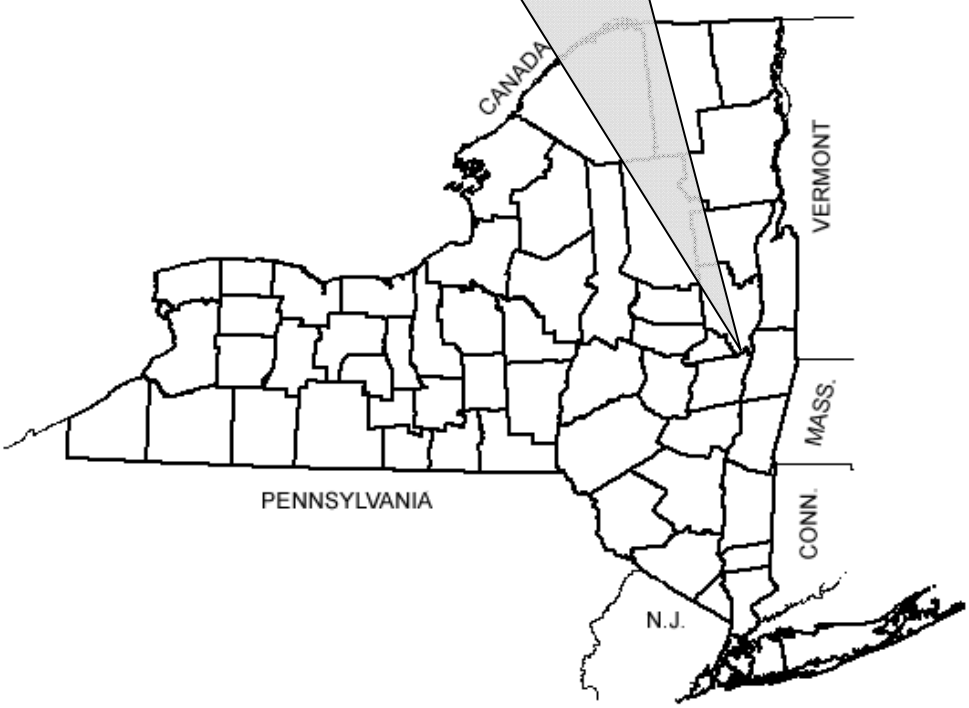
TRANSPORTATION PROJECT REPORT

DRAFT DESIGN REPORT / ENVIRONMENTAL IMPACT STATEMENT

January 2014

Highway Project
P.I.N. 1721.51
BINs: 1033141 / 1033142
Interstate 87 (I-87) Exit 4 Access Improvements
Albany County



U.S. Department of Transportation Federal Highway Administration

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

FHWA-NY-EIS-14-01-D

DRAFT ENVIRONMENTAL IMPACT STATEMENT

For

P.I.N. 1721.51, Interstate 87 (I-87) Exit 4 Access Improvements
Albany County, New York
SUBMITTED PURSUANT TO 42 U.S.C. 4332(2)(c)

BY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
US ARMY CORPS OF ENGINEERS
US ENVIRONMENTAL PROTECTION AGENCY
US FISH AND WILDLIFE SERVICE
NYS DEPT OF ENVIRONMENTAL CONSERVATION
NYS DEPT OF AGRICULTURE AND MARKETS
NYS OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION

ABSTRACT: This report describes the social, economic and environmental effects of the Exit 4 Access Improvement Project in Albany County, New York. The alternatives proposed include the No Build and others involved with providing improved access between Interstate 87 (I-87), Wolf Rd. and the Albany International Airport.

This document is available for public review and comments will be received until April 1, 2014. When issued, a joint Record of Decision will be made in accord with 23 CFR 771 and NYCRR Part 15, respectively. This environmental determination will be issued as a single Final Environmental Impact Statement and Record of Decision pursuant to Pub. L. 112-141, Stat. 405, Section 1319(b) unless FHWA determines statutory criteria or practicability considerations preclude issuance of the combined document pursuant to Section 1319.

Date 1/28/14
for Director, Office of Design
New York State Dept. of Transportation

Date 1/30/2014
Chief Operating Officer
Federal Highway Administration

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PROJECT APPROVAL SHEET

(Pursuant to SAFETEA-LU Matrix)

A. IPP Approval:

The project is ready to be added to the Regional Capital Program and project scoping can begin.

The IPP was approved by:

_____ 06/16/94

Regional Director

B. Scope Approval:

The project cost and schedule are consistent with the Regional Capital Program.

The scope was approved by:

_____ 07/20/07

Regional Director

C. Public Hearing Certification (23 USC 128):

A public hearing was held on _____ in accordance with 23 USC 128.

_____ _____

Project Manager

D. Recommendation for Design Approval:

The project cost and schedule are consistent with the Regional Capital Program.

_____ _____

Regional Program Manager

E. Recommendation for Design and Non-standard Feature Approval:

All requirements requisite to these actions and approvals have been met, the required independent quality control reviews separate from the functional group reviews have been accomplished, and the work is consistent with established standards, policies, regulations and procedures, except as otherwise noted and explained.

_____ _____

Regional Design Engineer

F. Non-standard Feature Approval:

The non-standard features have been adequately justified and it is not prudent to eliminate them as part of this project.

_____ _____

FHWA

G. Design Approval:

The required environmental determinations have been made and the preferred alternative for this project is ready for final design.

_____ _____

FHWA

LIST OF PREPARERS

Group Director Responsible for Production of the Design Approval Document:

Manuel T. Salorio, Jr., P.E., Shareholder, CHA Consulting, Inc.
Description of Work Performed by Firm: Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document.

Note: *It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.*

GLOSSARY

Abbreviations

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACAA	Albany County Airport Authority
ACC/MEV	Accidents per Million Entering Vehicles
ACC/MVM	Accidents per million vehicle miles
ACM	Asbestos-Containing Materials
ACOE	United States Army Corps of Engineers
ADAAG	Americans with Disabilities Act Accessibility Guidelines
ADA	Americans with Disabilities Act
APE	Area of Potential Effects
ARM	Abstract Request Map
BIN	Bridge Identification Number
BMP	Best Management Practices
CAAA90	Clean Air Act Amendments of 1990
CBIA	Coastal Barrier Improvement Act
CBRA	Coastal Barrier Resources Act
CCTV	Closed Circuit Television
C-D	Collector-Distributor
CDTA	Capital District Transportation Authority
CDTC	Capital District Transportation Committee
CEM	Cemetery
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Commercial Office
CO	Carbon Monoxide
COR	Commercial Office Residential
CORSIM	Corridor Simulation
CSRP	Conceptual Stage Relocation Plan
CWA	Clean Water Act
CZM	Coastal Zone Management
DBH	Diameter at Breast Height
DEC	Department of Environmental Conservation
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EMS	Emergency Medical Service
EPP	Expanded Project Proposal
EPM	Environmental Procedures Manual
ESA	Endangered Species Act
ETC	Estimated Time of Completion
FAA	Federal Aviation Administration
FIS	Flood Insurance Study
FHWA	Federal Highway Administration
FEMA	Federal Emergency Management Agency
GEIS	Generic Environmental Impact Statement
GHG	Greenhouse Gases
HAL	High Accident Location
HAR	Highway Advisory Radio
HC	Hydrocarbons
HCM	Highway Capacity Manual
HCOR	Highway Commercial Office Residential
HCS	Highway Capacity Software
HDM	Highway Design Manual
IPP	Initial Project Proposal
ITS	Intelligent Transportation Systems
Leg	Equivalent Sound Level
LiDAR	Light Detecting and Ranging

LOS	Level of Service
LWRP	Local Waterfront Revitalization Programs
MFR	Multi-Family Residential
MIST	Management Information System for Transportation (Schneider/Telvent)
MOE	Measures of Effectiveness
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MSATs	Mobile Source Air Toxics
MS4s	Municipal Separate Storm water Sewer Systems
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
N/A	Not Applicable
NBI	National Bridge Inventory
NEPA	National Environmental Policy Act
NHS	National Highway System
NOI	Notice of Intent
NOx	Nitrogen Oxides
NRCS	Natural Resources Conservation Service
NTCIP	National Transportation Communications for ITS Protocol
NYCRR	New York Codes, Rules and Regulations
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOL	New York State Department of Labor
NYSDOT	New York State Department of Transportation
NYSHP	New York State Heritage Program
NYSTA	New York State Thruway Authority
NWI	National Wetlands Inventory
OGS	Office of General Services
OR	Office Residential
O3	Ozone
PAC	Project Advisory Committee
PAH's	Polynuclear Aromatic Hydrocarbons
PDM	Project Development Manual
PEM1C	Palustrine Emergent Persistent Seasonally Flooded
PETSR	Pavement Evaluation and Treatment Selection Report
PI	Public Information
PIL	Priority Investigation Location
PIN	Project Identification Number
PFO1C	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded
PFO1E	Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded/Saturated
PM	Particulate Matter
PPM	Parts Per Million
PSA	Project Study Area
PSS1E	Palustrine Scrub-shrub Broad-Leaved Deciduous Seasonally Flooded/Saturated
PSR	Project Scoping Report
PUBFh	Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded
RCP	Reinforced Concrete Pipes
RECs	Recognized Environmental Conditions
RM	Route marker
ROW	Right-of-way
RPW	Relatively Permanent Water
RPZ	Runway Protection Zone
RRV	Runoff Reduction Volume
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SDL	Safety Deficient Location
SEQRA	State Environmental Quality Review Act
SFR	Single-Family Residential
SHPO	New York State Historic Preservation Officer
SIP	State Implementation Plan
SPDES	State Pollutant Discharge Elimination System

SPUI	Single Point Urban Interchange
STC	Sound Transmission Class
SWPPP	Storm water Pollution Prevention Plan
TCP/IP	Transmission Control Protocol / Internet Protocol
TDS	Traffic Detection Station
TEM	The Environmental Manual
TIA	Traffic Influence Area
TIP	Transportation Improvement Plan
TMA	Transportation Management Area
TMC	Transportation Management Center
TMDL	Total Maximum Daily Load
TNM	Traffic Noise Model
TNW	Traditionally Navigable Waterway
TO	Transportation Operations
TTC	Temporary Traffic Control
UFCM	Urban Fuel Consumption Method
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VISSIM	**V**erkehr **I**n **S**tädten - **SIM**ulationsmodell (German for “traffic in cities - simulation model”)
VHD	Vehicle Hours of Delay
VMS	Variable Message Signs
VMT	Vehicle Miles Traveled
WPNS	Wireless Private Network Service
WQC	Water Quality Certification
WQV	Water Quality Volume

Definitions

CORSIM	**COR**rridor **SIM**ulation. Microscopic, time step traffic simulation software package for signal systems, freeway systems, or combined signal and freeway systems.
SAFETEA-LU	**S**afe **A**ccountable **F**lexible **E**fficient **T**ransportation **E**quity **A**ct: A **L**egacy for **U**sers.
VISSIM	**V**erkehr **I**n **S**tädten – **SIM**ulationsmodell. The software package, developed by PTV Planung Transport Verkehr AG in Karlsuhe, Germany, is a microscopic, time step and behavior-based simulation model developed to model urban traffic and public transport operations and flows of pedestrians.
Qualifying Highway	The highways on the national system of interstate and defense highways and federal-aid primary system highways that are designated by the commissioner of transportation pursuant to Section 1627 of the N.Y. Vehicle & Traffic Law.

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COVER (Title / PIN / Location)

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F.	Traffic Information (*separately bound*)
G.	Wetland Assessment & Delineation Report (*separately bound*)
H.	Phase I/II Archaeological Survey Reports (*separately bound*)
I.	Noise Analysis Report (*separately bound*)
J.	Air Quality Analysis Report (*separately bound*)
K.	Hazardous Waste / Contaminated Materials Screening Report (*separately bound*)
L	Bridge Information (*separately bound*)
M	Right-of-Way Information
N	Groundwater Assessment Report (*separately bound*)

CHAPTER 1 - EXECUTIVE SUMMARY

1.1. Introduction

This report was prepared in accordance with the NYSDOT Project Development Manual, Title 17 of the New York Codes, Rules and Regulations Part 15 (17 NYCRR Part 15), and Title 23 of the Code of Federal Regulations Part 771 (23 CFR 771).

1.2. Purpose and Need

1.2.1. Where is the Project Located?

The proposed project involves access improvements between Interstate 87 (I-87), Wolf Road, and the Albany International Airport. The project study area includes I-87 between Sand Creek Road and Exit 5 (RM 87I 1108 2029), Wolf Road (known as Old Wolf Road) between the Exit 4 SB Exit Ramp and Albany-Shaker Road, Wolf Road between Albany-Shaker Road and Cerone Commercial Drive, and Albany-Shaker Road between Wolf Road and Meeting House Road. A total of approximately 8.0 miles of roadway within the Town of Colonie, Albany County are included in the project study area.

In addition to the project study area (PSA), a traffic influence area (TIA) has been established to reflect the area within which traffic patterns are closely related to or dependent on the roadway network within the project study area. The traffic influence area extends the project limits to include Watervliet-Shaker Road (NYS Route 155) between I-87 Exit 5 and Old Wolf Road, Watervliet-Shaker Road between Albany-Shaker Road and Sand Creek Road, Troy-Schenectady Road (NYS Route 7) between Albany-Shaker Road and I-87 Exit 6, Sand Creek Road between Watervliet-Shaker Road and Wolf Road, Wolf Road between Cerone Commercial Drive and Central Avenue (NYS Route 5), and I-87 between Exit 2 (NYS Route 5) and Exit 6 (NYS Route 7).

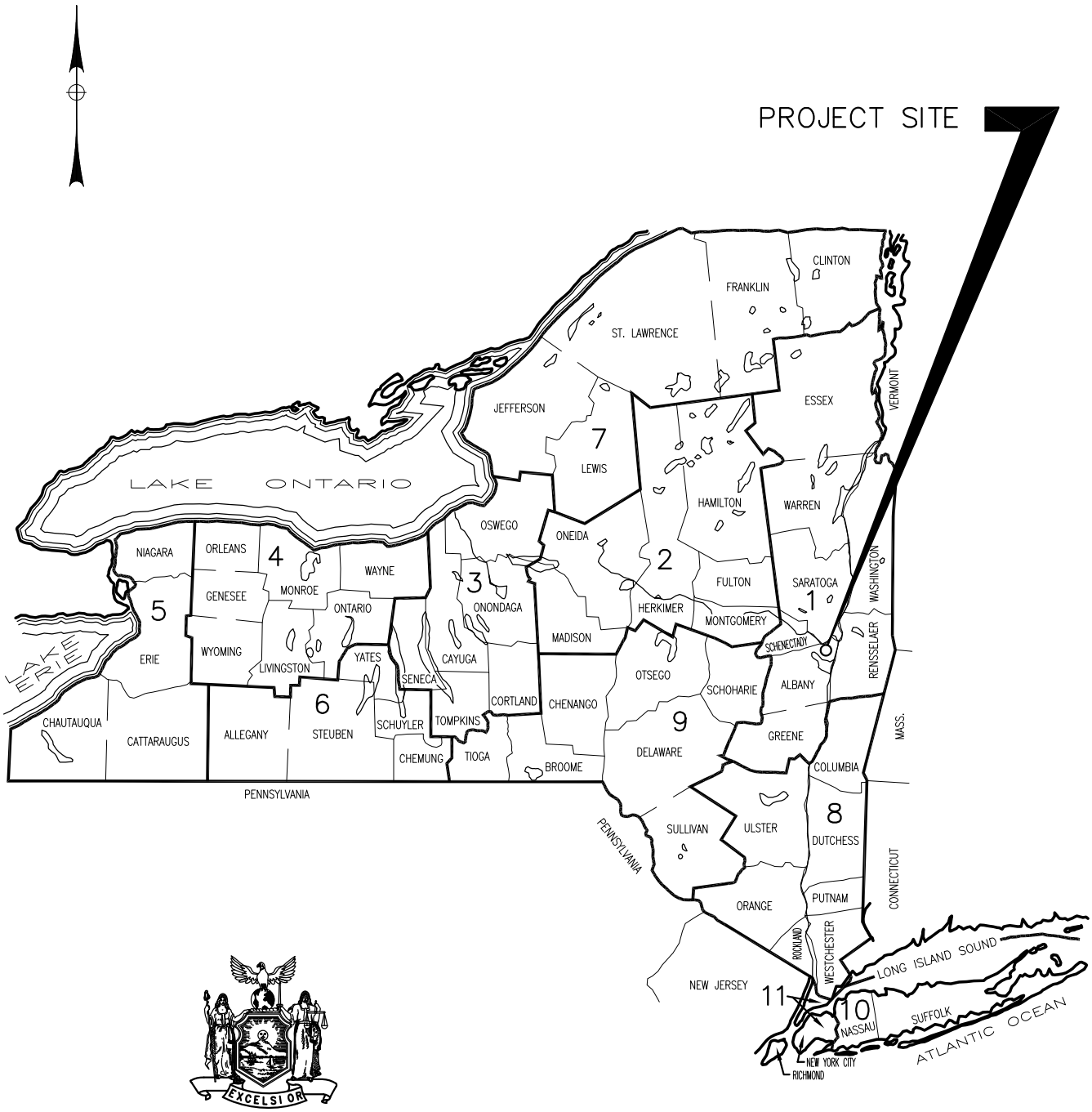
Four bridges are located within the project study area: BINs 103314 1 & 2 and BINs 103455 1 & 2. BINs 103314 1 & 2 carry I-87 northbound and southbound over Albany-Shaker Road and BINs 103455 1 & 2 carry I-87 northbound and southbound over Watervliet-Shaker Road. Four additional bridges are located within the traffic influence area. BINs 103313 1 & 2 carry I-87 northbound and southbound over Sand Creek Road and BINs 100262 1 & 2 carry I-87 northbound and southbound over Central Avenue.

Descriptions of the roadways included in the project study area and traffic influence area are summarized in Exhibit 1.2.1 a.

The project site is shown in Exhibit 1.2.1 b, the PSA and TIA are shown in Exhibit 1.2.1 c, and the project location is shown in Exhibit 1.2.1 d.

Exhibit 1.2.1 a
Summary of Project Area Roadways

Touring Route No.	Route Name	State Highway No.	Functional Classification	BIN No.	Features Crossed	Municipality	County	Length	Termini
Project Study Area									
87I	Interstate 87	57-17	Urban Principal Arterial Interstate	100262 1 & 2	Central Ave	Town of Colonie	Albany	3.0 mi (4.8 km)	Exit 2 to Exit 5
				103313 1 & 2	Sand Creek Rd				
				103314 1 & 2	Albany-Shaker Rd				
				103455 1 & 2	Watervliet-Shaker Rd				
155	Albany-Shaker Rd	-	Urban Principal Arterial	-	-	Town of Colonie	Albany	1.1 mi (1.8 km)	Watervliet-Shaker Rd to Old Wolf Rd
-	Albany-Shaker Rd	-	Urban Arterial	-	-	Town of Colonie	Albany	0.2 mi (0.4 km)	Old Wolf Rd to Maxwell Rd
910B	Wolf Rd	69-1	Urban Principal Arterial	-	-	Town of Colonie	Albany	1.2 mi (2.0 km)	Cerone Commercial Dr. to Albany-Shaker Rd
155	Old Wolf Rd	-	Urban Minor Arterial	-	-	Town of Colonie	Albany	0.8 mi (1.3 km)	Albany-Shaker Rd to Watervliet-Shaker Rd
155	Watervliet-Shaker Rd	879	Urban Principal Arterial	-	-	Town of Colonie	Albany	0.7 mi (1.2 km)	Old Wolf Rd to I-87 Exit 5
Traffic Influence Area									
7	Troy-Schenectady Rd	604	Urban Principal Arterial	-	-	Town of Colonie	Albany	3.3 mi (5.3 km)	Albany-Shaker Rd to I-87
910B	Wolf Rd	69-1	Urban Principal Arterial	-	-	Town of Colonie	Albany	1.2 mi (1.9 km)	Central Ave to Cerone Commercial Dr.
155	Watervliet-Shaker Rd	-	Urban Principal Arterial	-	-	Town of Colonie	Albany	1.0 mi (1.6 km)	Sand Creek Rd to Albany-Shaker Rd
-	Sand Creek Rd	-	Minor Arterial	-	-	Town of Colonie	Albany	2.0 mi (3.2 km)	Watervliet-Shaker Rd to Wolf Rd
5	Central Ave	385	Primary Urban Arterial	-	-	Town of Colonie	Albany	1.0 mi (1.6 km)	I-87 Exit 2 Ramps



MAP OF THE

STATE OF NEW YORK

SHOWING

INDIVIDUAL NYSDOT REGIONS

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CLOUGH HARBOUR & ASSOCIATES LLP

III Winners Circle, PO Box 5269 - Albany, NY 12205-0269

Main: (518) 453-4500 • www.cloughharbour.com

NOT TO SCALE

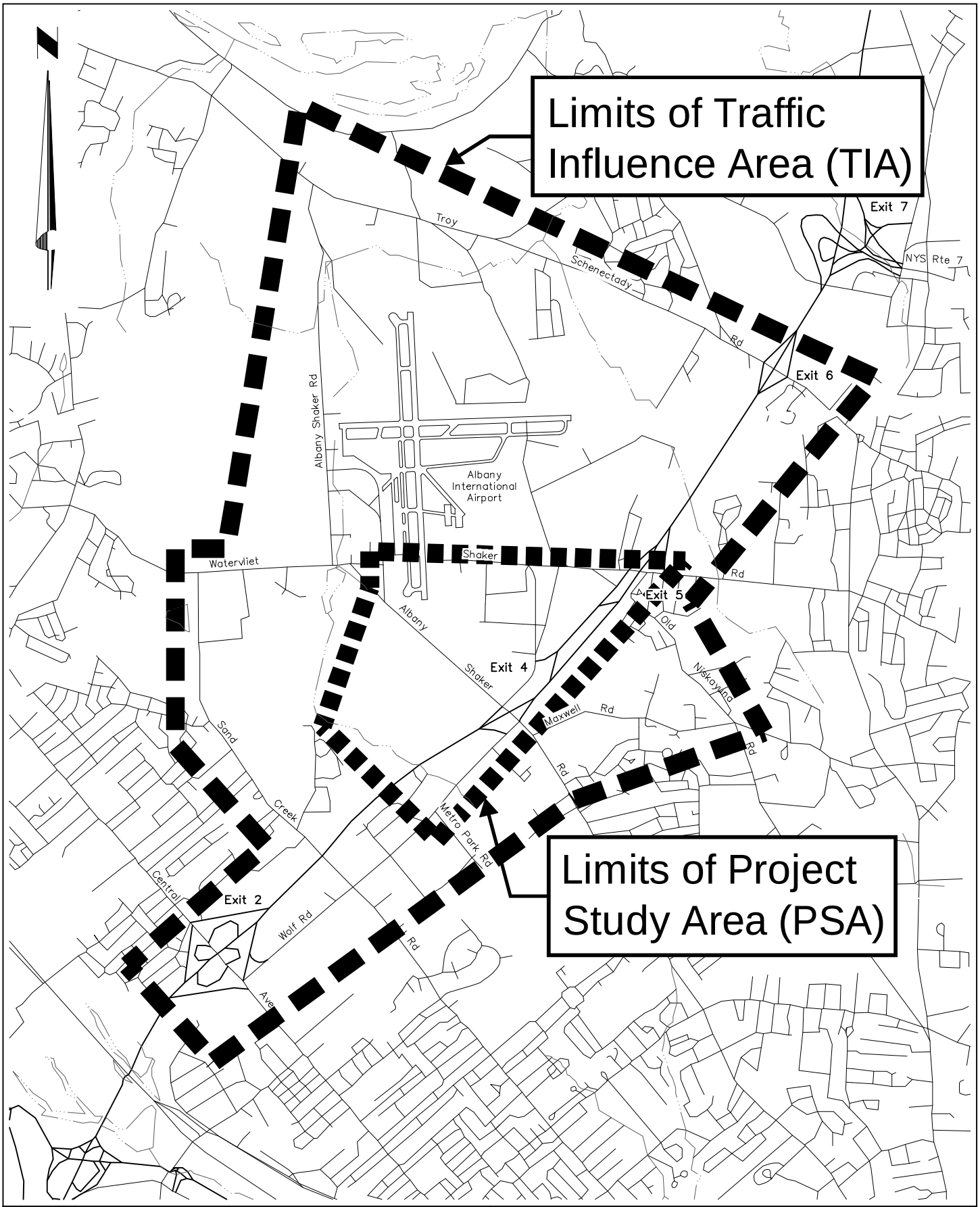
EXHIBIT: 1.2.1 b

PROJECT SITE MAP

INTERSTATE 87 (I-87) EXIT 3/4, ACCESS IMPROVEMENTS

TOWN OF COLONIE, ALBANY COUNTY, NEW YORK

P.I.N. 1721.51



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NOT TO SCALE

EXHIBIT: 1.2.1 c

PROJECT STUDY AREA / TRAFFIC INFLUENCE AREA MAP

INTERSTATE 87 (I-87) EXIT 3/4, ACCESS IMPROVEMENTS
TOWN OF COLONIE, ALBANY COUNTY, NEW YORK
P.I.N. 1721.51

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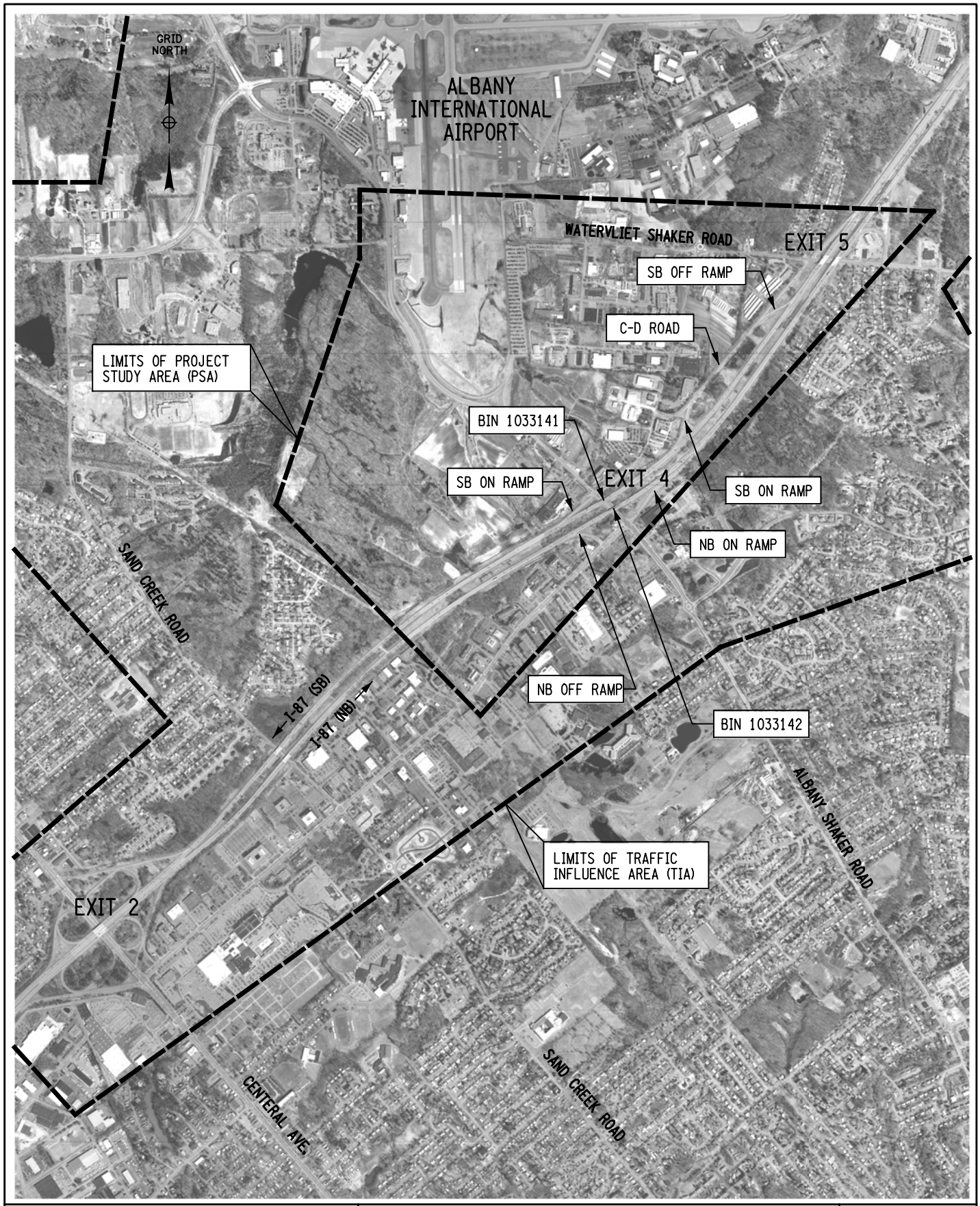

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PROJECT LOCATION MAP

INTERSTATE 87 (I-87) EXIT 3, AIRPORT CONNECTOR
TOWN OF COLONIE, ALBANY COUNTY, NEW YORK
P.I.N. 1721.51.121

EXHIBIT

1.2.1 d

DATE: 1/13

1.2.2. Why is the Project Needed?

The proposed transportation project has been initiated to address the following needs within the Exit 4 area:

Intersection Operating Conditions
The project is necessary to provide improved access between Interstate 87 (I-87), Wolf Road, and the Albany International Airport. Within the project study area, four of the seven intersections evaluated have movements that operate at a level of service E or worse during the peak hours:

- Exit 4 NB off-ramp & Wolf Road
- Albany-Shaker Road & Wolf Road
- Albany-Shaker Road & Old Wolf Road
- Old Wolf Road & Collector-Distributor (C-D) Road (Exit 4 SB Off-Ramp)

These poor operations will continue to deteriorate in the future.

Safety
The project is necessary to address safety concerns within the project study area. All seven intersections evaluated in the safety study exceed the statewide average crash rate for similar transportation facilities. The intersections included in the safety study are:

- Wolf Road & Metro Park Road
- Wolf Road & I-87 Exit 4 NB off-ramp
- Wolf Road & Albany-Shaker Road
- Albany-Shaker Road & Old Wolf Road/I-87 Exit 4 SB on-ramp
- Old Wolf Road & I-87 Exit 4 SB off-ramp
- Watervliet-Shaker Road & I-87 Exit 5 NB ramps
- Watervliet-Shaker Road & I-87 Exit 5 SB ramps

Structural Deficiencies
The existing I-87 bridges over Albany-Shaker Road (BINs 1033141 and 1033142) are over 50-years old. The sufficiency ratings and bridge inspection for the bridges indicate that the structural deficiencies need to be addressed.

Access
The existing roadway network does not provide direct access between I-87 southbound and Wolf Road or between I-87 and the Albany International Airport. The existing access limits the movement of goods between these two major transportation facilities as well as the mobility of Park n' Ride and Airport shuttles between Wolf Road, Old Wolf Road, and the airport.

Land Use and Economic Growth
The existing poor levels of service at intersections in the Exit 4 area inhibit mobility within the project area.

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

The proposed project is a significant long-term capital investment linking two of the major transportation facilities of the Capital District: I-87 and the Albany International Airport. Starting in the late 1970's and continuing into the early 1990's, a number of studies have looked at existing and future traffic operations in the project area. Each of these studies concluded that the existing I-87 interchanges would have difficulty handling the growth in traffic caused by expected increases in airport activity and continued economic development in the area without improvement to I-87 access. Based on these conclusions, the proposed project was added to the Capital District Transportation Committee's (CDTC) 1992-97 Transportation Improvement Plan (TIP) and added to the New York State Department of Transportation (NYSDOT) capital program. As such, the following project purpose has been developed by the Lead Agencies, with input from the Cooperating and Participating Agencies.

The project proposes to improve access between I-87 and the Albany International Airport and between I-87 and Wolf Road. Safety and traffic operations will be improved at Exit 4. The project will be designed to not adversely impact I-87 mainline operations between Exit 2 and Exit 5 and to allow for future long-term improvements to I-87.

Improving system connectivity between the existing pedestrian/bicycle facilities on Wolf Road and the facilities constructed as part of the Albany/Watervliet-Shaker Road project will also be considered during the evaluation of design alternatives.

The following Primary Project Objectives have been developed to recognize the overall goal of improving mobility and economic development for the Capital District.

(1) Improve access between I-87 and the Albany International Airport without precluding future, long-term I-87 mainline improvements, and without impacting I-87 mainline operations between Exit 2 and Exit 5.
(2) Improve access between I-87 and Wolf Road without precluding future, long-term I-87 mainline improvements, and without impacting I-87 mainline operations between Exit 2 and Exit 5.
(3) Improve intersection operating conditions in the existing Exit 4 area and address safety concerns in the areas that exceed the statewide average accident crash rate for similar transportation facilities.
(4) Eliminate the structural deficiencies associated with the I-87 northbound and southbound bridges over Albany-Shaker Road by providing bridges with a 50-year minimum service life.

In addition to the Primary Project Objectives, the following Secondary Objective will be considered during the evaluation of design alternatives.

(1) Improve system connectivity between the existing pedestrian/bicycle facilities on Wolf Road and the facilities constructed as part of the Albany/Watervliet-Shaker Road project.

The following considerations will also be included in the evaluation of alternatives.

(1) Impacts to existing sensitive environmental features in the project area.
(2) Impacts to active agricultural land in the project area.
(3) Impacts to viable commercial enterprises and other social and economic features in the project area.
(4) A gateway effect between I-87 and the Albany International Airport is desired.
(5) A pedestrian-friendly environment within the project area is desired.
(6) Application of transportation system management, transportation demand management, and transit enhancements.
(7) Project benefits versus cost.

1.3. What Alternative(s) Are Being Considered?

More than 50 alternatives have been evaluated on a conceptual level for the proposed project. In addition to comparison of the alternatives to the purpose and need statement, a review of the alternatives by the project stakeholders resulted in identification of two feasible alternatives, the Diamond Alternative and the Flyover Alternative, for consideration in the Environmental Impact Statement (EIS). Although the engineering considerations and environmental impacts of Diamond Alternative are discussed in detail in the remainder of this report, the Diamond Alternative has been dismissed from consideration as a feasible alternative for the following reasons:

- The estimated construction cost is 57% greater than the Flyover Alternative ($74.61M for the Diamond Alternative vs. $47.59M for the Flyover Alternative).

- The Diamond Alternative requires almost twice the area of ROW acquisitions required for the Flyover Alternative, equating to an additional $10.0M in ROW costs.
- The Diamond Alternative results in the addition of more than twice as many lane-miles of new roadway compared to the Flyover Alternative (3.39 lane-miles of roadway for the Diamond Alternative vs. 1.27 lane-miles of roadway for the Flyover Alternative). Future roadway maintenance costs directly correlate to the number of lane-miles of roadway.
- The proposed connector road bridge over I-87 requires almost three times the deck area of the proposed Flyover Ramp A bridge over I-87 resulting in higher future bridge maintenance costs for the Diamond Alternative.
- The Diamond Alternative results in relocation of two (2) commercial businesses. The relocation of these commercial businesses represents removal of $421,407 from the Town of Colonie tax base.
- The Diamond Alternative results in approximately twice the amount of wetland impacts than the Flyover Alternative (4.76 acres compared to 2.35 acres, respectively).
- The Diamond Alternative results in a 41% increase over No-Build conditions in energy consumption and greenhouse gas emissions.

For these reasons, the Diamond Alternative has been dismissed and the Flyover Alternative has been identified as the only remaining Feasible Alternative. The Flyover Alternative, along with the No-Build Alternative, is described below. For a more in-depth discussion of the design criteria and non-standard features, see Section 3.2.3. Design Criteria for Feasible Alternative(s).

No-Build Alternative:
This alternative provides for the continued maintenance of the existing highway by the NYSDOT maintenance forces with no capital funds being expended.

Flyover Alternative
This alternative includes construction of new Exit 4 ramps to complement the existing Exit 4 interchange. Improvements include construction of new ramps to connect I-87 NB and SB to Albany-Shaker Road approximately 1000 ft. west of the Albany-Shaker Road / Old Wolf Road intersection and a new ramp to connect Albany-Shaker Road, approximately 1,000 ft. west of the Albany-Shaker Road / Old Wolf Road intersection, to I-87 SB. This alternative also includes replacement of the I-87 bridges over Albany-Shaker Road; removal of the existing Exit 4 SB Exit Ramp, existing SB C-D road between Exit 5 and Exit 4, and the Exit 4 SB Entrance Ramp; replacement of the existing Exit 5 SB Entrance Ramp; pavement widening on I-87 NB to construct an auxiliary lane between the existing Exit 4 NB Exit Ramp and Exit 5 NB Exit Ramp; pavement widening and restriping for additional turn lanes and medians on Albany-Shaker Road; and restriping on the existing Exit 4 NB Exit Ramp.

This alternative improves operating conditions at the majority of the intersections in the I-87 Exit 4 area and reduces the travel time for major routes by 25%. This alternative also addresses safety concerns by diverting traffic away from the existing intersections that have crash rates which exceed the statewide average for similar facilities.

This alternative includes impacts to 15 properties, including 1 displacement. Typical Sections, Plans, and Profiles for the Flyover Alternative are included in Appendix A.

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

A Coordination Plan has been developed in accordance with SAFETEA-LU 6002 and distributed to the Cooperating and Participating Agencies. The purpose of the Coordination Plan is to identify the roles and responsibilities of the Cooperating and Participating Agencies and provide a schedule for their involvement in order to affect a more efficient environmental review for project decision making. The current version of the Coordination Plan for the project is included in Appendix E. The dates of the various reviews and other actions will be updated as the project is advanced.

Exhibit 1.4 a Environmental Summary					
NEPA Classification	Class I EIS	BY	Federal Highway Administration (FHWA)	Date	
SEQR Type:	Non-Type II (EIS)	BY	NYSDOT	Date	

Refer to Chapter 4 for a summary of the environmental effects and mitigation measures that are proposed for this project.

Anticipated Permits/Certifications/Coordination:

Phase I (I-87 Bridges over Albany-Shaker Road

Permits

NYSDEC
- State Pollutant Discharge Elimination System (SPDES) General Permit

USACE
- U.S. Army Corps of Engineers, Nationwide Permit #14

Phase II (Interchange Reconstruction)

Permits

NYSDEC
- State Pollutant Discharge Elimination System (SPDES) General Permit
- New York State Department of Environmental Conservation, Article 24 - Freshwater Wetlands Permit (PP 95-02)
- Water Quality Certification (Sec 401)

USACE
- U.S. Army Corps of Engineers, Section 404 Individual Permit

Coordination
- Coordination with NYSDEC pursuant to the "NYSDEC/NYSDOT Memorandum of Understanding Regarding ECL Article 15"
- Coordination with New York State Historic Preservation Officer (SHPO)
- Coordination with the US Fish and Wildlife Service
- Coordination with the New York Natural Heritage Program

Certifications
- NYSDOL: Asbestos Variances (Licensed Designer Specifications/Notes)

1.5. What Are The Costs & Schedules?

Design Approval / Record of Decision (ROD) is expected during the late Spring/early Summer 2014. The project will be constructed in two phases, the first being replacement of the I-87 bridges over Albany-Shaker Road and the second being reconstruction of the Exit 4 interchange ramps. Construction for Phase I is scheduled to last 20 months beginning in the Summer of 2014. Construction for Phase II is scheduled to last 30 months beginning in the Spring of 2019.

Exhibit 1.5 a Project Schedule	
Activity	**Date Occurred/Tentative**
NYSDOT Scoping Approval	July 20, 2007
NEPA Scoping Approval	February 5, 2009
Design Approval /Record of Decision	Spring/Summer 2014
Phase I Construction Start	Summer 2014
Phase I Construction Complete	Fall 2016
Phase II ROW Acquisition	TBD
Phase II Construction Start	Spring 2019
Phase II Construction Complete	Winter 2021

Exhibit 1.5 b Comparison of Alternatives Project Costs (Millions)		
Activities		Flyover Alternative
Construction Costs	Bridge	$ 7.69
	Highway	$ 17.61
Wetland Mitigation Costs		$ 0.57
SPDES Mitigation Costs		$ 0.31
Incidentals 10%		$ 2.62
Subtotal ($)		$ 28.80
Contingency (15% at Design Approval)		$ 4.32
Subtotal ($)		$ 33.12
Field Change Payment		$ 1.30
Subtotal ($)		$ 34.42
Mobilization (4%)		$ 1.37
Subtotal ($)		$ 35.79
Expected Award Amount (inflate current costs/ prices at 3%/yr to midpoint of each phase of construction to arrive at $ amount to be entered here). See HDM 21.6.3.2 B		$ 41.27
Construction Inspection (9%)		$ 3.72
ROW Costs ($)		$ 2.60
Total Project Costs		**$ 47.59**

1.6. Which Alternative is Preferred?

The alternative that best meets the project objectives is Alternative 2 – Flyover Alternative. This alternative results in the lowest vehicle hours of delay for the overall network addressing the overall goal

of improving mobility. This alternative also results in the least amount of impacts to wetland areas, ecological resources, viable commercial enterprises, as well as the least amount of right-of-way acquisitions and future maintenance costs. In addition, the construction cost is approximately 36% less than the other alternative initially identified as feasible.

See Section 3.2.2 for a discussion of this alternative.

1.7. Who Will Decide Which Alternative Will Be Selected And How Can I Be Involved In This Decision?

Exhibit 1.7 summarizes the public involvement activities and milestone dates for the proposed project.

Exhibit 1.7
Public Involvement Plan Schedule of Milestone Dates

Activity	Date Occurred/Tentative
DOT Project Scoping Process Initiated	2000
Project Advisory Committee Meeting No. 1	August 2000
Project Advisory Committee Meeting No. 2	August 2001
Project Website Developed	2001
Public Information Meeting No. 1	November 2001
Draft Expanded Project Proposal	February 2002
Conceptual Alternative Screening Document	October 2005
Notice of Intent to prepare an EIS	July 2007
Cooperating/Participating Agencies Meeting	October 2007
Public Information Meeting	October 2007
NEPA Scoping Report	January 2009
Draft Environmental Analysis Methodologies	November 2009
Cooperating/Participating Agencies Meeting	June 2011
Public Hearing	Winter 2013/2014
Current Project Letting date (Phase I)	Late Spring/ Early Summer 2014
Current Project Letting date (Phase II)	Spring 2019

A summary of the project history and agency and public involvement is included in Chapter 2 Section 2.1. Refer to Appendix E for Input from Stakeholders including the Public.

You may offer your comments in a variety of ways.

- There will be a Public Hearing scheduled in the Winter of 2013/2014 where you can talk to Department representatives, give comments to a stenographer or leave written comments.

- You can contact:

John Masi, Project Manager
Please include the six digit Project Identification Number (PIN) 1721.51
Questions or comments email: I87exit4@dot.ny.gov
telephone: (518) 485-9636

Mailing Address
New York State Department of Transportation
Region 1 Design
50 Wolf Road, POD 2-3
Albany, New York 12232

- You can visit the Project's website:

  www.dot.ny.gov/i87exit4

The deadline for submitting comments on this report circulation is April 1, 2014.

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

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

This chapter addresses the history and existing context of the project site, including the existing conditions, deficiencies, and needs for the Interstate 87 Exit 4 area.

2.1. Project History

The original Interstate highway system plan for the Capital District (late 1950's) proposed the construction of Interstate 687, also known as the Northway Connection. Interstate 687 was planned as an east-west expressway connecting Interstate 90 at Exit 5A (Corporate Woods) with Interstate 87 at Exit 3 near Albany-Shaker Road. Interstate 687 was also planned to provide an intermodal connection between the Albany International Airport, I-87 and I-90. When the southern section of I-87 was opened to traffic in 1960, a gap in interchange spacing and numbering was left between Exit 2 (Central Avenue) and Exit 4 (Wolf Road/Albany-Shaker Road) for the future Exit 3 interchange with Interstate 687.

Interstate 687 was never constructed due to changes in the State and Federal funding programs. The proposed highway was removed from the Capital District's long-range highway plan in 1973 and withdrawn from the national interstate system plan in 1977. However, the elimination of Interstate 687 did not eliminate the need to address area traffic problems or the need to provide improved access between the existing interstate system and the Albany International Airport.

Starting in the late 1970's and continuing into the early 1990's, a number of studies looked at existing and future traffic operations in the Wolf Road/Albany International Airport area:

- Albany-Shaker Road Corridor Study (Capital District Transportation Committee (CDTC, 1979)
- Albany County Airport Area Traffic Study (CDTC, 1990)
- Wolf Road/Exit 3 Area Transportation System Study (CDTC, 1990)
- Airport Area Final Generic Environmental Impact Statement (Town of Colonie, Village of Colonie, County of Albany, 1991)

Each of these studies concluded that the existing I-87 interchanges would have difficulty handling the growth in traffic caused by expected increases in airport activity and continued economic development in the area without improvements to I-87 access, either through a new Exit 3 interchange or a major reconfiguration of the existing Exit 4 interchange. A common recommendation among all of these studies was the construction of an Exit 3/4 Wolf Road/Airport Interchange. These studies recognized that such an interchange is necessary to address existing and future regional travel needs and planned development in the entire Wolf Road/Albany-Shaker Road/Albany International Airport area. Improved intermodal access between the interstate and the Albany International Airport would be only one of many benefits provided by the interchange.

As a result of these studies, the Exit 3/4 Wolf Road/Airport Interchange project was added to CDTC's 1992-97 Transportation Improvement Plan (TIP) in March 1992. The project is currently included as Project No. A240 on the 2013-2018 TIP. The project also was added to the New York State Department of Transportation (NYSDOT) capital program.

The merits of an Exit 3/4 Wolf Road / Airport Interchange were supported further by NYSDOT's *Northway Corridor Study* (April 1995) and *Albany County Airport Area: Summary Transportation Assessment* (August 1995).

In March 1997, CDTC adopted its *New Visions* long-range plan for transportation in the Capital District. Improving access to the Airport is included specifically in the *New Visions'* guiding principles ("plan and build for all modes"), strategies ("support intermodal transportation") and actions ("improve surface access

to the Albany County Airport"). In October 2007, CDTC adopted its *New Visions 2030* plan and in September 2011 adopted its *New Visions 2035* plan to extend the *New Visions* plan through the year 2030 and 2035, respectively.

In 2000, NYSDOT initiated the project scoping process to develop project needs and objectives, and evaluate project issues, elements and initiatives which would have an effect on project scope, cost and schedule. This process included traffic data collection, conceptual alternative development, and development of nearly 30 conceptual design alternatives.

A Project Advisory Committee (PAC), including local and State officials, was formed to provide input during the project development process. The first PAC meeting was held in August 2000 to familiarize the PAC with the project, review the design process, project objectives, and public involvement process.

In 2001, the number of conceptual alternatives was reduced to three basic alternatives that represented generalized access concepts: a Diamond Interchange, which would create a new interchange south of the existing Exit 4 interchange with a single access point to Wolf Road and access to the Albany International Airport; a Trumpet Interchange, which would create a new interchange south of the existing Exit 4 interchange with access to the Albany International Airport and two access points on Wolf Road; and a Split Interchange concept, which would include a new interchange south of the existing Exit 4 interchange, and a new interchange to replace the existing Exit 4 interchange north of its current location. This Split Interchange concept would split the traffic between the two interchanges, with Exit 3 primarily dedicated to access to Wolf Road, and the relocated Exit 4 providing access to Albany-Shaker Road and the Albany International Airport. The traffic operations of the three concepts were evaluated using CORSIM models to determine the relative operational benefits of each. CORSIM is a microscopic traffic simulation modeling tool that considers the system as a whole, instead of isolated intersections, freeway segments or ramp junctions. Results can be extracted from the model system-wide to provide comparative results for the entire study area.

A second PAC meeting was held in August 2001 to update the committee on project progress, concepts developed, traffic analysis results and potential environmental impacts for the three conceptual alternatives. Subsequent project meetings and discussions with the design team and involved agencies resulted in the development of approximately 25 additional alternatives. A project website was also developed in 2001 and a Public Information Meeting was held on November 15, 2001 to gain feedback on the concepts developed.

A draft Expanded Project Proposal (EPP) was developed and submitted to NYSDOT, CDTC and Federal Highway Administration (FHWA) in February 2002. Based on comments to the draft EPP, the project objectives were refined to include measures of effectiveness (MOE) that would allow all design alternatives to be consistently and objectively measured with respect to fulfilling the project objectives. The NYSDOT re-evaluated all of the concepts that had been previously developed to determine if any of the concepts should be retained for further evaluation with the revised project objectives and MOE's. Based on this re-evaluation, nineteen of the conceptual alternatives were retained for full evaluation using the revised project objectives and MOE. A *Conceptual Alternative Screening* document was developed to describe the features of the nineteen alternatives and to summarize the screening of each alternative. This document was distributed to the PAC in October 2005 for review and recommendation on preferred concepts to evaluate further in preliminary design. The *Conceptual Alternative Screening* document is included in Appendix C of this report. Based on the PAC comments and a review of the screening document by NYSDOT Region 1, four feasible alternatives were selected for advancement to Preliminary Design.

A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) was published in the July 16, 2007 Federal Register to inform agencies and the public of the beginning of the National Environmental Policy Act (NEPA) process for the proposed project. The NOI identified that the proposed project involves access improvements between I-87, Wolf Road, and the Albany International Airport; and addressing bridge structural deficiencies for BINs 1033141 and 1033142 carrying I-87 over Albany-Shaker Road.

NEPA Scoping meetings were held for the Cooperating and Participating Agencies and the public in October 2007. Comments on the Range of Alternatives under consideration and the project Purpose and Need were accepted through November 2007. A Coordination Plan was also developed and distributed to the Cooperating and Participating Agencies. The purpose of the Coordination Plan is to identify the roles and responsibilities of the Cooperating and Participating Agencies and provide a schedule for their involvement in order to affect a more efficient environmental review for project decision making. The current version of the Coordination Plan for the project is included in Appendix E. The dates of the various reviews and other actions will be updated as the project is advanced.

A draft NEPA Project Scoping Report (PSR) was developed and submitted to NYSDOT and FHWA in July 2008. Based on comments on the draft PSR, the purpose and need and range of alternatives were clarified and justification for eliminating alternatives was refined to be more specific. The revised PSR was distributed to the Cooperating and Participating Agencies in January 2009 and a meeting with the agencies held to review the document on April 2, 2009. Specifically, the feasible alternatives to be evaluated during preliminary design, the decision making process, and coordination process were discussed at the meeting. As a result of comments received at this meeting, four build alternatives were selected for further evaluation: Upgrade Alternative, Diamond Alternative, Flyover Alternative, and Single Point Urban Interchange (SPUI) Alternative.

A draft Environmental Analysis Methodologies document was prepared and distributed for review and comment to the Cooperating and Participating Agencies in September 2009. Comments on the Environmental Analysis Methodologies were accepted through October 14, 2009 and the final document was distributed to the agencies in November 2009.

In 2011, Federal Highway Administration determined that the proposal to build a new Exit 3 while retaining the complete Exit 4 did not meet interchange spacing requirements and could not be approved. As a result of this determination, the remaining alternatives under consideration were modified to incorporate removal of the existing Exit 4 ramps to eliminate duplicate movements and the project name was updated to I-87 Exit 4 Access Improvements.

A meeting with the Cooperating and Participating Agencies was held on June 1, 2011 to review the preliminary investigation of engineering considerations and environmental impacts of the feasible alternatives. A summary package, including descriptions, figures, and travel time and delay information was distributed to each agency along with a revised Coordination Plan. At this time, the Upgrade Alternative and SPUI Alternative were dismissed from further consideration since they did not meet the project's Purpose and Need, leaving only the Diamond Alternative and Flyover Alternative. Comments on the preliminary investigation of engineering considerations and environmental impacts were accepted through June 21, 2011.

As discussed in Section 4.4.17 of this report, the project proposes noise barriers to mitigate the adverse effects of highway noise. A public information meeting for the proposed noise barrier was held on August 22, 2013 and input solicited from the benefited receptors. Responses were received from 58% of the benefited receptors with 80% of the responses in favor of constructing the proposed noise barrier. Since a clear majority of the benefited receptors that responded are in favor of the recommended noise barrier, the barrier will be constructed during the second phase of the project's construction unless conditions change substantially during final design.

An evaluation of the Diamond and Flyover Alternatives and their impacts was completed and is documented in this report. The estimated construction cost for the Diamond Alternative is $74.61M which is 57% greater than the $47.59M construction cost for the Flyover Alternative. In addition, the Diamond Alternative requires almost twice the area of right-of-way acquisition as the Flyover Alternative and results in relocation of 2 additional commercial businesses. Further, the Diamond Alternative results in approximately twice the amount of wetland impacts than the Flyover Alternative (4.76 acres compared to 2.35 acres, respectively). For these reasons, the Flyover Alternative was identified as the Preferred Alternative and the Diamond Alternative was dismissed from further consideration in October 2013.

2.2. Transportation Plans and Land Use

2.2.1. Local Plans for the Project Area

2.2.1.1. Local Master Plan

Several significant local studies and plans have been undertaken within the project area. These include the Town of Colonie's *Comprehensive Plan*, CDTC's long-range *New Visions Regional Transportation Plan*, and the *Airport Area Generic Environmental Impact Statement (GEIS)*.

The Town of Colonie adopted a *Comprehensive Plan* in 2005. The plan establishes a set of goals to guide decision-making including:

- Improve mobility throughout the Town
- Promote commercial and industrial growth in specifically designated areas, taking advantage of the Town's infrastructure, location, and critical regional assets
- Protect the Town's natural resources such as stream corridors, steep slopes, floodplains, wetland systems, and unique ecosystems
- Encourage the conservation of viable farmland and significant open spaces throughout the Town
- Expand active and passive recreational resources available in the Town to meet the growing and changing demand for these amenities
- Maintain the Town's high level of public safety services; community services for youth, seniors, and the public at large; and public utility infrastructure and services
- Protect and promote the Town's significant cultural and historic resources

In September 2011, CDTC adopted its *New Visions 2035* plan to extend the *New Visions* plan through the year 2035. The *New Visions* plan for transportation in the Capital District includes improving access to the Airport in the *New Visions'* guiding principles ("plan and build for all modes"), strategies ("support intermodal transportation") and actions ("improve surface access to the Albany County Airport").

The Department was made aware of a potential plan that proposes a large mixed-use commercial/retail development on Albany-Shaker Road within the project limits. A brief discussion of the potential traffic impacts on the project is included in Section 3.3.1.6.

The proposed project will be designed to maintain compatibility with the Town of Colonie's *Comprehensive Plan* and with CDTC's long-range *New Visions Regional Transportation Plan* and Albany County's *Airport Area GEIS*. The project is being designed with input from the Cooperating and Participating Agencies as part of the NEPA process. These agencies include representatives from Town of Colonie, Albany County, the Albany International Airport, and CDTC.

2.2.1.2. Local Private Development Plans

The Town of Colonie has indicated that future plans include extension of Maxwell Road from the Maxwell Road roundabout constructed in 2010 to Marcus Boulevard (Wolf Road Service Road), and further extension of the Wolf Road Service Road to Aviation Road. Construction of these segments would create a service road parallel to Wolf Road that would extend from Albany-Shaker Road to Sand Creek Road.

In 1990, the Town of Colonie Planning Board developed a Generic Environmental Impact Statement (GEIS) for the 8500 acre area surrounding the Airport area to address long-term planning issues and identify necessary capital improvements associated with planned development of the area. The GEIS evaluated the planned development for the 15-year period of 1990-2005. The GEIS identified two land use scenarios to account for a "High Growth" future and a less-speculative "Target Growth" future. Both scenarios identified the need for transportation improvements to accommodate the cumulative effects of expected planned residential, commercial and Airport growth within the area.

Impacts resulting from other planned developments for the project area that would have a significant effect on the culture, land use patterns or traffic volumes in the area have been included in the traffic forecasts for the proposed project. The following developments were identified:

- Berkshire Bank, corner of Wolf Rd / Sand Creek Rd - Currently under construction and nearing completion.
- Shaker Veterinary Hospital, located at Maxwell Rd / Old Maxwell Rd intersection - Currently constructing addition to clinic.
- Senior citizen housing, northeast corner of Albany-Shaker Rd / Maxwell Rd roundabout – 50, 55+ townhouse units currently waiting on environmental permits.
- Parkside at the Crossings, Aviation Rd at Sand Creek Rd – 68, 55+ condominium units currently under construction.
- Cornerstone Apartments, located on Sand Creek Road between I-87 and Garden Terrace - Senior citizen housing currently under construction.
- Hilton Homes2 Suites, 10 Metro Park Road - Currently in planning stages to construct 100 room hotel.
- Capital Communications Federal Credit Union, 4 Winner Circle - Currently under construction.
- Hotel/Retail Development, 144 Wolf Road - Currently in planning stages to replace Lazare Lincoln Mercury with 82 room hotel, a multi-tentative retail store and a restaurant.
- Texas Roadhouse, 105 Wolf Road - Construction completed in September 2013.
- Texas Longhorn Steakhouse, 206-208 Wolf Road - Currently in planning stages.
- Bonefish Grill, 56 Wolf Road - Construction completed in October 2013.
- Soldier On, Heritage Lane – Currently in planning stages to renovate Ann Lee Nursing Home into 75 single person apartment units, a cafeteria, and emergency homeless intake offices and shelters.

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

2.2.2. Transportation Corridor

2.2.2.1. Importance of the Project Route Segment

The Exit 4 interchange provides an essential link between two major transportation facilities, I-87 and the Albany International Airport, as well as between I-87 and the commercial corridor on Wolf Road. However, the existing interchange does not provide direct access between these facilities. The proposed project was identified to address the identified access deficiencies.

There is also a gap in the existing pedestrian and bicycle network between the pedestrian and bicycle facilities along Albany-Shaker Road west of the Albany International Airport and Wolf Road. CDTC has identified a connection between these two facilities on their Bicycle Pedestrian Priority Network.

2.2.2.2. Alternate Routes

The existing Interstate 87 Exit 2 provides a connection between I-87 and Central Avenue. In the northbound direction, the existing ramp also provides a direct connection to Wolf Road at its southern terminus. In addition, there is a direct connection between Wolf Road southbound and I-87 NB approximately 250 feet north of the Central Avenue / Wolf Road intersection. The only other existing direct connections between I-87 and Wolf Road are at the I-87 Exit 4 NB Exit Ramp and I-87 Exit 4 NB Entrance Ramp. No direct connection exists between I-87 SB and Wolf Road; vehicles must utilize Central Avenue at Exit 2 and Old Wolf Road and Albany-Shaker Road at Exit 4.

The existing Exit 4 ramps provide the only existing connection between I-87 and the Albany International Airport. Other routes to access the airport involve circuitous routes along the state arterial and/or local street system from I-87 Exit 5 and Exit 6.

There are no alternative routes that would be suitable as a permanent detour or as an alternative route to alleviate congestion in the Exit 4 area.

2.2.2.3. Corridor Deficiencies and Needs

The existing roadway network in the Exit 4 area currently experiences capacity deficiencies as described in Section 2.3.1.7. These capacity deficiencies limit mobility and access between I-87, Wolf Road, and the Albany International Airport.

2.2.2.4. Transportation Plans

This project is on the approved CDTC Transportation Improvement Program (TIP) as project No. A240, I-87 Exit 3 or 4 Airport Connector. Exhibit 2.2.2.4 contains a summary of projects within the Traffic Influence Area listed on the regional TIP.

Exhibit 2.2.2.4
CDTC Transportation Improvement Program

TIP Number	Project Description	Let Date
A463	Queue Jumper Central Avenue / Wolf Road	FY 2011
A392	Relocation of Maxwell Road Part 2: Wolf Road Service Road	FY 2012
A524	Albany County High Risk Rural Road Safety: Various Locations	FY 2015

Plans to improve capacity on I-87 are not currently included in the Department's capital program; however, planning for projects on the I-87 corridor have included accommodations for potential future I-87 capacity improvements. The following possible future I-87 improvement scenarios have been considered during the development of alternatives for this project so as not to preclude these potential future improvements:

- The addition of one travel lane in each direction (northbound and southbound).
- The addition of one separated directional lane on I-87 in each direction (northbound and southbound).
- The addition of a separated 2-lane reversible lane configuration in addition to maintaining the existing three mainline lanes on I-87 in each direction (northbound and southbound).
- The addition of light rail in combination with any of the above I-87 improvements.

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

On I-87, the existing highway segments located to the south and north of the proposed project limits are similar to the highway segment within the project limits. Both segments consist of a six-lane urban arterial interstate with a median of varying width. A description of the existing geometry of the roadway is included in Section 2.3.3.1 of this report. There are currently plans to replace the I-87 bridges over Albany-Shaker Road (BINs 103314 1 & 2) as part of this project. The I-87 bridges over Watervliet-Shaker Road (BINs 103455 1 & 2) at Exit 5 were replaced in 2006/2007, and the Troy-Schenectady Road (NYS Route 7) bridge over I-87 (BIN 1004250) at Exit 6 was replaced in 2008/2010. Both of these projects included accommodations for potential future capacity improvements on I-87, as noted in Section 2.2.2.4. In addition, the I-87 bridges over Sand Creek Road (BINs 103313 1 & 2) were replaced in 2001. The Regional Planning Group has confirmed that there are no plans to reconstruct or widen this highway segment, or the adjoining segments, within the foreseeable future.

The existing roadway on Albany-Shaker Road west of the proposed project limits is similar to the roadway segment within the project limits. The segment consists of a four-lane urban arterial with no curbs or

sidewalks. The roadway segment east of the proposed project limits consists of a two-lane urban arterial with curbs and sidewalks on both sides of the roadway. A description of the existing geometry of the roadway is included in Section 2.3.3.1 of this report. The Maxwell Road intersection was relocated and a new roundabout constructed at its intersection with Albany-Shaker Road in 2009/2010.

The existing Wolf Road roadway segment located to the south of the proposed project limits is similar to the roadway segment within the project limits. Both segments consist of a five-lane urban arterial with curbs and sidewalks on both sides of the roadway. A description of the existing geometry of the roadway is included in Section 2.3.3.1 of this report. There are currently no plans for major highway work on the highway segment adjacent to the proposed project.

The existing Old Wolf Road roadway segment located to the north of the proposed project limits is similar to the roadway segment within the project limits. Both segments consist of a two-lane urban arterial with no curbs or sidewalks. A description of the existing geometry of the roadway is included in Section 2.3.3.1 of this report. The Old Wolf Road intersection with Watervliet-Shaker Road was reconstructed with a roundabout in 2009.

Plans to connect Albany-Shaker Road to Sand Creek Road via the Wolf Road Service Road are currently included on the CDTC's TIP. The Wolf Road Service Road would provide a connection between the Maxwell Road roundabout, discussed above, and the Sand Creek Road roundabout, constructed in 2009/2010 at the Sand Creek Road / Colonie Center driveway intersection. The connection between Aviation Road and the Sand Creek Road roundabout was completed in 2010. Although no design has been completed for the missing connection between the Maxwell Road roundabout and Aviation Road, it is assumed that this connection will be constructed prior to completion of the proposed project.

2.3. Transportation Conditions, Deficiencies and Engineering Considerations

2.3.1. Operations (Traffic and Safety) & Maintenance

2.3.1.1. Functional Classification and National Highway System (NHS)

Exhibit - 2.3.1.1
Classification Data

Route(s)	**Interstate 87**	**Albany-Shaker Rd (west of I-87)**	**Albany-Shaker Rd (east of I-87) / Wolf Rd / Watervliet-Shaker Rd**	**Old Wolf Rd**
Functional Classification	Urban Principal Arterial Interstate	Urban Principal Arterial	Urban Principal Arterial	Urban Minor Arterial
National Highway System (NHS)	Yes	Yes	No	No
Designated Truck Access Route	Yes	No	No	No
Qualifying Highway[1]	Yes	Yes	Yes	Yes
Within 1 mile of a Qualifying Highway	-	-	-	-
Within the 16 ft. vertical clearance network	Yes	No	No	No

1 Qualifying Highway – the highways on the national system of interstate and defense highways and federal-aid primary system highways that are designated by the commissioner of transportation.

2.3.1.2. Control of Access

I-87 and the interchange ramps are fully controlled access roadways within the project limits. The following four intersections within the project study area include a ramp as one of the approaches:

- Albany-Shaker Road / Old Wolf Road / Exit 4 SB Entrance Ramp
- Albany-Shaker Road / Wolf Road / Exit 4 NB Entrance Ramp
- Wolf Road / Exit 4 NB Exit Ramp
- Old Wolf Road / Terminal Drive / SB Exit Ramp

The existing and minimum required distance between the interstate ramp and nearest driveway is summarized below:

- Exit 4 SB Entrance Ramp to Hotel Indigo driveway, 25 ft. (minimum required distance is 50 ft.)
- Exit 4 NB Entrance Ramp to Sunoco driveway, 60 ft. (minimum required distance is 50 ft.)
- Exit 4 NB Exit Ramp to JT Maxies / Albany Carpet Warehouse driveway, 125 ft. (minimum required distance is 100 ft.)
- Exit 4 SB Exit Ramp to residential driveway, 105 ft. (minimum required distance is 50 ft.)

Only one of these intersections, shown in Exhibit 2.3.1.2, has a driveway that is located within the minimum required controlled access area of the ramp intersection. On the northwest corner of Albany-Shaker Road / Old Wolf Road / Exit 4 SB Entrance Ramp intersection, the one-way entrance driveway on Albany-Shaker Road for the Hotel Indigo is less than 50 ft. from the intersection.

The portions of Albany-Shaker Road, Wolf Road, and Old Wolf Road within the project study area are not controlled access roadways.

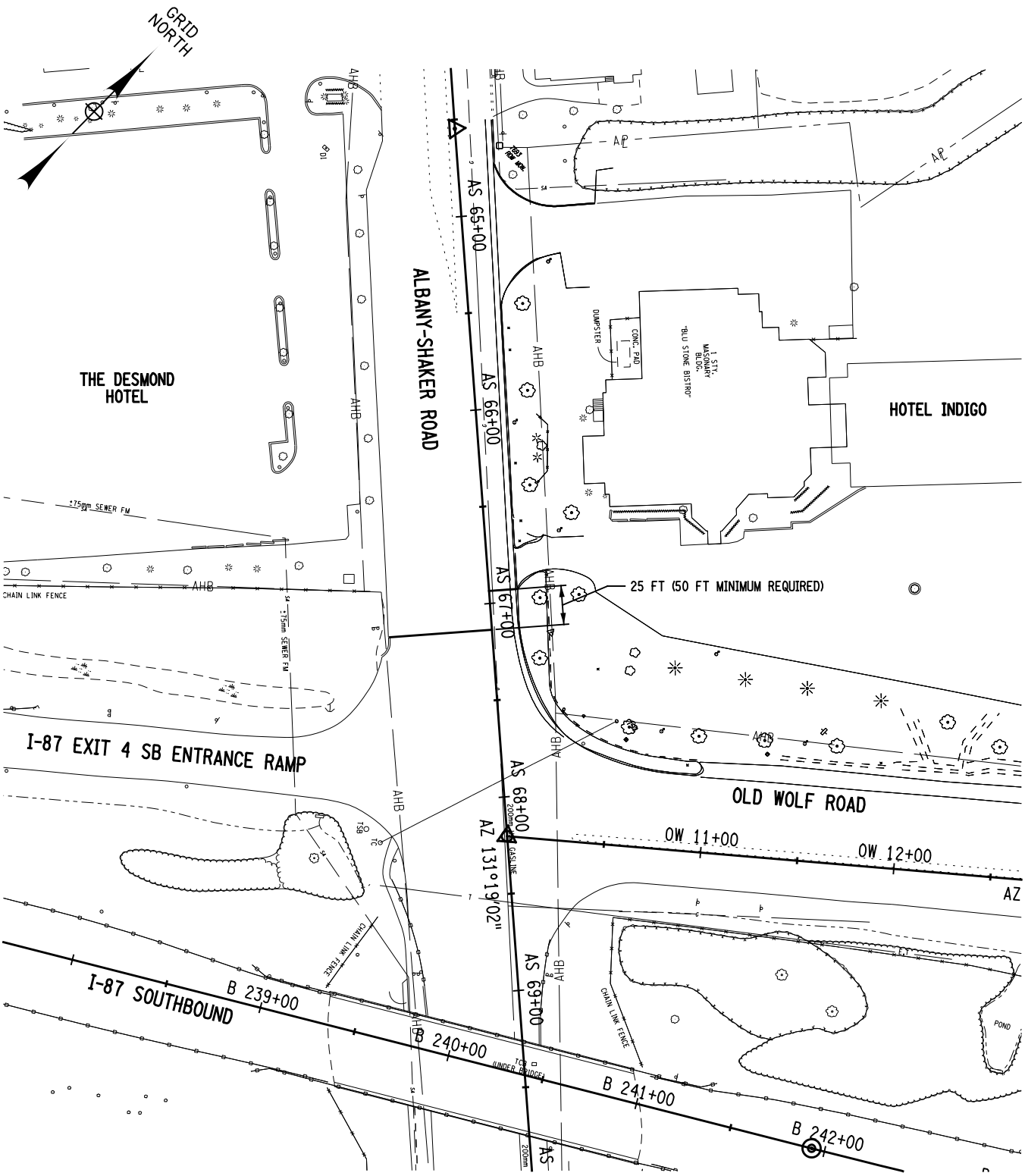
2.3.1.3. Traffic Control Devices

Traffic control devices within the project study area include pavement markings, traffic signs, traffic signals, and closed-circuit television surveillance systems. In general, the existing traffic control devices are in good condition on all of the study area roadways. Side road intersections and major commercial driveways are controlled either by stop signs or traffic signals. There are eight (8) unsignalized intersections within the project study area:

- Old Wolf Road / Watervliet-Shaker Road (roundabout)
- Old Wolf Road / Northway Lane
- Albany-Shaker Road / Maxwell Road (roundabout)
- Albany-Shaker Road / Old Maxwell Road
- Albany-Shaker Road / News Plaza
- Wolf Road / Ulenski Drive
- Wolf Road / Beltrone Drive
- Wolf Road / Cerone Commercial Drive

There are eight (8) signalized intersections within the project study area:

- Watervliet-Shaker Road / I-87 Exit 5 NB Ramps
- Watervliet-Shaker Road / I-87 Exit 5 SB Ramps / Sherwood Drive
- Old Wolf Road / I-87 Exit 4 SB Exit Ramp
- Old Wolf Road / Albany-Shaker Road
- Albany-Shaker Road / Wolf Road
- Wolf Road / I-87 Exit 4 NB Exit Ramp
- Wolf Road / Marcus Boulevard
- Wolf Road / Metro Park Road



HOTEL INDIGO DRIVEWAY / I-87 EXIT 4 SB ENTRANCE RAMP

NOT TO SCALE

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EXISTING NON-STANDARD ACCESS CONTROL LOCATION MAP

INTERSTATE 87 (I-87) EXIT 3 / 4 ACCESS IMPROVEMENTS

EXHIBIT

2.3.1.2

DATE: 8/13

FILE NAME = U:\9456\dsgn\Preliminary Design\172151_pedestrian-connection-figures.dgn
DATE/TIME = 9/19/2013
USER = 3176

All of these signals are maintained by NYSDOT and use loop detectors for phase activation.

The Watervliet-Shaker Road / I-87 Exit 5 ramp intersections both operate using five phases, providing a protected left-turn phase onto the on-ramps and split phasing for the minor approaches.

The Old Wolf Road / I-87 Exit 4 SB off-ramp intersection operates using three phases; the Exit 4 SB off-ramp approach is assigned the largest proportion of time at the signal due to the high exiting volume during the AM peak hour.

The Old Wolf Road / Albany-Shaker Road intersection operates using five phases, providing protected left-turn phase for the Albany-Shaker Road approaches.

The Albany-Shaker Road / Wolf Road and Wolf Road / I-87 Exit 4 NB off-ramp intersections operate off of the same signal controller, using overlap phases to progress traffic through both intersections. The intersection of Albany-Shaker Road / Wolf Road also has a pedestrian activated "No Turn On Red" sign for the Wolf Road northbound approach to help protect pedestrians crossing Albany-Shaker Road.

The Wolf Road intersections with Marcus Boulevard and Metro Park Road both operate using five phases, providing a protected left-turn phase for the Wolf Road southbound approaches.

2.3.1.4. Intelligent Transportation Systems (ITS)

The Regional ITS Coordinator was contacted to identify ITS elements within the project study area. Sufficient field devices have been implemented to provide traffic surveillance and motorist information in the area. Major ITS elements that have been implemented within or near the project area include:

Variable Message Signs (VMS): A total of eight large permanent message signs are located on the freeway system in the Albany area. Three permanent line matrix (3x20) at the following locations, VMS 101 on I-87 SB at Riverview Road; VMS 102 on I-90 WB at Washington Avenue; and VMS 103 on Route 7 WB at Elm St., are no longer in service and are scheduled be removed and replaced. Two other large VMS, VMS 108 and 109 are located on I-90 WB between Exits 3 and 2 and I-87 SB between Exits 4 and 2, are located close to the project area. In addition, ten (10) trailer mounted VMS are located in the project area. These signs are 3x8 or 3x10 character line or full matrix equipped with leased cellular data service or dedicated fiber optic communications.

The primary function of these signs is to provide motorists with incident and pre-planned event (e.g. construction information, etc.). Some of these signs are also used to display automated real time travel time messages.

All signs are National Transportation Communications for ITS Protocol (NTCIP) complaint and they are controlled by NYSDOT at the Capital District Transportation Management Center (TMC) using Management Information System for Transportation (MIST) (Schneider/Telvent) command and control software.

Closed-Circuit Television (CCTV) Surveillance Systems: Thirty-four CCTV cameras currently exist within the Capital District along I-87, I-787, I-90, NYS Route 7, and the NYS Thruway. Three of these cameras are located within the project study area: on I-87 at Exit 2, on I-87 between Sand Creek Road and Exit 4, and on I-87 at Exit 4 north of Albany-Shaker Road. All cameras are AXIS model Q6032-E MPEG 4 digital cameras. Communications occur through a dedicated fiber optic network. Several other cameras are used to provide traffic surveillance at intersections near the project area. Communications to these cameras are via a leased cellular data service. All cameras are controlled from the TMC using Axis Camera Station software.

Traffic Detection Stations (TDS): The Capital District roadway network is also equipped with Traffic Detection Stations located along I-87 between each interchange. These stations collect traffic count,

speed, and inductance occupancy data and provide traffic flow information to the TMC. Detector data is used to generate static and real time reports including construction work zone restriction tables and real time travel time information for VMS and web applications. Detector stations in the project area are linked to the TMC via a dedicated fiber optic network.

ITS Communication Network: A dedicated fiber optic network, configured in a collapsed ring topology, is used to communicate with most devices that are sited along expressways in the Albany area. The fiber backbone cable is located in a conduit duct bank that runs along the east side of I-87 in the project area. Several other public and private telecommunication entities occupy the conduit bank. Physical device connections are made to the main system via spur fibers that have been spliced by ring-cutting the backbone cable. All splices are located in manholes demarcated with a flexible post or a placard wired to the right-of-way fence. Fiber slack loop lengths should be checked as part of any modifications to the fiber network.

Leased communications such as dedicated T-1 circuits and cellular data services are used for all other field system devices. NYSDOT also uses a Wireless Private Network Service (WPNS) VLAN leased from Verizon to extend its enterprise network over Verizon's cellular network to field devices. Typically, WPNS is used to connect devices that are not on the fiber network.

The ITS telecommunication, field device, and central systems have recently been upgraded. A migration away from proprietary protocols that use point-to-point communications is nearly complete. For future planning and design purposes, it is anticipated that the complete IP-based system will implemented within the next 5 years. At the present time, Transmission Control Protocol / Internet Protocol (TCP/IP) is the primary communication protocol. Other services such as T-1 or RS232 are "tunneled" in TCP/IP.

2.3.1.5. Speeds and Delay

The posted speed limit on I-87 within the project study area is 55 mph (88 km/hr.). The design speed for this segment is 70 mph (110 km/hr.).

The posted speed limit on Albany-Shaker Road, Wolf Road, Old Wolf Road, and Watervliet-Shaker Road within the project study area is 40 mph (64 km/hr.). The design speed for these segments varies between 40 mph (70 km/hr.) and 60 mph (95 km/hr.).

Field travel time data was collected in January 2009 on the study area roadways. Data was collected using the average-car method, where a vehicle is driven along the route traveling with traffic while distance, travel time and delay are recorded. Travel time and delay runs were conducted during the AM (7am to 9am) and PM (4pm to 6pm) peak hours. The average travel time and delay collected from this study are summarized in Exhibit 2.3.1.5 a. The cause of the majority of the delay time experienced along the routes during data collection was related to traffic signal delay.

Exhibit 2.3.1.5 a Travel Time and Delay Summary				
Roadway: Segment	AM		PM	
	Overall Travel Time[1]	Delay[1]	Overall Travel Time	Delay
Northbound				
Wolf Road: Central Avenue to Metro Park Road	185	44	238	73
Wolf Road/Albany-Shaker Road: Metro Park Road to Old Wolf Road	159	65	335	198
I-87: Sand Creek Road Overpass to Airport	414	144	403	102
Southbound				
Watervliet-Shaker Road/CD Road/Old Wolf Road: Exit 5 NB Ramps to Albany-Shaker Road	209	69	201	63
Albany-Shaker Road/Wolf Road: Old Wolf Road to Metro Park Road	104	18	92	5
Wolf Road: Metro Park Road to Central Avenue	133	72	306	127
I-87: Exit 6 On-Ramp to Airport	206	52	303	35

[1] Travel Time and Delay provided in seconds.

Actual operating speeds during the AM and PM peak hours were compiled from data provided by NYSDOT and by information published by NYSDOT Highway Data Services. The average speed and 85th percentile operating speeds (where available) within the study area are provided in Exhibit 2.3.1.5 b.

Exhibit 2.3.1.5 b Existing Peak Hour Traffic Speeds (mph)						
Roadway: Segment	Direction	Average		85th Percentile		Source[1]
		AM	PM	AM	PM	
I-87: Exit 2 to Exit 4	NB	57	51	-	-	A
	SB	56	56	-	-	
I-87: Exit 4 to Exit 5	NB	49	45	-	-	A
	SB	56	57	-	-	
I-87: Exit 5 to Exit 6	NB	52	41	-	-	A
	SB	56	56	-	-	
Albany-Shaker Road: Airport to Old Wolf Road	WB[2]	30	29	-	-	B
Wolf Road: Metro Park Road to Exit 4 NB off-ramp	NB	34	26	-	-	B
	SB	37	34	-	-	
Old Wolf Road: Exit 4 ramp to Old Niskayuna Road	NB	33	27	43	42	C
	SB	33	23	41	41	
Watervliet-Shaker Road: Exit 5 SB off-ramp to Exit 5 NB ramps	EB	27	23	-	-	B
	WB	35	34	-	-	

[1] Sources of speed data:
A. Continuous count stations via NYSDOT Region 1
B. Running speeds from travel time study
C. NYSDOT Highway Data Services

[2] Travel times were not measured in the eastbound direction from the Airport.

2.3.1.6. Traffic Volumes

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

2.3.1.6. (1) Existing traffic volumes

Existing AM and PM peak hour turning movement volumes were collected at many of the study area intersections in June and July of 2006 and January 2009. Traffic data was collected in years prior for the entire study area. The data collection conducted in 2009 was focused at key intersections in order to provide an update to data collected in 2006. All data collected in 2006 and 2009 was provided to CDTC to be used as a base in their regional demand model.

With the data collected as a base, CDTC forecasted volumes for a seasonally adjusted Existing (2009) condition, Estimated Time of Completion (ETC) (2016) No-Build, ETC+10 (2026) No-Build, ETC+20 (2036) No-Build and ETC+30 (2046) No-Build conditions.

Refer to Exhibits 2.3.1.6 a and 2.3.1.6 b for a summary of the traffic data. A discussion of the traffic count methodology, peak hour, and turning movement volumes for intersections is included in Appendix F.

Exhibit 2.3.1.6 a
Traffic Data

Route	I-87	Albany-Shaker Rd	Wolf Rd
Directional Distribution[1]	38% NB, 62% SB: AM 64% NB, 36% SB: PM	41% EB, 59% WB: AM 61% EB, 39% WB: PM	29% NB, 71% SB: AM 58% NB, 42% SB: PM
Peak Hour Factor	0.92	0.95	0.97
% Peak Hour Trucks	2% AM, 2% PM	3% AM, 2% PM	1% AM, 1% PM
% Daily Trucks	8%	7%	-

[1] NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

Exhibit 2.3.1.6 b
Existing Traffic Volumes

Roadway: Segment	Existing (2009)	
	AADT[1]	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	56,700	3000 / 5100
I-87: Exit 4 to Exit 2 Southbound	56,700	5150 / 3750
I-87: Exit 4 to Exit 5 Northbound	64,400	2700 / 5800
I-87: Exit 5 to Exit 4 Southbound	48,900	4400 / 2500
I-87: Exit 5 to Exit 6 Northbound	66,700	2500 / 6000
I-87: Exit 6 to Exit 5 Southbound	67,800	6100 / 3300
Albany-Shaker Rd: West of Old Wolf	26,000	2300 / 2600
Wolf Rd: South of Exit 4	25,000	1950 / 2500

[1] AADT is the Average Annual Daily Traffic.

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

The Estimated Time of Completion (ETC)+20 design year was selected per Project Development Manual (PDM) Appendix 5. An ETC+30 year projection was also completed for intersections near the I-87

bridges over Albany-Shaker Road and new bridge(s) at the reconstructed Exit 4 interchange for each feasible alternative. Peak hour turning movement volumes for intersections with identified accident problems, all major intersections, and major traffic generator driveways/entrances are included for the design year(s) in Appendix F.

Future No-Build design year traffic volume forecasts were conducted by CDTC using their regional travel demand model. The forecasts were conducted for a seasonally adjusted Existing (2009) condition, ETC (2016) No-Build, ETC+10 (2026) No-Build, ETC+20 (2036) No-Build and ETC+30 (2046) No-Build conditions. The ETC+10 condition is presented in Appendix F.

Refer to Exhibit 2.3.1.6 c for a summary of the forecasted ETC, ETC+20 and ETC+30 No-Build traffic volumes. As shown in the exhibit, there is very little traffic growth projected through the design years under the No-Build condition, based on the regional travel demand model.

Exhibit 2.3.1.6 c
Forecast Traffic Volumes – No-Build

Roadway: Segment	ETC (2016)		ETC+20 (2036)		ETC+30 (2046)	
	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	56,700	3000 / 5100	57,800	3000 / 5200	58,300	3000 / 5250
I-87: Exit 4 to Exit 2 Southbound	57,800	5200 / 3850	58,900	5300 / 4100	59,400	5350 / 4250
I-87: Exit 4 to Exit 5 Northbound	65,600	2750 / 5900	66,700	2800 / 6050	67,200	2850 / 6050
I-87: Exit 5 to Exit 4 Southbound	48,900	4400 / 2550	50,000	4550 / 2750	50,600	4550 / 2800
I-87: Exit 5 to Exit 6 Northbound	67,800	2500 / 6100	69,400	2600 / 6250	-	- / -
I-87: Exit 6 to Exit 5 Southbound	67,800	6100 / 3450	67,200	6050 / 3800	-	- / -
Albany-Shaker Rd: West of Old Wolf	33,000	2450 / 3300	37,500	2600 / 3750	39,500	2800 / 3950
Wolf Rd: South of Exit 4	20,000	2050 / 2000	22,500	2000 / 2250	-	- / -

[1] AADT is the Average Annual Daily Traffic.

2.3.1.7. Level of Service and Mobility

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

A VISSIM microsimulation model was used to analyze the study area roadway network. VISSIM is capable of modeling complex geometry, traffic control and volumes, and all types of roadway facilities. The model was used to evaluate the travel time, intersection delay and network delay. The LOS applied to the intersections are based on the criteria set forth in the Highway Capacity Manual (HCM). Freeway and ramp junction LOS were evaluated using Highway Capacity Software (HCS). Additional details on the VISSIM model development, calibration and results can be found in Appendix F.

Exhibits 2.3.1.7 a and 2.3.1.7 b summarize the intersection delay and LOS for the 2009 Existing AM and PM peak hours, respectively. The following study area intersections have one or more approaches that experience LOS E or F during the Existing studied peak hours:

- Sand Creek Road & Wolf Road (PM)
- Exit 4 NB off-ramp & Wolf Road (AM & PM)
- Albany-Shaker Road & Old Wolf Road (PM)
- Old Wolf Road & Collector-Distributor (C-D) Road (AM)

Generally, the intersections experience higher delay levels during the PM peak hour since volumes are higher on Wolf Road and at the intersections. There are some additional intersections that have movements that experience LOS E or F during the peak hours; see Appendix F for details.

Exhibit 2.3.1.7 a
Intersection Level of Service
2009 Existing
AM Peak Hour

Intersection/Approach		Existing (2009) Delay (sec/veh)	LOS
Central Avenue & Wolf Road			
Central Avenue	EB	24.7	C
	WB	29.9	C
Exit 2 NB Off-Ramp	NB	40.2	D
Wolf Road	SB	20.6	C
OVERALL		29.2	C
Sand Creek Road & Wolf Road			
Sand Creek Road	EB	26.7	C
	WB	26.6	C
Wolf Road	NB	26.6	C
	SB	23.4	C
OVERALL		25.8	C
Metro Park Road & Wolf Road			
Hess Station	EB	26.6	C
Metro Park Drive	WB	20.3	C
Wolf Road	NB	3.3	A
	SB	5.5	A
OVERALL		5.7	A
Exit 4 NB Off-Ramp & Wolf Road			
Exit 4 NB Off-Ramp & Wolf Road	EB	64.2	E
Wolf Road	NB	11.7	B
	SB	6.7	A
OVERALL		26.0	C
Albany-Shaker Road & Wolf Road			
Albany-Shaker Road	EB	25.6	C
	WB	30.0	C
Wolf Road	NB	42.9	D
OVERALL		32.3	C
Albany-Shaker Road & Old Wolf Road			
Albany-Shaker Road	EB	38.8	D
	WB	37.9	D
Old Wolf Road	SB	54.2	D
OVERALL		44.3	D
Old Wolf Road & CD Road (Exit 4 SB Off-Ramp)			
Terminal Drive	EB	9.9	A
CD Road	WB	34.7	C
Old Wolf Road	NB	37.5	D
	SB	64.3	E
OVERALL		39.2	D
Exit 5 SB Ramps & Watervliet-Shaker Road			
Watervliet-Shaker Road	EB	15.4	B
	WB	16.6	B
Exit 5 SB Off-Ramp	SB	20.2	C
Sherwood Drive	SB	24.9	C
OVERALL		17.6	B
Exit 5 NB Ramps & Watervliet-Shaker Road			
Watervliet-Shaker Road	EB	11.8	B
	WB	12.1	B
Holly Lane	NB	34.6	C
Exit 5 NB Off-Ramp	SB	15.2	B
OVERALL		13.0	B

Exhibit 2.3.1.7 b
Intersection Level of Service
2009 Existing
PM Peak Hour

Intersection/Approach		Existing (2009)	
		Delay (sec/veh)	LOS
Central Avenue & Wolf Road			
Central Avenue	EB	30.7	C
	WB	33.0	C
Exit 2 NB Off-Ramp	NB	54.3	D
Wolf Road	SB	36.5	D
OVERALL		36.6	D
Sand Creek Road & Wolf Road			
Sand Creek Road	EB	91.0	F
	WB	51.3	D
Wolf Road	NB	42.1	D
	SB	43.2	D
OVERALL		54.1	D
Metro Park Road & Wolf Road			
Hess Station	EB	36.0	D
Metro Park Drive	WB	28.9	C
Wolf Road	NB	13.6	B
	SB	8.0	A
OVERALL		14.4	B
Exit 4 NB Off-Ramp & Wolf Road			
Exit 4 NB Off-Ramp & Wolf Road	EB	86.3	F
Wolf Road	NB	100.6	F
	SB	4.1	A
OVERALL		68.6	E
Albany-Shaker Road & Wolf Road			
Albany-Shaker Road	EB	49.6	D
	WB	41.6	D
Wolf Road	NB	52.9	D
OVERALL		48.9	D
Albany-Shaker Road & Old Wolf Road			
Albany-Shaker Road	EB	116.1	F
	WB	42.8	D
Old Wolf Road	SB	68.2	E
OVERALL		80.3	F
Old Wolf Road & CD Road (Exit 4 SB Off-Ramp)			
Terminal Drive	EB	6.3	A
CD Road	WB	34.7	C
Old Wolf Road	NB	14.4	B
	SB	39.1	D
OVERALL		31.6	C
Exit 5 SB Ramps & Watervliet-Shaker Road			
Watervliet-Shaker Road	EB	34.0	C
	WB	21.2	C
Exit 5 SB Off-Ramp	SB	27.3	C
Sherwood Drive	SB	38.7	D
OVERALL		28.4	C
Exit 5 NB Ramps & Watervliet-Shaker Road			
Watervliet-Shaker Road	EB	19.4	B
	WB	19.6	B
Holly Lane	NB	42.2	D
Exit 5 NB Off-Ramp	SB	28.8	C
OVERALL		21.4	C

Freeway analyses for I-87 were conducted in accordance with the Highway Capacity Manual (HCM2000) using HCS+. The analyses were conducted for the freeway segments between Exits 2 and 4, Exits 4 and 5, Exits 5 and 6, and on the segments on the bridge over Albany-Shaker Road. Ramp junctions were evaluated at Exits 2, 4 and 5. Weave areas were evaluated at Exit 2.

The results of the AM and PM peak hour Existing freeway, ramp junction, and weave area analyses are summarized in Exhibits 2.3.1.7 c and 2.3.1.7 d.

Exhibit 2.3.1.7 c
Freeway Level of Service
2009 Existing
AM Peak Hour

Direction[2]	Segment/Junction	Existing (2009)	
		Density pc/mi/ln[1]	LOS
FREEWAY SEGMENTS			
NB	Exit 2W on to Exit 4 off	19.6	C
	Exit 4 off to Exit 4 on	14.4	B
	Exit 4 on to Exit 5 off	17.6	B
	Exit 5 on to Exit 6 off	12.3	B
SB	Exit 6 on to Exit 5 off	29.9	D
	Exit 4 off to Exit 5 on	28.8	D
	Exit 5 on to Exit 4 on	30.1	D
	Exit 4 on to Exit 2W off	33.8	D
RAMP JUNCTIONS			
NB	Exit 2W on-ramp	16.5	B
	Exit 4 off-ramp	22.2	C
	Exit 4 on-ramp	15.6	B
	Exit 5 off-ramp	21.2	C
SB	Exit 4 off-ramp	33.3	D
	Exit 5 on-ramp	26.5	C
	Exit 4 on-ramp	27.9	C
	Exit 2W off-ramp	33.0	D
WEAVE AREAS			
NB	Exit 2E on-ramp to Exit 2W off-ramp	22.0	C
SB	Exit 2W on-ramp to Exit 2E off-ramp	28.5	D

[1] - pc/mi/ln = passenger cars per mile per lane
[2] – NB= northbound, SB = southbound

Exhibit 2.3.1.7 d Freeway Level of Service 2009 Existing PM Peak Hour			
Direction[2]	Segment/Junction	Existing (2009)	
		Density pc/mi/ln[1]	LOS
FREEWAY SEGMENTS			
NB	Exit 2W on to Exit 4 off	36.3	E
	Exit 4 off to Exit 4 on	31.5	D
	Exit 4 on to Exit 5 off	**	F
	Exit 5 on to Exit 6 off	31.5	D
SB	Exit 6 on to Exit 5 off	16.2	B
	Exit 4 off to Exit 5 on	16.3	B
	Exit 5 on to Exit 4 on	17.6	B
	Exit 4 on to Exit 2W off	24.5	C
RAMP JUNCTIONS			
NB	Exit 2W on-ramp	29.4	D
	Exit 4 off-ramp	33.4	D
	Exit 4 on-ramp	35.8	F
	Exit 5 off-ramp	45.0	F
SB	Exit 4 off-ramp	20.1	C
	Exit 5 on-ramp	16.9	B
	Exit 4 on-ramp	22.1	C
	Exit 2W off-ramp	25.5	C
WEAVE AREAS			
NB	Exit 2E on-ramp to Exit 2W off-ramp	39.2	E
SB	Exit 2W on-ramp to Exit 2E off-ramp	29.4	D

1 - pc/mi/ln = passenger cars per mile per lane
** - Density is greater than 45 pc/mi/ln and can no longer be calculated with the basic freeway analysis. Segment is oversaturated.
[2] – NB= northbound, SB = southbound

During the AM peak hour, all of the freeway segments, ramp junctions and weave areas are estimated to operate at LOS D or better. During the PM peak hour, the following locations operate at LOS E or worse under the Existing condition in the northbound direction:

- Freeway Segments
  - Exit 2W on to Exit 4 off
  - Exit 4 on to Exit 5 off
- Ramp Junctions
  - Exit 4 on-ramp
  - Exit 5 off-ramp
- Weave Areas
  - Exit 2E on to Exit 2W off

2.3.1.7. (2) Future no-build design year level of service

Level of service was also estimated for the 2016 (ETC), 2026 (ETC+10), 2036 (ETC+20) and 2046 (ETC+30) design years for the No-Build condition. These estimates were made using the existing geometry and intersection controls with the future volumes estimated and presented in 2.3.1.6. (2). Delay is estimated to increase through the ETC+20 design horizon due to background traffic growth. For the

ETC+30 condition, the LOS analysis was limited to the intersections adjacent to the I-87 bridge structures over Albany-Shaker Road, which are identified on Exhibit 2.3.1.7 e and listed below:

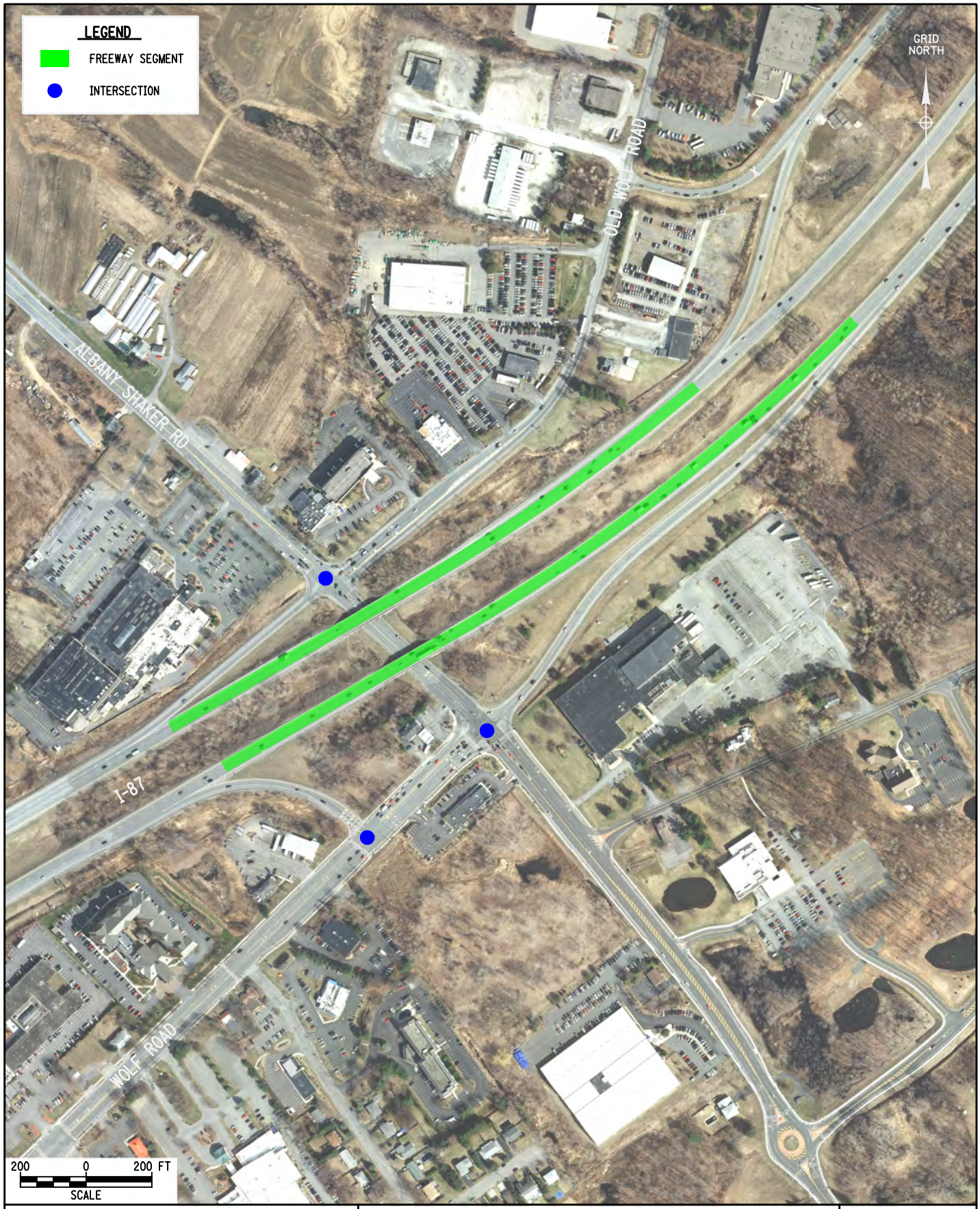
- Exit 4 NB off-ramp & Wolf Road
- Albany-Shaker Road & Wolf Road
- Albany-Shaker Road & Old Wolf Road

Exhibits 2.3.1.7 f and 2.3.1.7 g summarize the ETC, ETC+20 and ETC+30 intersection delay and LOS for the No-Build AM and PM peak hours, respectively. The ETC+10 results are presented in Appendix F.

For the ETC+20 No-Build condition, the following study area intersections will experience LOS E or worse for one or more approaches during the studied peak hours:

- Central Avenue & Wolf Road (PM)
- Sand Creek Road & Wolf Road (PM)
- Exit 4 NB off-ramp & Wolf Road (PM)
- Albany-Shaker Road & Old Wolf Road (AM & PM)
- Old Wolf Road & C-D Road (AM)
- Exit 5 SB Ramps & Watervliet-Shaker Road (PM)

There are some additional intersections that have movements that experience LOS E or F during the peak hours; see Appendix F for details.



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ETC+30 LEVEL OF SERVICE EVALUATION LOCATIONS NO-BUILD

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS ACCESS IMPROVEMENTS

FIGURE

2.3.1.7e

DATE: 9/13

FILE NAME = U:\9456\dsgn\Preliminary Design\Figures\Traffic Figures\172151_eis_no-build_LOS.dgn
DATE/TIME = 9/18/2013
USER = 3176

Exhibit 2.3.1.7 f
Intersection Level of Service
2016 (ETC), 2036 (ETC+20) & 2046 (ETC+30) No-Build
AM Peak Hour

Intersection/Approach		2016 (ETC)		2036 (ETC+20)		2046 (ETC+30)	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road							
Central Avenue	EB	24.9	C	26.2	C	N/A	
	WB	28.3	C	28.7	C		
Exit 2 NB Off-Ramp	NB	40.4	D	42.0	D		
Wolf Road	SB	22.8	C	22.8	C		
OVERALL		29.2	C	30.4	C		
Sand Creek Road & Wolf Road							
Sand Creek Road	EB	26.0	C	27.9	C	N/A	
	WB	25.2	C	26.7	C		
Wolf Road	NB	18.1	B	21.0	C		
	SB	18.0	B	19.4	B		
OVERALL		20.4	C	22.5	C		
Metro Park Road & Wolf Road							
Hess Station	EB	33.9	C	30.2	C	N/A	
Metro Park Drive	WB	23.9	C	24.8	C		
Wolf Road	NB	2.4	A	2.6	A		
	SB	2.9	A	2.6	A		
OVERALL		3.7	A	3.7	A		
Exit 4 NB Off-Ramp & Wolf Road							
Exit 4 NB Off-Ramp	EB	46.2	D	48.8	D	90.3	F
Wolf Road	NB	11.6	B	13.2	B	18.5	B
	SB	9.1	A	9.3	A	9.1	A
OVERALL		20.5	C	22.6	C	38.5	D
Albany-Shaker Road & Wolf Road							
Albany-Shaker Road	EB	19.2	B	18.4	B	18.9	B
	WB	21.0	C	18.3	B	18.5	B
Wolf Road	NB	36.8	D	37.0	D	40.5	D
OVERALL		25.1	C	24.4	C	25.5	C
Albany-Shaker Road & Old Wolf Road							
Albany-Shaker Road	EB	42.5	D	39.8	D	53.5	D
	WB	32.3	C	39.7	D	39.7	D
Old Wolf Road	SB	77.4	E	80.1	F	85.4	F
OVERALL		50.7	D	53.7	D	58.7	E
Old Wolf Road & CD Road (Exit 4 SB Off-Ramp)							
Terminal Drive	EB	8.9	A	9.4	A	N/A	
CD Road	WB	70.0	E	69.3	E		
Old Wolf Road	NB	42.9	D	44.8	D		
	SB	243.3	F	328.7	F		
OVERALL		92.1	F	115.2	F		
Exit 5 SB Ramps & Watervliet-Shaker Road							
Watervliet-Shaker Road	EB	16.4	B	17.6	B	N/A	
	WB	18.8	B	18.3	B		
Exit 5 SB Off-Ramp	SB	20.9	C	22.6	C		
Sherwood Drive	SB	25.8	C	26.5	C		
OVERALL		19.3	B	19.6	B		
Exit 5 NB Ramps & Watervliet-Shaker Road							
Watervliet Shaker Road	EB	14.0	B	15.4	B	N/A	
	WB	12.2	B	15.1	B		
Holly Lane	NB	30.7	C	38.7	D		
Exit 5 NB Off-Ramp	SB	15.7	B	17.4	B		
OVERALL		13.6	B	15.8	B		

Exhibit 2.3.1.7 g
Intersection Level of Service
2016 (ETC) & 2036 (ETC+20) No-Build
PM Peak Hour

Intersection/Approach		2016 (ETC)		2036 (ETC+20)		2046 (ETC+30)	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road							
Central Avenue	EB	29.5	C	32.4	C	N/A	
	WB	37.1	D	36.0	D		
Exit 2 NB Off-Ramp	NB	54.0	D	56.5	E		
Wolf Road	SB	35.9	D	39.4	D		
OVERALL		37.4	D	39.3	D		
Sand Creek Road & Wolf Road							
Sand Creek Road	EB	102.6	F	122.3	F	N/A	
	WB	154.2	F	187.0	F		
Wolf Road	NB	41.5	D	43.8	D		
	SB	38.1	D	39.1	D		
OVERALL		71.0	E	78.6	E		
Metro Park Road & Wolf Road							
Hess Station	EB	40.6	D	45.4	D	N/A	
Metro Park Drive	WB	48.0	D	52.8	D		
Wolf Road	NB	28.5	C	42.8	D		
	SB	5.4	A	4.6	A		
OVERALL		21.0	C	29.5	C		
Exit 4 NB Off-Ramp & Wolf Road							
Exit 4 NB Off-Ramp & Wolf Road	EB	64.6	E	79.7	E	114.9	F
Wolf Road	NB	182.9	F	198.5	F	339.6	F
	SB	6.4	A	5.7	A	5.9	A
OVERALL		105.6	F	115.2	F	169.6	F
Albany -Shaker Road & Wolf Road							
Albany-Shaker Road	EB	46.3	D	40.6	D	40.8	D
	WB	34.7	C	36.6	D	38.3	D
Wolf Road	NB	59.8	E	53.9	D	49.0	D
OVERALL		48.5	D	44.8	D	43.0	D
Albany -Shaker Road & Old Wolf Road							
Albany-Shaker Road	EB	304.1	F	461.5	F	457.7	F
	WB	41.0	D	42.7	D	49.5	D
Old Wolf Road	SB	60.4	E	62.8	E	86.1	F
OVERALL		149.7	F	212.1	F	214.6	F
Old Wolf Road & CD Road (Exit 4 SB Off-Ramp)							
Terminal Drive	EB	6.3	A	6.3	A	N/A	
CD Road	WB	27.0	C	37.5	D		
Old Wolf Road	NB	14.2	B	15.9	B		
	SB	27.5	C	28.7	C		
OVERALL		24.4	C	30.7	C		
Exit 5 SB Ramps & Watervliet-Shaker Road							
Watervliet-Shaker Road	EB	43.2	D	63.3	E	N/A	
	WB	22.8	C	25.9	C		
Exit 5 SB Off-Ramp	SB	28.5	C	32.4	C		
Sherwood Drive	SB	43.9	D	56.0	E		
OVERALL		32.1	C	41.5	D		
Exit 5 NB Ramps & Watervliet-Shaker Road							
Watervliet Shaker Road	EB	17.8	B	19.4	B	N/A	
	WB	19.2	B	21.4	C		
Holly Lane	NB	41.0	D	39.5	D		
Exit 5 NB Off-Ramp	SB	28.3	C	29.7	C		
OVERALL		20.3	C	22.2	C		

The results of the ETC, ETC+20 and ETC+30 AM and PM peak hour No-Build freeway analyses are summarized in Exhibits 2.3.1.7 h and 2.3.1.7 i. For the ETC+30 condition, the analysis was limited to the

I-87 segment containing the bridge structures over Albany-Shaker Road, as illustrated on Exhibit 2.3.1.7 e.

Exhibit 2.3.1.7 h
Freeway Level of Service
No-Build
AM Peak Hour

Direction	Segment/Junction	2016 (ETC)		2036 (ETC+20)		2046 (ETC+30)	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln[1]	LOS	Density pc/mi/ln[1]	LOS
FREEWAY SEGMENTS							
NB	Exit 2W on to Exit 4 off	19.6	C	19.6	C	-	-
	Exit 4 off to Exit 4 on	14.7	B	14.4	B	13.7	B
	Exit 4 on to Exit 5 off	18.0	B	18.3	C	-	-
	Exit 5 on to Exit 6 off	12.3	B	12.8	B	-	-
SB	Exit 6 on to Exit 5 off	29.9	D	29.6	D	-	-
	Exit 4 off to Exit 5 on	28.8	D	29.7	D	-	-
	Exit 5 on to Exit 4 on	30.4	D	31.4	D	31.4	D
	Exit 4 on to Exit 2W off	34.2	D	35.0	D	-	-
RAMP JUNCTIONS							
NB	Exit 2W on-ramp	16.6	B	16.6	B	-	-
	Exit 4 off-ramp	22.0	C	22.1	C	-	-
	Exit 4 on-ramp	16.8	B	16.3	B	-	-
	Exit 5 off-ramp	22.0	C	22.2	C	-	-
SB	Exit 4 off-ramp	32.8	D	32.8	D	-	-
	Exit 5 on-ramp	25.5	C	26.5	C	-	-
	Exit 4 on-ramp	28.1	D	28.6	D	-	-
	Exit 2W off-ramp	33.0	D	33.4	D	-	-
WEAVE AREAS							
NB	Exit 2E on-ramp to Exit 2W off-ramp	21.4	C	21.6	C	-	-
SB	Exit 2W on-ramp to Exit 2E off-ramp	31.1	D	32.8	D	-	-

1 - pc/mi/ln = passenger cars per mile per lane

Exhibit 2.3.1.7 i Freeway Level of Service No-Build PM Peak Hour							
Direction	Segment/Junction	2016 (ETC)		2036 (ETC+20)		2046 (ETC+30)	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln[1]	LOS	Density pc/mi/ln[1]	LOS
FREEWAY SEGMENTS							
NB	Exit 2W on to Exit 4 off	36.3	E	37.3	E	-	-
	Exit 4 off to Exit 4 on	31.5	D	32.2	D	31.8	D
	Exit 4 on to Exit 5 off	**	F	**	F	-	-
	Exit 5 on to Exit 6 off	32.0	D	32.8	D	-	-
SB	Exit 6 on to Exit 5 off	16.9	B	18.6	C	-	-
	Exit 4 off to Exit 5 on	16.7	B	18.0	B	-	-
	Exit 5 on to Exit 4 on	18.3	C	19.3	C	19.9	C
	Exit 4 on to Exit 2W off	25.2	C	26.8	D	-	-
RAMP JUNCTIONS							
NB	Exit 2W on-ramp	29.6	D	29.9	D	-	-
	Exit 4 off-ramp	33.5	D	33.9	D	-	-
	Exit 4 on-ramp	36.7	F	37.8	F	-	-
	Exit 5 off-ramp	46.6	F	48.1	F	-	-
SB	Exit 4 off-ramp	19.3	B	20.9	C	-	-
	Exit 5 on-ramp	16.7	B	18.0	B	-	-
	Exit 4 on-ramp	22.7	C	24.5	C	-	-
	Exit 2W off-ramp	26.2	C	27.7	C	-	-
WEAVE AREAS							
NB	Exit 2E on-ramp to Exit 2W off-ramp	39.1	E	38.9	E	-	-
SB	Exit 2W on-ramp to Exit 2E off-ramp	26.8	C	28.6	D	-	-

1 - pc/mi/ln = passenger cars per mile per lane
** - Density is greater than 45 pc/mi/ln and can no longer be calculated with the basic freeway analysis. Segment is oversaturated.

During the AM peak hour, all of the freeway segments, ramp junctions and weave areas are estimated to operate at LOS D or better through ETC+20. There some instances where the density reported decreases in future years. This is related to either no growth on the mainline combined with slight growth on the ramp or a slight decrease in ramp volumes. Since the traffic volumes are based on CDTC's regional demand model, future years incorporate planned projects and growth that influence traffic patterns and diversions, which result in these decreases.

During the PM peak hour, the following locations operate at LOS E or worse under the ETC+20 No-Build condition in the northbound direction:

- Freeway Segments
  - Exit 2W on to Exit 4 exit ramp
  - Exit 4 on to Exit 5 exit ramp
- Ramp Junctions
  - Exit 4 entrance ramp
  - Exit 5 exit ramp
- Weave Areas
  - Exit 2E entrance ramp to Exit 2W exit ramp

There is no substantial degradation in operations beyond the Exiting condition because there is little growth estimated on I-87 in the regional demand model. Similar to the AM peak hour, there are a few

instances where the density reported decreases in a future year; these instances are related to slight decreases in ramp volumes from the regional demand model.

2.3.1.8. Safety Considerations, Accident History and Analysis

An accident history investigation was conducted for the project study area. The accident data covered a three year period from January 1, 2007 to December 31, 2009 and covered the project study area on I-87, Wolf Road, Watervliet-Shaker Road, Albany-Shaker Road and Old Wolf Road. An updated set of data was also used that included an additional three months of data and included a signal study that was conducted at the intersection of Albany-Shaker Road & Old Wolf Road/I-87 SB entrance ramp. A detailed description of the analysis, accident records and collision diagrams are included in Appendix F.

The current High Accident Location (HAL) period is from November 1, 2007 to October 31, 2009. There were no HALs on the section of I-87 studied from Route Marker (RM) 2016 (Colonie Town Line) to RM 2042 (just north of the Exit 5 northbound on ramp). Wolf Road (NY 910B) was a Priority Investigation Location (PIL) from RM 1010 (Computer Drive) to RM 1015 (just south of Marcus Boulevard) and from RM 1016 (Marcus Boulevard) to 1019 (Albany-Shaker Road). Watervliet-Shaker Road (NY 155) was a Safety Deficient Location (SDL) from RM 3058 (Sherwood Drive) to RM 3060 (Old Niskayuna Road).

I-87 is a six lane divided Urban Principal Arterial Interstate highway with full control of access. There were 303 total accidents on this segment of I-87 during the study period. The accident rate was 0.87 accidents per million vehicle miles (acc/mvm) which is less than the expected accident rate of 1.10 acc/mvm for similar highways statewide. There was one fatality and no accidents involving pedestrians or bicyclists.

Wolf Road is a four lane divided Urban Principal Arterial highway with no control of access. There were 52 accidents in the first section studied (RM 1010 to 1015) during the January 1, 2007 to March 31, 2010 study period. The accident rate was 2.41 acc/mvm which is less than the expected accident rate of 3.59 acc/mvm for similar highways statewide. There was one accident involving a pedestrian and no accidents involving bicyclists.

There were 132 accidents in the second section of Wolf Road studied (RM 1016 to 1019) and the accident rate was 9.46 acc/mvm which is greater than the expected accident rate of 3.59 acc/mvm for similar highways statewide. There were no accidents involving pedestrians or bicyclists.

Watervliet-Shaker Road is a two lane undivided Urban Minor Arterial with no control of access. There were 46 accidents on the SDL section (RM 3058 to 3061 (Feiden Lane)) evaluated during the period January 1, 2007 to September 30, 2010. The accident rate of 8.79 acc/mvm is greater than the expected accident rate of 4.27 acc/mvm for similar highways statewide. There were no accidents involving pedestrians or bicyclists.

Albany-Shaker Road (CR 151) carries NY Touring Route 155. There were 55 accidents on the section studied, and the accident rate was 1.98 acc/mvm. This rate cannot be compared to the statewide average as it is not a state route. There were no accidents involving pedestrians or bicyclists.

Old Wolf Road (CR 153) also carries NY Touring Route 155. There were 55 accidents on the section studied, and the accident rate was 5.11 acc/mvm. This rate cannot be compared to the statewide average as it is not a state route. There were no accidents involving pedestrians and one involving a bicyclist.

A summary crash severity for the project area is provided in Exhibit 2.3.1.8 a and a summary of accident type for the project area intersections is provided in Exhibit 2.3.1.8 b.

Exhibit 2.3.1.8 a Crash Severity Jan 1, 2007 to Dec 31, 2009				
Facility Type	**Non-Reportable**	**Property Damage Only**	**Personal Injury**	**Fatality**
Non-freeway	0%	62%	38%	0%
Freeway	22%	53%	25%	0%*

* There was one fatality reported during the studied period.

Exhibit 2.3.1.8 b Crash Types: Intersections Jan 1, 2007 to Dec 31, 2009										
Link	**Head On**	**Right Angle**	**Rear End**	**Left Turn**	**Fixed Object**	**Over take**	**Side swipe**	**Ped/ Bike**	**Backing**	**Total**
Wolf Road & Metro Park Road	1	3	3	2	0	2	0	0	0	11
Wolf Road & I-87 Exit 4 NB off-ramp	0	0	9	0	0	3	0	0	0	12
Wolf Road & Albany-Shaker Road	0	10	42	27	0	6	0	0	0	85
Albany-Shaker Road & Old Wolf Road/I-87 Exit 4 SB on-ramp	0	1	11	5	1	1	2	0	0	21
Old Wolf Road & I-87 Exit 4 SB off-ramp	0	0	33	0	1	0	0	0	0	34
Watervliet-Shaker Road & I-87 Exit 5 NB ramps	0	1	2	4	2	0	0	0	0	9
Watervliet-Shaker Road & I-87 Exit 5 SB ramps	0	2	6	4	0	1	0	1	1	15
Total	1	17	106	42	4	13	2	1	1	187

The accident rates for intersections are expressed as accidents per million entering vehicles (ACC/MEV) and accident rates for roadway links are expressed as accidents per million vehicle miles (ACC/MVM). For intersections on or including State facilities, the statewide average accident rate for similar facilities is provided for comparison purposes. Accident rates for the project area intersections are summarized in Exhibit 2.3.1.8 c.

Exhibit 2.3.1.8 c Intersection Accident Rates		
Intersection	**Accident Rate ACC/MEV**	**Statewide Average ACC/MEV**
Wolf Road & Metro Park Road	0.27	0.15
Wolf Road & I-87 Exit 4 NB off-ramp	0.33	0.11
Wolf Road & Albany-Shaker Road	1.54	0.11
Albany-Shaker Road & Old Wolf Road/I-87 Exit 4 SB on-ramp	0.46	0.11
Old Wolf Road & I-87 Exit 4 SB off-ramp	1.77	0.19
Watervliet-Shaker Road & I-87 Exit 5 NB ramps	0.35	0.15
Watervliet-Shaker Road & I-87 Exit 5 SB ramps	0.66	0.15

As summarized in Exhibit 2.3.1.8 c, all of the studied intersections exceed statewide averages for similar facilities. Locations that particularly stand out as greatly exceeding the statewide average are Wolf Road & Albany-Shaker Road and Old Wolf Road & I-87 Exit 4 SB off-ramp. The predominant accident types at Wolf Road & Albany-Shaker Road were rear end and left-turn. At Old Wolf Road & I-87 Exit 4 SB off-ramp, all but one of the reported accidents were rear ends. A high occurrence of rear end accidents typically correlates to traffic congestion where vehicles are in stop-and-go traffic and/or reaching the end of forming queues.

2.3.1.9. Existing Police, Fire Protection and Ambulance Access

The project area is serviced by several police, fire and ambulance departments; I-87, Albany-Shaker Road, Wolf Road and Old Wolf Road are the major access routes for emergency services within the project study area.

None of the emergency service providers are stationed within the project area. Police service is provided by the Town of Colonie Police Department, Albany County Sheriff's Department and the New York State Police Troop G. The Town of Colonie Police Department, which patrols the local roads in the project area, is headquartered in the Town of Colonie Public Safety Building located on Old Wolf Road. The Albany County Sherriff's Department patrols the county roads in the project area and is headquartered at the Albany County Sheriff's Office located on Eagle Street in the City of Albany. The New York State Police Troop G primarily patrols I-87 within the project area and is headquartered off Exit 6 of Interstate 87 on Troy-Schenectady Road in the Town of Latham.

The project area is served by the Shaker Road Loudonville Fire Department, the Fuller Road Volunteer Fire Department, and the Village of Colonie Volunteer Fire Company. The majority of the PSA falls within the boundary of the Shaker Road Loudonville Fire District. A small portion of the project corridor, at the western end of the study area is covered by the Fuller Road and Village of Colonie Fire Departments. The Fuller Road District covers portions of I-87 at the western end and the land to the south; the Village of Colonie Department also handles a small piece of I-87 between the Fuller Road District boundary, the portion of I-87 west of Sand Creek Road, and the areas generally north of I-87.

Emergency Services are provided by the Town of Colonie Emergency Medical Services (EMS) Department, Albany Capitaland Ambulette, and Wildwood Transportation. The Town of Colonie EMS Department also provides mutual aid to neighboring communities as well as air ambulance services aboard the NYS Police Lifeguard Air Rescue helicopter.

2.3.1.10. Parking Regulations and Parking Related Conditions

Parking is restricted within the project limits on all of the major roadways including Albany-Shaker Road, Wolf Road, Old Wolf Road, and Watervliet-Shaker Road.

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

2.3.1.11. Lighting

Street lighting currently exists on Wolf Road, Albany-Shaker Road east of the former Engel's Farmstand, and Watervliet-Shaker Road in the Exit 5 area. In addition, street lighting also exists on Ulenski Drive, Beltrone Drive, and Metro Park Road.

The lighting on Wolf Road consists of aluminum post lighting standards. Utility pole-mounted aluminum bracket arm lighting are located on Albany-Shaker Road, Watervliet-Shaker Road, and Ulenski Drive. Aluminum post lighting standards are located on Beltrone Drive and decorative lighting poles and fixtures are located on Metro Park Road.

In general, the lighting fixtures are all well maintained and functioning.

2.3.1.12. Ownership and Maintenance Jurisdiction

Exhibit - 2.3.1.12
Existing Maintenance Jurisdiction

Part No.	Highway	Limits	Centerline (mi)	Lane (mi)	Agency	Authority
Highway						
1	I-87	Exit 2 - Exit 5	2.90	17.40	NYSDOT	Section 340-B Highway Law
2	Albany-Shaker Rd	Maxwell Rd - Meeting House Rd	1.47	6.19	Albany County	Section 129 Highway Law
3	Wolf Rd	Central Ave – Albany-Shaker Rd	1.90	8.54	NYSDOT	Section 10, Subdivision 25 Highway Law
4	Old Wolf Rd	Albany-Shaker Rd – Watervliet-Shaker Rd	0.78	1.72	Albany County	Section 129 Highway Law
5	Watervliet-Shaker Rd	Exit 5 - Old Wolf Rd	0.54	1.54	Albany County	Section 129 Highway Law
6	Metro Park Rd	Wolf Rd - Aviation Dr.	0.27	0.56	Town of Colonie	Section 81 Highway Law
Control of Snow and Ice						
7	I-87	Exit 2 - Exit 5	2.90	17.40	NYSDOT	Section 340-B Highway Law
8	Albany-Shaker Rd	Maxwell Rd - Meeting House Rd	1.47	6.19	Albany County	Section 135 Highway Law
9	Wolf Rd	Central Ave – Albany-Shaker Rd	1.90	8.54	NYSDOT	Section 12 Highway Law
10	Old Wolf Rd	Albany-Shaker Rd – Watervliet-Shaker Rd	0.78	1.72	Albany County	Section 135 Highway Law
11	Watervliet-Shaker Rd	Exit 5 - Old Wolf Rd	0.54	1.54	Albany County	Section 135 Highway Law
12	Metro Park Rd	Wolf Rd – Aviation Rd	0.27	0.56	Town of Colonie	Section 140 Highway Law

Exhibit - 2.3.1.12 Existing Maintenance Jurisdiction						
Part No.	**Highway**	**Limits**	**Centerline (mi)**	**Lane (mi)**	**Agency**	**Authority**
Sidewalks						
13	Albany-Shaker Rd	Maxwell Rd - Meeting House Rd	0.43	-	Albany County	Section 151 Highway Law
14	Wolf Rd	Central Ave – Albany-Shaker Rd	1.90	-	Town of Colonie/Village of Colonie	Section 140/ Section 46 Highway Law
Lighting						
15	Albany-Shaker Rd	Maxwell Rd - Meeting House Rd	0.58	-	Albany County	Section 81 Highway Law
16	Wolf Rd	Central Ave – Albany-Shaker Rd	1.90	-	Town of Colonie/Village of Colonie	By Agreement with the Town and Village
17	Watervliet-Shaker Rd	Exit 5 - Old Wolf Rd	0.54	-	Albany County	Section 81 Highway Law
18	Metro Park Rd	Wolf Rd – Aviation Rd	0.27	-	Beltrone	By Agreement with the Town
Municipally Owned Utilities						
19	Albany-Shaker Rd	Maxwell Rd - Meeting House Rd	1.47	-	Town of Colonie	Section 10, Subdivision 24 Highway Law
20	Wolf Rd	Central Ave – Albany-Shaker Rd	1.90	-	Town of Colonie	Section 10, Subdivision 24 Highway Law
21	Old Wolf Rd	Albany-Shaker Rd – Watervliet-Shaker Rd	0.78	-	Town of Colonie	Section 10, Subdivision 24 Highway Law
22	Watervliet-Shaker Rd	Exit 5 - Old Wolf Rd	0.54	-	Town of Colonie	Section 10, Subdivision 24 Highway Law
23	Metro Park Rd	Wolf Rd – Aviation Rd	0.27	-	Town of Colonie	Section 10, Subdivision 24 Highway Law
Note: Facilities shall be maintained by the listed agency pending signing of the agreement between the agency and the state.						

Refer to Appendix A for a maintenance jurisdiction map.

2.3.2. Multimodal

2.3.2.1. Pedestrians

There are no existing pedestrian facilities on I-87 and pedestrians are prohibited on Interstate Highways by state law.

The existing pedestrian facilities on Albany-Shaker Road consist of a mix of concrete and asphalt sidewalks. The existing sidewalks are typically 4-5 ft. in width and are in generally good condition. The sidewalks east of Wolf Road were reconstructed in 2010 as part of the Maxwell Road roundabout project. The pedestrian facilities along Albany-Shaker Road are not continuous through the project area. In general, an existing sidewalk is located on both sides of the road east of Wolf Road, on the south side of the road between Wolf Road and Old Wolf Road, and a shared use path is located along the southwest side of Albany-Shaker Road west of the Albany International Airport. There is no existing connection between the sidewalks east of Wolf Road and the shared use path west of the airport.

The existing pedestrian facilities along Wolf Road consist of concrete sidewalks along both sides of the roadway throughout the project study area. The existing sidewalks are typically 5 ft in width and are in fair condition. The sidewalks and ramps were constructed in 2001 to comply with Americans with Disabilities Act Accessibility Guidelines (ADAAG) requirements with respect to ramp slopes, ramp texture, and sidewalk surface conditions.

There are no existing separate provisions for pedestrians on Old Wolf Road or Watervliet-Shaker Road. The occasional pedestrian may legally use the paved shoulder.

A pedestrian generator checklist is included in Appendix F.

2.3.2.2. Bicyclists

There are no existing bicycle facilities on I-87 since bicyclists are prohibited on Interstate Highways by state law.

There are no designated State Bicycle Routes within the project study area. Albany-Shaker Road, Wolf Road, and Sand Creek Road are part of CDTC's Bicycle/Pedestrian Priority Network.

The Albany-Shaker Trail, shown in Exhibit 2.3.2.2., is a paved trail mainly along Albany-Shaker Road and Watervliet-Shaker Road. It begins at the intersection of Watervliet-Shaker Road and Airline Drive and extends approximately 1000 ft. north along the east side of Watervliet-Shaker Road before crossing over the roadway to the west side of the road. The trail continues north along the west side of Watervliet-Shaker Road and Albany-Shaker Road to Cornell Road. On either end of the trail, widened shoulders provide bicycle accommodations along Heritage Lane and Airline Drive connecting to the Ann Lee Pond Nature and Historic Preserve and on Cornell Road and British American Boulevard connecting to Troy-Schenectady Road (NYS Route 7).

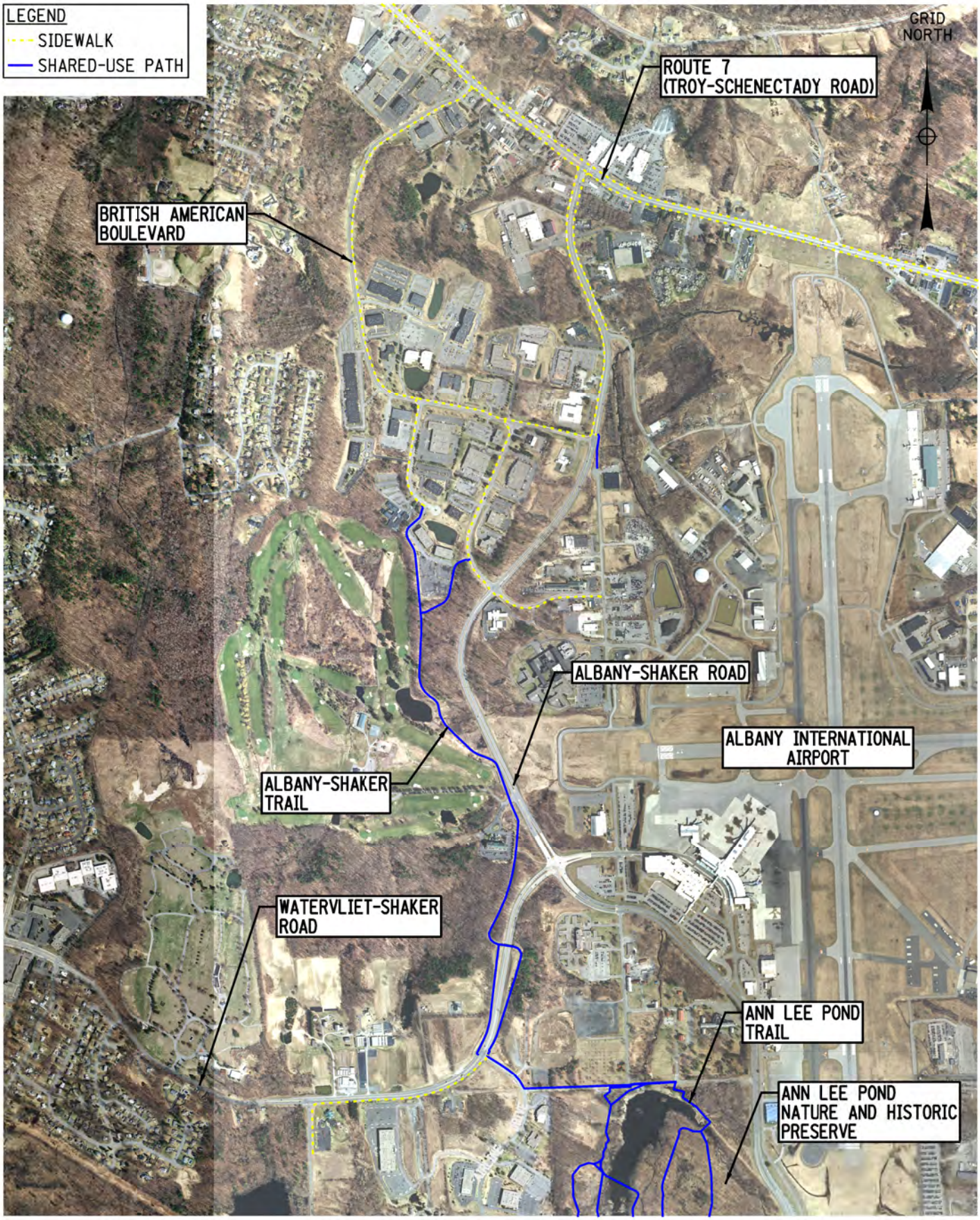
Together, the sidewalk, widened shoulders, and shared use path provide a connection between the Albany International Airport and Troy-Schenectady Road (NYS Route 7). The path accommodates pedestrians and bicycle traffic between NYS Route 7, NYS Route 155, and the Ann Lee Pond Nature and Historic Preserve. Sidewalks are located along Sand Creek Road, on Watervliet-Shaker Road between Sand Creek Road and Airline Drive, on Airline Drive between Watervliet-Shaker Road and Heritage Lane, and on Heritage Lane between Airline Drive and Ann Lee Pond. A shared use path is also located along Heritage Lane between Heritage Park and the Ann Lee Nursing Home.

The travel lanes on Wolf Road include 4 ft. curb offsets to accommodate bicyclists between Sand Creek Road and Albany-Shaker Road. South of Sand Creek Road, 14 ft. shared lanes accommodate bicyclists on Wolf Road. Bicyclists on Albany-Shaker Road, Old Wolf Road, and Watervliet-Shaker Road (at Exit 5) are currently accommodated on the existing travel lanes and shoulders.

2.3.2.3. Transit

Stops for one bus route run by Capital District Transportation Authority (CDTA) are located on Albany-Shaker Road within the project study area. Bus Route 31 runs between downtown Albany and the Albany International Airport and has stops along Albany-Shaker Road between Northern Boulevard and the airport.

Three additional routes operate in, but do not have any stops within the project study area. Bus Route 610 runs between Colonie Center and Route 7 at Vly Road. It has stops at Colonie Center and Albany International Airport within the traffic influence area. This route also provides flexible service for stops along the route by request. Bus Route 737 runs between downtown Albany, Corporate Woods, and Albany International Airport. It has stops at Route 7 at Vly Road, at British American Boulevard, the airport, Atrium Drive and Palisades, Corporate Woods, Washington Avenue and Lark Street, and Madison Avenue and Green Street. The Northway Express, Bus Route NX, also provides service through the project study area on I-87. It operates between downtown Albany and South Glens Falls with stops in



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ALBANY SHAKER TRAIL LOCATION MAP

INTERSTATE 87 (I-87) EXIT 3 / 4
ACCESS IMPROVEMENTS

EXHIBIT
2.3.2.2

DATE: 08/13

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DATE/TIME = 10/24/2013
USER = 2210

Clifton Park / Halfmoon, Round Lake, Ballston Spa, and Saratoga Springs, but no stops within the project study area.

Park and Ride lots are located throughout the Capital District. Many are owned by Capital District Transportation Authority (CDTA), while others are owned by private entities and located in shopping centers or mall parking lots. Parking at these privately owned lots is free and bus service is provided by CDTA. There are no park and ride lots located within the project study area; however, several are located along the I-87 corridor north and south of the project area. CDTA provides express service, transit service with limited stops, along I-87 between many of the park and ride lots along I-87 and downtown Albany.

2.3.2.4. Airports, Railroad Stations, and Ports

The Albany International Airport is located at the northern project limit along Albany-Shaker Road. The airport is owned and maintained by the Albany County Airport Authority, which has completed several safety improvements and parking expansions in the past 10-years. A major passenger terminal redevelopment project was completed in 1997. The airport serves as the major air center for the Capital Region, northeastern New York, and western New England. Passenger activity reached its highest level in 2005 with over 3.0 million annual passengers. Current activity (2011) has declined to under 2.5 million, but is forecast to steadily rebound to previous highs over the next 20-years. While the Airport has a large capital improvement plan for facility upgrades and rehabilitation, no significant airport expansions are planned for the foreseeable future.

Customer/passenger travel to and from the Airport is nearly exclusively by private passenger vehicles, including personal vehicles, taxi services, hotel shuttles, and rental cars. All major rental car companies operate from the airport parking garage, with most maintenance facilities located off Albany-Shaker Road to the north of the Airport. Currently, there is one private off-airport parking service provider located on Old Wolf Road, which transports passengers to the terminal by commercial passenger vans.

The Capital District Transportation Authority (CDTA) provides mass transit to the Airport from downtown Albany, via Albany-Shaker Road, on Commuter Bus Line 737. The bus service to the Airport is used primarily by employees working at the Airport. This bus service connects to other CDTA lines that serve the capital region. The Albany County Airport Authority (ACAA) does not anticipate passenger mass transit use to increase in the future, and has focused their efforts on providing numerous options of paid airport parking. Parking is a notable revenue source for the Airport.

No conflicts exist with the flight paths of aircraft using this airport.

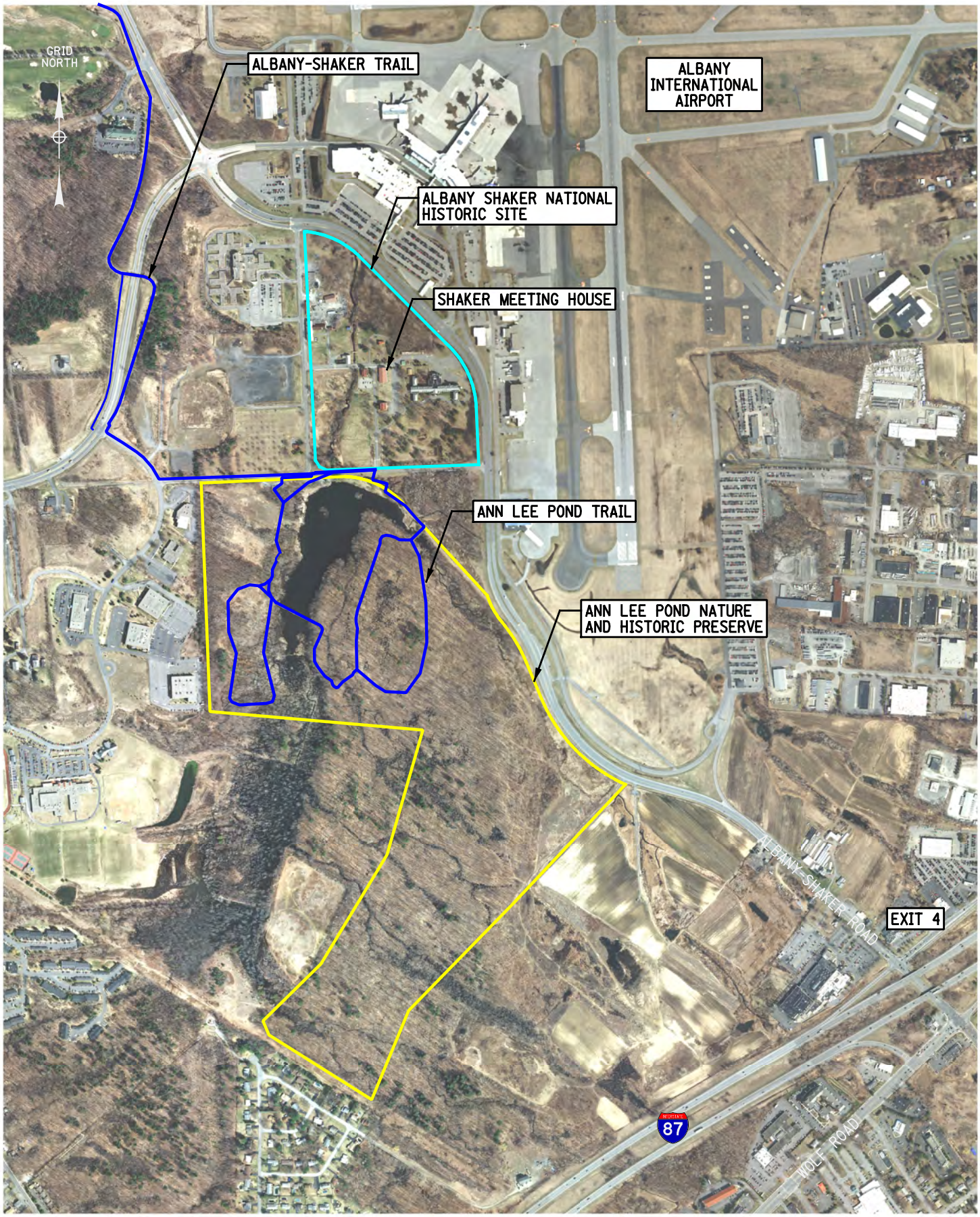
One rail line exists near the project area along the southern border of the Town of Colonie. I-87 crosses the rail line between Exit 1 and Exit 2 at a grade separated rail crossing. The rail line is owned by CSX Transportation (CSX) with operations run by both CSX and Amtrak. There are no at-grade rail crossings in or near the general project area.

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

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

The unique landscape character west of Wolf Road offers an array of experiences including historic sites (Ann Lee Home / First Shaker Settlement), and the Ann Lee Pond Nature and Historic Preserve. The preserve is located in the northwest corner of the project study area and includes walkways through the preserve as well as a connection to the shared use path along Albany-Shaker Road and Watervliet-Shaker Road west of the airport. Exhibit 2.3.2.5 a shows the location of the recreational sites associated with the Ann Lee Pond Nature and Historic Preserve.

A Section 4(f) evaluation will be required for any impacts to the Ann Lee Pond Nature and Historic Preserve because it is a publicly owned park. Neither Land and Water Conservation Funds nor Urban



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RECREATION AREAS LOCATION MAP

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT
2.3.2.5 a

DATE: 9/13

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Park and Recreation Recovery Funds were used at the Ann Lee Pond Nature and Historic Preserve; therefore, Section 6(f) and Section 110 evaluations would not be required for any project impacts to the Ann Lee Pond Nature and Historic Preserve.

2.3.3. Infrastructure

2.3.3.1. Existing Highway Section

Interstate 87:
The portion of I-87 from Exit 2 to Exit 5 typically consists of a six-lane divided highway with three travel lanes in each direction. The highway cross section typically consists of 48 ft. of concrete pavement with an asphalt overlay in each direction separated by a grass median varying in width. The roadway in each direction consists of three, 12 ft. travel lanes, an 8 ft. right shoulder, and a 4 ft. left shoulder. The median has an average width of 140 ft. At Exit 2 the median is 25 ft. of asphalt concrete with guide railing separating the directional traffic. Immediately north of Exit 2, the median changes to grass and widens out to approximately 140 ft. The section is typically uncurbed with the exception of bridges along the Interstate where 8 inch concrete curbs are located on both sides of the roadway.

The existing horizontal alignment on I-87 is generally straight with curves having radii greater than 5275 ft. The existing vertical alignment on I-87 is generally flat with grades ranging between +2.0% and -1.8%. Parking, pedestrians, and bicycles are all prohibited on I-87.

The right-of-way (ROW) on I-87 varies in width within the project study area. It is generally between 380 and 685 ft. in width. Access to I-87 is controlled through grade-separated interchanges at Exit 2 (NYS Route 5, Central Avenue), Exit 4 (Albany-Shaker Road), and Exit 5 (NYS Route 155, Watervliet-Shaker Road).

Albany-Shaker Road (NYS Route 155 / CR 151):
The portion of Albany-Shaker Road from the Albany International Airport to Maxwell Road typically consists of a four-lane roadway with two travel lanes in each direction. The highway cross section typically consists of four 11 ft. travel lanes. The portion between Wolf Road and Old Wolf Road consists of five lanes, two travel lanes in each direction and a variable left-turn lane in the center. East of the project area, approaching the Maxwell Road roundabout, the lane configuration changes to a two lane roadway consisting of one 11 ft. travel lane in each direction. The shoulder width along Albany-Shaker Road varies from 6 ft. between Maxwell Road and Wolf Road, no shoulders between Wolf Road and Old Wolf Road, 4 ft. shoulders between Old Wolf Road and the Albany International Airport long-term parking lot entrance, and 8 ft. shoulders west of the Albany International Airport long-term parking lot entrance. Left turn lanes are present at major intersections along the roadway. Curbs are located between Maxwell Road and the Albany International Airport long-term parking lot entrance.

The existing horizontal alignment of Albany-Shaker Road within the project study area is generally straight with horizontal curves having radii greater than 1130 ft. The existing vertical alignment is generally flat with grades less than 2.0%. Parking is prohibited on Albany-Shaker Road within the project study area. In general there are pedestrian accommodations east of Wolf Road consisting of 5 ft. concrete sidewalks on both sides of the roadway. An asphalt sidewalk is also located on the south side of the roadway between Wolf Road and Old Wolf Road.

The ROW on Albany-Shaker Road varies in width and is generally between 50 ft. and 100 ft. in width. Four existing intersections on Albany-Shaker Road are within the project study area. These intersections are at Meeting House Road, Old Wolf Road / Exit 4 SB Entrance Ramp, Wolf Road / Exit 4 NB Entrance Ramp, and Old Maxwell Road.

The intersection of Albany-Shaker Road and Meeting House Road is a T-type stop-controlled intersection. It is located at the northwest corner of the project study area approximately 1 mile west of Old Wolf Road. Meeting House Road has a one lane stop-controlled approach. A raised median is

located along this section of Albany-Shaker Road; therefore, access to Meeting House Road is limited to right-in and right-out movements. There are no existing sidewalks or crosswalks at this intersection.

The intersection of Albany-Shaker Road, Old Wolf Road, and the Exit 4 SB Entrance Ramp is a four-leg signalized intersection. Old Wolf Road has a three lane approach consisting of an 11 ft. left-turn lane, an 11 ft. travel lane, and an 11 ft. right-turn lane. The intersection leg opposite Old Wolf Road is the I-87 Exit 4 southbound entrance ramp, and consists of a 14 ft. one-way lane departing from the intersection. The eastbound Albany-Shaker Road approach consists of a 10 ft. left-turn lane, two 11 ft. travel lanes, and an 11 ft. right-turn lane. The westbound Albany-Shaker Road approach consists of a 10 ft. left-turn lane, an 11 ft. through lane, and a shared 11 ft. through/right-turn lane. There are no marked crosswalks at this intersection although an asphalt sidewalk is present on the southeast corner approaching the intersection.

The intersection of Albany-Shaker Road, Wolf Road, and the Exit 4 NB Entrance Ramp is also a four-leg signalized intersection. Wolf Road has a four lane approach consisting of an 11 ft. left-turn lane, a 12 ft. shared left-turn/through lane, a 12 ft. through lane, and a 15 ft. right-turn lane. The intersection leg opposite Wolf Road is the I-87 Exit 4 northbound entrance ramp. This leg consists of two 11 ft. one-way lanes departing from the intersection. The eastbound Albany-Shaker Road approach consists of a 10 ft. left-turn lane, an 11 ft. through lane, an 11 ft. shared through/right-turn lane, and a 12 ft. right-turn lane. The westbound Albany-Shaker Road approach consists of a 10 ft. left-turn lane, two 11 ft. through lanes, and an 11 ft. right-turn lane. There are marked crosswalks and pedestrian signals on the northbound and westbound approaches to this intersection.

The intersection of Albany-Shaker Road and Old Maxwell Road is a T-type stop-controlled intersection. It is located approximately 475 ft. east of Wolf Road. Maxwell Road has a one lane stop controlled approach. A raised median on Maxwell Road limits movements at this intersection to right-in and right-out. A marked crosswalk is located across Maxwell Road at this intersection.

Wolf Road (NYS Route 910B):
The portion of Wolf Road from Albany-Shaker Road to Cerone Commercial Drive typically consists of a five-lane roadway with two travel lanes in each direction and a two-way left-turn lane. The highway cross section typically consists of four 11 ft. travel lanes, a 16 ft. two-way left-turn lane, and 4 ft. curb offsets for a total pavement width of 68 ft. The two-way left-turn lane transitions to a left-turn lane at major intersections along Wolf Road. A 6 inch concrete curb is located on both sides along the entire length of the roadway.

The existing horizontal alignment of Wolf Road within the project study area is generally straight with horizontal curves with radii greater than 2865 ft. The existing vertical alignment within the project study area is generally flat with grades less than 1.6%. Parking is prohibited on Wolf Road within the project study area.

A continuous pedestrian facility, consisting of concrete sidewalks, accessibility ramps, marked crosswalks and pedestrian signals at major intersections is located along both sides of Wolf Road between Central Avenue and Albany-Shaker Road. A maintenance strip, approximately 5 ft. wide, is located between the sidewalk and curb.

The ROW on Wolf Road is approximately 100 ft. wide. Seven existing intersections on Wolf Road are within the project study area. These intersections are at Albany-Shaker Road, the Exit 4 NB Exit Ramp, Ulenski Drive, Marcus Boulevard, Beltrone Drive, Metro Park Road and Cerone Commercial Drive.

A description for the intersection of Wolf Road and Albany-Shaker Road is located under the “Existing Highway Section” for Albany-Shaker Road.

The intersection of Wolf Road and the Exit 4 northbound exit ramp is a T-type signalized intersection. The Exit 4 northbound exit ramp is a three lane approach consisting of two 12 ft. left-turn lanes and an 11 ft. right-turn lane. The northbound Wolf Road approach consists of four 11 ft. through lanes. The

southbound Wolf Road approach consists of two 11 ft. through lanes. Marked crosswalks and pedestrian signals are located on the northbound and eastbound approaches to the intersection.

The intersections of Wolf Road and Ulenski Drive and Wolf Road and Beltrone Drive are T-type stop-controlled intersections. In each case the westbound approach (Ulenski Drive and Beltrone Drive) is a one lane stop-controlled approach. The northbound and southbound Wolf Road approaches consist of two 11 ft. through lanes separated by a 16 ft. wide two-lane left-turn lane. Marked crosswalks are located on the westbound and northbound approaches to Ulenski Drive. Marked crosswalks are located on the westbound and southbound approaches to Beltrone Drive. No pedestrian signals are located at either intersection.

The intersection of Wolf Road and Marcus Boulevard is a four-way signalized intersection. The Marcus Boulevard approach is two lanes consisting of a 12 ft. left-turn/through lane and a 12 ft. right-turn lane. The approach opposite Marcus Boulevard is the Best Western driveway. The Best Western driveway approach consists of one 16 ft. wide lane. The northbound Wolf Road approach consists of an 11 ft. left-turn lane, two 11 ft. through lanes, and an 11 ft. right-turn lane. The southbound Wolf Road approach consists of an 11 ft. left-turn lane and two 11 ft. through lanes. Marked crosswalks and pedestrian signals are located across the Wolf Road and Marcus Boulevard approaches to the intersection.

The intersection of Wolf Road and Metro Park Road is a four-way signalized intersection. The Metro Park Road approach is two lanes consisting of a 15 ft. left-turn lane and a 15 ft. through/right-turn lane. The approach opposite Metro Park Road is the Hess gas station driveway. The Hess driveway approach consists of one 15 ft. wide lane. The northbound Wolf Road approach consists of two 11 ft. through lanes, and an 11 ft. right-turn lane. The southbound Wolf Road approach consists of an 11 ft. left-turn lane and two 11 ft. through lanes. Marked crosswalks and pedestrian signals are located across the Wolf Road and Metro Park Road approaches to the intersection.

The intersection of Wolf Road and Cerone Commercial Drive is a T-type stop-controlled intersection. The eastbound approach on Cerone Commercial Drive consists of one 16 ft. travel lane. The northbound and southbound Wolf Road approaches consist of two 11 ft. through lanes separated by a 16 ft. wide two-lane left-turn lane. A marked crosswalk is located across Cerone Commerical Drive.

Old Wolf Road (NYS Route 155 / CR 153):
Old Wolf Road is a two-lane roadway with one travel lane in each direction. The highway cross section typically consists of two 11 ft. asphalt concrete travel lanes and 5 ft. gravel shoulders. Concrete curbs are located on the western side of the roadway on the approach to Albany-Shaker Road and between Koto Japanese Steakhouse and Albany Park and Fly.

The existing horizontal alignment of Old Wolf Road is generally straight with one horizontal curve with a radius of 600 ft. The existing vertical alignment is generally flat with grades less than 2.0%. Parking is prohibited on Old Wolf Road and there are no pedestrian accommodations along the roadway.

The ROW on Old Wolf Road is approximately 50 ft. in width. Four existing intersections on Old Wolf Road are within the project study area. These intersections are at Albany-Shaker Road, Exit 4 SB Exit Ramp and Terminal Drive, Northway Lane, and Watervliet-Shaker Road and Old Niskayuna Road.

A description for the intersection of Old Wolf Road and Albany-Shaker Road is located under the “Existing Highway Section” for Albany-Shaker Road.

The intersection of Old Wolf Road and the Exit 4 SB Exit Ramp is a T-type signalized intersection. Terminal Drive is located approximately 75 ft. north of the ramp and forms a forth leg to the intersection. Traffic on the southbound approach on Old Wolf Road is required to stop prior to Terminal Drive at the traffic signal. The Exit 4 southbound exit ramp approach consists of one 15 ft. travel lane. The Terminal Drive approach consists of a 15 ft. travel lane. The Old Wolf Road approaches to the intersection consist of one 11 ft. travel lane in each direction. There are no pedestrian accommodations at the intersection.

The intersection of Old Wolf Road and Northway Lane is a T-type stop-controlled intersection. The Northway Lane approach consists of 15 ft. travel lane. The Old Wolf Road approaches to the intersection consist of one 11 ft. travel lane in each direction. There are no pedestrian accommodations at the intersection.

The intersection of Old Wolf Road, Old Niskayuna Road (CR 160), and Watervliet-Shaker Road (NYS Route 155) is a one-lane roundabout. The Old Wolf Road, Old Niskayuna Road, and Watervliet-Shaker Road approaches to the roundabout each consist of one 11 ft. travel lane. There are no pedestrian accommodations at the roundabout.

Watervliet-Shaker Road (NYS Route 155):
Watervliet-Shaker Road is a two-lane roadway with one travel lane in each direction. The highway cross section typically consists of two 11 ft. travel lanes and 6 ft. shoulders. There are no curbs along Watervliet-Shaker Road within the project study area.

The existing horizontal alignment of Watervliet-Shaker Road is generally straight with horizontal curves with radii greater than 8,000 ft. The existing vertical alignment is generally flat with grades less that 2.0%. parking is prohibited on Watervliet-Shaker Road and there are no pedestrian accommodations along the roadway.

The ROW on Watervliet-Shaker Road is approximately 45 ft. in width. Six existing intersections on Watervliet-Shaker Road are within the project study area. These intersections are at Old Wolf Road and Old Niskayuna Road (CR 160), Old Niskayuna Road, the Exit 5 SB ramps and Sherwood Drive, Old Niskayuna Road (CR 152), Swayze Drive, and the Exit 5 NB ramps and Holly Lane.

A description for the intersection of Watervliet-Shaker Road, Old Wolf Road, and Old Niskayuna Road is located under the “Existing Highway Section” for Old Wolf Road.

The intersection of Watervliet-Shaker Road and Old Niskayuna Road is located approximately 700 ft. east of the roundabout at Old Wolf Road. It is a T-type stop-controlled intersection. The Old Niskayuna Road approach consists of a 10 ft. travel lane. The Watervliet-Shaker Road approaches consist of 11 ft. travel lanes in each direction. There are no pedestrian accommodations at this intersection.

The intersection of Watervliet-Shaker Road and the Exit 5 southbound ramps and Sherwood Drive is a five-way signalized intersection. The Exit 5 southbound exit ramp approach consists of an 11 ft. left-turn lane and a 13 ft. through/right-turn lane. The Exit 5 southbound entrance ramp approach consists of one 13 ft. one-way lane departing from the intersection. The Sherwood Drive approach consists of a 22 ft. wide travel lane. The eastbound Watervliet-Shaker Road approach consists of a 12 ft. left-turn/through lane and a 12 ft. travel lane. The westbound Watervliet-Shaker Road approach consists of a 10 ft. left-turn lane and 10 ft. through lane. There are no pedestrian accommodations at the intersection.

The intersection of Watervliet-Shaker Road and Old Niskayuna Road (CR 152) is a T-type stop-controlled intersection. The Old Niskayuna Road approach is a 10 ft. travel lane. The Watervliet-Shaker Road approaches consist of two 11 ft. through lanes in each direction. There are no pedestrian accommodations at the intersection.

The intersection of Watervliet-Shaker Road and Swayze Drive is a four-way stop-controlled intersection. The Swayze Drive approach consists of a 15 ft. travel lane. The approach opposite Swayze Drive is the New York State Department of Transportation Maintenance Facility driveway. The driveway consists of an 18 ft travel lane. The driveway and Swayze drive are both stop-controlled. The Watervliet-Shaker Road approaches to the intersection consist of two 11 ft. travel lanes in each direction. There are no pedestrian accommodations at the intersection.

The intersection of Watervliet-Shaker Road and the Exit 5 northbound ramps and Holly Lane is a four-way signalized intersection. The Exit 5 northbound ramp approach consists of an 11 ft. left-turn lane and an 11 ft. through/right-turn lane. The Holly Lane approach consists of a 12 ft. travel lane. The eastbound

Watervliet-Shaker Road approach consists of an 11 ft. left-turn lane and an 11 ft. travel lane. The westbound Watervliet-Shaker Road approach consists of a 10 ft. left-turn lane and two 11 ft. travel lanes.

2.3.3.2. Geometric Design Elements Not Meeting Standards

2.3.3.2.(1) Critical Design Elements

Based on the roadway classification, traffic volumes, and design speeds, there are six existing non-standard features within the project study area. These non-standard features are described below.

Horizontal Curvature:
The Exit 4 SB Exit Ramp to Old Wolf Road has an existing radius of 310 ft. The Exit 5 NB Exit Ramp to Watervliet-Shaker Road has an existing radius of 247 ft. These are both less than the design standard of 444 ft. for a ramp with a design speed of 40 mph and a maximum superelevation of 8.0%.

Superelevation:
The Exit 4 NB Exit Ramp to Wolf Road has an existing maximum superelevation of 6.0% and minimum radius of 465 ft. This is less than the design standard maximum superelevation of 8.0% for a design speed of 40 mph and minimum radius of 444 ft.

Level of Service:
The existing level-of-service on 2 freeway segments (I-87 northbound between the Exit 2W entrance ramp and Exit 4 exit ramp and between the Exit 4 entrance ramp and Exit 5 exit ramp), at 2 ramp junctions (at the Exit 4 northbound entrance ramp and Exit 5 northbound exit ramp), and in 1 weave area (the northbound weave between the Exit 2E entrance ramp and Exit 2W exit ramp) on I-87 is LOS E or F during the PM peak hour. This is less than the design standard minimum level-of-service for interstates and other freeways of LOS D in heavily developed sections of metropolitan areas.

Control of Access:
On the northwest corner of the Albany-Shaker Road / Old Wolf Road / Exit 4 SB Entrance Ramp intersection, the one-way entrance driveway on Albany-Shaker Road for the Hotel Indigo is 25 ft. from the Exit 4 SB Entrance Ramp. This is less than the required controlled access distance of 50 ft. in either direction on the far side of the crossroad.

Pedestrian Accommodations:
The existing pedestrian facilities on Albany-Shaker Road between Old Wolf Road and Wolf Road consist of a 4 ft. wide asphalt sidewalk. This does not meet the design standard of 5 ft.

2.3.3.2.(2) Other Design Parameters

Based on the roadway classification, traffic volumes, and design speeds, there is one existing non-conforming feature within the project study area. This non-conforming feature is described below.

Deceleration Length:
The Exit 4 NB Exit Ramp to Wolf Road has an existing deceleration lane length of 200 ft. This is less than the American Association of State Highway and Transportation Officials (AASHTO) recommended length of 440 ft.

2.3.3.3. Pavement and Shoulder

The existing asphalt pavement surface on I-87 is in generally fair condition with some longitudinal cracking evident. The existing asphalt pavement surface on Albany-Shaker Road is in generally poor condition with severe cracking. Wolf Road underwent rehabilitation including resurfacing of the existing pavement during the summer of 2001, and currently has a good pavement surface. The existing asphalt pavement surface on Old Wolf Road is in generally fair to poor condition with transverse, longitudinal and edge cracking evident. No pavement cores have been taken as part of the project nor has a Pavement

Evaluation and Treatment Selection Report (PETSR) been prepared to date. It is not anticipated that a PETSR will be completed for this project.

2.3.3.4. Drainage Systems

The existing drainage system on I-87 in the project area generally consists of an open system of ditches and culverts. The existing drainage system is in generally fair to poor condition, and has several culverts partially blocked with silt and other debris. The State let a project in 2011 to replace/repair culverts on I-87 between Western Avenue and the Albany County/Saratoga County line. This project included television inspection of the existing drainage pipes/culverts; cleaning culvert and closed drainage systems; and cleaning, grading, and shaping of existing roadside drainage swales within the project study area. It also included a culvert extension and installation of safety grates on the culvert ends at the existing crossing located approximately 2,700 ft. south of Watervliet-Shaker Road.

The existing drainage system on Albany-Shaker Road west of the airport long-term parking lot entrance generally consists of an open system with surface water collected in roadside swales. The water is directed through cross-culverts and outlets into natural drainage courses which ultimately reach Shaker Creek on the western edge of the project study area. East of the airport's long-term parking entrance, the existing drainage on Albany-Shaker Road consists of a closed drainage system which outlets to a system of roadside drainage swales and eventually to Shaker Creek. Both drainage systems appear to be in generally good condition.

The existing drainage system on Wolf Road within the project limits generally consists of a closed system. The water is directed into natural drainage courses in a northwesterly direction toward Ann Lee Pond and Shaker Creek. The drainage system generally appears to be in good condition.

The existing drainage system on Old Wolf Road within the project limits consists of a closed system between Albany-Shaker Road and the I-87 Exit 4 southbound exit ramp. The closed drainage system inlets appeared to be clogged at several locations and the drainage system overall appears to be in generally poor condition. North of the I-87 Exit 5 southbound exit ramp, an open drainage system collects surface water in roadside swales. The open drainage system generally appears to be in good condition.

2.3.3.5. Geotechnical

A high, seasonal water table between 0.0 ft. and 4.0 ft. below the surface exists in many locations throughout the project study area due to the presence of underlying clay soils. Floodplain deposits are found in the vicinity of Shaker Creek and its floodplain. These deposits consist of a layer of sand, silt and gravel and are approximately 25 ft. thick.

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

2.3.3.6. Structure

2.3.3.6.(1) Description:

(a) BINs: 103314 1 & 2
(b) Feature carried and crossed: I-87 over Albany-Shaker Road
(c) Type of bridge, number and length of spans, etc.: The structures are three-span, simply-supported, steel multi-stringer bridges with structural lengths of 162 ft. The span lengths are 48 ft., 63 ft., and 45 ft. Both structures have two reinforced concrete stub abutments and two reinforced concrete multi-column piers on cast-in-place concrete piles
(d) Width of travel lanes, parking lanes, and shoulders: Both bridges carry three 12.0 ft. wide lanes, two 3.0 ft. wide shoulders, and two 2.6 ft. wide curbed safety walks with bridge rails.
(e) Sidewalks: There are no sidewalks on the I-87 bridges over Albany-Shaker Road. Pedestrians are prohibited on Interstate Highways by state law.
(f) Utilities carried: None

2.3.3.6.(2) Clearances (Horizontal/Vertical)

Each bridge has a curb-to-curb width of 42.0 ft. The out-to-out deck width for both bridges is 47.2 ft. Both bridges carry three 12.0 ft. wide lanes, two 3.0 ft. wide shoulders, and two 2.6 ft. wide curbed safety walks with bridge rails. The distance from the face of railing to the face of curb is 1.7 ft. Parking is not permitted on the bridges and no utilities are located on these bridges.

The existing minimum vertical clearances for the structures are as follows: 14.2 ft. over Albany-Shaker Road under the I-87 southbound structure, 15.0 ft. over Albany-Shaker Road under the I-87 northbound structure.

2.3.3.6.(3) History & Deficiencies

Original construction for BINs 1033141 and 1033142 was completed in 1959. In 1987, substructure rehabilitation was performed on both bridges to replace deteriorated concrete on the abutments and piers. The bridges have “two-course” deck construction consisting of a 7 inch thick concrete slab and a 4 inch cement concrete pavement. A 4-inch asphalt overlay was placed on the original concrete wearing surface in 1988. In 1996, the bridges were rehabilitated during which the asphalt overlay and the steel plate over the existing steel grating in the shoulders, as well as the asphalt and concrete overlays over the remainder of the bridge, were removed. A new concrete overlay was then placed over the entire bridge, filling in the steel grating, and scuppers were installed. New joints were installed at the piers and abutments, partial cover plates were bolted to the bottom flange of interior girders. Shortly after this work was completed, a 2 inch asphalt overlay was placed on the new concrete wearing surface. The approaches and wearing surface were resurfaced again between 2004 and 2006.

In 2011, steel columns were installed under the midspans of the cap beam bays at both piers of both bridges as a temporary repair to help support the severely deteriorated concrete cap beams. The columns installed under the northern piers are founded on timber cribbing resting on the existing grade. It is unknown if the columns beneath the southern piers extend down to the top of footing.

In 2011, NYSDOT took concrete core samples from pier columns of both of the above mentioned bridges. Upon visual inspection, the concrete cores look solid.

2.3.3.6.(4) Inspection

(a) Federal Sufficiency Rating: The current sufficiency ratings for BINs 1033141 and 1033142 are 32.0 and 36.6, respectively.
(b) State Condition Rating: The condition ratings for these structures are 4.094 for BIN 1033141 and 3.906 for BIN 1033142.
(c) Summary of Condition and Inspection Reports and In-depth Inspection.

<u>BIN 1033141</u>
BIN 1033141 is part of the New York State Biennial Bridge Inspection Program and receives annual routine structural and safety evaluations. The bridge has been rated with a General Recommendation of 4 (the best possible rating being 7), a State Computed Condition Rating of 4.094 (the best possible rating being 7) and a Federal Sufficiency Rating of 32 (the best possible being 100). The following items were rated 4 or lower (indicating moderate to severe structural deficiencies) in the 2010 Biennial and 2011 Interim Inspection Reports:

Joints (rated 4 over abutments and 3 over piers) – Asphalt along the joints at both abutments, as well as above both piers, exhibits mapcracking and is beginning to break apart. The concrete headers beneath the joints at Piers 1 & 2 have broken off in several bays. There is active leakage in Bays 1 & 6 at the Begin Abutment, and in Bays 1 & 2 at Pier 2. While there is no active leakage at the End Abutment and Pier 1, there is evidence of previous leakage with the existence of efflorescence staining on the concrete below.

Approach Erosion (rated 4) – At the end of the begin right wingwall, there is a 4.5 ft. wide by 1.5 ft. deep erosion gully that extends approximately 10 ft. down the embankment.

Approach Pavement (rated 4) – Cracked pavement at both abutment joints has created a slight bump for traffic. A 1 inch deep pothole is beginning to form along a sawcut line at the end right approach.

Guide Rail (rated 4) – At the end left guide rail, the box beam and first six posts have impact damage. Post 3 is severed at the base and the remaining five posts lean and twist to varying degrees away from the roadway. The remainder of railing is still firm and appears to still be functional. The guide rail has been repaired since the last biennial inspection was completed.

Structural Deck (rated 3 in Spans 1 & 3, rated 4 in Span 2) – In Spans 1 & 3, the underside of the concrete deck exhibits widespread mapcracking and deck leakage, resulting in rust and efflorescence staining with stalactites. Several reinforcing bars are partially exposed with minor section loss. The concrete was hollow sounding in many locations. In all Bays of Span 2, there is widespread mapcracking with water and light efflorescence staining. In Bay 2 near Pier 2, there is a 24 inch long by 16 inch wide by 2 ft., 3 inch deep spall on the underside of the deck. Concrete within the spall is brittle and the surrounding concrete is hollow sounding. Given that this area is over the westbound right lane of Albany-Shaker Road, a Safety Flag was issued in 2011.

Primary Members (rated 4 in Spans 1 & 3) – In Spans 1 & 3, the stringers in Bays 1 & 6 previously supported open steel grating and as a result, now exhibit moderate corrosion and steel delamination. At the worst two locations (Span 1, Bay 6, Panel 1 and Span 3, Bay 1, Panel 4), the bottom flange thickness is reduced to ¼ inch, representing a 43 percent section loss, along the full length of the member. The remaining stringers have 10 to 15 percent section loss to the bottom flange thickness, with 5 to 10 percent section loss to the web thickness.

Superstructure Paint (rated 1 in Spans 1 & 3, rated 4 in Span 2) – There is widespread paint failure of approximately 80% on the stringers and floorbeams in Bays 1 & 6 of Spans 1 & 3. The remaining outside bays and fascia beams exhibit peeling paint and the interior beams have pinpoint corrosion along many areas of the top and bottom flanges.

Pier: Bearings, Bolts & Pads (rated 4) – The expansion bearings at Pier 1 are all over-extended. Corrosion on the sliding surfaces is causing the plates to bow up. Fixed bearings at Pier 1 exhibit heavy corrosion in the hinged portion of the bearing. The remaining bearing components have moderate to heavy corrosion with the worst being 80-90% section loss to the anchor bolt nuts at the Girder 7 bearing. Sliders at the Pier 2 bearings (all expansion) are all incorrectly positioned with most being over-contracted. The Pier 2 bearings also exhibit moderate to heavy corrosion with a buildup of debris on some that inhibits movement.

Pier: Pedestals (rated 3 in Span 1, rated 4 in Span 2) – In 2008 and 2009, a yellow flag was issued for a large spall on the pedestal beneath Girder 7 on Pier 1 that had reduced the bearing area by 10%. This area was repaired and the flag was removed in the 2010 inspection. Several additional pedestals on Pier 1 still exhibit deterioration. The pedestal at Girder 4 has horizontal cracking 3 to 4 inches from the top and bottom of the pedestal with vertical cracking intermittently in between. There is also a 1 square foot shallow spall on the span 1 portion of the pedestal. The span 2 side of the pedestal under Girder 5 has a 3 inch deep spall over 70% of the face with exposed reinforcing bars. The spall wraps around to the side face and the top corner is broken off. The remaining faces of the Girder 5 pedestal, as well as the Girder 6 pedestal, have map cracking with small areas of hollow sounding concrete. There is also a shallow spall on the span 2 side of the Girder 6 pedestal. The underlying concrete is solid. At Pier 2, the pedestal under Girder 3 has a 21 inch long by 12 inch high by 5 ½ to 6 ½ inch deep spall on the top left corner, with exposed reinforcement. The underlying concrete is still solid and the spall has not impacted the bearing yet. The remaining faces exhibit mapcracking with scattered areas of hollow sounding concrete. The face of the Girder 6 pedestal closest to Span 2 at Pier 2 has an area of hollow sounding

concrete approximately 2 ft. in diameter. There is also a 1 inch deep spall approximately 1.5 ft. long by 4 to 6 inches wide. The remaining pedestals at Pier 2 are in fair to good condition.

A "Yellow" Flag was issued during the 2013 Interim Bridge Inspection of this bridge, which was completed on October 23, 2013. The "Yellow" flag was issued for poor conditions at the southern pier (Pier 1) involving deficiencies of the concrete columns and cap beam. Installation of supplemental supports are planned by NYSDOT.

Top of Pier Cap Beams (rated 4) – The epoxy coating on the tops of the cap beams at both piers is cracking and peeling, allowing leakage onto the concrete. The top surfaces are rough with isolated areas of hollowness and shallow spalls. The corner at the span 2 side of pier 1 in bay 5 has a spall 6 inches wide by 10 inches high by 3 to 4 inches deep for the full width of the bay.

Cap Beams and Pier Columns (rated 3 in Span 1, rated 4 in Span 2) – Columns at both piers exhibit widespread cracking with water, rust and efflorescence staining over the full height. The vertical faces of the cap beams at both piers exhibit areas of cracking and shallow spalling with small pockets of hollow sounding concrete. At Pier 1, the underside of the cap beam is spalled over 50-75% of the surface area. There are main horizontal reinforcing bars exposed with moderate to heavy corrosion and up to 10% section loss. No full de-bonding was found. At the top corner of the cap beam closest to Span 2, between pedestals 5 and 6, the concrete is spalled up to 3 inches deep with areas of rust staining. This spall extends the full width between pedestals and 6 to 9 inch down the face. The surrounding concrete is hollow sounding. At Pier 2, the underside of the cap beam is extensively cracked with damp concrete and rust staining. The concrete is hollow sounding over 50% of the area, but there is little spalling. Between columns 2 & 3 the lower corner toward span 2 is spalled off with exposed reinforcing steel. Water and rust staining is also evident in the spall area. The surrounding concrete is hollow sounding. After the 2010 inspection, steel columns were installed under the midspans of both cap beam bays at both piers. At Pier 2, the steel columns are bearing on timber cribbing resting on the existing grade. At Pier 1, it is unknown if the columns extend down to the top of footing. The steel columns at both piers are intended to be temporary repairs, and therefore the previous Yellow Flag was reissued during the 2011 inspection.

Utilities: Sign Structure (rated 4 in Span 2) – Two of the three remaining directional lane signs mounted on the outside of Girder 7 are losing reflectivity and are bent inward but still remain visible to traffic.

End Abutment: Bearings, Bolts & Pads (rated 4) – The left anchor bolt of the Girder 7 bearing is sheared off. All bearing components of the fascia bearings exhibit moderate corrosion with pack rust. Many of the interior girder anchor bolts are bent toward Pier 2.

End Abutment: Erosion or Scour (rated 4) – The block paving below Bay 1 is deteriorated and broken under the scupper downspout extending down most of the embankment length.

<u>BIN 1033142</u>
BIN 1033142 is also part of the New York State Biennial Bridge Inspection Program and receives annual routine structural and safety evaluations. The bridge has been rated with a General Recommendation of 4 (the best possible rating being 7), a State Computed Condition Rating of 3.906 (the best possible rating being 7) and a Federal Sufficiency Rating of 36.6 (the best possible being 100). The following items were rated 4 or lower (indicating moderate to severe structural deficiencies) in the 2010 Biennial and 2011 Interim Inspection Reports:

Railings (rated 4 in Span 1 & 3, rated 3 in Span 2) – In all three spans, there is a build-up of pack rust under the steel base plates that the bridge rail post anchorages are bolted through. The pack rust is causing the single outboard anchor bolt to break off at the nut. With there only being 3 anchor bolts at each post, there is a 33% loss in anchorage at 2 locations in Span 1, 5 locations in Span 2, and 1 location in Span 3. A Safety Flag has been issued only for Span 2 due to broken bolts on consecutive posts and the potential for bolts to drop on live traffic on Albany-Shaker Road.

Structural Deck (rated 3 in Spans 1 & 3, rated 4 in Span 2) – In Spans 1 and 3 where previous steel grating was replaced with concrete, the concrete deck in Bays 1 & 6 exhibits widespread cracking and deck leakage. There is also rust and efflorescence staining with stalactites. Some of the reinforcing bars are partially exposed with minor section loss. The concrete is hollow sounding at many locations. The remaining bays in Spans 1 and 3 have widespread mapcracking with water staining and areas of light efflorescence.

Primary Members (rated 4 in Span 1) – The stringers in Bays 1 and 6 of Span 1 have section loss in the flanges and webs, as well as delamination in the webs. The worst case of section loss is 30% of the flanges in bay 1, panel 1, and 5-10% in the webs.

Paint (rated 1 in Span 1, rated 4 in Span 2, rated 2 in Span 3) – In Spans 1 & 3, stringers in Bays 1 & 6 exhibit widespread paint failure of up to 80%. The remaining steel members in those spans, as well as Span 2, exhibit peeling paint and pinpoint corrosion along many portions of the top and bottom flanges of the interior beams.

Joints (rated 4) – Asphalt adjacent to the joint seal at pier 2 is beginning to crack. Broken off pieces of concrete header may be evidence that the joint is leaking.

Pier: Bearings, Bolts & Pads (rated 4 in Spans 1 & 2) – The expansion bearings at both piers are over-extended. All surfaces of the hinged portions exhibit heavy corrosion, which may be inhibiting movement. Anchor bolts on all bearings have moderate to heavy corrosion, with the outside fascia bolt nuts exhibiting 80-90% section loss.

Pier: Pedestals (rated 4 in Span 1, rated 2 in Span 2) – At the Pier 1 pedestals of Girders 2 & 7, the concrete is hollow sounding along portions of the vertical faces. The hollow concrete extends to the top near the bearings. At Pier 2, a red structural flag was issued in 2011 for the deterioration and cracking at the Girder 7 pedestal. On the outside edge of the pedestal, there is a 3/8 inch wide crack emanating from under the Span 3 masonry plate. The crack extends down the outside face of the pedestal for approximately 2 ft. to a hairline crack, and then into spall of soft crumbling concrete approximately 3 ft. long by 8 inches wide by 2 inches deep. The crack is also visible on the left side of the bearing, extending down the span 3 left corner for approximately 16 inches and stopping at the top of the cap beam. This crack is along a cold joint of an older repair. It was not mentioned in the 2010 inspection and is assumed to have rapidly propagated, likely from a frozen bearing. The remaining pedestals exhibit cracking, hollow sounding concrete and spalling with the largest spall being 19 inches long by 14 inches wide by 5 ¼ inches deep.

Pier: Cap Beams & Columns (rated Cap Beams rated 3 in Span 1 and 4 in Span 2; Columns rated 3 in Spans 1 & 2) – Columns at both piers exhibit widespread cracking with water, rust and efflorescence staining over the full height. The vertical faces of the cap beams have areas of cracking with small pockets of hollow sounding concrete and spalling. The undersides of the cap beams are spalled over 40-60% of the surface areas. There are main horizontal reinforcing bars exposed with section losses of up to 40-50% in some areas. After the 2010 inspection, steel columns were installed under the midspans of both cap beam bays at both piers. At Pier 2, the steel columns are bearing on timber cribbing resting on the existing grade. At Pier 1, it is unknown if the columns extend down to the top of footing. The steel columns at both piers are intended to be temporary repairs, and therefore the previous Yellow Flag was reissued during the 2011 inspection.

Two “Red” Flags were issued during the 2013 Interim Bridge Inspection of this bridge, which was completed on October 23, 2013. Both flags dealt with similar issues at Pier 2 (the “northern” pier). The flags were issued due to poor conditions of the concrete pedestals beneath the bearings of the outside girders. NYSDOT maintenance forces were dispatched promptly to reconstruct the pedestal areas by removing deteriorated concrete, installing new anchors and casting new concrete. NYSDOT is in the act of removing those flags now that repairs have been completed.

A “Yellow” Flag was issued for poor conditions at the southern pier (Pier 1) involving deficiencies of the concrete columns and cap beam. Installation of supplemental supports are planned by NYSDOT.

Utilities: Sign Structure (rated 4) – The horizontal clearance marker signs at Span 1 are dirty and losing reflectivity. The post for the right sign is twisted toward the bridge but still visible to traffic.

Scuppers (rated 3) – One scupper on the right side of Span 3 is plugged and grass is growing out of the top.

End Abutment: Erosion or Scour (rated 4) – Water runoff from a nearby scupper downspout has caused the concrete block slope protection to cave in and the slope beneath to erode, exposing a portion of the concrete footing beneath girder 1.

2.3.3.6.(5) Restriction

There are currently no restrictions on the I-87 bridges over Albany-Shaker Road.

2.3.3.6.(6) Future Conditions

The structures described above are in an advance state of deterioration. Without significant rehabilitation and restoration, and with a level of maintenance that is consistent with the level that can be assumed in the past, the structures will continue to deteriorate at an increasing rate. The eventual result would be unscheduled emergency repairs to maintain bridge function. These repairs would steadily increase in scope and cost as the structural elements reach the end of their service life. If significant improvements are not made, the ultimate result would be bridge closure.

2.3.3.6.(7) Waterway

A Coast Guard Checklist is not required.

2.3.3.7. Hydraulics of Bridges and Culverts

There are no bridges over waterways within the project limits.

Shaker Creek and several unnamed tributaries of Shaker Creek cross I-87 within the project study area. In general, these stream crossings are carried in 24-30 inch reinforced concrete pipes (RCP). The need for a hydraulic analysis for these crossings will be determined during final design.

2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

Guide rail is located along I-87 at several locations within the PSA. Box beam guide rail is typically located on both sides of the roadway at bridges and approaches in each direction of travel. Cable guide railing is located at various locations along the roadway to account for adjacent steep embankments and wetland areas adjacent to the roadway. There is currently no median barrier in either direction on I-87 within the project study area. In general, it appears that the existing guide railing is in good condition. The need for replacement of the existing guide railing will be determined during final design.

In general, there is no guide rail located on the remaining roadways within the PSA. However, concrete barrier is located along both edges of the roadway on Albany-Shaker Road as it passes beneath I-87. This barrier is used to shield the bridge columns from traffic on Albany-Shaker Road.

2.3.3.9. Utilities

In general, the project area is served by overhead and underground electric, telephone and cable television lines maintained by the National Grid, Verizon, and Time Warner Cable, respectively. There are no overhead utilities on I-87. In addition to these utilities, high voltage (115 kV) electric transmission

lines running in the east/west direction across Wolf Road and I-87 are located approximately 360 ft. south of Metro Park Road.

The project area is also served by private underground utility lines including National Grid gas lines, and municipally-owned underground utilities including water and sanitary sewer lines. The following utilities have been identified within the project area.

- City of Watervliet
- Dominion Transmission, Inc / Capitol
- Elantic Telecom, Inc.
- Fiber Technologies, LLC
- Level 3 Communications
- MCI
- National Grid
- NYSDOT, Region 1
- NYS Office of Technology / Department of Telecom
- Tech Valley Communications
- Time Warner Cable
- Town of Colonie / Latham Water District
- Verizon
- Village of Colonie
- Windestream

2.3.3.10. Railroad Facilities

There is one rail line near the project area along the southern border of the Town of Colonie. I-87 crosses the rail line between Exit 1 and Exit 2 at a grade separated rail crossing. The rail line is owned by CSX Transportation (CSX) with operations run by both CSX and Amtrak. The project is not expected to impact the existing rail line or its drainage systems.

There are no railroads within the project limits and no at-grade crossings within 0.6 mi. that could impact traffic conditions.

2.3.4. Potential Enhancement Opportunities

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

2.3.4.1. Landscape

The general landscape on I-87 in the project area consists mainly of undisturbed natural areas, characterized by wetland and wooded areas on both sides of the highway and in the median, interspersed with commercial development.

There is little or no formal landscaping along Albany-Shaker Road west of I-87. This area is mainly characterized by agricultural uses with large areas of natural landscaping on the southern side of the roadway. East of I-87, the landscaping along Albany-Shaker Road consists of manicured lawns interspersed with areas of natural landscaping between residential areas. Landscaping along Wolf Road and Old Wolf Road also consists mainly of manicured lawns interspersed with areas of natural landscaping between developed areas. The areas surrounding these roadways contain some small agricultural areas, but is mainly characterized by commercial land uses along both side of the roadways with little natural landscaping.

2.3.4.1. (1) Terrain

The proposed project is located in the Town of Colonie, Albany County, New York. The I-87 highway corridor can be described as having level terrain with land uses along the highway segment typically being residential and commercial uses.

Albany-Shaker Road can be described as having level terrain with land uses along the roadway segment a mixture of agricultural, commercial, and residential land uses. West of Old Wolf Road, the land use is primarily related to agriculture and the airport. The Ann Lee Pond Nature and Historic Preserve is located at the northwestern corner of the PSA, bordered to the north by Albany-Shaker Road.

Wolf Road and Old Wolf Road can be described as having a level terrain. Land use along Wolf Road generally consists of closely-spaced retail and office establishments while the land use along Old Wolf Road generally consists of light industrial and agricultural uses.

Watervliet-Shaker Road can be described as having level terrain. Land use along Watervliet-Shaker Road generally consists of residential land uses with a few interspersed commercial properties.

2.3.4.1. (2) Unusual Weather Conditions

There are no unusual weather conditions within the project area.

2.3.4.1. (3) Visual Resources

The general visual landscape on I-87 in the project area consists mainly of undisturbed natural areas, characterized by wetland and wooded areas on both sides of the highway and in the median, interspersed with commercial development.

The general visual landscape on Albany-Shaker Road west of I-87 consists of farmland and undeveloped areas. This area is mainly characterized by agricultural uses with large areas of natural landscaping on the southern side of the roadway. At the northwestern end of Albany-Shaker Road is the airport that consists of visual resources associated with runways such as fencing, flat level pavements and assorted structures such as lights and towers. East of I-87, the visual landscape of Albany-Shaker Road consists mainly of man-made features and few undisturbed areas, consisting mainly of residential areas. The general visual landscape of Wolf Road and Old Wolf Road also consists mainly of man-made features and very few undisturbed areas. The areas surrounding these roadways contains some small agricultural areas, but is mainly characterized by commercial land uses along both side of the roadways with little natural landscaping.

The visual character of the PSA is defined by low flat landforms with little variation in lines or color. Man-made objects in the area generally consist of non-distinctive commercial type of architecture with little variation in form, color or texture. Some visually interesting retail or restaurant buildings exist close to Albany-Shaker Road.

The visual integrity of the natural environment is interrupted by numerous man-made forms associated with agriculture, commercial land use and the airport, resulting in a visual environment with little visual intactness or unity. Vividness of the visual environment is low with no distinctive views and the overall visual quality of the PSA is low to moderate.

Viewer groups consist primarily of travelers passing through the area along I-87 or Albany-Shaker Road, and visitors/employees of the various commercial establishments and restaurants. The only residential neighborhood exists at the southeastern end of the PSA and is accessible from Sand Creek Road.

The only location of a key or significant viewpoint is the parking lot at the end of the runway. Here, visitors often park at day or nighttime to watch planes land or takeoff. The parking lot is located on Albany-Shaker Road approximately 0.7 mi. west of I-87.

2.3.4.2. Opportunities for Environmental Enhancements

The existing Ann Lee Pond Nature and Historic Preserve area provides an opportunity for environmental enhancement. Access to the preserve by pedestrians and bicycles is provided by a shared use path along Albany-Shaker Road and Watervliet-Shaker Road. Opportunities such as enhancement of the area trails and extension of the shared use path will enhance the Ann Lee Pond Nature and Historic Preserve as well as access to the area.

2.3.5. Miscellaneous

There are no other unusual features within the project area that would affect the proposed project.

CHAPTER 3 – ALTERNATIVES

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

3.1. Alternatives Considered and Eliminated from Further Study

I-87 Bridges over Albany-Shaker Road

Two alternatives were considered for addressing the structural deficiencies of the I-87 bridges over Albany-Shaker Road: rehabilitation of the existing bridges and replacement of the bridges.

While a rehabilitation of these structures that would address the previously identified structural deficiencies is possible, it would fundamentally require element by element replacement. As discussed in Section 2.3.3.6 and documented in the most recent Biennial Inspection Reports included in Appendix L, the bottom surfaces of the structural decks exhibit widespread map-cracking, water staining and efflorescence, with areas of exposed reinforcement. The superstructure steel displays areas of significant deterioration, has fatigue sensitive details that have been previously retrofitted and displays indications of earlier impacts to one fascia girder. The pier capbeams are seriously deteriorated and require reinforcement in the form of “temporary” steel columns. The existing concrete columns also exhibit serious deterioration. The deterioration of the concrete elements mentioned herein has advanced to the point of reinforcing steel exposure and deterioration leading to compromised load carrying capacity. A properly scoped rehabilitation would include the replacement of these elements. While these structural deficiencies can be addressed through an extensive rehabilitation project, they are accompanied by functional inadequacies, imposed by the configuration of the bridges, which cannot be mitigated by rehabilitation in-kind.

An examination of the National Bridge Inventory (NBI) data for these two structures reveals that the “Deck Geometry” and “Underclearance” items have Appraisal Ratings of “2” which indicate a “basically intolerable condition requiring a high priority of replacement”. The “Deck Geometry” inadequacy can be traced to nonstandard shoulders on the mainline, and the “Underclearance” inadequacy is attributable to the shoulder pier locations dictated by the current span configuration and required roadway width. These inadequacies are exacerbated by the high traffic volumes experienced at this location.

Considering the intensity of the rehabilitation work required to meet the project’s Purpose and Need by addressing the existing structural deficiencies, the inability of that work to mitigate functional inadequacies present at this critical location, and the bridge rehabilitation versus replacement cost ratio is greater than 85%, bridge rehabilitation has been dismissed as a feasible alternative. Therefore, all of the alternatives considered, and discussed below, include replacement of these bridges.

No-Build/Maintenance Alternative

The No-Build/Maintenance Alternative will result in the continued deterioration of traffic operations in the Exit 4 area, resulting in increased delay and no reduction of accidents at the existing high accident locations. This alternative will also result in the continued deterioration of the I-87 structures over Albany-Shaker Road, resulting in increased maintenance and eventually requiring the structures to be closed to traffic. This alternative will not satisfy the project objectives or the programming goal; however, it will be retained as a base condition against which the feasible alternatives will be compared.

Upgrade Alternative

The Upgrade Alternative will provide additional capacity along the existing roadway network in the Exit 4 area. This alternative will include reconstruction of the existing roadways in the Exit 4 area and the following improvements:

- Replacement of the I-87 bridges over Albany-Shaker Road and reconstruction of the bridge approaches on I-87 northbound and southbound,
- Pavement widening for additional travel lanes, turn lanes, and medians on Albany-Shaker Road, Wolf Road, and Old Wolf Road,
- Pavement widening to accommodate an additional travel lane on the Exit 4 southbound entrance ramp,
- Pavement widening to lengthen the deceleration lane for the Exit 4 northbound exit ramp,
- Construction of an auxiliary lane on I-87 northbound between the existing Exit 4 northbound entrance ramp and the existing Exit 5 northbound exit ramp,
- Replacement of traffic signals at the following locations:
    - Wolf Road / Exit 4 northbound exit ramp
    - Albany-Shaker Road / Wolf Road / Exit 4 northbound entrance ramp
    - Albany-Shaker Road / Old Wolf Road

This alternative will require a retaining wall between I-87 southbound and the Exit 4 southbound entrance ramp. It will also have potential impacts to overhead utility lines on Albany-Shaker Road to accommodate widening the pavement adjacent to the existing travel lanes, or box widening, for additional travel lanes, turn lanes, and medians. In areas of box widening, the existing roadway pavement will be milled and inlayed. This alternative will include impacts to 12 properties and result in approximately 1.1 acres of wetland impacts; however, it will not result in any displacements or impacts to farmland.

The overall level of service (LOS) at most Exit 4 intersections improves from LOS F for the No-Build to LOS D or better for the Upgrade Alternative. Although this alternative will improve operating conditions at the majority of the intersections in the Exit 4 area, this alternative will only reduce the travel time for major routes by 10%. In addition, several movements at key intersections within the study area will continue to operate below LOS D.

The Upgrade Alternative will not reduce existing traffic volumes at the Exit 4 southbound exit ramp or improve the geometry at this location. Therefore, this alternative will not fully address the high number of accidents at the Old Wolf Road & Exit 4 southbound exit ramp intersection and along the Collector-Distributor (C-D) road or eliminate the potential for queues to extend onto the I-87 southbound mainline from Old Wolf Road during the morning peak hour. This alternative will not reduce the traffic volumes at any of the other intersections in the Exit 4 area since it will only include pavement widening and geometric improvements to the existing facilities. The pavement widening at the Albany-Shaker Road / Old Wolf Road, Albany-Shaker Road / Wolf Road, and Wolf Road / Exit 4 northbound Exit Ramp intersections will also result in wider pedestrian crossings at these locations.

This alternative will address structural deficiencies of BINs 1033141 & 2 by replacing the bridges carrying I-87 over Albany-Shaker Road.

The Upgrade Alternative will improve access between I-87 and the airport and between I-87 and Wolf Road by reducing travel times during the peak hours. It will improve mobility through the Exit 4 area by reducing delay and travel time and improving the LOS at major intersections, but to a lesser extent than the feasible alternatives.

Safety will be a concern for this alternative. This alternative provides the least amount of safety improvements by retaining all of the existing movements in the Exit 4 area. Although it does provide additional travel lanes through the project area, it will not reduce the number of left-turn movements or provide more direct access between I-87 southbound and Wolf Road nor between I-87 northbound and the Albany International Airport.

The estimated total cost for the Upgrade Alternative is $36.7 million. Although this alternative has the lowest construction cost of the build alternatives evaluated, it provides the least amount of traffic operational and safety improvements. *This alternative will not meet the project's Purpose and Need and therefore will not be considered further*.

A plan of the Upgrade Alternative is included in Appendix A.

Single Point Urban Interchange (SPUI) Alternative

The SPUI Alternative will provide a new Exit 4 interchange at Albany-Shaker Road to replace the existing Exit 4 ramps. This alternative will include the following improvements:

- Construction of Exit 4 SPUI ramps between I-87 and Albany-Shaker Road,
- Reconstruction of Wolf Road between Ulenski Drive and Albany-Shaker Road to accommodate shifting of the Wolf Road / Albany-Shaker Road intersection 350 ft. east of its existing location,
- Reconstruction of the Exit 5 southbound entrance ramp,
- Removal of access between Old Wolf Road and Albany-Shaker Road through construction of a cul-de-sac on Old Wolf Road approximately 700 ft. north of its existing intersection with Albany-Shaker Road,
- Replacement of the I-87 bridges over Albany-Shaker Road at Exit 4 and reconstruction of the bridge approaches on I-87 northbound and southbound,
- Pavement widening for additional travel lanes, turn lanes, and medians on Albany-Shaker Road,
- Removal of the existing Exit 4 northbound exit ramp, northbound entrance ramp, southbound exit ramp, and southbound entrance ramp,
- Construction of an auxiliary lane on I-87 northbound between the existing Exit 4 northbound entrance ramp and the existing Exit 5 northbound exit ramp, and
- Replacement / installation of traffic signals at the following locations:
    - Albany-Shaker Road / Wolf Road
    - Albany-Shaker Road / SPUI Ramps

This alternative will require retaining walls between I-87 and the SPUI ramps. It will also have potential impacts to overhead utility lines on Albany-Shaker Road to accommodate box widening and relocation of the Albany-Shaker Road / Wolf Road intersection. In areas of box widening, the existing roadway pavement will be milled and inlayed. This alternative will include impacts to 23 properties and 2 commercial displacements. It will require approximately 3.7 acres of wetland impacts; however, it does not result in any impacts to farmland.

The overall level of service (LOS) at most Exit 4 intersections improves from LOS F for the No-Build to LOS C for the SPUI Alternative. This alternative will reduce the travel time for major routes by 30%. This alternative will address reducing queues on the Exit 4 southbound exit ramp to Old Wolf Road during the morning peak hour by replacing the existing ramp with a new ramp at the SPUI.

The SPUI Alternative will address safety concerns by diverting traffic away from and/or reducing the pavement width at the existing intersections that have crash rates which exceed the statewide average for similar facilities. The SPUI is anticipated to operate at a LOS C thereby reducing the potential for vehicles backing up on the Exit 4 southbound exit ramp onto the I-87 southbound mainline. This alternative will include pavement widening on Albany-Shaker Road at the SPUI ramps resulting in wider pedestrian crossings at this location; however, in general, this alternative would retain the existing pavement widths on Wolf Road and Albany-Shaker Road.

This alternative will address structural deficiencies of BINs 1033141 & 2 by proposing to replace the bridges carrying I-87 over Albany-Shaker Road.

The SPUI Alternative will improve access between I-87 and the airport and between I-87 and Wolf Road by reducing travel times during the peak hours. It will also reduce the number of signalized intersections that southbound vehicles must travel through to access Wolf Road from I-87 southbound.

Constructability will be a concern for this alternative. The longer bridge length required by this alternative to accommodate the SPUI ramps under I-87 will result in larger beams being required to support the bridge structure. To maintain adequate vertical clearances for vehicles under the bridge as well as traffic signal heads, the elevation of I-87 over Albany-Shaker Road will be significantly higher than existing.

This will result in elevation differences between the existing roadway and proposed roadway making it more difficult to shift traffic during construction. In addition, the proposed SPUI ramps are located in the same location as the existing Exit 4 NB Exit Ramp, Exit 4 NB Entrance Ramp, Exit 4 SB Entrance Ramp and Old Wolf Road at its intersection with Albany-Shaker Road. The overlap of the existing and proposed roadways, along with the elevation differences will require complicated Work Zone Traffic Control to maintain traffic during construction and may require the use of an off-site detour further decreasing mobility through the area during construction.

The estimated total cost for the SPUI Alternative is $81.9 million. Although this alternative will provide the highest amount of traffic operational improvements for the major road operations, it has the highest construction cost and greatest amount of wetland impacts of the build alternatives evaluated. This alternative will also require relocation of the Albany-Shaker Road / Wolf Road intersection to the east and elimination of the connection between Old Wolf Road and Albany-Shaker Road in order to accommodate the SPUI. The elimination of this connection will impact access for the Town of Colonie Police Department and businesses on Old Wolf Road; thereby not meeting the project's need to support the land use and economic growth of the region. Due to the relatively high cost, failure to the meet the project need to support the land use and economic development of the region through elimination of the connection between Old Wolf Road and Albany-Shaker Road, and impact to right-of-way and wetlands, *this alternative does not meet the project's Purpose and Need and will not be considered further*.

A plan of the SPUI Alternative is included in Appendix A.

3.2. Feasible Build Alternatives

3.2.1. Description of Feasible Alternatives

Two feasible alternatives to address the project objectives for the Interstate 87 (I-87) Exit 4 Access Improvement project have been developed: the Diamond Alternative and the Flyover Alternative. Descriptions of each feasible alternative are summarized below.

Diamond Alternative

The Diamond Alternative includes replacement of the existing Exit 4 ramps through construction of a full-access, grade-separated diamond interchange approximately 3,200 ft. south of the I-87 / Albany-Shaker Road crossing, which will connect to Wolf Road and Albany-Shaker Road via a new connector road. Key elements of this alternative include:

Geometry

- Construction of a new connector road between Wolf Road, at Metro Park Road, and Albany-Shaker Road, approximately 1,000 ft. west of Old Wolf Road.
- Construction of new Exit 4 interchange ramps to connect I-87 to the connector road.
- Replacement of the I-87 bridges over Albany-Shaker Road and reconstruction of the bridge approaches on I-87 northbound and southbound.
- Construction of a new bridge to carry the connector road over I-87 northbound and southbound.
- Reconstruction of 3,900 ft. of I-87 northbound at the new interchange ramp to shift the mainline into the existing median and avoid impacts to the existing overhead electric utility line.
- Pavement widening for additional turn lanes on Wolf Road and Albany-Shaker Road.
- Construction of a new intersection on Albany-Shaker Road at the connector road approximately 1,000 ft. west of Old Wolf Road.
- Removal of the existing Exit 4 northbound exit ramp, northbound entrance ramp, southbound exit ramp, and southbound entrance ramp.
- Removal of the C-D road between the existing Exit 5 southbound entrance ramp and Exit 4 southbound exit ramp.
- Replacement of the existing Exit 5 southbound entrance ramp with a new direct ramp connection from Watervliet-Shaker Road to I-87 southbound.

- Retains non-standard horizontal curve at one location on the Exit 5 northbound exit ramp to Watervliet-Shaker Road. Since this ramp is outside the reconstruction limits and scope of the project, no justification for retaining this non-standard feature is required.
- Retains non-standard level-of-service on I-87 on three freeway segments, at one ramp junction, and in one weave area. This non-standard feature is proposed to be retained because mitigating the non-standard level-of-service would require the addition of a fourth mainline lane on I-87 in both directions between Exit 1 and Exit 7 which would cost over $50 million, result in additional wetland and right-of-way impacts, and is beyond the scope of the proposed project. A non-standard feature justification form is included in Appendix D.

Operational	• Includes replacement/installation of traffic signals at the following intersections:
	  o Wolf Road / connector road / Metro Park Road
	  o Connector road / Exit 4 northbound ramps
	  o Connector road / Exit 4 southbound ramps
	  o Connector road / Albany-Shaker Road
	• Includes removal of traffic signals at the following intersections:
	  o Wolf Road / Exit 4 northbound exit ramp
	  o Old Wolf Road / existing Exit 4 southbound exit ramp
	• Overall LOS at most Exit 4 intersections improve from LOS F for the No-Build to LOS B or C.
	• Reduces the travel time for major routes by 20%.
	• Reduces potential for queuing on the I-87 southbound mainline during the morning peak hour by replacing the existing Exit 4 southbound exit ramp to Old Wolf Road with a new ramp at the proposed Diamond Interchange which is anticipated to operate at LOS B or better during the peak hours.
	• Addresses safety concerns by diverting traffic away from existing intersections that have crash rates which exceed the statewide average for similar facilities.
	• Addresses pedestrian facility system connectivity by providing sidewalks on the south side of Albany-Shaker Road between Wolf Road and the connector road and a shared use path between the connector road and entrance to Albany International Airport.
	• Potential impact to pedestrian mobility due to large intersections created along the connector road at Wolf Road and Albany-Shaker Road. Pedestrians would need to traverse up to 5 lanes of traffic to cross the intersections. Cross walks and pedestrian signals will be installed at each location to alleviate impacts.
	• Includes removal of existing I-87 Exit 4 ramps resulting in removal of conflicts from the Wolf Road / I-87 northbound exit ramp, Albany-Shaker Road / Wolf Road, Albany-Shaker Road / Old Wolf Road, and Old Wolf Road / Exit 4 southbound exit ramp intersections.

Control of Access	• Control of access for this alternative will meet the criteria in HDM Chapter 2 for each of the project area roadways.
Right-of-Way	• This alternative will include right-of-way (ROW) impacts to 24 properties. • This alternative will include two commercial displacements and one residential displacement. • Potential State-owned underground utility impacts along I-87 northbound which may require relocation. • Potential overhead utility impacts on Albany-Shaker Road which may require relocation.
Environmental	• This alternative will result in approximately 4.76 acres of wetland impacts. • This alternative will result in approximately 21.9 acres of farmland impacts. • This alternative will result in noise impacts which can be abated by noise barriers. • There are no significant visual impacts associated with this alternative.
Cost	• Total estimated construction cost of this alternative is $74.61 M.

Project Goals

- These improvements meet the objectives to improve access between I-87 southbound and Wolf Road, improve access between I-87 northbound and Albany International Airport, address structural deficiencies of the I-87 bridges over Albany-Shaker Road, address safety concerns in areas that exceed the statewide average crash rate for similar facilities, and supporting the land use and economic growth of the region.

Exhibit 3.2.1 a summarizes the proposed right-of-way acquisitions for the Diamond Alternative.

Exhibit 3.2.1 a
Diamond Alternative – Summary of ROW Impacts

Tax ID No.	Owner	Type	Parcel (acres)	Acquisition (acres)
30.-3-74.1	Parc Parners LLC	Fee	3.26	0.023
30.-3-75	Scaring Daniel M	Fee	0.30	0.028
30.-3-77	Engel Edward W	Fee	38.00	0.339
42.1-1-31	Beltrone Marital Trust II	Fee	1.25	0.013
42.2-1-13	Wolf Road Park	Fee	3.60	0.087
42.2-1-13	Wolf Road Park	T.E.[1]	3.60	0.670
42.2-1-14	Wolf Road Park	Fee	4.00	0.058
30.18-2-1.1	ET Person LLC	Fee	13.54	13.54
30.4-1-6.5	Town of Colonie	Fee	0.86	0.658
30.4-1-3	Amerada Hess Corporation[2]	Fee	0.80	0.800
30.4-1-4	AMJ Corporation	Fee	1.64	0.284
30.4-1-4	AMJ Corporation	T.E.[1]	1.64	0.024
30.4-1-6.1	Penfield Hotel Lp	Fee	2.72	0.212
30.4-1-6.1	Penfield Hotel Lp	T.E.[1]	2.72	0.363
30.4-1-12	Atlantic Refining Mktg Corp	Fee	0.46	0.013
30.4-1-12	Atlantic Refining Mktg Corp	T.E.[1]	0.46	0.037
30.-5-10	ET Person LLC[2]	Fee	20.80	20.800
30.-5-9	Albany County Airport Authority	Fee	72.30	9.106
30.-5-1	Albany County Airport Authority	Fee	44.40	4.865
30.-5-2	Albany County Airport Authority	Fee	0.22	0.095
30.-5-3	Albany County Airport Authority	Fee	0.43	0.196
30.-5-4	Engel John K[2]	Fee	0.23	0.230
30.-5-5	Village Square of Penna Inc	Fee	5.05	0.083
30.-5-7	Village Square of Penna Inc	Fee	0.60	0.033
30.-5-7	Village Square of Penna Inc	T.E.[1]	0.60	0.034
30.-5-8	Village Square of Penna Inc	Fee	7.60	0.011
30.-5-8	Village Square of Penna Inc	T.E.[1]	7.60	0.067
16.4-8-1	Niagara Mohawk Power Corp	Fee	197.30	0.315
16.4-8-1	Niagara Mohawk Power Corp	T.E.[1]	197.30	0.900
42.1-1-12	Anderson Development Corp	T.E.[1]	1.60	0.018
42.1-1-3	Windsor Wolf Rd Properties LLC	T.E.[1]	10.50	0.016
Total Acquisitions Required (acres)				**53.918**

[1] Temporary Easement
[2] Displacement required

Typical Sections, Plans, and Profiles for the Diamond Alternative are included in Appendix A.

Exhibit 3.2.1.b summarizes the proposed costs for the Diamond Alternative.

Exhibit 3.2.1 b
Summary of Diamond Alternative Costs - Million Dollars (Calculated Year)

Activities		Phase I (I-87 Bridges over Albany-Shaker Road)	Phase II (Interchange Reconstruction)
Construction	Bridge	$ 4.84	$ 5.84
	Highway	$ 2.39	$ 21.49
Wetland Mitigation		$ 0.02	$ 0.95
Storm Pollution Discharge Elimination System		$ 0.03	$ 0.30
Subtotal (2011)		$ 7.28	$ 28.58
Incidentals[1] (10%)		$ 0.73	$ 2.86
Subtotal (2011)		$ 8.01	$ 31.44
Contingencies[2](15% @ Design Approval)		$ 1.20	$ 4.72
Subtotal (2011)		$ 9.21	$ 36.16
Potential Field Change Payment[3]		$ 0.42	$ 1.12
Subtotal (2011)		$ 9.63	$ 37.28
Mobilization (4%)		$ 0.39	$ 1.49
Subtotal (2011)		$ 10.02	$ 38.77
Expected Award Amount – Inflated[4] @ 3%/yr to midpoint of Construction (2015)		$ 10.82	$ 46.07
Construction Inspection (8%)		$ 0.97	$ 4.15
ROW Costs (2013)		$ 0.00	$ 12.60
Total Cost		**$ 11.79**	**$ 62.82**

Notes:
1. The potential cost increase due to unknown or un-tabulated items.
2. NYSDOT recommends standard contingencies: 25% Scoping stage, 15% Design Approval stage, 5% Advanced Detail Plans stage.
3. According to HDM Chapter 21 Section 21.3.9.4, EB 03-029 & EB 06-057.
4. The escalation rate of 3% to account for potential future increases in labor, material, equipment and other costs associated with Capital Program work. The anticipated midpoint is 10/01/15 for Phase I and 01/01/19 for Phase II.

Although the engineering considerations and environmental impacts of Diamond Alternative are discussed in detail in the remainder of this report, the Diamond Alternative has been dismissed from consideration as a feasible alternative for the following reasons:

- The estimated total project cost is 57% greater than the Flyover Alternative ($74.61M for the Diamond Alternative vs. $47.59M for the Flyover Alternative).
- The Diamond Alternative requires almost twice the area of ROW acquisitions required for the Flyover Alternative, equating to an additional $10.0M in ROW costs.
- The Diamond Alternative results in the addition of more than twice as many lane-miles of new roadway compared to the Flyover Alternative (3.39 lane-miles of roadway for the Diamond Alternative vs. 1.27 lane-miles of roadway for the Flyover Alternative). Future roadway maintenance costs directly correlate to the number of lane-miles of roadway.

- The proposed connector road bridge over I-87 requires almost three times the deck area of the proposed Flyover Ramp A bridge over I-87 resulting in higher future bridge maintenance costs for the Diamond Alternative.
- The Diamond Alternative results in relocation of two (2) commercial businesses compared to no commercial relocations for the Flyover Alternative. The relocation of these commercial businesses represents removal of $165,595 in assessed value from the Town of Colonie tax base.
- The Diamond Alternative results in approximately twice the amount of wetland impacts than the Flyover Alternative (4.76 acres compared to 2.35 acres, respectively).
- The Diamond Alternative results in a 35% increase in energy consumption and greenhouse gas emissions compared to the Flyover Alternative.

For these reasons, the Diamond Alternative has been dismissed from further consideration as a feasible alternative, and the Flyover Alternative, discussed below, has been identified as the only remaining Feasible Alternative and the Preferred Alternative.

Flyover Alternative

The Flyover Alternative includes construction of new Exit 4 ramps to replace and/or complement the existing Exit 4 interchange ramps. This alternative has been identified as the preferred alternative because it meets all of the project objectives and results in the least amount of environmental impacts. Key elements of this alternative include:

Geometry

- Construction of a new flyover ramp to connect I-87 northbound to Albany-Shaker Road (1,000 ft. west of Old Wolf Road).
- Construction of a new ramp to connect I-87 southbound to Albany-Shaker Road (1,000 ft. west of Old Wolf Road).
- Construction of new ramp to connect Albany-Shaker Road (1,000 ft. west of Old Wolf Road) to I-87 southbound.
- Construction of a new intersection on Albany-Shaker Road at the flyover ramp approximately 1,000 ft. west of Old Wolf Road.
- Replacement of the I-87 bridges over Albany-Shaker Road and reconstruction of the bridge approaches on I-87 northbound and southbound.
- Construction of new bridge(s) to carry the I-87 northbound to Albany-Shaker Road flyover ramp over I-87 northbound and southbound.
- Pavement widening for additional turn lanes and medians on Albany-Shaker Road.
- Pavement widening on I-87 northbound to create an auxiliary lane between the existing Exit 4 northbound entrance ramp and Exit 5 northbound exit ramp.
- Restriping the existing Exit 4 northbound exit ramp to create a one lane ramp allowing right-turns only onto Wolf Road and removal of the existing traffic signal at the intersection with Wolf Road.
- Removal of the existing Exit 4 southbound exit ramp and southbound entrance ramp.
- Removal of the C-D road between the existing Exit 5 southbound entrance ramp and Exit 4 southbound exit ramp.
- Replacement of the existing Exit 5 southbound entrance ramp with a new direct ramp connection from Watervliet-Shaker Road to I-87 southbound.

- Retains non-standard horizontal curve at Exit 5 northbound exit ramp. Since this ramp is outside the reconstruction limits and scope of the project, no justification for retaining this non-standard feature is required.
- Retains non-standard level-of-service on I-87 on 3 freeway segments and in 1 weave area. This non-standard feature is proposed to be retained because mitigating the non-standard level-of-service would require the addition of a fourth mainline lane on I-87 in both directions between Exit 1 and Exit 7 which would cost over $50 million, result in additional wetland and right-of-way impacts, and is beyond the scope of the proposed project. A non-standard feature justification form is included in Appendix D.

Operational

- Includes replacement/installation of traffic signals at the following intersections
  - Albany-Shaker Road / Old Wolf Road
  - Albany-Shaker Road / Flyover ramp
- Includes removal of traffic signals at the following intersections
  - Wolf Road / Exit 4 northbound exit ramp
  - Old Wolf Road / existing Exit 4 southbound exit ramp
- Overall LOS at most Exit 4 intersections improves from LOS F for the No-Build to LOS C or better.
- Reduces the travel time for major routes by 25%.
- Reduces potential for queuing on the I-87 southbound mainline during the morning peak hour by replacing the existing Exit 4 southbound exit ramp to Old Wolf Road with a new ramp connecting to Albany-Shaker Road 1,300 ft west of Old Wolf Road. This new intersection is anticipated to operate at LOS C or better during the peak hours.
- Addresses safety concerns by diverting traffic away from existing intersections that have crash rates which exceed the statewide average for similar facilities.
- Addresses pedestrian facility system connectivity by providing sidewalks on the south side of Albany-Shaker Road between Wolf Road and the connector road and a shared use path between the connector road and entrance to Albany International Airport.
- Includes removal of existing I-87 Exit 4 southbound ramps resulting in removal of conflict from the Albany-Shaker Road / Old Wolf Road and Old Wolf Road / Exit 4 southbound exit ramp intersections.

Control of Access

- Control of access for this alternative will meet the criteria in HDM Chapter 2 for each of the project area roadways.

Right-of-Way

- This alternative will include right-of-way (ROW) impacts to 15 properties.
- This alternative will result in 1 residential displacement.

- Potential State-owned underground utility impacts along I-87 northbound which may require relocation.
- Potential overhead utility impacts on Albany-Shaker Road which may require relocation.

Environmental

- This alternative will result in approximately 2.35 acres of wetland impacts.
- This alternative will result in approximately 15.2 acres of farmland impacts.

- This alternative will result in noise impacts which can be abated by noise barriers.
- There are no significant visual impacts associated with this alternative.

Cost

- Total estimated cost of this alternative is $47.59 M.

Project Goals

- These improvements meet the objectives to improve access between I-87 southbound and Wolf Road, improve access between I-87 northbound and Albany International Airport, address structural deficiencies of the I-87 bridges over Albany-Shaker Road, address safety concerns in areas that exceed the statewide average crash rate for similar facilities, and supporting the land use and economic growth of the region.

Exhibit 3.2.1 c summarizes the proposed right-of-way acquisitions for the Flyover Alternative.

Exhibit 3.2.1 c
Flyover Alternative – Summary of ROW Impacts

Tax ID No.	Owner	Type	Parcel (acres)	Acquisition (acres)
30.4-1-12	Atlantic Refining Mktg Corp	Fee	0.46	0.004
30.4-1-12	Atlantic Refining Mktg Corp	T.E.[1]	0.46	0.027
30.-3-74.1	Parc Partners LLC	Fee	3.26	0.075
30.-3-75	Scaring Daniel M	Fee	0.30	0.040
30.-3-75	Scaring Daniel M	T.E.[1]	0.30	0.011
30.-3-77	Engel Edward W	Fee	38.00	0.261
30.-3-77	Engel Edward W	T.E.[1]	38.00	0.103
30.-5-10	ET Person LLC	Fee	20.80	16.598
30.-5-9	Albany County Airport Authority	Fee	72.30	5.867
30.-5-9	Albany County Airport Authority	T.E.[1]	72.30	0.160
30.-5-1	Albany County Airport Authority	Fee	44.40	5.636
30.-5-2	Albany County Airport Authority	Fee	0.22	0.099
30.-5-3	Albany County Airport Authority	Fee	0.43	0.191
30.-5-4	Engel John K[2]	Fee	0.23	0.230
30.-5-5	Village Square of Penna Inc	Fee	5.05	0.085
30.-5-7	Village Square of Penna Inc	Fee	0.60	0.029
30.-5-7	Village Square of Penna Inc	T.E.[1]	0.60	0.039
30.-5-8	Village Square of Penna Inc	Fee	7.60	0.054
30.-5-8	Village Square of Penna Inc	T.E.[1]	7.60	0.031
30.4-1-6.21	FMW RRI II, LLC	Fee	2.46	0.004
30.4-1-6.4	N and D Restaurants, Inc.	Fee	2.47	0.076
30.4-1-6.4	N and D Restaurants, Inc.	T.E.[1]	2.47	0.086
Total Acquisitions Required (acres)				**29.706**

[1] Temporary Easement
[2] Displacement required

Typical Sections, Plans, and Profiles for the Flyover Alternative are included in Appendix A.

Exhibit 3.2.1.d summarizes the proposed costs for the Flyover Alternative.

Exhibit 3.2.1 d Summary of Flyover Alternative Costs - Million Dollars (Calculated Year)			
Activities		Phase I (I-87 Bridges over Albany-Shaker Road)	Phase II (Interchange Reconstruction)
Construction	Bridge	$ 5.22	$ 2.47
	Highway	$ 3.10	$ 14.51
Wetland Mitigation		$ 0.02	$ 0.55
Storm Pollution Discharge Elimination System		$ 0.03	$ 0.28
Subtotal (2011)		$ 8.37	$ 17.81
Incidentals[1] (10%)		$ 0.84	$ 1.78
Subtotal (2011)		$ 9.21	$ 19.59
Contingencies[2](15% @ Design Approval)		$ 1.38	$ 2.94
Subtotal (2011)		$ 10.59	$ 22.53
Potential Field Change Payment[3]		$ 0.47	$ 0.83
Subtotal (2011)		$ 11.06	$ 23.36
Mobilization (4%)		$ 0.44	$ 0.93
Subtotal (2011)		$ 11.50	$ 24.29
Expected Award Amount – Inflated[4] @ 3%/yr to midpoint of Construction (2015)		$ 12.41	$ 28.86
Construction Inspection (8%)		$ 1.12	$ 2.60
ROW Costs (2013)		$ 0.00	$ 2.60
Total Cost		**$ 13.53**	**$ 34.06**

Notes:
1. The potential cost increase due to unknown or un-tabulated items.
2. NYSDOT recommends standard contingencies: 25% Scoping stage, 15% Design Approval stage, 5% Advanced Detail Plans stage.
3. According to HDM Chapter 21 Section 21.3.9.4, EB 03-029 & EB 06-057.
4. The escalation rate of 3% to account for potential future increases in labor, material, equipment and other costs associated with Capital Program work. The anticipated midpoint is 10/01/15 for Phase I and 01/01/19 for Phase II.

3.2.2 Preferred Alternative

The Flyover Alternative has been identified as the Preferred Alternative because it meets all of the project objectives and results in the least amount of environmental impacts. This alternative includes construction of new Exit 4 ramps to replace and/or complement the existing Exit 4 interchange ramps.

3.2.3. Design Criteria for Feasible Alternative(s)

3.2.3.1. Design Standards

The proposed project will be designed in accordance with the following design standards and guidelines:

- American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets (2004)*
- NYSDOT *Highway Design Manual* (HDM)

- *Americans with Disabilities Act Accessibility Guidelines* (ADAAG)

3.2.3.2. Critical Design Elements

Exhibit 3.2.3.2 a
Critical Design Elements for Interstate 87

PIN:	1721.51	NHS (Y/N):	Yes
Route No. & Name:	I-87	Functional Classification:	Urban - Principal Arterial Interstate
Project Type:	Reconstruction	Design Classification:	Interstate (*HDM Exhibit 2-1*)
% Trucks:	8%	Terrain:	Level
ADT:	122,000	Truck Access/Qualifying Hwy.	Yes

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	70 mph[1,2] HDM Section 2.7.1.1 A	55 mph posted	70 mph
2	Lane Width	12.0 ft minimum HDM Section 2.7.1.1 B	12.0 ft	12.0 ft
3	Shoulder Width right left	10.0 ft minimum, 12.0 ft desirable 4.0 ft minimum, 12.0 ft desirable HDM Section 2.7.1.1 C, Exhibit 2-2	10.0 ft 6.0 ft	10.0 ft 6.0 ft
4	Bridge Roadway Width	Full Approach Width BM Section 2.3.1, Table 2-1	42.0 ft	52.0 min.
5	Maximum Grade	3% HDM Section 2.7.1.1 E, Exhibit 2-2	2%	3% max.
6	Horizontal Curvature	1,810 ft @ e_{max} = 8.0% HDM Section 2.7.1.1 F, Exhibit 2-2	5,730 ft	5,730 ft min.
7	Superelevation	8.0% maximum HDM Section 2.7.1.1 G	2.8%	8.0% max.
8	Stopping Sight Distance	730 ft minimum HDM Section 2.7.1.1 H, Exhibit 2-2	790 ft	730 ft min.
9	Horizontal Clearance without barrier with barrier	15 ft Use larger of 4 ft or shoulder width HDM Section 2.7.1.1 I	8 ft shoulder width	15 ft min. shoulder width
10	Vertical Clearance (above traveled way)	16.0 ft minimum, 16.5 ft desirable BM Section 2.4.1, Table 2-2	16.0 ft min	16.5 ft min.
11	Travel Lane Cross Slope	1.5% min. to 2% max. HDM Section 2.7.1.1 K	1.5% to 2.0%	2%
12	Rollover between lanes edge of traveled way	4% 8% HDM Section 2.7.1.1L	4% 8%	4% 8%
13	Structural Capacity	New and Replacement Bridges NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle Bridge Rehabilitations NYSDOT Standard Specifications for Highway Bridges AASHTO HS 20 Live Load Buried Structures (Box Culverts, 3-sided Frames and Pipes) NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle BM Section 2.6, HDM 19.5.3	N/A	NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle
14	Level of Service	"C" minimum "D" in heavily developed metropolitan areas HDM Section 2.7.1.1 N	F	E
15	Control of Access	Fully controlled HDM Section 2.7.1.1.O	Full	Full
16	Pedestrian Accommodation	N/A	None	N/A
17	Median Width	36.0 ft rural, 10.0 ft urban HDM Section 2.7.1.1.P	36 ft – 150 ft	118 ft min.

1 – The Regional Traffic and Safety Group has determined that the use a design speed of 70 mph is consistent with anticipated off-peak 85th percentile speed within the range of the functional class speeds for the terrain and volume.
2 – Refer to Section 2.3.1.5 Speeds and Delays and Appendix F of this report for additional information on speed data.

Exhibit 3.2.3.2 b
Critical Design Elements for Interstate 87 Ramps

PIN:	1721.51	NHS (Y/N):	Yes
Route No. & Name:	I-87 Ramps	Functional Classification:	Urban - Principal Arterial Interstate
Project Type:	Reconstruction	Design Classification:	Interstate (*HDM Exhibit 2-1*)
% Trucks:	Varies	Terrain:	Level
ADT:	Varies	Truck Access/Qualifying Hwy.	Yes

	Element	Standard	Existing Condition	Proposed Condition
1	Design Speed	40 mph[1, 2] HDM Section 2.7.5.2 A	40 mph posted	40 mph
2	Lane Width single lane two lanes	18.0 ft[2, 3] 25.0 ft HDM Section 2.7.5.2 B, Exhibit 2-9	14.0 ft – 15.0 ft	18.0 ft 27.0 ft
3	Shoulder Width right left	6.0 ft minimum 3.0 ft minimum HDM Section 2.7.5.2 C, Exhibit 2-10	10.0 ft 6.0 ft	6.0 ft 3.0 ft
4	Bridge Roadway Width	Full Approach Width HDM Section 2.7.5.2 D	N/A	Approach Width
5	Maximum Grade	6% HDM Section 2.7.5.2 E, Exhibit 2-10	4.7%	5.0% max.
6	Horizontal Curvature	444 ft @ e_{max} = 8.0% HDM Section 2.7.5.2 F, Exhibit 2-10	465 ft	465 ft min.
7	Superelevation	8.0% maximum HDM Section 2.7.5.2 G	6.0%	8.0% max.
8	Stopping Sight Distance	305 ft minimum HDM Section 2.7.5.2 H, Exhibit 2-10	305 ft	305 ft min.
9	Horizontal Clearance right left	Use larger of shoulder width or 6.0 ft 3.0 ft min., under structures add 4.0 ft beyond shoulder to pier or abutment HDM Section 2.7.5.2 I	shoulder width shoulder width	shoulder width 3.0 ft min.
10	Vertical Clearance (above traveled way)	16.0 ft minimum, 16.5 ft desirable BM Section 2.4.1, Table 2-2	16.0 ft min.	16.5 ft min.
11	Travel Lane Cross Slope	1.5% Min. to 2% Max. HDM Section 2.7.5.2 K	1.5% to 2.0%	2%
12	Rollover between lanes edge of traveled way	4% 8% HDM Section 2.7.5.2 L	4% 8%	4% 8%
13	Structural Capacity	New and Replacement Bridges NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle Buried Structures (Box Culverts, 3-sided Frames and Pipes) NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle BM Section 2.6, HDM 19.5.3	N/A	NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle
14	Level of Service	"C" minimum "D" in heavily developed metropolitan areas HDM Section 2.7.1.1 N	F	E
15	Control of Access	Fully controlled HDM Section 2.7.5.2.O	Partial	Full (Diamond) Partial (Flyover)
16	Pedestrian Accommodation	N/A	N/A	N/A

1 – The Regional Traffic and Safety Group has determined that the use a design speed of 70 mph is consistent with anticipated off-peak 85th percentile speed within the range of the functional class speeds for the terrain and volume.
2 – Refer to Section 2.3.1.5 Speeds and Delays and Appendix F of this report for additional information on speed data.
3 – Lane width varies based on horizontal curvature of roadway (see HDM Exhibit 2-9).

Exhibit 3.2.3.2 c
Critical Design Elements for Wolf Road, Old Wolf Road, and Albany-Shaker Road

PIN:	1721.51	NHS (Y/N):	Yes
Route No. & Name:	NY 910B, NY 155, CR 153, CR 151	Functional Class:	Urban Principal Arterial
Project Type:	Reconstruction	Design Class:	Urban Arterial
% Trucks:	Varies	Terrain:	Level
ADT:	Varies	Truck Access/Qual. Hwy.:	Yes (NY 910B, NY 155, CR 153)

	Element	Standard Criteria			Existing Conditions			Proposed Condition		
		Wolf Rd (NY 910B)	Old Wolf Rd (CR 153)	Albany-Shaker Rd (CR 151)	Wolf Rd (NY 910B)	Old Wolf Rd (CR 153)	Albany-Shaker Rd (CR 151)	Wolf Rd (NY 910B)	Old Wolf Rd (CR 153)	Albany-Shaker Rd (CR 151)
1	Design Speed:	40 mph	40 mph	45 mph HDM Section 2.7.2.2 A	40 mph posted			40 mph[1]	40 mph[1]	45 mph[1]
2	Lane Width: Travel Lanes Turn Lanes	12.0 ft minimum 11.0 ft minimum, 12 ft desirable HDM Section 2.7.2.2 B, Exhibit 2-4			11 ft	11 ft	11 ft	12 ft 12 ft		
3	Should Width (right): Curbed Uncurbed	0 ft – 4 ft minimum 8 ft HDM Section 2.7.2.2 C, Exhibits 2-3 & 2-4			2 ft -	0 ft left 8 ft right	2.0 ft 8.0 ft	2 ft	2 ft	2 ft
4	Bridge Roadway Width:	Full Approach Width BM Section 2.3.1, Table 2-1			N/A			N/A		
5	Maximum Grade:	7%	7%	6% HDM Section 2.7.2.2 E, Exhibit 2-4	0.71%	0.90%	1.38%	1.0% max.	3.0% max.	1.2% max.
6	Horizontal Curvature:	533 ft	533 ft	711 ft HDM Section 2.7.2.2 F, Exhibit 2-4	2,865 ft	600 ft	1,150 ft	533 ft min.	533 ft min.	711 ft min.
7	Superelevation Rate:	4% HDM Section 2.7.2.2 G			N.C.	N.C.	N.C.	4% max.		
8	Stopping Sight Distance:	305 ft	305 ft	360 ft HDM Section 2.7.2.2 H, Exhibit 2-4	940 ft	545 ft	1,635 ft	305 ft min.	305 ft min.	360 ft min.
9	Horizontal Clearance: Curbed with barrier Curbed without barrier Curbed at intersections Uncurbed with barrier Uncurbed without barrier	0.0 ft 1.5 ft 3.0 ft HDM Section 2.7.2.2 I Shoulder width, 4.0 ft min. 10.0 ft HDM Section 2.7.2.1 I			15.0 ft N/A 10.0 ft N/A N/A	15.0 ft N/A 3.0 ft N/A 10.0 ft	15.0 ft N/A N/A N/A N/A	0.0 ft min. 1.5 ft min. 3.0 ft min. Shoulder width, 4.0 ft min. 10.0 ft min.		
10	Vertical Clearance: Designated Route Non-Designated Route	16.0 ft 14.0 ft BM Section 2.4.1, Table 2-2			- N/A	- N/A	16.0 ft -	16.5 ft min. N/A		
11	Pavement Cross Slope: Min./Max.	1.5 % / 2.0% HDM Section 2.7.2.2 K			2.0%			1.5% 2.0%		
12	Rollover: Between lanes/edge of travel lane	4.0% / 8.0% HDM Section 2.7.2.2 L			4.0%			4.0% / 8.0%		
13	Structural Capacity: New and Replacement Bridges Buried Structures (Box Culverts, 3-sided Frames and Pipes)	NYSDOT LRFD Specifications AASHTO HL-93 Live Load & NYSDOT Design Permit Vehicle NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle BM Section 2.6, HDM 19.5.3			N/A			N/A		
14	Pedestrian Accommodations	ADAAG & HDM Chapter 18			ADAAG & HDM Chapter 18			ADAAG & HDM Chapter 18		

1 – Refer to Section 2.3.1.5 Speeds and Delays and Appendix F of this report for additional information on speed data.

Exhibit 3.2.3.2 d
Critical Design Elements for Proposed Connector Road

PIN:	1721.51	NHS (Y/N):	TBD
Route No. & Name:	TBD	Functional Classification:	Urban – Principal Arterial
Project Type:	New Construction	Design Classification:	Urban Arterial
% Trucks:	-	Terrain:	Level
ADT:	-	Truck Access/Qualifying Hwy.	TBD

	Element	Standard	Proposed Condition
1	Design Speed	40 mph HDM Section 2.7.2.2 A	40 mph
2	Lane Width travel lane turning lane	12.0 ft min. 11.0 ft min., 12.0 ft des. HDM Section 2.7.2.2 B, Exhibit 2-4	12.0 ft 12.0 ft
3	Shoulder Width (uncurbed)	8.0 ft HDM Section 2.7.2.2 C, Exhibit 2-3	8.0 ft
4	Bridge Roadway Width	Full Approach Width HDM Section 2.7.2.2 D	92 ft (approach width)
5	Maximum Grade	7% HDM Section 2.7.2.2 E, Exhibit 2-4	3.0% max.
6	Horizontal Curvature	485 ft @ e_{max} = 6.0% HDM Section 2.7.2.2 F, Exhibit 2-4	711 ft min.
7	Superelevation	4% HDM Section 2.7.2.2 G	4.0% max.
8	Stopping Sight Distance	305 ft minimum HDM Section 2.7.2.2 H, Exhibit 2-4	305 ft min.
9	Horizontal Clearance Curbed with barrier Curbed without barrier Curbed at intersections Uncurbed with barrier Uncurbed without barrier	0.0 ft 1.5 ft 3.0 ft Shoulder width, 4.0 ft min. 10.0 ft HDM Section 2.7.5.2 I	0.0 ft min. 1.5 ft min. 3.0 ft min. Shoulder width, 4.0 ft min. 10.0 ft min.
10	Vertical Clearance Designated Route Non-Designated Route	16.0 ft 14.0 ft BM Section 2.4.1, Table 2-2	16.5 ft min.
11	Pavement Cross Slope Minimum Maximum	1.5% 2.0% HDM Section 2.7.2.2 K	2.0%
12	Rollover between lanes edge of traveled way	4% 8% HDM Section 2.7.2.2 L	4% 8%
13	Structural Capacity New and Replacement Bridges Buried Structures (Box Culverts, 3-sided Frames and Pipes)	NYSDOT LRFD Specifications, AASHTO HL-93 Live Load, and NYSDOT Design Permit Vehicle NYSDOT LRFD Specifications, AASHTO HL-93 Live Load, and NYSDOT Design Permit Vehicle BM Section 2.6, HDM Sections 2.7.2.2 M & 19.5.3	NYSDOT LRFD Specifications, AASHTO HL-93 Live Load, and NYSDOT Design Permit Vehicle
14	Pedestrian Accommodation	ADAAG & HDM Chapter 18 HDM Section 2.7.2.2 N	ADAAG & HDM Ch. 18
15	Median Width	4.0 ft with left turn lane HDM Section 2.7.2.1 O, Exhibit 2-3	4.0 ft with left turn lane

3.2.3.3. Other Design Parameters

Exhibit 3.2.3.3 Other Design Parameters			
	Element	**Criteria**	**Proposed Condition**
Interstate 87 / Interstate 87 Ramps			
1	Design Vehicle	WB 67	WB 67
2	Drainage Design Storm: Culverts Storm Drain Systems Ditches	 50 yr frequency 10 yr frequency (50 yr if no overflow relief) 25 yr frequency HDM Section 8.3.2.4, Table 8-2	 50 yr frequency 10 yr frequency (50 yr if no overflow relief) 25 yr frequency
3	Freeboard	2 ft below outside edge of the lowest shoulder HDM Section 8.6.1.1	
4	Clear Zone Fill Slopes Cut Slopes	 30.0 ft – 45.0 ft 23.0 ft – 43.5 ft HDM Section 10.2.1, Tables 10-1 and 10-2	 30.0 ft – 45.0 ft 23.0 ft – 43.5 ft
5	Speed Change Lanes lane width shoulder width	 Same as adjacent travel lane 6 ft interstate, 4 ft other roadways HDM Section 2.7.5.3	 12.0 ft 6.0 ft
Wolf Road / Old Wolf Road / Albany-Shaker Road / Connector Road			
1	Level of Service (for non – interstate projects)	"C" rural "D" urban HDM Section 5.2.2.1	"D"
2	Design Vehicle	WB 67	WB 67
3	Drainage Design Storm: Culverts Storm Drain Systems Ditches	 50 yr frequency 10 yr frequency (50 yr if no overflow relief) 25 yr frequency HDM Section 8.3.2.4, Table 8-2	 50 yr frequency 10 yr frequency (50 yr if no overflow relief) 25 yr frequency
4	Freeboard		
5	Clear Zone Fill Slopes Cut Slopes	 15.0 ft – 39.0 ft 15.0 ft – 31.5 ft HDM Section 10.2.1, Tables 10-1 and 10-2	 15.0 ft – 39.0 ft 15.0 ft – 31.5 ft

3.3. Engineering Considerations

3.3.1. Operations (Traffic and Safety) & Maintenance

3.3.1.1. Functional Classification and National Highway System

This project will not change the functional classification of any existing highway in the project study area.

The functional classification of the proposed Interstate 87 Exit 4 Ramps and connector road will be Urban Principal Arterial Interstate and Urban Principal Arterial, respectively.

3.3.1.2. Control of Access

I-87 and the interchange ramps will be fully controlled access roadways within the project limits.

The following two intersections within the project study area included in the Diamond Alternative will include a ramp as one of the approaches:

- Connector road / I-87 NB ramps
- Connector road / I-87 SB ramps

The following three intersections within the project study area included in the Flyover Alternative will include a ramp as one of the approaches:

- Albany-Shaker Road / flyover ramps
- Albany-Shaker Road / Wolf Road / Exit 4 NB Entrance Ramp
- Wolf Road / Exit 4 NB Exit Ramp

One location was identified in Section 2.3.3.2 as having non-standard access control at an existing intersection with an interstate ramp on one approach. On the northwest corner of the Albany-Shaker Road / Old Wolf Road / Exit 4 SB Entrance Ramp intersection, the one-way entrance driveway on Albany-Shaker Road for the Hotel Indigo is 25 ft. from the Exit 4 SB Entrance Ramp. This is less than the required controlled access distance of 50 ft. in either direction on the far side of the crossroad. Both alternatives include removal of the existing Exit 4 SB Entrance Ramp; thereby removing the existing non-standard access control at this location.

No control of access will be provided on the remaining roadways within the project study area.

3.3.1.3. Traffic Control Devices

3.3.1.3. (1) Traffic Signals

The Diamond Alternative includes replacement/installation of traffic signals at the following intersections, with the signal phasing noted:

- Wolf Road / connector road / Metro Park Road (eight phases; protected NB left, all other lefts protected-permitted)
- connector road / Exit 4 northbound ramps (protected EB left)
- connector road / Exit 4 southbound ramps (protected WB left)
- connector road / Albany-Shaker Road (protected WB left)

All new traffic signals will be fully actuated with detectors and will be owned and maintained by NYSDOT. A force-off detector will be installed on the Albany-Shaker Road eastbound approach to the connector road as a precaution to prevent unanticipated queue lengths from extending in to the airport's Runway Protection Zone (RPZ).

The Diamond Alternative includes removal of existing traffic signals at the following intersection:

- Wolf Road / Exit 4 northbound Exit Ramp
- Old Wolf Road / existing Exit 4 southbound Exit Ramp

The Flyover Alternative includes replacement/installation of traffic signals at the following intersections, with the signal phasing noted:

- Albany-Shaker Road / Wolf Road (protected EB left, protected-permitted WB left)
- Albany-Shaker Road / Flyover Ramps (protected-permitted WB left)

All new traffic signals will be fully actuated with detectors and will be owned and maintained by NYSDOT. A force-off detector will be installed on the Albany-Shaker Road eastbound approach to the flyover ramps as a precaution to prevent unanticipated queue lengths from extending in to the airport's Runway Protection Zone (RPZ). A copy of the June 3, 2013 correspondence between the NYSDOT and the FAA is included in Appendix E.

The Flyover Alternative also includes removal of traffic signals at the following intersections:

- Wolf Road / Exit 4 northbound Exit Ramp

- Old Wolf Road / existing Exit 4 southbound Exit Ramp

3.3.1.3. (2) Signs

Existing signs will be evaluated and replaced as necessary. New signs will be added where required.

3.3.1.4. Intelligent Transportation Systems (ITS)

NYSDOT envisions that the work performed under this project will be limited to modifying, upgrading, and relocating equipment in and around the project area. Implementation of major field systems shall not be included in this project.

Where applicable, all proposed ITS work shall comply FHWA ITS design standards more fully described in FAPG 23 CFR 940, SUBCHAPTER K - INTELLIGENT TRANSPORTATION SYSTEMS PART 940 - INTELLIGENT TRANSPORTATION SYSTEM ARCHITECTURE AND STANDARDS, http://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0940.htm. This process must be used for projects involving the implementation of major functional changes to an existing ITS system.

All new equipment shall have a minimal physical, power, and communications footprint. Equipment shall be sited at locations that are favorable to solar power and wireless communications and/or take advantage of using existing power and communication facilities. Installation of new utility services shall be avoided wherever possible.

All devices shall be compliant and operate with Schneider\Telvent's MIST system Ver. 4 or the current master control software used at the TMC.

ITS elements will be used to mitigate identified problems and deficiencies such as operational problems, efficiency issues and deficiencies in the following areas:

- Safety,
- Recurring congestion,
- Non-recurring congestion,
- In-route motorist information and advisory,
- Mobility,
- Incident response and clearing, and
- System interrelationships

The following provides a general description of the equipment plan for the proposed ITS conceptual plan for the Exit 4 area. For each roadway segment, specific equipment deployment proposals considered depends upon the level of congestion on the roadway segment and coordination required to alleviate or reduce the impacts of congestion. The ITS placement, primary location and final location will be determined during final design, when detailed field studies will be conducted to determine precise locations of field equipment.

VMS

The VMS deployment is based on providing real time information at strategic locations in the local area. Locations were selected to provide information in advance of major route interchanges, i.e. route decision points and airport access: for example, VMS should be deployed on I-87 northbound prior to the new Exit 4. There is currently a mobile VMS in this segment. The mobile VMS will be post-mounted in 2013-14.

Using a permanent sign at this location and using the mobile sign at another location will be considered. Deploying VMS simply at some sequential interval, such as each interchange along the project roadway network, is considered unnecessary or inappropriate, given the layout of the project network.

Due to highway construction efforts for the new interchange, the implementation cost of ITS infrastructure at the construction zone will be minimal; therefore, a secondary VMS at on the southbound approach to the new Diamond Interchange will be considered for the Diamond Alternative.

The I-87 southbound approach to the new Exit 4 Exit Ramp is another location where VMS can provide useful information to motorists.

There are currently mobile VMS located in the following areas (In bold are recommendations from NYSDOT, Region 1 ITS):

- I-87 Exit 4 northbound on ramp at the intersection with Albany-Shaker Road and Wolf Road
  VMS 21 - RM 910B11011019 Relocate depending on Preferred Alternative. Current location is poor. Use is high.

- I-87 northbound between Exit 4 and Exit 5 on the right side of the road
  VMS 111 RM 87I11082040 Existing plans are to post-mount at existing location using the HWY standby contract. Use is high.

- I-87 northbound between Exit 2 and Exit 4, just before the Exit 4 northbound off ramp, on the right side of the road
  VMS 29 - Sign has been moved south to 87I11082023. Existing plans are to post mount at existing location using Hwy standby contract. Use is high.

- Albany-Shaker Road between Meeting House Road and the Desmond, on the eastbound side of the road
  Use is low. Increase use or consider eliminating. A permanent structure is not warranted at this time.

There is a permanent VMS located in the following area:

- I-87 southbound between Exit 2 and Exit 4, before the Sand Creek Road overpass

<u>Highway Advisory Radio (HAR)</u>
HAR utility is low and problematic. Permanent HAR implementation should be corridor-based, not spot located. A corridor-based solution is beyond the scope of this project.

Temporary stations for construction purposes may be considered, but given HAR broadcast range limitations, an implementation of several synchronized HAR's may be needed.

The proposed level of HAR deployment will provide coverage for all roadway segments. HAR is a cost-effective ITS element that can be deployed individually or in complement to VMS to support information dissemination. Two HAR stations, along I-87 at the southern and northern ends of the project study area, will be considered. These HAR can be implemented at temporary locations and operated during the construction period to support the construction phases. The coverage range of the HAR and operating frequency are two key issues that should be addressed during final design.

<u>CCTV</u>
Specialized structures for CCTV shall be avoided. Existing structures or structures that can be easily modified to accept a mount shall be considered. CCTV located at signalized intersections shall make use of existing physical and communication infrastructure. It is likely that only infrastructure items such as conduit, pull boxes, and wiring, etc. will be included in this project. In similar projects, NYSDOT has installed the camera.

For CCTV, high deployment corresponds to full coverage, medium deployment corresponds to partial coverage, and low deployment corresponds to spot specific locations that are critical in nature. CCTV deployment also depends upon the geometric conditions and available line of sight along the roadway. For example, the number of cameras required to provide full CCTV coverage will be different for each of the feasible alternatives.

Cameras already exist along the I-90 and I-87 corridors in the Albany area. Within the project study area, cameras are located on I-87 between Sand Creek Road and Exit 4, between Albany-Shaker Road and Exit 5, and at Exit 6.

The primary assignment for the Diamond Alternative proposes the following additional cameras: two cameras along the connector road on each approach to the Exit 4 ramps and one on I-87 located between Exit 4 and Albany-Shaker Road. Wolf Road between the connector road and Albany-Shaker Road should also be considered for camera coverage because the level of congestion.

The primary assignment for the Flyover Alternative proposes one additional camera along I-87 located between Exit 4 and Albany-Shaker Road.

Traffic Detector Stations
No additional detector stations shall be installed. If the existing detector station is impacted by construction, a new site shall be constructed and brought online prior to disrupting the existing site.

Road Weather Information System (RWIS)
An RWIS sensor is located at RM 87I11082045 in loop detector cabinet 5. No RWIS is needed in this project.

Ramp Metering
The Interstate 87/Route 9 Integrated Corridor Study concluded that ramp metering is not warranted at this time. It should not be considered for implementation as part of this project.

Traffic Signal Modification
Traffic Signal Modification is another ITS effort that should be considered. Based on the preferred alternative, the local intersections can also be optimized and coordinated with I-87 operation. This coordination can run between intersections and possibly ramp metering equipment to reduce the congestion at the interchange. This coordination can also include intersections on Wolf Road.

The ITS field elements support, communication, and control network sub-systems include:

Communication
The communications system required to support the ITS field element equipment should be a combination of a local and state owned network at the construction area, and leased lines services for other areas. Communication requirements details such as communication protocols, data rates, polling frequency, message types, and kinds of interfaces will be addressed in the design phases but they should be compatible with NTCIP standards and the state specific standards.

The I-87 Exit 4 area can be furnished with an ITS duct system that supports communication requirements and power service distribution. It is recommended that a minimum of three conduits be included in the ITS duct system. These conduits may be equipped with inter-duct for better accessibility and usage. The primary conduit assignment is:

- Local Communication Backbone Conduit: this conduit will be around the construction roadway to implement local network links.
- Communication Access Conduit: this conduit will be designed for the connection of ITS elements to the local communication network. This conduit will be parallel with local communication backbone but has more access points related to ITS elements. For network

security and protection, it is recommended that the communication access cables not be installed on the local communication backbone.

- Power service Distribution Conduit: this conduit is used to feed the ITS element at the construction area from identified power sources. It saves the overall implementation cost of the project to minimize the civil works. If this conduit is considered, the cost of implementation will mainly consist of material costs.

It is recommended, that the network access point (or example: junction boxes) will be a uniform distributed shape placed each 300 ft. This reduces the construction cost for future ITS expansion in the project area.

Several technology alternatives for the communication network exist, but the best performance solution is to have wire-line communications in the construction area. Wireless solutions can be considered for the ITS elements on other areas. The design should consider these options and provide a combination of wire-line, wireless and leased services. "Leased services" refers to data transmission provided by the local telephone service provider. These services can be a low speed data rate service, ITS Data Element, or high-speed service for video transmission.

Control Center

The TMC and Troop G headquarters are located at Route 7 (near Wade Road) in Latham where they relocated to in May 2013.

The proposed ITS will be controlled and operated from the control center which is located at the State Police Troop G Headquarters at 760 Troy Schenectady Road in the Town of Latham. All project ITS elements will be controlled/operated from this control center. The control center equipment will be detailed in the design phases but it is anticipated the following equipment will be required:

- Communication Interface Module
- Ramp Metering Control Sub-system
- Local Communication Network Monitoring Sub-system

3.3.1.5. Speeds and Delay

3.3.1.5. (1) Proposed Speed Limit

The existing posted speed limits of 55 mph on I-87 and 40 mph on Albany-Shaker Road, Wolf Road, Old Wolf Road and Watervliet-Shaker Road will be retained upon completion of the project.

The proposed speed limit on the connector road will be 40 mph.

3.3.1.5. (2) Travel Time Estimates

Travel time on the network roadways was evaluated from the VISSIM models for the future Build alternative conditions. The 2036 (ETC+20) travel time estimates are presented in Exhibits 3.3.1.5 a and 3.3.1.5 b.

Exhibit 3.3.1.5 a Travel Time Estimates 2036 (ETC+20) Build Alternatives AM Peak Hour			
Roadway: Segment	**No-Build (m:ss)**	**Diamond (m:ss)**	**Flyover (m:ss)**
Northbound			
I-87: Sand Creek Overpass to Airport	6:05	4:23	3:41
I-87: Sand Creek Overpass to Exit 6 Off-Ramp	3:55	3:55	3:56
Southbound			
I-87: Exit 6 On-Ramp to Airport	7:03	6:10	4:59
I-87: Exit 6 On-Ramp to Wolf Road (Metro Park)	6:53	4:33	5:19
I-87: Exit 6 On-Ramp to Sand Creek Overpass	3:37	3:40	3:35

m:ss = minutes:seconds

Exhibit 3.3.1.5 b Travel Time Estimates 2036 (ETC+20) Build Alternatives PM Peak Hour			
Roadway: Segment	**No-Build (m:ss)**	**Diamond (m:ss)**	**Flyover (m:ss)**
Northbound			
I-87: Sand Creek Overpass to Airport	7:37	4:40	3:52
I-87: Sand Creek Overpass to Exit 6 Off-Ramp	4:36	4:38	4:33
Southbound			
I-87: Exit 6 On-Ramp to Airport	5:57	6:37	5:09
I-87: Exit 6 On-Ramp to Wolf Road (Metro Park)	6:05	4:49	5:23
I-87: Exit 6 On-Ramp to Sand Creek Overpass	3:46	3:43	3:41

m:ss = minutes:seconds

The Diamond Alternative reduces the expected travel time for major routes by 20% when compared to the No-Build Alternative. In the southbound direction during the AM peak hour, the travel time to the airport is reduced from 7:03 to 6:10 (0:53 reduction) and the travel time to Metro Park Road is reduced from 6:53 to 4:33 (2:20 reduction). In the northbound direction during the PM peak hour, the travel time to the airport is reduced from 7:37 to 4:40 (2:57 reduction). However, the travel time to the airport in the southbound direction during the PM peak hour is estimated to be greater than the No-Build Alternative. This is a result of the longer distance a vehicle must travel to reach the Exit 4 southbound off-ramp and then to Albany-Shaker Road.

The Flyover Alternative reduces the expected travel time for major routes by 25% when compared to the No-Build Alternative. In the southbound direction during the AM peak hour, the travel time to the airport is reduced from 7:03 to 4:59 (2:07 reduction) and the travel time to Metro Park Road is reduced from 6:53 to 5:19 (1:34 reduction). In the northbound direction during the PM peak hour, the travel time to the airport is reduced from 7:37 to 3:52 (3:45 reduction).

For both alternatives, the northbound and southbound through travel times (between Sand Creek Road Overpass and Exit 6 ramps) on I-87 are approximately the same as No-Build. As a result, it is not anticipated that the Build Alternatives will increase delay for through vehicles on I-87.

Overall, the Flyover Alternative provides the most reductions in travel time when compared to the No-Build condition.

3.3.1.6. Traffic Volumes

CDTC used their regional demand model to estimate future traffic volumes for the project study area with and without the project alternatives. For the Build alternatives, they incorporated the proposed connections and geometry into the roadway network to establish the traffic patterns.

There are several elements of the Diamond Alternative that change the existing traffic patterns:

- Existing elements removed
    - Exit 4 SB off-ramp
    - Exit 5 SB on-ramp
    - C-D road between Exits 5 and 4 SB
    - Exit 4 SB on-ramp
    - Exit 4 NB off-ramp
    - Exit 4 NB on-ramp
- New ramp facilities
    - Exit 5 SB on-ramp from Watervliet-Shaker Road (creating a “diamond” configuration with the Exit 5 SB off-ramp)
    - Exit 4 NB and SB on- and off-ramps to a new connector road (creating a new “diamond” interchange
- New roadway
    - Connector Road from Wolf Road at Metro Park Road to Albany-Shaker Road (crossing over I-87)

All of these modifications to the existing system change the traffic patterns on segments of I-87 and the local roadway system. The addition of the Connector Road and Exit 4 Diamond ramps change patterns on the Exit 2 and Exit 5 ramps, especially for those with Wolf Road origins or destinations.

The AM and PM peak hour traffic flow diagrams are presented in Appendix F.

Exhibit 3.3.1.6 a and Exhibit 3.3.1.6 b present the projected 2016 (ETC), 2036 (ETC+20) and 2046 (ETC+30) Diamond Alternative traffic volumes for the study area; the No-Build volumes are also shown for comparison purposes.

Exhibit 3.3.1.6 a
Forecast Build Alternative Traffic Volumes
ETC & ETC+20
Diamond Alternative

Roadway: Segment	2016 (ETC)				2036 (ETC+20)			
	No-Build		Diamond		No-Build		Diamond	
	AADT[1]	AM Peak / PM Peak	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	56,700	3000 / 5100	60,000	3300 / 5400	57,800	3000 / 5200	61,100	3650 / 5500
I-87: Exit 4 to Exit 2 Southbound	57,800	5200 / 3850	57,800	5200 / 3850	58,900	5300 / 4100	58,900	5300 / 4050
I-87: Exit 4 to Exit 5 Northbound	65,600	2750 / 5900	62,800	2500 / 5650	66,700	2800 / 6050	63,900	2650 / 5750
I-87: Exit 5 to Exit 4 Southbound	48,900	4400 / 2550	59,400	5350 / 3650	50,000	4550 / 2750	65,000	5850 / 3900
I-87: Exit 5 to Exit 6 Northbound	67,800	2500 / 6100	63,900	2400 / 5750	69,400	2600 / 6250	65,600	2550 / 5900
I-87: Exit 6 to Exit 5 Southbound	67,800	6100 / 3450	67,800	6100 / 3500	67,200	6050 / 3800	68,900	6200 / 3625
Albany-Shaker Rd: West of Old Wolf	33,000	2450 / 3300	18,000	1100 / 1800	37,500	2600 / 3750	19,500	1400 / 1950
Wolf Rd: South of Exit 4	20,000	2050 / 2000	14,000	900 / 1400	22,500	2000 / 2250	16,500	1050 / 1650

(1) AADT is the Average Annual Daily Traffic.

Exhibit 3.3.1.6 b
Forecast Build Alternative Traffic Volumes
ETC+30
Diamond Alternative

Roadway: Segment	2046 (ETC+30)			
	No-Build		Diamond	
	AADT[1]	AM Peak / PM Peak	AADT	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	58,300	3000 / 5250	61,100	3650 / 5500
I-87: Exit 4 to Exit 2 Southbound	59,400	5350 / 4250	59,400	5350 / 4050
I-87: Exit 4 to Exit 5 Northbound	67,200	2850 / 6050	64,400	2650 / 5800
I-87: Exit 5 to Exit 4 Southbound	50,600	4550 / 2800	65,000	5850 / 3900
Albany-Shaker Rd: West of Old Wolf	39,500	2800 / 3950	20,000	1600 / 2000

(1) AADT is the Average Annual Daily Traffic.

There are also several elements of the Flyover Alternative that change the existing traffic patterns:

- Existing elements removed
  - Exit 4 SB off-ramp
  - Exit 5 SB on-ramp
  - Collector-Distributor (C-D) road between Exits 5 and 4
  - Exit 4 SB on-ramp
- Existing elements modified
  - Exit 4 NB off-ramp restricted to right-turn only onto Wolf Road SB
- New ramp facilities

- Exit 4 NB off-ramp to new intersection on Albany-Shaker Road
- Exit 5 SB on-ramp relocated to north (creates “diamond” with SB off-ramp)
- Exit 4 SB off-ramp to new intersection on Albany-Shaker Road
- Exit 4 SB on-ramp, accessed from new intersection on Albany-Shaker Road

All of these modifications to the existing system change the traffic patterns on segments of I-87 and the local roadway system. The removal of the C-D road and the Exit 4 SB off-ramp to Old Wolf Road significantly reduces the volumes on Old Wolf Road. Providing ramps to the new intersection on Albany-Shaker Road reduce the number of intersections vehicles destined for Albany International Airport have to drive through.

The AM and PM peak hour traffic flow diagrams are presented in Appendix F.

Exhibit 3.3.1.6 c and 3.3.1.6 d present the projected 2016 (ETC), 2036 (ETC+20) and 2046 (ETC+30) Flyover Alternative traffic volumes for the study area; the No-Build volumes are also shown for comparison purposes. As shown, the I-87 volume projections for the Flyover Alternative show slight growth at 0.5% per year or less through ETC+20.

Exhibit 3.3.1.6 c
Forecast Build Alternative Traffic Volumes
ETC & ETC+20
Flyover Alternative

Roadway: Segment	2016 (ETC)				2036 (ETC+20)			
	No-Build		Flyover		No-Build		Flyover	
	AADT[1]	AM Peak / PM Peak	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak	AADT	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	56,700	3000 / 5100	61,100	3250 / 5500	57,800	3000 / 5200	62,800	3500 / 5650
I-87: Exit 4 to Exit 2 Southbound	57,800	5200 / 3850	59,400	5350 / 3900	58,900	5300 / 4100	60,600	5450 / 4150
I-87: Exit 4 to Exit 5 Northbound	65,600	2750 / 5900	65,600	2700 / 5900	66,700	2800 / 6050	66,100	2800 / 5950
I-87: Exit 5 to Exit 4 Southbound	48,900	4400 / 2550	58,900	5300 / 3650	50,000	4550 / 2750	65,000	5850 / 3900
I-87: Exit 5 to Exit 6 Northbound	67,800	2500 / 6100	68,300	2550 / 6150	69,400	2600 / 6250	68,900	2650 / 6200
I-87: Exit 6 to Exit 5 Southbound	67,800	6100 / 3450	66,700	6000 / 3500	67,200	6050 / 3800	68,300	6150 / 3800
Albany-Shaker Rd: West of Old Wolf	33,000	2450 / 3300	19,000	1800 / 1900	37,500	2600 / 3750	22,000	2200 / 2200
Wolf Rd: South of Exit 4	20,000	2050 / 2000	18,500	1600 / 1850	22,500	2000 / 2250	19,500	1800 / 1950

(1) AADT is the Average Annual Daily Traffic.

Exhibit 3.3.1.6 d
Forecast Build Alternative Traffic Volumes
ETC+30
Flyover Alternative

Roadway: Segment	2046 (ETC+30)			
	No-Build		Flyover	
	AADT[1]	AM Peak / PM Peak	AADT	AM Peak / PM Peak
I-87: Exit 2 to Exit 4 Northbound	58,300	3000 / 5250	63,300	3550 / 5700
I-87: Exit 4 to Exit 2 Southbound	59,400	5350 / 4250	61,100	5500 / 4100
I-87: Exit 4 to Exit 5 Northbound	67,200	2850 / 6050	66,100	2800 / 5950
I-87: Exit 5 to Exit 4 Southbound	50,600	4550 / 2800	65,000	5850 / 3900
Albany-Shaker Rd: West of Old Wolf	39,500	2800 / 3950	24,500	2300 / 2450

(1) AADT is the Average Annual Daily Traffic.

The Department was made aware of a potential plan that proposes a large mixed-use commercial/retail development on Albany-Shaker Road within the project limits. Traffic generated from this potential development has not been included in the future traffic volume forecasts since no formal submittal for the project has been submitted to any government agency, no details on the scope of the development are available, there is no expected build timeframe for the development, and it has not been included in CDTC's long range plan. However, using CDTC's regional growth model, projected traffic increases were developed based on a potential development scenario which assumed "worst case" traffic conditions in which most users would travel on the proposed interchange ramps to access the development. Although the traffic projections showed an increase in volume at the interchange due to the development, the interchange ramps have ample additional capacity to accommodate the projected volumes.

3.3.1.7. Level of Service and Mobility

3.3.1.7 (1) At Project Completion & Design Year

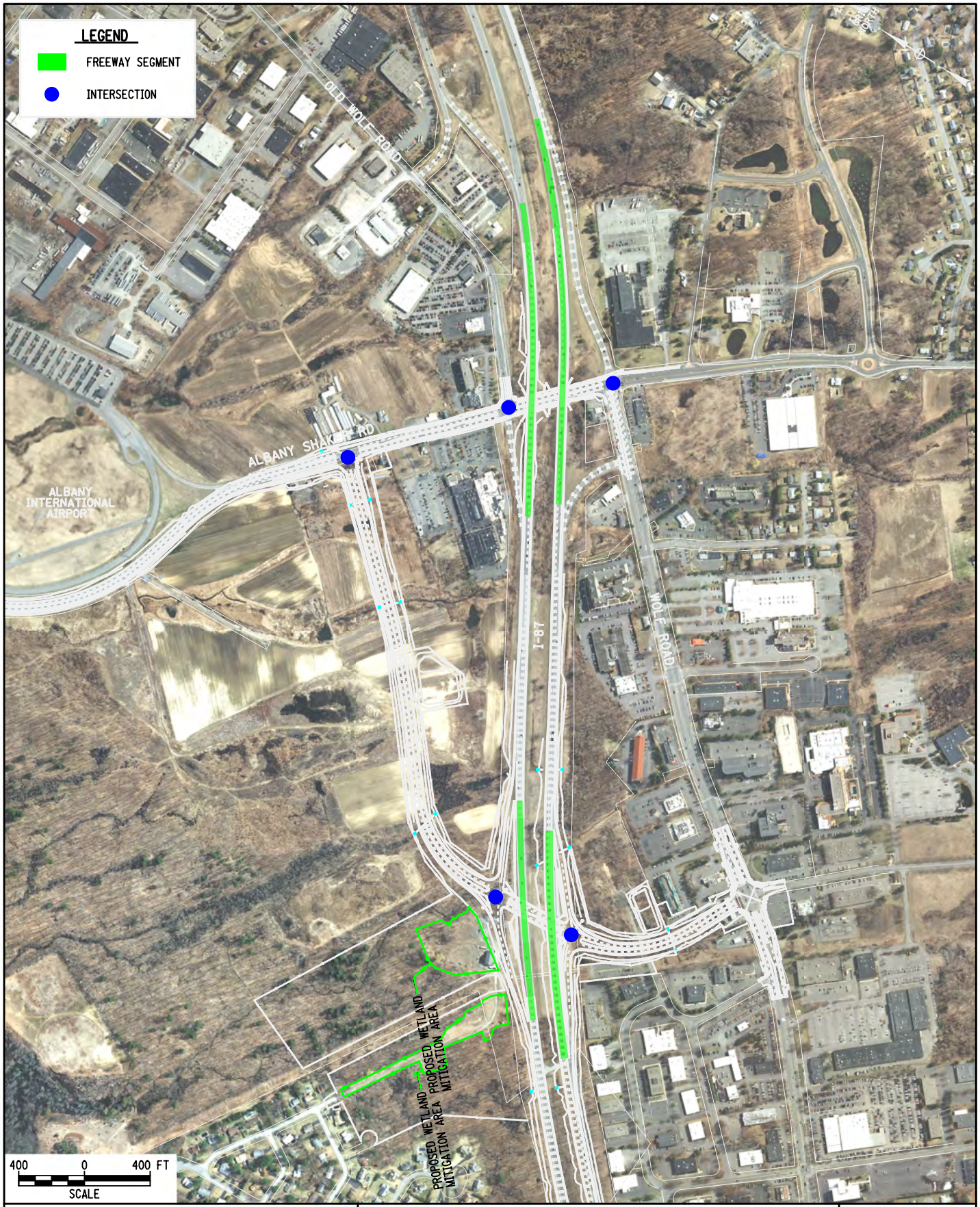
Two build alternatives were evaluated for the purpose of this study: the Diamond Alternative and Flyover Alternative.

Summaries of the LOS for each build alternative for the ETC, ETC+10, ETC+20, and ETC+30 future year conditions are presented in detail in Appendix F. Note that the ETC+30 condition was only evaluated for the intersections adjacent to the bridges, as illustrated on Exhibits 3.3.1.7 a and 3.3.1.7 k.

Summaries of the intersection LOS for the ETC, ETC+20 and ETC+30 future design years for the Diamond Alternative are presented in Exhibits 3.3.1.7 b through 3.3.1.7 e; the No-Build results are also shown for comparison purposes. As shown in these analyses, there are intersections within the study area, but outside the project area, that continue to have movements that experience LOS E or worse at ETC+20 during the studied peak hours. These intersections are:

- Central Avenue & Wolf Road (PM)
- Sand Creek Road & Wolf Road (PM)
- Exit 5 SB Ramps & Watervliet-Shaker Road (PM)

At the project area intersections, all intersection approaches are estimated to operate at LOS D or better through ETC+20. There is one movement, the westbound left-turn at the Albany-Shaker Road & Connector Road intersection that operates at LOS E during both peak hours. This is a relatively low volume movement, and the LOS E is a result of priority given to the major through movements on Albany-Shaker Road and the Connector Road.



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ETC+30 LEVEL OF SERVICE EVALUATION LOCATIONS DIAMOND ALTERNATIVE

INTERSTATE 87 (I-87) EXITS 3/4 ACCESS IMPROVEMENTS

FIGURE

3.3.1.7a

DATE: 8/13

FILE NAME = U:\9456\dsgn\Preliminary Design\Figures\Traffic Figures\172151.ets.diamond.LOS.dgn
DATE/TIME = 10/29/2013
USER = 2210

Exhibit 3.3.1.7 b
Intersection Level of Service
Diamond Alternative
ETC & ETC+20 AM Peak Hour

Intersection/Approach		2016 (ETC)				2036 (ETC+20)			
		No-Build		Diamond		No-Build		Diamond	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road									
Central Avenue	EB	24.9	C	24.4	C	26.2	C	25.0	C
	WB	28.3	C	28.4	C	28.7	C	27.7	C
Exit 2 NB Off-Ramp	NB	40.4	D	40.2	D	42.0	D	41.5	D
Wolf Road	SB	22.8	C	19.1	B	22.8	C	20.6	C
OVERALL		29.2	C	28.3	C	30.4	C	29.0	C
Sand Creek Road & Wolf Road									
Sand Creek Road	EB	26.0	C	22.9	C	27.9	C	24.0	C
	WB	25.2	C	23.3	C	26.7	C	24.3	C
Wolf Road	NB	18.1	B	19.1	B	21.0	C	21.8	C
	SB	18.0	B	14.8	B	19.4	B	17.1	B
OVERALL		20.4	C	19.0	B	22.5	C	21.1	C
Metro Park Road & Wolf Road									
Hess Station	EB	33.9	C	17.3	B	30.2	C	18.9	B
Metro Park Drive	WB	23.9	C	28.5	C	24.8	C	25.3	C
Wolf Road	NB	2.4	A	18.1	B	2.6	A	19.5	B
	SB	2.9	A	16.3	B	2.6	A	17.5	B
OVERALL		3.7	A	17.7	B	3.7	A	18.9	B
Albany-Shaker Road & Wolf Road									
Albany-Shaker Road	EB	19.2	B	3.4	A	18.4	B	4.0	A
	WB	21.0	C	6.5	A	18.3	B	7.7	A
Wolf Road	NB	36.8	D	14.8	B	37.0	D	14.7	B
OVERALL		25.1	C	6.7	A	24.4	C	7.3	A
Albany-Shaker Road & Old Wolf Road									
Albany-Shaker Road	EB	42.5	D	13.3	B	39.8	D	14.2	B
	WB	32.3	C	15.6	B	39.7	D	16.9	B
Old Wolf Road	SB	77.4	E	26.5	C	80.1	F	26.6	C
OVERALL		50.7	D	18.3	B	53.7	D	19.2	B
Exit 5 SB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	16.4	B	25.8	C	17.6	B	43.2	D
	WB	18.8	B	20.8	C	18.3	B	26.1	C
Exit 5 SB Off-Ramp	SB	20.9	C	25.4	C	22.6	C	33.8	C
Sherwood Drive	SB	25.8	C	31.7	C	26.5	C	35.6	D
OVERALL		19.3	B	23.7	C	19.6	B	31.8	C
Exit 5 NB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	14.0	B	19.2	B	15.4	B	21.6	C
	WB	12.2	B	16.4	B	15.1	B	17.1	B
Holly Lane	NB	30.7	C	38.3	D	38.7	D	36.3	D
Exit 5 NB Off-Ramp	SB	15.7	B	17.4	B	17.4	B	18.6	B
OVERALL		13.6	B	17.6	B	15.8	B	18.9	B
Albany-Shaker Road & Connector Road									
Albany-Shaker Road	EB	N/A		5.8	A	N/A		6.9	A
	WB			5.6	A			7.1	A
New Exit 4 Ramps	NB			32.4	C			29.8	C
OVERALL				13.9	B			15.3	B
Diamond NB Ramps & Airport Connector									
Connector Road	EB	N/A		8.3	A	N/A		19.7	B
	WB			16.8	B			25.4	C
Diamond NB Off-Ramp	NB			16.2	B			17.5	B
OVERALL				13.0	B			18.9	B
Diamond SB Ramps & Airport Connector									
Connector Road	EB	N/A		6.6	A	N/A		10.7	B
	WB			7.6	A			20.5	C
Diamond SB Off-Ramp	SB			16.3	B			14.7	B
OVERALL				10.1	B			15.6	B

Exhibit 3.3.1.7 c
Intersection Level of Service
Diamond Alternative
ETC & ETC+20 PM Peak Hour

Intersection/Approach		2016 (ETC)				2036 (ETC+20)			
		No-Build		Diamond		No-Build		Diamond	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road									
Central Avenue	EB	29.5	C	27.3	C	32.4	C	29.4	C
	WB	37.1	D	31.6	C	36.0	D	36.5	D
Exit 2 NB Off-Ramp	NB	54.0	D	52.6	D	56.5	E	54.9	D
Wolf Road	SB	35.9	D	37.1	D	39.4	D	36.6	D
OVERALL		37.4	D	35.5	D	39.3	D	38.0	D
Sand Creek Road & Wolf Road									
Sand Creek Road	EB	102.6	F	89.9	F	122.3	F	118.6	F
	WB	154.2	F	157.0	F	187.0	F	174.0	F
Wolf Road	NB	41.5	D	38.1	D	43.8	D	41.1	D
	SB	38.1	D	37.0	D	39.1	D	39.6	D
OVERALL		71.0	E	70.0	E	78.6	E	79.1	E
Metro Park Road & Wolf Road									
Hess Station	EB	40.6	D	25.6	C	45.4	D	29.5	C
Metro Park Drive	WB	48.0	D	29.1	C	52.8	D	36.2	D
Wolf Road	NB	28.5	C	25.6	C	42.8	D	30.4	C
	SB	5.4	A	21.4	C	4.6	A	25.1	C
OVERALL		21.0	C	24.8	C	29.5	C	29.4	C
Albany-Shaker Road & Wolf Road									
Albany-Shaker Road	EB	46.3	D	13.0	B	40.6	D	15.6	B
	WB	34.7	C	11.1	B	36.6	D	13.1	B
Wolf Road	NB	59.8	E	16.0	B	53.9	D	21.2	C
OVERALL		48.5	D	13.1	B	44.8	D	16.3	B
Albany-Shaker Road & Old Wolf Road									
Albany-Shaker Road	EB	304.1	F	17.3	B	461.5	F	13.3	B
	WB	41.0	D	15.4	B	42.7	D	10.2	B
Old Wolf Road	SB	60.4	E	28.2	C	62.8	E	37.0	D
OVERALL		149.7	F	19.4	B	212.1	F	18.2	B
Exit 5 SB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	43.2	D	51.8	D	63.3	E	69.4	E
	WB	22.8	C	27.0	C	25.9	C	31.4	C
Exit 5 SB Off-Ramp	SB	28.5	C	28.0	C	32.4	C	32.4	C
Sherwood Drive	SB	43.9	D	48.5	D	56.0	E	52.0	D
OVERALL		32.1	C	38.2	D	41.5	D	47.7	D
Exit 5 NB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	17.8	B	19.7	B	19.4	B	20.6	C
	WB	19.2	B	20.3	C	21.4	C	20.8	C
Holly Lane	NB	41.0	D	35.3	D	39.5	D	39.3	D
Exit 5 NB Off-Ramp	SB	28.3	C	22.8	C	29.7	C	27.3	C
OVERALL		20.3	C	20.6	C	22.2	C	22.0	C
Albany-Shaker Road & Connector Road									
Albany-Shaker Road	EB	N/A		14.1	B	N/A		16.2	B
	WB			13.8	B			29.8	C
New Exit 4 Ramps	NB			30.0	C			33.4	C
OVERALL				19.1	B			24.6	C
Diamond NB Ramps & Airport Connector									
Connector Road	EB	N/A		15.0	B	N/A		16.3	B
	WB			41.3	D			39.0	D
Diamond NB Off-Ramp	NB			16.8	B			20.2	C
OVERALL				20.1	C			22.1	C
Diamond SB Ramps & Airport Connector									
Connector Road	EB	N/A		14.5	B	N/A		15.5	B
	WB			21.2	C			20.4	C
Diamond SB Off-Ramp	SB			16.0	B			21.4	C
OVERALL				17.2	B			18.9	B

Exhibit 3.3.1.7 d
Intersection Level of Service
Diamond Alternative
ETC+30 AM Peak Hour

Intersection/Approach		2046 (ETC+30)			
		No-Build		Diamond	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Exit 4 NB Off-Ramp & Wolf Road					
Exit 4 NB Off-Ramp	EB	90.3	F	-	-
Wolf Road	NB	18.5	B	-	-
	SB	9.1	A	-	-
OVERALL		38.5	D	-	-
Albany -Shaker Road & Wolf Road					
Albany-Shaker Road	EB	18.9	B	4.1	A
	WB	18.5	B	7.7	A
Wolf Road	NB	40.5	D	16.2	B
OVERALL		25.5	C	7.8	A
Albany-Shaker Road & Old Wolf Road					
Albany-Shaker Road	EB	53.5	D	15.9	B
	WB	39.7	D	17.4	B
Old Wolf Road	SB	85.4	F	27.0	C
OVERALL		58.7	E	20.1	B
Albany-Shaker Road & Connector Road					
Albany-Shaker Road	EB	-	-	7.0	A
	WB	-	-	7.2	A
New Exit 4 Ramps	NB	-	-	30.9	C
OVERALL		-	-	15.6	B
Diamond NB Ramps & Airport Connector					
Connector Road	EB	-	-	18.2	B
	WB	-	-	26.3	C
Diamond NB Off-Ramp	NB	-	-	17.5	B
OVERALL		-	-	18.4	B
Diamond SB Ramps & Airport Connector					
Connector Road	EB	-	-	11.5	B
	WB	-	-	20.2	C
Diamond SB Off-Ramp	SB	-	-	14.8	B
OVERALL		-	-	15.7	B

Exhibit 3.3.1.7 e Intersection Level of Service Diamond Alternative ETC+30 PM Peak Hour					
Intersection/Approach		2046 (ETC+30)			
		No-Build		Diamond	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Exit 4 NB Off-Ramp & Wolf Road					
Exit 4 NB Off-Ramp	EB	114.9	F	-	-
Wolf Road	NB	339.6	F	-	-
	SB	5.9	A	-	-
OVERALL		169.6	F	-	-
Albany-Shaker Road & Wolf Road					
Albany-Shaker Road	EB	40.8	D	16.5	B
	WB	38.3	D	13.4	B
Wolf Road	NB	49.0	D	20.1	C
OVERALL		43.0	D	16.5	B
Albany-Shaker Road & Old Wolf Road					
Albany-Shaker Road	EB	457.7	F	4.8	A
	WB	49.5	D	24.0	C
Old Wolf Road	SB	86.1	F	41.7	D
OVERALL		214.6	F	23.0	C
Albany-Shaker Road & Connector Road					
Albany-Shaker Road	EB	-	-	17.8	B
	WB	-	-	18.4	B
New Exit 4 Ramps	NB	-	-	35.0	D
OVERALL		-	-	23.2	C
Diamond NB Ramps & Airport Connector					
Connector Road	EB	-	-	25.6	C
	WB	-	-	32.2	C
Diamond NB Off-Ramp	NB	-	-	21.7	C
OVERALL		-	-	27.6	C
Diamond SB Ramps & Airport Connector					
Connector Road	EB	-	-	18.4	B
	WB	-	-	26.3	C
Diamond SB Off-Ramp	SB	-	-	23.7	C
OVERALL		-	-	22.6	C

The results of the ETC, ETC+20 and ETC+30 AM and PM peak hour Diamond Alternative freeway analyses are summarized in Exhibits 3.3.1.7 g through 3.3.1.7 j; the No-Build results are also shown for comparison purposes. Note that the ETC+30 condition was only evaluated for freeway segments adjacent to the bridges, as illustrated on previously on Exhibit 3.3.1.7 a. The locations where freeway operations were evaluated are illustrated on Exhibit 3.3.1.7 f.

NOTE:
1. A WEAVE ANALYSIS IS NOT APPLICABLE TO I-87 NB AND SB SEGMENTS BETWEEN EXIT 5 AND EXIT 6 BECAUSE THE INTERCHANGE SPACING IS TOO FAR.

NOT TO SCALE

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FREEWAY OPERATIONS EVALUATION LOCATIONS DIAMOND ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS ACCESS IMPROVEMENTS

FIGURE 3.3.1.7f

DATE: 9/13

FILE NAME = U:\9456\Acad\31\Acad\2008-2009 ANALYSIS\DEIS FIGURES 2012\Diamond Freeway Eval.dgn
DATE/TIME = 9/19/2013
USER = 3176

Exhibit 3.3.1.7 g
Freeway Level of Service
Diamond Alternative
ETC & ETC+20 AM Peak Hour

Direction	Segment/Junction	2016 (ETC)				2036 (ETC+20)			
		No-Build		Diamond		No-Build		Diamond	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS									
NB	Exit 2W on to Exit 4 off	19.6	C	21.6	C	19.6	C	23.9	C
	Exit 4 off to Exit 4 on	14.7	B	16.0	B	14.4	B	16.7	B
	Exit 4 on to Exit 5 off	18.0	B	16.3	B	18.3	C	17.3	B
	Exit 5 on to Exit 6 off	12.3	B	11.8	B	12.8	B	12.5	B
SB	Exit 6 on to Exit 5 off	29.9	D	29.9	D	29.6	D	30.9	D
	Exit 4 off to Exit 5 on	28.8	D	N/A		29.7	D	N/A	
	Exit 5 on to Exit 4 on	30.4	D	N/A		31.4	D	N/A	
	Exit 5 on to Exit 4 off	N/A		35.4	E	N/A		40.4	E
	Exit 4 off to Exit 4 on	N/A		30.7	D	N/A		33.4	D
	Exit 4 on to Exit 2W off	34.2	D	34.2	D	35.0	D	35.0	D
RAMP JUNCTIONS									
NB	Exit 2W on-ramp	16.6	B	18.1	B	16.6	B	20.1	C
	Exit 4 off-ramp	22.0	C	20.9	C	22.1	C	23.3	C
	Exit 4 on-ramp	16.8	B	14.7	B	16.3	B	15.5	B
	Exit 5 off-ramp	22.0	C	19.2	B	22.2	C	20.1	C
SB	Exit 5 on-ramp	25.5	C	26.1	C	26.5	C	29.2	D
	Exit 4 off-ramp	32.8	D	29.8	D	32.8	D	32.1	D
	Exit 4 on-ramp	28.1	D	26.1	C	28.6	D	28.2	D
	Exit 2W off-ramp	33.0	D	33.3	D	33.4	D	33.8	D
WEAVE AREAS									
NB	Exit 2E on-ramp to Exit 2W off-ramp	21.4	C	22.2	C	21.6	C	24.8	C
SB	Exit 2W on-ramp to Exit 2E off-ramp	31.1	D	29.8	D	32.8	D	31.0	D

1 - pc/mi/ln = passenger cars per mile per lane

Exhibit 3.3.1.7 h
Freeway Level of Service
Diamond Alternative
ETC & ETC+20 PM Peak Hour

Direction	Segment/Junction	2016 (ETC)				2036 (ETC+20)			
		No-Build		Diamond		No-Build		Diamond	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS									
NB	Exit 2W on to Exit 4 off	36.3	E	39.5	E	37.3	E	40.8	E
	Exit 4 off to Exit 4 on	31.5	D	31.1	D	32.2	D	31.5	D
	Exit 4 on to Exit 5 off	**	F	43.0	E	**	F	44.6	E
	Exit 5 on to Exit 6 off	32.0	D	30.1	D	32.8	D	31.7	D
SB	Exit 6 on to Exit 5 off	16.9	B	17.2	B	18.6	C	18.4	C
	Exit 4 off to Exit 5 on	16.7	B	N/A		18.0	B	N/A	
	Exit 5 on to Exit 4 on	18.3	C	N/A		19.3	C	N/A	
	Exit 5 on to Exit 4 off	N/A		23.9	C	N/A		25.5	C
	Exit 4 off to Exit 4 on	N/A		17.6	B	N/A		18.3	C
	Exit 4 on to Exit 2W off	25.2	C	25.2	C	26.8	D	26.5	D
RAMP JUNCTIONS									
NB	Exit 2W on-ramp	29.6	D	31.1	D	29.9	D	31.4	D
	Exit 4 off-ramp	33.5	D	32.4	D	33.9	D	32.9	D
	Exit 4 on-ramp	36.7	F	29.7	D	37.8	F	30.8	D
	Exit 5 off-ramp	46.6	F	36.4	E	48.1	F	36.9	E
SB	Exit 5 on-ramp	16.7	B	18.4	B	18.0	B	20.1	C
	Exit 4 off-ramp	19.3	B	22.6	C	20.9	C	24.2	C
	Exit 4 on-ramp	22.7	C	21.8	C	24.5	C	22.8	C
	Exit 2W off-ramp	26.2	C	26.3	C	27.7	C	27.3	C
WEAVE AREAS									
NB	Exit 2E on-ramp to Exit 2W off-ramp	39.1	E	39.4	E	38.9	E	41.2	E
SB	Exit 2W on-ramp to Exit 2E off-ramp	26.8	C	23.9	C	28.6	D	25.8	C

1 - pc/mi/ln = passenger cars per mile per lane
** - Density is greater than 45 pc/mi/ln and can no longer be calculated with the basic freeway analysis. Segment is oversaturated.

Exhibit 3.3.1.7 i
Freeway Level of Service
Diamond Alternative
ETC+30 AM Peak Hour

Direction	Segment/Junction	2046 (ETC+30)			
		No-Build		Diamond	
		Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS					
NB	Exit 4 off to Exit 4 on	13.7	B	17.0	B
	Exit 4 on to Exit 5 off	-	-	17.3	B
SB	Exit 5 on to Exit 4 on	31.4	D	-	-
	Exit 5 on to Exit 4 off	-	-	40.4	E
	Exit 4 off to Exit 4 on	-	-	33.1	D

Exhibit 3.3.1.7 j Freeway Level of Service Diamond Alternative ETC+30 PM Peak Hour					
Direction	Segment/Junction	2046 (ETC+30)			
		No-Build		Diamond	
		Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS					
NB	Exit 4 off to Exit 4 on	31.8	D	31.5	D
	Exit 4 on to Exit 5 off	-	-	**	F
SB	Exit 5 on to Exit 4 on	19.9	C	-	-
	Exit 5 on to Exit 4 off	-	-	25.5	C
	Exit 4 off to Exit 4 on	-	-	18.0	B

During the AM peak hour, the following locations operate at LOS E under the ETC+20 condition in the southbound direction:

- Freeway Segments
  - Exit 5 on to Exit 4 off

During the PM peak hour, the following locations operate at LOS E under the ETC+20 condition in the northbound direction:

- Freeway Segments
  - Exit 2W on to Exit 4 off
  - Exit 4 on to Exit 5 off
- Ramp Junctions
  - Exit 5 off
- Weave Areas
  - Exit 2E on to Exit 2W off

The southbound freeway segment between Exit 5 on and Exit 4 off is estimated to degrade from LOS D to LOS E during the AM peak hour when compared to No-Build ETC+20. The operations were approaching the LOS E threshold under the No-Build conditions and higher volume for the Diamond Alternative pushed it over the LOS E threshold (>35 pc/m/l). The new ramp configuration and removal of the C-D Road is the primary reason for the increase in traffic volume between Exits 5 and 4.

Summaries of the intersection LOS for the ETC, ETC+20 and ETC+30 future design years for the Flyover Alternative are presented in Exhibits 3.3.1.7 l through 3.3.1.7 o; the No-Build results are also shown for comparison purposes. The ETC+30 condition was only evaluated for the intersections adjacent to the bridges, as illustrated on Exhibit 3.3.1.7 k.

As shown in these analyses, there are intersections within the study area, but outside the project area, that continue to have approaches that experience LOS E or worse at ETC+20 during the studied peak hours:

- Central Avenue & Wolf Road (PM)
- Sand Creek Road & Wolf Road (PM)
- Exit 5 SB Ramps & Watervliet-Shaker Road (PM)

At the project area intersections, all intersection approaches are estimated to operate at LOS D or better through ETC+20. There is one movement, the westbound left-turn at the Albany-Shaker Road & New Exit 4 Ramps intersection, which operates at LOS E during both peak hours. This is a relatively low volume movement and the LOS E is a result of signal timing priority given to the major through movements on Albany-Shaker Road and the Exit 4 ramps. Observation of other factors such as vehicle

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ETC+30 LEVEL OF SERVICE EVALUATION LOCATIONS FLYOVER ALTERNATIVE

INTERSTATE 87 (I-87) EXITS 3/4 ACCESS IMPROVEMENTS

FIGURE

3.3.1.7k

DATE: 8/13

FILE NAME = U:\9456\dsgn\Preliminary Design\Figures\Traffic Figures\172151_ets_flyover_LOS.dgn
DATE/TIME = 10/29/2013
USER = 2210

queue and volume-to-capacity ratio show that there is reserve capacity for the movement and the delay level is related to the cycle length used to serve the other major movements at the intersection.

Exhibit 3.3.1.7 I
Intersection Level of Service
Flyover Alternative
ETC & ETC+20 AM Peak Hour

Intersection/Approach		2016 (ETC)				2036 (ETC+20)			
		No-Build		Flyover		No-Build		Flyover	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road									
Central Avenue	EB	24.9	C	25.8	C	26.2	C	29.1	C
	WB	28.3	C	28.5	C	28.7	C	31.0	C
Exit 2 NB Off-Ramp	NB	40.4	D	42.5	D	42.0	D	46.2	D
Wolf Road	SB	22.8	C	20.9	C	22.8	C	29.4	C
OVERALL		29.2	C	29.2	C	30.4	C	33.6	C
Sand Creek Road & Wolf Road									
Sand Creek Road	EB	26.0	C	23.9	C	27.9	C	27.0	C
	WB	25.2	C	25.5	C	26.7	C	26.7	C
Wolf Road	NB	18.1	B	17.6	B	21.0	C	20.8	C
	SB	18.0	B	14.5	B	19.4	B	17.7	B
OVERALL		20.4	C	19.0	B	22.5	C	21.8	C
Metro Park Road & Wolf Road									
Hess Station	EB	33.9	C	36.7	D	30.2	C	40.9	D
Metro Park Drive	WB	23.9	C	18.0	B	24.8	C	19.0	B
Wolf Road	NB	2.4	A	2.9	A	2.6	A	3.1	A
	SB	2.9	A	1.5	A	2.6	A	1.7	A
OVERALL		3.7	A	3.5	A	3.7	A	3.7	A
Exit 4 NB Off-Ramp & Wolf Road									
Exit 4 NB Off-Ramp & Wolf Road	EB	46.2	D	14.8	B	48.8	D	28.2	D
Wolf Road	NB	11.6	B	N/A		13.2	B	N/A	
	SB	9.1	A			9.3	A		
OVERALL		20.5	C			22.6	C		
Albany-Shaker Road & Wolf Road									
Albany-Shaker Road	EB	19.2	B	9.8	A	18.4	B	9.9	A
	WB	21.0	C	11.2	B	18.3	B	12.3	B
Wolf Road	NB	36.8	D	23.8	C	37.0	D	26.5	C
OVERALL		25.1	C	12.9	B	24.4	C	13.5	B
Albany-Shaker Road & Old Wolf Road									
Albany-Shaker Road	EB	42.5	D	16.0	B	39.8	D	8.5	A
	WB	32.3	C	13.5	B	39.7	D	12.8	B
Old Wolf Road	SB	77.4	E	27.7	C	80.1	F	30.0	C
OVERALL		50.7	D	18.0	B	53.7	D	14.1	B
Exit 5 SB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	16.4	B	17.1	B	17.6	B	22.6	C
	WB	18.8	B	24.5	C	18.3	B	21.7	C
Exit 5 SB Off-Ramp	SB	20.9	C	23.5	C	22.6	C	23.5	C
Sherwood Drive	SB	25.8	C	26.4	C	26.5	C	26.5	C
OVERALL		19.3	B	23.1	C	19.6	B	22.5	C
Exit 5 NB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	14.0	B	13.2	B	15.4	B	16.6	B
	WB	12.2	B	10.6	B	15.1	B	15.8	B
Holly Lane	NB	30.7	C	28.2	C	38.7	D	32.8	C
Exit 5 NB Off-Ramp	SB	15.7	B	14.2	B	17.4	B	18.4	B
OVERALL		13.6	B	12.3	B	15.8	B	16.7	B
Albany-Shaker Road & New Exit 4 Ramps									
Albany-Shaker Road	EB	N/A		13.3	B	N/A		20.6	C
	WB			11.2	B			20.6	C
New Exit 4 Ramps	NB			18.6	B			19.3	B
OVERALL				15.2	B			20.0	C

Exhibit 3.3.1.7 m
Intersection Level of Service
Flyover Alternative
ETC & ETC+20 PM Peak Hour

Intersection/Approach		2016 (ETC)				2036 (ETC+20)			
		No-Build		Flyover		No-Build		Flyover	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Central Avenue & Wolf Road									
Central Avenue	EB	29.5	C	31.1	C	32.4	C	32.8	C
	WB	37.1	D	49.6	D	36.0	D	54.0	D
Exit 2 NB Off-Ramp	NB	54.0	D	54.8	D	56.5	E	58.3	E
Wolf Road	SB	35.9	D	38.9	D	39.4	D	44.2	D
OVERALL		37.4	D	43.4	D	39.3	D	46.9	D
Sand Creek Road & Wolf Road									
Sand Creek Road	EB	102.6	F	107.1	F	122.3	F	127.0	F
	WB	154.2	F	151.6	F	187.0	F	188.3	F
Wolf Road	NB	41.5	D	39.3	D	43.8	D	42.4	D
	SB	38.1	D	39.1	D	39.1	D	52.1	D
OVERALL		71.0	E	71.1	E	78.6	E	83.1	F
Metro Park Road & Wolf Road									
Hess Station	EB	40.6	D	36.3	D	45.4	D	37.1	D
Metro Park Drive	WB	48.0	D	41.6	D	52.8	D	41.3	D
Wolf Road	NB	28.5	C	6.3	A	42.8	D	7.3	A
	SB	5.4	A	4.1	A	4.6	A	4.2	A
OVERALL		21.0	C	8.4	A	29.5	C	9.1	A
Exit 4 NB Off-Ramp & Wolf Road									
Exit 4 NB Off-Ramp & Wolf Road	EB	64.6	E	5.7	A	79.7	E	6.0	A
Wolf Road	NB	182.9	F	N/A		198.5	F	N/A	
	SB	6.4	A			5.7	A		
OVERALL		105.6	F			115.2	F		
Albany-Shaker Road & Wolf Road									
Albany-Shaker Road	EB	46.3	D	19.5	B	40.6	D	20.3	C
	WB	34.7	C	18.4	B	36.6	D	19.9	B
Wolf Road	NB	59.8	E	20.4	C	53.9	D	34.9	C
OVERALL		48.5	D	19.5	B	44.8	D	24.2	C
Albany-Shaker Road & Old Wolf Road									
Albany-Shaker Road	EB	304.1	F	18.3	B	461.5	F	12.1	B
	WB	41.0	D	9.2	A	42.7	D	8.4	A
Old Wolf Road	SB	60.4	E	29.4	C	62.8	E	48.3	D
OVERALL		149.7	F	18.9	B	212.1	F	19.1	B
Exit 5 SB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	43.2	D	42.6	D	63.3	E	64.2	E
	WB	22.8	C	23.9	C	25.9	C	29.3	C
Exit 5 SB Off-Ramp	SB	28.5	C	27.9	C	32.4	C	30.2	C
Sherwood Drive	SB	43.9	D	45.6	D	56.0	E	49.1	D
OVERALL		32.1	C	33.0	C	41.5	D	43.6	D
Exit 5 NB Ramps & Watervliet-Shaker Road									
Watervliet-Shaker Road	EB	17.8	B	21.6	C	19.4	B	22.6	C
	WB	19.2	B	21.0	C	21.4	C	23.5	C
Holly Lane	NB	41.0	D	32.2	C	39.5	D	45.4	D
Exit 5 NB Off-Ramp	SB	28.3	C	31.0	C	29.7	C	33.1	C
OVERALL		20.3	C	23.2	C	22.2	C	25.0	C
Albany-Shaker Road & New Exit 4 Ramps									
Albany-Shaker Road	EB	N/A		18.2	B	N/A		23.4	C
	WB			15.3	B			18.8	B
New Exit 4 Ramps	NB			19.7	B			23.1	C
OVERALL				18.5	B			22.7	C

Exhibit 3.3.1.7 n Intersection Level of Service Flyover Alternative ETC+30 AM Peak Hour					
Intersection/Approach		2046 (ETC+30)			
		No-Build		Flyover	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Exit 4 NB Off-Ramp & Wolf Road					
Exit 4 NB Off-Ramp	EB	90.3	F	81.9	F
Wolf Road	NB	18.5	B	-	-
	SB	9.1	A	-	-
OVERALL		38.5	D	-	-
Albany-Shaker Road & Wolf Road					
Albany-Shaker Road	EB	18.9	B	11.8	B
	WB	18.5	B	12.6	B
Wolf Road	NB	40.5	D	25.3	C
OVERALL		25.5	C	14.5	B
Albany-Shaker Road & Old Wolf Road					
Albany-Shaker Road	EB	53.5	D	15.5	B
	WB	39.7	D	14.1	B
Old Wolf Road	SB	85.4	F	30.0	C
OVERALL		58.7	E	18.3	B
Albany-Shaker Road & New Exit 4 Ramps					
Albany-Shaker Road	EB	-	-	18.9	B
	WB	-	-	24.3	C
New Exit 4 Ramps	NB	-	-	19.3	B
OVERALL		-	-	20.2	C

Exhibit 3.3.1.7 o Intersection Level of Service Flyover Alternative ETC+30 PM Peak Hour					
Intersection/Approach		2046 (ETC+30)			
		No-Build		Flyover	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Exit 4 NB Off-Ramp & Wolf Road					
Exit 4 NB Off-Ramp	EB	114.9	F	7.4	A
Wolf Road	NB	339.6	F	-	-
	SB	5.9	A	-	-
OVERALL		169.6	F	-	-
Albany-Shaker Road & Wolf Road					
Albany-Shaker Road	EB	40.8	D	26.9	C
	WB	38.3	D	29.3	C
Wolf Road	NB	49.0	D	40.5	D
OVERALL		43.0	D	31.0	C
Albany-Shaker Road & Old Wolf Road					
Albany-Shaker Road	EB	457.7	F	14.5	B
	WB	49.5	D	7.4	A
Old Wolf Road	SB	86.1	F	44.9	D
OVERALL		214.6	F	19.2	B
Albany-Shaker Road & New Exit 4 Ramps					
Albany-Shaker Road	EB	-	-	25.3	C
	WB	-	-	19.4	B
New Exit 4 Ramps	NB	-	-	29.3	C
OVERALL		-	-	26.5	C

The results of the ETC, ETC+20 and ETC+30 AM and PM peak hour Flyover Alternative freeway analyses are summarized in Exhibits 3.3.1.7 q through 3.3.1.7 t; the No-Build results are also shown for

comparison purposes. Note that the ETC+30 condition was only evaluated for freeway segments adjacent to the bridges, as illustrated on Exhibit 3.3.1.7 k. The locations where freeway operations were evaluated are illustrated on Exhibit 3.3.1.7 p.

Exhibit 3.3.1.7 q
Freeway Level of Service
Flyover Alternative
ETC & ETC+20 AM Peak Hour

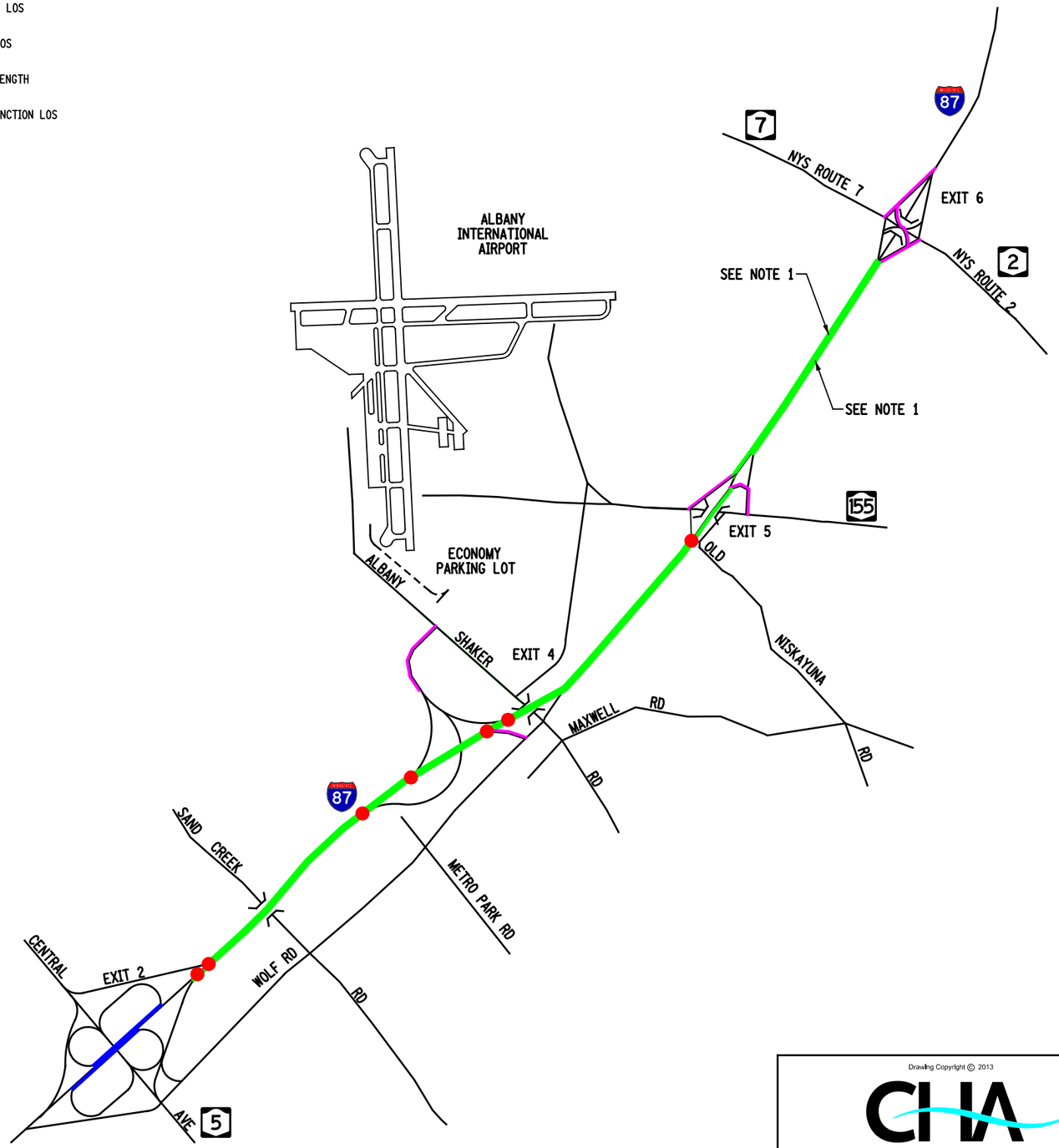
Direction	Segment/Junction	2016 (ETC)				2036 (ETC+20)			
		No-Build		Flyover		No-Build		Flyover	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS									
NB	Exit 2W on to Exit 4 off	19.6	C	21.2	C	19.6	C	22.9	C
	Exit 4 off to Exit 4 off	N/A		16.0	B	N/A		16.0	B
	Exit 4 off to Exit 4 on	14.7	B	14.4	B	14.4	B	14.7	B
	Exit 4 on to Exit 5 off	18.0	B	13.2	B	18.3	C	13.7	B
	Exit 5 on to Exit 6 off	12.3	B	12.5	B	12.8	B	13.0	B
SB	Exit 6 on to Exit 5 off	29.9	D	29.4	D	29.6	D	30.1	D
	Exit 4 off to Exit 5 on	28.8	D	N/A		29.7	D	N/A	
	Exit 5 on to Exit 4 on	30.4	D	N/A		31.4	D	N/A	
	Exit 5 on to Exit 4 off	N/A		35.0	D	N/A		40.4	E
	Exit 4 off to Exit 4 on	N/A		31.0	D	N/A		33.4	D
	Exit 4 on to Exit 2W off	34.2	D	35.4	E	35.0	D	36.2	E
RAMP JUNCTIONS									
NB	Exit 2W on-ramp	16.6	B	18.0	B	16.6	B	19.5	B
	Exit 4 off-ramp to ASR	N/A		20.3	C	N/A		22.3	C
	Exit 4 off-ramp to Wolf	22.0	C	17.5	B	22.1	C	17.5	B
	Exit 4 on-ramp	16.8	B	N/A		16.3	B	N/A	
	Exit 5 off-ramp	22.0	C	N/A		22.2	C	N/A	
SB	Exit 5 on-ramp	25.5	C	26.1	C	26.5	C	29.5	D
	Exit 4 off-ramp	32.8	D	26.3	C	32.8	D	28.9	D
	Exit 4 on-ramp	28.1	D	27.1	C	28.6	D	29.6	D
	Exit 2W off-ramp	33.0	D	33.6	D	33.4	D	34.1	D
WEAVE AREAS									
NB	Exit 2E on-ramp to Exit 2W off-ramp	21.4	C	21.8	C	21.6	C	23.9	C
SB	Exit 2W on-ramp to Exit 2E off-ramp	31.1	D	32.4	D	32.8	D	33.8	D

1 - pc/mi/ln = passenger cars per mile per lane

LEGEND

- FREEWAY LOS
- WEAVE LOS
- QUEUE LENGTH
- RAMP JUNCTION LOS

GRID NORTH



NOTE:
1. A WEAVE ANALYSIS IS NOT APPLICABLE TO I-87 NB AND SB SEGMENTS BETWEEN EXIT 5 AND EXIT 6 BECAUSE THE INTERCHANGE SPACING IS TOO FAR.

NOT TO SCALE

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FREEWAY OPERATIONS EVALUATION LOCATIONS FLYOVER ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS ACCESS IMPROVEMENTS

FIGURE 3.3.1.7p

DATE: 9/13

FILE NAME = U:\9456\Aoad\31\Aoad\2008-2009 ANALYSIS\DEIS FIGURES 2012\Flyover Freeway Eval.dgn
DATE/TIME = 9/19/2013
USER = 3176

Exhibit 3.3.1.7 r
Freeway Level of Service
Flyover Alternative
ETC & ETC+20 PM Peak Hour

Direction	Segment/Junction	2016 (ETC)				2036 (ETC+20)			
		No-Build		Flyover		No-Build		Flyover	
		Density pc/mi/ln[1]	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS									
NB	Exit 2W on to Exit 4 off	36.3	E	40.8	E	37.3	E	43.0	E
	Exit 4 off to Exit 4 off	N/A		30.8	D	N/A		30.8	D
	Exit 4 off to Exit 4 on	31.5	D	30.1	D	32.2	D	30.1	D
	Exit 4 on to Exit 5 off	**	F	30.9	D	**	F	31.2	D
	Exit 5 on to Exit 6 off	32.0	D	32.3	D	32.8	D	32.5	D
SB	Exit 6 on to Exit 5 off	16.9	B	17.2	C	18.6	C	18.6	C
	Exit 4 off to Exit 5 on	16.7	B	N/A		18.0	B	N/A	
	Exit 5 on to Exit 4 on	18.3	C	N/A		19.3	C	N/A	
	Exit 5 on to Exit 4 off	N/A		23.9	C	N/A		25.5	C
	Exit 4 off to Exit 4 on	N/A		19.3	C	N/A		19.9	C
	Exit 4 on to Exit 2W off	25.2	C	25.5	C	26.8	D	27.1	D
RAMP JUNCTIONS									
NB	Exit 2W on-ramp	29.6	D	31.9	D	29.9	D	32.4	D
	Exit 4 off-ramp to ASR	N/A		33.0	D	N/A		34.0	D
	Exit 4 off-ramp to Wolf	33.5	D	29.3	D	33.9	D	29.3	D
	Exit 4 on-ramp	36.7	F	N/A		37.8	F	N/A	
	Exit 5 off-ramp	46.6	F	N/A		48.1	F	N/A	
SB	Exit 5 on-ramp	16.7	B	18.5	B	18.0	B	20.1	C
	Exit 4 off-ramp	19.3	B	18.8	B	20.9	C	20.4	C
	Exit 4 on-ramp	22.7	C	20.7	C	24.5	C	21.6	C
	Exit 2W off-ramp	26.2	C	26.3	C	27.7	C	27.6	C
WEAVE AREAS									
NB	Exit 2E on-ramp to Exit 2W off-ramp	39.1	E	39.6	E	38.9	E	41.8	E
SB	Exit 2W on-ramp to Exit 2E off-ramp	26.8	C	26.7	C	28.6	D	29.2	D

1 - pc/mi/ln = passenger cars per mile per lane
** - Density is greater than 45 pc/mi/ln and can no longer be calculated with the basic freeway analysis. Segment is oversaturated.

Exhibit 3.3.1.7 s
Freeway Level of Service
Flyover Alternative
ETC+30 AM Peak Hour

Direction	Segment/Junction	2046 (ETC+30)			
		No-Build		Flyover	
		Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS					
NB	Exit 4 off to Exit 4 off	N/A		29.7	D
	Exit 4 off to Exit 4 on	13.7	B	N/A	
	Exit 4 off to Exit 4 on	N/A		29.0	D
SB	Exit 5 on to Exit 4 on	31.4	D	N/A	
	Exit 5 on to Exit 4 off	N/A		40.4	E
	Exit 4 off to Exit 4 on	N/A		19.6	C

Exhibit 3.3.1.7 t Freeway Level of Service Flyover Alternative ETC+30 PM Peak Hour					
Direction	Segment/Junction	2046 (ETC+30)			
		No-Build		Flyover	
		Density pc/mi/ln	LOS	Density pc/mi/ln	LOS
FREEWAY SEGMENTS					
NB	Exit 4 off to Exit 4 off	N/A		16.0	B
	Exit 4 off to Exit 4 on	31.8	D	N/A	
	Exit 4 off to Exit 4 on	N/A		14.4	B
SB	Exit 5 on to Exit 4 on	19.9	C	N/A	
	Exit 5 on to Exit 4 off	N/A		25.5	C
	Exit 4 off to Exit 4 on	N/A		33.4	D

During the AM peak hour, the following locations operate at LOS E under the ETC+20 condition in the southbound direction:

- Freeway Segments
  - Exit 5 on to Exit 4 off
  - Exit 4 on to Exit 2W off

During the PM peak hour, the following locations operate at LOS E or worse under the ETC+20 condition in the northbound direction:

- Freeway Segments
  - Exit 2W on to Exit 4 off
- Weave Areas
  - Exit 2E on to Exit 2W off

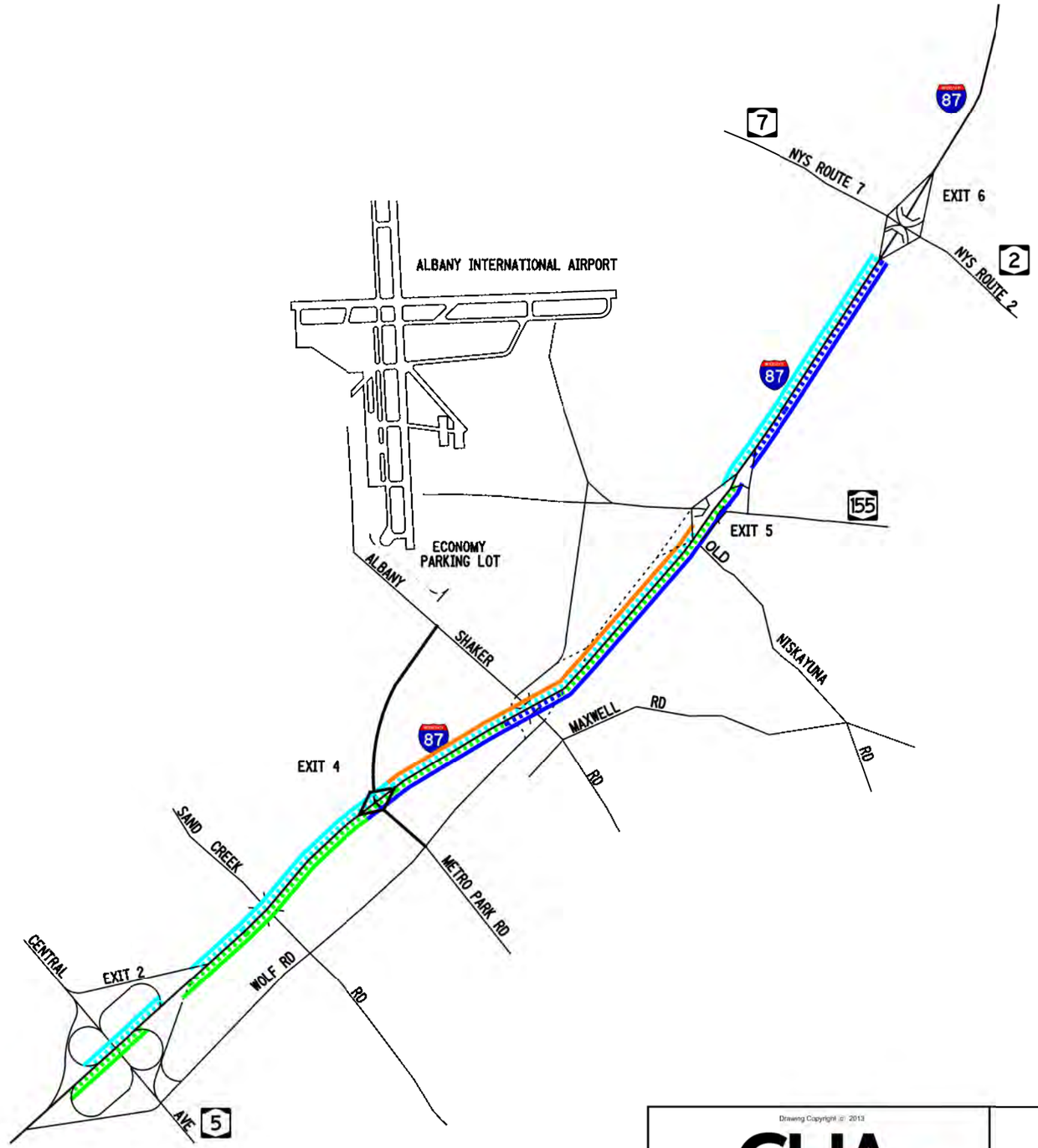
The operations for some of these locations are a change from a LOS D in the No-Build condition. The southbound freeway segments from Exit 5 to Exit 4 and Exit 4 to Exit 2W were approaching the LOS E threshold under the No-Build conditions and slightly higher volume for the Flyover Alternative pushed them over the LOS E threshold (>35 pc/m/l). The new ramp configuration and removal of the C-D Road is the primary reason for the increase in traffic volume between Exits 5 and 4. The segment from Exit 4 to Exit 2W was exactly at the threshold for No-Build ETC+20 AM and adds only 150 additional vehicles for the Flyover Alternative.

The freeway LOS for the Diamond Alternative ETC+20 AM and PM peak hours are shown on Exhibits 3.3.1.7 u and 3.3.1.7 v, respectively. The freeway LOS for the Flyover Alternative ETC+20 AM and PM peak hours are shown on Exhibits 3.3.1.7 w and 3.3.1.7 x, respectively. These exhibits also show the No-Build LOS for comparison purposes.

Network-wide measures of effectiveness (MOE's) were gathered from the VISSIM models to compare the Build alternatives. Vehicle hours of delay (VHD) and vehicle miles traveled (VMT) are both presented in Exhibit 3.3.1.7 y.

LEGEND

LOS	NO-BUILD	BUILD
A		
B		
C		
D		
E		
F		



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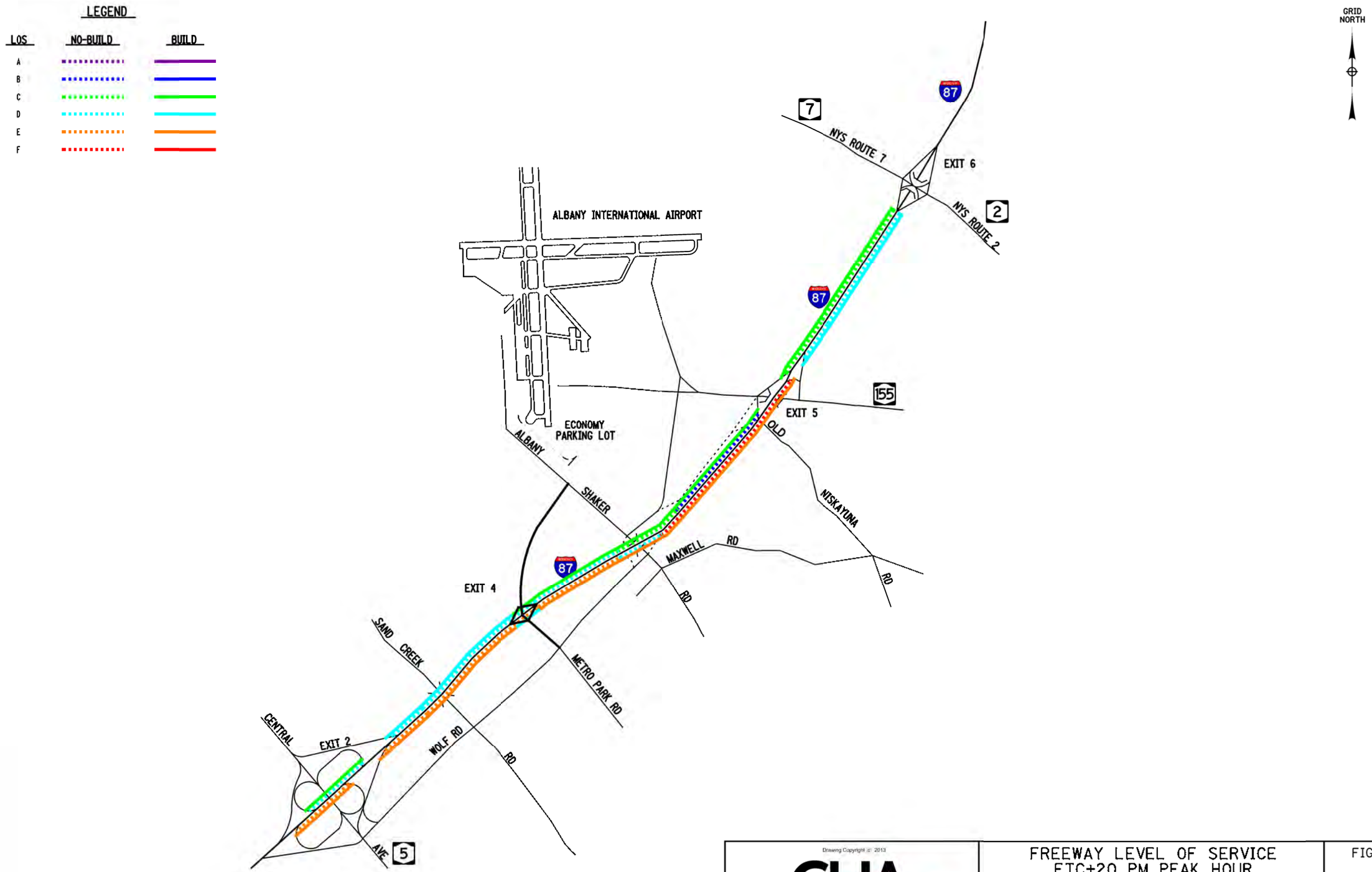
FREEWAY LEVEL OF SERVICE
ETC+20 AM PEAK HOUR
DIAMOND ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS
ACCESS IMPROVEMENTS

FIGURE
3.3.1.7u

DATE: 10/13

FILE NAME = U:\9456\Acad\31\Acad\2008-2009 ANALYSIS\DEIS FIGURES 2012\Diamond ETC 20 AM LOS.dgn
DATE/TIME = 10/24/2013
USER = 2210



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FREEWAY LEVEL OF SERVICE
ETC+20 PM PEAK HOUR
DIAMOND ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS
ACCESS IMPROVEMENTS

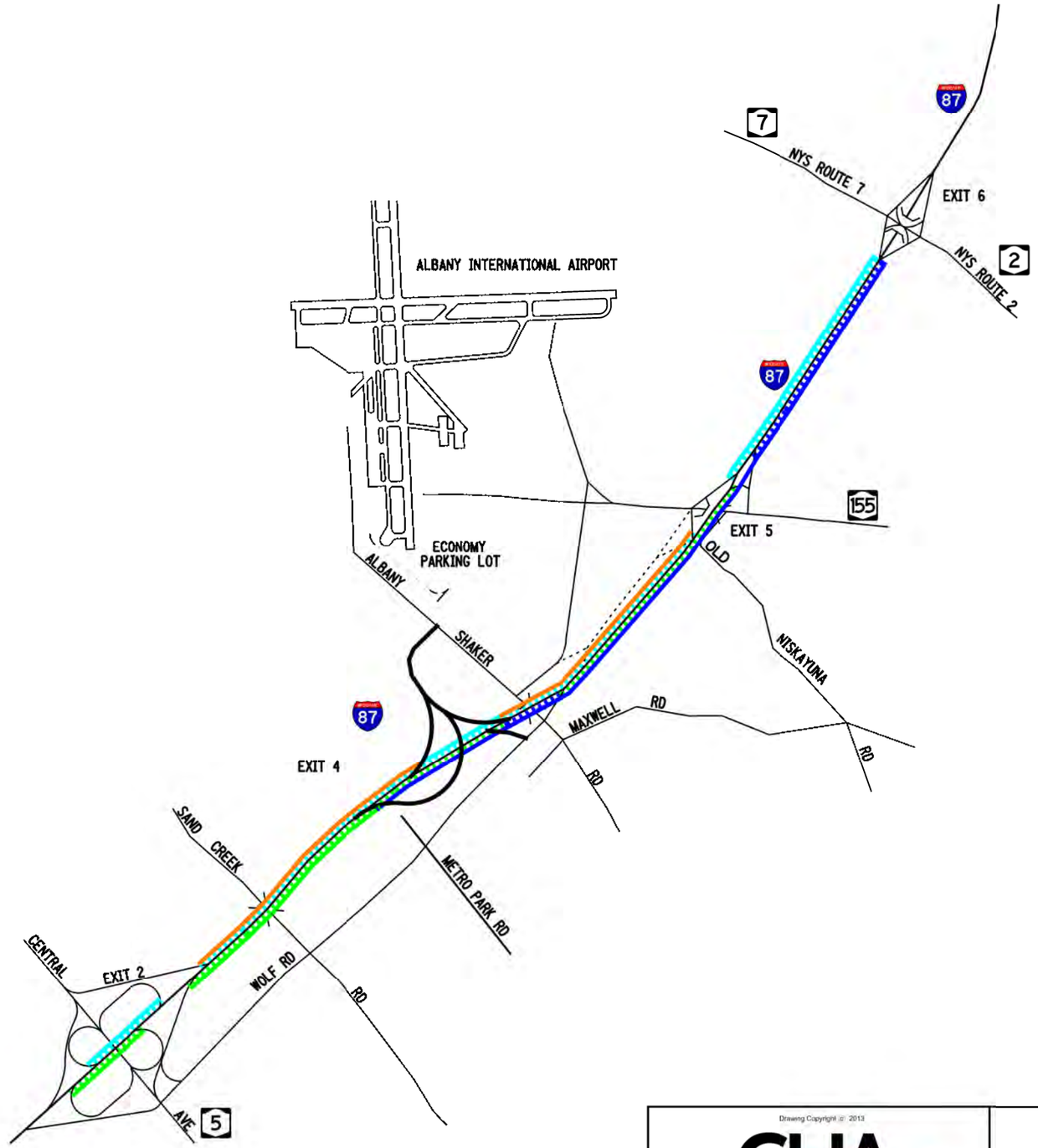
FIGURE
3.3.1.7v

DATE: 10/13

FILE NAME = U:\9456\Road\31\Road\2008-2009 ANALYSIS\DEIS FIGURES 2012\Diamond ETC 20 PM LOS.dgn
DATE/TIME = 10/24/2013
USER = 2210

LEGEND

LOS	NO-BUILD	BUILD
A		
B		
C		
D		
E		
F		



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FREEWAY LEVEL OF SERVICE
ETC+20 AM PEAK HOUR
FLYOVER ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS
ACCESS IMPROVEMENTS

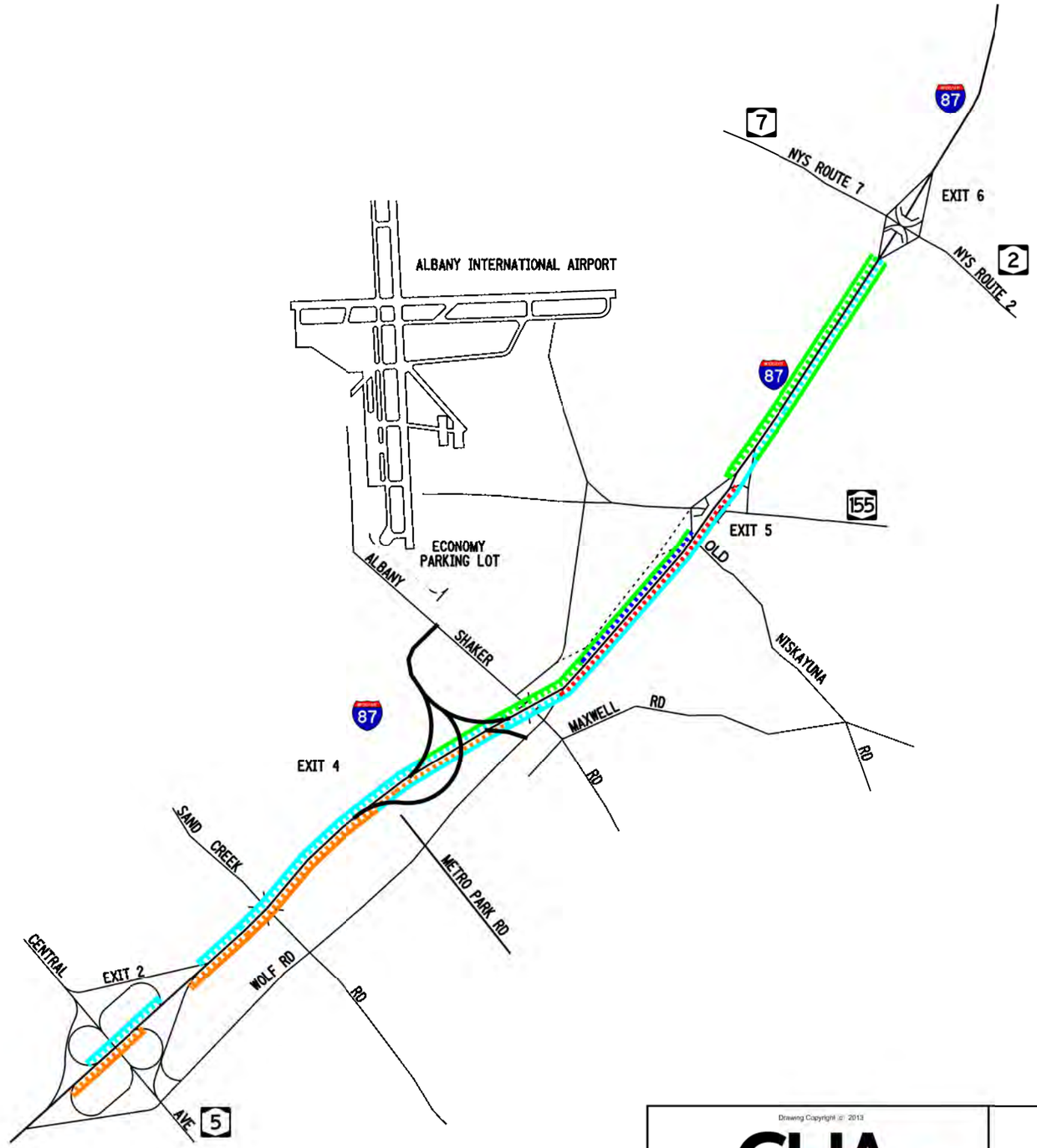
FIGURE
3.3.1.7w

DATE: 10/13

FILE NAME = U:\9456\Road\31\Road\2008-2009 ANALYSIS\DEIS FIGURES 2012\Flyover ETC 20 AM LOS.dgn
DATE/TIME = 10/24/2013
USER = 2210

LEGEND

LOS	NO-BUILD	BUILD
A		
B		
C		
D		
E		
F		



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FREEWAY LEVEL OF SERVICE
ETC+20 PM PEAK HOUR
FLYOVER ALTERNATIVE

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS
ACCESS IMPROVEMENTS

FIGURE
3.3.1.7x

DATE: 10/13

FILE NAME = U:\9456\Acad\31\Acad\2008-2009 ANALYSIS\DEIS FIGURES 2012\Flyover ETC 20 PM LOS.dgn
DATE/TIME = 10/24/2013
USER = 2210

Exhibit 3.3.1.7 y Network Measures of Effectiveness 2036 (ETC+20) Design Year			
	No-Build	**Diamond**	**Flyover**
AM Peak Hour			
Vehicle Hours of Delay	274	219	195
Vehicle Miles Traveled	55,940	56,530	57,480
PM Peak Hour			
Vehicle Hours of Delay	785	402	372
Vehicle Miles Traveled	63,480	70,450	66,140

As shown, the Build alternatives dramatically reduce the VHD during the PM peak hour, with the Flyover Alternative providing slightly better VHD improvements than the Diamond Alternative. For the Diamond Alternative, the VHD decreases by 20% for the AM Peak Hour and 49% for the PM Peak Hour. For the Flyover Alternative, the VHD decreases by 29% for the AM Peak Hour, and 53% for the PM Peak Hour. The VMT increases for both of the Build alternatives compared to the No-Build condition because they both have greater volume demand than the No-Build condition (i.e. more volume is diverted to the improved interchange). So although the distance that some vehicles travel within the network is reduced due to the Build alternative geometry, the increased number of vehicles in turn causes increased VMT.

The ETC+20 design year 95th percentile queues for the I-87 off-ramps at Exits 4, 5, and 6 were determined using Synchro 7. Exhibit 3.3.1.7 z below provides a summary of the ETC+20 design year queues; the No-Build queues are provided for comparison purposes.

Exhibit 3.3.1.7 z 95th Percentile Queues - ETC+20 Design Year No-Build & Diamond Alternative					
Approach	**mvmt**	**No-Build AM**	**Diamond AM**	**No-Build PM**	**Diamond PM**
Exit 4 Ramps					
Exit 4 NB Off-Ramp	L	310*	159	380	266
	R	137	103	123	41
Exit 4 SB Off-Ramp	LR	878	-	551	-
	L	-	257	-	482
	R	-	154	-	471
Exit 5 Ramps					
Exit 5 NB Off-Ramp	L	157	161	418	408
	TR	59	22	0	0
Exit 5 SB Off-Ramp	L	395	767	410	740
	TR	223	494	336	249
Exit 6 Ramps					
Exit 6 NB Off-Ramp	L	350	336	237	190
	R	50	36	50	21
Exit 6 SB Off-Ramp	L	174	147	216	219
	R	494	540	661	593

* All 95th Percentile Queues shown in feet.

As shown, all of the Diamond Alternative queues are estimated to be approximately the same or less than the No-Build queues with the exception of the Exit 5 southbound off-ramp. The Exit 5 southbound left-turn movement for both peak periods and the through/right turn movement during the AM peak hour are estimated to have longer queues than the No-Build Alternative. The longer queues at this off-ramp are a result of the elimination of the C-D Road to Old Wolf Road, and the resulting redistribution of volumes in

the area. However, it is estimated that the queues for these movements will not extend back to the I-87 mainline.

It is also noted that existing queue observations show that the Exit 4 SB off-ramp often backs to the I-87 mainline during the AM peak hour. The extent of that queue is not captured in the No-Build Synchro results shown since it is a cumulative result of the southbound queue on Old Wolf Road at Albany-Shaker Road backing to the intersection with the Exit 4 SB off-ramp. Since the C-D Road is eliminated with the Diamond Alternative, this queuing condition is also eliminated.

The ETC+20 design year 95th percentile queues for the I-87 off-ramps at Exits 4, 5, and 6 were determined using Synchro 7. Exhibit 3.3.1.7 aa below provides a summary of the ETC+20 design year queues; the No-Build queues are provided for comparison purposes.

Exhibit 3.3.1.7 aa
95th Percentile Queues - ETC+20 Design Year
No-Build & Flyover Alternative

Approach	mvmt	No-Build AM	Flyover AM	No-Build PM	Flyover PM
Exit 4 Ramps					
Exit 4 NB Off-Ramp to Wolf Rd	L	310*	-	380	-
	R	137	57	123	21
Exit 4 SB Off-Ramp to Old Wolf Rd	LR	878	-	551	-
Exit 4 Off-Ramp to ASR	L	-	367	-	728
	R	-	534	-	518
Exit 5 Ramps					
Exit 5 NB Off-Ramp	L	157	156	418	493
	TR	59	21	0	0
Exit 5 SB Off-Ramp	L	395	385	410	610
	TR	223	276	336	231
Exit 6 Ramps					
Exit 6 NB Off-Ramp	L	350	380	237	189
	R	50	53	50	14
Exit 6 SB Off-Ramp	L	174	201	216	229
	R	494	554	661	615

* All 95th Percentile Queues shown in feet.

For the Flyover Alternative, all of the Build Alternative queues are estimated to be approximately the same or less than the No-Build queues with the exception of the Exit 4 off-ramp to Albany-Shaker Road and the Exit 5 southbound left-turn movement during the PM peak hour. It is estimated that the Exit 4 off-ramp to Albany-Shaker Road queue will be longer than No-Build due to the combination of the northbound off-ramp left-turn volume and the southbound off-ramp volume at the new intersection. However, the queue is not estimated to extend back to the I-87 mainline. As with the Diamond Alternative, the Exit 5 SB off-ramp queue is estimated to be longer than the No-Build Alternative due to the elimination of the C-D road, and the resulting redistribution of volume. It is not estimated that the southbound queue will extend back to the I-87 mainline in this alternative.

Like the Diamond Alternative, since the C-D Road is eliminated with the Flyover Alternative, the existing queuing condition of the Exit 4 SB off-ramp to the I-87 mainline is eliminated.

3.3.1.7 (2) Work Zone Safety & Mobility

A. Work Zone Traffic Control Plan

Vehicular, pedestrian, and bicycle traffic will be maintained throughout the project area during construction operations. The proposed connector road and new Exit 4 ramps are primarily located in

undeveloped areas and can be constructed without conflict to existing traffic operations. Short duration lane closures established in accordance with the Federal Manual on Uniform Traffic Control Devices and New York State Supplement (MUTCD) and guidelines set forth by the NYSDOT will be used to complete work on I-87 and the local road system.

Pedestrian traffic will be maintained along Wolf Road and Albany-Shaker Road where facilities currently exist using staged sidewalk construction and temporary walkways. Temporary pedestrian facilities will be designed to meet ADAAG standards.

It is anticipated that the work zone traffic control plan for the replacement of the I-87 bridges over Albany-Shaker Road will employ a two-stage construction plan and over-widened structures. The first stage will shift traffic to the right into three 11-foot lanes in both directions of I-87 and allow for demolition of the existing structures and construction of new, over-widened structures over part of the existing I-87 median. The second stage will shift traffic to the left into three 11-foot lanes in both directions of I-87 onto the new structures and allow for the demolition of the remainder of the existing structures and the completion of construction of the new structures. Three lanes of traffic in each direction will be maintained on I-87 at all times.

Long term detours will not be required during construction.

Detailed work zone traffic control plans will be developed during final design to determine specific methods required to maintain traffic during construction. All construction activities will be coordinated with local emergency response services and school transit services to minimize impacts to these services.

B. Special Provisions

Due to the close proximity to residential homes and hotels to the connector road and proposed Exit 4 ramps, and the ability to maintain traffic with acceptable delays during the daylight hours, night time construction (10:00 pm to 6:00 am) will not be utilized to construct the connector road or proposed Exit 4 ramps for either of the feasible alternatives. However, night time construction may be utilized to shorten the overall construction duration of the project in areas where work is not located adjacent to residential areas. It is anticipated that night time construction would be limited to replacement of the I-87 bridges over Albany-Shaker Road. The use of time related provisions will be evaluated during final design. The work zone traffic control will need to be coordinated with emergency service providers.

C. Significant Projects (per 23 CFR 630.1010)

Significant projects are defined in 23 CFR 630.1010. The applicability of the provisions in 23 CFR 630.1012(b)(2), Transportation Operations, and 630.1012(b)(3), Public Information, is dependent upon whether a project is determined to be significant. Significant projects are:

- All Interstate system projects within the boundaries of a designated Transportation Management Area (TMA) that occupy a location for more than three days with either intermittent or continuous lane closures shall be considered as significant projects. A TMA is an area designated by the US Secretary of Transportation, having an urbanized area population of over 200,000. The following TMAs have been designated in New York State:

    - New York--Newark, NY-NJ-CT.
    - Buffalo, NY
    - Rochester, NY
    - Albany, NY
    - Syracuse, NY
    - Poughkeepsie--Newburgh, NY

    For an Interstate system project or categories of Interstate system projects that are classified as significant, but in the judgment of the Region they do not cause sustained work zone impacts, the

Region may document (in the project files) an exception to § 630.1012(b)(2) and § 630.1012(b)(3). Exceptions to these provisions may be granted by the Regional Director or FHWA (consistent with the PS&E column of the Design Related Approval Matrix in the Project Development Manual) based on the ability to show that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts. FHWA approvals should be progressed through the Design Quality Assurance Bureau's Project Development Section similar to Design Approval.

- Other significant projects identified by the Region. The Department's work zone policy provisions, the project's characteristics, and the magnitude and extent of the anticipated work zone impacts should be considered when determining if a project is significant or not.

Since the proposed project includes replacement of the I-87 bridges over Albany-Shaker Road as well as construction of acceleration and deceleration lanes along the I-87 mainline at the proposed ramps, it is considered a significant project. A Transportation Management Plan (TMP) will be developed to address safety and mobility in the project area during construction. The TMP will consist of:

- Temporary Traffic Control (TTC) Plan that address traffic safety and control through the work zone,
- Transportation Operations (TO) strategies that will be used to ease work zone impacts, and
- Public Information (PI) strategies to inform those affected by the project of the expected work zone impacts and changing conditions.

3.3.1.8. Safety Considerations, Accident History and Analysis

As discussed in Section 2.3.1.8, the accident rates at all of the studied intersections exceed statewide averages for similar facilities. The dismissed Upgrade Alternative did not address many of the crash patterns in the study area since the alternative only included adding additional capacity at the existing intersections and is not estimated to divert traffic to other routes. The existing C-D road between Watervliet-Shaker Road and Old Wolf Road, which also serves the Exit 4 southbound off-ramp and Exit 5 southbound on-ramp, is maintained with the Upgrade Alternative. In addition to the 34 accidents at the intersection with Old Wolf Road & I-87 SB off-ramp, another 14 accidents occurred on the C-D road during the studied period. Traffic routinely backs up on the C-D road to the Exit 4 southbound off-ramp. While it is anticipated that the number of accidents would be reduced due to less congestion under the alternative, the geometric conditions in this area would remain the same.

The Diamond and Flyover Alternatives both remove the C-D road and the existing Exit 4 and 5 ramp configuration, therefore eliminating those accidents and resulting in an accident cost savings of $584,000 per year ($11,680,000 over 20 years). The traffic volumes at the Wolf Road & Albany-Shaker Road intersection are also reduced under these alternatives which will improve operations and safety. The Diamond Alternative removes the Exit 4 northbound on-ramp and reduces the peak hour volumes at this intersection by 42 percent. The Flyover Alternative reduces the peak hour volumes at this intersection by 35 percent.

The Diamond and Flyover Alternatives will also improve safety at the intersections with Albany-Shaker Road & Old Wolf Road/I-87 Exit 4 southbound on-ramp and Wolf Road & I-87 Exit 4 northbound off-ramp. The Flyover Alternative eliminates the I-87 Exit 4 southbound on-ramp at the existing intersection and modifies the I-87 Exit 4 northbound off-ramp to be unsignalized with right-turns onto Wolf Road southbound only. The Diamond Alternative eliminates the I-87 Exit 4 southbound on-ramp and the I-87 Exit 4 northbound off-ramp at their existing intersections. These modifications reduce volume and congestion.

The proposed clear zone on Wolf Road will be approximately 15 ft wide for both alternatives. The clear zone on Albany-Shaker Road will be approximately 15 ft for both alternatives. The clear zone on the connector road will be approximately 15 ft for the Diamond Alternative. The clear zone on I-87 will be a

minimum 30 ft for both alternatives. The clear zone on all project area roadways will be refined during final design to adjust for slopes, roadway curvature, etc.

3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access

Refer to Section 3.3.1.7(2) for a discussion of the anticipated impacts during construction.

As identified in Section 2.3.1.9, the project area is serviced by the following entities: The Town of Colonie Police Department, the Albany County Sherriff's Department, New York State Police Troop G, the Shaker Road Fire Department, the Fuller Road Fire Department, the Village of Colonie Fire Department, the Town of Colonie Emergency Medical Services Department, Albany Capitaland Ambulette, and Wildwood Transportation. The Town of Colonie Police Department and the Town of Colonie Emergency Medical Services Department are headquartered in the Town of Colonie Public Safety Building located on Old Wolf Road. The Shaker Road fire stations are located southeast of I-87 and the project corridor; however, this district responds to emergencies on the north side of I-87, east and west of Albany-Shaker Road. With the exception of a small portion of I-87 and individual properties on the north side of the highway, the Fuller Road Fire department provides service to locations south of the project corridor. The Village of Colonie Fire Department provides service to locations along I-87 and Wolf Road, west of Sand Creek Rd.

Diamond Alternative

The Diamond Alternative proposes to remove the existing Exit 4 ramps and replace them with a new diamond interchange along a connector road between Wolf Road, at Metro Park Road, and Albany-Shaker Road, approximately 1,000 ft. west of Old Wolf Road. Although access to I-87 will be at a new location, traffic analyses show that this alternative significantly improves the overall Level of Service and will result in a reduction in travel time for major routes within the Exit 4 area. The layout of the Shaker Road Loudonville District is such that their stations are located generally southeast of I-87; however, the district covers the vast majority of I-87 and the area to the north within the project corridor and the neighboring area. Since the proposed project will improve Level of Service and traffic flow, response time is not expected to be adversely impacted. The Village of Colonie Fire Station is situated such that access within or through the project corridor would likely be handled via Exit 2. As such, the subject project is not expected to affect existing routes or response time. Due to the location of the Fuller Road Fire station, the subject project is not expected to affect existing routes or response time. The Town of Colonie EMS Facility is located on Old Wolf Road, immediately north of the project area; police response is often from locations other than headquarters. The improved mobility within the overall area would be expected to have a positive impact on ambulance and police response times.

It is not anticipated that this alternative will have any adverse impacts on police, fire protection, or ambulance access; however, this alternative has been dismissed and is no longer considered a feasible alternative. No additional coordination with emergency service providers with respect to proposed Work Zone Traffic Control schemes is required.

Flyover Alternative

The Flyover Alternative proposes to remove the existing Exit 4 southbound ramps, restrict movements on the existing Exit 4 northbound exit ramp to right-turns only, and provide new access to and from I-87 southbound and from I-87 northbound to Albany-Shaker Road. Although access to I-87 will be at a new location, traffic analyses show that this alternative improves the overall Level of Service and will result in a reduction in travel time and delay for major routes within the Exit 4 area. The layout of the Shaker Road Loudonville District is such that their stations are located generally southeast of I-87; however, the district covers the vast majority of I-87 and the area to the north within the project corridor and the neighboring area. Since the proposed project will improve Level of Service and traffic flow, response time is not expected to be adversely impacted. The Village of Colonie Fire Station is situated such that access within or through the project corridor would likely be handled via Exit 2. As such, the subject project is not expected to affect existing routes or response time. Due to the location of the Fuller Road Fire station, the subject project is not expected to affect existing routes or response time. The Town of Colonie EMS Facility is located on Old Wolf Road, immediately north of the project area; police response is often from

locations other than headquarters. The improved mobility within the overall area would be expected to have a positive impact on ambulance and police response times.

It is not anticipated that this alternative will have any adverse impacts on police, fire protection, or ambulance access. A letter will be forwarded to the departments identified above during the DEIS review process to confirm that the proposed alternative does not adversely impact response times. Additionally, advance notice of Work Zone Traffic Control schemes shall be provided to the emergency service providers such that response times are not adversely impacted during the construction period.

3.3.1.10. Parking Regulations and Parking Related Issues

Parking will be prohibited on the proposed connector road included in the Diamond Alternative.

No changes to parking regulations on the existing roadways within the project study area are proposed.

3.3.1.11. Lighting

No changes to the existing street lighting systems are proposed.

No street lighting is proposed on the connector road included in the Diamond Alternative.

3.3.1.12. Ownership and Maintenance Jurisdiction

No changes to the ownership and maintenance jurisdiction are proposed on the existing roadways within the project study area. NYSDOT will continue ownership and maintenance responsibilities for Interstate 87 and the Exit 4 and Exit 5 ramps. Refer to Chapter 2 Section 2.3.1.12 for a discussion of the existing ownership and maintenance responsibilities.

NYSDOT will assume ownership and maintenance responsibilities for the proposed interchange ramps, connector road, and the proposed bridges on the ramps and connector road.

3.3.1.13. Constructability Review

The project has been reviewed for constructability. The proposed I-87 bridges over Albany-Shaker Road will be replaced in a similar method used for other bridge replacements along the I-87 corridor. The majority of remaining work included in the project will be completed off-line.

3.3.2. Multimodal

3.3.2.1. Pedestrians

Wolf Road is part of CDTC's Proposed Priority Bicycle / Pedestrian Network and improving system connectivity between the existing pedestrian / bicycle facilities on Wolf Road and the facilities constructed as part of the Albany / Watervliet-Shaker Road project is a secondary objective of the proposed project.

A Pedestrian Generator Checklist is included in Appendix F.

<u>Diamond Alternative</u>
Pedestrians are prohibited on Interstate Highways by state law. There are no pedestrian crossings or other provisions proposed at the ramp terminals.

This alternative includes new 5 ft. sidewalks along the both sides of Albany-Shaker Road between Wolf Road and Old Wolf Road, a new 5 ft. sidewalk along the south side of Albany-Shaker Road between Old Wolf Road and the connector road, and a 10 ft. shared use path along the south side of Albany-Shaker Road between the connector road and the southern entrance to Albany International Airport. The proposed pedestrian facilities will provide a connection to the existing pedestrian crossing and facilities at

the airport; to the existing pedestrian facilities on Albany-Shaker Road east of Wolf Road which connect to The Crossings Of Colonie 2,050 ft. east of the Albany-Shaker Road / Wolf Road intersection; and to Meeting House Road, the Ann Lee Pond Nature and Historic Preserve, and the shared use path constructed as part of the Albany / Watervliet-Shaker Road reconstruction project.

No separate pedestrian facilities will be constructed along the connector road; however, pedestrians may legally use the 8 ft shoulders.

New Americans with Disabilities Act (ADA) compliant pedestrian crossings and pedestrian signals will be provided at the Wolf Road / connector road, Albany-Shaker Road / connector road, and Albany-Shaker Road / Meeting House Road intersections.

Flyover Alternative
Pedestrians are prohibited on Interstate Highways by state law. No pedestrian facilities will be provided on the proposed Exit 4 ramps; however, pedestrian crossings will be provided at the ramps' terminal on Albany-Shaker Road.

This alternative includes new 5 ft. sidewalks along the both sides of Albany-Shaker Road between Wolf Road and Old Wolf Road, a new 5 ft. sidewalk along the south side of Albany-Shaker Road between Old Wolf Road and the flyover ramps, and a 10 ft. shared use path along the south side of Albany-Shaker Road between the flyover ramps and the southern entrance to Albany International Airport. The proposed pedestrian facilities will provide a connection to the existing pedestrian crossing and facilities at the airport; to the existing pedestrian facilities on Albany-Shaker Road east of Wolf Road which connect to The Crossings Of Colonie approximately 2,050 ft. east of the Albany-Shaker Road / Wolf Road intersection; and to Meeting House Road, the Ann Lee Pond Nature and Historic Preserve, and the shared use path constructed as part of the Albany / Watervliet-Shaker Road reconstruction project.

New ADA compliant pedestrian crossings and pedestrian signals will be provided at the Albany-Shaker Road / flyover ramps and Albany-Shaker Road / Meeting House Road intersections.

3.3.2.2. Bicyclists

Wolf Road and Albany-Shaker Road are part of CDTC's proposed Bicycle and Pedestrian Priority Network and improving system connectivity between the existing pedestrian / bicycle facilities on Wolf Road and the facilities constructed as part of the Albany / Watervliet-Shaker Road project is a secondary objective of the proposed project.

The two feasible alternatives were presented to CDTC's Bicycle and Pedestrian Task Force at the October 11, 2011 task force meeting. Varying degrees of bicycle and pedestrian accommodations were presented. The task force recommended that the 14 ft. shared travel lanes option for Albany-Shaker Road be dismissed because shared travel lanes are not thought to be effective on higher speed roadways. In addition, the task force did not feel that shared travel lanes would provide appropriate accommodations for lower skill level riders that may be utilizing this system to access Ann Lee Pond Nature and Historic Preserve and The Crossings at Colonie.

Diamond Alternative
Bicyclists are prohibited on Interstate Highways by state law.

This alternative includes new 5 ft. bike lanes along the both sides of Albany-Shaker Road between Wolf Road and the connector road, and a 10 ft. shared use path along the south side of Albany-Shaker Road between the connector road and the southern entrance to Albany International Airport. These proposed facilities will provide a connection to the airport entrance; The Crossings of Colonie, located 2,050 ft. east of the Albany-Shaker Road / Wolf Road intersection, via the existing 4 ft. shoulders on Albany-Shaker Road east of Wolf Road; and to Meeting House Road, the Ann Lee Pond Nature and Historic Preserve, and the shared use path constructed as part of the Albany / Watervliet-Shaker Road reconstruction project.

No separate bicycle facilities will be constructed along the connector road; however, the occasional bicyclist may legally use the 8 ft shoulders of this uncontrolled access highway.

Flyover Alternative
Bicyclists are prohibited on Interstate Highways by state law.

This alternative includes new 5 ft. bike lanes along the both sides of Albany-Shaker Road between Wolf Road and the flyover ramps, and a 10 ft. shared use path along the south side of Albany-Shaker Road between the flyover ramps and the southern entrance to Albany International Airport. These proposed facilities will provide a connection to the airport entrance; The Crossings Of Colonie, located 2,050 ft. east of the Albany-Shaker Road / Wolf Road intersection, via the existing 4 ft. shoulders on Albany-Shaker Road east of Wolf Road; and to Meeting House Road, the Ann Lee Pond Nature and Historic Preserve. and the shared use path constructed as part of the Albany / Watervliet-Shaker Road reconstruction project.

3.3.2.3. Transit

The Capital District Transportation Authority (CDTA) currently provides transit service along I-87, Albany-Shaker Road, and Wolf Road within the project study area. No changes are proposed to the existing system along I-87 or Wolf Road; however, if appropriate, transit signal priority along Albany-Shaker Road will be considered during final design.

3.3.2.4. Airports, Railroad Stations, and Ports

The project will not involve improvements at the Albany International Airport; however, the runway approach surface and southernmost portion of airport property exist within the PSA. The feasible alternatives would result in improved intermodal access between the I-87 interchange and the airport and are a compatible land use adjacent to the airport.

The project includes construction of a shared use path along the south side of Albany-Shaker Road between the airport entrance and the connector road, for the Diamond Alternative, or flyover ramps, for the Flyover Alternative. This path with provide enhanced bicycle and pedestrian accessibility between the airport and destination points to the east such as Wolf Road and the various hotels located along Albany-Shaker Road and Wolf Road.

The Federal Aviation Administration and Albany International Airport were contacted to review the feasible alternatives and provide input on potential impacts to the airport. As a result of these efforts, the location of the proposed intersection on Albany-Shaker Road with the connector road / flyover ramps has been modified to avoid encroachment of the proposed roadways into the Runway Protection Zone (RPZ). In addition, a force-off detector will be installed on the Albany-Shaker Road eastbound approach to this intersection as a precaution to prevent unanticipated queue lengths from extending into the RPZ. Copies of relevant correspondence with the FAA and airport have been included in Appendix E.

The Diamond Alternative will provide improved access between I-87 and the airport through construction of the connector road and new interchange ramps on I-87. The connector road terminates at a new intersection on Albany-Shaker Road approximately 1,000 ft. west of Old Wolf Road. No new roadways, intersections, or vehicle queues will be located in or extend into the RPZ.

The Flyover Alternative will provide improved access between I-87 and the airport through construction of a new northbound exit ramp on I-87 which brings vehicles over I-87 and outlets at a new intersection on Albany-Shaker Road approximately 1,000 ft. west of Old Wolf Road. No new roadways, intersections, or vehicle queues will be located in or extend into the RPZ.

Potential conflicts between construction equipment, e.g. a tall crane that will erect bridge girders, and the flight paths of aircraft using the Albany International Airport have been considered and no conflicts are expected.

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

The Ann Lee Pond Nature and Historic Preserve is located on Meeting House Road, near the northern project limit along Albany-Shaker Road, and The Crossings at Colonie is located on Albany-Shaker Road approximately 2,050 ft east of Wolf Road.

These feasible alternatives both include new 5 ft. sidewalks along the both sides of Albany-Shaker Road between Wolf Road and Old Wolf Road, a new 5 ft. sidewalk along the south side of Albany-Shaker Road between Old Wolf Road and the connector road or flyover ramps, 5 ft. bicycle lanes on both sides on Albany-Shaker Road between Wolf Road and the connector road or flyover ramps, and a 10 ft. shared use path along the south side of Albany-Shaker Road between the connector road or flyover ramps and the southern entrance to Albany International Airport. The proposed bicycle and pedestrian facilities will improve access to recreation areas in and around the project area by providing a connection between the existing pedestrian crossing and facilities at the airport; to the existing facilities on Albany-Shaker Road east of Wolf Road which connect to The Crossings of Colonie approximately 2,050 ft. east of the Albany-Shaker Road / Wolf Road intersection; and to Meeting House Road, the Ann Lee Pond Nature and Historic Preserve, and the shared use path constructed as part of the Albany / Watervliet-Shaker Road reconstruction project.

3.3.3. Infrastructure

3.3.3.1. Proposed Highway Section

3.3.3.1. (1) Curb

Diamond Alternative
The Diamond Alternative includes box widening and overlay work on Wolf Road and Albany-Shaker Road and will replace the existing curb where it currently exists. In addition, new vertical faced curb will be placed along Albany-Shaker Road west of the new connector road up to where the existing curb begins approximately 800 ft. south of Meeting House Road. No curbs will be provided along the new connector road or ramps.

Flyover Alternative
The Flyover Alternative includes box widening and overlay and reconstruction work on Albany-Shaker Road and reconstruction work on Wolf Road. This alternative will replace the existing curb where it currently exists. In addition, new vertical faced curb will be placed along Albany-Shaker Road west of the flyover ramps up to where the existing curb begins approximately 800 ft. south of Meeting House Road. No curbs will be provided along the flyover ramps.

3.3.3.1. (2) Grades

Exhibit 3.3.3.1 (2) summarizes the proposed maximum grades for the feasible alternatives.

Exhibit 3.3.3.1 (2) Proposed Grades		
Location	**Diamond Alternative**	**Flyover Alternative**
Interstate 87 (I-87)	2.00%	2.00%
Exit 4 Ramps	5.00%	5.00%
Exit 5 Ramps	5.00%	5.00%
Albany-Shaker Road	0.50%	1.20%
Wolf Road	0.65%	Existing
Old Wolf Road	Existing	3.00%
Connector Road	3.00%	N/A
Metro Park Road	1.60%	Existing

There are no existing climbing lanes, and the proposed grades do not warrant a climbing lane.

3.3.3.1. (3) Intersection Geometry and Conditions

Refer to the plans in Appendix A for the geometry of the proposed intersections.

Diamond Alternative
The existing intersection geometry will be modified at several locations within the project study area due to the removal of the existing Exit 4 ramps and construction of the new connector road and Exit 4 ramps. Specifically, the following geometric modifications will be included in this alternative:

- Albany-Shaker Road / Wolf Road
  - Remove existing Exit 4 northbound entrance ramp leg of intersection,
  - Remove existing through lane and restripe Wolf Road approach to consist of one right-turn lane and two left-turn lanes. Restripe existing left turn lane to two-way left turn lane and flush median.
  - Remove existing left-turn lane and restripe Albany-Shaker Road eastbound approach to consist of two through lanes and one right-turn lane.
  - Remove existing right-turn lane on Albany-Shaker Road westbound approach.
- Albany-Shaker Road / Old Wolf Road
  - Remove existing Exit 4 southbound entrance ramp leg of intersection.
  - Restripe Old Wolf Road approach to consist of two left-turn lanes and one right-turn lane.
  - Remove existing right-turn lane on the Albany-Shaker Road eastbound approach.
  - Restripe Albany-Shaker Road westbound approach to consist of one through lane and one shared through / right-turn lane.
- Wolf Road / Exit 4 northbound Exit Ramp
  - Remove existing Exit 4 northbound exit ramp.
- Wolf Road / Metro Park Road
  - Construction new approach to intersection (connector road) opposite Metro Park Road. This approach consists of one left-turn lane, one through lane, and one right-turn lane.
  - Lengthen existing left-turn lane on Wolf Road northbound approach and add second left-turn lane.
  - Construct right-turn lane on Wolf Road southbound approach.
- Albany-Shaker Road / Proposed Connector Road
  - Construct new intersection on Albany-Shaker Road approximately 1,000 ft. west of Old Wolf Road.
  - Construct one left-turn lane on Albany-Shaker Road westbound approach.
  - Construct two right-turn lanes on Albany-Shaker Road eastbound approach.
  - Construct two left-turn lanes and one right-turn lane on the connector road approach.
- Proposed Connector Road / Proposed Exit 4 northbound ramps
  - Construct new intersection on connector road approximately 1,150 ft. west of Wolf Road.
  - Exit 4 northbound Exit Ramp consists of two left-turn lanes and one right-turn lane.

  - Exit 4 northbound Entrance Ramp consists of two travel lanes.
  - Connector road eastbound approach consists of one left-turn lane and two through lanes.
  - Connector road westbound approach consists of two through lanes and one right-turn lane.
- Proposed Connector Road / Proposed Exit 4 southbound ramps
  - Construct new intersection on connector road approximately 1,660 ft. west of Wolf Road.
  - Exit 4 southbound Exit Ramp consists of one left-turn lane and one right-turn lane.
  - Exit 4 southbound Entrance Ramp consists of two travel lanes.
  - Connector road eastbound approach consists of two through lanes and one right-turn lane.
  - Connector road westbound approach consists of two left-turn lanes and two through lanes.
- Old Wolf Road / Existing Exit 4 southbound Exit Ramp
  - Remove existing Exit 4 southbound Exit ramp.

Flyover Alternative

The existing intersection geometry will be modified at several locations within the project study area due to the removal of some of the existing Exit 4 ramps and construction of the new Exit 4 ramps. Specifically, the following geometric modifications will be included in this alternative:

- Albany-Shaker Road / Wolf Road
  - Construct a second left-turn lane on the Albany-Shaker Road eastbound approach to consist of two left-turn lanes, two through lanes and one right-turn lane.
- Albany-Shaker Road / Old Wolf Road
  - Remove existing Exit 4 southbound entrance ramp leg of intersection.
  - Restripe Old Wolf Road approach to consist of two left-turn lanes and one right-turn lane.
  - Remove existing right-turn lane on the Albany-Shaker Road eastbound approach.
  - Restripe Albany-Shaker Road westbound approach to consist of one through lane and one shared through / right-turn lane.
- Wolf Road / Exit 4 northbound Exit Ramp
  - Restripe the existing Exit 4 northbound exit ramp to consist of one right-turn only lane onto Wolf Road southbound.
- Albany-Shaker Road / Proposed Flyover Ramps
  - Construct new intersection on Albany-Shaker Road approximately 1,000 ft. west of Old Wolf Road.
  - Construct one left-turn lane on the Albany-Shaker Road westbound approach.
  - Construct one right-turn lane on the Albany-Shaker Road eastbound approach.
  - Construct two left-turn lanes and one right-turn lane on the flyover ramps approach.
- Old Wolf Road / Existing Exit 4 southbound Exit Ramp
  - Remove existing Exit 4 southbound Exit ramp.

In addition to the geometric modifications at intersections, the Flyover Alternative will also include construction of an auxiliary lane on I-87 northbound between the existing Exit 4 northbound entrance ramp and the existing Exit 5 northbound exit ramp.

3.3.3.1. (4) Roadside Elements:

a) Snow Storage, Sidewalks, Utility Strips, Bikeways, Bus Stops –

The proposed alternatives will provide sidewalks on both sides of Albany-Shaker Road between Wolf Road and Old Wolf Road and a sidewalk along the south side of Albany-Shaker Road west of Wolf Road to the connector road or flyover ramps. The alternatives also include 5 ft bike lanes on Albany-Shaker Road between Wolf Road and the connector road or flyover ramps intersection. West of that intersection a shared use path along the south side of Albany-Shaker Road will provide pedestrian and bicycle access to Meeting House Road and the airport. The sidewalk will be separated from the travelled way by curbs and a 3 ft utility strip which will also

provide snow storage. The shared use path will be separated from the travelled way by curbs and a 5 ft utility strip which will provide snow storage.

There are no existing bikeways within the project study area; however The Crossings at Colonie and the shared use path constructed as part of the Albany / Watervliet-Shaker Road project are included in the Capital District Regional Bike-Hike Map and Wolf Road and Albany-Shaker Road are part of CDTC's proposed Bicycle and Pedestrian Priority Network.

CDTA currently provides transit service along I-87, Albany-Shaker Road, and Wolf Road within the project study area. Route 610 (Flex Service Wolf Road) provides service between Colonie Center on NYS Route 5 and NYS Route 7 at Vly Road. This route includes stops along Wolf Road within the project area. Route 737 (Corporate Woods – Airport) provides service between the Empire State Plaza in downtown Albany, Corporate Woods, the airport, and NYS Route 7 at Vly Road. This route includes stops along Albany-Shaker Road. CDTA also provides bus service on I-87, Northway Xpress, between Albany and points north. This service does not provide any connections to destinations in the Exit 4 area. No changes are proposed to the existing system along I-87 or Wolf Road; however, if appropriate, transit signal priority along Albany-Shaker Road will be considered during final design.

b) Driveways – The driveways will be modified to comply with the current NYSDOT "Policy and Standards for Design of Entrances to State Highways."

c) Clear Zone – The clear zone on Wolf Road will be approximately 15 ft. wide. The clear zone on Albany-Shaker Road will be approximately 15 ft. The clear zone on the connector road will be approximately 15 ft. The clear zone on I-87 will be a minimum of 30 ft. The clear zone on all project area roadways will be refined during final design to adjust for slopes, roadway curvature, etc.

See Appendix A for typical sections of the project area roadways.

3.3.3.2. Special Geometric Design Elements

3.3.3.2. (1) Non-Standard Features

Diamond Alternative

This alternative contains one non-standard feature.

Level of Service: Five locations along I-87 will experience a Level-of-Service E in ETC+20 during the peak hours. This is less than the minimum required LOS D for interstates and their ramps in heavily developed sections of metropolitan areas. The following locations will have a proposed LOS E:

AM Peak Hour
- I-87 southbound, between the Exit 5 entrance ramp and the Exit 4 exit ramp

PM Peak Hour
- I-87 northbound, between the Exit 2W entrance ramp and the Exit 4 exit ramp
- I-87 northbound, between the Exit 4 entrance ramp and the Exit 5 exit ramp
- I-87 northbound, between the Exit 2E entrance ramp and the Exit 2W exit ramp (weave area)
- I-87 northbound, ramp junction at the Exit 5 exit ramp

The I-87 southbound segment will experience a LOS D during the AM peak hour under No-Build conditions. The I-87 northbound locations will experience a LOS E or F under No-Build conditions (as shown in Exhibit 2.3.1.7 h). Addressing the non-standard LOS would require the addition of a fourth mainline travel lane on I-87 northbound from the Exit 1 entrance ramp to a point just north of the Exit 7 entrance ramp as well as a fourth mainline travel lane on I-87 southbound from the Exit 6 entrance ramp to the Exit 1 exit ramp. Given that improvements on I-87 would cost over $50 million, result in additional

wetland and right-of-way impacts, and are beyond the scope of the proposed project, the non-standard levels-of-service will be retained.

Flyover Alternative

This alternative contains one non-standard feature.

Level of Service: Four locations along I-87 will experience a Level-of-Service E in ETC+20 during the peak hours. This is less than the minimum required LOS D for interstates and their ramps in heavily developed sections of metropolitan areas. The following locations will have a proposed LOS E:

AM Peak Hour
- I-87 southbound, between the Exit 5 entrance ramp and the Exit 4 exit ramp
- I-87 southbound, between the Exit 4 entrance ramp and the Exit 2W exit ramp

PM Peak Hour
- I-87 northbound, between the Exit 2W entrance ramp and the Exit 4 exit ramp
- I-87 northbound, between the Exit 2E entrance ramp and the Exit 2W exit ramp (weave area)

All of these segments are projected to experience a LOS D or worse during the peak hours under No-Build conditions. Three other locations will experience LOS F during the PM peak hour (as noted in Exhibit 2.3.1.7 h). Addressing the non-standard LOS would require the addition of a fourth mainline travel lane on I-87 northbound from the Exit 1 entrance ramp to a point just north of the Exit 7 entrance ramp as well as a fourth mainline travel lane on I-87 southbound from the Exit 6 entrance ramp to the Exit 1 exit ramp. Given that improvements on I-87 would cost over $50 million, result in additional wetland and right-of-way impacts, and are beyond the scope of the proposed project, the non-standard levels-of-service will be retained.

Non-standard feature justification forms are located in Appendix D.

3.3.3.2. (2) Non-Conforming Features

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

3.3.3.3. Pavement and Shoulder

The proposed project is not necessary to address any existing pavement deficiencies. The proposed pavement treatment will consists of widening the pavement adjacent to the existing travel lanes, or box widening, and overlay of the entire roadway in areas where travel lanes, turn lanes and medians are proposed along I-87, Wolf Road, Old Wolf Road and Albany-Shaker Road. The Diamond Alternative also includes full-depth reconstruction on I-87 northbound for approximately 3,900 ft where the I-87 northbound mainline is shifted into the existing median to accommodate the new Exit 4 ramps and avoid impacts to the existing electric utility tower.

The pavement courses and thicknesses for each of the project area roadways will be determined during final design.

3.3.3.4. Drainage Systems

Existing drainage ditches/structures will be cleaned as part of all feasible alternatives. Other work will consist of extension of existing culverts in areas of pavement widening and construction of approximately 3,750 ft. of a new closed drainage system along Albany-Shaker Road between Old Wolf Road and the airport.

The Diamond Alternative also includes construction of drainage ditches and check dams along the connector road, diamond interchange ramps, and portions of I-87 to collect, treat, and convey stormwater. Runoff will be collected and conveyed to stormwater treatment basins located along the east side of the

proposed connector road. These drainage ditches, or dry swales, will provide stormwater treatment for runoff.

The Flyover alternative includes construction of drainage ditches and check dams along the flyover ramps and portions of I-87 to collect, treat, and convey stormwater. Runoff will be collected and conveyed to stormwater treatment basins located with the existing I-87 median. These drainage ditches, or dry swales, will provide stormwater treatment for runoff.

3.3.3.5. Geotechnical

A high seasonal water table between 0 ft. and 4 ft. below the existing ground surface is present in many locations within the project area. Underdrain, drainage swales, or other appropriate measures will be incorporated into the project to minimize issues during construction or long-term maintenance issues associated with the high water table.

A partial set of subsurface data (log sheets from borings CB-44 (only sheet 1 of 4 provided), CB-47, and CB-50) from the general location of the I-87 bridges over Albany-Shaker Road that included a Boring Location Plan & General Subsurface Profile from a set of 1985 rehabilitation plans was reviewed. These three borings were drilled in 1956 to approximate depths ranging from 127 to 240 (CB-44 depth not confirmed) feet below the existing grade at that time. This information indicates subsurface conditions generally consisting of loose to medium compact brown and gray silty sand ranging in thickness from approximately 90 to 130 feet overlying soft to firm gray clayey silt and silty clay. It appears that lower clayey silt and silty clay stratum was not penetrated at the depths explored in the 1956 borings.

Based on cursory review of the boring data provided, it may be feasible to support the replacement bridges over Albany-Shaker Road using shallow footings. The feasibility of this option will be dependent on a number of factors including, but not limited to, the location of the new substructures and corresponding bearing elevations, the new bridge loads, and settlement tolerances. Should the positioning of the new substructures result in footings bearing in unsuitable bearing materials or the settlement estimates exceed the tolerances for the new structures, the supporting the new structures on deep foundation systems will need to be considered.

Soil borings were taken in August and September 2013 at the proposed bridge abutment locations and the Flyover Alternative Ramp A alignment. The subsurface exploration borings progressed indicated a majority of the material in Silty Sand with the water table within the top three (3) feet of the ground surface. The ground surface consisted of organic material and flora material. Based on the existing conditions along the proposed ramp alignment, and given that embankment placed on top of organic and flora material continually settles over time, twelve (12) inches from the original ground surface will be removed prior to construction of the proposed embankment to reduce settlement under the proposed roadway.

3.3.3.6. Structures

3.3.3.6. (1) Description of Work

There are two feasible alternatives under consideration. Both include the replacement of the I-87 bridges over Albany-Shaker Road (BIN 1033141 & 1033142) as well the construction of a new bridge to carry the connector road or flyover ramp over I-87 northbound and southbound.

<u>BIN 1033141 & 1033142 (I-87 northbound and southbound)</u>

The I-87 bridges will be replaced with structures that will each carry three 12 ft. travel lanes with one 10 ft. shoulder and one 6 ft. shoulder. Each bridge will be over widened by 30.5 ft. to accommodate lane shifts during construction. Refer to the typical sections included in Appendix A. The superstructures will likely consist of single span steel multi-girders. There will be no utilities carried on either bridge.

Diamond Alternative

For this alternative, a new bridge will be constructed to replace the existing Exit 4 interchange via a new connector road. The new structure will carry six 12 ft. travel lanes, a 4 ft. flush median, and two 8 ft. shoulders. The superstructure will likely be a two span steel multi-girder structure. No utilities will be carried by the bridge.

Flyover Alternative

For this alternative, a new bridge will be constructed to carry a new flyover ramp that will connect I-87 northbound to Albany-Shaker Road. The new structure will carry one 15 ft. travel lane, one 6 ft. shoulder and one 3 ft. shoulder. The superstructure will likely be a two span steel multi-girder structure, with both spans being straight. No utilities will be carried by the bridge.

3.3.3.6. (2) Clearances (Horizontal/Vertical)

Horizontal clearance for the northbound or southbound lanes of I-87 under the proposed new bridges is 52 ft. (12 ft. travel lanes, a 10 ft. shoulder and a 6 ft. shoulder) with an additional minimum 20 ft clear width from edge of shoulder to front face of abutment in each direction and a median of varying width. The proposed clear width (curb to curb) on the new bridge for the Diamond Alternative is 92 ft. The proposed clear width (curb to curb) for the Flyover Alternative is 24 ft. Refer to the typical sections included in Appendix A.

A proposed clear width of 52 ft. (12 ft. travel lanes, a 10 ft. shoulder and a 6 ft. shoulder) for the northbound and southbound lanes of I-87 is the same for BIN 1033141 and 1033142. For the Diamond Alternative, the horizontal clearance of Albany-Shaker Road under the southbound I-87 bridge (BIN 1033141) is 54 ft. curb to curb with a 5 ft. sidewalk and 3 ft. maintenance strip on each side and an additional minimum of 12 ft. of clear width from the back edge of sidewalk to the front face of abutment on each side. Under the northbound I-87 bridge (BIN 1033142), the horizontal clearance varies between 54 ft. and 70 ft 3 inches curb to curb. These is also a 3 ft. maintenance strip, a 5 ft. sidewalk and a minimum clear width of 12 ft. and 6 ft. on the left and right side, respectively, between the back edge of sidewalk and the front face of abutment. For the Flyover Alternative, the horizontal clearance of Albany-Shaker Road under the southbound I-87 bridge (BIN 1033141) is 86 ft. curb to curb with one 3 ft. maintenance strip, one 5 ft. sidewalk, and an additional minimum of 12 ft. of clear width from the back edge of sidewalk to the front face of abutment on each side. Under the northbound I-87 bridge (BIN 1033142), the horizontal clearance varies curb to curb but is approximately 92 ft. There is also a 3 ft. maintenance strip, one 5 ft. sidewalk, and a minimum clear width of 12 ft. and 4 ft. on the left and right side, respectively, between the back edge of sidewalk and the front face of abutment.

Vertical clearances will be as shown in Exhibits 3.2.3.2a, 3.2.3.2b, and 3.2.3.2c.

3.3.3.6. (3) Live Load

All of the above mentioned bridges will be designed using LRFD for an HL-93 live load and the NYS Design Permit Vehicle.

3.3.3.6. (4) Associated Work

Due to the need to construct the new bridge in the Diamond Alternative high enough to allow for the required vertical clearance over I-87, several retaining walls will be required along the ramps (extending out from the ends of the wingwalls) to retain fill and minimize impact to the highway.

3.3.3.6. (5) Waterway

None of the above mentioned bridges cross waterways. A Coast Guard Jurisdiction Checklist is not required.

3.3.3.7. Hydraulics of Bridges and Culverts

Shaker Creek is located in the northwestern portion of the project area and extends southeast and crosses I-87 in a 24 inch diameter reinforced concrete pipe (RCP) culvert approximately 2,700 ft. south of Albany-Shaker Road. Several unnamed tributaries of Shaker Creek also cross I-87 in culverts 24 inches to 30 inches in diameter within the project area. No detailed floodplain information is available with the project limits because the study by detailed methods was only completed to a point approximately 1,350 ft. south of Ann Lee Pond (approximately 3,500 ft. west of I-87). Likewise, the tributaries of Shaker Creek have not been studied by detailed methods.

There are no regulated floodplains within the project corridor. The existing culverts under I-87 would be extended for both of the feasible alternatives to accommodate pavement widening and, in the case of the Diamond Alternative, the connector road. It is anticipated that the existing culverts will be extended; however, the proposed culvert treatments will be determined during final design.

3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

All guiderail within the project limits including bridge railing will be evaluated during final design for conformance to design standards and replaced or repaired, if necessary. Several areas of existing cable guide rail are scheduled to be replaced with box beam guide rail along I-87 during the 2013 construction season. The new box beam guide railing will be maintained where feasible.

Exhibit 3.3.3.8 summarizes locations where new or replacement guide railing is proposed.

Exhibit 3.3.3.8
Proposed Location of Guide Railing

Type	Location	Side	Length (m)
Diamond Alternative			
Box Beam	I-87 NB	LT/RT	950±
Box Beam	I-87 SB	LT/RT	550±
Box Beam	connector road	LT/RT	5,000±
Box Beam	Exit 4 NB exit ramp	LT/RT	1,400±
Box Beam	Exit 4 NB entrance ramp	LT/RT	1,000±
Box Beam	Exit 4 SB exit ramp	LT/RT	950±
Box Beam	Exit 4 SB entrance ramp	LT/RT	900±
Box Beam	Exit 5 SB entrance ramp	LT/RT	150±
Box Beam	Albany-Shaker Road	LT/RT	5,570±
Flyover Alternative			
Box Beam	I-87 NB	LT/RT	2,300±
Box Beam	I-87 SB	LT/RT	3,900±
Box Beam	Exit 4 NB exit ramp	LT/RT	3,600±
Box Beam	Exit 4 SB entrance ramp	LT/RT	2,000±
Box Beam	Exit 4 SB exit ramp	LT/RT	1,550±
Box Beam	Exit 5 SB entrance ramp	RT	150±
Box Beam	Albany-Shaker Road	LT/RT	5,570±

3.3.3.9. Utilities

The proposed project will require relocation of overhead electric, telephone and cable utilities within the project area along Albany-Shaker Road. In addition, existing underground utilities including water and sanitary sewer lines will be modified or relocated as necessary due to the installation of the new closed drainage system and horizontal and vertical alignment modifications. As the design progresses and the

exact nature and extent of utility conflicts are determined, correspondence and coordination with utility owners will be maintained.

The utility owners which currently own facilities within the project area that could be potentially impacted by the project include:

- City of Watervliet
- Dominion Transmission, Inc / Capitol
- Elantic Telecom, Inc.
- Fiber Technologies, LLC
- Level 3 Communications
- MCI
- National Grid
- NYSDOT, Region 1
- NYS Office of Technology / Department of Telecom
- Tech Valley Communications
- Time Warner Cable
- Town of Colonie / Latham Water District
- Verizon
- Village of Colonie
- Windstream

Three underground fiber optic cable lines run along the east side of I-87 northbound. These lines are owned by NYSDOT, NYS Office of General Services (OGS), and Windstream. Although relocation of private utilities within interstate rights-of-way is typically reimbursable to the utility owner, the current agreement with Windstream states that the utility owner is responsible for relocations costs for the fiber optic cable. Relocation costs for the fiber optic cable owned by NYSDOT and NYSOGS have been included in the project construction costs for each alternative.

In addition, an existing 115 kV overhead electric transmission line is located just south of the proposed connector road bridge over I-87. The Diamond Alternative includes relocation of the I-87 northbound mainline to the west to avoid impacts to a tower located along the transmission line. The minimum required vertical clearance of 24.2 ft. above the proposed roadway surface for a 115 kV transmission line will be provided over I-87, the Exit 4 northbound exit ramp, and the Exit 4 southbound entrance ramp.

Utility impacts will be identified for the preferred alternative during final design.

3.3.3.10. Railroad Facilities

There are no railroad facilities affected due to the construction of the proposed project.

3.3.4. Landscape and Environmental Enhancements

Refer to Chapter 4 for complete discussion.

3.3.4.1. Landscape Development and Other Aesthetics Improvements

The Department will provide/replace landscaping as a part of the overall enhancement and aesthetic improvement efforts for this project. Refer to Chapter 4 for a more detailed discussion.

3.3.4.2. Environmental Enhancements

There are no proposed environmental enhancements planned for this project. Opportunities for environmental enhancements will be evaluated in accordance with the GreenLITES program during final design.

3.3.5. Miscellaneous

There is no other pertinent information on the proposed conditions.

CHAPTER 4 – SOCIAL, ECONOMIC and ENVIRONMENTAL CONDITIONS and CONSEQUENCES

The New York State Department of Transportation (NYSDOT) has prepared this National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) for the proposed Interstate 87 Exit 4 Access Improvement project to assess the project's effect on the environment. This document will also be used to satisfy State Environmental Quality Review Act (SEQRA) requirements.

4.1 Introduction

The purpose of this chapter is to identify and evaluate the potential social, economic, and environmental consequences of the feasible alternatives (referred to herein as the "proposed project"). Potential avoidance, minimization, and/or mitigation measures are presented as appropriate. This project involves reconstruction / replacement of Interstate 87 Exit 4 in the Town of Colonie, Albany County, New York.

4.1.1 Environmental Classification

NEPA Classification

This project is classified as a NEPA Class I project in accordance with 23 CFR 771. NEPA Class I projects require the preparation of an Environmental Impact Statement to determine the likely impact the proposed project alternatives will have on the environment.

SEQR Classification and Lead Agencies

The Department has determined that this project is a State Environmental Quality Review Act (SEQRA) Non-Type II action (EIS) in accordance with 17 NYCRR Part 15 - Procedures for Implementation of State Environmental Quality Review Act. SEQRA Non-Type II projects include actions that are more likely to require the preparation of an EIS to determine the potential impacts the proposed project alternatives will have on the environment.

4.1.2 Coordination with Agencies

NEPA Cooperating and Participating Agencies

The following agencies have been identified as Cooperating and/or Participating Agencies in accordance with 23 CFR 771:

- Federal Highway Administration – Lead Agency
- NYS Department of Transportation – Joint Lead Agency
- US Army Corps of Engineers – Cooperating / Participating Agency
- US Environmental Protection Agency – Cooperating / Participating Agency
- US Fish and Wildlife Service – Cooperating / Participating Agency
- NYS Department of Environmental Conservation – Cooperating / Participating Agency
- NYS Department of Agriculture and Markets – Participating Agency
- NYS Office of Parks, Recreation, and Historic Preservation – Cooperating / Participating Agency
- Saint Regis Mohawk Tribe – Participating Agency
- Stockbridge-Munsee Community Band of Mohican Indians – Participating Agency
- Delaware Tribe - Participating Agency
- Federal Aviation Administration – Participating Agency
- USDA Natural Resources Conservation Service – Participating Agency
- Capital District Transportation Committee – Participating Agency
- Albany County Executive's Office – Participating Agency

- Town of Colonie – Participating Agency
- Village of Colonie – Participating Agency
- City of Albany – Participating Agency
- Albany County Airport Authority – Participating Agency
- NYS Thruway Authority – Participating Agency
- Capital District Transportation Authority – Participating Agency

4.2 Social

The purpose of this section is to discuss the social environment of the project study area (PSA). The project study area consists of the I-87 highway corridor and the adjacent local roadways in the Town of Colonie. The land use along I-87 is primarily residential and commercial. Land use along the local roadways consists of a mix of agriculture, residential, commercial, airport and light industrial. The project involves modifying the existent geometry of I-87 to improve access between I-87 and the airport and Wolf Road; eliminating the structural deficiencies associated with the I-87 bridges over Albany-Shaker Road and improving operations and safety in the Exit 4 area. A secondary objective includes improving connectivity between the existing pedestrian/bicycle facilities on Wolf Road and the facilities on Albany-Shaker Road and Watervliet-Shaker Road.

4.2.1 Land Use

Demographics and Affected Population

The project area is located in the Town of Colonie, Albany County, New York. Albany, Schenectady, Rensselaer, and Saratoga counties comprise the Capital District, also known as the Capital Region. According to the Comprehensive Economic Development Strategy for the Capital District (2004), in the past decade the population of the Capital Region has been increasing at almost twice the rate of both New York State's population and most northeastern states. This trend, however, is not reflected in the County Population Change percentage for Albany County, relative to the State Population Change percentage, presented in Exhibit 4.2.1 a, for the two decades of 1990 to 2000 and 2000 to 2010. Although the populations of the Town of Colonie and Albany County have slightly increased in the last two decades, the change has been, by small margins, less than that of the State's, in each of the last two decades.

Exhibit 4.2.1 a
Population Trends Comparison, New York State, Albany County and Town of Colonie 1990-2010

Location	Population			Population Change			
				1990 to 2000		2000 to 2010	
	1990	2000	2010	Increase Amount	Percent	Increase Amount	Percent
New York State	17,990,455	18,976,457	19,378,102	986,002	5.5	401,645	2.0
Albany County	292,793	294,565	304,204	1,772	0.6	9,639	3.0
Town of Colonie	76,497	79,258	81,591	2,761	3.6	2,333	3.0

Source (New York State: 1990; 2000; and 2010): U.S. Census Bureau
Source (Albany County and Town of Colonie: 1990 and 2000): Capital District Regional Planning Commission
Source (Albany County and Town of Colonie: 2010): U.S. Census Bureau

The Albany County unemployment rate for August 2011 was 6.9 percent, which is 0.8% below the state rate of 7.7%. Although the County unemployment rate is less than the State's, it has increased significantly over the past decade: in December 1999, December 2007, and December 2008, Albany County unemployment rates were at 2.7%, 3.9% and 5.6%, respectively.

The percentage of the population residing in Albany County and the Town of Colonie, relative to ethnic minorities, which includes African-American, Hispanic or Latino, American Indian and Alaska Native, Native Hawaiian and Pacific Islander, and Asian, is less than the statewide populations for the same

groups. Exhibit 4.2.1 b presents percentages of the total population, at the State, County, and Town levels, relative to racial and ethnic groups.

Exhibit 4.2.1 b
Percent of Population by Race and Ethnicity, New York State, Albany County and Town of Colonie, 2010

Location	Ethnic Background (percent of total population)								
	White	Black or African American	Asian	American Indian and Alaska Native	Native Hawaiian and Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino (of any race)	Not Hispanic or Latino
New York State	65.7	15.9	7.3	0.6	0.04	7.4	3.0	17.6	82.4
Albany County	78.2	12.7	4.8	0.2	0.03	1.6	2.5	4.9	95.1
Town of Colonie	85.2	5.3	6.6	0.2	0.01	0.8	1.9	3.1	96.9

Source (New York State):
Source: Year U.S. Census Bureau, 2010 American Community Survey
Source (Albany County and Town of Colonie): Capital District Regional Planning Commission

The median household income and per capita income for both Albany County and the Town of Colonie are higher than the State's. The percentage of the population living in poverty is significantly lower (10.9 percentage points) relative to the State percentage and significantly lower (9.3 percentage points) relative to the County.

Exhibit 4.2.1 c shows that the Median Household Income and Per Capita Income in the Town of Colonie are higher than that of the County and the State. The median household income and the Per Capita Income for Albany County are similar to the State's. The percent of the population living in poverty in Albany County (13.7%) and the Town of Colonie (6.3%) is lower than the State's (14.9%) average for the period of 2000 to 2010. In 1999, employment and wages were up in many sectors, and overall unemployment was down from the previous year.

Exhibit 4.2.1 c
Population by Income and Poverty Status
New York State, Albany County and Town of Colonie, 2010

Location	Median Household Income	Per Capita Income	Percent Population in Poverty
New York State	$ 54,148	$ 30,011	14.9
Albany County	$ 53,965	$ 29,914	13.7
Town of Colonie	$ 67,700	$ 36,248	6.3

Source: Year U.S. Census Bureau, 2010 American Community Survey

Exhibit 4.2.1 d presents data on population relative to age, at the State, County, and Town levels. The portion of the population between the ages of 18 and 64, which is considered the part of the population that is eligible to work, is essentially the same, percentage wise, at the State and Town levels with the County level slightly higher (2.2%). The percentage of the population under 18 years of age is similar at the State, County, and Town levels. The percentage of the population age 65 years and over is similar at the state and county levels, 13.5% and 13.9%, respectively, but slightly higher at the Town level (16.2%).

Exhibit 4.2.1 d Population by Age New York State, Albany County, Town of Colonie, 2010						
Location	Population by Age					
	Under 18 Years		18-64 Years		65 Years & Over	
	Number	Percent	Number	Percent	Number	Percent
New York State	4,324,929	22.3	12,435,230	64.2	2,617,943	13.5
Albany County	60,631	19.9	201,259	66.2	42,314	13.9
Town of Colonie	15,903	19.5	52,430	64.3	13,258	16.2

Source: Year U.S. Census Bureau, 2010 American Community Survey

Exhibit 4.2.1 e presents information about housing units relative to ownership and occupancy. Over 77 percent of the residences in the Town of Colonie are owned by the people that live in them. By comparison, 61.9 percent of the residences in the County are owned by the people that live in them, and 57.3 percent of the residences in the State are owned by the people that live in them. Nearly 23 percent of the homes occupied in the Town are rented by tenants; comparatively 38 and 43 percent of the residences in the County and State, respectively are rented by tenants. The number of vacant housing units in the Town is over ten times less than the State and almost three times less than the County. This indicates that the demand for housing in the Town is higher than at both the County and State levels.

Exhibit 4.2.1 e Occupancy Status, New York State, Albany County and Town of Colonie, 2010							
Location	Housing Units						
	Total	Owner Occupied		Renter Occupied		Vacant	
		Number	Percent	Number	Percent	Number	Percent
New York State	18,806,605	10,771,541	57.3	8,035,064	42.7	911,784	4.8
Albany County	285,796	176,933	61.9	108,863	38.1	17,266	6.0
Town of Colonie	77,245	59,540	77.1	17,705	22.9	968*	1.3

Source: Year U.S. Census Bureau, 2010 American Community Survey, *2005-2009 Data

The values presented in Exhibit 4.2.1 f show that the housing and contract rent values in the Town are greater than the County's, but lower than the State's, especially the median housing value.

Exhibit 4.2.1 f Median Housing Value and Contract Rent, New York State, Albany County and Town of Colonie, 2005-2009		
Location	Median Housing Value	Median Contract Rent
New York State	$296,500	$ 903
Albany County	$213,300	$ 743
Town of Colonie	$230,200	$ 811

Source: 2010 U.S. Census

In conclusion, neither of the proposed alternatives (Diamond or Flyover) would adversely affect a specific demographic group presented herein. However, it is important to note that, generally speaking, the impacts resulting from the Flyover Alternative are fewer and smaller relative to those associated with the Diamond Alternative.

Approximately 53.92 acres of right-of-way acquisition (Fee and Temporary Easements) will be necessary from 24 parcels under the Diamond Alternative. Approximately one-half of the proposed acquisitions will affect properties on Wolf Road. The majority of the remaining acquisitions will impact properties along Albany-Shaker Road; two acquisitions will also occur on Sunset Boulevard, one on Computer Drive South, and two on Metro Park Road. Properties impacted under this alternative are identified for uses

including retail, hotel/motel, gas transmission, gasoline sales, parking lot, nursery, fast food, storage, and office buildings; vacant farmland, two (2) residential properties and commercial properties are also identified. A minor amount of right-of-way is defined as not more than 10 percent of a parcel for parcels under 10 acres in size, 1 acre of a parcel 10 to 100 acres in size and 1 percent of a parcel for parcels greater than 100 acres in size. A more than minor right-of-way impact as defined under NEPA will occur to ten (10) parcels. Four (4) of the ten (10) properties will be acquired in full: a property owned by Amerada Hess Corporation (30.4-1-3), a residential property owned by John K Engel (30.-5-4), and two properties owned by ET Person LLC (30.18-2-1.1 and 30.-5-10). Three (3) of the ten (10) properties will involve displacements: the property owned by Amerada Hess Corporation (30.4-1-3) which is being acquired in full; a residential property owned by John K Engel (30.-5-4) which is being acquired in full because access to the house on the property would be limited after construction of the new intersection and sidewalk on Albany-Shaker Road; and a property owned by ET Person LLC (30.-5-10) which is being acquired in full due to impacts to the building from the proposed roadway footprint and for wetland mitigation and protection. A summary of the right-of-way impacts which exceed the “minor amount” threshold described above is included in Exhibit 4.2.1 g.

The Diamond Alternative also includes impacts to parking at three (3) commercial properties, a commercial office building at 26 Computer Drive South, the Courtyard by Marriott on Wolf Road, and the Macaroni Grill on Metro Park Road. These impacts will be considered in the appraisal of the respective properties and compensation will be offered accordingly and/or the lost parking will be replaced (cured) via the creation of new parking stalls.

Approximately 29.71 acres of right-of-way acquisition (Fee and Temporary Easements) will be necessary from 15 parcels under the Flyover Alternative. The proposed acquisitions associated with the Flyover Alternative predominantly affect properties on Albany-Shaker Road. Four (4) of the impacted parcels are owned by the Albany County Airport Authority and are identified for uses including residential, parking lot, vacant commercial, air transport and vacant farmland. Two (2) small vacant properties along Albany-Shaker Road are identified as commercial. An additional three (3) properties are owned by Village Square of Penna Inc., two (2) are listed as motel/hotel and the other is identified as vacant commercial. The remaining acquisitions will impact land associated with the following uses: a gasoline station/mini mart, a motel, a commercial business, a residential property and nursery. A minor amount of right-of-way is defined as not more than 10 percent of a parcel for parcels under 10 acres in size, 1 acre of a parcel 10 to 100 acres in size and 1 percent of a parcel for parcels greater than 100 acres in size. A more than minor right-of-way impact as defined under NEPA will occur to seven (7) parcels. One (1) property will be acquired in full and displaced: a residential property owned by John K Engel (30.-5-4) which is being acquired in full because access to the house on the property would be limited after construction of the new intersection and sidewalk on Albany-Shaker Road.

The Flyover Alternative also includes the potential for temporary impacts to the existing parking / dumpster area located behind the Red Roof Inn on Wolf Road. Permanent impacts will be avoided where feasible through the use of retaining walls to limit the extent of embankment. Impacts will be considered in the appraisal of the respective properties and compensation will be offered accordingly and/or the lost parking will be replaced (cured) via the creation of new parking stalls.

Exhibit 4.2.1 g More than Minor ROW Impacts						
PID #	Diamond Alternative			Flyover Alternative		
	Property Size (acres)	Estimated Fee Acquisition (acres)	Percent Impact (per NEPA)	Property Size (acres)	Estimated Fee Acquisition (acres)	Percent Impact (per NEPA)
30.18-2-1.1	13.54	13.54	> 1 acre*	-	-	-
30.4-1-3	0.80	0.80	100%*	-	-	-
30.4-1-4	1.64	0.28	17%	-	-	-
30.4-1-6.5	0.86	0.66	77%	-	-	-
30.-3-75				0.30	0.04	13%
30.-5-1	44.40	4.87	> 1 acre	44.40	5.64	> 1 acre
30.-5-2	0.22	0.095	43%	0.22	0.10	45%
30.-5-3	0.43	0.196	46%	0.43	0.19	44%
30.-5-4	0.23	0.23	100%*	0.23	0.23	100%*
30.-5-9	72.30	9.11	> 1 acre	72.30	5.87	> 1 acre
30.-5-10	20.80	20.80	> 1 acre*	20.80	16.60	> 1 acre
* Full acquisition of property.						

The Diamond Alternative would involve full acquisition of four (4) properties owned by the Amerada Hess Corporation (30.4-1-3), John K Engel (30.-5-4), and ET Person LLC (30.18-2-1.1 and 30.-5-10). The acquisition of these four (4) properties would have a very small impact on the tax base. The equalized assessed value of 156 Wolf Road (Hess Station) based on the 2011 tax assessment data from the Town of Colonie is $23,246 (does not include water and sewer). The equalized assessed value of 680 Albany-Shaker Road (John K Engel) is $215,100 (does not include water and sewer). The equalized assessed value of 200 Sunset Boulevard (ET Person) is $142,349. The equalized assessed value of 70 Sunset Boulevard (ET Person) is $40,712. The total equalized assessed value for all properties within the Town of Colonie is $10,454,120,991. As such, the annual property tax lost by acquiring the four (4) properties represents less a very small percentage of the Town of Colonie tax base.

The Flyover Alternative would involve full acquisition of one (1) property owned by John K Engel (30.-5-4). The equalized assessed value of 680 Albany-Shaker Road (John K Engel property) based on the 2011 tax assessment data from the Town of Colonie is $215,100 (does not include water and sewer). The total equalized assessed value for all properties within the Town of Colonie is $10,454,120,991. As such, the annual property tax lost by acquiring the property represents less a very small percentage of the Town of Colonie tax base.

The proposed right-of-way impacts for the Diamond Alternative and Flyover Alternative are shown in Exhibits 4.2.1 i and 4.2.1 j, respectively.

The Diamond Alternative right-of-way impacts described above contributed to its dismissal as a feasible alternative. The Diamond Alternative requires almost twice the area of ROW acquisitions required for the Flyover Alternative, equating to an additional $10.0M in ROW costs. In addition, this alternative results in relocation of two (2) commercial businesses, representing removal of $165,595 from the Town of Colonie tax base. For these reasons, and those summarized in Section 3.2.1 of this report, the Diamond Alternative has been dismissed from further consideration as a feasible alternative.

Comprehensive Plans and Zoning

The Town of Colonie *Comprehensive Plan*[1] identified a number of goals, including the need to improve mobility throughout the Town by strategically investing in highway infrastructure, improving access to

[1] http://www.colonie.org/pedd/compplan/index.htm

public transportation, and making significant enhancements to the safety and attractiveness of non-motorized modes of travel (e.g., walking and bicycling). Traffic congestion and transportation infrastructure have been identified as important issues by the Town; two of the top three concerns of Town residents are traffic and not having enough sidewalks. It is mentioned in the 2005 comprehensive plan that efforts are underway to address concerns related to transportation, including the "future creation of an Exit 3 interchange…." The overriding intent of the proposed project, which is to alleviate traffic congestion by providing the traveling public direct access from the Northway (I-87) to Albany International Airport as an alternative to having to go through business districts and local traffic patterns, supports the transportation improvement goals associated with improved mobility outlined in the comprehensive plan. Additionally, each of the proposed alternatives includes accommodations for pedestrians and bicyclists, where appropriate. As such, the project is consistent with previously identified plans.

The project area is comprised predominantly of three (3) zoning districts: Airport Business Area, Commercial Office, and Commercial Office Residential (see Exhibit 4.2.1 h). Land Conservation and Single-family Residential also occur in the PSA, but make up a smaller part of it. The vast majority of the project study area is zoned as Airport Business Area and Commercial Office Residential. The southernmost portion of the project area, between Albany-Shaker Road to the north, and the limits of the PSA to the south, is zoned as Commercial Office Residential. The portion of the PSA east of I-87 and north of Albany-Shaker Road is zoned Commercial Office and Single-family Residential. The portion of the PSA west of I-87 and north of Albany-Shaker Road is zoned mostly Airport Business Area with some of the Land Conservation Zone. The portion of the PSA west of I-87 and south of Albany-Shaker Road is zoned primarily Land Conservation with two relatively smaller portions zoned as Airport Business Area and Single-Family Residential. The western most portion of the project area, west of I-87, is mapped as Land Conservation. The northeastern most portion of the project area north and south of Old Niskayuna Road, on the west and east sides of I-87 include portions of two (2) residential developments; (1) an additional area along Sunset Boulevard, on the north side of I-87 in the southwestern portion of the project area is also mapped as Single-Family Residential (SFR).The northwestern most corner of the project area, adjacent to the airport, is zoned as Neighborhood Commercial Office Residential (NCOR); two (2) additional properties along Wolf Road, are also mapped as NCOR. Three (3) properties along Old Niskayuna Road, in the northernmost portion of the project area are zoned as Multi-Family Residential (MFR).

In general, the proposed project is consistent with the existent zoning. However, a portion of the PSA falls within an area zoned as Land Conservation. Both the Diamond and Flyover Alternatives would require right-of-way acquisitions in this area for the roadway footprint. However, the Diamond Alternative has a slightly larger footprint (11 acres) in this area compared to the Flyover (9 acres), and the footprint is situated further from any of the other adjoining zones (Airport Business and Commercial Office Residential). The Flyover Alternative's footprint is smaller within the Land Conservation zoning, and situated closer to the adjoining Airport Business and Commercial Office Residential zones; thereby resulting in less fragmentation of the land conservation area.

Due to the nature of the two alternatives, related access control, proximity to an already built-up commercial area and location relative to properties zoned as Land Conservation, neither alternative is expected to result in a significant increase in development in the immediate area. Under the Diamond Alternative, there is a potential for some development to occur along both sides of the connector road (a distance of 300 ft. from the interchange), within the area zoned as Airport Business. The extent of development would be limited because of the Land Conservation zoning.

Under the Flyover Alternative, access would be controlled along both the northbound and southbound ramps connecting I-87 and Albany-Shaker Road. Therefore, development opportunity associated with this alternative would essentially be limited to highway-related businesses in the southwest and southeast quadrants of the intersection of the I-87 ramps and Albany-Shaker Road, assuming that access control in this area does not preclude the potential for driveway access. Overall, this project is expected to have minimal effect on the overall zoning and planning within the area.

4.2.2 Neighborhoods and Community Cohesion

Community Cohesion

The PSA encompasses the I-87 Adirondack Northway corridor, including adjacent commercially developed areas along Wolf Road, between Watervliet-Shaker Road, to the north, and Sand Creek Road, to the south. Two residential neighborhoods are located adjacent to the project corridor. The Sunset Boulevard neighborhood is located west of I-87 at the southern end of the corridor off of Sand Creek Road; the other is located at the northeastern end of the project corridor, along the east side of I-87 at Exit 5, south of Watervliet-Shaker Road. The areas to the east and west of I-87 are connected by the local roadway network. As such, neighborhoods and community cohesion would not be affected by either alternative, because the majority of changes would occur along the existent alignment, or nearly so. Where new alignments are proposed, the areas are presently undeveloped, and the roads that connect residential neighborhoods and commercial areas to the east and west of I-87 would not be affected.

Sidewalk and bicycle facilities are currently discontinuous; pedestrian accommodations along Albany-Shaker Road are not continuous and the sidewalk within the PSA consists only of a short segment along Albany-Shaker Road, between Wolf Road and Maxwell Road. A shared use path exists along Albany-Shaker Road, between the Albany International Airport and NYS Route 7, which is north of the project corridor. The path accommodates pedestrian and bicycle traffic between NYS Route 7, NYS Route 155 and the Ann Lee Pond Preserve. Improvements proposed under both the Diamond and Flyover Alternatives include the construction of a continuous sidewalk along Albany-Shaker Road from Wolf Road to the I-87 ramps/connector road intersection with Albany-Shaker Road, where the sidewalk transitions to a shared use path that proceeds north to connect with the existing shared use path constructed as part of the Watervliet / Albany-Shaker Road reconstruction project. The construction of new sidewalk would provide a connection from the residential communities located near Maxwell Road to the Ann Lee Pond Preserve, and northward along the existing shared use path. Similarly, users of the existing shared use path would now have safer access to the commercial areas located to the south of I-87.

The project will not divide neighborhoods, will not isolate part of a neighborhood, will not generate new development, or will not otherwise affect community cohesion. The age and ethnic background of the affected population is of a similar composition as the rest of the Town.

Home and Business Relocations

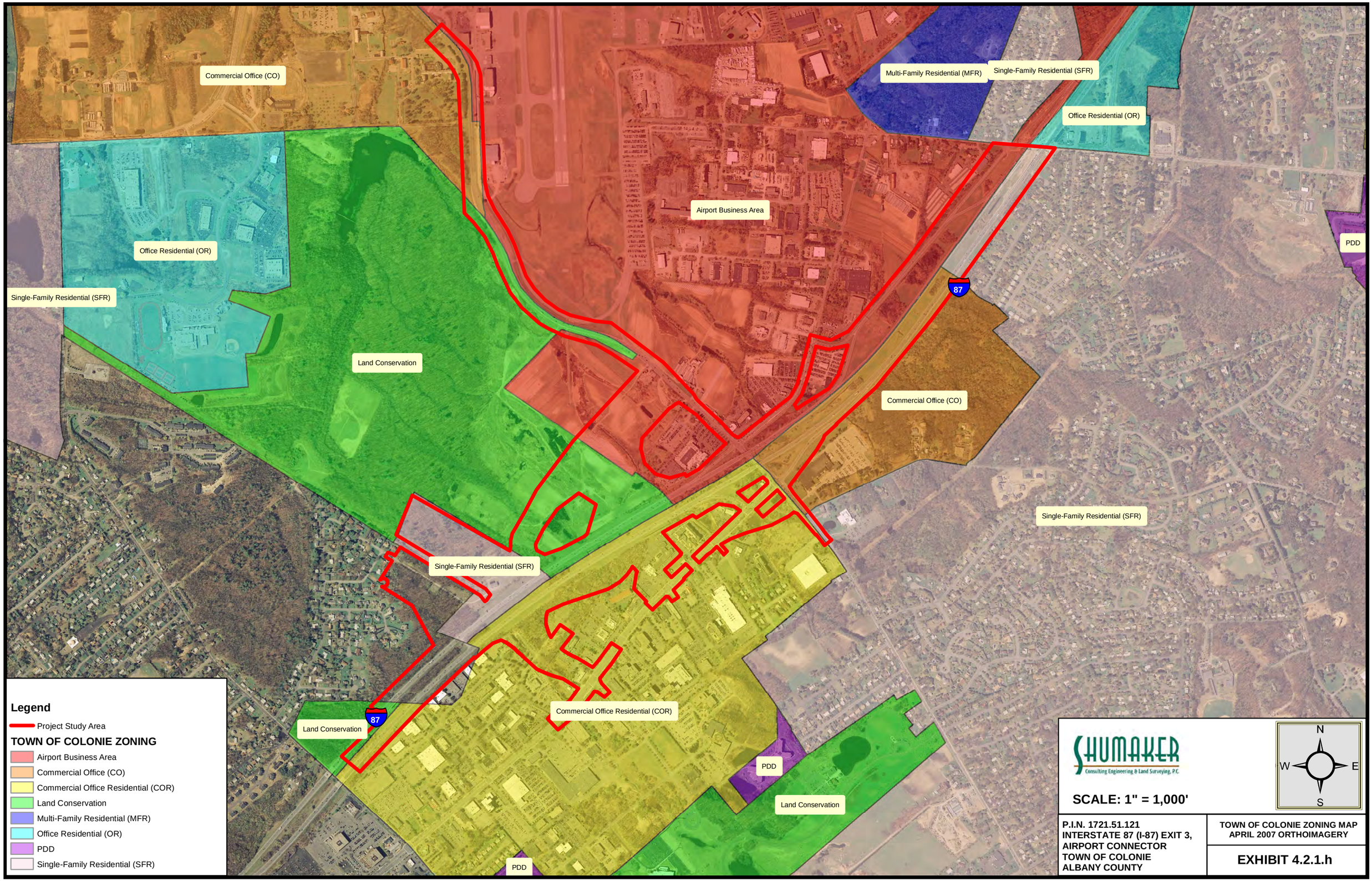
Right-of-way impacts are discussed in detail in Section 3.2.1 and again in Section 4.2.1. In summary, the Diamond Alternative would result in right-of-way impacts to 24 properties, which includes the full acquisition of four (4) properties for a total acquisition of 53.92 acres. This alternative will also result in two (2) commercial displacements (30.4-1-3, Amerada Hess Corporation, and 30.-5-10, E.T. Person LLC) and displacement of one (1) residential home (30.-5-4, John K Engel).

The Flyover Alternative would result in right-of-way impacts to 15 properties; which include full acquisition of one (1) property and displacement of one (1) residential home (30.-5-4, John K Engel). The total right-of-way acquisition proposed under this alternative would be 29.71 acres, which is significantly less compared to the Diamond Alternative.

A Conceptual Stage Relocation Plan (CSRP) has been developed for both alternatives and is included in Appendix M.

Effects Assessment

<u>Diamond Alternative</u>
A more than minor amount of right-of-way would be acquired from ten (10) properties under the Diamond Alternative. The construction of a new road providing access from Wolf Road and Metro Park Road to the I-87 northbound entrance and exit ramps, as part of the proposed diamond interchange would result in the displacement of two (2) commercial properties: the Hess Gas Station and a commercial building



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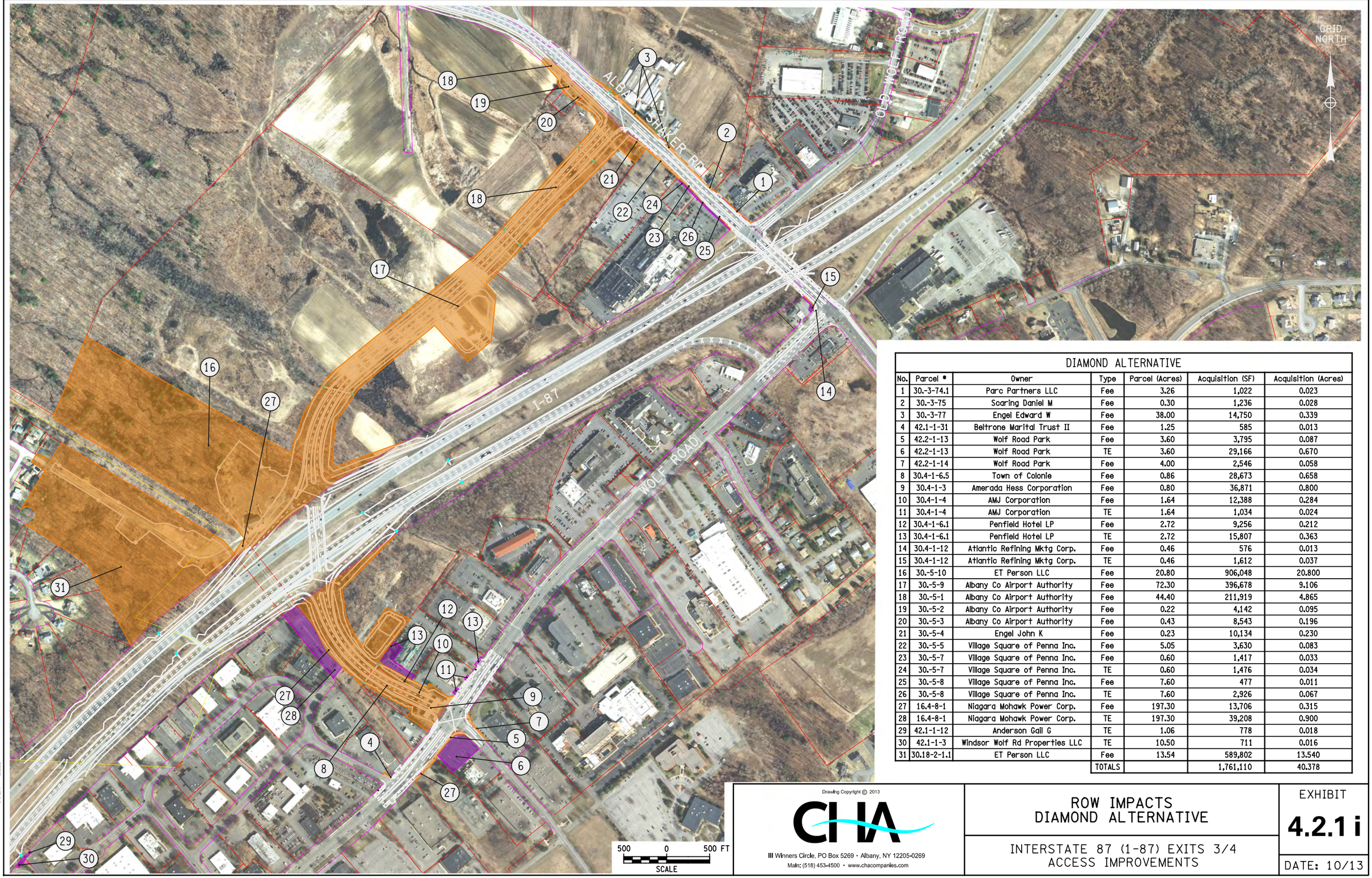

DIAMOND ALTERNATIVE						
No.	Parcel #	Owner	Type	Parcel (Acres)	Acquisition (SF)	Acquisition (Acres)
1	30.-3-74.1	Parc Partners LLC	Fee	3.26	1,022	0.023
2	30.-3-75	Soaring Daniel M	Fee	0.30	1,236	0.028
3	30.-3-77	Engel Edward W	Fee	38.00	14,750	0.339
4	42.1-1-31	Beltrone Marital Trust II	Fee	1.25	585	0.013
5	42.2-1-13	Wolf Road Park	Fee	3.60	3,795	0.087
6	42.2-1-13	Wolf Road Park	TE	3.60	29,166	0.670
7	42.2-1-14	Wolf Road Park	Fee	4.00	2,546	0.058
8	30.4-1-6.5	Town of Colonie	Fee	0.86	28,673	0.658
9	30.4-1-3	Amerada Hess Corporation	Fee	0.80	36,871	0.800
10	30.4-1-4	AMJ Corporation	Fee	1.64	12,388	0.284
11	30.4-1-4	AMJ Corporation	TE	1.64	1,034	0.024
12	30.4-1-6.1	Penfield Hotel LP	Fee	2.72	9,256	0.212
13	30.4-1-6.1	Penfield Hotel LP	TE	2.72	15,807	0.363
14	30.4-1-12	Atlantic Refining Mktg Corp.	Fee	0.46	576	0.013
15	30.4-1-12	Atlantic Refining Mktg Corp.	TE	0.46	1,612	0.037
16	30.-5-10	ET Person LLC	Fee	20.80	906,048	20.800
17	30.-5-9	Albany Co Airport Authority	Fee	72.30	396,678	9.106
18	30.-5-1	Albany Co Airport Authority	Fee	44.40	211,919	4.865
19	30.-5-2	Albany Co Airport Authority	Fee	0.22	4,142	0.095
20	30.-5-3	Albany Co Airport Authority	Fee	0.43	8,543	0.196
21	30.-5-4	Engel John K	Fee	0.23	10,134	0.230
22	30.-5-5	Village Square of Penna Inc.	Fee	5.05	3,630	0.083
23	30.-5-7	Village Square of Penna Inc.	Fee	0.60	1,417	0.033
24	30.-5-7	Village Square of Penna Inc.	TE	0.60	1,476	0.034
25	30.-5-8	Village Square of Penna Inc.	Fee	7.60	477	0.011
26	30.-5-8	Village Square of Penna Inc.	TE	7.60	2,926	0.067
27	16.4-8-1	Niagara Mohawk Power Corp.	Fee	197.30	13,706	0.315
28	16.4-8-1	Niagara Mohawk Power Corp.	TE	197.30	39,208	0.900
29	42.1-1-12	Anderson Gail G	TE	1.06	778	0.018
30	42.1-1-3	Windsor Wolf Rd Properties LLC	TE	10.50	711	0.016
31	30.18-2-1.1	ET Person LLC	Fee	13.54	589,802	13.540
			TOTALS		1,761,110	40.378

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ROW IMPACTS DIAMOND ALTERNATIVE

INTERSTATE 87 (1-87) EXITS 3/4 ACCESS IMPROVEMENTS

EXHIBIT

4.2.1 i

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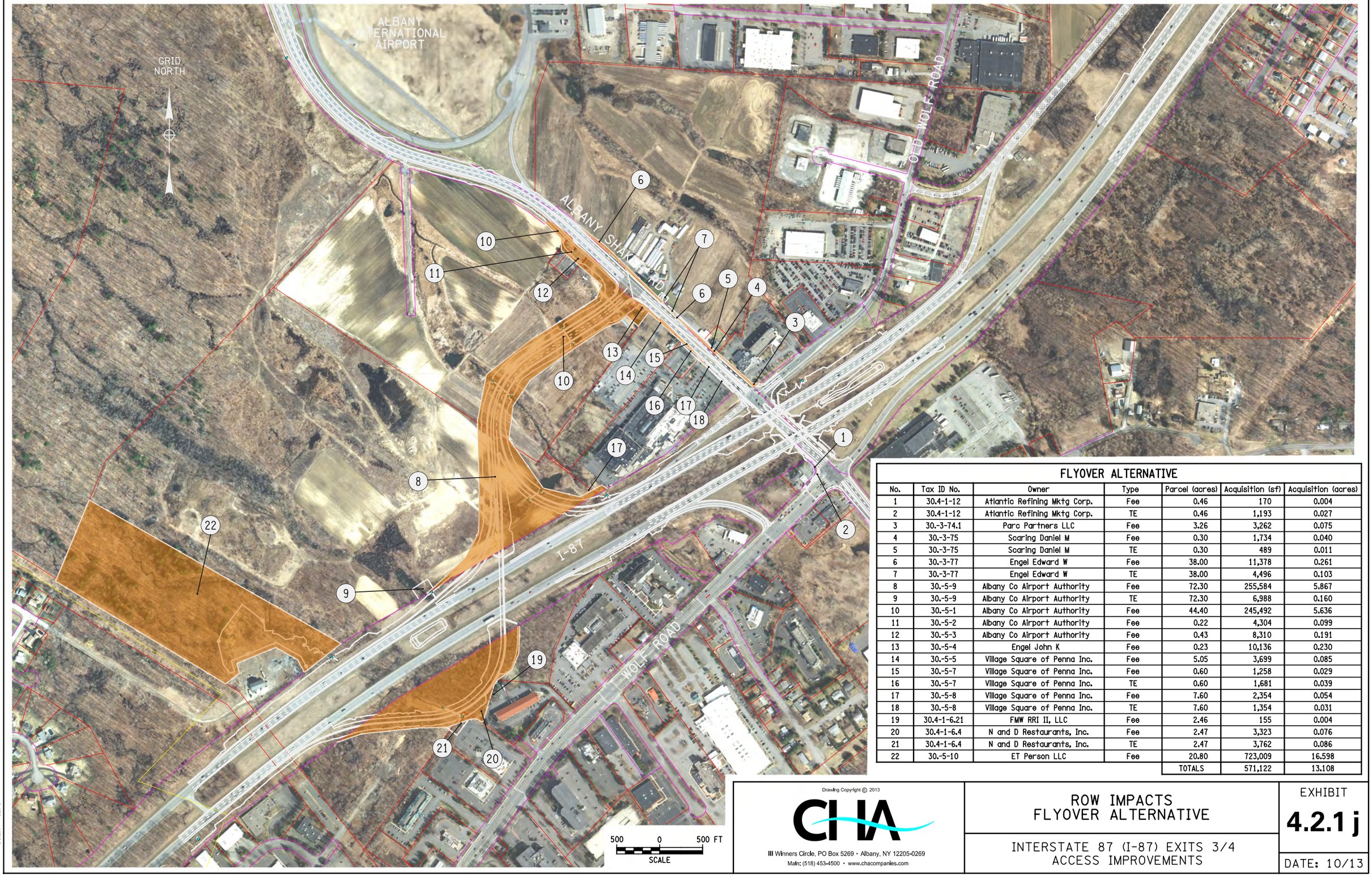

FLYOVER ALTERNATIVE

No.	Tax ID No.	Owner	Type	Parcel (acres)	Acquisition (sf)	Acquisition (acres)
1	30.4-1-12	Atlantic Refining Mktg Corp.	Fee	0.46	170	0.004
2	30.4-1-12	Atlantic Refining Mktg Corp.	TE	0.46	1,193	0.027
3	30.-3-74.1	Parc Partners LLC	Fee	3.26	3,262	0.075
4	30.-3-75	Scaring Daniel M	Fee	0.30	1,734	0.040
5	30.-3-75	Scaring Daniel M	TE	0.30	489	0.011
6	30.-3-77	Engel Edward W	Fee	38.00	11,378	0.261
7	30.-3-77	Engel Edward W	TE	38.00	4,496	0.103
8	30.-5-9	Albany Co Airport Authority	Fee	72.30	255,584	5.867
9	30.-5-9	Albany Co Airport Authority	TE	72.30	6,988	0.160
10	30.-5-1	Albany Co Airport Authority	Fee	44.40	245,492	5.636
11	30.-5-2	Albany Co Airport Authority	Fee	0.22	4,304	0.099
12	30.-5-3	Albany Co Airport Authority	Fee	0.43	8,310	0.191
13	30.-5-4	Engel John K	Fee	0.23	10,136	0.230
14	30.-5-5	Village Square of Penna Inc.	Fee	5.05	3,699	0.085
15	30.-5-7	Village Square of Penna Inc.	Fee	0.60	1,258	0.029
16	30.-5-7	Village Square of Penna Inc.	TE	0.60	1,681	0.039
17	30.-5-8	Village Square of Penna Inc.	Fee	7.60	2,354	0.054
18	30.-5-8	Village Square of Penna Inc.	TE	7.60	1,354	0.031
19	30.4-1-6.21	FMW RRI II, LLC	Fee	2.46	155	0.004
20	30.4-1-6.4	N and D Restaurants, Inc.	Fee	2.47	3,323	0.076
21	30.4-1-6.4	N and D Restaurants, Inc.	TE	2.47	3,762	0.086
22	30.-5-10	ET Person LLC	Fee	20.80	723,009	16.598
				TOTALS	571,122	13.108

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ROW IMPACTS
FLYOVER ALTERNATIVE

INTERSTATE 87 (I-87) EXITS 3/4
ACCESS IMPROVEMENTS

EXHIBIT
4.2.1 j

DATE: 10/13

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located on Sunset Boulevard. This alternative includes displacement of one (1) residential building located at 680 Albany-Shaker Road. This alternative would also include full acquisition of second property owned by ET Person on Sunset Boulevard. As a result, this alternative would result in a small loss of jobs and a minimal percentage of impact to the Town tax base. The remaining property acquisitions are not expected to adversely impact the overall use of the existing properties.

The Diamond Alternative right-of-way and relocation impacts described above contributed to its dismissal as a feasible alternative. The Diamond Alternative requires almost twice the area of ROW acquisitions required for the Flyover Alternative, equating to an additional $10.0M in ROW costs. In addition, this alternative results in relocation of two (2) commercial businesses, representing removal of $165,595 from the Town of Colonie tax base. For these reasons, and those summarized in Section 3.2.1 of this report, the Diamond Alternative has been dismissed from further consideration as a feasible alternative.

Flyover Alternative

A more than minor amount of right-of-way would be acquired from seven (7) properties under the Flyover Alternative. Construction of the new flyover ramps would result in displacement of one (1) residential building located at 680 Albany-Shaker Road. This alternative would result a minimal percentage of impact to the Town tax base. The remaining property acquisitions are not expected to adversely impact the overall use of the existing properties.

Neither alternative is expected to cause adverse impacts upon neighborhood character and stability.

4.2.3 Social Groups Benefited or Harmed

Elderly and/or Disabled Persons or Groups

The census data provided in Section 4.2.1 indicates that, 16.2% of the population of the Town of Colonie is 65 or older, which is slightly higher than the State and County percentage (14%). Approximately 12% of the population in the Town of Colonie is identified as having a disability; this percentage is consistent with the State (11%) and County (12%) statistics.

No nursing homes or senior living centers were identified within the PSA. The Albany County Nursing Home, Colonie Manor Adult Home and Beltrone Living Center senior housing facility are located beyond the project corridor. The Down Syndrome Aim High Resource Center is located at the end of Marcus Road, which is a side street off of Wolf Road. This center provides parent-to-parent and professional services and support to individuals with Down syndrome and their families. A senior citizen housing complex located on the northeast corner of the Albany-Shaker Road / Maxwell Road roundabout is currently awaiting permit approvals; if construction progresses, this development would be located within the project area.

In general, a large percentage of the project impact area is comprised of commercial development, and with the exception of the Down Syndrome Aim High Resource Center, the developed area does not include services targeting elderly and disable persons. Furthermore, according to the Town of Colonie census data, there is not a significant concentration of elderly or disabled persons in the Town. The construction of this project will not adversely impact elderly and disabled persons.

Transit Dependent, Pedestrians, and Bicyclists

There are no designated State Bicycle Routes within the project study area. As indicated previously, some sidewalks exist within the project area and nearby; however, they are discontinuous. According to CDTC's Long-Range Regional Transportation Plan ("New Visions") Albany-Shaker Road is designated as a secondary Local Collector Bicycle Route and Wolf Road is part of the Proposed Priority Bicycle/Pedestrian Network. Both alternatives include the construction of sidewalks along the southern portion of Albany-Shaker Road transitioning to a shared use path along Albany-Shaker Road, north of the I-87 ramps/connector road intersection, which is consistent with regional plans and would have a positive effect on pedestrian/bicycle accessibility within the area. Based on the nature and function of the

proposed action, it has been determined that transit dependent pedestrians and bicyclists would not be adversely affected by the proposed action.

Low Income, Minority and Ethnic Groups (Environmental Justice)

The United States Environmental Protection Agency (EPA) defines Environmental Justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies." Executive Order (EO) 12898 was developed to focus federal attention on the environmental and human health condition of minority and low-income populations with the goal of achieving environmental protection for all communities.

Low income, minority, and ethnic groups comprise a small percentage of the community affected by the proposed project, as evidenced by the census data referenced herein (Exhibits 4.2.1 b and 4.2.1 c; Section 4.2.1 Land Use, Demographics and Affected Environment). Furthermore, the Albany County Map of Environmental Justice Areas did not depict an Environmental Justice Area within the PSA.

Based on consideration of the demographics of the PSA, as well as the nature of the project, it has been determined that Low income, Minority and Ethnic Groups would not be disproportionately adversely affected by changes proposed under either alternative. For the most part, proposed changes to the infrastructure occur in previously developed areas, in close proximity to the roadway's existent alignment, or in undeveloped areas; thereby having less of an impact on land use and the local population. As such, no further study with regard to Executive Order 12898 is necessary.

4.2.4 School Districts, Recreational Areas, and Places of Worship

School Districts

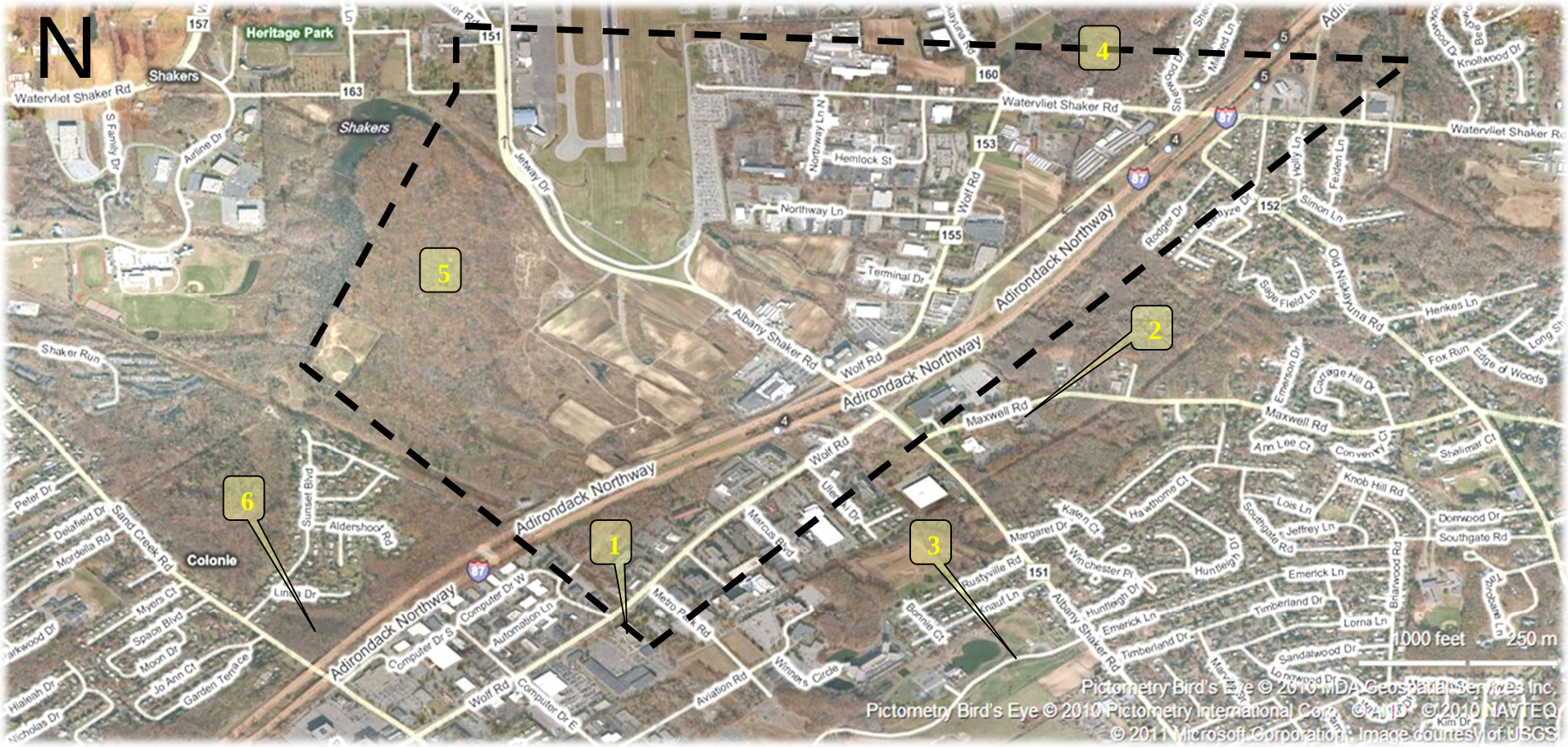
There are no schools within the project corridor. The Town of Colonie is comprised of two (2) school districts, North Colonie and South Colonie. The vast majority of the project area is part of the North Colonie School District. Only the western most portion of the project area (Sunset Blvd neighborhood) north of I-87 falls within the South Colonie School District.

Overall neither alternative is expected to have an adverse effect on school districts and bus routes. This determination is based on the location of the schools serving the project area and district boundaries relative to the location of residential neighborhoods. School buses may experience a minor delay during the construction period, especially, if they travel through the Albany-Shaker Road corridor and intersection with Wolf Road. The school districts shall be notified in advance of the selected Work Zone Traffic Control schemes so that school buses can modify routes and/or plan for minor delays accordingly.

Recreational Areas

A search for recreational areas conducted using bing™ web (www.bing.com) and the Town of Colonie Parks and Recreation Department web site (www.colonie.org/parks/#facilities) resulted in the identification of four recreational areas near the PSA. The identified sites are: (1) The Crossings of Colonie, (2) an isolated fragment of the Albany Pine Bush Preserve (3) Ann Lee Pond Preserve, and (4) Bauer Environmental Park (see Exhibit 4.2.4 a).

The Crossings of Colonie is a town park, situated outside of the PSA. The southern-most portion of the isolated fragment of the Albany Pine Bush Preserve is transected by the PSA's northern boundary. The greater part of the Albany Pine Bush Preserve proper is located to the southwest of the PSA, at the I-90/I-87 Interchange-bounded by I-87 to its east and I-90 to its south. The Ann Lee Pond Preserve occupies a larger part of the area, south of Albany-Shaker Road and west of I-87, in the eastern and southern portions of the PSA. The Bauer Environmental Park is situated between the west side of I-87 and the residential subdivision along Sunset Boulevard, immediately south of the southern terminus of the PSA (see Exhibit 4.2.4 a).



LOCUS #	FEATURE CATEGORY	FEATURE NAME	FEATURE ADDRESS
1	Place of Worship	Saint Francis Chapel	145 Wolfe Rd
2	Place of Worship	Blessed Virgin Mary Czestochowa	250 Maxwell Rd
3	Parks & Recreation	The Crossings of Colonie	580 Albany Shaker Rd
4	Parks & Recreation	Albany Pine Bush Preserve	108 Wade Rd
5	Parks & Recreation	Ann Lee Pond Preserve	Shakers
6	Parks & Recreation	Bauer Environmental Park	Sunset Boulevard

Aerial Accessed on 4 February 2011 from: http://www.bing.com/maps/

PROJECT STUDY AREA BOUNDARIES

SHUMAKER Consulting Engineering & Land Surveying, P.C.

Exhibit 4.2.4.a

None of the identified recreational areas would be directly or indirectly affected by either alternative because of their locations relative to proposed new roads and/or modifications to existent roadways.

Places of Worship

A search for places of worship conducted on bing™ web (www.bing.com) and YellowPages.com (http://www.yellowpages.com/colonie-ny/churches-places-of-worship), revealed two places of worship near the PSA. The identified places include (1) Saint Francis Chapel and (2) Blessed Virgin Mary Czestochowa. The Saint Francis Chapel is situated immediately adjacent to the southeastern corner of the PSA. The Blessed Mary Virgin Czestochowa is situated on Maxwell Road just east of the PSA.

None of the places of worship identified above would be affected by either of the proposed alternatives because of their locations relative to the proposed new roads and/or modifications to existent roadways.

4.3 Economic

4.3.1 Regional and Local Economies

Based on consideration of the nature and function of the proposed project, existing land use, minimal impact on existing businesses and limited opportunity for new development along roadways proposed under the two alternatives, it has been determined that an adverse effect on the regional and local economies is not expected.

CDTC was contacted regarding coordination with the Freight Task Force in July 2013. Although the group has been inactive, the CDTC Goods Movement Task Force is on record as endorsing the project since 1995. The Goods Movement Task Force is currently being reconstituted as the Freight Advisory Committee. This group met on October 9, 2013. The NYSDOT attended the meeting to discuss the project and any related items of interest to the Committee.

The Albany International Airport dedicated air-cargo terminal, serving primarily UPS and Federal Express, daily scheduled cargo operations are in the Northeast Airport Quadrant, south of NYS Route 7. Most heavy duty truck freight traffic enters this location from I-87 Exit 6. Additional daily scheduled cargo-exclusive operations are handled by DHL from the Million Air corporate terminal in the Southwest Airport Quadrant. Air-freight and mail transported by scheduled commercial passenger service aircraft access the airport through the passenger terminal access road via Albany-Shaker Road in the Southwest Airport Quadrant. As daily scheduled DHL and passenger carrier mail and freight predominantly use I-87 Exit 4, the Exit 4 project will preserve and enhance highway access for time-critical freight movement. Proposed I-87 Exit 4 improvements do not pose a potential adverse effect on air-cargo, freight and mail transportation ingress and egress at Albany International Airport.

The need for an Origin/Destination (O/D) analysis of freight related business in the Exit 4 area was also considered and discussed with CDTC representatives. CDTC did not recommend this type of analysis for the project since the project is expected to decrease travel time for truck movements and goods delivery in the project area and thus will be beneficial to freight related business in general.

4.3.2 Business Districts

Established Business Districts

The Wolf Road area is a significant established business district within the Town of Colonie. The predominant land uses along Wolf Road include retail commercial, business/office developments, hotels, and restaurants.

Effects on Business Districts

Right-of-way acquisitions are expected from approximately 24 properties for the Diamond Alternative; the acquisition of two (2) active businesses (Hess Station and ET Person LLC) is also proposed. The Diamond Alternative will have a more substantial impact along Wolf Road due to the proposed new connector road between Wolf Road, at Metro Park Road, and Albany-Shaker Road. With the exception of the Hess Station, the remaining businesses will not be significantly impacted as a result of the subject project. During the construction period, traffic flow may be somewhat impacted; however, access to businesses will be maintained.

With regard to direct property impacts, the Flyover Alternative would have minimal impact to properties along Wolf Road. Impacts will be concentrated to both sides of Albany-Shaker Road west of I-87. Linear acquisitions will impact the frontage of several properties along Albany-Shaker Road. The Flyover Alternative includes construction of new interchange ramps on the south and western sides of The Desmond Hotel; however, the overall impact will be minimal. Rooms facing the proposed ramps consist of conference and meeting rooms with limited views to the surrounding area. In addition, the proposed work will increase visibility from the highway for potential hotel patrons. Significant adverse impacts on the Wolf Road business district or commercial properties along Albany-Shaker Road will not occur under the Flyover Alternative.

Long-term impacts to the existing business district are anticipated to be positive. This determination is based upon proposed improvements to vehicular and pedestrian mobility and accessibility within the project corridor.

4.3.3 Specific Business Impacts

Established Businesses

The Hess Station located at 156 Wolf Road and ET Person LLC located at 200 Sunset Boulevard would be displaced under the Diamond Alternative.

The Flyover Alternative will not result in a significant impact to any business within the established business district.

Effects Assessment

Acquisition of the Hess and ET Person properties will result in the loss of a small number of jobs, unless they are relocated. Acquisition will be handled in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and as amended, Federal and State law and local regulations and the State right-of-way acquisition process. The acquisition of these businesses is anticipated to have an overall minor social and economic impact. The improved vehicle and pedestrian mobility that is anticipated with the project could ultimately have a positive impact on remaining local businesses.

The Diamond Alternative business relocation impacts described above contributed to its dismissal as a feasible alternative. A more detailed summary for dismissal of the Diamond Alternative is included Section 3.2.1 of this report.

4.4 Environmental

4.4.1 Wetlands

State Freshwater Wetlands

Based on review of the New York State Freshwater Wetlands Map, it has been determined that Wetland A-10 occurs within the PSA; twelve (12) wetland areas were delineated and have been determined to be associated with NYSDEC Wetland A-10 or within the one-hundred (100) foot Adjacent Area of the wetland. The preferred wetland mitigation site also contains wetlands associated with A-10. The mapped NYSDEC wetland is generally located in the largely undeveloped northwestern and north central portions of the PSA (see Exhibit 4.4.1 a). An Article 24 Freshwater Wetlands permit will be required to authorize impacts to NYSDEC Freshwater Wetlands and their 100-foot regulated adjacent area; impacts exceed the threshold for use of General Permits under the Memorandum of Agreement for Article 24. The proposed bridge replacement work under Construction Phase I will not impact DEC-regulated wetlands. Specific impacts are discussed later in this section.

State Tidal Wetlands

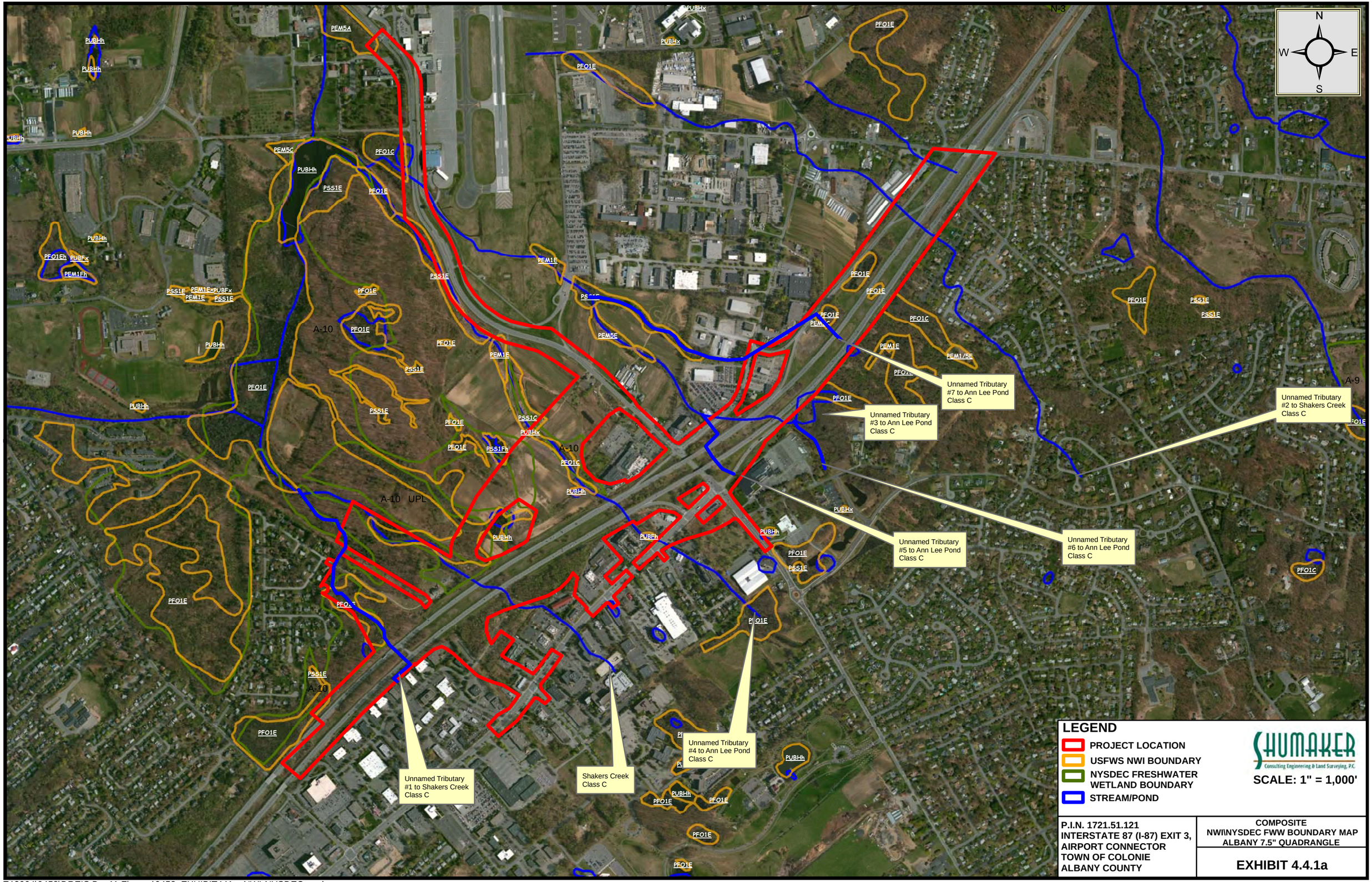
A review of the NYSDEC GIS wetland data files indicates that there are no NYSDEC jurisdictional tidal wetlands or regulated adjacent areas within or near the project limits, and ECL Article 25 does not apply.

Federal Jurisdiction Wetlands

Prior to the field survey effort, a number of sources including the Albany United States Geological Survey (USGS) Quadrangle; the National Wetlands Inventory (NWI) Map, published by the United States Fish and Wildlife Service (USFWS); the New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetlands Map; the Albany County Soil Survey Map; and aerial photography were reviewed to gather information regarding natural resources relative to the PSA.

The major hydrologic features within the PSA are identified in Section 4.4.2. The NWI Map indicated that sixteen (16) wetlands occur within the PSA, and are characterized as Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded/Saturated (PFO1E), Palustrine Forested Broad-Leaved Deciduous Seasonally Flooded (PFO1C), Palustrine Emergent Persistent Seasonally Flooded (PEM1C), Palustrine scrub-shrub Broad-Leaved Deciduous Seasonally Flooded/Saturated (PSS1E) and Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded (PUBFh). One (1) additional mapped NWI wetland is depicted at the proposed wetland mitigation area. The mapped NWI wetlands are scattered throughout the PSA, in both the largely undeveloped areas and adjacent to the developed areas and transportation corridor (see Exhibit 4.4.1 a).

A total of 52 areas within the PSA met the three-parameter federal criteria of a hydroperiod during the growing season, hydrophytic vegetation and hydric soils, and were therefore delineated as wetlands in accordance with the Corps of Engineers 1987 Manual and the Northeast Regional Supplement (see Exhibit 4.4.1 a). Approximately 28.08 acres of wetlands were delineated within the PSA. The wetlands are comprised primarily of shallow emergent marsh and palustrine forest communities. The individual wetlands are described in the Draft Wetland Assessment and Delineation Report, dated October 2013, which is included as Appendix G. The overall dominant plant species within the shallow emergent marsh communities that exist adjacent to the developed areas and the existing transportation corridors consist of Common Reed (*Phragmites australis*), Reed Canarygrass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicaria*), Water Horsetail (*Equisetum fluviatile*), Narrow-leaved Cattail (*Typha angustifolia*), Sensitive Fern (*Onoclea sensibilis*), Spotted Jewelweed (*Impatiens capensis*), Soft Rush (*Juncus effusus*), Arrowleaf Tearthumb (*Polygonum sagittatum*), Sedges (*Carex* spp.), Grasses (*Poa* spp.), Goldenrods (*Solidago* spp.), Common Winterberry (*Illex verticillata*) and Speckled Alder (*Alnus incana*). The overall dominant species within the shallow emergent marsh communities that exist within the largely undeveloped areas consist of Sedges (*Carex* spp.), Sensitive Fern, Soft Rush, Arrowleaf Tearthumb, Woolgrass (*Scirpus cyperinus*), Goldenrods, Eastern Marsh Fern (*Thelypetris palustris*), Reed



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Canarygrass, Purple Loosestrife, Narrow-leaved Cattail and Common Reed. The overall dominant species within the palustrine forest communities that exist within the PSA consist of Green Ash (*Fraxinus pennsylvanica*), Red Maple (*Acer rubrum*), American Elm (*Ulmus americana*), Pin Oak (*Quercus palustris*), Swamp White Oak (*Quercus bicolor*), Willow (*Salix* sp.), Quaking Aspen (*Populus tremuloides*), Musclewood (*Carpinus carolina*), Paper Birch (*Betula papyrifera*), Silky Dogwood (*Cornus amomum*), Northern Arrowwood (*Viburnum recognitum*), Black Elderberry (*Sambucus nigra*), Common Winterberry, Tatarian Honeysuckle (*Lonicera tatarica*), Riverbank Grape (*Vitis riparia*), Ostrich Fern (*Matteuccia struthiopteris*), Purple Loosestrife, Royal Fern (*Osmunda regalis*), Cinnamon Fern (*Osmunda cinnamomea*), Sensitive Fern, Eastern Marsh Fern, Spotted Jewelweed, Tussock Sedge (*Carex stricta*), Sweet Flag (*Acorus calamus*), Common Reed, Grasses (*Poa* spp.), Sedge (*Carex* sp.), Reed Canarygrass and Water Horsetail. The primary functions provided by the wetlands throughout the PSA consist predominantly of floodflow alteration, sediment/toxicant retention and nutrient removal. Additionally, the shallow emergent marsh wetland communities, in the largely remote areas within the PSA, also provide the primary function/value of wildlife habitat.

Wetland Hydrologic Connections

The jurisdictional wetlands are hydrologically connected to waters of the United States that flow directly to the Mohawk River, which is a Traditionally Navigable Waterway (TNW), as defined by the U.S. Army Corps of Engineers (USACE).

Wetlands J, P, S/SX and II directly abut Shaker Creek, which is a perennial Relatively Permanent Water (RPW) that flows northwesterly through the project area, then northerly beyond the PSA, eventually outletting to the Mohawk River (a TNW). The drainage area size for this reach of Shaker Creek is approximately 138 acres. It is important to note that Shaker Creek flows through Wetland SX, but that the OHWM was not delineated because the area was flooded at the time by a beaver dam.

Wetland K is associated with Shaker Creek; Wetlands M, Q, HH, JJ, NN, OO and PP/PPX are expected to be associated with Shaker Creek outside of the PSA and thus have a connection to the Mohawk River, a TNW.

Wetlands N, O and EE directly abut unnamed tributary #1 to Shaker Creek, which is a seasonal RPW that flows northwest through the project area to Shaker Creek, eventually outletting to the Mohawk River, a TNW. The drainage area size for unnamed tributary #1 to Shaker Creek is approximately 39 acres.

Wetland DD directly abuts unnamed tributary #2 to Shaker Creek, which is a perennial RPW that flows northwest through the project area to Shaker Creek, and eventually outlets to the Mohawk River, a TNW. The drainage area size for unnamed tributary #2 is approximately 249 acres.

Wetlands A, B and R directly abut unnamed tributary #3 to Ann Lee Pond, which is a perennial RPW that flows northwest through the project area to Ann Lee Pond. Ann Lee Pond outlets to Shaker Creek and flows generally north outside of the project limits, eventually outletting to the Mohawk River (a TNW). The drainage area size for unnamed tributary #3 to Ann Lee Pond is approximately 93 acres.

Wetland Y is associated with unnamed tributary #3 to Ann Lee Pond, which outlets to Shaker Creek and eventually discharges to the Mohawk River, a TNW.

Wetlands H, I, FF and RR/RRX directly abut unnamed tributary #4 to Ann Lee Pond, which is a perennial RPW that flows northwest through the project area to Ann Lee Pond, which outlets to Shaker Creek. Shaker Creek flows northerly outside of the project limits and eventually outlets to the Mohawk River, a TNW. The drainage area size for unnamed tributary #4 to Ann Lee Pond is approximately 251 acres.

Wetlands F and G are associated with unnamed tributary #4 to Ann Lee Pond. Wetlands CC, KK, LL, QQ and TT/TTX are expected to be associated with unnamed tributary #4 to Ann Lee Pond outside of the PSA, and therefore possess a connection to the Mohawk River, a TNW.

Wetlands A and C directly abut unnamed tributary #5 to Ann Lee Pond, which is a seasonal RPW that flows northwest through the project area to Ann Lee Pond. Ann Lee Pond outlets to Shaker Creek and flows generally north outside of the project limits eventually outletting to the Mohawk River, a TNW. The drainage area size for unnamed tributary #5 to Ann Lee Pond is approximately 11 acres.

Wetland D is expected to be associated with unnamed tributary #5 to Ann Lee Pond outside of the PSA, and therefore, possesses a connection to the Mohawk River a TNW.

Wetlands R and Z directly abut unnamed tributary #6 to Ann Lee Pond, which is a perennial RPW that flows northwest through the project area to Ann Lee Pond. Ann Lee Pond outlets to Shaker Creek and flows generally north outside of the project limits, eventually outletting to the Mohawk River, a TNW. The drainage area size for unnamed tributary #6 to Ann Lee Pond is approximately 19 acres.

Wetlands U, V, W, X, AA, BB and UU are expected to be associated with unnamed tributary #7 to Ann Lee Pond (seasonal RPW) outside of the PSA, and therefore possess a connection to the Mohawk River, a TNW. The drainage area size for unnamed tributary #7 to Ann Lee Pond is approximately 191 acres.

Executive Order 11990

An Executive Order 11990 Wetland Finding will need to be approved by Federal Highway Administration (FHWA) stating and supporting that (1) there are no practicable alternatives to construction in the wetland(s), and (2) the proposed action includes all practicable measures to minimize harm to the wetland(s) which may result from such use. An approved EO 11990 Wetland Finding will be included in the Final Environmental Impact Statement. It is anticipated that project-related impacts for Construction Phases I and II will be included in one Executive Order Wetland Findings, but that each construction phase would have separate wetland permits.

A summary of wetland characteristics and impacts by alternative is shown in Exhibit 4.4.1 b.

Exhibit 4.4.1 b
Wetland Characteristics and Impacts by Alternative

Wetland ID	NYSDEC Wetland ID	Jurisdictional (Yes / No)	Cover Type	Cowardin Wetland Class	Principal Functions	Wetland Area within PSA*	Wetland Area Impact**	
						Total (acres)	Diamond Alternative (acres)	Flyover Alternative (acres)
A	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.86	-	0.11
B	-	Yes	shallow emergent marsh	R2UB3	floodflow alteration, sediment/toxicant retention, and nutrient removal	0.01	-	-
C	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/ toxicant retention, and nutrient removal	0.02	0.025	0.02
D	-	Yes	shallow emergent marsh	PEM5E	sediment/toxicant retention and nutrient removal	0.94	-	-
E	-	No	shallow emergent marsh	PEM5E	sediment/toxicant retention	0.12	-	-
F	-	Yes	shallow emergent marsh	PEM5E	sediment/toxicant retention and nutrient removal	0.36	0.22	0.22
G	-	Yes	shallow emergent marsh	PEM1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.00	-	-
H	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.00	-	-
I	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.77	-	-
J	-	Yes	palustrine forest/ shallow emergent marsh	PFO1E/ PEM5E	floodflow alteration, sediment/toxicant retention, and nutrient removal/ retention	0.28	0.10	-
K	-	Yes	palustrine forest	PFO1E	sediment/toxicant retention	0.02	-	0.02
L	-	No	palustrine forest	PFO1E	sediment/toxicant retention	0.22	0.22	-
M	-	Yes	palustrine forest	PFO1E	sediment/toxicant retention	0.01	0.03	-
MX North	-	Yes	Palustrine forest	PFO1E	sediment/toxicant retention	0.26	0.12	-
MX South	-	Yes	Palustrine Forest/ Shallow Emergent Marsh	PFO1E/ PEM1E	sediment/toxicant retention	0.43	0.13	-

Exhibit 4.4.1 b Wetland Characteristics and Impacts by Alternative								
Wetland ID	NYSDEC Wetland ID	Jurisdictional (Yes / No)	Cover Type	Cowardin Wetland Class	Principal Functions	Wetland Area within PSA*	Wetland Area Impact**	
						Total (acres)	Diamond Alternative (acres)	Flyover Alternative (acres)
N	-	Yes	shallow emergent marsh	PEM1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.07	0.05	-
O	-	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.10	-	0.01
OX	-	Yes	Palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.50	0.14	-
P	-	Yes	palustrine forest shallow emergent marsh	PFO1E/ PEM1E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.43	0.23	-
Q	-	Yes	shallow emergent marsh	PEM5E	sediment/toxicant retention and nutrient removal	0.16	0.01	-
R	-	Yes	shallow emergent marsh/ palustrine forest	PEM5E/ PFO1E	floodflow alteration, sediment/toxicant retention, sediment/shoreline stabilization and nutrient removal	0.90	0.15	0.15
S	-	Yes	shallow emergent marsh/ palustrine forest	PEM5E/ PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.72	0.34	-
	-	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.40	0.08	-
T	-	No	shallow emergent marsh	PEM1E	sediment/toxicant retention and nutrient removal	0.04	0.04	-
U	-	Yes	shallow emergent marsh	PEM1F	floodflow alteration, sediment/toxicant retention and nutrient removal	0.07	0.01	0.01
V	-	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.31	-	-
VX	-	Yes	shallow emergent marsh	PEM1E	sediment/toxicant retention	0.15	0.05	0.05
W	-	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.82	0.01	0.01
WX		Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.74	0.02	0.02

Exhibit 4.4.1 b Wetland Characteristics and Impacts by Alternative								
Wetland ID	NYSDEC Wetland ID	Jurisdictional (Yes / No)	Cover Type	Cowardin Wetland Class	Principal Functions	Wetland Area within PSA*	Wetland Area Impact**	
						Total (acres)	Diamond Alternative (acres)	Flyover Alternative (acres)
X	-	Yes	palustrine forest/ wet meadow	PFO1E/ PEM1E	floodflow alteration, sediment/toxicant retention and nutrient removal	1.40	-	-
Y	-	Yes	shallow emergent marsh/ palustrine forest	PEM5E/ PFO1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.20	-	-
Z	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.00	-	-
AA	-	Yes	palustrine forest/ wet meadow	PFO1E/ PEM1E	sediment/toxicant retention	0.01	-	-
BB	-	Yes	palustrine forest/ shallow emergent marsh	PFO1E/ PEM1E	sediment/toxicant retention and nutrient removal	0.10	-	-
CC	A-10	Yes	shallow emergent marsh	PEM1E	sediment/ toxicant retention and nutrient removal	3.38	1.35	1.02
CCX	-	Yes	shallow emergent marsh	PEM1E	Groundwater Recharge/Discharge, sediment/ toxicant retention and nutrient removal	Included in CC	-	-
DD	-	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.19	-	0.01
DDX	-	Yes	shallow emergent marsh	PEM1E	floodflow alteration and sediment/toxicant retention	0.39	-	-
EE	A-10	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention, nutrient removal, production export and wildlife habitat	0.54	0.03	-
FF	A-10	Yes	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	0.61	-	0.08
GG	A-10	No	shallow emergent marsh	PEM1F	sediment/toxicant retention and nutrient removal	0.12	-	0.06

Exhibit 4.4.1 b Wetland Characteristics and Impacts by Alternative								
Wetland ID	NYSDEC Wetland ID	Jurisdictional (Yes / No)	Cover Type	Cowardin Wetland Class	Principal Functions	Wetland Area within PSA*	Wetland Area Impact**	
						Total (acres)	Diamond Alternative (acres)	Flyover Alternative (acres)
HH	A-10	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat	0.05	-	0.03
HHX	A-10	Yes	palustrine forest	PFO1E	groundwater recharge/discharge, sediment/toxicant retention, nutrient removal and wildlife habitat	0.16	0.03	-
II***	A-10	Yes	palustrine forest	PFO1E	floodflow alteration, sediment/toxicant retention, nutrient removal, sediment/shoreline stabilization and wildlife habitat	5.39	0.66	0.04
JJ	A-10	Yes	shallow emergent marsh	PEM1E	floodflow alteration, sediment/toxicant retention and nutrient removal	0.16	0.16	0.07
KK	A-10	Yes	wet meadow	PEM1E	sediment/toxicant retention and nutrient removal	0.00	-	-
KKX	A-10	Yes	Wet meadow	PEM1E	groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention and wildlife habitat	0.90	-	-
LL	A-10	Yes	wet meadow	PEM1E	sediment/toxicant retention	0.00	-	-
MM	A-10	Yes	shallow emergent marsh	PEM1F	sediment/toxicant retention and wildlife habitat	0.00	-	-
NN	A-10	Yes	wet meadow	PEM1E	sediment/toxicant retention, nutrient removal, wildlife habitat and visual quality/aesthetics	0.00	-	-
OO	A-10	Yes	shallow emergent marsh	PEM1E	floodflow alteration, sediment/toxicant retention, nutrient removal, wildlife habitat and visual quality/aesthetics	0.00	-	-
PP	A-10	Yes	shallow emergent marsh	PEM1E	floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat	0.28	0.14	-
PPX	A-10	Yes	palustrine forest	PFO1E	groundwater recharge/discharge, floodflow alteration, and wildlife habitat	Included with PP	-	-
QQ	A-10	Yes	wet meadow	PEM1E	sediment/toxicant retention	0.00	-	-

Exhibit 4.4.1 b
Wetland Characteristics and Impacts by Alternative

Wetland ID	NYSDEC Wetland ID	Jurisdictional (Yes / No)	Cover Type	Cowardin Wetland Class	Principal Functions	Wetland Area within PSA*	Wetland Area Impact**	
						Total (acres)	Diamond Alternative (acres)	Flyover Alternative (acres)
RR	A-10	Yes	wet meadow	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and sediment/shoreline stabilization	1.74	0.26	0.26
RRX	A-10	Yes	Shallow emergent marsh	R3EM	groundwater recharge/discharge, sediment/toxicant retention, and nutrient removal	Included with RR	-	-
SS	A-10	Yes	shallow emergent marsh	PEM1F	sediment/toxicant retention and nutrient removal	0.00	-	-
TT	A-10	No	shallow emergent marsh	PEM5E	floodflow alteration, sediment/toxicant retention, nutrient removal and wildlife habitat	1.61	0.15	0.16
TTX		Yes	shallow emergent marsh/ palustrine forest	PEM1E/ PSS1E	groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, and wildlife habitat	0.17	-	-
UU		Yes	shallow emergent marsh	PEM1E	floodflow alteration and sediment/toxicant retention	0.19	-	-
UUX		Yes	shallow emergent marsh	PEM1E	floodflow alteration and sediment/toxicant retention	0.29	-	-
VV		Yes	palustrine forest	PFO1E	floodflow alteration	0.13		
WW		Yes	shallow emergent marsh	PEM1E	floodflow alteration and sediment/toxicant retention	0.07	-	-
XX		TBD	palustrine forest	PFO1E	floodflow alteration	0.08	-	-
WMA		Yes	shallow emergent marsh	PEM1E		0.21	-	-
					Total	**28.08**	**4.76**	**2.35**

* PSA = Project Study Area
** Impacts to NYSDEC 100' Adjacent Area are not included in this table; impacts to NYSDEC 100' Adjacent Area are included in Exhibits 4.4.1 c, 4.4.1 f, and 4.4.1 g.
*** The PSA was expanded to encompass the preferred wetland mitigation site, which is in the vicinity of Wetland II. As a result, the boundaries of Wetland II were extended relative to the bounds of the wetland mitigation site. The area of Wetland II within the PSA was originally 0.75 acres, but has increased to 5.39 acres adding 4.64 acres. The total wetland acreage within the PSA has been adjusted from 23.44 acres to 28.08 acres. The mitigation site will be designed to avoid permanent impacts to existing wetlands.

Exhibits 4.4.1 c and 4.4.1 d summarize wetland impacts by jurisdictional agency and plant community, respectively.

Exhibit 4.4.1 c Summary of Wetland Impacts by Jurisdictional Agency				
Jurisdictional Agency	Diamond Alternative Impacts		Flyover Alternative Impacts	
	(sf)	(acres)*	(sf)	(acres)*
NYSDEC & USACE	120,949	2.78	74,702	1.72
USACE	86,249	1.98	27,443	0.63
Total	207,198	4.76	102,145	2.35
NYSDEC 100 ft. Adjacent Area	436,460	10.02	326,718	7.50

* Total acreages are slightly greater than the sf impact due to the rounding of multiple impacts of 0.00X to 0.01.

Exhibit 4.4.1 d Impacts to Wetlands Relative to Plant Community				
Plant Community Classification	Diamond Alternative Impacts		Flyover Alternative Impacts	
	(sf)	(acres)*	(sf)	(acres)*
Shallow emergent marsh	123,275	2.83	85,378	1.96
Palustrine forest	72,481	1.67	5,282	0.13
Wet meadow	11,326	0.26	11,498	0.26
Total	207,082	4.76	102,158	2.35

* Total acreages are slightly greater than the sf impact due to the rounding of multiple impacts of 0.00X to 0.01.

Wetland Protection Policy of the Delaware River Basin

The subject project is not located within the Delaware River Basin; therefore, this policy does not apply.

Effects Assessment

The PSA is approximately 285 acres; approximately 28.08 acres or 10% of the PSA is characterized as wetland. The Diamond Alternative would result in a direct loss of 4.76 acres or 17% of the total wetland area in the PSA. The Flyover Alternative would result in a direct loss of 2.35 acres or 8% of the total wetland area in the PSA. A USACE Section 404 Individual Permit will be required to authorize impacts to federally-jurisdictional wetlands. For those wetlands that are mapped as NYSDEC-Freshwater Wetlands, a NYSDEC Article 24 permit will also be required to authorize impacts with the wetland boundary and the 100-foot adjacent area. This project will be constructed in two (2) phases: Phase I includes only the replacement of the I-87 bridges over Albany-Shaker Road; Phase II includes all other work. Permanent wetland impacts associated with Phase I are estimated to be less than one half acre and will be permitted under a Nationwide Permit #14. Phase II will require a Section 404 Individual Permit from the USACE. The permits will be obtained during the final design phase of the project. It has been determined that the proposed activities for Phase II will require a Project Specific 401 Water Quality Certification (WQC), pursuant to 15 NYCRR 608, Protection of Waters. It is anticipated that the Phase I work will meet the general conditions of the Nationwide permit and, therefore, will be covered under the Blanket Water Quality Certification included in the Nationwide Permit #14. NYSDOT will obtain the permit prior to commencement of project activities and will adhere to any conditions or requirements. The public will have the opportunity to comment through both the NYSDEC Section 401 Water Quality Certification and the USACE Section 404 Individual Permit process.

Potential indirect impacts are also likely to occur as a result of increased runoff from the additional impervious area and the introduction of roadway de-icing salts and other toxicants present in highway runoff such as motor oil to enter the wetlands adjacent to the new portions of roadway. Overall, the potential for indirect impacts is greatest in the vicinity of the new connector road proposed under the Diamond Alternative between Wolf Road and Albany-Shaker Road since there is currently no roadway there. Wetlands likely to be indirectly affected by the Diamond Alternative include the remaining portions

of Wetlands CC, RRX, KKX, PP, PPX, and II. A similar situation exists under the Flyover Alternative as a result of the new ramps connecting I-87 northbound and southbound to Albany-Shaker Road. Wetlands likely to be indirectly affected by the Flyover Alternative include Wetlands CC and RR/RRX. Overall, the Flyover Alternative would have a much smaller indirect impact on wetlands. Indirect impacts will be minimized to the extent possible by utilizing appropriate erosion and sediment control measures during construction as well as post construction management practices focused on water quality and quantity. Temporary impacts may occur as a result of grading efforts. For estimating purposes, the areas of temporary impact were calculated by using an offset of 10 feet from the proposed limit of work. This estimate is approximate and expected to represent worst-case scenario. Temporary impacts associated with the Diamond and Flyover Alternatives are estimated as 68,389 sf (1.57 ac) and 48,352 sf (1.11 ac), respectively. Upon completion of the project, all areas experiencing temporary wetland disturbance will be re-graded and seeded with an appropriate emergent or forested wetland seed mix.

Exhibit 4.4.1 e
Summary of Wetland Impact by Alternative*

Proposed Alternative	Total Wetlands Impacts (acres)
Diamond	4.76
Flyover	2.35

* Only permanent direct wetland impacts are included in this table. Impacts to NYSDEC 100' Adjacent Area are not included.

Four (4) of the wetland areas (Wetlands L, T, GG and XX) delineated within the bounds of the current PSA could be determined to be non-jurisdictional by the USACE. Wetlands are considered jurisdictional by the USACE if they are adjacent to or abut a Traditionally Navigable Water or directly abut a Relatively Permanent Water. Wetlands that are isolated from or adjacent to a RPW or a non-Relatively Permanent Water (Non-RPW) need to have a significant nexus determination completed to determine whether or not the USACE can assert jurisdiction. Wetlands L, T, GG, and XX are adjacent to a RPW or are isolated from a RPW or a Non-RPW. However, it is important to note that, for the purposes of impact assessment and mitigation of wetland impacts on federally funded projects, regardless of absence of agency jurisdiction, all wetland impacts must be mitigated if they cannot be avoided, as directed by E.O. 11990 to comply with Section 404(b) guidelines.

Twelve (12) of the fifty-two (52) wetland areas within the PSA correspond with mapped NYSDEC Freshwater Wetland A-10. Excavation and fill activities within the 100-foot Adjacent Area are also regulated by the State. The wetland areas associated with Wetland A-10 are: CC, EE, FF, GG, HH, HHX, II, JJ, KKX, PP/PPX, RR/RRX, and TT. The impacts to the 100-foot Adjacent Area for each of these wetlands, relative to each alternative, are presented below.

The Diamond Alternative involves replacing the existent Exit 4 ramps with a full-access, grade-separated diamond interchange and a connector road between Wolf and Albany-Shaker Roads. The Diamond Alternative would affect three different wetland habitat types: palustrine emergent, palustrine forested and wet meadow, and would include 27 of the 52 wetland areas: C, F, J, L, M, MX South, MX North, N, OX, P, Q, R, S, SX, T, U, VX, W, WX, CC, EE, HHX, II, JJ, PP/PPX, RR, and TT.

Out of the 27 wetland areas that would be affected by the Diamond Alternative, Wetlands C, F, J, M, MX North, MX South, N, OX, P, Q, R, U, VX, W, and WX are directly influenced by the I-87 corridor, and, although they inherently provide some level of wildlife habitat, they primarily provide drainage for the existent roadway network. In a later discussion, these wetlands are identified as Category 1 wetlands. As a result, the effect from disturbing these wetland areas under this alternative would be minimal from an environmental perspective, since the post construction function of these wetlands would be similar to their existing condition. Impacts to the remaining Wetlands (L, S, SX, T, CC, EE, II, JJ, PP/PPX, RR, and TT) bear more significance because they not only provide wildlife habitat and other functions and services, but are contiguous with or part of the greater Shaker Creek/Ann Lee Pond wetland/stream complex. These wetlands are discussed later in this section as Category 2 wetlands. Additionally, individual

surface area impacts to these areas are higher relative to those wetlands listed above as being directly influenced by the roadway network.

The Diamond Alternative would impact a total of 10.02 acres of land within the regulated 100-foot Adjacent Area. Exhibit 4.4.1 f presents a breakdown of impacts in the 100-foot Adjacent Area relative to each wetland area that corresponds with NYSDEC Freshwater Wetland A-10.

Exhibit 4.4.1 f
Impact to NYSDEC 100' Adjacent Area for Diamond Alternative

Wetland Adjacent Area	Cover Type	Impact (sf)	Impact (acre)
CC	shallow emergent marsh	36,303	0.83
EE	palustrine forest	59,458	1.36
FF	shallow emergent marsh	0.00	0.00
GG	shallow emergent marsh	0.00	0.00
HH	palustrine forest	23,307	0.54
HHX	palustrine forest	37,057	0.85
II	palustrine forest	79,541	1.83
JJ	shallow emergent marsh	24,334	0.56
KKX	wet meadow	4,808	0.11
PP/PPX	shallow emergent marsh/ palustrine forest	29,236	0.67
RR/RRX	wet meadow/ shallow emergent marsh	26,638	0.61
TT	shallow emergent marsh	105,655	2.43
Total		**436,460**	**10.02**

The Flyover Alternative involves constructing ramps that would replace or complement existent ramps, providing direct access to Albany-Shaker Road and the Albany International Airport from I-87. The Flyover Alternative would also affect three wetland habitat types: palustrine emergent, wet meadow and forested, and would include 19 of the 52 Wetlands: A, C, F, K, O, R, U, VX, W, WX, CC, DD, FF, GG, HH, II, JJ, RR, and TTX.

Out of the 19 wetland areas that would be permanently affected by the Flyover Alternative, Wetlands A, C, F, K, O, R, U, VX, W, WX, and DD are directly influenced by the I-87 corridor, and, although they inherently provide some level of wildlife habitat, they primarily provide drainage for the existent roadway network. Impacts to the remaining wetland areas (CC, FF, GG, HH, JJ, RR, and TT), bear more significance, because they not only provide wildlife habitat and other functions and services, but are contiguous with or part of the greater Shaker Creek/Ann Lee Pond wetland/stream complex. Additionally, individual areas of impact to these areas are higher relative to those wetlands listed above as being directly influenced by the roadway network.

The Flyover Alternative would impact a total of 7.50 acres of land within the regulated 100-foot Adjacent Area. Exhibit 4.4.1 g presents a breakdown of impacts in the 100-foot Adjacent Area relative to each wetland area that corresponds with NYSDEC Freshwater Wetland A-10.

Exhibit 4.4.1 g Impact to NYSDEC 100' Adjacent Area for Flyover Alternative			
Wetland Adjacent Area	**Cover Type**	**Impact (sf)***	**Impact (acre)***
CC	shallow emergent marsh	40,653	0.93
EE	palustrine forest	11,825	0.27
FF	shallow emergent marsh	30,394	0.70
GG	shallow emergent marsh	28,029	0.64
HH	palustrine forest	29,112	0.67
HHX	palustrine forest	0.00	0.00
II	palustrine forest	23,963	0.55
JJ	shallow emergent marsh	23,937	0.55
KKX	wet meadow	0.00	0.00
PP/PPX	shallow emergent marsh/ palustrine forest	0.00	0.00
RR/RRX	wet meadow/ shallow emergent marsh	35,201	0.81
TT	shallow emergent marsh	103,604	2.38
Total		**326,718**	**7.50**

* Additional temporary impacts within the 100 ft. adjacent area of FWW A-10 are likely to accompany development of the preferred wetland mitigation site.

Relative to wetland impacts, the Flyover Alternative would be the Least Environmentally Damaging Practicable Alternative; it impacts a smaller cumulative area of wetlands, and it impacts significantly less forested wetland; 0.13 acres of palustrine forest compared to the Diamond Alternative, which would impact 1.67 acres of palustrine forest. Additionally, the Flyover Alternative impacts a fewer number of the wetland areas that are part of the Shaker Creek/Ann Lee Pond wetland/stream complex.

In addition to avoidance and minimization of impacts on wetlands and streams, other impacts, including archaeological sites, commercial buildings and ROW acquisitions factored into alignment considerations. Overall, the Flyover Alternative has been designed to avoid and minimize impacts to all wetlands, regardless of type, size, or quality, to the extent practicable. Specific minimization efforts include locating the northbound exit ramp and Exit 5 southbound entrance ramp to avoid impacts to Wetlands J and VX, respectively. These design elements minimized wetland impact by 0.372 acres. Key design elements selected to avoid and minimize wetland impacts on the Diamond Alternative include modifications to the connector road alignment. Design modifications included a reduction in horizontal curvature, crossing I-87 at a skew, and utilizing the existing gravel road for the intersection with Albany-Shaker Road. Additionally, the Exit 5 southbound ramp was positioned to minimize impacts to Wetland VX. These design elements resulted in a reduction of approximately 2.35 acres of wetland impact when compared to the original design. Additional minimization measures will be employed during final design to the extent practicable. Lastly, because of the previously disturbed condition of the wetlands that would be affected by the proposed project, the impacts to wetlands that could not be avoided or minimized can be readily mitigated through restoration, enhancement, or creation, or a combination thereof.

The Diamond Alternative results in approximately twice the amount of wetland impacts in comparison to the Flyover Alternative (4.76 acres compared to 2.35 acres, respectively). For this reason, in addition to those summarized in Section 3.2.1 of this report, the Diamond Alternative has been dismissed from further consideration as a Feasible Alternative.

Mitigation Summary

All appropriate measures will be taken to avoid and minimize any impacts. Avoidance and minimization techniques that have been incorporated into the project include adjusting the alignment, steepening the side slopes and reducing all stream crossing lengths to the greatest extent possible.

Compensatory wetland mitigation will be performed to offset unavoidable impacts to the NYS State freshwater wetland and federal wetlands. Mitigation measures will consist of wetland creation on one or more sites located within the Shaker Creek watershed. Mitigation plans will be developed during the design and permitting phases. For the purposes of comparing alternatives for this EIS, several mitigation sites have been identified and screened for site suitability criteria that include soil type, proximity to surface water features, proximity to wildlife habitat/open spaces, vegetative cover type, size, and presence of existing wetlands. There are several other factors that will also dictate the suitability of the site but these require more in-depth assessment such as the depth to groundwater and groundwater elevation fluctuation, subsurface conditions, threatened and endangered species habitat, and historic and pre-historic cultural resources.

Wetland mitigation will be required for the Flyover Alternative due to the amount of wetland impact, which is 2.35 acres. The impacted wetlands consist of 0.13 acres of forested wetlands, 1.96 acres of emergent wetlands, and 0.26 acres of wet meadow (see Exhibit 4.4.1d). Based on typically accepted replacement ratio guidance from USACE, a total of 2.48 acres of compensatory wetland creation is proposed, broken down as follows:

- Flyover
  - Emergent/wet meadow impact = 2.22 acres @ 1:1 replacement = 2.22 acres compensation
  - Forested wetland impact = 0.13 acre @ 2:1 replacement = 0.26 acre compensation

The goal for wetland mitigation will be to replace or enhance the functions and values (or functions and benefits for State wetlands) of the existing wetlands impacted by the project. Those functions include floodflow alteration or the ability of wetlands to alter/decrease peak storm flow, sediment/toxicant retention, nutrient removal, and wildlife habitat. Of the listed functions, flood storage is a primary concern within the Shaker Creek Watershed due to the extent of past development. Mitigation will consist of measures to meet each of these functions and values/benefits.

There are several sites within the Shaker Creek Watershed which appear to be suitable candidates for wetland creation and stream mitigation (refer to section 4.4.2 for a discussion of stream impacts and mitigation). The Potential Wetland Mitigation Sites map is provided in Exhibit 4.4.1 h. A preliminary analysis of each area was used to determine the suitability of successful wetland creation. The results are summarized below:

- Wetland Mitigation Area 1 consists of approximately 14.9 acres. This site is owned by LaSalle Albany LLC and Albany County and is currently isolated and highly disturbed by recreational use. There are adjacent forested wetlands and limited invasive species present. This site is classified by the NRCS as prime farmland and farmland of statewide importance; however this is not active farmland. According to USDA Soil Survey, the soils are loamy fine sand with the depth to water table at 18-24 inches. Some opportunities for stream restoration in this area may be available. The site is located within other undeveloped lands that are unlikely to be developed. A stream corridor and undeveloped lands link this parcel to Ann Lee Pond, making this site valuable for wildlife habitat if restored.

- Located on Sand Creek Road, Wetland Mitigation Area 2 provides sufficient area for wetland mitigation and opportunities for stream creation and restoration. This 11 acre parcel consists of two properties owned by SFR I, LLC, and British American, LLC. Currently the parcel is an old fallow field. The area is considered prime farmland by the NRCS, if drained. Soils are classified by the NRCS as fine loamy sand with a depth to water table greater than 6 feet. The site does include some degraded wetlands associated with farm ditches. It is located across Sand Creek

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Potential Wetland Mitigation Sites

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT

4.4.1 h

Date: 7/2013

Road from State wetland and Stump pond. Although separated by the road, the proximity of this mitigation site to other undeveloped habitat increases its value for wildlife use. The site is currently intended (and permitted) to serve as mitigation for a British American project yet to be developed.

- The area identified as Wetland Mitigation Area 3 is currently an 11.5 acre fenced pasture used for grazing horses. It is owned by Beltrone Marital Trust II. The topography is gently sloping, and it appears there may be some wetlands present at the toe of slope. The area is classified as being prime farmland or farmland of statewide importance by the NRCS. The hydric rating of the soils of this site is unknown, and the depth to water table varies from 1 foot to more than 6 feet. Without further investigation it is unknown if any stream restoration could occur in this area.

- Wetland Mitigation Area 4 consists of approximately 9 acres of early successional field. The site is owned by David A Weir and appears previously disturbed. The NRCS classifies this area as prime farmland; however, this parcel is not actively farmed. According to the USDA Soil Survey the majority of soils are silt loam and partially hydric. Depth to water table is around two feet. The site backs up to some forested areas and contains limited invasive species. There are good opportunities to improve wildlife habitat. Although this site has good potential to meet wetland mitigation requirements, there does not appear to be any opportunities for stream restoration.

- The area identified as Wetland Mitigation Area 5 is a 14 acre successional field adjacent to state and federal wetlands, making this area a good potential for wetland mitigation, habitat restoration, and possibly some stream restoration. The area is classified as prime farmland by the NRCS; however, it is not active farmland. Soils are described as fine loamy sand that is partially hydric with a depth to water table at greater than six feet. The area consists of two parcels each privately owned by David A Weir.

- Wetland Mitigation Area 6 is a 5.5 acre parcel located at the end of Lear Jet Lane. This site is owned by the People of New York State and is currently isolated. The area of this parcel that may be used for mitigation is located at the bottom of steep slopes and is adjacent to state and federal forested wetland areas. Soils are listed as partially hydric by the USDA Soil Survey with a depth to water table at approximately less than one foot. NRCS classifies the area as prime farmland if drained. Vegetation within this site consists of a dense cover of common reed, a highly invasive species, which will require the development of a long term invasive species management plan. If the Diamond option is selected as the preferred alternative, this site will not provide sufficient area for mitigation. At this time there does not appear to be any opportunity for stream restoration in this area.

- Located next to Nexus Park, Wetland Mitigation Area 7 is a 5 acre, actively farmed parcel owned by Meadowdale Estates, LLC. This parcel is an active farm field that backs up to a forested area, providing opportunities for improved wildlife habitat. The NRCS has classified this parcel as prime farmland and farmland of statewide importance. According to the USDA Soil Survey, the soils are partially hydric fine loamy sand with a depth to water table greater than six feet. Common reed is present on the western end of this parcel, and two piezometers were observed within the field indicating there is likely to be some wetland areas on or adjacent to the parcel. Due to the limited area available for mitigation, this parcel is feasible for the Flyover option and possibly for the Diamond option if used in conjunction with mitigation on another parcel.

- Wetland Mitigation Area 8 consists of approximately 8 acres. This site is at the corner of Wolf and Albany-Shaker Roads behind a small strip of businesses and is owned by Colonie Holdings, LLC. The parcel is surrounded by development but appears to have a small wetland and stream associated with it which could provide limited hydrology and limited stream restoration possibilities. According to the USDA Soil Survey, soils are partially hydric, and the depth to water table is greater than 6 feet. Even though the site is classified by the NRCS as prime farmland and farmland of statewide importance it is not actively farmed. The site does contain an abundance

of Common Reed which will result in a long term invasive species management plan to be developed and implemented.

- The area identified as Wetland Mitigation Area 9 is located just south of the new round-a-bout at Albany-Shaker and Maxwell Road. As of 2010 the property was owned by Marilyn Radtke. This property is about 23 acres in size, of which it is estimated around 13 acres could be used for wetland mitigation, which would be sufficient area for mitigation for this project. The site is highly disturbed, and has recently been harvested for hay. It is listed by the NRCS as prime farmland and farmland of statewide importance. Hydrology could be tied to the adjacent NWI wetland; however, the USDA Soil Survey indicates soils are not hydric or partially hydric, and the depth to water table is greater than six feet. There is good potential for stream restoration on this site since it is the headwaters of Shaker Creek. A stream corridor begins here and flows through Area 13. An invasive species management plan that would address the entire corridor on the east side of Wolf Road, coupled with on-site wetland creation focusing on water quality improvements could result in opportunities for stormwater storage and improved water quality. Wildlife habitat value is limited due to surrounding development. This area has been identified by the Town of Colonie for the extension of a Wolf Road Service Road from Winners Circle to the round-a-bout at Albany-Shaker and Maxwell.

- Wetland Mitigation Area 10 is a privately own parcel located on Watervliet-Shaker Road. The property includes a highly disturbed fallow field located behind some greenhouses and Emeritus Assisted Living Housing. This property is about 31 acres in size of which approximately $20^{+}/_{-}$ could be used for wetland mitigation. The NRCS identifies this property as prime farmland and farmland of statewide importance. There is a stream located on the southern portion of the property that would connect the area to a water of the U.S. It is unknown at this time if there is any stream restoration possibilities associated with the existing stream. Hydric soils may occur on the site. The depth to water table ranges from one to more than six feet with the shallower areas occurring closer to the stream. This property does back up to some wooded areas which would be preferable; however, access to this site may be difficult since it is set back away from a main road.

- Wetland Mitigation Area 11 is a 28 acre parcel located behind Hoffman's Playland on Route 9. According to NYSDEC and USFWS NWI mapping this area is adjacent to state and NWI identified wetland areas. Approximately 8 acres of this property is currently used as a golf driving range and consists of maintained turf grass. It appears that vegetative community of the remaining 20 acres consists of old field or early successional forest. The USDA has identified the area as prime farmland and farmland of statewide importance; however it is not currently active farmland. A stream is present on the south portion of the property, but it is unknown at this time if there are any restoration possibilities. Soils are listed by the USDA Soil Survey as partially hydric and unknown hydric, and the depth to water table ranges from one to more than 6 feet deep. The site's connection to undeveloped lands increases the wildlife value.

- Wetland Mitigation Area 12 is approximately 9 acres and consists of a portion of I-87 right-of-way. The existing on/off ramps though this area will be removed as part of the project, leaving the possibility of expanding the existing wetlands on this site with full restoration of paved, compacted and disturbed/degraded roadside areas. The proximity of this site to I-87 will present challenges to prevent the site from being overtaken by invasive species during the establishment period. A dense scrub-shrub or forested wetland community would be the best option for long term control of invasive species. Wildlife value for this site would be limited due to the lack of direct connections to other habitat.

- Wetland Mitigation Area 13 is approximately 34 acres and consists of 2 privately owned parcels owned by ET Person LLC. This site is located at the end of Sunset Boulevard just west of the project area. The parcel contains portions of State Wetland A-10 which is a Class 1 wetland. Several vegetative species listed as Endangered or Threatened by the State of New York have been identified within this wetland complex. The parcel also contains a small stream that is a

headwater to Shaker Creek and is classified a Standard C, Class C stream. The wetland areas within the parcel would be considered a red maple-hardwood swamp by Edinger et al. (2002) with surrounding areas classified floodplain forest. Soils are listed as predominantly non-hydric by the USDA Soil Survey with a depth to water table about 6 to 18 inches. NRCS classifies the area as prime farmland and farmland of statewide importance. Vegetation within areas that could be used for wetland creation or restoration consists of highly invasive species such as common reed (*Phragmites australis*), Japanese knotweed (*Polygonum cuspidatum*), mugwort (*Artemisia vulgaris*), and black locust (*Robinia pseudoacacia*). The presence of these species will require the development of a long term invasive species management plan. Mitigation objectives that would best be met on this parcel would be to restore wetland areas that have been filled in over time by previous owners of the property and to provide protection in perpetuity to this highly sensitive area. The restored wetland areas would ensure no net loss of wetlands within the project area.

Wetland Mitigation Area 13 has been identified as the preferred area for mitigating wetland impacts resulting from the proposed project. Based on the above analysis there appears to be sufficient land area with suitable conditions to restore previously disturbed wetland, create new wetland, and increase flood storage area within the watershed to meet the mitigation requirements for the impacts associated with the Flyover Alternative. In addition, by acquiring 16.60 acres of property for 2.48 acres of wetland mitigation, future preservation of the existing wetlands on the remainder of the site will be ensured. NYSDOT met in the field with NYSDEC on October 7, 2013 and with USACE on November 5, 2013 to review the preferred wetland mitigation area and discuss its feasibility and potential for wetland mitigation. Correspondence with NYSDEC and USACE regarding the wetland mitigation site is included in Appendix B. A draft mitigation plan is shown in Exhibit 4.4.1 i. In order to avoid creating breeding areas for waterfowl due to the mitigation area's proximity to the airport, no ponds will be created as part of the wetland mitigation plan. The details of the wetland mitigation plan will be developed during project design and permitting.

A supplemental wetland investigation / delineation effort was conducted in November 2013 in support of the preferred wetland mitigation site. Since the proposed wetland mitigation design will abut Wetland II, the previously delineated boundaries of Wetland II were extended to encompass the bounds of the preferred wetland mitigation site. An additional 4.64 acres of wetland has been added to the original 0.75 acres of Wetland II within the PSA. The easternmost portion of the site is upland area suitable for compensatory mitigation; therefore, no additional permanent wetland impacts have been identified. Temporary impacts will occur during construction in order to provide a hydrologic connection between the wetland mitigation area and existing wetlands at the site. In addition, the mitigation site includes wetland creation, preservation and protection of land from future development.

It is anticipated that a post wetland monitoring plan will be required for the proposed wetland creation areas. If a wetland monitoring plan is required, coordination with the USACE will determine the frequency of the reports and the information required.

4.4.2 Surface Waterbodies and Watercourses

Surface Waters

The proposed project activities will result in impacts to Waters of the U.S. As a result of the total amount of impact, it is expected that this work will be authorized under a USACE Section 404 Individual Permit. The permit will be applied for during final design. Mitigation will be required to compensate for unavoidable impacts. Work will not commence until the permit is acquired, and will adhere to any conditions set forth by the permit requirements.

A Project Specific Individual Section 401 Water Quality Certification will be required for this project since a USACE Section 404 Individual Permit is anticipated. The public will have an opportunity to comment through the permit process.

Surface Water Classification and Standards

Based upon a review of the NYSDEC Environmental Resource Maps for regulated streams, the reach of Shaker Creek and its tributaries and the tributaries to Ann Lee Pond associated with the wetlands within the PSA were determined to be NYSDEC Class C streams.

The best usage of Class C waters is for fishing and non-contact activities. There are two man-made Ponds (Pond 1 and Pond 2) in the PSA. Pond 1 is located between Wetlands FF and GG, and outlets to Unnamed Tributary #4 to Ann Lee Pond. Pond 2 is located within Wetland CC. Both ponds have been classified as Open Water for the purpose of calculating impacts relative to USACE jurisdiction and regulatory authority.

Stream Bed and Bank Protection

Discharges of fill or other disturbances occurring at or below the Ordinary High Water Mark of any streams within the PSA will require authorization under a USACE Section 404 permit. A NYSDEC Section 401 Water Quality Certificate is issued for any project that requires a USACE Section 404 permit. A NYSDEC Article 15 Protection of Waters Permit is required for disturbing the bed or banks of a stream with a classification of C(t) or higher or for the excavation or placement of fill in State navigable waters and their adjacent and contiguous wetlands. As a state agency, NYSDOT is not required to apply for Article 15 Permits pursuant to a 1997 Memorandum of Understanding (MOU) with NYSDEC, which supersedes the 1977 Article 15 DEC/DOT MOU. NYSDOT coordinates directly and informally with NYSDEC regarding any such activities affecting resources protected by Article 15. The purpose of the MOU is to maintain reasonable costs to the people of the state, where Article 15 Permits are required for state sponsored transportation projects, by streamlining the permit process, with the understanding that NYSDOT and NYSDEC have a common interest and obligation in protecting and enhancing the environment, while at the same time providing the public with state-of-the-art transportation services.

Since all of the streams affected by this project are Class C Standard C streams and they do not meet the State's definition of navigable, coordination with the NYSDEC regarding the Protection of Waters Regulatory Program Permit (Article 15) would not be required.

In General, the impacts to streams relative to each alternative are nearly similar and minimal; however, the Flyover Alternative induces a slightly smaller impact.

The Diamond Alternative would affect multiple portions of Shaker Creek, a portion of the unnamed tributary #1 of Shaker Creek, and a portion of Unnamed Tributary #4 of Ann Lee Pond. Impact to Shaker Creek includes a 0.07 acre area along 316 linear feet of the creek, where it converges with Wetland II, as it exits a culvert beneath the southbound lane of I-87. The impact would be a result of the proposed I-87 southbound entrance and exit ramps and the connector road. The second impact to Shaker Creek would affect 0.01 acres along 48 linear feet of stream where it flows through Wetland P, which is located in the infield area between the two opposing lanes of I-87, upslope from Wetland II. This impact is a result of shifting the northbound lanes of I-87 to the west to avoid impacts to the existing overhead power lines crossing I-87 at the proposed Exit 4 northbound exit ramp. Fill from the east-side side-slope at the proposed Exit 4 northbound entrance ramp, just north of the proposed connector road, would be placed in a small segment of Shaker Creek, and Wetland J. The impact to Shaker Creek at this location would be approximately 0.01 acres along 33 linear feet of stream. In order to maintain drainage conditions at this location, the ground surface between Wetland K and the proposed culvert end may need to be graded such that drainage would continue to flow from Wetland K to the proposed culvert end. An additional impact to Shaker Creek will occur as a result of the need to realign a portion of the creek. An existent culvert, beneath the travel lanes of I-87 northbound, north of the proposed diamond interchange and connector road, at the point just south of where the proposed Exit 4 northbound entrance ramp would merge with I-87 northbound, would need to be extended at both ends, relative to the designed side slopes along the west side of I-87 northbound and the east side of the Exit 4 northbound entrance ramp. The proposed realignment of Shaker Creek is estimated to permanently impact 0.01 acres along 15 linear feet of stream between Wetlands J and K. An additional temporary impact of 94 linear feet and 0.01 acres is

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WETLAND MITIGATION PLAN
FLYOVER ALTERNATIVE

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ACCESS IMPROVEMENTS

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4.4.1 i

DATE: 01/14

anticipated to construct the new channel and tie into the existing creek. The proposed new length of this segment of Shaker Creek is approximately 190 ft. Another concern associated with realigning Shaker Creek, is its potential effect on the remaining unfilled portion of Wetland J, relative to any surface water connection there may be. The remaining portion of Wetland J is expected to continue functioning as it does currently, because, regardless of any surface water connection to Shaker Creek, its primary source of hydrology is a shallow groundwater table, as was evidenced by the presence of ground water within approximately 9-inches of the top of two soil test pits in two different locations within the wetland where surface water was absent.

The total cumulative impact to Shaker Creek under the Diamond Alternative would be 0.10 acres along 412 linear feet of stream. Slope lengthening along the western shoulder of I-87 northbound, would affect 0.01 acres along 54 linear feet of unnamed tributary #1 of Shaker Creek, where it flows through Wetland N. The Diamond connector road to Albany-Shaker Road would affect 0.03-acres along 139 linear feet of unnamed tributary #4 of Ann Lee Pond, where it would cross through Wetland RR. The impacts to streams relative to each alternative are presented in Exhibit 4.4.2 a.

The Flyover Alternative would affect a portion of Shaker Creek, a portion of unnamed tributaries #1 and #2 of Shaker Creek, and a portion of Unnamed Tributary #4 of Ann Lee Pond. The impact to Shaker Creek will occur where the channelized stream changes direction at a right angle at the northerly corner of the parking lot behind the Dunkin' Donuts on Wolf Road. The downstream end of a culvert that conveys storm water from Wolf Road occurs at the right angle in the stream channel. The channel follows I-87 northbound from wetlands S/SX along the backs of parking lots to businesses along Wolf Road, until it turns 90-degrees in a westerly direction, where it heads toward I-87 northbound and into Wetland J, before it converges with Ditch E and enters a culvert into Wetland P. This construction of the proposed I-87 northbound exit ramp to Albany-Shaker Road and corresponding culvert would result in an impact of approximately 180 linear feet and 0.09 acres to Shaker Creek. The second impact would occur to unnamed tributary #1 of Shaker Creek as a result of grading and shifting the ditch. This work would affect approximately 0.01 acres along 63 linear feet of unnamed tributary #1. The third impact would occur to unnamed tributary #2 of Shaker Creek where it converges with Wetland D before entering a culvert beneath the northbound lane of I-87. Fill from slope lengthening along the eastern shoulder of the existent northbound lane of I-87 would affect 0.01 acres along approximately 34 linear feet of stream. The Flyover connector road to Albany-Shaker Road would affect 0.03-acres along 197 linear feet of unnamed tributary #4 of Ann Lee Pond, where it would cross through Wetland RR.

Exhibit 4.4.2 a
Stream Impacts by Alternative

Surface Water	Diamond Impacts			Flyover Impacts		
	Linear Feet	Area (acres)	Volume*	Linear Feet	Area (acres)	Volume*
Shaker Creek	412**	0.10**	TBD**	180	0.09	TBD
Unnamed Tributary #1 of Shaker Creek	54	0.01	TBD	63	0.01	TBD
Unnamed Tributary #2 of Shaker Creek	-	-	-	34	0.01	TBD
Unnamed Tributary #3 of Ann Lee Pond	-	-	-	-	-	-
Unnamed Tributary #4 of Ann Lee Pond	139	0.03	TBD	197	0.03	TBD
Unnamed Tributary #5 of Ann Lee Pond	-	-	-	-	-	-
Unnamed Tributary #6 of Ann Lee Pond	-	-	-	-	-	-
Unnamed Tributary #7 of Ann Lee Pond	-	-	-	-	-	-
Total	605	0.14	TBD	474	0.14	TBD

*Volume of impact will need to be determined during final design.
**Existing channel will be impacted, but stream will be reconstructed on a modified alignment to allow for culvert extension.

The stream impacts would be minimal relative to area and length, and also with respect to overall environmental impact. Regardless of alternative, all of the work would affect channels that have been previously altered / disturbed during the original construction of the I-87 corridor. The post construction condition of the impacted streams is expected to be similar to its current condition.

Open Waters

Neither Alternative will impact Pond 1. The Diamond Alternative will impact 0.10-acres of Pond 2, resulting from the construction of the roadbed and subsequent fill and cut slopes. The Flyover Alternative will impact 0.13-acres of Pond 2, resulting from the construction of the roadbed and subsequent fill and cut slopes. The impacts to Open Waters relative to each alternative are presented in Exhibit 4.4.2 b.

Exhibit 4.4.2 b
Open Water Impacts by Alternative

Open Water (Ponds)	Total Area in PSA (acres)	Diamond Impacts Area (acres)	Flyover Impacts Area (acres)
Pond 1*	0.18	0.00	0.00
Pond 2**	0.17	0.10	0.13
Total	0.35	0.10	0.13

*Pond 1 is located between Wetlands FF and GG.
**Pond 2 is located within Wetland CC.

Mitigation Summary

The Diamond Alternative results in approximately 28% more stream impacts compared to the Flyover Alternative (605 linear feet compared to 474 linear feet, respectively). The Diamond Alternative has been dismissed from further consideration as a Feasible Alternative due to environmental impacts, in addition to those summarized in Section 3.2.1 of this report. Therefore, no mitigation measures have been developed for the Diamond Alternative.

Section 404 (b)(1) Guidelines of the Clean Water Act (CWA) state in part that, "…no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential impacts of the discharge on the aquatic ecosystem." Efforts have been made during the preliminary design phase to avoid and minimize impacts to surface waters under both build alternatives. This includes adjustment of vertical alignments and steepening of side slopes to minimize embankment areas and minimize the length of culvert extensions to the maximum extent practicable. Additionally, hydrologic connections have been maintained. Specific avoidance and minimization measures as they relate to wetland impacts are discussed in more detail in Section 4.4.1 of this report. Measures to further reduce impacts will continue to be assessed and utilized as appropriate as the design progresses.

The NYSDOT Soil Erosion and Sediment Control standards and NYSDEC technical standards will be adhered to during the design and construction of the preferred alternative. To the extent possible new structures should provide a natural bottom to help preserve aquatic habitat and provide a means of safe access for wildlife.

Regulatory Guidance letter No. 02-02 states that stream functions lost due to unavoidable stream impacts must be mitigated. Compensatory mitigation for impacts to streams will primarily include enhancement of degraded stream channels. Out of kind mitigation, as defined by the USACE, should be considered for impacts to streams within the project area. As discussed above, each build alternative will impact Shaker Creek and one of its unnamed tributaries. Stream mitigation options include, but are not limited to, establishment of a buffer zone to protect aquatic resources, stream habitat enhancement along non-impacted streams, restoration of previously channelized streams, stabilization of eroding banks, and planting of vegetative barriers along wildlife corridors.

Based on evidence of prior disturbances to water courses in or near the PSA, it appears that there may be a number of opportunities to provide stream mitigation using the aforementioned options, or a combination thereof. Specific examples include opportunities associated with Ditch J which is a

watercourse that has been previously straightened and channelized; this channel could be restored. Ditch J is located on the west side of Albany-Shaker Road, where Wetland VV abuts it (Exhibit 4.4.9 a). There is a channelized section of Shaker Creek, located outside the PSA, between Wetland SX and the delineated section of Shaker Creek, upstream of Wetland J; opportunities for restoration may be feasible. This section of Shaker Creek appears on Exhibit 4.4.9 a, from the edge of the PSA at Wetland SX along the westerly side of multiple parking lots. Additionally, channelized watercourses are associated with Wetlands CC/CCX and RR/RRX; the watercourses could be restored and given shrub riparian zones. Overall, these watercourses and others within the project area are important ecological components to the Shaker Creek/Ann Lee Pond stream/wetland complex, and any ecological improvements (e.g., restoration or enhancement) to these features would benefit the watershed by restoring aquatic habitat and improving water quality functions. Additionally, it may be feasible to incorporate stream mitigation measures into the wetland mitigation site designs, depending on selected locations and suitability. The mitigation required to offset stream impacts that would occur under the Diamond Alternative would be much more substantial compared to the Flyover Alternative, since the linear impact is nearly twice as much.

It is expected that impacts to man-made Pond 2 (i.e., open waters), located within Wetland CC, will not require mitigation.

Stream mitigation measures will be further evaluated as the project design progresses; selected measures will be included in the USACE/NYSDEC Joint Permit Application package, which will be prepared during final design.

4.4.3 Wild, Scenic, and Recreational Rivers

State Wild, Scenic and Recreational Rivers

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

National Wild and Scenic Rivers

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

Section 4(f) Involvement

The proposed project does not involve any work in or adjacent to Wild, Scenic and Recreational Rivers. No further consideration is required.

Mitigation Summary

The proposed project does not involve any work in or adjacent to Wild, Scenic and Recreational Rivers or wildlife or waterfowl refuges. No mitigation is required.

4.4.4 Navigable Waters

State Regulated Waters

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

Office of General Services Lands Under Water

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

U.S. Coast Guard Authority

Since the project does not involve the construction or modification of any bridge, dam, dike, or causeway over any navigable water of the United States, Coast Guard Authorization is not required.

Rivers and Harbors Act – Section 10

No Section 10 waters exist within the proposed project area; therefore, Section 10 is not applicable.

4.4.5 Floodplains

Although the effective Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for the Town of Colonie (September 1979) indicates that the proposed shared use path encroaches on the 100-year floodplain at the northwestern limits of the project, this study is outdated and does not reflect the reconstruction of Route 155 and the associated changes in the Shaker Creek Floodplain. As such, updated limits (see Exhibits 4.4.5 a, 4.4.5 b and 4.4.5 c) have been referenced from the preliminary Albany Countywide FIS (March 2013) which although not final, were developed using recent LiDAR (Light Detection and Ranging) and survey data. Based on conversations with the New York State Department of Environmental Conservation (DEC), they have no reason to believe that the 100-year floodplain limits will be revised within the project area in the final FIS. As a result, it appears that the proposed project will be located outside of the regulated floodplain and no impacts are anticipated.

State Flood Insurance Compliance Program

As stated above, there are no regulated floodplains impacted within the project corridor. As such, the provisions of 6 NYCRR 502- Floodplain Management for State Projects do not apply.

Executive Order 11988

There are several tributaries that flow through the project area; however, the regulated floodplain is limited to the Shaker Creek corridor located in the northwestern corner of the proposed project. Each of the tributary channels were previously impacted during the original construction of the I-87 corridor and are currently conveyed under the highway in small diameter (24-36 inch) culvert pipes. There is no documented history of flooding at any of these crossings, and given the limited capacity of the existing culverts, it is likely that the 100-year floodplain is contained within the channel downstream of I-87. As such, it is anticipated that proposed culverts associated with each alternative will be sized accordingly, and that the project will not impact any floodplains. Therefore, EO 11988 does not apply.

4.4.6 Coastal Resources

State Coastal Zone Management Program

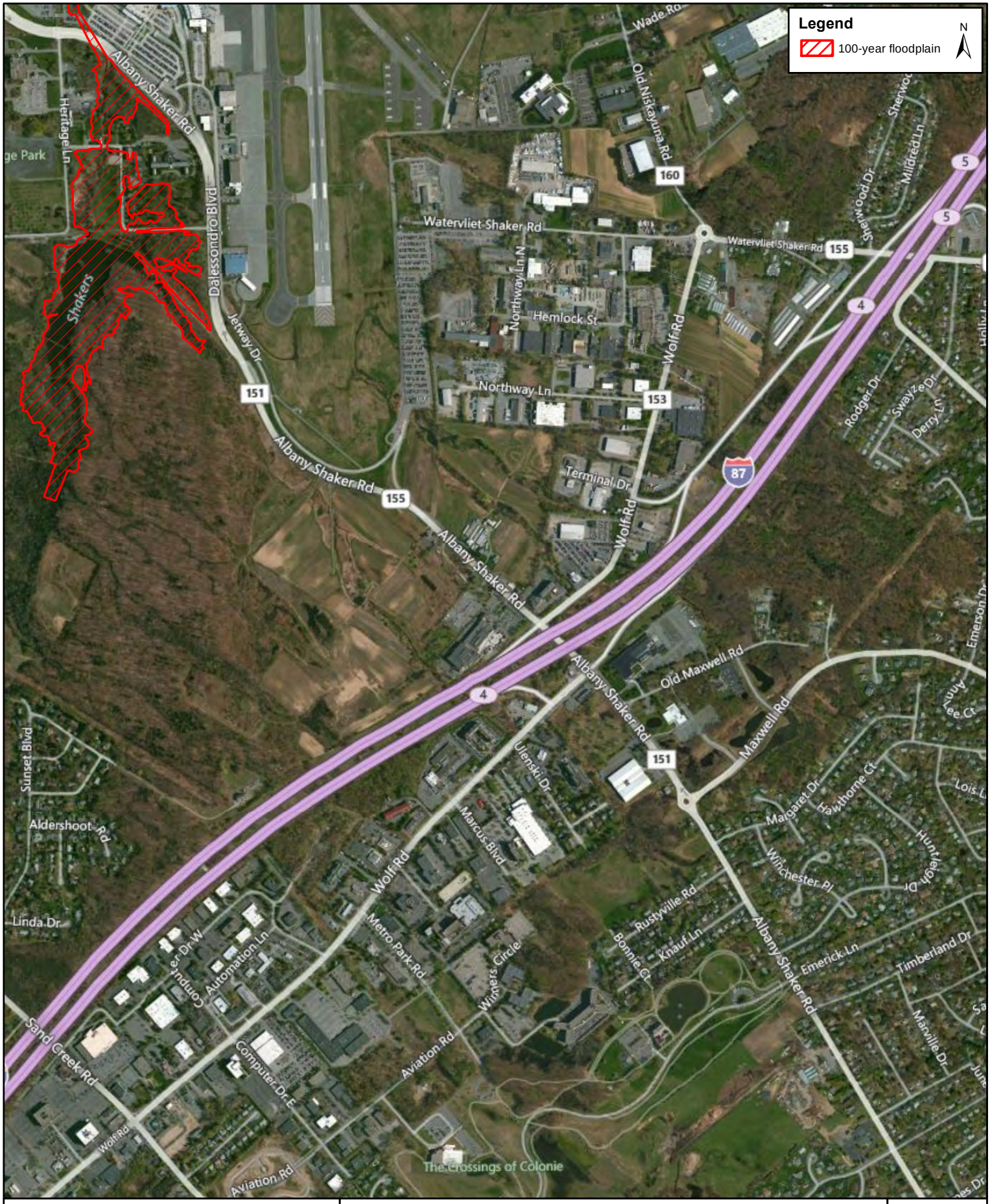
The proposed project is not located in a State Coastal Zone Management (CZM) area, according to the Coastal Zone Area Map from the NYS Department of State's Coastal Zone Management Unit.

State Coastal Erosion Hazard Area

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

Waterfront Revitalization and Coastal Resources Program

According to NYS DOS "List of Approved Coastal Local Waterfront Revitalization Programs (LWRPs)," dated March 2007, the proposed project is not located in a Local Waterfront Revitalization Area. No further action is required.



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FEMA FLOOD ZONES

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

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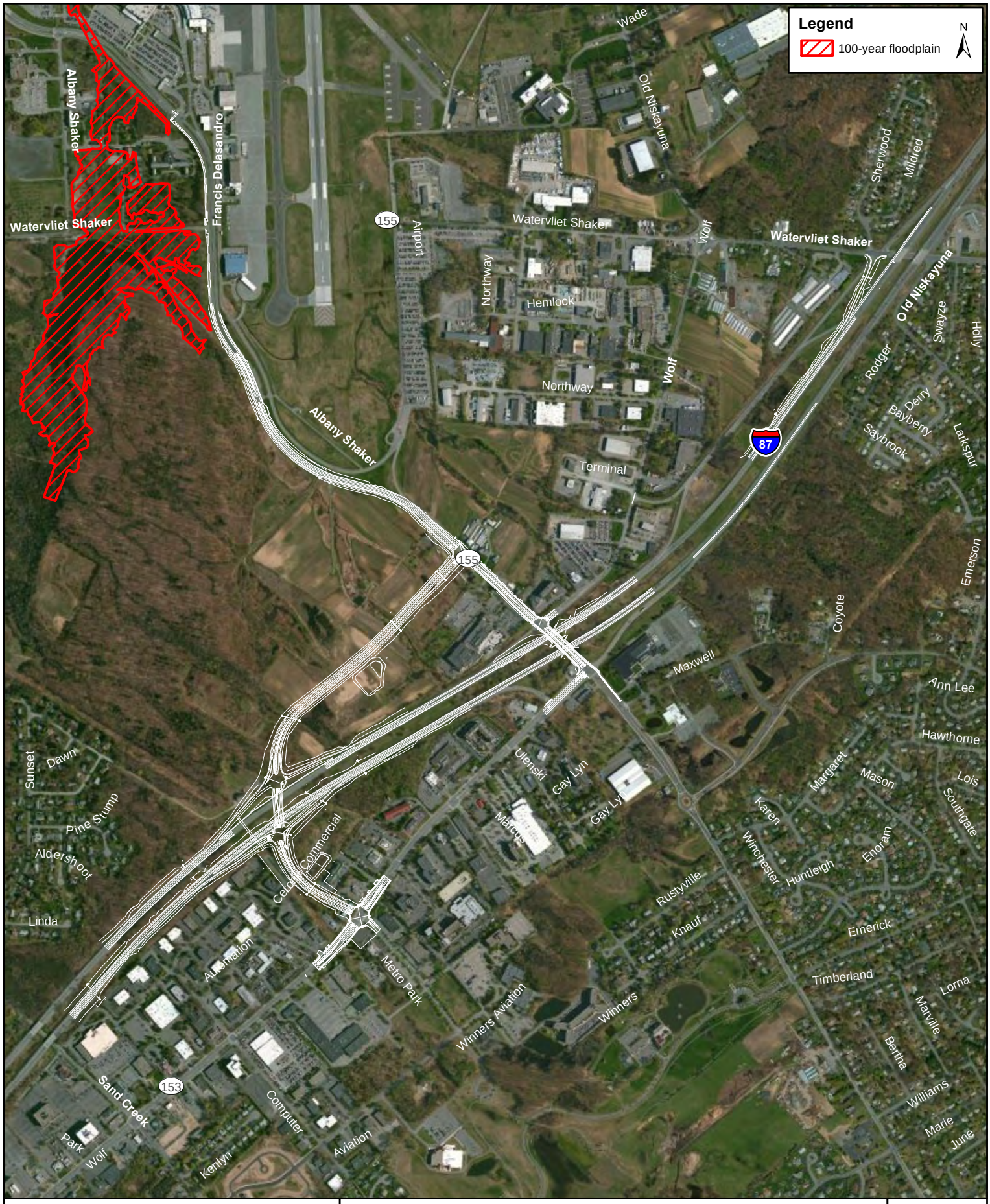
4.4.5 a

DATE: 07/2013



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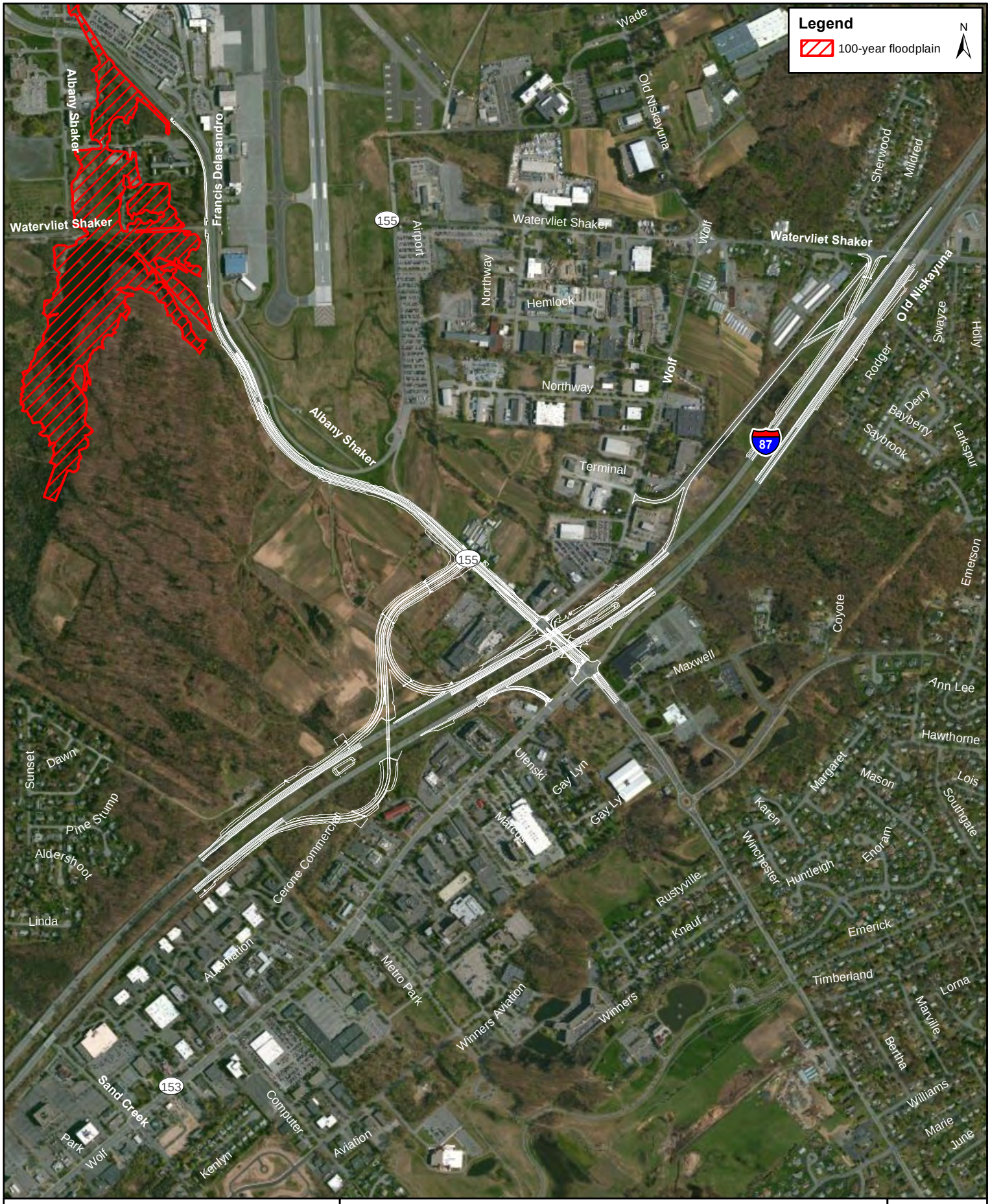
DIAMOND ALTERNATIVE
FEMA FLOOD ZONES

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT

4.4.5 b

Date: 10/2013



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FLYOVER ALTERNATIVE
FEMA FLOOD ZONES

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT

4.4.5 c

Date: 10/2013

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

The proposed project is not located in, or near a coastal area under the jurisdiction of the Coastal Barrier Resources Act (CBRA) or the Coastal Barrier Improvement Act (CBIA). These acts do not apply to the proposed project and no further action is required.

4.4.7 Groundwater Resources, Aquifers, and Reservoirs

Aquifers

A review of the EPA-designated Sole Source Aquifer Areas Federal Register Notices, Maps, and Fact Sheets indicates that the project is located in the project review area for the Schenectady-Niskayuna Sole Source Aquifer. The proposed project requires Federal Sole Source Aquifer Section 1424(e) review by FHWA and EPA, pursuant to E.O. 12372, since the project will involve the construction of additional through-traffic lanes, interchanges or rotaries on existing roadways and the construction of a two or more lane highway on new alignment.

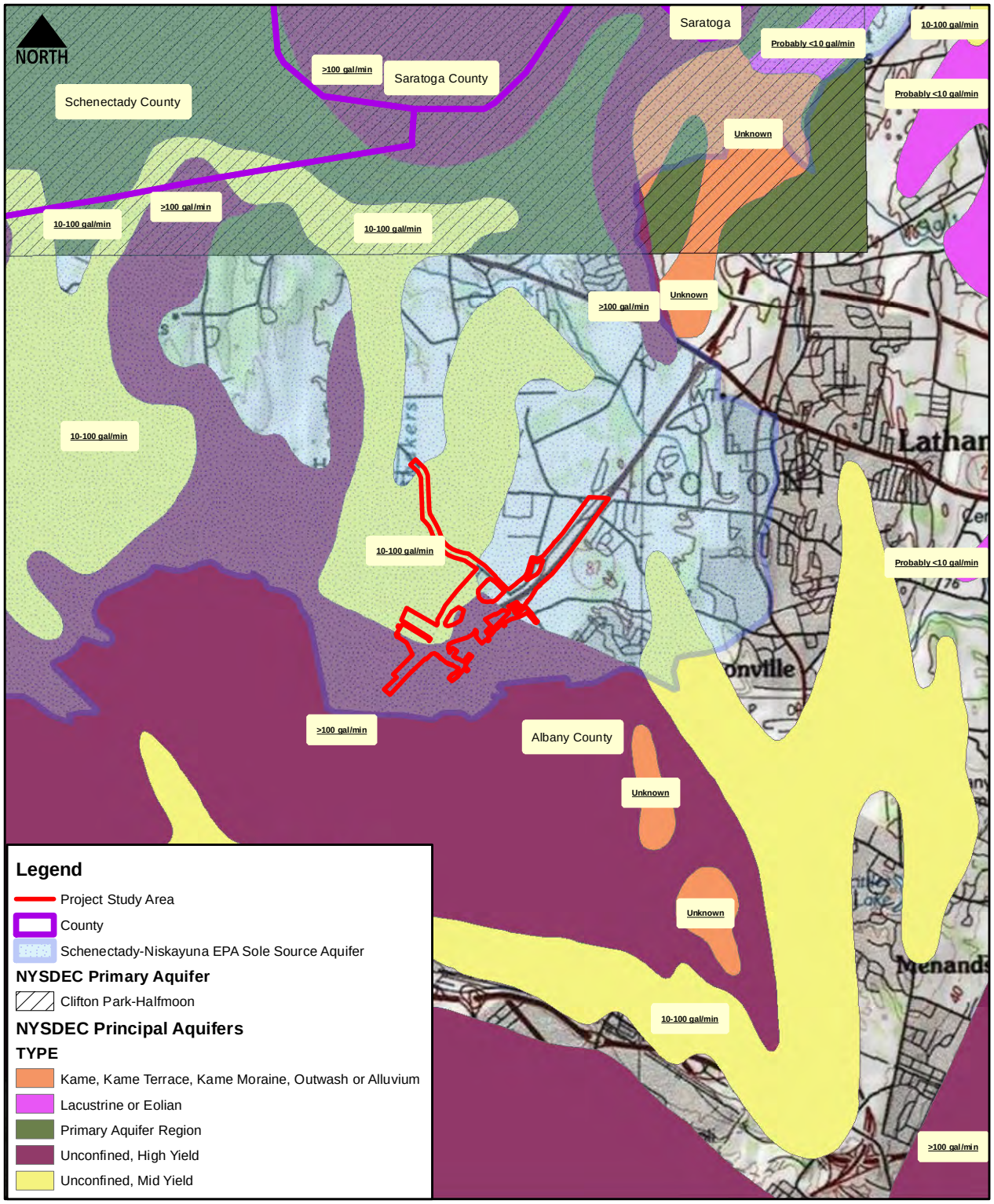
Review of available mapping shows that the proposed project is not located over a NYSDEC Primary Water Supply Aquifer; however, it is located over a NYSDEC Principal Aquifer Area (see Exhibit 4.4.7 a). As such, a review of potential impacts on the aquifers is required. A first -order analysis (Toler Analysis) of the effects of de-icing salts on groundwater quality was used to provide a conservative indicator of aquifer impacts associated with the roadway-related chemicals applied to the roadway surfaces proposed under this project.

The Schenectady-Niskayuna Aquifer System is approximately 20 miles long and underlies approximately 30 square miles in the lowermost part of the Mohawk River drainage basin. The width of the aquifer is approximately one-half mile at its western edges and over five miles at its widest point. Aquifer recharge occurs from precipitation directly on the land, by seepage from the tributary streams flowing across the aquifer, by subsurface flow from the till on the sides of the valley and by seepage from bedrock and deposits of low permeability underlying the aquifer. Average annual precipitation in this area is approximately 36 inches[2]. Ground water levels closely reflect the level of the Mohawk River. Within the flood plain, depth to water is generally less than 30 feet, but at higher elevations may be as much as 70 feet. Springs discharge at the base of some slopes. The water table extends up into the till and bedrock adjacent to the aquifer, water levels are generally less than 25 feet below land surface but may be as deep as 50 feet in places adjacent to small down cut stream valleys (http://www.epa.gov/region02/water/aquifer/schen/schenect.htm). Exhibit 4.4.7 a shows the location of the aquifer boundary relative to the project study area.

The PSA is located in the southeastern most portion of the Schenectady-Niskayuna Aquifer System, which consists of a complex series of discontinuous coarse sand and gravel deposits, underlain by glacial till. Till, silt and sand overlie bedrock throughout most of the area.

As presented in Exhibit 4.4.7 a, the southern half of the PSA is situated over a portion of an Unconfined High-yield (>100 gallons/minute) Principal Aquifer and an Unconfined Mid-yield (10 to 100 gallons/minute) Principal Aquifer. Mid-yield unconfined aquifers consist of sand and gravel with a saturated zone generally less than 10 feet thick, but can be thicker in the presence of silty sand and gravel that are less permeable (yields in areas adjacent to streams may exceed 100 gallons per minute through pumping-induced infiltration, but areas cannot be depicted at the scale provided because they are too small). High-yield unconfined aquifers consist of sand and gravel of high transmissivity and with a saturated thickness greater than 10 feet (areas typically are associated with surface water sources that can provide additional pumping-induced recharge).

[2] National Cooperative Soil Survey. 1992. Soil Survey of Albany County, New York: 5.



Aquifer Map

SHUMAKER
Consulting Engineering & Land Surveying, P.C.

EXHIBIT4.4.7 a

NOT TO SCALE

INTERSTATE 87 EXIT 4
AIRPORT CONNECTOR
PIN 1721.51
TOWN OF COLONIE
ALBANY COUNTY, NY

The purpose of a groundwater impact analysis is to determine whether the project will significantly impact the Sole Source or other critical aquifers as a result of the addition of new impervious surfaces. As new impervious pavement is added to the aquifer recharge area, additional deicing chemicals will be applied to the roadway. The contaminants are deposited on roadways and enter the hydrologic system in the form of stormwater during precipitation events. A percentage of the runoff infiltrates through the soil resulting in the potential for groundwater contamination. As discussed in Section 4.4.8, stormwater management practices are proposed to control the quantity and quality of the runoff in accordance with current regulations and guidelines.

A detailed quantification of contaminant fate and transport to the aquifer is beyond the scope of this study; however, a first-order calculation (Toler Analysis) of commonly used deicing chemicals can be used to estimate a potential worst-case impact to an aquifer. Chloride is used as a tracer chemical because it is a highly soluble component of rock salt. By the nature of the Toler Analysis, all additional chloride added to the road surface as a result of this project will be shown to increase the chloride concentration in the underlying aquifer. This process assumes that the underlying aquifer does not contain a thick confining layer and is highly susceptible to surficial contamination.

A Toler Analysis was completed to determine the effect of increased chloride ion concentrations to the aquifer and in Shaker Creek derived due to the application of deicing salt on the new connector road. Since no wells were identified within 500 feet of the project study area, the Toler Analysis as it applies to surface waters was applied to determine the general potential for impact on the aquifer. This method appeared appropriate since the analysis for surface water assumes that all the salt spread in a given period of time is diluted by all runoff and all salt enters the stream through groundwater recharge carried in natural groundwater discharge; therefore, it can be expected that a certain amount, if not all, of the chloride could remain in the aquifer unless otherwise withdrawn from a well or discharged to a stream in groundwater. The values resulting from the Toler Analysis are expressed in milligrams per liter (mg/l) or parts per million (ppm), this is a way of expressing highly diluted concentrations of substances in a liquid, such as groundwater. In other words, parts per million or ppm means out of a million, just as percent means out of a hundred. One ppm is equivalent to 1 milligram of a substance per liter of water (mg/l). The analysis identified a 0.084 mg/l (ppm) increase in the chloride ion concentration levels in Shaker Creek as derived from roadway runoff within a drainage area of approximately 0.7 square miles (431-acres). The drainage area begins on the east side of the I-87 corridor, and includes the area west to Ann Lee Pond, where Shaker Creek flows northward under Meeting House Road to the Mohawk River. The background chloride ion concentration of the Mohawk River was estimated to be 50.200 mg/l (ppm) in 2011. This estimate was based on chloride ion concentrations measured in 1953 and 1974, which were 16 and 28 mg/l (ppm)[3], respectively; as a result, chloride concentration levels increased by 0.600 mg/l every year for a period of 20-years. Assuming the trend remains consistent, the current chloride ion concentrations in the Mohawk River would be around 50.200 mg/l (ppm) (i.e.0.6 mg/l increase over the 37-year period from 1974 to 2011 plus the 28 mg/l concentration measured in 1974).

The Diamond Alternative has been dismissed as a feasible alternative; therefore, the Toler Analysis was completed for the Flyover Alternative. The Toler Analysis has been performed to estimate the worst-case chloride concentrations associated with the Flyover Alternative. Within the PSA, there is currently an estimated 18.45 lane-miles. Under the Flyover Alternative approximately 1.27 lane-miles would be added to the PSA. The chloride ion concentration levels were calculated for existent lane-miles (18.45) within the PSA; the concentration of chloride ions in runoff from the existent lane-miles in the PSA was calculated at 1.197 mg/l (ppm). Chloride ion concentrations in runoff from the added lanes proposed under the Flyover Alternative were calculated at approximately 0.084 mg/l (ppm). The addition of this amount to the estimated 2011 background concentration of the Mohawk River (50.200 ppm), results in 50.284 mg/l (ppm). A concentration of 50.284 ppm is well below the current Federal and State Health Standard of 250 ppm. Furthermore, it is important to note that, the Toler Analysis for surface waters does not account for runoff that does not reach the receiving water body. Therefore, even though the increase

[3] Peters NE & JT Turk. 1981. Increases in sodium and chloride in the Mohawk River, New York, from the 1950s to the 1970s attributed to road-salt. Water Resources Bulletin **17**: 586-597.

in the chloride ion concentration levels in the Mohawk River is insignificant at 0.084 mg/l, the result might actually be significantly less when considering proposed stormwater quality measures.

Measures are being developed to manage erosion and sediment and control water quality and quantity in accordance with current NYSDEC SPDES regulations. Development of these management practices will continue during final design, and a SPDES permit will be obtained for the project. The identified measures will ultimately be part of the Erosion and Sediment Control Plan and the Stormwater Pollution Prevention Plan which will be adhered to during construction; the identified practices will help further avoid and minimize adverse impacts to the Sole Source Aquifer.

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

A portion of the aquifer recharge zone and stream flow source zone for the Niskayuna well field lies within the Town of Colonie. Based on review of available mapping, it has been determined that the study area for this project is south of these areas, and as such, will not contribute to contamination of the Niskayuna well field.

Based on input from the Environmental Services division of the Albany County Health Department, there are not any public water supply wells located within approximately 656 feet (200 meters) of the PSA. Furthermore, the local area is served by public water within the Latham Water District, which draws water from the Mohawk River to prepare drinking water. As a result, no further discussion is required regarding the effects of the proposed project on nearby drinking water wells. A Toler Analysis for estimating chloride concentrations on wells is not required.

4.4.8 Stormwater Management

The project is considered to be a re-development project and shall be designed in accordance with the criteria presented in the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-10-001), *New York State Standards for Erosion and Sediment Control, Chapter 9: Redevelopment Projects of the Stormwater Management Design Manual (August 2010), A*ppendix B of Chapter 8 of the *New York State Department of Transportation Highway Design Manual: NYSDOT Design Requirements and Guidance for SPDES General Permit (dated October 22, 2009).*

The proposed project is located within the urbanized area of the Town of Colonie which is subjected to regulated Municipal Separate Stormwater Sewer Systems (MS4s) control. However, NYSDOT will maintain ownership of the post construction stormwater management areas, and NYSDOT will be responsible for long-term inspection and maintenance of these stormwater practices, not the local municipality.

The project is not located within a Total Maximum Daily Load (TMDL) Watershed. Ann Lee (Shaker) Pond / Stump Pond (1201-0096) is listed as a 303(d) waterbody segment with verified impairments that are required to be addressed by a segment / pollutant-specific TMDL. However, this project does not directly discharge into Ann Lee Pond (the nearest discharge point is approximately 0.7 miles from Ann Lee Pond) and, therefore, will not require water quality treatment practices to reduce pollutant and phosphorus loadings.

The Diamond Alternative will result in 65.94 acres of disturbance, and the Flyover Alternative will result in 43.69 acres of disturbance. Since the limits of grading associated with the proposed construction of this project will exceed 1 acre, a State Pollutant Discharge Elimination System (SPDES) General Permit for Construction Activities (GP-0-10-001), issued by the NYS Department of Environmental Conservation (NYSDEC), will be required. This project is required to assess the requirements for stormwater management practices. A Stormwater Pollution Prevention Plan (SWPPP) with the appropriate sediment and erosion control measures will be developed. Temporary and permanent stormwater management practices will be required based on the total amount of disturbance and changes in the total impervious area.

The objective of the SWPPP is to minimize the number and amount of pollutants in the stormwater runoff from the project site by maintaining compliance with the stormwater regulatory requirements. This is achieved by designing and implementing Best Management Practices (BMP's) to control potential pollutants in the runoff from the project site during and after construction. The following erosion and sediment control practices will be considered during final design:

- Temporary surface stabilization
- Check Dams
- Drainage Pipe Inlet/Outlet Stabilization
- Construction Entrance
- Tree/Vegetation Protection Barrier
- Silt Fence
- Surface Stabilization
- Dust Control

The increases in impervious area are directly related to adding the proposed interstate ramps, traffic lanes on I-87 and the local road system, and pedestrian and bicycle accommodations within the project limits. The effects of the increased area on water quality and quantity will be analyzed.

Drainage areas within the project limits were identified using USGS contour maps and digital mapping. Hydrologic and hydraulic analyses were completed for the proposed project. The majority of stormwater collected both within and adjacent to the project limits is conveyed via overland flow and discharged into Shaker Creek and its tributaries. Peak flow attenuation will be required for flows that directly discharge to the creek. In addition, due to the increase in impervious area water quality treatment will be required.

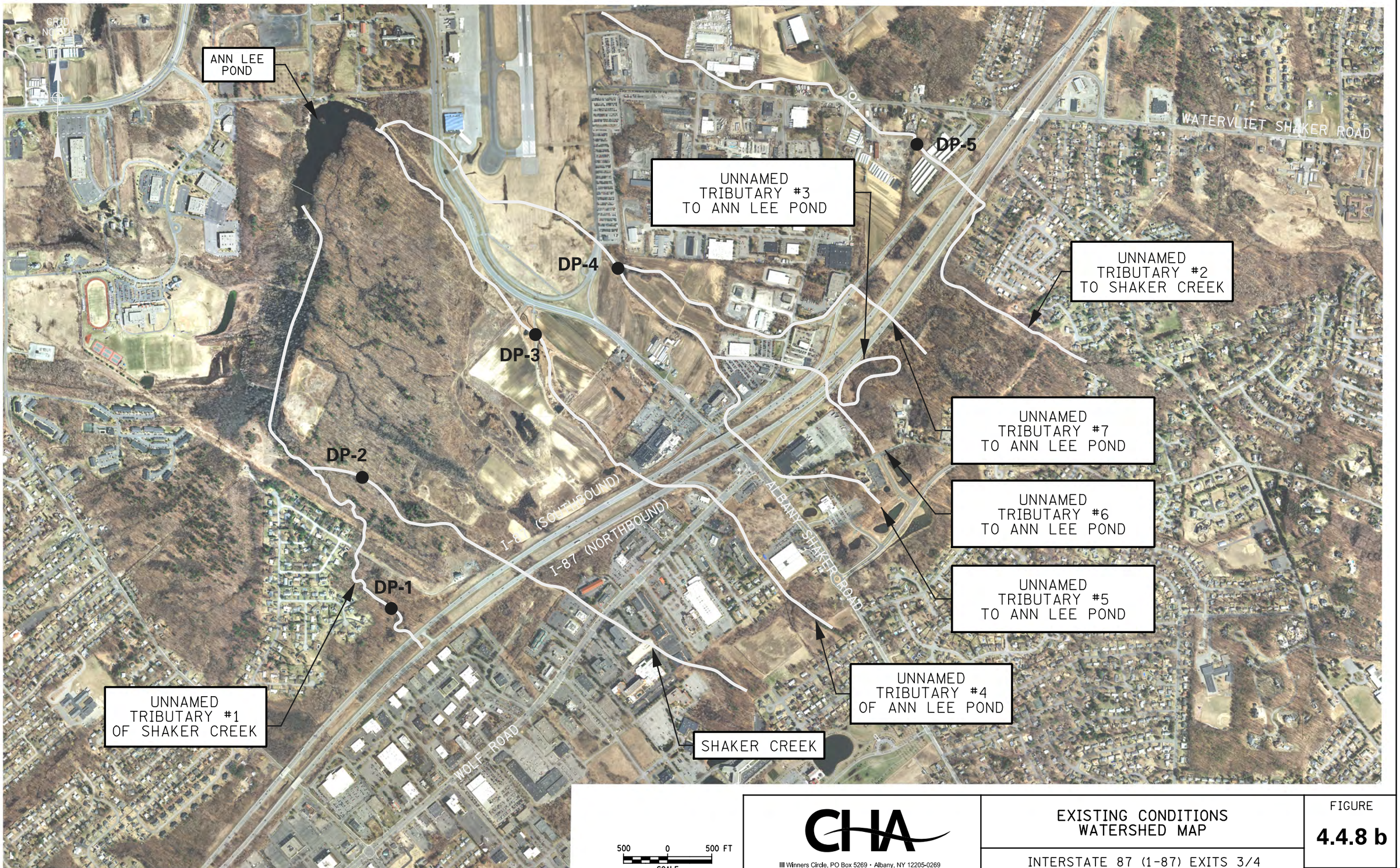
Water Quantity Volume

In order to evaluate the potential impacts associated with the redevelopment of the site, existing and proposed condition hydrographs were generated. The conditions were modeled using the SCS unit hydrograph method using a type II rainfall distribution. Rainfall amounts were referenced from the New York State Stormwater Management Design Manual, August 2010. The 24-hour rainfall amounts for the 1-, 10-, and 100-year design storms in Albany County are 2.4-, 4.5-, and 7.0-inches respectively.

Runoff curve numbers and times of concentration were computed using standard NRCS TR-55 methodology. Additionally, peak stormwater flows and hydrographs for the existing and post-development conditions were computed using the Haestad Method's Pondpack Hydrology Program (Version V8i).

For the purposes of the analysis, five (5) design points were defined to characterize the natural drainage patterns of the watershed (see Exhibit 4.4.8 b). Design Point 1 (DP-1) is located at an existing 24" RCP culvert crossing under I-87. Design Point 2 (DP-2) is located at existing outlet from the airport wetland mitigation area into an unnamed tributary of Shaker Creek. Design Point 3 (DP-3) is located at an existing culvert under a gravel road within the vacant farmland on the south side of Albany-Shaker Road. Another unnamed tributary of Shaker Creek is carried by this culvert. Design Point 4 (DP-4) is located at a tributary of Shaker Creek on the north side of Albany-Shaker Road at the southeast corner of the airport's long term parking lot. Lastly, Design Point 5 (DP-5) is located on an unnamed tributary of Shaker Creek between Old Wolf Road and the existing service road between the Exit 5 southbound entrance ramp and the Exit 4 southbound exit ramp.

Exhibit 4.4.8 a provides a summary of the proposed impervious areas.



500 0 500 FT
SCALE

CHA
III Winners Circle, PO Box 5269 • Albany, NY 12205-0269
Main: (518) 453-4500 • www.chacompanies.com

EXISTING CONDITIONS WATERSHED MAP

INTERSTATE 87 (I-87) EXITS 3/4 ACCESS IMPROVMENTS

FIGURE
4.4.8 b

DATE: 03/13

FILE NAME = U:\9456\dgn\Preliminary Design\Figures\172151_water_shed_existing_conditions.dgn
DATE/TIME = 10/29/2013
USER = 2210

Exhibit 4.4.8 a Summary of Impervious Surfaces		
	Diamond Alternative	**Flyover Alternative**
Total Disturbed Area (acres)	65.9	43.7
Existing Impervious Area (acres)	19.6	11.5
Replaced Impervious Area (acres)	11.2	6.4
New Impervious Area (acres)	16.4	9.1
Total Proposed Impervious Area (acres)	27.6	15.5
% Increase in Impervious Area	40.82%	34.78%

The proposed project will increase impervious area and alter the permeability of the site. This increase in impervious area will create the potential for an increase in the amount of stormwater runoff and a need for stormwater treatment. In accordance with the governing regulations, this increase in peak flows must be mitigated such that the proposed mitigated condition peak runoff rates will be no greater than the existing condition rates for each the design storm events. Hydraulic routing was performed to ensure that the design criteria were met.

Stormwater management practices selected for the proposed project will be comprised primarily of stormwater basins (pocket ponds) and dry swales. Pocket ponds are considered to be an effective treatment option for water quality, and suitable for small contributing drainage areas up to 5 acres and sites with proximity to groundwater. In addition, due to the shallow groundwater constraint on site, the dry swales with permanent stone check dams are proposed to be built into the side slopes of the roadway embankment. These selected standard stormwater practices will meet both water quality and quantity requirements set forth by the governing regulations.

Exhibit 4.4.8 c Summary of Existing and Proposed Stormwater Runoff Flows - Diamond Alternative (cfs)					
Design Point	**Return Event**			**Treatment Method**	
	1-yr	**10-yr**	**100-yr**	**Quality**	**Quantity**
Existing Conditions					
DP-1	0.9	9.2	28.4	N/A	
DP-2	0.6	8.5	36.5		
DP-3	13.6	42.3	88.3		
DP-4	0.3	2.8	8.9		
DP-5	1.0	9.1	27.2		
Proposed Conditions					
DP-1	0.3	5.6	25.5	dry swale	
DP-2	0.9	8.7	35.3	dry swale and pocket ponds	
DP-3	12.8	40.8	80.3	dry swale	
DP-4	0.2	0.9	5.6	dry swale	
DP-5	0.7	7.3	24.2	dry swale	

Exhibit 4.4.8 d Summary of Existing and Proposed Stormwater Runoff Flows - Flyover Alternative (cfs)					
Design Point	**Return Event**			**Treatment Method**	
	1-yr	**10-yr**	**100-yr**	**Quality**	**Quantity**
Existing Conditions					
DP-1	0.6	3.5	9.2	N/A	
DP-2	0.2	3.0	15.2		
DP-3	4.1	21.8	56.6		
DP-4	3.9	16.7	38.0		
DP-5	1.0	9.1	27.2		
Proposed Conditions					
DP-1	0.1	1.4	7.9	dry swale	
DP-2	0.2	2.4	13.3	pocket pond	
DP-3	1.5	16.6	51.3	dry swale	
DP-4	5.3	15.6	32.4	dry swale and pocket ponds	
DP-5	0.4	5.5	24.0	dry swale	

Water Quality Volume

The unified approach for sizing Stormwater Management Practices in the State of New York to meet pollutant removal goals requires the calculation of the Water Quality Volume (WQ_v) and the Runoff Reduction Volume (RRv). WQ_v is a value designed to improve water quality sizing to capture and treat 90% of the average annual stormwater runoff volume. The 90% Rainfall Event Number (P) was found to be 1.0 inches for the project area. Exhibit 4.4.8 e provides a summary of the WQv calculations.

Exhibit 4.4.8 e Summary of WQv		
	Diamond Alternative	**Flyover Alternative**
Initial Water Quality Volume, $WQv_{(Initial)}$	2.346 ac-ft	1.054 ac-ft
Target Water Quality Volume, $WQv_{(Target)}$	1.630 ac-ft	0.702 ac-ft
Standard Practice Water Quality Volume (using dry swales and check dams), $WQv_{(Practice)}$	1.721 ac-ft	1.781 ac-ft
Standard Practice Water Quality Volume (using detention basins), $WQv_{(Practice)}$	3.840 ac-ft	0.350 ac-ft
Standard Practice Water Quality Volume (Total, using dry swales and basins), $WQv_{(Practice)}$	5.561 ac-ft	2.131 ac-ft

The amount of Water Quality Volume required to be treated (Target Water Quality Volume) for the Diamond Alternative is 1.630 acre-ft. (25% of replaced impervious areas and 100% of new impervious areas). The preferred amount of Water Quality Volume required to be treated (Initial Water Quality Volume) for the Diamond Alternative is 2.346 acre-ft. The actual amount of water quality to be treated (Standard Practice Water Quality Volume) through the use of dry swales equipped with check dams for this alternative will be 1.721 acre-ft. To increase this amount and meet the Initial Water Quality Volume, detention ponds will be used. With the addition of the detention ponds, the Standard Practice Water Quality Volume for the Diamond Alternative is 5.561 acre-ft, which is more than sufficient and satisfies the requirements of the Stormwater Management Design Manual.

The Diamond Alternative has been dismissed from further consideration as a Feasible Alternative due to environmental impacts, in addition to those summarized in Section 3.2.1 of this report.

The amount of Water Quality Volume required to be treated (Target Water Quality Volume) for the Flyover Alternative is 0.702 acre-ft (25% of replaced impervious areas and 100% of new impervious areas). The preferred amount of Water Quality Volume required to be treated (Initial Water Quality Volume) for the Flyover Alternative is 1.054 acre-ft. The actual amount of water quality to be treated (Standard Practice Water Quality Volume) through the use of dry swales equipped with check dams for this alternative will be 1.781 acre-ft. This is greater than the Initial Water Quality Volume and meets the requirements of the Stormwater Management Design Manual. To be consistent with the Diamond Alternative and to ensure that more than enough treatment is provided, additional water quality volume from detention basins has been added to the Flyover Alternative as well. These basins are required to meet the Water Quantity requirements, but will also provide Water Quality benefits. With the addition of a detention pond, the Standard Practice Water Quality Volume is 2.131 acre-ft.

In addition to Water Quality Volume Requirements, NYSDEC has recently implemented a Runoff Reduction Volume (RRv) Requirement. This analysis will be completed for the preferred alternative during final design.

Potential impact on surface water quality associated with the project would be the result of stormwater runoff and associated pollutants. Pollutants associated with the project could include deicing salts, particulates, nutrients, heavy metals, and hydrocarbons, including polynuclear aromatic hydrocarbons (PAH's). Pollutant sources may include road surface material, vehicle exhaust and degradation, lubrication system losses, roadway maintenance activities, and by-products of combustion. Of these pollutants, deicing salts are considered a primary pollutant due to the potential quality of salts applied to the roadway during snow removal operations, and because they are potentially the most difficult to mitigate. A Toler Analysis was completed to determine the effect of these pollutants to Shaker Creek. The results of this analysis are summarized in Section 4.4.7 of this report. The results of the analysis indicated that the increases in chloride concentrations resulting from the project would be insignificant.

Treatment Practices

Two methods to treat stormwater from the project corridor will be used to adequately provide water quality treatment and peak flow mitigation for the entire project area. These include an open channel, dry swales with check dams, to provide water quality treatment and extended detention basins which ultimately discharge into Shaker Creek, to provide water quality and water quantity treatment. Due to the linear nature of the project and site limitation due to the high groundwater table and location of existing wetland and farmland areas, the majority of the stormwater runoff will be treated in dry swales constructed in the roadway embankment with check dams which will also serve to convey runoff to the extended detention basins.

Soil erosion plans and details will also be developed during the advance detail design phases of the project in accordance with Section 209 Soil Erosion and Sediment Control of the NYSDOT Standard Specifications in order to satisfy the requirements of the SWPPP. These plans and details will include both temporary and permanent measures to prevent soil erosion and provide fences, seeding, mulching, and stabilized construction access points. These measures will serve to minimize the potential for pollutants from the proposed project to reach Shaker Creek.

Based on the classification of the Shaker Creek, Class C, located within the project area, a NYSDEC Protection of Waters permit is not required for this project. Although a permit is not required, this project should not diminish the water quality standards of Shaker Creek. During construction, precautions will be taken to prevent contamination of Shaker Creek by silt, sediment, fuels, solvents, lubricants, or any other pollutants. Promptly after construction, care will be taken to stabilize all disturbed areas. Vegetated pipe outlet locations will be utilized, as well as plantings in removed old roadbed locations to allow water to percolate prior to entering Shaker Creek. Green infrastructure practices will be implemented as conditions permit.

4.4.9 General Ecology and Wildlife Resources

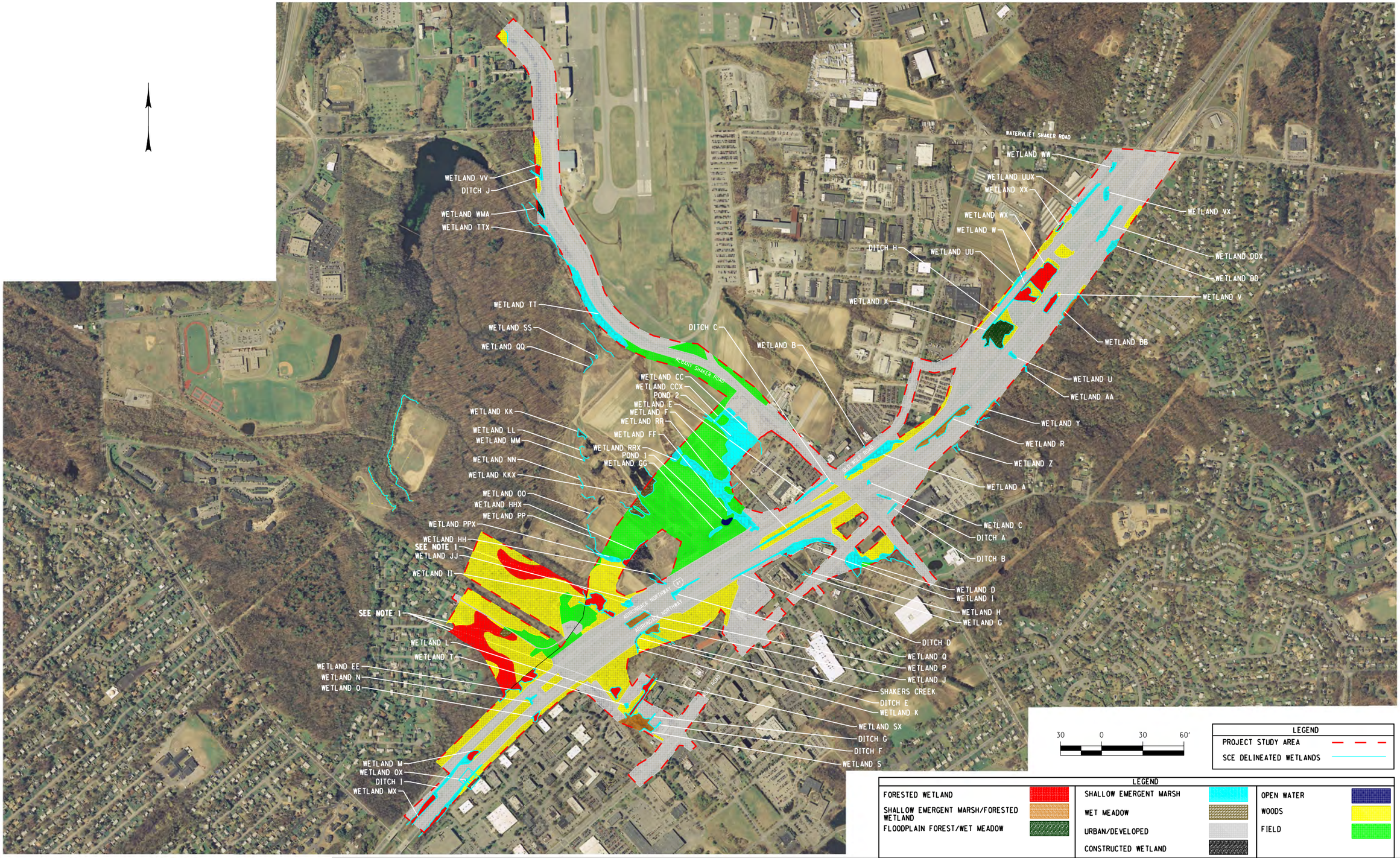
Fish, Wildlife, and Waterfowl

The following vegetative communities were identified within the bounds of the PSA, and are presented in Exhibit 4.4.9 a, Vegetative Community Map: forested wetland; shallow emergent marsh; floodplain forest; wet meadow; scrub-shrub swamp, urban/developed; open water; woods; field; and constructed wetland.

Invasive species identified on-site included: Garlic mustard (*Alliaria petiolata*), Tatarian honeysuckle (*Lonicera tatarica*), Common reed (*Phragmites australis*), Mulitflora rose (*Rosa multiflora*), Purple loosestrife (*Lythrum salicaria*), Japanese barberry (*Berberis thunbergii*), White sweetclover (*Melilotus alba*), Black locust (*Robinia pseudoacacia*), and Norway maple (*Acer platanoides*).

In general, all types of vegetative communities in and around urban settings inherently provide habitat for most types of wildlife. However, since these habitats have been or are continually being disturbed, the assemblages of species usually consist of those wildlife species that have evolved to adapt to changes to the landscape derived from anthropogenic activity. Wildlife species included, but are not limited to, white-tailed deer (*Odocoileus virginianus*), skunk (*Mephitis mephitis*), gray squirrel (*Sciurus carolinensis*), coyote (*Canis latrans*), mallard (*Anas platyrhynchos*), resident Canada geese (*Branta canadensis maxima*) and crow (*Corvus brachyrhyncos*). As a result, these habitats are less likely to harbor those species that have not evolved to adapt to change and are only capable of surviving in static landscapes rather than dynamic urban settings. The less tolerant species are classified as rare or threatened with extinction or in danger of becoming extinct. The wildlife resources and ecological framework provided by the habitat in the PSA would not be significantly affected by the proposed project. Furthermore, rare, threatened, or endangered species have not been found to occur in the PSA. It is important to note, however, that a pine bush community does exist in the area, which is inhabited by several plant and animal species adapted to living under a narrow range of conditions and disturbances; had the PSA encompassed part or all it, the level of disturbance that would occur in association with this type of project would certainly have an adverse effect on several rare species.

As discussed in Section 4.4.1, a number of wetlands have been identified within the PSA. Wetlands are a key component of the local ecology and for discussion purposes on this project, fall into one of two categories; (1) those that have developed as a result of the original construction of the I-87 corridor or existed prior to it but are now mainly associated with roadway drainage and subsequently sediment retention or (2) those that existed prior to the original construction of the I-87 corridor, and continued to exhibit ecological functions as they had before construction-related disturbances occurred. As mentioned previously, although both types of wetlands provide habitat for wildlife, the wetlands in category 2 are ecologically more significant in this landscape and thus relative to this project. Although wetlands in both categories would be disturbed by the proposed alternatives, mitigation of the impacts on wetlands should be focused on wildlife habitat and sediment retention within the Shaker Creek watershed. Wetland mitigation measures are discussed in Section 4.4.1. Furthermore, the portions of these wetlands that will remain post construction are part of the greater whole of the wetland/stream complex associated with Shaker Creek and Ann Lee Pond and their tributaries, which will continue to provide wetland functions and services the same as they do now. Exhibit 4.4.9 b lists the wetlands delineated in the PSA according to the above two categories.



LEGEND	
PROJECT STUDY AREA	
SCE DELINEATED WETLANDS	

LEGEND					
FORESTED WETLAND		SHALLOW EMERGENT MARSH		OPEN WATER	
SHALLOW EMERGENT MARSH/FORESTED WETLAND		WET MEADOW		WOODS	
FLOODPLAIN FOREST/WET MEADOW		URBAN/DEVELOPED		FIELD	
		CONSTRUCTED WETLAND			

NOTE 1: WETLANDS IN THIS AREA HAVE NOT BEEN DELINEATED. WETLAND AREA HATCHING IS BASED ON NWI WETLANDS.

AS BUILT REVISIONS
DESCRIPTION OF WORK: _____
_____
_____

SIGNATURE _____ DATE _____

DOCUMENT NAME: $FILES$

EXIT 3/4 ACCESS IMPROVEMENT
TOWN OF COLONIE
COUNTY: ALBANY

PIN 1721.51
PS&E DATE

BRIDGES
CULVERTS

ALL DIMENSIONS IN m UNLESS OTHERWISE NOTED

EXHIBIT 4.4.9a
VEGETATIVE COMMUNITY MAP

CONTRACT NUMBER _____

SHUMAKER

DRAWING NO.
EXHIBIT 4.4.9a

NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION 1

FILE NAME = $FILEL$
DATE/TIME = $DATE$ /$TIME$
USER = $NAME$

DESIGN SUPERVISOR _____ JOB MANAGER _____ DESIGNED BY _____ DRAFTED BY _____ ESTIMATED BY _____ CHECKED BY _____ CHECKED BY _____

Exhibit 4.4.9 b Breakdown of Wetlands By Category		
Wetland ID*		
CATEGORY 1		CATEGORY 2
A	W/WX	EE
B	T	HH/HHX
C	U	II
D	V/VX	KK/KKX
E	X	LL
F	Y	MM
G	Z	NN
H	AA	OO
I	BB	PP/PPX
J	CC/CCX	QQ
K	DD/DDX	SS
L	EE	TT/TTX
M/MX	FF	VV
N	GG	
O/OX	JJ	
P	RR/RRX	
Q	UU/UUX	
R	WW	
S/SX	XX	
* See Exhibit 4.4.1 b for Wetland ID's.		

Habitat Areas, Wildlife Refuges, and Wildfowl Refuges

The Albany Pine Bush Preserve occurs in the vicinity of the PSA, but would not be adversely affected by either alternative because it is not located close enough to the PSA to be of concern. Wildlife Refuges and Waterfowl Refuges do not exist in or near the PSA; therefore, no further consideration is required.

Endangered and Threatened Species

Coordination with the NYSDEC and the United States Fish and Wildlife Service (USFWS) is required for federal aid or permitted construction projects. The details of the agency reviews are presented below. The USFWS Federally Listed Endangered and Threatened Species and Candidate Species list was reviewed and the NYSDEC, Division of Fish, Wildlife, & Marine Resources, New York Natural Heritage Program (NYNHP) was contacted to identify the potential for Federal or State-listed endangered or threatened species to occur on-site. A discussion of these findings is presented below, and copies of the associated correspondence are provided in Appendix B.

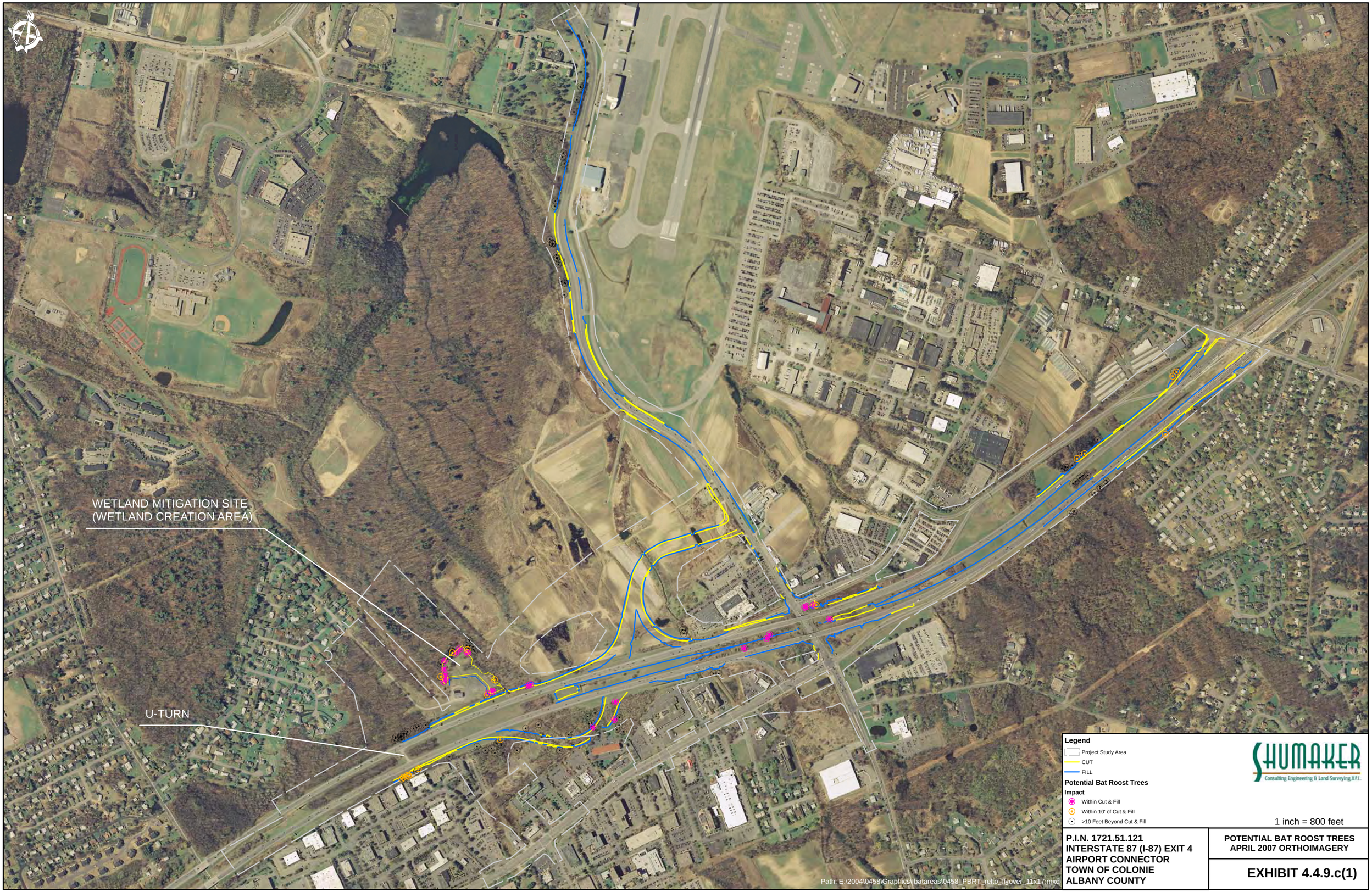
<u>Endangered or Threatened Species (Federal)</u>
Correspondence with the USFWS was initiated in September 2000 regarding the presence of federally listed endangered or threatened species in the vicinity of the proposed project. The USFWS response letter, dated October 25, 2000, identified the potential for the Karner blue butterfly (*Plebejus melissa samuelis*) to occur in the vicinity of the project area. The USFWS indicated that an evaluation of the existing habitat at the project site, and its potential to support the Karner blue butterfly or Wild lupine (*Lupinus perennis*) should be completed. However, since this time agency letters are no longer encouraged and initial species review is performed by the Consultant by reviewing the USFWS Federally Listed Endangered Threatened and Candidate Species. The USFWS list (as of 01/12/12) identified the following endangered, threatened, and de-listed species for Albany County: Indiana bat (*Myotis sodalis*), Karner blue butterfly, Shortnose sturgeon (*Acipenser brevirostrum*), Bog turtle (*Clemmys muhlenbergii*), and Bald eagle (*Haliaeetus leucocephalus*). Since 2012, the USFWS developed and implemented the Information, Planning and Conservation System (IPaC) for the review of projects relative to federally-listed threatened and endangered species and their habitats. A preliminary list of threatened and endangered species was generated based on the PSA boundaries. This list was obtained on July 31,

2013 and is included in Appendix B. Similar to the 2012 list, the current list includes the Karner blue butterfly, Indiana Bat, and Bog Turtle. On October 2, 2013, the USFWS proposed to list the northern long-eared bat (*Myotis septentrionalis*) as an endangered species throughout its range under the Endangered Species Act. The listing is expected in the Fall of 2014. In the meantime, while FHWA does not consider the northern long-eared bat as listed at this time, FHWA encourages NYSDOT to identify and resolve potential conflicts between an action and species prior to the species listing, so as not to stop or delay a project once the species is listed. Therefore, in an effort to address the project's effects on the Northern Long-Eared bat and identify potential impact mitigation, the Department has provided the information shown in the next paragraphs. Additionally, information provided by NYSDOT Office of Environment indicates that the NY Bight Distinct Population Segment of Atlantic Sturgeon is now federally listed.

Summer and winter habitat preferred by the endangered Indiana bat was identified to occur within Albany County. Summer roosts are typically found within large, often dead trees that have exfoliating bark and are often found within a canopy gap in forests or along fence lines and wooded edges. Indiana bats forage in semi-open to closed forested habitats, forest edges, and along riparian areas. Wintering habitat mainly consists of caves or occasionally abandoned mines; preferred wintering habitat does not occur within the project limits. Information in the Federal Register regarding the natural history of the Northern Long-Eared bat states that, in general, summer roost habitat varies across the species range, but it is usually found in correlation with old growth forests, with trees 100 years old or older. It further suggests that suitable summertime foraging habitat includes unfragmented mature successional forest, and that foraging occurs between the canopy and understory on forested hillsides and ridges, rather than along riparian areas. It is worthwhile to note, that Northern Long-Eared bats are not as selective as the Indiana bat when choosing roost trees. Although, the project area does not possess unfragmented mature successional forest or forested hillsides and ridges, little is still known about the species in New York State. According to USFWS, forest patch size has not been determined and if there are several patches of forest in proximity to one another, it may be suitable to the Northern Long-Eared bat. It is understood that the Northern Long-Eared bat may roost in tree cavities, whereas the Indiana bat will not. It is expected that the USFWS will be publishing additional guidance in the near future; this guidance will be reviewed as it becomes available.

A field screening to identify Potential Bat Roost Trees (PBRTs) was conducted during the week of January 6, 2014. Potential roost trees have sloughing or exfoliating bark or cavities that could be suitable to Northern Long-Eared bats. All trees, live or dead, greater than or equal to 3 inches diameter at breast height (DBH), within or up to approximately 50 feet beyond proposed cut and fill lines for the Flyover Alternative and possessing one or more of potential roost tree characteristics were identified and their locations recorded with a hand held GPS. A total of 158 PBRTs were identified. Twenty-four (24) PBRTs were located at or within proposed cut and fill lines for the Flyover Alternative and will need to be removed. Eighteen (18) PBRTs were located within 10 feet of the outer edges of the cut and fill lines and may or may not need to be removed to facilitate construction. The project will directly affect a minimum of twenty-four (24) trees, with the potential to affect an additional eighteen (18) trees for a total of forty-two (42) PBRTs. The largest number of PBRTs (12) within cut and fill are concentrated at the wetland mitigation site; therefore, it is possible that some of the impacts can be avoided during construction of the mitigation wetland to reduce the overall impact. The remaining ten (10) PBRTs within cut and fill are concentrated at: the I-87 bridges over Albany Shaker Road (5 PBRTs); the Flyover on-ramp off of I-87 northbound (3 PBRTs); and off the I-87 southbound shoulder just northeast of the wetland mitigation site (2 PBRTS). The remaining one hundred sixteen (116) PBRTs are greater than 10 feet beyond the edges of the cut and fill lines and extend up to a distance of approximately 50 feet from the outer edges of the cut and fill lines and are not expected to be negatively impacted. The locations of all 158 PBRTs are depicted in Exhibit 4.4.9 c (1) and have been categorized using unique symbols based on their proximity to cut and fill lines: within cut and fill, within 10 feet of cut and fill, and >10 feet beyond cut and fill.

Mitigation for the PBRTs that would need to be removed could consist of girdling appropriately selected live trees in the area in addition to planting replacement trees; however, it is important to note that the abutting Ann Lee Pond Nature and Historic Preserve provides close to 300 acres of unfragmented mature successional forest and over 3 miles of forest edge habitat where many undocumented PBRTs occur. PBRTs within 10 feet of cut and fill (18) are scattered throughout the project impact area, but are concentrated at the wetland mitigation site (5 PBRTs) and between I-87 northbound near the U-Turn and



P.I.N. 1721.51.121
INTERSTATE 87 (I-87) EXIT 4
AIRPORT CONNECTOR
TOWN OF COLONIE
ALBANY COUNTY

POTENTIAL BAT ROOST TREES
APRIL 2007 ORTHOIMAGERY

EXHIBIT 4.4.9.c(1)

buildings along Computer Drive West (6 PBRTs). These trees can be protected from intentional or accidental removal by enclosing them with high visibility fencing and informative signage, in addition to educating the contractor. Based on an inventory of existing habitat, publically available information regarding the Northern Long-Eared bat, and consideration of potential impacts it has been determined that this project May Affect, but is not likely to Adversely Affect, the Northern Long-Eared bat. In order to protect the Northern Long-Eared bat from project-related impacts (i.e. tree removals), the USFWS requires that if any trees need to be removed, the cutting of trees at these sites must be accomplished only from November 1 through March 31. Any additional mitigation measures appropriate to the project will be further assessed and coordinated with the USFWS as the project progresses.

A preliminary search was conducted for trees (standing dead or dying) and snags suitable for Indiana bat (*Myotis sodalis*) summer roosting habitat in wooded areas that would be directly affected by the two (2) proposed alternatives. However, it is important to note that, based on a footnote on the USFWS Albany County list, Indiana bats "…are likely extirpated or in such small numbers that it is unlikely that they would be present and impacted by any specific proposed projects…." Based on a June 18, 2013 letter provided to NYSDOT from FHWA, the New York Field Office of the USFWS published a document listing each federally endangered and threatened species that is known to occur within each county in New York. Section 7 of the ESA requires species-specific investigations for projects within those counties. Regarding the Indiana Bat, the document includes the same note regarding extirpation or small numbers as identified above. Based on this note, FHWA concluded that projects within Albany County have "No Effect" on Indiana Bats or their habitat.

Prior to the FHWA's July 18, 2013 letter the search for potential Indiana Bat habitat was conducted. Wooded areas selected for review were identified based on the impact areas of the two alternatives and the bounds of the PSA. Wooded areas within the bounds of the PSA that were encompassed by or abutted by the outermost cut and fill lines of the composite drawing of the alternatives were selected to be searched for trees and snags suitable for Indiana bat summer roosting habitat. Determinations regarding the suitability of trees and snags for providing summer roosting habitat for the Indiana bat were based on information provided in the USFWS Recovery Plan (April 2007).[4]

Twelve wooded areas within the PSA, totaling approximately 32 acres, falling partially or wholly in areas affected by either one of the alternatives or both, were identified. For the purposes of this summary, the areas have been assigned identities, based on an area's position in the landscape relative to the existent roadway (see Exhibit 4.4.9 c). Exhibit 4.4.9 d provides basic information about the wooded areas that were searched.

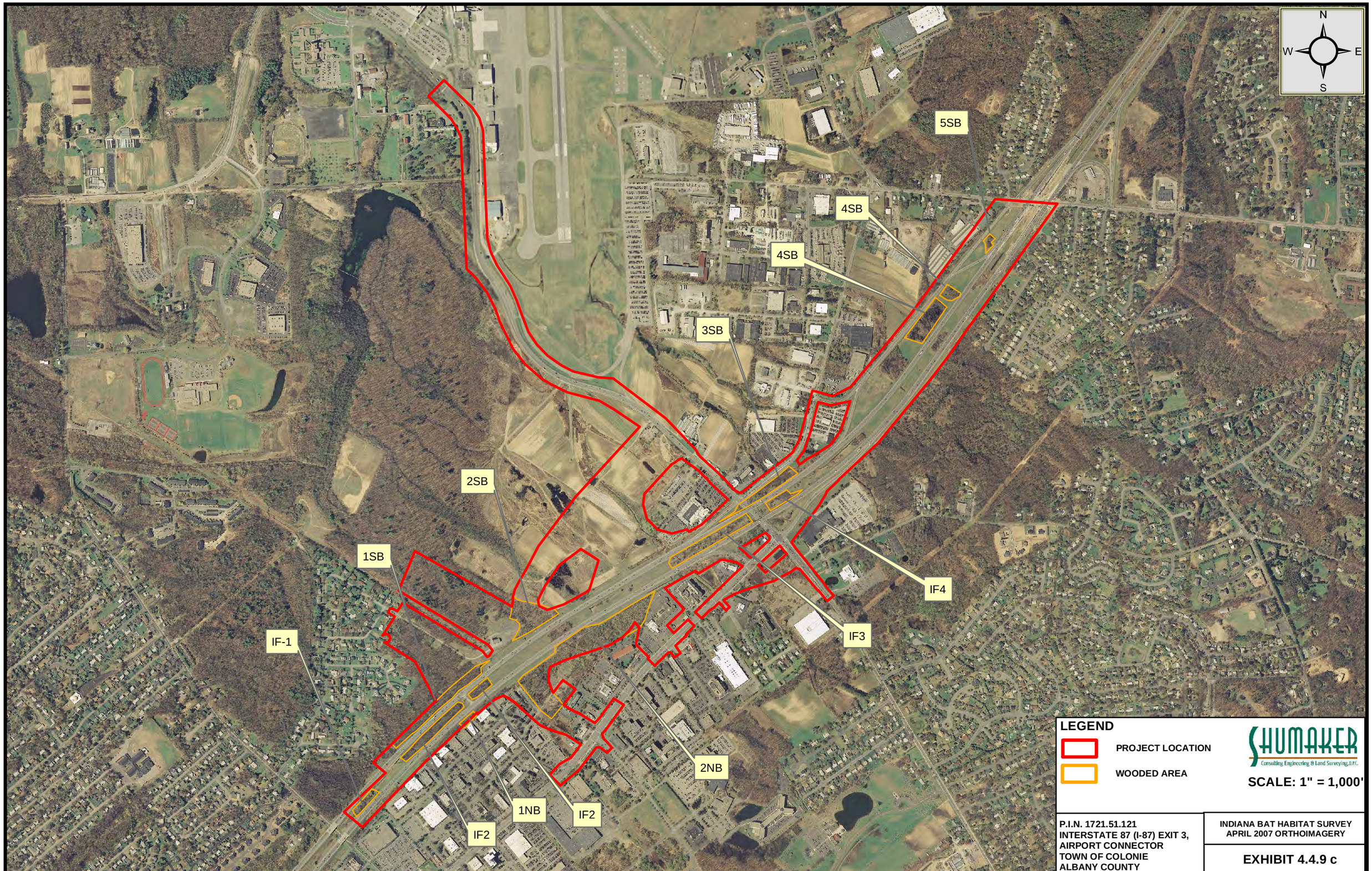
Exhibit 4.4.9 d
Summary of Indiana Bat Screening Effort

WOODED AREA ID	SIZE IN ACRES	NOTES ABOUT TREES AND SNAGS RELATIVE TO SUITABLE INDIANA BAT SUMMER ROOSTING HABITAT
1 North-Bound (1NB)	0.395	• Representative tree species throughout the area: red oak (*Quercus rubra*) and red maple (*Acer rubrum*). • No snags. • No shagbark hickory (*Carya ovata*) or other living trees with exfoliating bark observed.
2 North-Bound (2NB)	6.432	• Representative tree species throughout the area: red oak , quaking aspen (*Populus tremula*), red maple (*Acer rubrum*), gray birch (*Betula* populifolia), and pin oak (*Q. palustris*). • Snags but small diameter trunks[1] and short in height or no bark or bark still firmly attached, or a combination thereof. • No shagbark hickory or other living trees with exfoliating bark observed.
3 North-Bound (3NB)	0.304	• Representative tree species throughout the area: silver maple (*Acer saccharinum*) • No snags • No shagbark hickory or other living trees with exfoliating bark observed.

[4] U.S. Fish and Wildlife Service (USFWS). 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

Exhibit 4.4.9 d Summary of Indiana Bat Screening Effort		
WOODED AREA ID	**SIZE IN ACRES**	**NOTES ABOUT TREES AND SNAGS RELATIVE TO SUITABLE INDIANA BAT SUMMER ROOSTING HABITAT**
Infield 1(IF1)	1.068	• Representative tree species throughout the area: red oak, eastern cottonwood (*Populus deltoides*), red maple, swamp white oak (*Q. bicolor*), and green ash (*Fraxinus pennsylvanica).* • Three Snags at southern terminus with unobstructed southern exposure -Sands Creek Road; snags are without bark or have bark that is still firmly attached. • Any other snags small diameter trunks or no bark or not ideal solar gain, or a combination thereof. • No shagbark hickory or other living trees with exfoliating bark observed.
Infield 2 (IF2)	3.251	• Representative tree species throughout the area: red oak, red maple, and green ash. • Any snags observed had small diameter trunks or no bark or bark firmly attached, or a combination thereof. • No shagbark hickory or other living trees with exfoliating bark observed.
Infield 3 (IF3)	1.183	• Representative tree species throughout the area: box elder and eastern cottonwood. • No snags. • No shagbark hickory or other living trees with exfoliating bark observed.
Infield 4 (IF4)	6.006	• Representative tree species throughout the area: staghorn sumac (*Rhus typhina*). • No snags • No shagbark hickory or other living trees with exfoliating bark observed.
1 South-Bound (1SB)	3.487	• Representative tree species throughout the area: red oak and red maple. • This area has the highest density of snags, relative to the other search areas, and the trees have greater diameter trunks than the other areas; the majority of snags have loosely attached bark. • The snags in this area are the most suitable for Indiana bat summer roosting habitat relative to the other search areas; however, their suitability relative to snags ideal for roosting, in general, is questionable. • Most of the snags occur on the interior of the wooded area, where they likely do not receive adequate solar exposure required by gestating females • No shagbark hickory or other living trees with exfoliating bark observed.
2 South-Bound (2SB)	3.345	• Representative tree species throughout the area: red oak and gray birch • Some snags, but they don't have bark. • No shagbark hickory or other living trees with exfoliating bark observed.
3 South-Bound (3SB)	0.688	• Representative tree species throughout the area: box elder (*Acer negundo*). • No snags. • No shagbark hickory or other living trees with exfoliating bark observed.
4 South-Bound (4SB)	5.631	• Representative tree species throughout the area: red maple. • Snags small diameter trunks or no bark or bark still firmly attached, or a combination thereof. • No shagbark hickory or other living trees with exfoliating bark observed.
5 South-Bound (5SB)	0.245	• Representative tree species throughout the area: red maple, swamp white oak , and green ash. • One snag, American elm (*Ulmus americana*), with bark firmly attached; two other snags without bark. • No shagbark hickory or other living trees with exfoliating bark observed.
Total Area	**32.035**	
1 The USFWS NY Field Office Indiana Bat Project Review Fact Sheet (May 2012) refers to potential roost trees as being generally >4" DBH.		

The wooded areas were searched for trees and snags suitable for Indiana bat summer roosting habitat on March 15, 2011. Shagbark hickory or other live tree species with exfoliating bark, known to be used by Indiana bats for roosting, were not observed in any of the twelve search areas. Snags were not observed in search areas 1NB, 3NB, IF3, IF4, and 3SB.



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The snags observed in search areas 2NB, IF1, IF2, 2SB, 4SB, and 5SB would be considered unsuitable as Indiana bat summer roosting habitat because they did not have bark on them or, if bark was present, it was still firmly attached, or a combination thereof. Additional characteristics exhibited by the snags in these search areas that negatively affects their suitability as Indiana bat summer roosting habitat included relatively small diameter trunks (< 4 inches), short height, poor solar gain,[5] or a combination thereof.

Search area 1SB has the highest density of snags relative to all of the other search areas. The snags had relatively larger diameter trunks than the other areas and loose fitting bark was observed on a number of snags, unlike any of the other areas. In general, snags suitable for Indiana bat summer roosting habitat occurred in the interior of the wooded area, where they presumably would not receive the solar exposure required by gestating Indiana bats when the surrounding trees, dormant at the time, are bearing leaves. The Diamond Alternative would affect 2-acres of 1SB; the Flyover Alternative would not affect 1SB at all. As a result of the preliminary habitat screening, it was concluded that the Diamond Alternative would have an adverse effect on summer roosting habitat, but the Flyover Alternative would not. However, upon receipt of updated information from the USFWS and FHWA it has been determined that this project will have "No Effect" on the Indiana bat, and as such, neither further review in the form of a Biological Assessment nor mitigation measures are necessary.

The Karner blue butterfly has also been listed as an endangered species with known or likely occurrences within Albany County. According to the NYSDEC-NYNHP Conservation Guide, Karner blue butterflies can be found in extensive pine barrens, oak savannas or openings in oak woodlands, and unnatural openings such as airports and right-of-ways that contain Wild lupine. Karner blue butterfly larvae feed solely on the Wild lupine plant. As such, this species is restricted to dry sandy areas with open woods and clearings that support Wild lupine. Wild lupine is an early successional species; therefore, disturbances that reduce tree and shrub canopy cover are necessary for Wild lupine to persist. As stated in the Karner Blue Butterfly Recovery Plan (USFWS, September 2003), "under some conditions, occasional disturbances that remove the litter layer are needed for Wild lupine regeneration."

In accordance with prior recommendations from the USFWS, the project site was investigated for the occurrence of Wild lupine and potential Karner blue butterfly habitat during June 2009. The on-site Successional Old Field and Mowed Roadside/Pathway ecological communities observed during the field reconnaissance may potentially offer limited habitat for Wild lupine and subsequently the Karner blue butterfly. However, the presence of invasive species throughout these communities significantly reduces the potential for the occurrence of Wild lupine. It should be noted that Wild lupine was not observed within the project limits. Due to the limited potential for preferred habitat and the absence of Wild lupine, it appears that project-related impacts will have no effect upon the Federally-listed endangered Karner blue butterfly.

The Shortnose sturgeon is found within the Hudson River. Since the proposed project does not involve work in the Hudson River, it will have no effect on the Shortnose sturgeon.

The threatened Bog turtle is currently listed as a historic record for Albany County. This semi-aquatic species prefers a habitat that provides cool, shallow slow-moving water, deep muck soils, and tussock-forming vegetation. A bog turtle habitat matrix was created to aid in determining the presence or absence of suitable bog turtle habitat; a copy is provided in Appendix B. Based on an investigation of the on-site shallow emergent marsh wetland communities, taking into account soils characteristics, dominant plant community, source of hydrology, and land use, it appears that they do not provide habitat suitable to Bog turtle. Therefore, it has been determined that project-related impacts will have no effect upon the Federally-listed threatened Bog turtle. Effects determinations regarding federally listed threatened and endangered species are coordinated through USFWS via IPaC, whereby the project sponsor or its representatives assess the effects of the project on species found to be of concern and submit findings to the USFWS for review.

[5] Solar gain assumed to be poor by considering a snag's height relative to the heights of dormant trees present around it and imagining the amount of shade it would be in when trees are bearing leaves.

Prior to August 2007, the USFWS had listed the Bald eagle as a threatened species within known or likely occurrences within Albany County; however, this species was delisted on August 8, 2007. As such, there are no Endangered Species Act (ESA) requirements for the Bald eagle; however it remains protected under the Bald and Golden Eagle Protection Act. Potential Bald eagle habitat includes large trees in undisturbed areas near large lakes and reservoirs, marshes and swamps, or stretches along rivers where the birds can find open water and their primary food, fish. There are no large bodies of water within the project study area. Based on review of the existing vegetative communities, it appears that suitable Bald eagle habitat does not occur on-site. As such, project-related impacts to the Bald eagle are not expected.

Endangered or Threatened Species (State)

The NYSDEC NYNHP was initially contacted regarding the potential for endangered and threatened species to occur within the limits of the proposed project in September 2000. The NYSDEC NYNHP response letter, dated October 10, 2000, identified the endangered Karner blue butterfly and an endangered vascular species, Puttyroot (*Aplectrum hyemale*). Since a significant time period has elapsed, a new project review request was sent to the NYSDEC NYNHP requesting an updated response letter. The response letter, dated May 12, 2010 identifies the endangered Karner blue butterfly, the unlisted Edwards' hairstreak butterfly (*Satyrium edwardsii*), the unlisted Bird dropping moth (*Cerma cora*), the unlisted A Noctuid moth (*Chytonix sensilis*), the special concern Inland barrens buckmoth (*Hemileuca maia maia*), the unlisted Two-striped cord grass moth (*Macrochilo bivittata*), and the unlisted Pine barrens zanclognatha (*Zanclognatha martha*). A supplemental project review request was submitted electronically to the NYSDEC NYNHP on July 31, 2013 requesting an updated response due to the lag time since the previous review request. The response letter, dated August 9, 2013, identified a historical record of the endangered vascular species, Puttyroot (*Aplectrum hyemale)*. The ecological communities within the PSA have been evaluated relative to determine whether they provide habitat for identified species; a discussion of the potential for each species to exist within the PSA follows.

As stated above, due to the limited potential for preferred Wild lupine habitat on-site, the project will have no effect on the State-listed endangered Karner blue butterfly.

According to the NYSDEC NYNHP Conservation Guide, the endangered Puttyroot is an orchid of rich woods that is often found near limestone outcrops or in calcareous talus. Most of the woods within the project study area are mixed deciduous or mixed deciduous-evergreen. The loss of moist, interior forests, as a result of development and the invasion of exotic species, has greatly contributed to this species' decline. Associated ecological communities include Appalachian Oak-hickory Forest and Limestone Woodland. The Successional Northern Hardwoods communities observed within the project study area did not possess the characteristics of preferred Puttyroot habitat. Furthermore, it has been determined that the presence of invasive species throughout these communities further reduces the potential for suitable habitat. It should be noted that Puttyroot was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Puttyroot habitat does not exist within the project study area. As such, project-related impacts to the State-listed endangered Puttyroot are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the unlisted Edwards' hairstreak butterfly has a lifecycle that occurs in sandy pine barrens, rocky ridges, outcrops and occasionally other habitats in close association with substantial patches of scrub oak. Most of the woods within the project study area are mixed deciduous or mixed deciduous-evergreen, which does not include the species Pitch pine (*Pinus rigida*). The loss of habitat and potentially, Gypsy moth (*Lymantria dispar*) spraying are threats to the Edwards' hairstreak butterfly, which is considered a vulnerable species in the state of New York. Associated ecological communities include Maritime Grassland, Pitch Pine-oak Forest, Pitch Pine-oak-heath Woodland and Pitch Pine-scrub Oak Barrens. The Successional Northern Hardwoods communities observed within the project study area did not possess the characteristics of preferred Edwards' hairstreak butterfly habitat. It should be noted that the Edwards' hairstreak butterfly was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Edwards' hairstreak butterfly habitat does not exist within the project study area. As such, project-related impacts to the unlisted Edwards' hairstreak butterfly are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the unlisted Bird dropping moth has a lifecycle that occurs in pine barrens often associated with the larvaes food plant, Fire cherry (*Prunus pennsylvanica*). Most of the woods within the project study area are mixed deciduous or mixed deciduous-evergreen, which does not include the species Pitch pine (*Pinus rigida*) or fire cherry. The loss of habitat from development and potentially, Gypsy moth spraying are threats to the Bird dropping moth, which is considered a critically imperiled species in the state of New York. Associated ecological communities include Pitch Pine-oak Forest, Pitch Pine-scrub Oak Barrens and Sandstone Pavement Barrens. The Successional Northern Hardwoods communities observed within the project study area did not possess the characteristics of preferred Bird dropping moth habitat. It should be noted that the Bird dropping moth was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Bird dropping moth habitat does not exist within the project study area. As such, project-related impacts to the unlisted Bird dropping moth are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the unlisted A Noctuid moth has a lifecycle that is typically confined to xeric sites, especially pine barrens. Most of the woods within the project study area are mixed deciduous or mixed deciduous-evergreen, which does not include the species Pitch pine (*Pinus rigida*). The lack of fire could reduce populations, but complete burning of the occupied habitat also could be a threat to the A Noctuid moth, which is considered a critically imperiled species in the state of New York. Associated ecological communities include Pitch Pine-oak Forest, Pitch Pine-scrub Oak Barrens and Sandstone Pavement Barrens. The Successional Northern Hardwoods communities observed within the project study area did not possess the characteristics of preferred A Noctuid moth habitat. It should be noted that the A Noctuid moth was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred A Noctuid moth habitat does not exist within the project study area. As such, project-related impacts to the unlisted A Noctuid moth are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the special concern Inland barrens buckmoth has a lifecycle that occurs in sand plain pine barrens. Most of the woods within the project study area are mixed deciduous or mixed deciduous-evergreen, which does not include the species Pitch pine (*Pinus rigida*). The loss of habitat and habitat fragmentation are the primary threats to the Inland barrens buckmoth, which is considered a critically imperiled species in the state of New York. Associated ecological communities include Chestnut Oak Forest, Pitch Pine-oak Forest, Pitch Pine-oak-heath Woodland and Pitch Pine-scrub Oak Barrens. The Successional Northern Hardwoods communities observed within the project study area did not exhibit the characteristics of preferred Inland barrens buckmoth habitat. It should be noted that the Inland barrens buckmoth was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Inland barrens buckmoth habitat does not exist within the project study area. As such, project-related impacts to the special concern Inland barrens buckmoth are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the unlisted Pine barrens zanclognatha has a lifecycle that occurs in inland sandy pitch pine-scrub oak barrens and is usually most numerous where there is substantial leaf litter and a pine canopy. Most of the woods within the PSA are mixed deciduous or mixed deciduous-evergreen, which does not include the species Pitch pine (*Pinus rigida*). The loss of habitat due to development and wildfires are the primary threats to the Inland barrens buckmoth, which is considered a critically imperiled species in the state of New York. Associated ecological communities include Chestnut Oak Forest, Pitch Pine-heath Barrens, Pitch Pine-oak Forest, Pitch Pine-oak-heath Rocky Summit, Pitch Pine-scrub Oak Barrens and Sandstone Pavement Barrens. The Successional Northern Hardwoods communities observed within the project study area did not possess the characteristics of preferred Pine barrens zanclognatha habitat. It should be noted that the Pine barrens zanclognatha was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Pine barrens zanclognatha habitat does not exist within the project study area. As such, project-related impacts to the unlisted Pine barrens zanclognatha are not anticipated.

According to the NYSDEC NYNHP Conservation Guide, the unlisted Two-striped cord grass moth has a lifecycle that occurs generally in wetland areas and is probably associated with a particular grass or large sedge. None of the wetlands within the project study area predominantly consist of or contain a high

diversity of non-invasive grasses and or sedges. The loss of habitat due to succession, invasive plants or human activities that impact wetlands are the primary threats to the Two-striped cord grass moth, which is considered a critically imperiled species in the state of New York. Associated ecological communities include Pitch Pine-oak Forest and Pitch Pine-scrub Oak Barrens. The wetland communities observed within the project study area did not possess the characteristics of preferred Two-striped cord grass moth habitat. It should be noted that the Two-striped cord grass moth was not observed within the project limits. Furthermore, it has been determined that the presence of invasive species throughout these communities further reduces the potential for suitable habitat. It should be noted that Two-striped cord grass moth was not observed within the project limits. Based on review of the existing on-site vegetative communities, the preferred Two-striped cord grass moth habitat does not exist within the project study area. As such, project-related impacts to the unlisted Two-striped cord grass moth are not anticipated.

Based on initial coordination with the NYSDEC and USFWS, assessment of ecological communities within the study area, consideration of habitat requirements for identified species, and anticipated impacts, it has been determined that the project will not affect state or federally listed threatened or endangered species.

Exhibit 4.4.9 e presents a summary of Impacts to Ecological Resources identified herein.

Exhibit 4.4.9 e
Summary of Impacts to Ecological Resources Relative to Alternative

Ecological Resource	Impacts Relative to Alternative***			
	Diamond		Flyover	
	Area of Impacts (sf)	Linear Impact (ft)	Area of Impact (sf)	Linear Impact (ft)
Perennial Streams	6,063*	605*	5,766	474
Intermittent Streams	0	0	0	0
Wetlands	188,669**	N/A	84,374**	N/A
Woods	406,880	N/A	222,428	N/A
Field	350,599	N/A	264,279	N/A

* See Section 4.4.2 for impact discussion.
** See Section 4.4.1 for more detail regarding wetlands.
*** Impacts associated with development of the preferred wetland mitigation site are not included. Impacts to natural resources will be minimized; since the intent is to enhance the site, impacts are expected to be minimal.

Invasive Species

Executive Order 13112 aims to; (1) prevent the introduction of invasive species; (2) provide for their control; and (3) minimize the economic, ecological, and human health impacts that invasive species cause. Under Executive Order 13112, federal agencies cannot authorize, fund or carry out actions that it believes are likely to cause or promote the introductions or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

As stated above, invasive species occur on-site and include: Garlic mustard (*Alliaria petiolata*), Tatarian honeysuckle (*Lonicera tatarica*), Common reed (*Phragmites australis*), Mulitflora rose (*Rosa multiflora*), Purple loosestrife (*Lythrum salicaria*), Japanese barberry (*Berberis thunbergii*), White sweetclover (*Melilotus alba*), Black locust (*Robinia pseudoacacia*), and Norway maple (*Acer platanoides*). Proposed project activities will disturb areas observed to contain invasive species. As such, environmental performance commitments and management practices will be utilized on-site to minimize the potential introduction or spread of any invasive species due to disturbances caused by proposed project. These environmental performance commitments will include installing temporary erosion and sediment control practices to limit the spread of invasive species by acting as a barrier to reproductive methods and mulching and seeding disturbed areas with native species as soon as possible after initial construction to limit the opportunity for any invasive species to become established or spread. Additionally, construction equipment access and movement will be limited within the project area and all equipment used during

construction will be inspected and cleaned prior to entering and leaving the site as a control to spreading any invasive species. Furthermore, any invasive species spoil will be properly disposed of and all mulch used on-site will be weed-free.

Roadside Vegetation Management

Existing roadside vegetation consists primarily of mowed roadside/pathways and maintained lawn areas. Efforts will be made to replace wildlife-supporting vegetation that is removed during proposed construction activities.

4.4.10 Critical Environmental Areas

State Critical Environmental Areas

According to information obtained from NYSDEC, the proposed project does not involve work in or near a Critical Environmental Area.

State Forest Preserve Lands

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

4.4.11 Historic and Cultural Resources

National Heritage Areas Program

The proposed project is located within the Hudson River Valley National Heritage Area. Specifically, the Albany-Shaker Historic Site is located at 25 Meeting House Road adjacent to the northern project limit. The proposed project will not impact any sites identified within the National Heritage Area. The Management Entity, Hudson River Valley Greenway Board, was contacted by letter dated August 13, 2013 to ensure that the project is consistent with the Heritage Area Management Plan. A copy of the letter is included in Appendix B.

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

The Area of Potential Effects (APE) includes the area in which the project alternatives under consideration may directly or indirectly cause alterations in the character or use of historic properties (both architectural and archaeological properties). It includes I-87 between Sand Creek Road and Watervliet-Shaker Road, Wolf Road between Cerone Commercial Drive and Albany-Shaker Road, Albany-Shaker Road between Maxwell Road and the Albany International Airport entrance, Old Wolf Road between the Exit 4 southbound exit ramp and Albany-Shaker Road, the existing Exit 4 ramps and southbound C-D road, the I-87 Exit 5 SB entrance ramp, the fields located on the south side of Albany-Shaker Road west of I-87, and commercial land located at the end of Sunset Boulevard adjacent to I-87 SB. The boundary of the APE for both feasible alternatives is shown on Exhibit 4.4.11 a.

A Pre-Reconnaissance (Phase IA) and Phase IB Reconnaissance Survey were conducted to identify historic and cultural resources that may be affected by the project.

A Cultural Resources Pre-Reconnaissance Survey was conducted by the NYS Cultural Resources Program of the New York State Museum to determine if there are any historical or cultural resources that will be affected by the proposed project. The pre-reconnaissance survey identified one prehistoric site, one historic site (the John Wolf Kemp House located at 216 Wolf Road, architectural property, NR Number 90 NR 02778), and a high potential for other pre-historic and historic sites within the project study area. Since the pre-reconnaissance survey was completed, the John Wolf Kemp House has been demolished for the construction of a new hotel on Wolf Road. Also identified in the pre-reconnaissance survey, the Watervliet Shaker Historic District (NR Number 90 NR 02797) is listed in the National Register

of Historic Places and is located adjacent to the western project limit at the intersection of Albany-Shaker Road and Meeting House Road. The historical and cultural resources identified are summarized in Exhibits 4.4.11 b and 4.4.11 c.

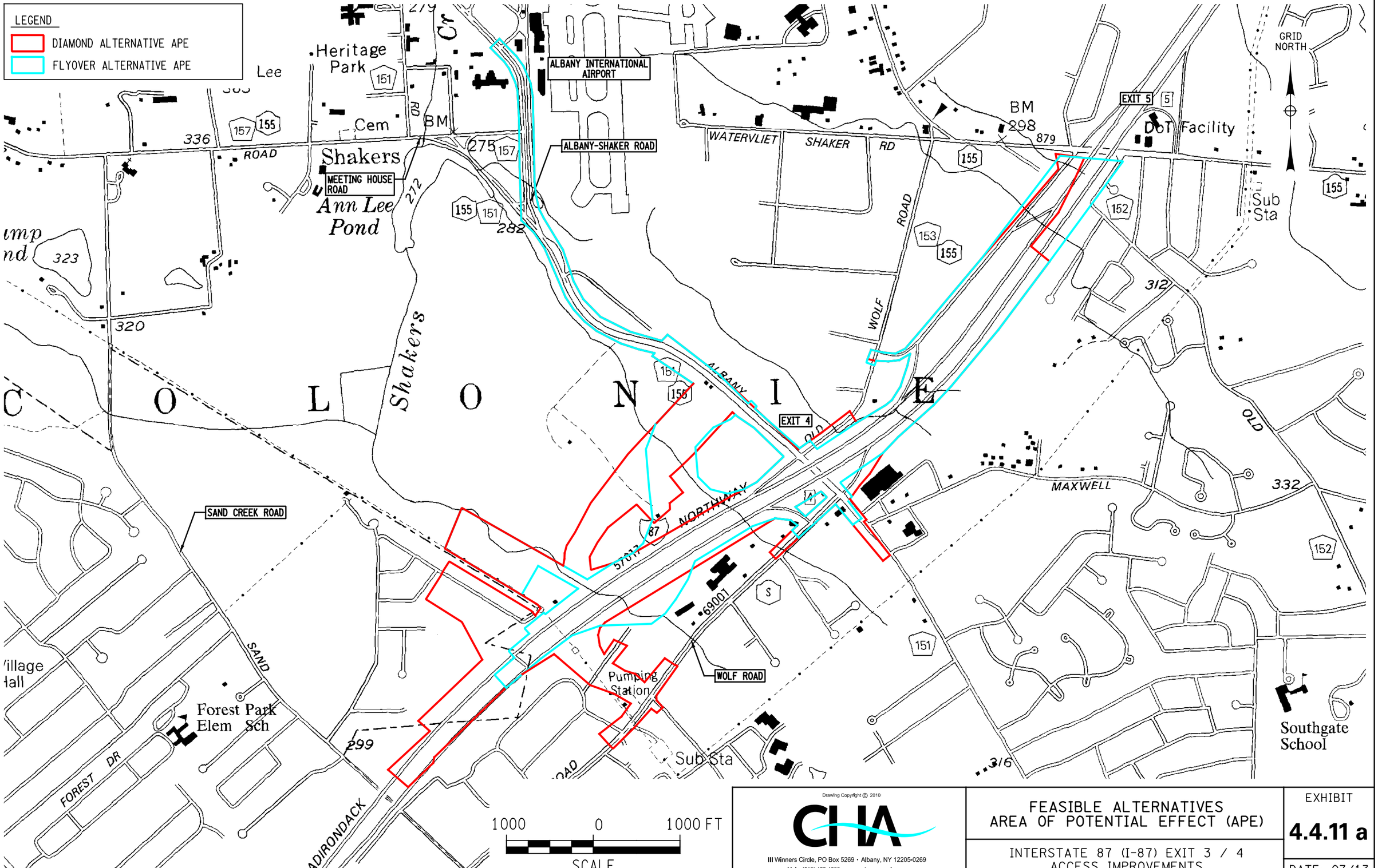
Exhibit 4.4.11 b
Summary of Historical and Cultural Resources

Location	Resource Type			Comment
	Section 4(f)	Section 6(f)	Section 1010	
Publicly Owned Park / Recreational Area				
Ann Lee Pond Nature and Historic Preserve	Yes	Yes	No	No Effect
The Crossings at Colonie	Yes	No	No	No Effect
Wildlife and Waterfowl Refuges				
None	-	-	-	-
Historic Sites				
Hudson River Valley National Heritage Area	Yes	No	No	No Effect
Watervliet Shaker Historic District (90 NR 02797)	Yes	No	No	No Effect
Albany Shaker National Historic Site	Yes	No	No	No Effect
John Wolf Kemp House (90 NR 02778)	Yes	No	No	No Effect
Engel Farm Pre-Contact Archaeological Site	Yes	No	No	Adverse Effect (Flyover Alt)

A Phase IB Reconnaissance Survey was conducted in the summer and fall of 2011. The survey consisted of shovel testing at standard 50 ft. intervals, surface collection, and artifact collection and cataloging and laboratory testing. Six historic and/or pre-historic sites were identified as a result of this survey: Desmond historic archaeological site, Exit 5 north historic archaeological site, Exit 5 south historic archaeological site, Stickley historic archaeological site, Engels Farm pre-contact archaeological site, and the Wolf-Kemp Family Cemetery historic archaeological site (see Maps 3a-3b in Appendix H). Based on the feasible project alternatives, the Stickley, Desmond, Exit 5 north, and Exit 5 south sites are likely avoidable and no further work was recommended. Should project work be proposed adjacent to any of these sites, a clear avoidance and protection plan, such as fencing off squash patches, will be assembled to ensure preservation of these sites. Based on the historic significance and visibility of the Wolf-Kemp Family Cemetery, a clear avoidance and protection plan will be assembled to assure the preservation of this site. Finally, the Engels Farm site was recommended for Phase II archaeological site examination. This fairly large dispersed site is located within the footprint of the Flyover Alternative in the agricultural fields west of I-87 and is characteristic of Pine Bush pre-contact sites. A Phase I Archaeological Investigation Report has been prepared and was submitted to the NYS Office of Parks, Recreation and Historic Preservation for review in December 2011. The State Historic Preservation Office (SHPO) concurred with the determination to complete a Phase II Site Examination to better assess any potential impacts to the Engels Farm pre-contact archaeological site.

A Phase II Site Examination was conducted at the Engel's Farm Site in June 2012 to redefine the vertical and horizontal limits of the site and make recommendations for eligibility for listing on the National Register of Historic Places. The survey consisted of shovel tests at 15 ft. intervals, surface collection, up to 81 sf of excavation of rectangular 3 ft. x 3 ft. or 3 ft. x 6 ft. units once artifact concentrations are determined through close-interval shovel testing, artifact collection, and cataloging and laboratory testing. A Phase II Site Examination report was prepared and submitted to SHPO for review in November 2012. Based on the findings of the Phase II report, three options are available to address impacts to the Engel's Farm Site: Phase III Data Recovery, site impacts consisting of placing embankment fill over the site with minimal ground disturbance, and avoidance.

The Engel Farm Precontact Archaeological Site is a National Register eligible site. The site was identified during Cultural Resources Reconnaissance Survey (Phase I testing) and was further investigated through a Site Examination (Phase II) study. The Site Examination study identified four Loci, or concentrations of artifacts, within the Site. Loci 2, 3, and 4 produced low densities of artifacts. The



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FEASIBLE ALTERNATIVES
AREA OF POTENTIAL EFFECT (APE)

INTERSTATE 87 (I-87) EXIT 3 / 4
ACCESS IMPROVEMENTS

EXHIBIT
4.4.11 a

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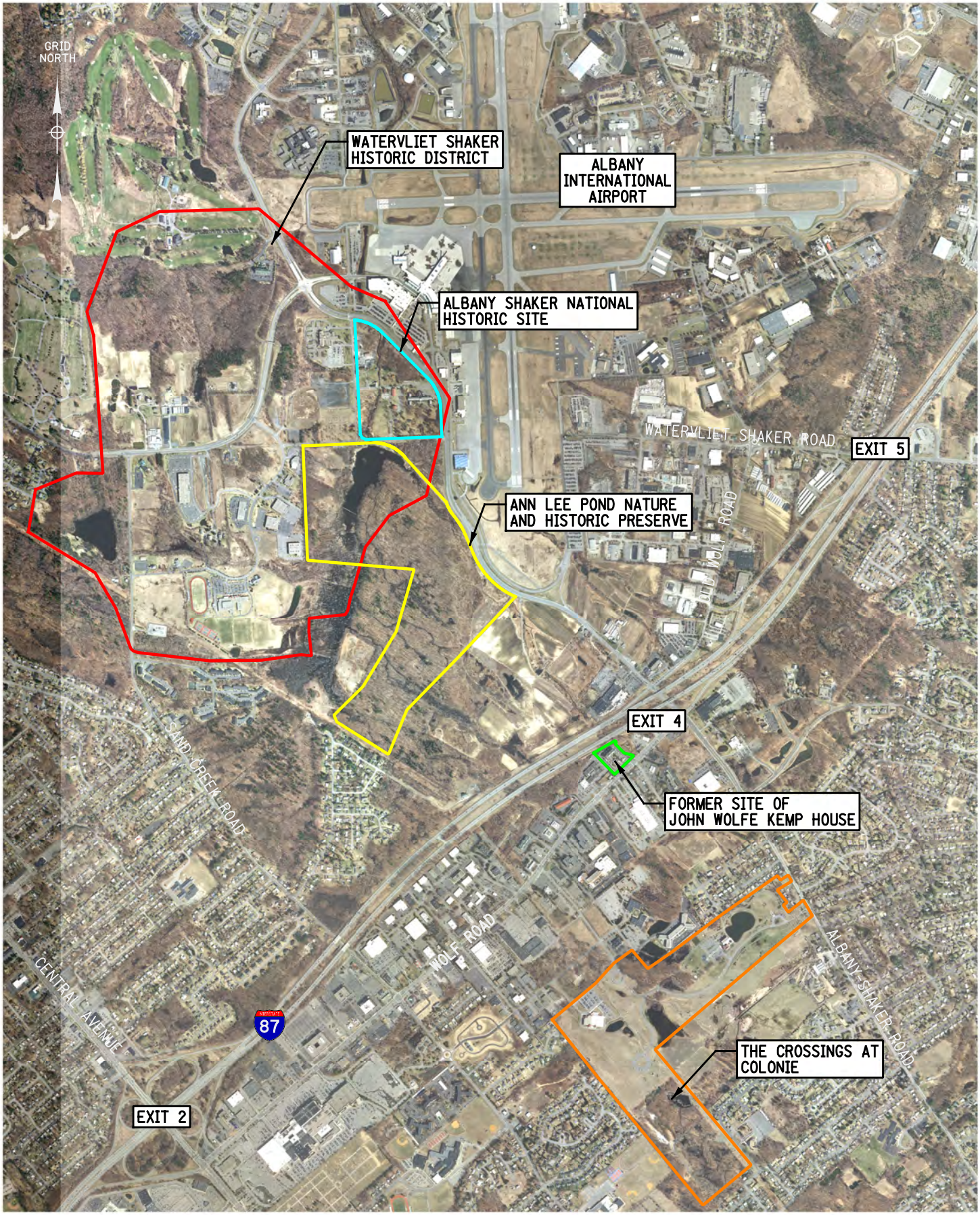

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HISTORIC AND SECTION 4(F) PROPERTY LOCATION MAP

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS IMPROVEMENTS

EXHIBIT

4.4.11 c

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majority of important information and research value of Loci 2, 3, and 4 has been recovered through the Site Examination; no further archaeological work is recommended for these Loci. Locus 1 produced a notable concentration of Native American artifacts including partial projectile points, chert bifaces, and fire-cracked rocks, in sufficient numbers to warrant the recommendation of Data Recovery if Locus 1 could not be avoided. The Diamond Alternative would avoid the Engel Farm Precontact Archaeological Site. The Flyover Alternative would affect the Engel Farm Site, by placement of embankment fill under the proposed flyover ramps.

A Phase IB Reconnaissance Survey was conducted at wetland mitigation site #13 in October 2013. The survey consisted of shovel testing at standard 50 ft intervals, surface collection, and artifact collection and cataloging and laboratory testing. No historic or pre-historic sites were identified as a result of this survey. An Addendum to the Phase I Archaeological Investigation Report has been prepared and was submitted to the NYS Office of Parks, Recreation and Historic Preservation and the Native American Tribes for review in October 2013. The State Historic Preservation Office (SHPO) concurred with the determination that there is no likelihood of intact archaeological deposits in this area. A copy of the October 2013 Addendum is included in Appendix H.

Copies of the Phase I and Phase II reports have also been provided to the Saint Regis Mohawk Tribe, Mohican Nation, and Delaware Tribe for review and comment. A Data Recovery Plan and draft Finding Document were developed and distributed to the SHPO and Native American Tribes in July 2013 for their review and comment, and a request for SHPO's concurrence with the Finding of Effect. Through this coordination process, it was determined that the Flyover Alternative results in Adverse Effects to the site and the final Finding Document was developed. SHPO and the Native American Tribes all concurred with the finding of Adverse Effect. The Finding Document recommends data recovery, which will include archaeological field work, reporting, artifact processing, analysis of floral and palynological remains, radiocarbon dating, public education and dissemination of the collected data. As requested during the coordination period, the archaeological collection will be offered first to the Mohican Nation for curation at their national museum in Wisconsin. If the collection is rejected by the museum, the collection will be offered to the New York State Museum, following state guidelines for Phase III data retrieval projects. The final data recovery program will be identified in a Memorandum of Agreement (MOA). A draft MOA has been developed by NYSDOT and FHWA and is included in Appendix H. The draft MOA reflects the current understanding of conditions and negotiations amount all Section 106 Consulting Parties. The draft MOA has not been reviewed or commented on by SHPO and the Native American Tribes yet. NYSDOT and FHWA anticipate minor adjustments to the draft MOA as Section 106 Consultation continues. Any adjustments will be included in the final version of the MOA.

Because the project is a federally funded action, the Department will be following the Section 106 Process of the National Historic Preservation Act. This ensures compliance with the NYSHPA Section 14.09 process.

Architectural Resources

The pre-reconnaissance survey identified fifteen historic sites within a 2 mile radius of the project area. However, only one historic site, the John Wolf Kemp House located at 216 Wolf Road (NR Number 90 NR 02778) was located within the project study area. The John Wolf Kemp House has since been demolished for the construction of a new hotel on Wolf Road. There are no other National Register eligible or listed architectural resources within the APE.

Section 110 of the National Historic Preservation Act addresses broad preservation responsibilities of federal agencies for their programs and properties under their ownership or control. However, the provision of Section 110 that most often applies to individual undertakings is the requirement for federal agencies to exercise a higher standard of care to minimize harm when their actions may adversely affect National Historic Landmarks. There are no National Historic Landmarks located with the APE, and Section 110 of the National Historic Preservation Act therefore does not apply.

Archaeological Resources

A Phase I archaeological survey was conducted to determine the presence of archaeological resources, and indicated that resources were found in the project vicinity. A copy of this conclusion from the survey is included in Appendix H. Of the six sites identified, five are avoidable. Should project work be proposed in close proximity to any of these sites, a clear avoidance and protection plan will be assembled to ensure preservation of these sites. The last site, the Engels Farm Precontact Archaeological Site is located within an agricultural field north of I-87. This site is represented by a cluster of artifacts and several other stray finds made during this survey and previous surveys outside of the Engels Farm Site. While these are not considered to be part of the site, they contribute to its interpretation and represent a continuum of Native American use of this portion of the Pine Bush.

A Phase I Archaeological Investigation Report has been prepared and submitted to the NYS Office of Parks, Recreation and Historic Preservation for review. A meeting was held on January 11, 2012 with a representative of the Stockbridge-Munsee Band of the Mohican Nation to review the project and visit the Engel Farm Precontact Archaeological Site. A copy of the Phase I Archaeological Investigation (see Appendix H) was also provided for their review. Project information and copies of cultural resource reports have also been provided to the Saint Regis Mohawk Tribe and the Delaware Tribe. Based on their review and recommendation, a Phase II Site Examination was conducted to determine the potential impacts to the Engels Farm pre-contact archaeological site.

The Phase II Site Examination was conducted at the Engel's Farm Site in June 2012 to redefine the vertical and horizontal limits of the site and make recommendations for eligibility for listing on the National Register of Historic Places. A Phase II Site Examination report was prepared to fully identify and evaluate potential impacts from the project. A copy of the Phase II Site Examination was provided to SHPO, the Saint Regis Mohawk Tribe, the Mohican Nation, and the Delaware Tribe for review and comment in November 2012. Additional coordination with SHPO and Native American Tribes will be required to explore measures to avoid, minimize or mitigate effects on the Engel's Farm Site, to determine if a Data Recovery effort will be necessary and to determine what mitigation measures will be appropriate.

A Phase IB Reconnaissance Survey was conducted at wetland mitigation site #13 in October 2013. A copy of the October 2013 Addendum and response from SHPO are included in Appendix H. No historic or pre-historic sites were identified as a result of this survey. An Addendum to the Phase I Archaeological Investigation Report has been prepared and was submitted to the NYS Office of Parks, Recreation and Historic Preservation and the Native American Tribes for review in October 2013. Based on their review and the determination that there is no likelihood of intact archaeological deposits in this area, no further work is recommended at this location.

Historic Bridges

There are two bridges located within the project's area of potential effect that are over 50 years old: the I-87 bridges over Albany-Shaker Road (BINs 1033141 and 1033142) were originally constructed in 1959. These bridges will be replaced as part of the proposed project. The bridges were included in the NYSDOT Historic Bridge Inventory and were determined to not be eligible for the National Register of Historic Places.

The NYSDOT Historic Bridge Inventory does not include historic determinations for any canal bridges in the state (there is a separate Canal Bridge Inventory).

Historic Parkways

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

Native American Involvement

The Phase I archaeological survey indicates that archaeological resources were found within the project's area of potential effect. A copy of this conclusion from the survey is included in Appendix H. A Phase II Site Examination report was prepared to fully identify and evaluate potential impacts from the project and recommends Phase III Data Recovery for the Engel's Farm Site. To satisfy Section 106 requirements, the proposed project will include consultation with Native American Tribes that may be affected, which include the Saint Regis Mohawk Tribe, the Mohican Nation, and the Delaware Tribe. Coordination with SHPO and the Native American Tribes has been ongoing. A draft Memorandum of Agreement (MOA) that will stipulate mitigation measures and data recovery has been developed by NYSDOT and FHWA. The draft MOA reflects the current understanding of conditions and negotiations amount all Section 106 Consulting Parties. The draft MOA has not been reviewed or commented on by SHPO and the Native American Tribes yet. NYSDOT and FHWA anticipate minor adjustments to the draft MOA as Section 106 Consultation continues. Any adjustments will be included in the final version of the MOA. A copy of the draft MOA is included in Appendix H.

The American Indian Religious Freedom Act does not apply to this project given the absence of any identified ceremonial site or sacred place.

The proposed project does not lie within Federal, Tribal, or Indian-owned property. The Archaeological Resources Protection Act of 1979 does not apply. Furthermore, conformance with this Act is covered in the Section 106 Process.

Section 4(f) Involvement

The Phase I archaeological survey identified one archaeological site, the Engels Farm Precontact Archaeological Site, within the project's area of potential effect. The site lies within the footprint of the Flyover Alternative. A draft Finding Document was developed and distributed to the SHPO and Native American Tribes for their review and comment with a request for SHPO's concurrence with the Finding of Effect. Through this coordination process, it was determined that the Flyover Alternative results in Adverse Effects to the site and the final Finding Document was developed. The proposed data recovery effort will include archaeological field work, reporting, artifact processing, analysis of floral and palynological remains, radiocarbon dating, public education and dissemination of the collected data. As requested during the coordination period, the archaeological collection will be offered first to the Mohican Nation for curation at their national museum in Wisconsin. If the collection is rejected by the museum, the collection will be offered to the New York State Museum, following state guidelines for Phase III data retrieval projects.

The Watervliet Shaker Historic District (NR Number 90 NR 02797) is listed in the National Register of Historic Places and is located adjacent to the western project limit at the intersection of Albany-Shaker Road and Meeting House Road. Based on the proposed work, there will be no project impacts within the historic district.

Exhibits 4.4.11 b and 4.4.11 c summarize the Section 4(f) properties and their location within the PSA.

4.4.12 Parks and Recreational Resources

State Heritage Area Program

The proposed project is located within a New York State Regional Heritage Area / Corridor along the Mohawk Valley. However, the proposed project will not impact areas identified as State Heritage Areas.

National Heritage Areas Program

The proposed project is located within the Hudson River Valley National Heritage Area. Specifically, the Albany Shaker Historic Site is located at 25 Meeting House Road adjacent to the northern project limit. However, the proposed project will not impact areas identified as National Heritage Areas.

National Registry of Natural Landmarks

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

Section 4(f) Involvement

The proposed project is located adjacent to Albany Shaker Historic Site on Meeting House Road and Ann Lee Pond Nature and Historic Preserve, a significant publicly owned park. However, the project will not result in any impacts to the park.

Section 6(f) Involvement

One site has been identified within the project's area of potential effect that has been partially or fully federally funded through the Land and Water Conservation Act. Albany County received development/redevelopment funds between 1986 and 1988 for improvements at Ann Lee Pond Nature and Historic Preserve. However, the project will not result in any 6(f) impacts to the preserve.

Section 1010 Involvement

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

4.4.13 Visual Resources

Introduction

The purpose of this visual impact assessment investigation is to assess the potential visual impacts resulting from the reconstruction of Exit 4 on Interstate 87 including reconstructed entering and exiting ramps, an overpass and intersections to connecting arterial roadways. The proposed project is located in the northern portion of Albany County within the Town of Colonie along Interstate 87 (the Northway), Wolf Road, and Albany-Shaker Road. Consideration of visual impacts is a required element of both NEPA (23 CFR 771) and SEQRA (7 NYCRR 15). Federal regulations also require that the project's effect on all Registered Natural Landmarks be determined (36 CFR 62). This visual impact assessment has been conducted in compliance with the FHWA's guidance in *Visual Impact Assessment for Highway Projects, 1981*, and the NYSDEC *Assessing and Mitigating Visual Impacts, DEP 00-2*.

Effects Assessment

The proposed project consists of reconfiguring Exit 4 on Interstate 87, in an effort to improve efficiency of motorists wishing to access Albany International Airport, various business parks, restaurants, and retail locations along Wolf Road, and the surrounding communities associated with Albany-Shaker Road. The proposed project has two alternatives, the Diamond Alternative, and the Flyover Alternative. The Diamond Alternative proposes a new intersection on Wolf Road at the existing Metro Park Road / Wolf Road intersection. The proposed intersection leads to an overpass and proposed entrance and exit ramps for both northbound and southbound Interstate 87 motorists. A new intersection to Albany-Shaker Road is also proposed approximately 1,000 feet west of Old Wolf Road. In this alternative all of the existing Exit 4 ramps will be removed. The second alternative, the Flyover Alternative proposes the addition of an intersection on Albany-Shaker Road approximately 1,000 feet West of Old Wolf Road, which connects to a proposed I-87 southbound entrance ramp and exit ramp and I-87 northbound exit ramp. The northbound exit ramp includes a "flyover" of Interstate 87 approximately 500 feet south of the

existing Exit 4 northbound exit to Wolf Road. In this alternative the existing Exit 4 southbound ramps will be removed.

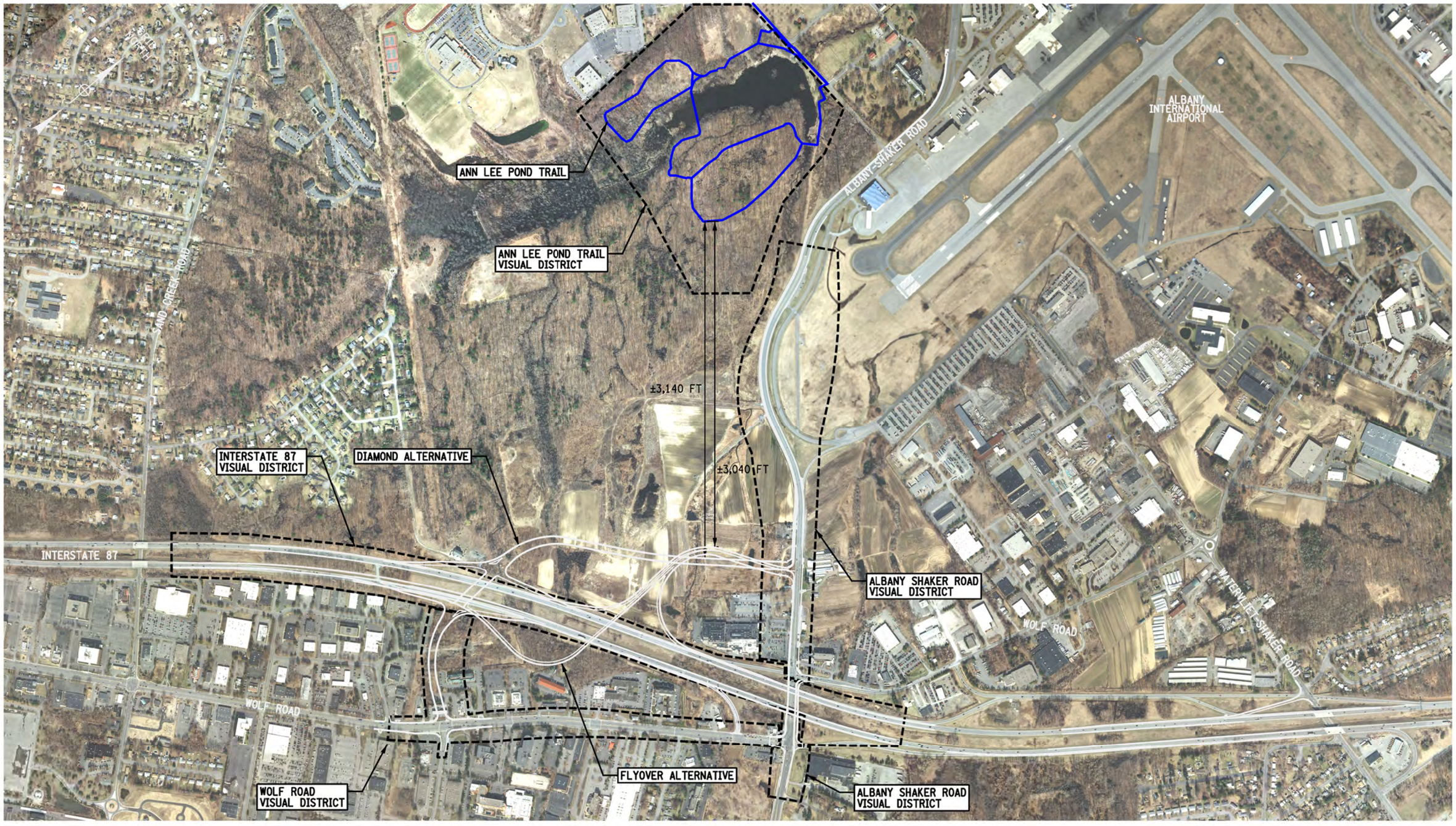
The project consists of four visual districts, or parts of a view-shed that have distinctly different visual or spatial characteristics (see Exhibit 4.4.13 a).

First Interstate 87, a low profile highway right-of-way with woodlands and grasslands directly adjacent to either side of the right-of-way creating a visual and audible buffer separating other regional uses. The visual character along Interstate 87 is three 12 foot lanes northbound and southbound with adjacent 8 foot paved shoulders and 20 foot wide drainage swales/snow storage along the outside. A center median of approximately 150 feet separates the northbound and southbound motorists. The total right-of-way width within the project site is approximately 350-400 feet wide. Motorists along Interstate 87 are focused on moving efficiently through various regions, minimal necessities are required and provided at exits; small buildings with little to no regional character, gas stations and chain restaurants. Occasionally larger facilities are visual to gather the basic needs in one location to add convenience. This creates minimal man made character to distract high speed motorists. This visual district simultaneously allows the natural land features to dominate the view-shed in rural and suburban areas such as the project site.

The project's second visual district includes Wolf Road, a relatively short arterial road of four twelve foot travel lanes, 2 in each direction, and a fifth central turn lane dedicated to accessing various business parks, shopping centers, restaurants, and other commercial facilities that accompany these districts. The visual character of Wolf Road consist of 5 motorists lanes, 2 snow storage shoulders of 5 feet wide each, a 3-5 foot lawn strip, and a 6 foot sidewalk on either side. Beyond the right-of-way, restaurant, office, and retail buildings are typically one to two stories set back from the road way with lawn and small landscape plantings between. Occasionally larger three to five story office buildings exist, which are set back further from the right-of-way. The majorities of buildings have parking and drive isles along the front and sides of the buildings which is visible to viewers within the district. The character of this district is commercial in nature with limited visual relief from buildings and signage.

The third visual district, Albany-Shaker Road, is an arterial roadway connecting various residential, commercial, office facilities within the Town of Colonie, and the main connection to Albany International Airport. Within the project site Albany-Shaker Road consists of two to six lanes of travel with an average of four for the majority of the visual district. In each travel direction two, 12 foot wide lanes and a 5 foot shoulder for snow storage along the edge of the road with an additional 20 feet of storm swale grass edge where possible. Albany-Shaker Road right-of-way differs from Wolf Road in that no continuous walks along the edge of the road exist to encourage alternate modes of transportation. Albany-Shaker Road's character is primarily composed of commercial buildings and the airport. The visual character of Albany-Shaker Road is less cluttered than Wolf Road, with occasional views of wooded areas and successional farm fields These views, along with the large horizontal expanse of the airport create a much more open and rural visual character along Albany-Shaker Road.

The fourth visual district is the Ann Lee Pond Trail; the trail is looped around Ann Lee Pond and within the surrounding dense woodlands and rolling meadowlands. The Ann Lee Pond Trail is entirely double track with varying surface materials of dirt and stone. The visual character of the Ann Lee Pond Trail is a natural peaceful setting, with many opportunities for people to view wildlife. The depth and density of the many buffers surrounding the trail create visual seclusion from non-trail distractions. The current vegetation within the area of the Ann Lee Pond Nature and Historic Preserve is a dense successional hardwood forest, containing mainly oaks, maples with scattered spruce and white pine, with a dense understory consisting of deciduous shrubs and herbaceous material. Along the eastern portion of the preserve, the vegetation along the trails becomes increasingly denser with a typical view depth of no more than 75 to 100 ft. Visual landmarks such as the Desmond, the Hotel Indigo, and I-87 are not visible due to the dense vegetation along the trail in the area which would be the closest to the proposed alternatives. In addition, the topography along the trail is a rolling with higher and lower spots. These variations in elevations are approximately 5 to 8 ft. in height and provide additional screening along this section of the trail. It should be noted that the trail system is approximately 1,000 feet from the nearest point of the proposed shared-use path on Albany-Shaker Road and approximately 3,500 linear feet from



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VISUAL DISTRICT MAP

INTERSTATE 87 (I-87) EXITS 3/4
ACCESS IMPROVEMENTS

EXHIBIT
4.4.13 a

DATE: 9/13

the proposed connector road / flyover ramp intersection with Albany-Shaker Road. The buffer between the proposed connector road / flyover ramp intersection and the trail system is shown on Exhibit 4.4.13 a. A map showing the location of the Ann Lee Pond Trail is included on Exhibit 4.4.13 c.

Visually the project includes many different user/viewer groups. The first viewer group consists of motorists traveling within the project boundary northbound and southbound on Interstate 87, or motorists traveling along Wolf Road and Albany-Shaker Road. A determination that motorists traveling northbound or southbound will be visually impacted in a similar manner, therefore for the basis of this investigation will be considered as one viewer group. Motorists traveling along Wolf Road and Albany-Shaker Road are visually impacted similarly to those traveling along Interstate 87, and therefore will be included in the same viewer group. Slight differences are occasionally noted between interstate motorists and arterial road motorists as well as between the two arterial road motorists. Those differences are considered minor but are noted where necessary. Pedestrian viewer groups visual impact concerns are quite different in various locations around the proposed site and as such have been divided into three user groups due to the nature of their intended use and focus. Bicyclists are similar to pedestrians in their visual impact concerns; however the differences are great enough to warrant different viewer groups. Bicyclists have also been divided into the same viewer groups as pedestrians based on intended use and focus. The viewer groups and the potential visual impact as determined by this investigation with a detailed justification follow.

Exhibit 4.4.13 b
Summary of View Groups and Potential Visual Impacts

Viewer Group	Potential Visual Impact
Motorists	Minimal due to duration, focus, and existing character
Pedestrians along arterial roads	Minimal due to duration, focus, and existing character
Pedestrians using Ann Lee Trial	Minimal due to location, and buffer
Pedestrians along proposed alignment	None, no pedestrian access presently
Bicyclists along arterial roads	Minimal due to duration and focus
Bicyclists along Ann Lee Trail	Minimal due to duration, location, and focus
Bicyclists along proposed alignment	None, no bicyclist access presently
Hotel Patrons/ Office/ Restaurant	Minimal due to the use of buildings and view of site

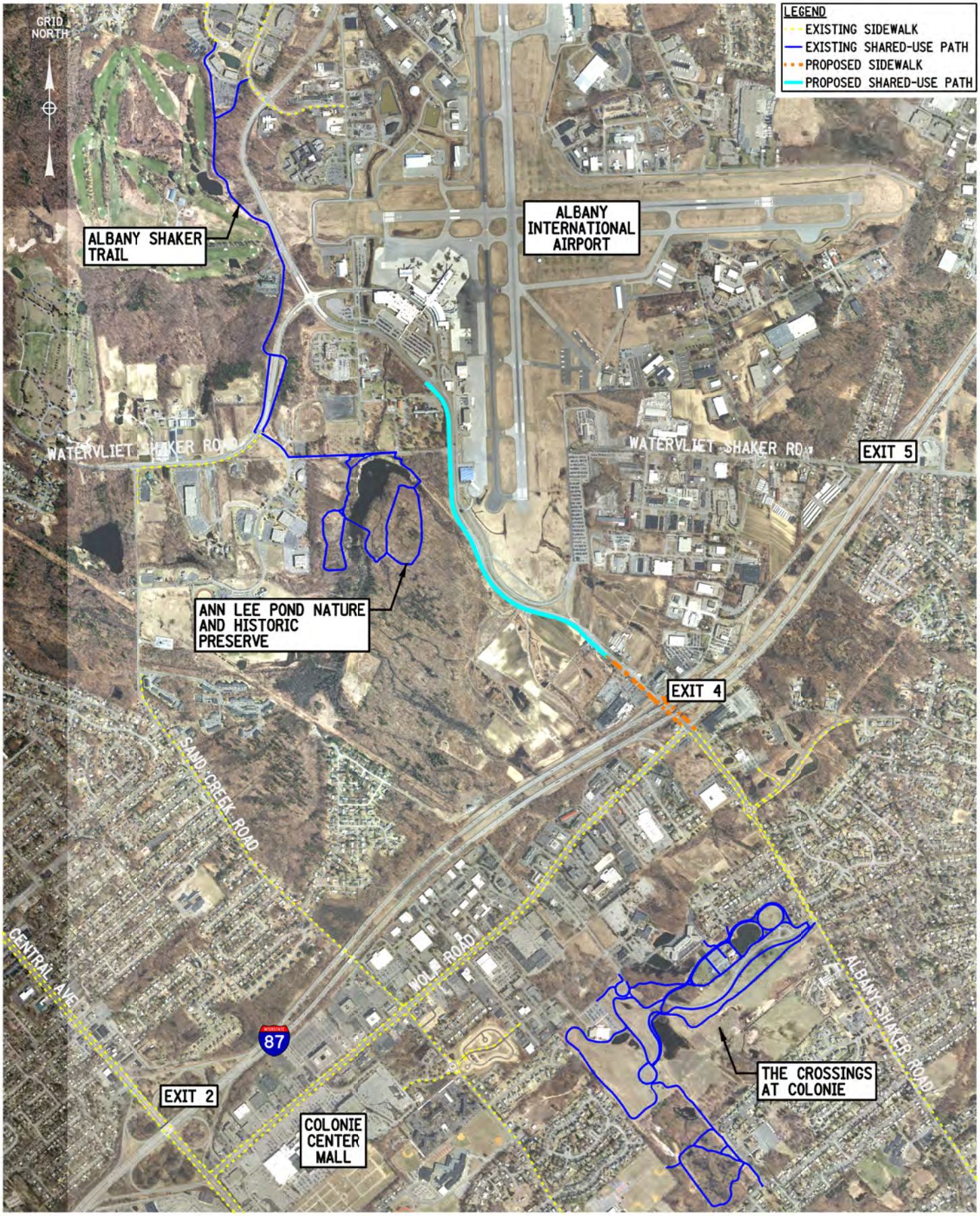
As described in Section 1.2.3., the purpose of the proposed project is to provide improved mobility within the Exit 4 area by improving access between I-87, the airport, and Wolf Road. Although improving the visual character is not one of the project goals, the potential visual impact of the project has been evaluated and is summarized by user/view group below.

Overall Visual Character

While the proposed alternatives have been evaluated based on viewer groups, the project will be a new feature in the landscape and has the ability to affect the visual character of the area as well as the individual viewer groups. The project is located in an interchange area where flyovers, bridges and ramps are common visual elements, both on the I-87 mainline as well as the surrounding collector roadway network. While being new elements within the visual landscape, the locations and context of the elements are not inconsistent with those that currently exist in the corridors and at those locations that would be expected. While the interchange features may be additions to the existing visual landscape they are not anticipated to alter the visual character significantly based on the expected elements and their visual perceptions when viewed.

Motorists

Currently there are two sub-viewer groups, interstate motorists, and arterial road motorists. Motorists driving northbound or southbound along Interstate 87 will have minimal visual impact from the proposed overpass or flyover ramp. The justification for minimal visual impact is the duration at which motorists will see the proposed work, due to the rate of travel, the visual similarity to other overpasses in the Capital



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PEDESTRIAN / BICYCLE ACCOMMODATIONS NETWORK

INTERSTATE 87 (I-87) EXIT 3/4 ACCESS IMPROVEMENTS

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Region along Interstate 87, and the focus of motorists as they drive past the additional overpass will be on the road in front of them and not the overpass itself. The same justification applies to the addition of entrance and exit ramps. The second sub-viewer group is motorists driving along Wolf Road and Albany-Shaker Road. Their determined visual impact will also be minimally impacted. The arterial road motorist's visual impact will be driving through an additional intersection or past an additional highway interchange along their respective roads. The impact to drivers along both Wolf Road and Albany-Shaker Road due to the proposed work will be minimal because of the duration in which drivers will pass through the additional intersections or highway interchanges will be minimal, the focus of these motorists while driving through the project site will be on the road in front of them or the destination along their respective road, and the additional intersection and highway interchanges fits the existing character of this area along the highway corridor. The addition of motorists on the new overpass does not exist at present, therefore has no visual impact from the proposed work.

Pedestrians

Pedestrians have been divided into three sub-viewer groups for this investigation, based on the three possible interactions with the proposed improvements. Pedestrians along Wolf Road are the first viewer group, they are minimal in volume, and their visual impact is also considered minimal. The duration in which pedestrians will be walking past the portion of the site that connects to Wolf Road is longer than a motorist, a minute rather than a matter of seconds; however the duration of their total trip that could be spent visually impacted by the proposed improvements is brief. The potential visual impact from the site will be an additional pedestrian cross walk that matches the existing character of Wolf Road. An additional crosswalk will have little additional negative visual impact on existing and future pedestrians, due to the many that exist now..

Pedestrians that use the Ann Lee Pond Trail, which is considered to have some level of recreational importance, have the potential of impact caused by the proposed work. The intended uses of a recreational trail; desired seclusion from motorized vehicles, non-natural distractions, and focus on the trail ahead are some of the elements that were considered when determining potential visual impacts. It should be noted that the existing trail currently located at the south eastern end of Albany International Airport's main runway. Pedestrians exercising along the Ann Lee Trail are not anticipated to be closer than approximately1,000 feet from the existing alignment of the Albany-Shaker Road Corridor. The proposed improvements are not anticipated to clear significant areas of existing vegetation or realign the improvements that would lead to a reduction in the buffer or reduction in the overall vegetative density or height. The existing trail is located approximately 3,500 linear feet to the southwest of the proposed intersection of the proposed connector road / flyover ramp and Albany-Shaker Road. The area between the connector road / flyover ramps and the Ann Lee Pond Trail consists of both mature deciduous forest with understory and successional fields. Views from the trail of the connector road / flyover ramps are anticipated to be of broken views of limited portions of the connector road / flyover ramps and interchange areas. The potential impact of views from the trail is not anticipated to be significant due to the density of the existing buffer, the distance from existing/proposed Albany-Shaker Road corridor and the distance (nearly a mile) from the connector road / flyover ramps.

The final Pedestrian sub-viewer group is the pedestrian group that will be able to walk from the Wolf Road/Albany-Shaker Road intersection utilizing the new pedestrian connection to the Albany International Airport entrance. Currently there are few pedestrians that utilize this area due to the lack of pedestrian facilities within the corridor. As a result of the project there may be an increase in the amount of pedestrians, however due the distance from the larger commercial areas located along Wolf Road the number of new pedestrians is anticipated to be minimal. The pedestrians that will utilize the facilities will have views of the airport runway and associated clear area as well as the proposed improvements that are proposed. In all cases the pedestrian experience is monotone with few areas of interest. The addition of the proposed improvements will not significantly alter the quality of the pedestrian viewshed along the Albany-Shaker Road corridor.

Exhibit 4.4.13 c shows the location of the existing and proposed pedestrian and bicycle accommodations within the PSA.

Bicyclists

Bicyclists have also been divided into the same three viewer groups as pedestrians based on the three possible interactions with the site. The minimal visual impact is similar for these three viewer groups along Wolf Road and Albany-Shaker Road, users of the Ann Lee Trail, and potential future users because of the proposed concepts. The only change in visual impact from pedestrians would be the proposed concepts encourage safer bicycle travel along Albany-Shaker Road. This change, however, has no visual impact and further would not cause a large increase in bicyclists along Albany-Shaker Road because the surrounding character and uses are not ideal for this mode of travel, therefore the visual impact on bicyclists would be minimal.

Hotel Patrons / Office / Restaurant

The final viewer group consists of hotel patrons, office building employees, and restaurant patrons. These viewers are combined together due to their intended focus and similarities in views around the site. It should be noted that within the project area, hotels and restaurants are generally faced on at least one side by the Northway and another by a major collector roadway (i.e. Wolf Road, Albany-Shaker Road, etc.) The greatest concern is for the hotel patrons, specifically the Desmond Hotel due to its proximity to the proposed flyover and ramp. Based on a review of the hotel layout this viewer group will be impacted minimally because the use of the rooms viewing the proposed clearing of vegetation to the south and east are conference and meeting rooms. On the western side of the facility, guest rooms currently have view of the of the cleared runway approach area associated with the Albany International Airport. It should be noted that while these rooms may have views to the proposed improvements, the market draw of the Desmond is the internal courtyard, restaurants and meeting rooms which focus patrons and guests attention and activities toward center of the building. This existing building design and use limit views of the outside areas toward the proposed improvements minimizing any potential impacts to this user group. The other viewers in this group, office building employees, and restaurant patrons, do not have existing site lines to the proposed clearing or overpass and will have minimal impacts in either of the proposed concepts. Based on the configuration of the existing hotels and restaurants in the project area this viewer group as a whole is not anticipated to be significantly impacted as a result of the proposed project.

Registered Natural Landmarks

There are no landmarks listed on the National Registry of Natural Landmarks within or near the project area that could be affected by the proposed project.

4.4.14 Farmlands

State Farmland and Agricultural Districts

Based on the initial review of the NYS Agricultural District Maps for Albany County, the proposed project appears to be located in a portion of NYS Agricultural District #3 (see Exhibits 4.4.14 a and 4.4.14 b). Verification of the limits of Agricultural District #3 with the New York State Department of Agriculture and Markets has indicated that the Albany County legislature removed a portion of the lands in the district south of Albany-Shaker Road in August 2011. Specifically, the property removed is known as the Engel Farm. Although there has been recent interest in developing the land to the north of Albany-Shaker Road, they remain in the Agricultural District at this time. The review of the NYS Agricultural District Maps for the area north of Albany-Shaker Road indicated that the project right-of-way and limit of disturbance do not encroach on the Agricultural District #3. Since the proposed project will not acquire more than one acre from an actively operated farm within any of the Agricultural Districts, or more than ten acres within any of the individual Agricultural Districts, the notification requirements of the NYS Agriculture and Markets Law do not apply.

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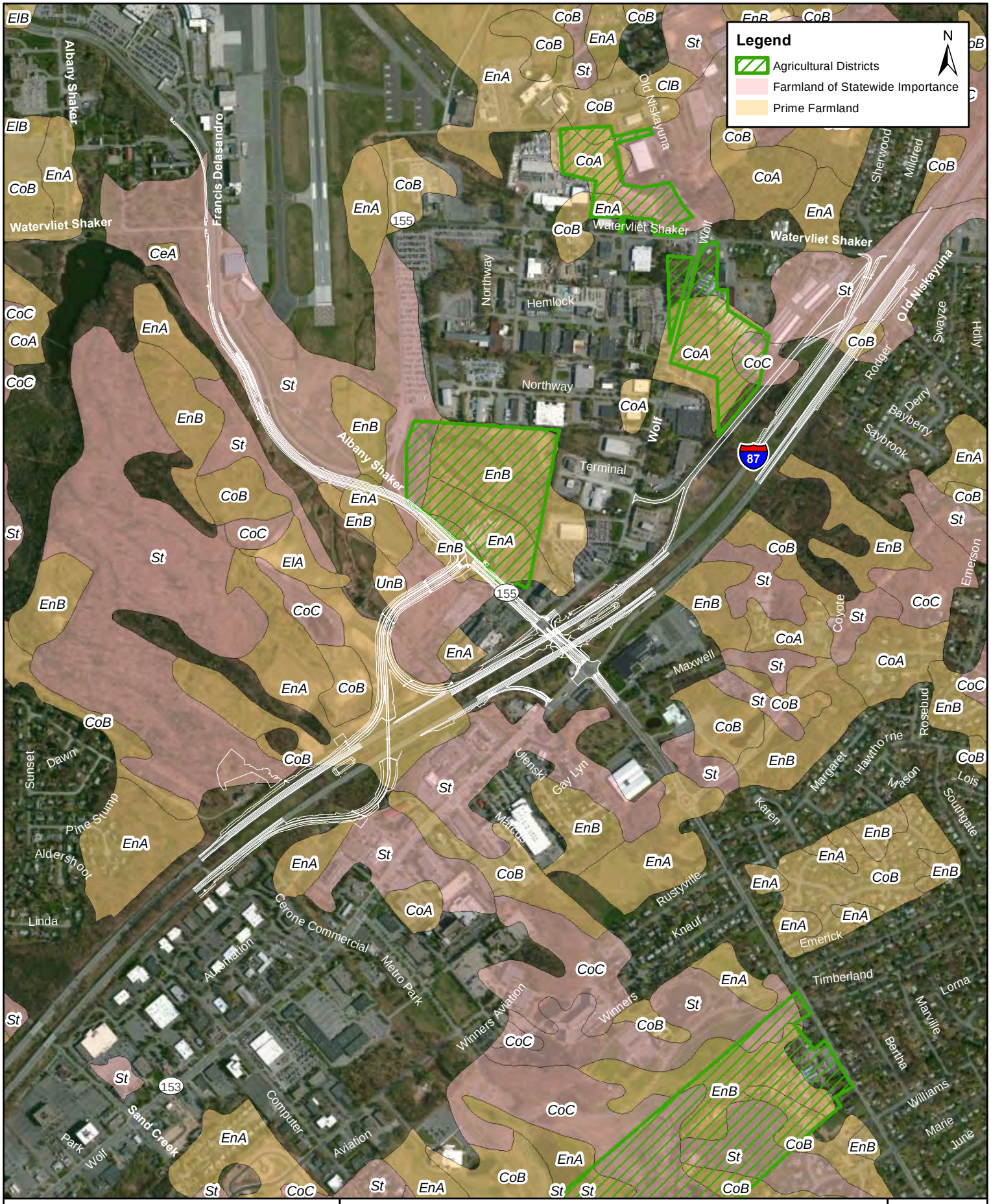
DIAMOND ALTERNATIVE
FARMLAND CLASSIFICATION

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT

4.4.14 A

Date: 10/2013



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FLYOVER ALTERNATIVE FARMLAND CLASSIFICATION

INTERSTATE 87 (I-87) EXIT 3/4
ACCESS IMPROVEMENTS

EXHIBIT
4.4.14 B

Date: 10/2013

Federal Prime and Unique Farmland

The limits of disturbance for the majority of this project occur within the existing ROW or previously disturbed lands with the exception of Albany-Shaker Road in the area of the proposed entrance to I-87and the southbound lanes of I-87. The review of soil survey data as it relates to farmland impacts was limited to this area.

Based on the review of the Albany County soil survey data there are soils identified as Prime farmland and Soils of Statewide Importance within the proposed area of disturbance for both alternatives (see Exhibits 4.4.14 a and 4.4.14 b). Prime farmland includes Elnora loamy fine sand (EnA and EnB) and Unadilla silt loam (UnB). Soils of Statewide Importance include Stafford loamy fine sand (St). These lands are owned by the Albany County Airport Authority and leased to area farmers.

The provisions of the Federal Farmland Protection Policy Act (7CFR Part 658) apply to the proposed project. The US Department of Agriculture Farmland Conversion Rating (Form AD-1006) was submitted to the Natural Resources Conservation Service (NRCS). The total ROW taking of all farmland for the Diamond Alternative is 21.9 acres with an additional 45.6 acres of indirect farmland impact. Of the total farmland to be converted for this option, 13.7 acres is Prime Farmland and 8.2 acres is Statewide Important Farmland. The total ROW taking of all farmland within an Agricultural District is 0.20 acres for the Diamond Alternative. The total ROW taking of all farmland for the Flyover Alternative is 15.2 acres. An additional 25.5 acres of farmland will be affected indirectly through the loss of access that would make the land viable. Of the total farmland to be converted to non-agricultural uses for this option, 9.7 acres is Prime Farmland and 5.5 acres is Statewide Important Farmland. The total ROW taking of all farmland within an Agricultural District is 0.08 acres for the Flyover Alternative. The lists of Prime and Unique Farmland, Farmland of Statewide Importance, and Form AD-1006 are included in Appendix B.

Originally form AD-1006 was prepared and submitted to the NRCS for the alternatives under consideration in March 2013. The NRCS completed their portions of the Farmland Conversion Impact Rating Form on April 2, 2013 for both the Diamond and the Flyover Alternatives. According to the NRCS, the conversion at that time represents less than 0.001% of farmland in Albany County. The remaining portions of the form were finalized at that time. As a result, the Diamond Alternative received 94 points and the Flyover Alternative received 106 points. Projects that receive less than 160 points do not require further evaluation. A copy of the form is included in Appendix B.

Since the forms were submitted in March 2013, both alternatives have been refined to avoid impacts to the Runway Protection Zone (RPZ) at Albany International Airport and to add wetland mitigation site #13 to the impacted area. New forms have not been completed and submitted to the NCRS for the revised alternatives. The refined alternatives represent approximately 20 additional acres of impact, and the new total will still represent less than 0.001% of farmland in Albany County. The change in acreage is not considered significant, and any change in point value will remain well below the threshold of 160 points for further evaluation.

4.4.15 Air Quality

Regulatory Framework

Transportation conformity is required under Clean Air Act section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with (‘‘conform to’’) the purpose of the State Implementation Plan (SIP). Conformity currently applies to areas that are designated nonattainment and those redesignated to attainment after 1990 (‘‘maintenance areas’’ with plans developed under Clean Air Act section 175A) for the following transportation- related criteria pollutants: Ozone, particulate matter (PM2.5 and PM10), carbon monoxide (CO), and nitrogen dioxide (NO2). Conformity to the purpose of the SIP means that transportation activities will not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the relevant national ambient air quality standards (NAAQS or ‘‘standards’’). EPA’s transportation conformity rule establishes the criteria and procedures for determining whether transportation activities conform to the SIP. EPA first

promulgated the transportation conformity rule on November 24, 1993 (58 FR 62188), and subsequently published several other amendments including the 2008, *Transportation Conformity Rule Amendments to Implement Provisions Contained in the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).*

The proposed project is in an area classified as a "Former Subpart 1" nonattainment under the 1997 8-Hr ozone standard (0.08 ppm). Under the 2008 8-hour ozone standard (0.07 ppm) the area was classified "attainment" effective July 20, 2012. It addition, it is anticipated that the conformity requirements under the 1997 ozone standard will be revoked, effective July 20, 2013, after which transportation conformity would no longer be an applicable regulatory requirement of this project. However, until then, under the requirements of the Clean Air Act Amendments of 1990 (CAAA90) it is required that the impact of certain transportation projects on air quality must be evaluated to determine if they conform to the purpose of the State Implementation Plan which is the attainment of the National Ambient Air Quality Standards (NAAQS). The transportation conformity regulation, "Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded, Developed or Approved Under Title 23 U.S.C or the Federal Transit Act" (40 CFR Parts 51 and 93), is used for conformity determinations. The project has been classified as a non-exempt project under these regulations.

Screening processes and air quality analyses were performed in accordance with the NYSDOT Air Quality and Project-Level PM Guidance in January 2012. These analyses include the following: screening-level assessments of microscale carbon monoxide (CO) and particulate matter (PM), and qualitative mesoscale assessments of mobile source air toxics (MSATs), Ozone (O_3), Hydrocarbons (HC, aka volatile organic compounds [VOCs]), and Nitrogen Oxides (NOx).

As part of the environmental processing for this project under the National Environmental Policy Act and the State Environmental Quality Review Act, public information meetings will be conducted to gather and address any concerns potentially affected parties may have. See Appendix E for public information meeting data.

Transportation Conformity

The proposed project has been studied by CDTC, and is listed as Project No. A240 in the 2010-2015 TIP. In accordance with the CAA Amendments of 1990, the proposed project has been assessed to determine if it conforms to the purpose of the SIP. It is included in the currently conforming Transportation Improvement Program (TIP) and Regional Transportation Plan. The conformity determination for CDTC's 2010-15 TIP and 2035 New Visions Plan containing this project was most recently approved by CDTC on September 15, 2011 and by FHWA / FTA on December 9, 2011. The *Final Conformity Regulations on Transportation Conformity (40 CFR, Parts 51 and 93)* published by USEPA on November 24, 1993 and effective January 31, 1994, has been used to ensure that the project addresses the conformity requirements.

The Capital District Transportation Committee (CDTC) is the designated Metropolitan Planning Organization (MPO) for the Capital District Transportation Management Area (TMA) which includes the metropolitan area of Albany, Rensselaer, Saratoga and Schenectady counties, with the exception of the Glens Falls urban area, which extends into northern Saratoga County. As the MPO, CDTC, in cooperation with the NYSDOT and the Capital District Transportation Authority (CDTA), is responsible for carrying out the continuing, comprehensive, coordinated transportation planning process for the Capital District region. Part of the planning responsibility is the maintenance of a long-range Regional Transportation Plan (RTP). CDTC's most recent RTP is called New Visions. Additionally, the Committee is responsible for maintaining short-range Transportation Improvement Programs (TIP's) for the metropolitan area's major highway and transit facilities.

Carbon Monoxide (CO) Microscale Analysis

Intersections impacted by a project with a build ETC, ETC+10, and ETC+20 level of service (LOS) of only A, B, or C, are generally excluded from microscale air quality analysis. Intersections within the project area exhibiting ETC, ETC +10 or ETC+20 build LOS D or worse are limited to the following intersections:

- Central Avenue & Wolf Road
- Sand Creek Road & Wolf Road
- Exit 5 Southbound & Watervliet-Shaker Road

Intersections with LOS D or worse are subject to the second set of screening criteria, below:

- 10% or more reduction in the source-receptor distance (that is, the straight line distance between the edge of the travel lane closest to the receptor and that point of the receptor closest to the roadway);
- 10% or more increase in traffic volume on affected roadways for ETC, ETC+10 or ETC+20;
- 10% or more increase in vehicle emissions for ETC, ETC+10 or ETC+20;
- Any increase in the number of queued lanes for ETC, ETC+10 or ETC+20; or
- 20% reduction in speed, when build estimated average speed is at 30 mph or less.

The intersection of Exit 5 Southbound Off-Ramp and Watervliet-Shaker Road is projected to have a 10% or more increase in traffic volume and requires further analysis, provided below. The two remaining intersections do not exceed any of the screening criteria thresholds and do not require further analysis.

Volume Threshold Analysis consists of utilizing the volumes anticipated along the highest approach to the intersection with information and tables found within the NYSDOT Environmental Procedures Manual (EPM). It analyzes the emissions anticipated against the volumes projected and determines if a volume threshold is exceeded to require modeling. Based on the analysis, the intersection of the Exit 5 Southbound Off-Ramp and Watervliet-Shaker Road does not exceed this volume threshold.

A quantitative air quality analysis for CO is not required since this project will not increase traffic volumes, reduce source-receptor distances by 10% or more, or change other existing conditions to such a degree as to jeopardize attainment of the National Ambient Air Quality Standards. The project does not require a project-level conformity determination.

Mesoscale Analysis

Mesoscale analysis is a methodology adopted for air quality effects when a project would significantly affect conditions over a large area (i.e. regionally significant). Mesoscale analysis (regional air quality) covers a geographic area that is larger than the immediate project area, but smaller than the entire network system.

The project proposes new or significant modifications to interchanges on access-controlled facilities (I-87), which could significantly affect traffic conditions over a large area. It is therefore appropriate to consider regional air quality effects of the project by way of a mesoscale analysis.

The mesoscale emission analysis was conducted according to the air quality guidance in Chapter 1.1 of the NYSDOT EPM. The analysis was done for VOC, CO, NOx, and Particulate Matter (PM 2.5 and PM 10). Peak hour emissions were estimated for all three pollutants based on the annual average daily traffic volume (AADT) and peak hourly speed for each segment of the affected roadways. This information resulted in a relative comparison of the project's effect on regional air quality.

Emission factors used in the mesoscale analysis were obtained from NYSDOT Mobile 6.2 Emission Factor Tables, and assumed default vehicle mix distribution for Albany, Rensselaer, Saratoga and Schenectady Counties (NYSDOT 2008). Emission factors supplied by these tables are based on the functional classification of each road studied, analysis year and vehicle speed. Emission factors for

VOCs and NOx are generated using the summertime conditions (month of July) for the evaluation, while CO emission factors are based on wintertime conditions (January). Particulate Matter emissions factors were obtained from the NYSDOT MOBILE6.2 PM Emission Factor Tables. Total emission levels are then obtained by multiplying the emission factors by total daily vehicle miles traveled.

The emission estimates for each alternative are based on the vehicle volume and speed for each segment of the roadway. Due to the proposed interchange improvements, traffic patterns for the surrounding roadways will be changed. Vehicle speeds will be improved on different segments depending on the build alternatives. Vehicle emissions from the affected roadways have been analyzed to study the project's relative impact on regional emissions.

The results for VOCs, NOx, and PM 10 indicate that increases of VMT in all three alternatives are offset by predicted improvements in emissions technologies sufficient to lower levels over the entire study period. CO and PM 2.5 levels decrease from ETC to ETC +10 due to technological improvements, however VMT increases from ETC+10 to ETC+20 outweigh any technological improvements from ETC+10 to ETC+20. The No-Build Alternative has the least amount of emissions for all three pollutants compared to the Diamond and Flyover Alternatives. This is due in most part to lower VMT in the No-Build Alternative due to traffic diversions and, in some cases, higher volumes for segments in the design alternatives. The increase in CO emissions between the No-Build Alternative and proposed design alternatives range from 7.1% to 8.6% for ETC and from 6.5% to 8.8% for ETC+20. The increase in VOC emissions is approximately 6.8% in both design alternatives for ETC and ranges between 4.5% to 5.6% for ETC+20. The increase in NOx emissions between the No-Build Alternative and proposed design alternatives range from 6.4% to 8.0% for ETC and from 4.4% to 7.1% for ETC+20. The increase in both PM 2.5 and PM 10 emissions between the No-Build Alternative and proposed design alternatives range from 7.8% to 11.1% for ETC and from 8.3% to 12.0% for ETC+20. The Diamond Alternative is projected to provide lower emissions than the Flyover Alternative. From the above regional emissions analysis, it can be concluded that the proposed project will not significantly increase regional emissions. All three alternatives will provide a decrease in emissions from ETC to ETC+20. Please see Appendix J for a complete table of mesoscale emissions.

Mobile Source Air Toxics (MSATs) Analysis

Mobile source air toxics (MSAT) are compounds emitted from highway vehicles and non-road equipment which are known or suspected to cause cancer or other serious health and environmental effects. Controlling air toxic emissions became a national priority with the passage of the CAAA90, whereby Congress mandated that the EPA regulate 188 air toxic compounds, of which a group of 93 compounds emitted from mobile sources that are of concern. Particularly relevant to vehicle travel are acrolein, benzene, 1, 3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

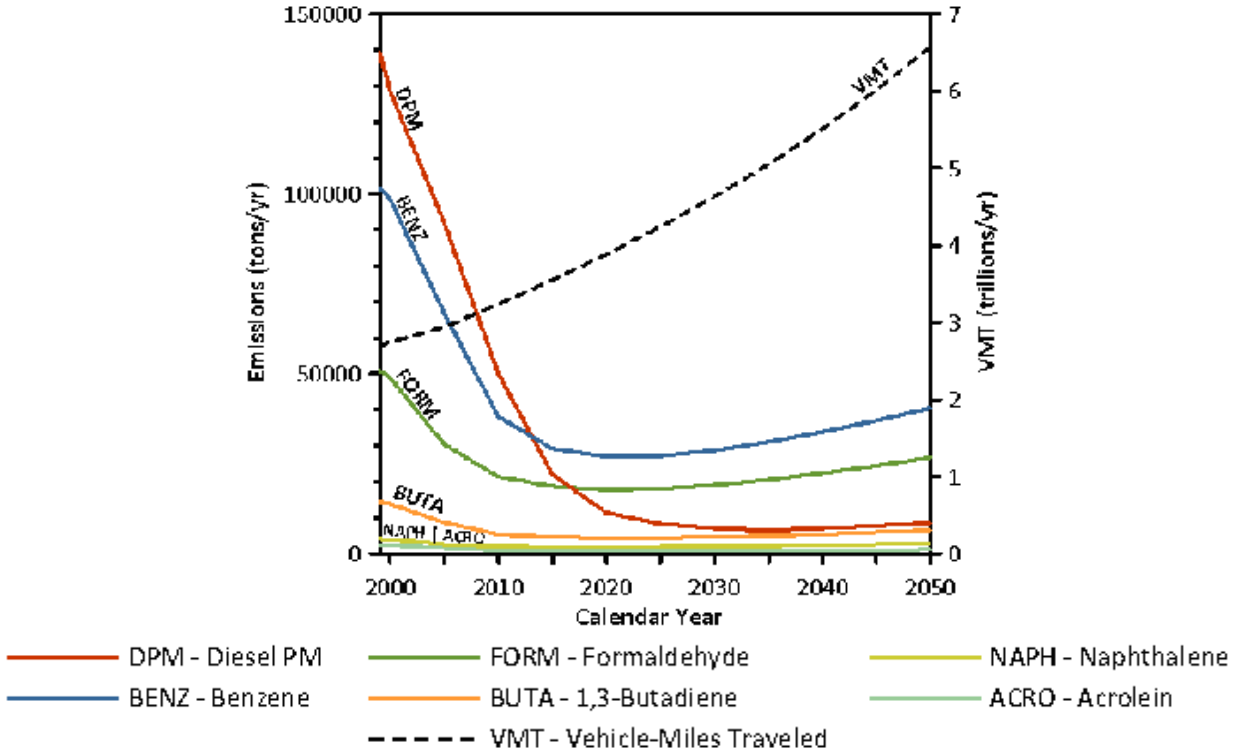
In 2006, FHWA issued guidance for analysis of MSATs from highway projects, and it updated this guidance in 2009 and 2012. A three tiered approach is used for analyzing MSAT in NEPA documents, depending on specific project circumstances:

- No analysis for projects with no potential for meaningful MSAT effects;
- Qualitative analysis for projects with low potential MSAT effects; or
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The second category of projects includes those that serve to improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects. Most highway projects that need an MSAT assessment fall into this category. Based on the example projects defined in the FHWA guidance "Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents" (updated December 6, 2012), the CSSTP-007-00(694), CSMSL-0006-00(293) and CSSTP-0006-00(877) projects would be classified as projects with Low Potential MSAT Effects. Thus, a qualitative analysis is appropriate.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Exhibit 4.4.15 a.

Exhibit 4.4.15 a
National MSAT Emission Trends (1999 – 2050) for
Vehicles Operating on Roadways Using EPA's MOBILE6.2 Model



Note:
(1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
(2) (2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors
Source: U.S. Environmental Protection Agency. MOBILE6.2 Model run 20 August 2009.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives.

For each alternative assessed, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Because the VMT estimated for the No Build Alternative is slightly lower than for any of the Build Alternatives, higher levels of MSAT could be expected from any of the Build Alternatives compared to the No Build. Exhibit 4.4.15 b below, summarizes the forecasted No-Build and Build Alternative VMT proximate to the project. For additional information concerning traffic and VMT, please refer to Appendix J. In addition, because the estimated VMT under each of the Build Alternatives are nearly the same, varying by less than 2 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely

be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent from 1999 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Exhibit 4.4.15 b
Vehicle Miles Traveled Summary

VMT		Year		
		2016	2026	2036
Alternative	No Build	444,685	459,667	467,906
	Diamond	478,343	489,412	500,235
	Flyover	482,171	497,864	508,720

Particulate Matter (PM) Analysis

This project has not been classified as a NEPA Categorical Exclusion or a SEQR Type II Action, but has been determined to result in no increased diesel truck volumes in the project area. The project actions do not individually or cumulatively have a significant effect on PM emissions. It can therefore be concluded that the project will have no significant adverse impact on ambient PM levels. However, the effects of the proposed alternatives on PM levels was considered in the Mesoscale analysis above.

Construction Impact

During construction, temporary air quality impacts will be minimized to the maximum extent practicable. Construction activities can temporarily degrade air quality by way of dust generation due to movement of soil, particulate emissions associated with construction equipment operating with diesel fuel, increased emissions from construction worker vehicles or traffic diversions and detours.

Airborne dust levels will be controlled through wetting of soil surfaces, covering of trucks and other dust sources. These requirements will be included as part of the specifications of the construction contract.

This project will not have any significant traffic diversions or detours.

Greenhouse Gas Analysis

Climate change is an important national and global issue, and many efforts are underway to reduce the emission of anthropogenic (manmade) greenhouse gases that contribute to the warming. The Transportation section is worthy of consideration in this regard because it is the second largest source of total greenhouse gases (GHG) in the U.S., representing somewhere between 31 and 35% of anthropogenic CO2 emissions. In 2004, the transportation sector was responsible for 31% of all U.S. CO2 emissions. It is also worthy to note that the United States is leading the world in reducing its CO2 emissions, and it’s doing so by a wide margin. This is according to both the International Energy Agency (IEA) in Paris and the Energy Information Administration in Washington. According to the IEA, the reasons for this bid reduction were: lower oil use, the economic downturn, and a substantial shift from coal to natural gas in the power sector.

Because climate change is a global issue and the emissions changes due to project alternatives are very small compared to global totals, FHWA does not require GHG emissions analyses for most transportation projects. However, to meet New York State Energy Plan goals and associated New York State guidance, total tons of carbon emitted under each alternative are presented in Section 4.4.16, Energy, below.

4.4.16 Energy

Introduction

Federal Highway Administration 1987 guidelines for preparing environmental impact statements require quantifying direct and indirect energy consumption due to a highway project. The State Energy Plan, adopted in 2002, calls for the State's transportation sector to be more energy efficient and sets goals for reducing consumption. Accordingly, the potential energy effects of the reconstruction and operation of I-87 Exit 4 are compared to taking no action (the No-Build alternative).

Because the Build alternatives will increase operating speeds and change travel patterns along the project corridor, the proposed project has the potential to affect energy consumption. Both the potential direct and indirect energy impacts of the proposed project are analyzed based on guidance and procedures for estimating the energy impacts from construction and operation of transportation projects.

Methodology

The Exit 4 Access Improvements Energy Analysis is based on NYSDOT's *Draft Energy Analysis Guidelines for Project-Level Analysis*, dated November 2003. The energy analysis addresses two elements: direct and indirect energy consumption. Direct energy refers to the fuel consumed by vehicles using the highway facility. Indirect energy refers to energy associated with construction and operation of the facility.

<u>Direct Energy</u>
Direct energy impact is the energy consumed by vehicles using a facility based on vehicular volumes, weight and average travel speeds. The direct energy analysis uses the Urban Fuel Consumption Method (UFCM) for light duty vehicles and medium and heavy trucks described in NYSDOT's energy analysis guidelines. Input assumptions for the analysis include:

- Vehicle volumes are derived for each facility segment, producing vehicle miles of travel (VMT) per link.
- Vehicle weights are based on vehicle classifications which are used to identify fuel consumption rates.

For this analysis, VMTs were determined as a result of finding the measures of effectiveness from traffic microsimulation models. These VMTs are inclusive of the entire project study area, which includes I-87, Wolf Road, Albany-Shaker Road, Watervliet-Shaker Road and other local roads. Since AM and PM peak hour microsimulation models were used for the traffic analysis, the VMTs used to calculate the direct energy consumption are the sum of the AM and PM peak hour VMTs.

Based on an average vehicle weight, and average speed for each link and time period, the fuel consumption rates for light duty vehicles and medium and heavy trucks were determined using values provided in NYSDOT's *Draft Energy Analysis Guidelines*, which adjusts 1980 base year factors for No-Build and Build conditions.

To estimate the total corridor fuel use for No-Build and Build conditions for the morning and evening weekday peak hours, VMTs by link were multiplied by their corresponding fuel consumption rate and summed. The peak hour results were then factored using 24-hour ATR counts to get daily fuel use, even though the higher off-peak travel speeds would reduce actual fuel usage slightly. The daily usage was multiplied by 350 to estimate annual fuel use. This multiplier accounts for the difference in traffic volume on weekends versus average weekday usage.

<u>Indirect Energy</u>
The remaining energy impacts are the indirect energy associated with constructing, operating and maintaining the roadway network. The indirect energy analysis was conducted using the Input-Output Approach in NYSDOT's *Draft Energy Analysis Guidelines for Project-Level Analysis*. Maintenance

Energy is based on the lane-miles of pavement type for a facility. The indirect energy analysis is focused on the differences in the energy consumed due to construction between the No-Build and the Build alternatives. Construction energy covers production and transport of materials, powering on-site equipment, worker transportation and other factors plus the materials used in construction itself.

The total Indirect Vehicle Energy Consumption is the sum of maintenance and construction energy consumption.

Construction Energy

The energy consumption related to construction activities was calculated using the Input-Output Approach. Using the estimated cost of construction for the Build Alternatives and tables from NYSDOT that provide cost index and construction energy factors, the total construction energy was estimated. For the No-Build alternative it is assumed that the I-87 bridges over Albany-Shaker Road would need to be replaced within the 20 years study period. To incorporate this construction work into the energy analysis a $12 million construction cost was included for the No-Build alternative.

Energy Required for Roadway Maintenance

The energy required to operate and maintain each alternative is based on the energy consumed for roadway maintenance (patching, crack sealing, lighting, landscape maintenance, etc.) based on the total lane-miles for each alternative. Annual energy consumption for maintenance per lane mile is provided in the guidance document. It is assumed that the No-Build Alternative would require 5% more in annual maintenance than the build alternatives.

Energy Analysis

The greenhouse gas emissions related to Direct Vehicle Energy Consumption were determined using the combustion coefficient for motor vehicle fuel because these emissions are related to motor vehicles using the facility. The same methodology was used to determine the greenhouse gas emissions related to Indirect Vehicle Energy Consumption. Since Indirect Vehicle Energy Consumption is related to construction and maintenance vehicles, a combustion coefficient for diesel fuel was used. In both cases, the coefficients were used to calculate the total tons of carbon emitted as a result of the energy consumed.

The total annual energy consumption for each alternative is shown in Exhibit 4.4.16 a.

Exhibit 4.4.16 a
Annual Energy Consumption (in Billions BTU)

	No-Build	Diamond	Flyover
Direct Energy			
Autos	21.43	22.66	21.94
Medium Trucks	0.84	0.92	0.87
Heavy Trucks	0.39	0.43	0.40
Sub-total	**22.66**	**24.01**	**23.22**
Indirect Energy			
Construction	13.06	44.22	31.50
Maintenance	67.54	77.58	53.56
Sub-total	**80.61**	**121.79**	**85.07**
TOTAL	**103.27**	**145.80 (+41.1%)**	**108.29 (+4.9%)**

The Diamond Alternative requires the largest amount of both direct and indirect energy. This is due to several factors. The Diamond Alternative requires the construction of four new ramps and a new connector road, as well as reconstruction of 3,900 feet of I-87, which results in the construction cost of the

Diamond Alternative being significantly higher than the Flyover Alternative, therefore increasing its construction energy. Also, the VMTs for the Diamond Alternative are slightly higher than the Flyover Alternative, resulting in higher direct energy consumption for the Diamond Alternative. This is related to the slightly longer distance being traveled to Albany International Airport from I-87 southbound in the Diamond Alternative as opposed to the Flyover Alternative, which locates the Exit 4 ramps closer to the current location of the interchange.

Although the results of this analysis show that the Flyover alternative also has an energy consumption 4.9% greater than the No-Build, the analysis does not take into account the reduction in travel time that would be gained by the build alternatives. As discussed in Section 3.3.1.5 the Flyover Alternative and the Diamond Alternative are expected to reduce travel times for major routes by 25% and 20%, respectively, compared to the No-Build Alternative. The reduced travel times are a result of reduced delay at intersections. The reduced delay, which is not considered in the direct energy analysis methodology, results in a greater direct energy consumption for the No-Build Alternative. Consequently, the difference in energy consumption between the No-Build Alternative and the build alternatives is actually less than that reported in Exhibit 4.4.16 a.

The total greenhouse gas emissions for each alternative are shown in Exhibit 4.4.16 b.

Exhibit 4.4.16 b
Greenhouse Gas Emissions (in tons of Carbon)

	No-Build	**Diamond**	**Flyover**
Direct Energy			
Autos	452.2	478.2	463.0
Medium Trucks	17.8	19.3	18.5
Heavy Trucks	8.4	9.3	8.7
Sub-total	**478.4**	**506.8**	**490.2**
Indirect Energy			
Sub-total	**1754.4**	**2650.8**	**1851.5**
TOTAL	**2232.8**	**3157.6 (41.4%)**	**2341.7 (4.9%)**

Similar to the energy consumption analysis the greenhouse gas emissions analysis results in the Diamond Alternative having the largest amount of greenhouse gas emissions and the Flyover Alternative having a slightly higher greenhouse gas emission than the No-Build Alternative. This can be attributed to many of the same factors described above.

Mitigation Summary

The proposed build alternatives require a substantial one time energy expenditure related to construction materials, operations and equipment. The Diamond Alternative also requires maintenance of additional lane-miles versus the Flyover Alternative. Weighing this increased energy consumption against the improved operating efficiency of vehicles in the Exit 4 area results in an increase in the total direct carbon emissions (and therefore CO_2 emissions), as compared to the No-Build Alternative. The results indicate that the Diamond Alternative will have an increase in emissions when compared to the No-Build Alternative, while the difference between the No-Build Alternative and the Flyover Alternative is too small to indicate that one is more energy efficient than the other. The increase in energy consumption and emissions, along with the reasons listed in Section 3.2.1 of this report, has resulted in dismissal of the Diamond Alternative from further consideration as a feasible alternative.

4.4.17 Noise

A noise study was conducted to assess the impacts of both traffic generated noise and construction noise which may be expected to occur as a result of the proposed project. The procedures followed for this analysis are in accordance with the Federal-Aid Program Guide, 23 CFR 772, Procedures for Abatement

of Highway Traffic Noise and Construction Noise, and the NYSDOT Noise Analysis Policy. A *Noise Study Report* is included in this document as Appendix I. Refer to Exhibit 4.4.17 f for a summary of the Traffic Noise Levels.

The proposed project is categorized as a Type I project based on the following criteria included in the FHWA "Highway Traffic Noise Policy and Guidance" issued in July 2010 (revised January 2011).

- The construction of a highway on a new location
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange

Regulatory Framework and Guidance

Noise is defined as unwanted or excessive sound, and can interfere with sleep, work, relaxation, and/or recreation. The extent to which noise interferes with daily activities is based on noise duration, loudness, noise frequency, time of day, and personal preferences. Overall, noise can affect the quality of life.

Highway traffic is a dominant source of noise in urban and rural environments, and has been identified as an environmental issue of concern by local, state, and federal officials. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher travel speeds, and greater numbers of trucks. In contrast, terrain, vegetation, and natural/manmade obstacles can reduce traffic noise levels. Three specific attributes are significant in the study of the amount and the nature of such noise:

- The frequency distribution of the noise
- The intensity of the noise
- The time varying pattern of the noise

The equivalent sound level (L_{eq}) descriptor was developed to account for fluctuations (time varying pattern) in noise levels (intensity). The Leq descriptor is used to convert all of the sound energy over a selected period of time into one equivalent noise level. Although the human ear is sensitive to a large range of frequencies, the typical frequency range of hearing is from 20 to 10,000 Hz, human hearing is not equally sensitive along this range of frequencies. It is more sensitive to sound in the higher frequencies than to sounds in the lower frequencies. The A-scale weighting network has been devised to measure noise in a way that closely resembles human hearing. Through the A-scale network, a noise level meter electronically adjusts some of the higher, middle, and lower frequencies when noise is measured, placing a greater emphasis on the middle to high frequencies. Thus, noise levels described in this study are presented as equivalent sound levels measured in A-scaled decibels, Leq (dBA).

In response to the issues associated with highway traffic noise, the Federal Highway Administration (FHWA) developed a highway noise regulation as required by the Federal-Aid Highway Act of 1970 (Public Law 91-605, 84 Stat. 1713). The noise regulation, "Procedures for Abatement of Highway Traffic Noise and Construction Noise" (23 CFR 772), requires highway agencies, such as the NYSDOT, to investigate traffic noise impacts in areas adjacent to all Federal or Federal-aid highway projects authorized under Title 23, and consider abatement if the agency identifies impacts. The noise regulation also requires highway agencies to maintain written statewide noise policies. Noise policies specify how each highway agency will implement the noise regulation, and must be approved by FHWA.

On July 13, 2010, FHWA issued a final rule to amend their noise regulation. The 2010 final rule required highway agencies to revise their current noise policies to demonstrate compliance with the amended noise regulation, obtain FHWA approval of the revised noise policies, and implement the policies by July 13, 2011. NYSDOT's noise policy meets the requirements of the final rulemaking and has received FHWA approval.

Methodology

A noise analysis was performed in accordance with 23 CFR Part 772 with guidance from *The Environmental Manual*, NYSDOT, 2010, Chapter 4.4.18 - *Noise Analysis Policy and Procedures.* All noise predictions made in this study utilized the prediction model conforming to that in the FHWA Traffic Noise Model (TNM) Report No. FHWA-PD-96-010, 23 CFR, Part 772.17(a) Traffic Noise Prediction. Analysis required by this standard must use the FHWA TNM. The FHWA TNM represents the most up-to-date noise prediction model.

The first step in a noise analysis is to identify the areas and associated activities (i.e., land uses) that will potentially be affected by highway noise. The areas on both sides of the entire length of the proposed highway project were considered. All land uses fall under one of seven Activity Categories (A - G) defined in 23 CFR 722. A noise impact may occur if a noise level approaches or exceeds the FHWA Noise Abatement Criteria (NAC). “Approaches” is defined as being within 1 dBA of the NAC. The NAC, specific to each Activity Category, is defined as the noise level where there may be noise impacts that require consideration of mitigation. The seven Activity Categories along with their respective descriptions and NACs are provided in Exhibit 4.4.17 a.

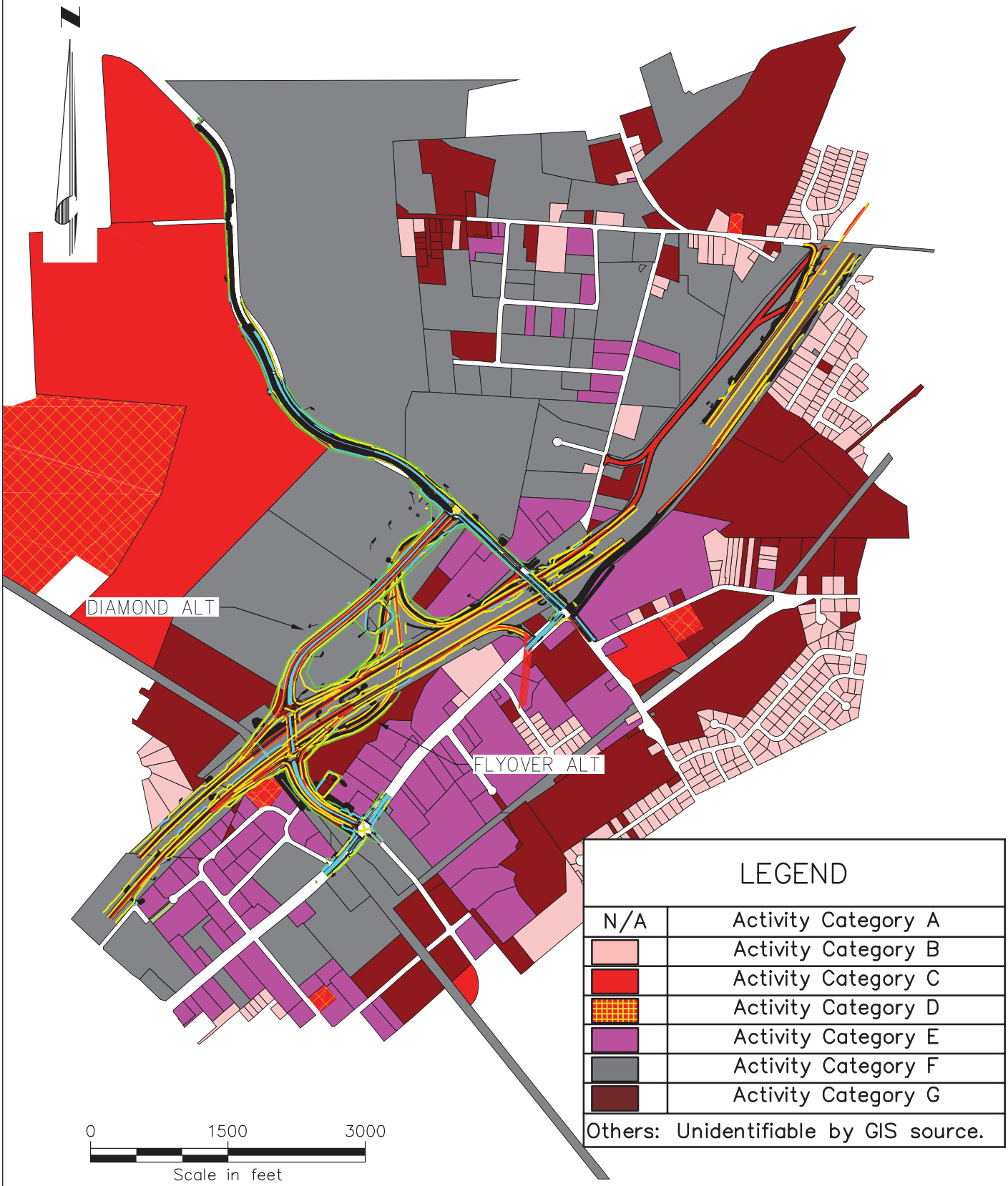
Impacts to receptors can also occur when the projected noise levels substantially exceed the existing noise levels in an area. NYSDOT Noise Analysis Policy and Procedures defines a substantial increase as an increase of 6 dBA over existing levels. Noise abatement measures must be examined and evaluated for all areas where traffic noise impacts are determined to occur.

Exhibit 4.4.17 a Noise Abatement Criteria				
Activity Category	**Noise Abatement Criteria[1,2]**		**Evaluation Location**	**Activity Category Description**
	L_{eq}(h) dBA	**L10(h) dBA**		
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential
C[3]	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in A-D or F.
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

1 Either L_{eq}(h) or L10(h) (but not both) may be used on a project.
2 The L_{eq}(h) and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
3 Includes undeveloped lands permitted for this Activity Category.

Existing Conditions

The existing land uses in the vicinity of the project are described in Section 2.3.4.1 of this document. The Land Use Activity Category Map (Exhibit 4.4.17 b) was created by utilizing GIS data provided by Village of Colonie and Town of Colonie GIS Departments and refined using further investigation of specific sites. Properties located proximate to the proposed project include Activity Categories B, C/D, E, F and G. properties. Six locations were identified for field noise measurements (Receiver Nos. 1 – 6). These measurements are used to validate predicted noise levels through comparison between measured and predicted levels. Additional receptor locations were subsequently included in the TNM models to account for nearby receptors and outdoor use areas. A map of receiver locations is included as Exhibit 4.4.17 c. A complete description of properties selected for noise measurement is included in Exhibit 4.4.17 d .



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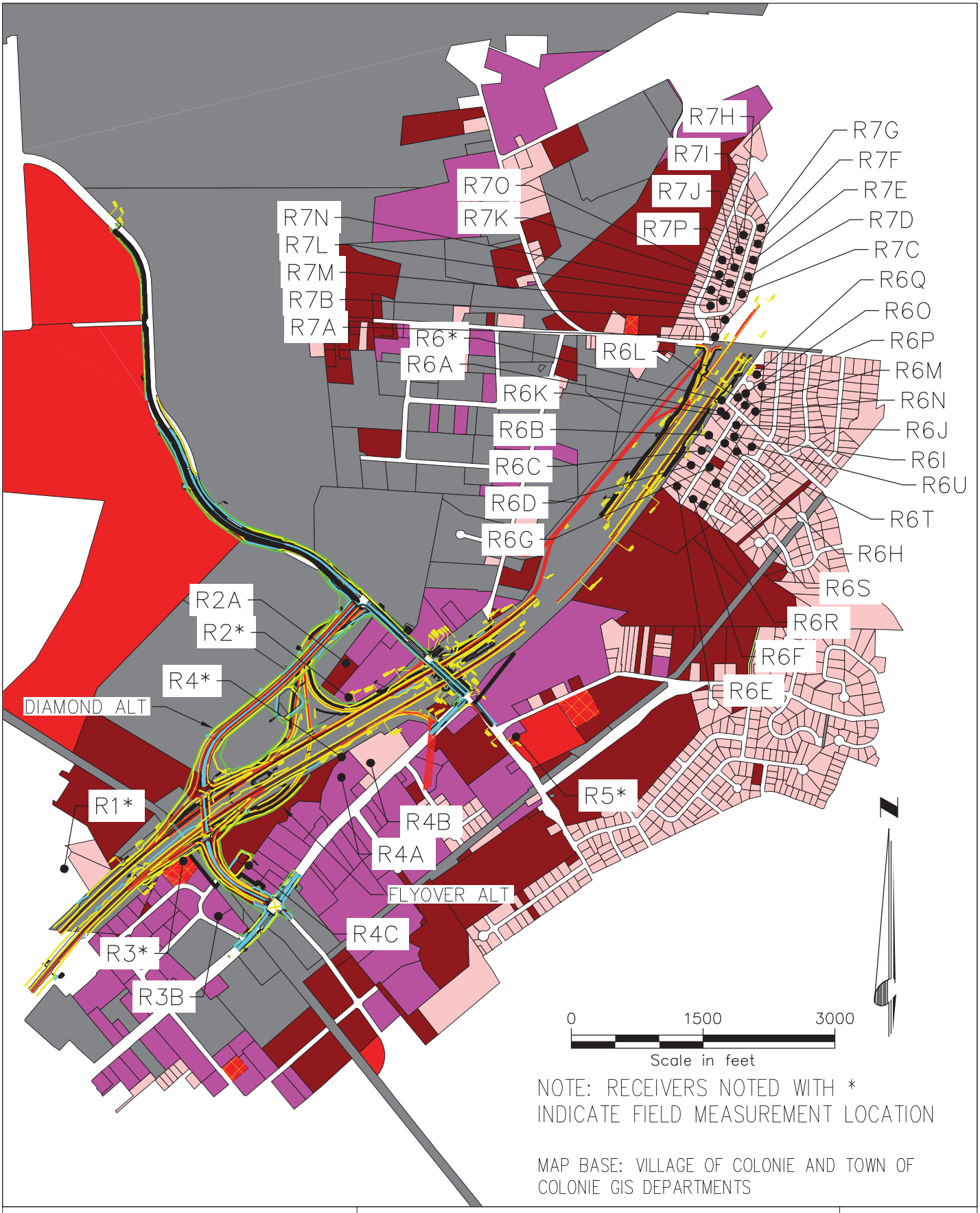
LAND USE
ACTIVITY
CATEGORY MAP

INTERSTATE 87 (I-87) EXIT 3 / 4
ACCESS IMPROVEMENTS

EXHIBIT

4.4.17 b

DATE: 1/12



NOTE: RECEIVERS NOTED WITH * INDICATE FIELD MEASUREMENT LOCATION

MAP BASE: VILLAGE OF COLONIE AND TOWN OF COLONIE GIS DEPARTMENTS

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RECEIVER LOCATION PLAN

INTERSTATE 87 (I-87) EXIT 3 / 4 ACCESS IMPROVEMENTS

EXHIBIT

4.4.17 c

DATE: 1/12

Exhibit 4.4.17 d Measurement Receiver Descriptions		
Identification	**Activity Category**	**Description**
R1	B	Residence along Aldershoot Rd. Rear yard
R2	E*	The Desmond Hotel and Conference Center, Not outdoor use area. Measurement location and model verification only, see R2A for outdoor use area.
R3	D	Mc Ginnis Women's Medical Center, measurement location. No Outdoor Use Areas. Use Interior Noise Level for Effects Assessment.
R4	E*	Best Western Parking Lot, measurement location, not outdoor use area. See R4A - R4C for nearby hotel outdoor use areas.
R5	C	Library on Albany-Shaker Road , measurement location
R6	B*	Residences along old Niskayuna, measurement location, not outdoor use area. See R6A-R6L for outdoor use areas specific to individual or clusters of similar homes.
R2A	E	Outdoor use area at Desmond.
R4A	E	Outdoor use area at Best Western.
R4B	B	Outdoor use area at Homewood Suites (Primarily Long Term Stay).
R4C	E	Outdoor use area at Courtyard Albany Airport.
R6A - R6L	B	Homes proximate to old Niskayuna Rd. and Rodgers Road. Outdoor use areas, used in barrier analysis.
R7A-R7P	B	Homes located along Sherwood Drive and Mildred Lane, north of Watervliet-Shaker Road and east of I-87.

* Indicates measurement location only, used for model verification validation purposes only.

Initially, one receptor location (R4) was identified for continuous 12-hour monitoring to determine the peak noise hours (AM and PM) Based on the 12-hour measurements obtained at location R4. The PM peak noise levels occurred between 3:30 and 4:30 PM. The AM peak noise levels occurred between 8:00 and 9:00 AM.

L_{eq} measurements were collected in the AM and PM peak noise hours at the remaining five receptors in general accordance with *Field Measurement of Existing Noise Levels*, NYSDOT, 1985, and current FHWA literature using a Quest Technologies Noise Pro DLX ANSI Type II Sound Level Meter. Measurements were collected over a period of several weeks ranging from December 2011 to January 2012, during dry weather and normal traffic (i.e. midweek, non-vacation) conditions. Traffic volumes were collected by visual count for nearby local roads, and interstate volumes were obtained from continuous count stations. Noise measurement data is included in Appendix I.

Existing noise levels were then modeled using TNM; roadways were separated into segments, each with discrete traffic volumes. Modeled traffic noise levels at each representative receptor location were calculated based on distances from the roadways to the nearest receptors, topography, attenuation due to soft ground, and traffic volumes.

Exhibit 4.4.17 e Comparison of Measured and Calculated Existing Noise Levels				
Receiver ID	Measured dBA	Modeled dBA	Difference dBA	Notes
AM				
R1	62	63	1	
R2	71	68	-3	Tractor Trailers, Airplanes x 2, box truck in parking lot
R3	71	72	1	
R4	74	72	-2	
R5	63	64	1	
R6	69	66	-3	
PM				
R1	61	62	1	
R2	70	68	-2	Parking Lot Traffic noted
R3	72	73	1	
R4	74	73	-1	
R5	62	64	2	
R6	72	69	-3	

Shaded cells indicate poor correlation of validation data.

Correlation between existing and modeled is shown to be acceptable if the difference between the two values is 3 dBA or less. As shown in Exhibit 4.4.17 e, both AM and PM modeled noise levels demonstrated an acceptable validation of the model for all receivers. It should be noted that Receivers R1 through R4 are located within the Albany International Airport's Noise Impact contours.

Effects Assessment

Two future (2036) scenarios were modeled in both the AM and PM peak noise hours: the Diamond Alternative and the Flyover Alternative. When identifying noise impacts, the worst case noise level, whether from the AM or PM peak noise period, is used.

Results for the two build alternatives are presented in Exhibit 4.4.17 f. Impacts, including noise levels that approach or exceed the NAC and significant increases over existing levels, are noted as shaded cells.

Exhibit 4.4.17 f Assessment Results									
Receiver ID	Existing Predicted	Peak Hour	Impact Crt'n	Diamond	Delta	Peak Hour	Flyover	Delta	Peak Hour
	dBA		dBA	dBA	dBA		dBA	dBA	
R1	63	AM	66	61	-2	PM	64	2	PM
R2	71	AM	N/A	66	-6	AM	65	-3	PM
R2A	57	AM	71	57	0	PM	56	-1	PM
R3*	41	PM	52	32	-10	PM	42	1	PM
R4	74	PM	N/A	68	-6	PM	71	-2	PM
R4A	52	PM	71	46	-6	PM	51	-1	PM
R4B	64	PM	66	62	-2	PM	63	-1	PM
R4C	62	AM	71	61	-1	PM	63	1	PM
R5	64	AM	66	63	-1	AM	63	-1	AM
R6	69	PM	66	69	0	PM	69	0	PM
R6A	67	PM	66	68	1	PM	67	0	PM
R6B	65	PM	66	66	1	PM	65	0	PM
R6C	65	PM	66	66	1	PM	64	-1	PM
R6D	65	PM	66	66	1	PM	65	0	PM
R6E	68	PM	66	70	2	PM	68	0	PM
R6F	61	PM	66	63	2	PM	62	1	PM
R6G	63	PM	66	64	1	PM	63	0	PM
R6H	63	PM	66	64	1	PM	62	-1	PM
R6I	60	PM	66	61	1	PM	60	0	PM
R6J	63	PM	66	64	1	PM	63	0	PM
R6K	65	PM	66	66	1	PM	66	1	PM
R6L	66	PM	66	67	1	PM	67	1	PM
R6M	63	PM	66	63	0	PM	64	1	PM
R6N	61	PM	66	61	0	PM	62	1	PM
R6O	64	PM	66	65	1	PM	65	1	PM
R6P	63	PM	66	63	0	PM	63	0	PM
R6Q	65	PM	66	66	1	PM	66	1	PM
R6R	58	PM	66	59	1	PM	59	1	PM
R6S	59	PM	66	61	2	PM	59	0	PM
R6T	60	PM	66	61	1	PM	60	0	PM
R6U	58	PM	66	59	1	PM	59	1	PM
R7A	69	PM	66	70	1	PM	71	2	PM
R7B	65	PM	66	65	0	PM	66	1	PM
R7C	63	PM	66	61	-2	PM	64	1	PM
R7D	62	PM	66	58	-4	PM	63	1	PM
R7E	60	PM	66	56	-4	PM	62	2	PM
R7F	59	PM	66	53	-6	PM	60	1	PM
R7G	58	PM	66	51	-7	PM	58	0	PM
R7H	56	PM	66	51	-5	PM	54	-2	PM
R7I	57	PM	66	52	-5	PM	55	-2	PM
R7J	58	PM	66	53	-5	PM	56	-2	PM
R7K	60	PM	66	54	-6	PM	57	-3	PM
R7L	61	PM	66	58	-3	PM	59	-2	PM
R7M	61	PM	66	61	5	PM	62	1	PM
R7N	58	PM	66	58	0	PM	60	2	PM
R7O	57	PM	66	56	-1	PM	59	2	PM
R7P	56	PM	66	54	-2	PM	57	1	PM

Shaded cells indicate impacts.
* See indoor noise level summary below.

Predicted noise levels at receivers for both design alternatives decrease from existing conditions at several locations. For both the Diamond and Flyover Alternatives, this is due in part, to shielding effects provided by the proposed entrance and exit ramps. These shielding effects are particularly important for Receivers R1, R2 and R4 A-C. Changes in traffic patterns and volumes account for the change at Receiver R5.

Receiver 3 is a medical center with no outdoor frequent use areas. Therefore, indoor NAC for Activity Use D are applicable to this receiver. The building is constructed of brick, with fewer than 30% of the area of the facing wall occupied by window and door openings. FHWA's *The Audible Landscape*, 1974, was consulted to determine an appropriate noise level reduction for the building using the graph and data supplied in Exhibits 4.4.17 g1 and 4.4.17 g2, below.

Indoor noise levels at Receiver 3 are computed by subtracting 31 dBA from the outdoor level. Results for Receiver 3 are presented as indoor noise levels.

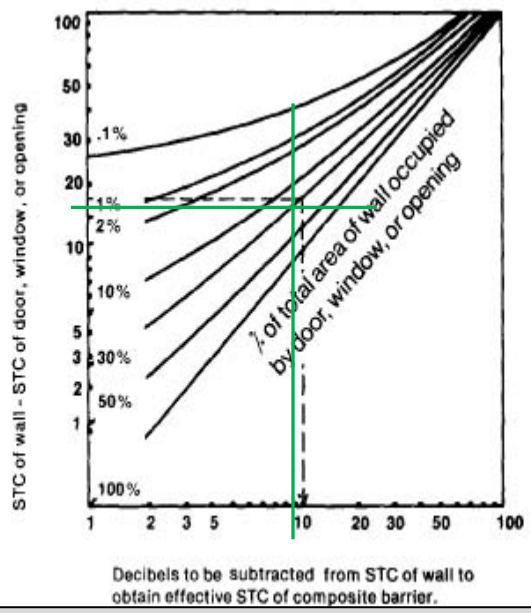


Exhibit 4.4.17 g1
Sound Transmission Class for Receiver 3

Exhibit 4.4.17g2 Sound Transmission Calculation	
Sound Transmission Class (STC) for Brick Wall	40
STC of ordinary 3/16" glass	25
STC Wall - STC Glass window	15
% of Total Area of Wall Occupied by Windows, etc.	<30%
dB to be subtracted from STC of wall to obtain effective STC of composite barrier	9
STC of composite wall	31

The only noise impacts identified are at Receivers 6 and 7. Noise levels at Receiver 6 exceed the NAC in existing conditions and for the No-Build, Diamond and Flyover Alternatives. A total of 11 and 9 residences in the vicinity of Receiver R6 experience noise impacts in the Diamond and Flyover alternatives, respectively. A

total of 1 and 4 residences in the vicinity of Receiver R7 experience noise impacts in the Diamond and Flyover Alternatives, respectively. No impacts are noted at any other locations.

Although the noise impacts have been evaluated for both the Diamond and Flyover Alternatives, the Diamond Alternative has been dismissed from further consideration as a feasible alternative for the reasons listed in Section 3.2.1 of this report.

Abatement Summary

23 CFR 772 and the Noise Policy require that abatement be considered for all locations that may experience a noise impact. Noise abatement measures must be considered reasonable and feasible to warrant implementation. Feasibility is defined as the practical capability of the abatement being built as well as achieving acoustic effectiveness. The acoustic effectiveness test for feasibility is that a majority of the impacted receptors receive a 5 dB(A) reduction from the measure. A substantial reduction in noise level of 10 dBA is desirable, while a 7 dBA reduction is considered the design goal. Reasonableness occurs when the cost of the noise abatement measure is less than a specified cost index based on the total cost per dwelling unit benefited, and that the benefited residents concur with the abatement recommendation.

Due to impacts at Receivers R6 and R7, mitigation analysis was performed for the Flyover Alternative. Four (4) noise abatement techniques were reviewed for this project: traffic management techniques, alternative highway locations, noise barriers, and acquisition of real property to serve as a buffer zone. The major source of noise impacting receptors at Receiver R6 is I-87, the main alignment of which is not being significantly altered in either of the proposed scenarios. Therefore, traffic management techniques and alternative highway locations are not considered feasible. Likewise, acquisition of real estate to serve as a buffer, would require the relocation of a number of existing residences along I-87.

Noise barriers including walls and berms were considered for abatement on this project. The elevation of I-87 ranges from 5 ft to 15 ft above the surrounding residences in the vicinity of the impacted residences. As such, a berm sheltering the impacted residents in this area would require an unfeasible amount of area to construct a berm, rendering it infeasible. Finally, noise walls were considered for each alternative.

East Wall

The first barrier (East Wall) proposed consists of a wall located at the top of embankment slope along the east side of the northbound lane of I-87, south of Watervliet-Shaker Road. A total of 47 dwelling units were represented and assessed for effects in the abatement analysis. The Flyover Alternative includes the addition of an auxiliary lane between the existing Exit 4 northbound entrance ramp and the existing Exit 5 northbound exit ramp.

Summaries of the barrier descriptions and benefited dwellings are provided in Exhibits 4.4.17 h and 4.4.17 i, respectively. The Feasibility and Reasonableness Worksheet is provided in Exhibit 4.4.17 j. Finally, a plan view of the proposed limits of the barrier is provided in Exhibit 4.4.17 n.

Exhibit 4.4.17 h
Barrier Summary (East Wall)

Heights along Barrier			Length	Wall Area
Min	Avg	Max		
ft.	ft.	ft.	ft.	sf
12	20.29	24	2,242	46,146

Exhibit 4.4.17 i Benefited Dwelling Unit Summary (East Wall)				
Benefited Receptors (Achieving ≥ 5 dBA reduction)	**Benefited Receptors Achieving Noise Reduction Design Goal (≥ 7 dBA)**	**Benefited Receptors Achieving Noise Reductions (≥ 5 dBA but < 7 dBA)**	**Impacted Receptors**	**Number of Impacted Receptors Achieving ≥ 5 dBA reduction**
35	20	15	10	8

Exhibit 4.4.17 j Feasibility And Reasonableness Worksheet (East Wall)		
Feasibility		
Engineering Considerations	Can the measure be built?	Y
Noise Reduction	Does the proposed measure provide a reduction of at least 5 dB(A) to a majority of the impacted receptors?	Y
Reasonableness		
Viewpoints of benefited property owners and residents	Were responses obtained from at least half of the benefited property owners and residents?	Y
	Do a majority of the responses favor the measure?	Y
Cost Index	If a barrier: Is the proposed barrier less than 2,000 square feet per benefited receptor?	Y
Noise Reduction Design Goal	Do a majority of the benefited receptors achieve the Noise Reduction Design Goal of 7 dB(A)?	Y

The proposed noise barrier was found to be technically reasonable and feasible. A public information meeting for the propose noise barrier was held on August 22, 2013, and input was solicited from the benefited receptors. Responses were received from 58% of the benefited receptors with 80% of the responses in favor of constructing the proposed noise barriers.

The Noise Study Report found in Appendix I of this document provides a complete description of mitigation measures.

West Wall

Impacts to receptors located in the northwest quadrant of Watervliet-Shaker Road at I-87 were studied for the Flyover Alternative in the PM Peak hours. The proposed wall flanked the exit ramp of southbound I-87. A total of 46 dwelling units were represented and assessed for effects in the West Wall abatement analysis. The barrier length ranged from approximately 1,000 ft. to 1,500 ft., with segment heights ranging from 10 ft to 30 ft. Feasibility requirements, as described above, could be met with a number of barrier designs; however, cost indices of the various designs could not be met. Abatement measures at the West Wall location are not recommended. Exhibits 4.4.17 k through 4.4.17 m are provided below for one of the better performing designs considered.

Exhibit 4.4.17 k Barrier Summary (West Wall)				
Heights along Barrier			**Length**	**Wall Area**
Min	**Avg**	**Max**		
ft.	**ft.**	**ft.**	**ft.**	**Sf**
10	18.2	24	1,246	22,653.00

Exhibit 4.4.17 l Benefited Dwelling Unit Summary (West Wall)				
Benefited Receptors (Achieving ≥ 5 dBA reduction)	**Benefited Receptors Achieving Noise Reduction Design Goal (≥ 7 dBA)**	**Benefited Receptors Achieving Noise Reductions (≥ 5 dBA but < 7 dBA)**	**Impacted Receptors**	**Number of Impacted Receptors Achieving ≥ 5 dBA reduction**
10	7	3	4	3

Exhibit 4.4.17 m Feasibility And Reasonableness Worksheet (West Wall)		
Feasibility		
Engineering Considerations	Can the measure be built?	Y
Noise Reduction	Does the proposed measure provide a reduction of at least 5 dB(A) to a majority of the impacted receptors?	Y
Reasonableness		
Viewpoints of benefited property owners and residents	Were responses obtained from at least half of the benefited property owners and residents?	N
	Do a majority of the responses favor the measure?	N/A
Cost Index	If a barrier: Is the proposed barrier less than 2,000 square feet per benefited receptor?	N
Noise Reduction Design Goal	Do a majority of the benefited receptors achieve the Noise Reduction Design Goal of 7 dB(A)?	Y

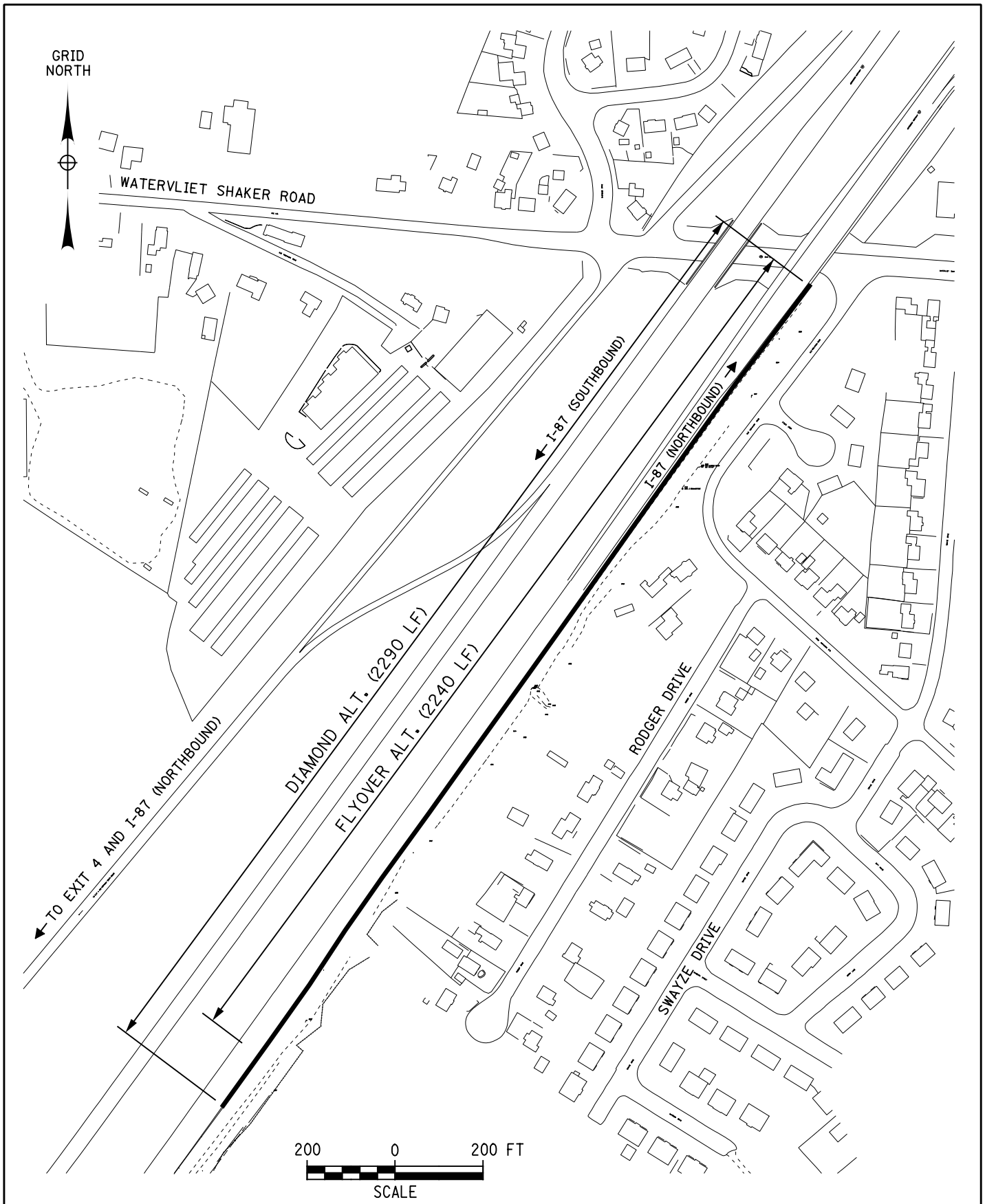
Based on the studies performed thus far, abatement in the form of a 10 to 24 foot high noise barrier is recommended along the east side of I-87 between Albany-Shaker Road and Watervliet-Shaker Road for a length of approximately 2,200 to 2,300 feet. These initial indications of likely recommended abatement are based upon a preliminary design for the Flyover Alternative for a barrier that will reduce the noise level by ≥5 dBA for 35 receptors.

A public information meeting for the proposed noise barrier was held on August 22, 2013, and input was solicited from the benefited receptors. Responses were received from 58% of the benefited receptors with 80% of the responses in favor of constructing the proposed noise barriers. Since a clear majority of the benefited receptors that responded are in favor of the recommended noise barrier, the barrier will be constructed during the second phase of the project's construction unless conditions change substantially during the final design phase.

4.4.18 Asbestos

Screening

An asbestos screening for this project, including a review of as-built record plans and a site visit, was performed in accordance with the NYSDOT The Environmental Manual (TEM). Suspect asbestos-containing materials (ACM) that could potentially be impacted as a result of the proposed project were observed on the two bridge structures. A full asbestos assessment, including sampling and analysis, of all ACMs at the bridges will be performed prior to construction activities. If asbestos is determined to be present at the bridges, an Asbestos Special Note and Specification will be prepared by NYSDOT personnel or a consultant with an Asbestos Designer License.



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NOISE BARRIER LOCATION PLAN

INTERSTATE 87 (I-87) EXITS 3/4
ACCESS IMPROVMENTS

EXHIBIT

4.4.17 n

DATE: 08/13

FILE NAME = U:\9456\dsgn\Preliminary Design\Figures\172151_noise_barrier.dgn
DATE/TIME = 10/29/2013
USER = 2210

4.4.19 Hazardous Waste and Contaminated Materials

Screening

A Hazardous Waste/Contaminated Materials Site Screening (HW/CM Screening) for this project was performed in accordance with NYSDOT TEM in order to determine whether or not any recognized environmental conditions (RECs) are present in the PSA. An REC exists when there is the presence or likely presence of hazardous substances or petroleum products (including products currently in compliance with applicable regulations), based on readily observable or recorded evidence that indicates an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on a property or into the ground, ground water, or surface water associated with a property.

The HW/CM Screening included a review of Federal, State, and Local regulatory data files, historic maps and aerial photographs, interviews with government agencies, and site 'walkover' inspections.

Several RECs were noted during the HW/CM Screening as noted in Exhibits 4.4.19 a and 4.4.19 b, below. Any contaminated material encountered during construction will be segregated in accordance with all applicable regulations and NYSDOT policies.

The following sites have been identified as areas of concern for the Diamond Alternative.

Exhibit 4.4.19 a Summary of Potential Areas of Concern – Diamond Alternative					
Potential AOC	**Address**	**Description**	**Potential Media Impacted**	**Contaminants of Concern**	**Comments**
The Desmond Albany Hotel	660-668 Albany-Shaker Road	Former fuel company, UST, documented releases	Soil, Groundwater	Petroleum	Construction activities at some locations on or along this property could contact impacted soil and/or groundwater
Fill Area	680 Albany-Shaker Road	Fill Pile of unknown origin	Fill Material	Unknown	Property acquisition is proposed and construction activities at this property could contact fill material
Hess Station	156 Wolf Road	Existing gasoline service station, USTs, documented releases	Soil, Groundwater	Petroleum	Construction activities at or adjoining this property could contact impacted soil and/or groundwater
Dominion Transmission	154 Wolf Road	Hazardous waste generator facility	Soil	PCBs and benzene	Construction activities at this property could contact impacted media
ET Person LLC (formerly Cerone Construction)	200 Sunset Boulevard	Former USTs, documented releases, potential fill area	Soil, Groundwater	tetrachloroethene and petroleum	Construction activities at this property could contact impacted soil and/or groundwater
NYS Land	West of 158-170 Wolf Road	Fill area, C&D material staging	Soil	Unknown	Construction activities at this property could contact fill and C&D material

Exhibit 4.4.19 b Summary of Potential Areas of Concern – Flyover Alternative					
Potential AOC	**Address**	**Description**	**Potential Media Impacted**	**Contaminants of Concern**	**Comments**
Entenmann's	242 Wolf Road	Former gasoline service station, UST facility	Soil, Groundwater	Petroleum	Construction activities at or adjoining this property could contact impacted soil and/or groundwater
SUNOCO	656 Albany-Shaker Road	Existing gasoline service station, UST facility	Soil, Groundwater	Petroleum	Construction activities at or adjoining this property could contact impacted soil and/or groundwater
The Desmond Albany Hotel	660-668 Albany-Shaker Road	Former fuel company, UST, Spills listings	Soil, Groundwater	Unknown	Construction activities at some locations along or on this property could contact impacted soil and/or groundwater
Avis Rental Car	674-676 Albany-Shaker Road	Former UST and fuel facility, Spills listings	Soil, Groundwater	Petroleum	Construction activities at or adjoining this property could contact impacted soil and/or groundwater
Fill Area	680 Albany-Shaker Road	Fill pile of unknown origin	Fill Material	Unknown	Property acquisition is proposed and construction activities at this property could contact fill material
Latham Construction	271 Wolf Road	Spill Listings, former UST systems, outside drum storage	Soil, Groundwater	PCBs; petroleum; unknown contents of drums	Construction activities at or adjoining this property could contact impacted soil and/or groundwater

Site specific investigations will be performed to identify potential hazardous materials/hazardous substances associated with the relevant areas of concern prior to construction activities including, but not be limited to, assessments of suspect ACMs, petroleum/chemical tanks, soil and groundwater quality, or geophysical investigation as applicable to each area of concern.

Based on the findings of the Hazardous Waste/Contaminated Materials Site Screening, it is recommended that subsurface sampling and geophysical investigations be performed at Right-of-Way, deep excavation, and property acquisition locations adjacent to or on identified sites of concern to determine the scope of the impacts

Mitigation Summary

Potential RECs identified in the HW/CM Screening and considered for acquisition may warrant remediation. Additional investigations will be performed, as required, to assess potential impacts to the sites. Site-specific remediation plans will be developed as warranted.

4.5 Construction Effects

Construction Impacts

Several short-term impacts may be caused by the construction activities for the feasible alternative. The anticipated construction impacts include noise, air, surface water, and traffic interruptions during construction operations. These impacts may include traffic delays due to lane closures, dust and noise from earthwork and construction equipment, and water quality impacts due to runoff from the construction areas. It is anticipated that Phase I (I-87 over Albany-Shaker Road bridge replacement) construction operations will have a duration of 2 years; while Phase II (interchange ramps) construction operations will have a duration of 3 years.

During construction, three lanes of traffic would be maintained in each direction. A construction zone would be established and the posted speed would be lowered through the project area. The traffic disruptions would be temporary, and minimized to the extent practicable. The proposed methods of maintaining traffic during construction are more fully described in Section 3.3.1.7. It is anticipated that the following stages of construction would be used during each phase of construction: clearing and grubbing; construction of site access; materials delivery; construction of new bridges and approach work, connector road, and interchange ramps; removal of existing bridges; restoration of impacted areas.

During construction, re-fueling of construction vehicles could result in fuel spills. Although the size of the spill would dictate the specific response actions required, the following measures would be incorporated into the contract documents to minimize impacts of fuel and other types of spills.

- An appropriate absorbent will be kept in a staging area and spread on all areas where fuel has been spilled.
- The NYSDEC will be contacted immediately. All clean-up procedures will strictly adhere to requirements.
- Contaminated material will be excavated and temporarily stockpiled on impermeable plastic.
- All fuel / chemical storage areas will be over impermeable ground.
- Contaminated materials will be removed from the site and disposed of in accordance with NYSDEC regulations.

Construction activity that could cause noise impacts include earthwork, land clearing, paving and structure construction. Based on typical noise levels for the equipment anticipated for construction of the project, noise levels may reach 70 dBA within approximately 200 ft. of the construction boundary and 80 dBA within 75 ft. The staging proposed for the feasible alternatives would allow most of the work to be completed during the day. Only those activities that require lane closures would be performed at night. These activities include:

- Initial set-up of the traffic staging / lane shifts
- Excavation and embankment to be removed or placed for temporary widening for staging
- Placement of temporary pavement for staging

Public outreach and agency coordination will be conducted prior to construction to ensure that stakeholders have an opportunity to provide input on the proposed project and alternatives considered. Pre-construction activities will also include land acquisition. Additional information about public involvement and input from stakeholders is included in Appendix E. A summary of right-of-way acquisitions for each of the feasible alternatives is included in Section 3.2.1.

Mitigation Measures

These impacts will be minimized through a variety of measures included in the contract documents.

The use of temporary and long-term closures will be needed during construction. These lane closures may result in delays to the traveling public. To minimize effects to businesses, access to existing businesses will be maintained for the duration of construction. Traffic delays will be minimized through the development of detailed Work Zone Traffic Control and Construction Sequencing Plans. These plans will require coordination with adjacent property and business owners in the surrounding Aerotropolis to minimize the potential effects of the construction. They will also specify restrictions on the time and length of lane closures and restrictions on lane closures during non-construction hours to minimize impacts to the traveling public on both I-87 and the local roadway system. In addition, existing pedestrian and bicycle accommodations will be maintained along the local roadways during construction.

To minimize the effects of the construction on air quality and noise, dust control measures, and requirements for mufflers on all equipment exhaust systems will be included in the construction specifications.

Although construction noise is unavoidable in its entirety, it can be mitigated and controlled. Mitigation measures will be incorporated into the contract documents to reduce construction noise and perceived impacts in the project area. For a project of this type, the following example mitigation strategies are available:

Source Control:

- Use properly designed and well-maintained mufflers in all internal combustion engines, engine enclosures, and intake silencers.
- Perform regular equipment maintenance and use new equipment subject to new product noise emission standards.

Site Control:

- Place stationary equipment as far away as possible from particularly sensitive receptors.
- Choose strategic sites for waste disposal.
- Coordinate work operations to coincide with time periods when people are least likely to be affected.
- Limit work hours (i.e., limited nighttime operations).
- Eliminate “tailgate banging.”
- Reduce backing-up procedures for equipment with backup alarms. Replace backup alarms with strobes where acceptable per OSHA and other regulations.
- Construct proposed noise barrier(s) prior to performing any other construction operations.

Community Awareness:

- Notify the public of construction operations prior to starting construction.
- Establish methods to handle complaints.

Water quality impacts will be minimized through the development of Soil Erosion and Water Pollution Control Plans and Details, and a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will identify measures to avoid or minimize impacts to surface waters and groundwater at the project site both during and after construction activities. The goal of the SWPPP is to minimize runoff and replicate pre-construction hydrology. Soil erosion control measures will be used during construction, including the installation of silt fence, check dams, drainage structure inlet protection, sediment traps and the

stabilization of construction entrances. Temporary disturbance areas will be reseeded and stabilized following construction.

Public outreach and agency coordination will be conducted during construction to notify motorists of the status of ongoing work and upcoming work. Notification to stakeholders and motorists will be distributed via the project website, 511NY, variable message signs (VMS), and AM band highway advisory radio (HAR).

4.6 Indirect and Secondary Effects

Indirect Socioeconomic Effects

A project of this type has the potential to indirectly affect social conditions, by impacting land use, community character, the local economy, and by spurring growth. Indirect/secondary effects are caused, as defined in 40 CFR §1508.8, "…by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Indirect effects result from changes in patterns of land use, population density, or growth and related effects on air, water, and other natural resources, including ecosystems. FHWA uses indirect and secondary effects interchangeably.

New York State's SEQRA under 17 NYCRR 15.11 (b), requires consideration of reasonably related short-term and long-term impacts of a project. These include not only direct effects of a project, but also indirect or secondary effects.

Starting in the late 1970's and continuing into the early 1990's, four separate studies were conducted to determine future traffic operations in the Wolf Road/Albany International Airport area as follows:

- Albany-Shaker Road Corridor Study (Capital District Transportation Committee (CDTC, 1979)
- Albany County Airport Area Traffic Study (CDTC, 1990)
- Wolf Road/Exit 3 Area Transportation System Study (CDTC, 1990)
- Airport Area Final Generic Environmental Impact Statement (Town of Colonie, Village of Colonie, County of Albany, 1991)

Each study concluded that, without improvements to access to I-87, the vehicle capacity of the I-87 interchanges would not meet traffic demand expected by increases in the growth from airport activity and continued economic development in the area. A common solution among all of these studies was the construction of an Exit 4 Wolf Road/Airport Interchange. As a result, the Exit 4 Wolf Road/Airport Interchange project was added to CDTC's 1992-97 Transportation Improvement Plan (TIP) in March 1992. The project is currently included as Project No. A240 on the 2010-2015 TIP. The project was also added to the New York State Department of Transportation (NYSDOT) capital program. In March 1997, CDTC adopted its *New Visions* long-range plan for transportation in the Capital District. Improving access to the Airport is included specifically in the *New Visions'* guiding principles ("plan and build for all modes"), strategies ("support intermodal transportation") and actions ("improve surface access to the Albany County Airport"). In October 2007, CDTC adopted its *New Visions 2030* plan and in September 2011 adopted its *New Visions 2035* plan to extend the *New Visions* plan through the year 2030 and 2035, respectively. As a result, the time period for assessing Indirect/Secondary Effects and Cumulative effects is between the late 1970's to 2036, which corresponds with traffic studies that identified that the existent interchange would not be able to service future traffic volumes associated with growth and development in the area, without improving access to I-87. The end of the assessment period, 2036, accounts for the 20-year period beyond the project's ETC to include the greatest projected increase in population growth for the Town of Colonie.

The following resources have been identified as being impacted by the proposed alternatives: wetlands; streams; archaeological sites; outdoor and indoor areas affected by noise; forested areas; and individual properties. Direct impacts associated with the Diamond Alternative, as summarized in Section 3.2.1, contributed to its dismissal as a feasible alternative; therefore, the indirect and secondary impacts discussion pertains only to the Flyover Alternative.

Social Consequences

In general, based on the nature and general location of the proposed project, direct social consequences of the proposed project are negligible compared to similar projects of this type. As a result, indirect social consequences to the environment in or near the PSA can be expected to be minimal, especially when considering that the preferred alternative-the Flyover-induces few social impacts in comparison with the Diamond Alternative. Furthermore, the proposed project has been studied and planned and is incorporated in the Town of Colonie's *Comprehensive Plan*; the CDTC's long-range *New Visions Regional Transportation Plan*; and the *Airport Area Generic Environmental Impact Statement*. As such, the proposed project has been designed to be compatible with each of the studies, including input by representatives from the Town of Colonie, Albany County, Albany International Airport, and the CDTC, all of which are cooperating and participating agencies of the NEPA process. Part of the project includes improving pedestrian facilities and motor vehicle traffic mobility, which result in positive social benefits.

One potential negative social consequence associated with the project is the use of land for the new roadway alignment, that is zoned Land Conservation. This use of the land for the proposed ramps between I-87 and Albany-Shaker Road is a contradiction to past planning; however, knowing that the project has been studied and planned by local authorities, it is expected that contingencies have been erected to prevent the continued use of Land Conservation areas.

Economic Consequences

Similar to the social consequences, direct economic consequences of the proposed project are minimal. As a result, indirect economic consequences are expected to be negligible, if any. Although the limits of disturbance for the majority of this project occur within the existing ROW or previously disturbed lands, there is a portion along Albany-Shaker Road west of I-87 and along the southbound lanes of I-87 that would impact farmland. As a result, approximately 15.2 acres of ROW taking of farmland will occur under the Flyover Alternative. Although this acreage is not significant, an additional 25.5 acres of farmland would be indirectly impacted due to the loss of access needed to make the land viable. The indirect impacts have a potential for an economic impact; however, the majority of this land is owned by the Albany County Airport Authority, is no longer actively farmed, and has been removed from the agricultural district. Coordination was initiated with the Albany County Soil and Water Conservation District to assess the economic significance of the farmland impacts. In a letter dated August 29, 2013, the Albany County Agricultural and Farmland Protection Board provided comments pertaining to the economic effects to farmland relative to this project (Appendix B). A summary of the key comments are provided below:

- A stated in the Design Report, the project right-of-way and limit of disturbance result in insignificant impacts (strip takings along Albany-Shaker Road) on Agricultural District #3.
- Parcels 30.-5-1 and 30.-5-9, owned by the Albany County Airport Authority, are no longer farmed. The agricultural assessment value of parcel 30.-3-77 is estimated to be $22,193. The agricultural assessment value of farmland on Old Wolf Road is estimated to be $12,667. This farmland is used for the production of various vegetables. The current alternatives do not appear to encroach on these active farmlands; therefore, no economic impact is anticipated.
- It appears that the only potential impact to farms in the project area would be the possibility of disrupted access during construction on Albany-Shaker Road and/or Wolf Road, and drainage issues that may arise during and/or after construction.

Commercial establishments within the project area will experience a change in views of the physical landscape from the project. In general, hotels and restaurants within the project area are generally faced on at least one side by I-87 and another by a major collector roadway (i.e. Wolf Road, Albany-Shaker Road, etc.). The greatest concern is for the hotel patrons, specifically the Desmond Hotel due to its proximity to the proposed flyover and ramp. The economic consequences of construction of the new ramps are minimal because the use of the rooms viewing the proposed clearing of vegetation to the south and east are conference and meeting rooms. On the western side of the facility, guest rooms currently have view of the of the cleared runway approach area associated with the Albany International Airport. It should be noted that while these rooms may have views to the proposed improvements, the market draw

of the Desmond is the internal courtyard, restaurants and meeting rooms which focus patrons and guests attention and activities toward center of the building. This existing building design and use limit views of the outside areas toward the proposed improvements minimizing any potential impacts to hotel patrons. No significant impacts are anticipated as a result of the proposed project.

The proposed project has been studied and planned to be consistent with the Town's, County's, and Airport's combined long-term goals and objectives for developing infrastructure and the socioeconomic environment of the area, while at the same time protecting the Town's natural resources and conserving farmland and open space. The project is expected, based on existing studies and plans, to foster business development and economic growth. The Diamond Alternative would affect two businesses, the Amerada Hess gas station and a commercial property owned by ET Person LLC. The preferred alternative, the Flyover Alternative, does not affect any businesses. With the exception of impacts to farmlands and the small loss of tax base from ROW impacts, the overall economic consequences of the project would be beneficial.

Environmental Consequences

In general, the indirect impacts to environmental resources would be proportional to the induced development. Based on information cited above, the project will result in an increased potential for development and, thereby, indirect impacts on the environment. Resources of consideration include wetlands, ecology, streams, farmland, air and noise. Although wetland impacts could result from induced development, little to no wetland loss is expected as a result of existing wetland locations, zoning, and regulations requiring mitigation for impacts exceeding 0.10 acre. Indirect wetland impacts may include decreased quality of wetlands adjacent to the new roadway corridor. Overtime, they may gradually degrade due to runoff from the adjacent development. With regard to ecology, a larger percentage of invasive species may be introduced into the disturbed area; however, since development along the new flyover ramp corridors will be limited, a significant increase in fragmentation is not anticipated. Any development will result in an increase in impervious area; however, since induced development is limited and sediment toxicant increases will be minimized using practices required under the SPDES program, the project is not expected to result in significant indirect impacts to water quality.

Significant indirect social, economic and environmental consequences are not anticipated.

4.7 Cumulative Effects

Under 40 CFR §§1500-1508, Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act, Federal agencies must address the cumulative impact of an action. A cumulative impact is defined as (40 CFR 1508.7):

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions."

Generally, direct impacts identified for a project that are considered to be minor or that fall below established impact criteria thresholds might lead to an adverse effect, when included with impacts from past, present, or reasonably foreseeable future actions. The resources discussed in previous sections, as being directly affected by the proposed project are discussed in this section relative to past, present, and reasonably foreseeable future actions to determine the significance, if any, of the cumulative impact of the proposed project.

The majority of the PSA was directly impacted during the original development of the local roadway network and the I-87 corridor, which followed, and the subsequent commercial and industrial development that ensued both. As a result, the current state of the PSA and vicinity is fully developed. To a certain point, the past development has had a positive effect on the socioeconomic environment, which has reached its climax, resulting in localized traffic congestion, a negative effect. This cause and effect is the source of the proposed project, the objective of which is to alleviate traffic congestion,

particularly related to motorists traveling to and from the Albany International Airport. On the other hand, it is reasonable to assume that the original development of the area negatively impacted the landscape and its natural resources (e.g., wetlands, wildlife and habitats, and streams), but that they have reached a level of recovery, if not destroyed, to continue to function, albeit not necessarily in the same capacity as they did prior to the initial disturbance.

In conclusion, the PSA has previously been significantly disturbed, and has reached near full development capacity, the overall cumulative effect of the project would be positive with regard to the socioeconomic environment with only a negligible negative effect on the natural environment. The positive effect would result from the decrease in traffic congestion with the construction of the connector road between I-87 and Albany-Shaker Road. The negative effect on the natural environment could be perceived as negligible because all of the areas within the bounds of the PSA, including the fields currently being used for agriculture, where the alignment of the connector has been sited, have been previously disturbed, including, but not limited to, wetlands, streams, and habitat.

There are several current and reasonably foreseeable projects near the PSA that could, when considered with the proposed action, induce negative effects to the natural and socioeconomic environments. Town of Colonie representatives have shared future plans to construct a service road parallel to the east side of Wolf Road, east of I-87, between Albany-Shaker Road and Sand Creek Road, by extending Maxwell Road to connect with Marcus Boulevard and Aviation Road Other reasonably foreseeable projects include:

- Berkshire Bank, corner of Wolf Rd / Sand Creek Rd - Currently under construction and nearing completion.
- Shaker Veterinary Hospital, located at Maxwell Rd / Old Maxwell Rd intersection - Currently constructing addition to clinic.
- Senior citizen housing, northeast corner of Albany-Shaker Rd / Maxwell Rd roundabout - 50, 55+ townhouse units currently waiting on environmental permits.
- Parkside at the Crossings, Aviation Rd at Sand Creek Rd - 68, 55+ condominium units currently under construction.
- Cornerstone Apartments, located on Sand Creek Road between I-87 and Garden Terrace - Senior citizen housing currently under construction.
- Hilton Homes2 Suites, 10 Metro Park Road - Currently in planning stages to construct 100 room hotel.
- Capital Communications Federal Credit Union, 4 Winner Circle - Currently under construction.
- Hotel/Retail Development, 144 Wolf Road - Currently in planning stages to replace Lazare Lincoln Mercury with 82 room hotel, a multi-tentative retail store and a restaurant.
- Texas Roadhouse, 105 Wolf Road - Construction completed in September 2013.
- Texas Longhorn Steakhouse, 206-208 Wolf Road - Currently in planning stages.
- Bonefish Grill, 56 Wolf Road - Construction completed in October 2013.
- Soldier On, Heritage Lane – Currently in planning stages to renovate Ann Lee Nursing Home into 75 single person apartment units, a cafeteria, and emergency homeless intake offices and shelters.

The following table provides a summary of cumulative impacts of the feasible alternative relative to affected resources identified herein, in previous sections:

Exhibit 4.7 Cumulative Impacts Summary				
Affected Resource	**Impact From Past Actions**	**Impact From Present Actions**	**Direct Impact From Project**	**Impact From Reasonably Foreseeable Future Actions**
Land Use	Land use has been developed according to zoning.	None.	Conversion of small portion of Land Conservation Zone to transportation use due to proposed flyover ramps.	All other development meets current land use designations; introduction of the connector road has potential to induce development in limited space in proximity to its intersection with Albany-Shaker Road and thus a potential small shift in land use.
Social/Economic	Development and growth of the area per the Town's comprehensive plan has been positive.	Development and growth of the area is nearing capacity resulting in traffic congestion negatively affecting safety for motorists, bicyclists, and pedestrians.	None expected; intent of project is to solve access and mobility problems.	Population growth; continued development.
Wetlands/Streams	Wetlands and streams have been impacted by development, but have recovered and are functioning at some level.	DOT maintenance; no other actions identified.	wetlands and streams impacted by proposed flyover ramps.	wetlands likely being impacted by some, if not all, future development identified in 2.2.1.2; state and federal regulations governing wetland impacts, permit requirements, achieve no not loss; therefore, although some small localized impacts will occur, no net loss is anticipated within the general area because of mitigation requirements.
Water Source Quality	Erosion and sedimentation impacts prior to storm water management regulations.	Impacts minimized through SPDES requirements.	New impervious area, could potentially increase pollutant loadings to waterbodies. However, SPDES regulations require Water Quality treatment, thus minimizing the effect.	Developments identified in section 2.2.1.2 would have to adhere to the SPDES program.
Ecology & Wildlife	Past development has had a negative effect on ecology and wildlife.	Currently a stable environment relative to type and amount of development, habitat loss and fragmentation.	Negligible effect relative to connector road; most of the area is presently used for cultivation.	Future actions will require study of effects; wildlife habitat loss and fragmentation from development identified in section 2.2.1.2.

Exhibit 4.7 Cumulative Impacts Summary				
Affected Resource	**Impact From Past Actions**	**Impact From Present Actions**	**Direct Impact From Project**	**Impact From Reasonably Foreseeable Future Actions**
Farmland	Historically, much of the land that has been developed was likely farmland.	None identified.	Portions of areas zoned as Land Conservation are cultivated for local produce; land that is currently cultivated will remain after project completion; the project will not acquire more than one acre from an actively operated farm within any of the Agricultural Districts, or more than ten acres within any of the individual Agricultural Districts. Coordination with NRCS has been initiated with regard to the FFPPA to ensure project is being progressed to avoid and minimize impact on prime/unique farmland.	Most future actions would impact farmland that has already been converted to an irrevocable use.
Air Quality	Air quality has been negatively affected by past development.	Traffic congestion negatively effects air quality.	Regional emissions analysis indicates that the project will not significantly increase regional emissions. Emissions will decrease from ETC+10 to ETC+20. The MSAT emissions will increase, but because of the EPA National Control Program, future emissions are likely to be less than present levels.	Continued economic and population growth will affect air quality. However, EPA's National Control Program will likely result in an overall future reduction in air quality impacts.
Noise	Noise levels inherent with past development have been compatible with designated land use/zoning.	Noise levels inherent with present development have been compatible with designated land use/zoning.	Impacts were identified at 2 receivers. Noise abatement techniques have been considered. Noise barriers have been determined to be technically reasonable and feasible as mitigation.	Increased noise from increased traffic and activity resulting from build-out development. Future development is expected to be compatible with existing zoning and land uses; therefore, development would not be sensitive to noise.

Exhibit 4.7 Cumulative Impacts Summary				
Affected Resource	**Impact From Past Actions**	**Impact From Present Actions**	**Direct Impact From Project**	**Impact From Reasonably Foreseeable Future Actions**
Energy	Demand for energy relative to past development has been commensurate with the increase in development, traffic and energy supply.	Demand for energy relative to present development has been commensurate with traffic, development and energy supply.	Energy supply is adequate to support the one time energy demand for the construction, materials, and operation of equipment. Results of analyses indicate that the emissions difference between the No-Build and the Flyover Alternative is too small to indicate that one is more efficient that the other.	Increased traffic and activity from development will result in an increase in energy use; however, development identified in section 2.2.1.2 is not likely to place a significant demand on energy.
Archaeological Resources	Unknown.	Unknown.	Phase I and II studies have been conducted to identify archaeological sites. With the exception of the Engel Farm Site; impacts will be avoided. The project will result in adverse impacts to this site; however, a Phase III Data Recovery effort will be completed in accordance with State Guideline for Phase II data retrieval projects.	Future privately funded projects could potentially affect archaeological resources. Historic/archaeological resources are afforded some protection under the SEQRA process and State regulations for historic preservation.
Forested Areas	Loss and fragmentation of forested areas.	Loss and fragmentation of forested areas.	Loss and fragmentation of forested areas.	Continued loss and fragmentation of forested areas.
Visual	The visual resources in the area have changed due to development in portions of the project area and activities within view of the project area.	Minimal due to transportation focus, developed nature of much of the corridor and zoning/protections on undeveloped areas.	The visual impact assessment indicates minimal impact on viewer groups. Impact is mainly associated with removal of vegetation and new bridge construction.	Viewer groups are not significantly impacted because of duration, focus and existing character. Future projects could have a minimal effect on visual character, but due to nature of the area, significant impacts are not anticipated.

Relative to past actions the proposed project would not cumulatively have an adverse effect. Based on those future reasonably foreseeable development projects identified in Section 2.2.1.2, cumulative effects to the area could include, but are not limited to: further habitat loss and fragmentation; population growth that has the potential to create negative social effects and impacts to air, water, and natural resources; loss of wetlands; impacts to streams; and loss of designated open space. However, since this project is

not expected to significantly induce development, significant cumulative impacts are not obvious and do not appear significant based on review of reasonably foreseeable development projects.

4.8 Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The proposed project is consistent with state, regional, and local planning efforts. The project would not involve a change in land use or zoning within or adjacent to the project area. Interstate 87 and other roadways within the Exit 4 area would continue to function as they do currently and the overall impacts to the project area would be minimal.

The feasible alternative would all involve short-term use of the human environment in the following ways:

- Create some traffic delays during construction. The delays would be greatest along I-87 and Albany-Shaker Road.
- Have some impact on surface water quality during construction. These impacts would be mitigated through development of detailed Erosion and Sediment Control Plans and Details for the construction documents.
- Cause short-term increases in the purchase of construction materials in the region and create short-term increases in regional construction jobs.

The project would also involve the following long-term impacts:

- Acquire 15.2 acres of land that is Prime Farmland or Statewide Important Farmland. Although this land would no longer be available for food production, the majority of it is owned by the Albany County Airport Authority, has been removed from the agricultural district, and no longer actively farmed.
- Alleviate traffic congestion, provide reserve capacity, increase mobility, and reduce delay between I-87, Wolf Road and the Albany International Airport.
- Improve safety by replacing the I-87 bridges over Albany-Shaker Road.
- Improve pedestrian and bicycle continuity by providing access along Albany-Shaker Road between Wolf Road, the Ann Lee Pond Nature and Historic Preserve, the shared use path that currently terminates at Ann Lee Pond, and the Albany International Airport.
- Potentially improve emergency response times by reducing delay in the Exit 4 area.
- Remove 29.12 acres of privately owned land from the tax base.

4.9 Irreversible and Irretrievable Commitments of Resources

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources which would not be retrieved upon, or after, completion of the project. These resources include the following:

- Fiscal Resources: construction of the project will require a substantial one-time expenditure of both State and Federal funds which are not retrievable.
- Construction Materials: considerable amount of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material are expended. Additionally large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continue availability of these resources.
- Energy Resources: all of the alternatives would require the commitment of energy for the construction of the project.

- Land Resources: land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for the use of the land, or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.
- Highway Maintenance Costs: the project would require the commitment of resources for highway maintenance. The Flyover Alternative includes the addition of 1.27 lane-miles of roadway.

The commitment of these resources is based on the concept that residents in the immediate area, State, and region will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of resources.

4.10 Adverse Environmental Impacts that cannot be Avoided or Adequately Mitigated

Implementation of the proposed project would result in adverse environmental impacts that cannot be avoided or adequately mitigated. Although not considered to be significant, these impacts consist of the following:

- Increase the total annual energy consumption by approximately 4.9%.
- Require loss of existing vegetation / habitat.
- Result in minor increase in traffic volume.
- Result in temporary delays during construction.
- Result in noise impacts to some sensitive areas. A noise barriers is proposed along I-87 northbound south of Watervliet-Shaker Road.