier • Signals, signage, striping, lighting • Staged Construction	> 1.200	> 1.200	$25-30	$5.0	$30-35	• Reduction of mainline spans from 6 to 3. • Widening to support additional turn lanes • Satisfies all current seismic requirements and truck loading (HL-93) truck loading • Impact to adjacent buildings

[1] HS-20 truck loading (ASD Method per AASHTO Standard Specification, 17th Edition).
[2] Rating factor is governed by mainline girder denoted S2 on record plans, with length 72.5'. AASHTO 3.23.2.3.1.4: In no case shall an exterior stringer have less carrying capacity than an interior stringer.
[3] All costs include a 20% contingency and 4% mobilization cost. Cost estimate is escalated to mid-point of construction (September 2016) at an annual 3% inflation rate. Costs do not include design, right-of-way and inspection costs. Verizon's share has been incorporated into the mainline column for the purposes of this breakdown.
[4] Cost of Seismic Upgrade is included in Costs for Alternatives 1 – 3B. Alternative 4 would be built to comply with seismic requirements.

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CHAPTER VI - PROJECT COORDINATION

On November 4, 2009, the WCPDWT met with the Village of Ardsley, Village of Dobbs Ferry and their design consultants, WSP ▪ SELLS (SELLS) to provide the village officials with a project status update and next steps. Members of the Village Councils and Village Administration were present. SELLS gave a brief overview of the project goals and objectives and described the tasks completed to date. Village officials expressed concern that the project would include provisions to address operational deficiencies through the corridor.

A follow up presentation was given to officials from the Villages of Ardsley and Dobbs Ferry on April 28, 2010. SELLS provided a project update which included the results of the data collection effort and alternatives analysis results. This included the results of the traffic analysis for the various alternatives. Town officials were satisfied that the preferred alternative included provisions to allow future improvements such as rehabilitation of the Ashford Avenue/NYS Route 9A intersection and the possible additions of a pedestrian ramp to the South County Trailway and a new NB entrance ramp to the SMRP. Village officials were concerned about the impact to traffic during construction. SELLS informed them that construction would be performed in stages with at least one lane of traffic open at all times. A copy of the presentation provided is included in Appendix H.

A public informational meeting was held the evening of May 16, 2012 at Dobbs Ferry High School in the Village of Dobbs Ferry. Present were Mayor Peter Porcino of Ardsley, Mayor Hartley Connett of Dobbs Ferry, members of both Village Boards, Westchester County Legislator Mary Jane Shimsky, a representative from the New York State Senator Andrea Stewart-Cousin's office, WCPDW&T Commissioner Jay Pisco, County Engineers, representatives from SELLS and approximately 50 members of the public.

Scott Donnelly, Director of Design Coordination for the WCDPWT opened the technical presentation by recognizing the elected officials in attendance, introducing members of his staff and representatives from the consultant engineering firm WSP SELLS. He gave a brief overview of the bridge replacement project and turned the floor over to David Weiss of SELLS. Mr. Weiss provided a 30-35 minute presentation on the details of the project. Of particular note, it was emphasized that the scope of the project is only the mainline and ramp structures, as the funding appropriated is solely for the repair/replacement of the bridge proper. In addition, other future considerations were mentioned such as the installation of a new entrance ramp to the NB SMRP and the installation of a pedestrian ramp to the South County Trailway; however, it was noted that project funding is insufficient to accommodate these improvements. It was reiterated that design for the project will not preclude any of the future improvements envisioned for the corridor.

Below is a summary of comments received from the public that evening, following the technical presentation:

Construction Noise

- A resident expressed concern over disruption to quality of life due to noise from nighttime construction activity.
- The County advised that nighttime construction will be necessary to facilitate the replacement of the bridge and will be minimized as much as possible.

SMRP Northbound On-Ramp

- A number of attendees expressed several concerns over the existing entrance to the north bound Saw Mill River Parkway, such as:
    - Existing tight turn radii onto and off of the ramp at Ashford Avenue.
    - The hairpin (180 degree) turn at the base of the ramp, combined with the short acceleration lane on the Saw Mill River Parkway.
    - Installation of a new NB on ramp on the north side of Ashford Avenue while either maintaining the existing on/off ramp or converting that ramp to exit only.
    - A desire to eliminate the ramp completely – traffic would be forced to use permanent alternative routes such as Lawrence Street to Route 9A to the east, or Ogden Avenue to the west.
    - If the ramp is removed, the signal would also be removed – it was felt that this may alleviate some of the existing congestion in the corridor.
- The County made note of a few points related to the ramp:
    - All attempts will be made to improve the turning radii onto and off of the new fill ramp structure.
    - As this project is a bridge replacement and will not include a new NB ramp structure, the current ramp configuration (entrance/exit, hairpin turn) will remain.
    - Any decision with regard to a change in/removal of the ramp would require NYSDOT approval as well as mitigation at the SMRP/Lawrence Street intersection and Ashford Avenue/Ogden Avenue intersections at the very least. These measures are not in the scope of this bridge replacement project.
- During the technical presentation, it was noted by SELLS that replacing the entrance point from the south side of Ashford Avenue to the north side of Ashford Avenue in the form of a new entrance ramp would actually reduce levels of service at the Ashford/SMRP Entrance Ramp intersection and cause added delay at the adjacent intersections. This is due to the fact that the EB Ashford Avenue volume currently turning right is greater than the WB Ashford Avenue turning left to enter the SMRP. Switching the movements would put the greater volume on a proposed EB left turn movement, adding EB through delay.
- It was further mentioned that while the desired condition would be to eliminate all left turns at this location, NYSDOT/FHWA, in all likelihood, would not allow a new entrance to be opened without closing the existing entrance – due to the proximity of concurrent entrances and the need to maintain a non-standard feature (existing hairpin turn) when a new standard ramp is available.

Traffic Conditions – Existing, During Construction and Future

- Most comments on the project related to concern over traffic conditions in the corridor – existing, anticipated conditions during construction and future conditions.
- It was noted during the presentation that the project would be staged and a detour route will be implemented along Lawrence Street and Route 9A, east of the SMRP. It was acknowledged that local citizens who want to reach the Village of Dobbs Ferry will more than likely make use of Ogden Avenue to the west of the SMRP to avoid travelling through the work zone. As such, a temporary signal will be placed at the Ogden Avenue/Ashford Avenue intersection to aide in traffic control.
- One resident noted that Westchester Bee-Line Bus service uses Odgen Avenue and could restrict traffic movement during construction. They requested that the bus service potentially seek an alternate route.

- Another resident recommended using Price Street as part of the detour route, as an alternative to Ogden Avenue. Price Street is another residential street one block to the east that intersects Ashford Avenue.
- Legislator Shimsky and several residents expressed concern over the potential for stacking into both left and right turn lanes on the NB SMRP at Lawrence Street.
- The Legislator suggested getting surrounding Villages involved in discussions even if additional funds are needed to mitigate impacts in other jurisdictions.
- The County is cognizant of the traffic situation but advised residents that the funding appropriated for the project is limited to rehabilitation of the mainline and ramp structures. Due to the nature of Ashford Avenue as a primary east-west corridor, structural rehabilitation is critical and is the primary focus. Without rehabilitation, the structure will continue to deteriorate, necessitating emergency repairs and potential closure.
- One resident made note that the bridge is bound on either side by a two-lane Ashford Avenue. Regardless of how many lanes are on the new bridge, the main source of congestion is a result of only having one lane in each direction outside of the project limits. This will remain a problem into the future as long as Ashford Avenue remains a two-lane roadway on either side of the bridge.
- Emergency vehicle access will need to be a priority during construction. Ashford Avenue is a critical link to the nearby hospital in Dobbs Ferry. Emergency pre-emption of the traffic signals will be considered for the emergency service providers that use this corridor.

Area Development

- Several residents raised the question of the impact of the proposed Rivertowns Square commercial development – proposed at the intersection of the SB Saw Mill River Parkway and Lawrence Street.
- The County acknowledged the proposed development but it is not certain when construction would occur. Residents are primarily concerned with concurrent construction impacts.
- The proposed Sportime complex on Elm Street was also mentioned.

Mass Transit – Traffic Reduction Options

- Legislator Shimsky and several residents expressed a desire to provide more mass transit in the form of shuttle busses either during construction or as a permanent condition to help reduce the amount of vehicles on Ashford Avenue. Of particular note was service to Metro North Railroad.
- A trustee from Ardsley echoed the need for shuttle busses and recommended carpool measures – regional rideshare or similar.

Pedestrians and Bicycles

- A student of Dobbs Ferry High School in attendance noted concern over pedestrian crossings at Ashford Avenue and Ogden Avenue.
- The County noted that the temporary signal at Ashford and Ogden may improve pedestrian crossing conditions at this intersection.
- A member of the “Complete Streets” coalition expressed concern over implementing bicycle provisions on the structure.

- The County noted that bicycles will continue to use the roadway as they presently do and that pedestrians will continue to use the sidewalks.

Flooding Issues on SMRP

- One resident expressed concern of what may happen during construction when the SMRP floods, subjecting it to closure.
- The County responded that flooding is under NYSDOT's jurisdiction and very little can be done to accommodate this historical condition under the bridge project.

Preferred Alternative (Precast Replacement and Fill Ramp Structure) vs. Complete Bridge Replacement

- A few residents expressed the desire to completely replace the existing structure with a new, widened structure with a dedicated left turn lane for the SMRP on ramp. They felt additional funding should be sought and the project should maximize the opportunity to completely replace the structure rather than fully rehabilitate the current superstructure and maintain the existing lane configuration.
- Residents and elected officials were supportive of measures to seek additional funds in support of the full replacement option.

Prior to the meeting, the Village Manager of Ardsley, George Calvi, submitted a letter with a number of concerns to Jay Pisco, Commissioner of Public Works. A copy of this letter in included in Appendix E. Additionally, a letter from resident Larry Nardecchia, P.E. expressing concerns is also included in Appendix E. A number of these concerns were voiced during the questions and answer period of the public informational meeting.

A copy of the presentation is included in Appendix H.