Prepared For:

City of Hudson
530 Warren Street
Hudson, NY 12534

DRAFT Feasibility Study

City of Hudson Truck Route Traffic Study
Columbia County, NY

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LIST OF ABBREVIATIONS

AADT	-	Average Annual Daily Traffic
AASHTO	-	American Association of State Highway Transportation Officials
ACC	-	Accidents
ACC/MVM	-	Accidents per Million Vehicle Miles
ADA	-	Americans with Disabilities Act
ATR	-	Automatic Traffic Recorder
BIN	-	Bridge Identification Number
BM	-	NYSDOT Bridge Manual
BMP	-	Best Management Practices
CEA	-	Critical Environmental Area
CM	-	Contaminated Materials
CMAQ	-	Congestion Mitigation and Air Quality Program
CO	-	Carbon Monoxide
DEM	-	Digital Elevation Model
DRI	-	Downtown Revitalization Initiative
EO	-	Executive Order
EPM	-	Environmental Procedures Manual
ESRI	-	Environmental Systems Research Institute
FAST	-	Fixing America's Surface Transportation
FEMA	-	Federal Emergency Management Administration (U.S.)
FHWA	-	Federal Highway Administration
FIRM	-	Flood Insurance Rate Maps
FNOI	-	Final Notice of Intent
GARVEES	-	Grant Anticipation Revenue Vehicles
GIS	-	Geographic Information System
GP	-	General Permit
HALs	-	High Accident Locations
HCM	-	Highway Capacity Manual
HDM	-	New York State Department of Transportation Highway Design Manual
HMA	-	Hot Mix Asphalt
HSIP	-	Highway Safety Improvements Program
HW	-	Hazardous Waste
IPAC	-	Information, Planning, and Conservation System
LRFD	-	Load Reduction Factor Design
LWRP	-	Local Waterfront Revitalization Program
MEV	-	Million Entering Vehicles
MVM	-	Million Vehicle Miles
NBI	-	No Build with Improvements Option
NEPA	-	National Environmental Policy Act
NHPP	-	National Highway Performance Program
NHS	-	National Highway System
NOX	-	Nitrogen Oxide
NRCS	-	Natural Resources Conservation Service
NWI	-	National Wetlands Inventory
NYCRR	-	New York Codes, Rules and Regulations
NYNHP	-	New York Natural Heritage Program
NYSDAM	-	New York State Department of Agriculture and Markets

NYSDEC	-	New York State Department of Environmental Conservation
NYSDOT	-	New York State Department of Transportation
NYSITS	-	New York State Office of Information Technology Services
OPRHP	-	Office of Parks, Recreation and Historic Preservation
PDM	-	Project Development Manual
PII	-	Priority Investigation Intersection
PIL	-	Priority Investigation Location/Intersection
PNOI	-	Preliminary Notice of Intent
ROW	-	Right-of-Way
SDL	-	Safety Deficient Location
SEQRA	-	State Environmental Quality Review Act
SGIS	-	Smart Growth Impact Statement
SGPIPA	-	Smart Growth Infrastructure Policy Act
SH	-	State Highway
SHPO	-	State Historic Preservation Office
SIB	-	State Infrastructure Banks
SPDES	-	Stormwater Pollutant Discharge Elimination System
SSURGO	-	Soil Survey Geographic Database
STP	-	Surface Transportation Program
STIP	-	State Transportation Improvement Program
SWPPP	-	Stormwater Pollution Prevention Plan
TAP	-	Transportation Alternatives Program
TEM	-	The Environmental Manual
USACE	-	United States Army Corps of Engineers
USDA	-	United States Department of Agriculture
USDOT	-	United States Department of Transportation
USFWS	-	United States Fish and Wildlife Service
USGS	-	United States Geological Survey
VOC	-	Volatile Organic Compounds

CHAPTER 1 - EXECUTIVE SUMMARY

1.1 Introduction and Background

This Feasibility Study evaluates the environmental and social impacts along with associated with providing alternate truck route options, specific to through truck traffic, around the City of Hudson in Columbia County.

The City of Hudson has created a project website where the information pertaining to this truck route traffic feasibility study can be reviewed. The City website link is: https://cityofhudson.org/business/truck-route.php

For the purposes of this study, the term truck traffic means vehicle classifications 6 through 13 as defined by the Federal Highway Administration (FHWA). Class 6 vehicles are 3-axle, single unit trucks or your basic box delivery truck with a double rear axle.

The main purpose of this Feasibility Study was to identify possible alternate truck route options for through truck traffic that currently travel within the City of Hudson. The existing through truck traffic traveling along the narrow urban streets along the existing designated truck route has been an on-going concern for the City and its residents for many years. Relocation of through truck traffic has a potential for improving the environmental quality and the quality of life for residents in the City of Hudson, where the existing truck traffic currently has the most profound impact.

Truck traffic affects the City of Hudson's neighborhoods surrounding the existing truck route in many ways. The specific areas of concern that the proposed project seeks to address are the environmental (public health), physical (infrastructure degradation) and social (neighborhoods and residents) impacts of truck traffic.

The movement of trucks through designated corridors contributes to air pollution in the City of Hudson. In areas where residential land uses are proximate to the truck corridors, acute and chronic exposure to elevated pollution levels negatively affect the populations living nearby.

It has been observed in areas where trucks stray beyond designated routes, certain corners are bereft of any physical structures as truck traffic has simply destroyed various above ground appurtenances. The problems inflicted on street corners along the existing designated route are likewise readily apparent. Beyond the damage caused by intense truck traffic upon pavement, curbing and various streetscape materials, the seismic loading (vibrations) from heavy vehicles accelerates the deterioration of water lines, sanitary sewer lines and storm sewer lines that lie beneath the City of Hudson's busiest streets.

The social and economic impacts of truck traffic upon the City's business district and neighborhoods are especially worrisome. The community must contend with the particularly noxious influences of high truck volume such as noise, odors, dust, congestion, and visual degradation. In the City of Hudson, pedestrian traffic is very important to residents and visitors. Through truck traffic directly and negatively affects business and quality of life within the City. Diesel exhaust from truck traffic is a complex mixture of gases and fine particles. In an urban area such as Hudson, the narrow streets and tall buildings make it much harder for the gases and particles to dissipate in comparison to a rural setting with wider street and less buildings. When the exhaust cannot dissipate, it causes an unhealthy environment for pedestrians in the city.

It should be noted that this study is directly related to the evaluation of through truck traffic in the City and does not intend to reroute existing local truck traffic that will have delivery destinations within the City of Hudson.

Existing Truck Route History:

1999: A Truck Route Task Force, convened by the Columbia-Hudson Partnership, organized and collaborated an effort between the Hudson Development Corporation and the Columbia Economic Development Corporation. The task force was assembled to identify and implement alternate truck routes around the City of Hudson to reduce the impact on the citizens. The Truck Route Task Force conducted interviews with truckers that passed through the City of Hudson and determined that many would prefer not to drive through the City of Hudson due to the slow, stop/start nature of urban driving and the tight radius turns that they make while traveling through the City.

The Truck Route Task Force discussed several options that would utilize all existing roads to bypass the City. They held a meeting with the New York State Department of Transportation (NYSDOT) to determine the feasibility of the proposed alternate routes. NYSDOT determined the proposed routes to be feasible and would only require the posting of new signs and bulletins to trucking companies reporting the newly designated routes. The task force made significant progress, however, was disbanded in early 2000 as town supervisors for the municipalities of Greenport, Claverack, and Stockport objected to allowing increased trucking traffic through their towns.

MJ Engineering and Land Surveying received a memo from a former member of the Truck Route Task Force in 2020 that summarized their findings during their investigation and showed some of the routes that were under consideration. Some of the routes that were developed by the truck route task force were also considered during this feasibility study.

2009: Scenic Hudson, an environmental conservation organization committed to protecting the Hudson River Valley and the communities within, proposed an alternate truck route for quarry trucks traveling to the waterfront from the quarry located at the eastern City limits. The alternate route proposed to run concurrent with the railroad from the intersection of South 7th Street and Union Street and travel west to where the railroad intersects Front Street. The proposed route was rejected by CSX Transportation due to the safety concerns of running a road on top of an active rail line.

2011: A petition signed by concerned residents was submitted to the Town of Greenport Planning Commission requesting approval from the Town of Greenport for an alternate route for gravel trucks traveling through Green Street (US Route 9/NY Route 23B), Columbia Street (NY Route 23B/NY Route 9G), delivering crushed gravel from the quarry located at the eastern City limits to the Hudson River to be unloaded onto barges. Some of the concerns cited by the petition included the noise and vibrations caused by trucks traveling near low setback housing units, damage to subterranean infrastructure, exposure to airborne toxins and diesel soot, and safety to pedestrians and bicyclists on sidewalks and at intersections. According to the petition, the truck traffic has greatest impact to the residents living in the northern part of the City who often live in low or moderate-income housing, have children, or are elderly or handicapped.

2013: The Hudson Development Corporation applied to the New York State Department of Environmental Conservation (NYSDEC) for a grant under the Environmental Justice Community Impact Grant Program to perform a study on the impacts that trucks have on the environmental, infrastructural, economic health of the City along commercial centers such as by the waterfront and Warren Street. The application for the grant discussed that the arts and tourism drive the local economy and that the noise, and fumes from trucks directly impede economic activity and the goal of the Hudson Development Corporation to revitalize the City. The grant was not approved.

2019: The City received funding from the NYSDOT for the feasibility study and was secured by Assembly member Didi Barrett.

In direct response to the concerns being raised, the City prepared an RFP in June of 2020 to conduct a formal engineering study to evaluate the feasibility of alternate routes for through truck traffic to by-pass the City limits to the greatest extent possible.

This report will identify several alternate truck route options, investigate the details of these options, and select a number of preferred truck route options for analysis and comparison. Once the analysis has been completed, one or more feasible options will be selected to carry forward into future phases of this project. At this time, this report will only identify in concept any feasible options. Refer to **Chapter 3**, **Sections 3.5** and **Section 3.7** for definitions of the term "preferred" and "feasible" as they relate to this feasibility study.

Findings:

This Feasibility Study initially investigated twelve (12) alternate truck route options for rerouting through truck traffic around the City of Hudson. The study also investigated an option that entailed improvements to the existing route as an avenue for comparison to the alternate truck route options. Upon further refinement and coordination, the study concluded that five (5) alternate truck route options were preferred. The five (5) preferred alternate truck route options will provide alternate routes of travel for through truck traffic around the City of Hudson utilizing a combination of new and existing roads.

A feasible option(s) has not been chosen at this point in the process for the DRAFT Feasibility Report. Designation of feasible option(s) will not occur until the information is presented to the project stakeholders and general public; at such time comments can be received and reviewed. Once all the stakeholder coordination and comment review are completed, this study will recommend one or more feasible alternate truck route options.

Next Steps:

As part of project planning, the next steps for the project would be to coordinate with potential funding partners to evaluate potential funding opportunities for project scoping, preliminary and final design. The options discussed in **Section 3.10.11** in **Chapter 3** of this report require a number of actions to enhance their applicability to fund the project. These include:

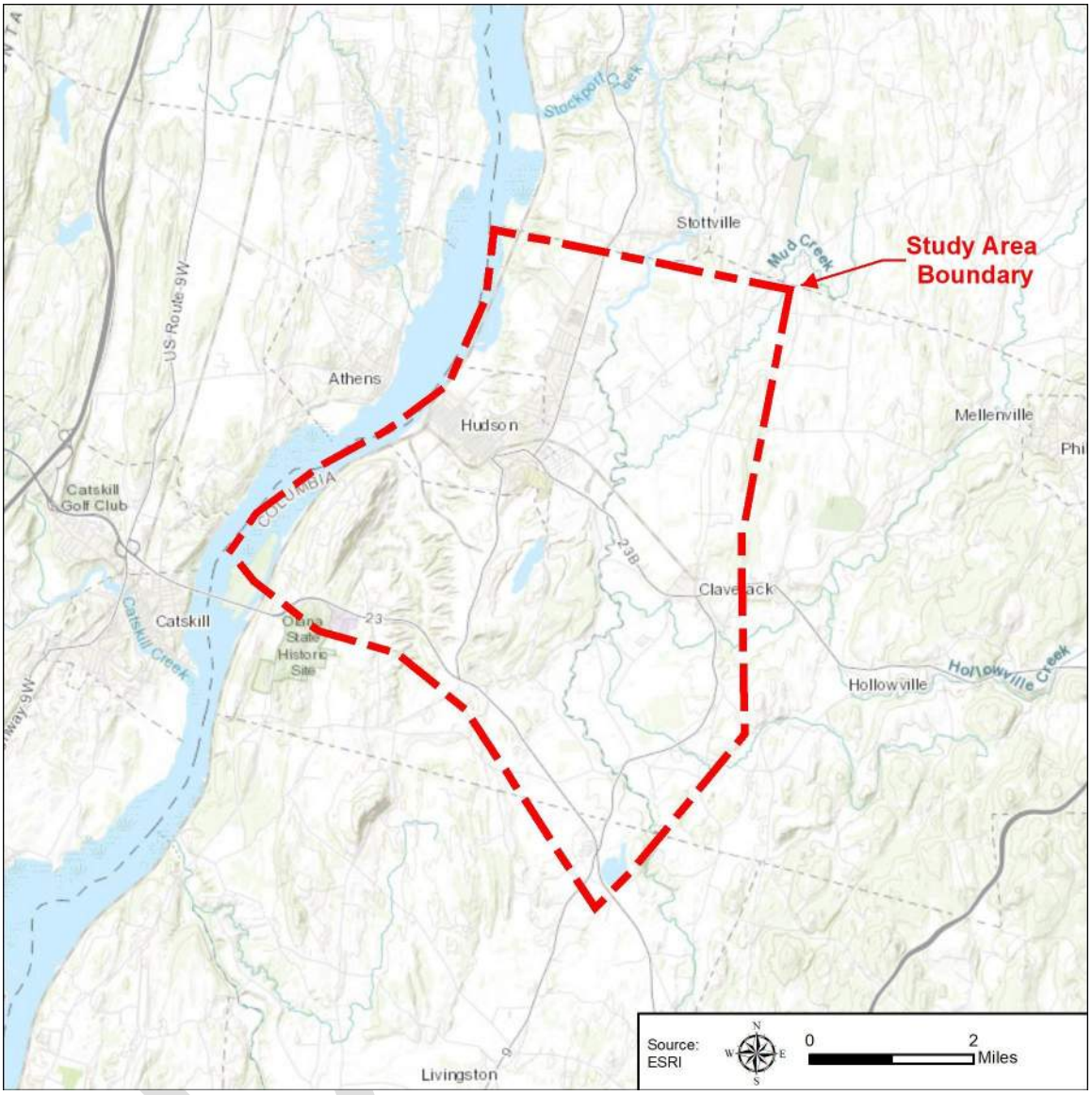
1. Continue Public Outreach:
    - Address any environmental, economic, social, etc. concerns that stakeholders and businesses may have as the project advances.
    - Communicate the project development with the business community. Utilize the findings from the Feasibility Study to help articulate the significance of the project.
2. Position the Project for State and/or Federal Funding:
    - Utilize the results from the Feasibility Study to help demonstrate support for increased safety within the City as well as any environmental enhancements, that the project can address.
    - Articulate the livability enhancements that the project will generate by moving trucks out of the downtown City area.
    - Leverage previous partnering experience between NYSDOT and Columbia County.
3. Develop a Financing Plan
    - Estimate the level of funding and associated financing that could be supported through various local value capture mechanisms.

- Coordinate with the NYSDOT and Columbia County the strategies to narrow down the funding sources for further consideration.
- Target key funding programs and discretionary grant opportunities for federal and state funding and financing through state and local partnership.

1.2 Project Location

1.2.1 Project Regional Map

1.2.2 Project Location and Study Area



1.3 Purpose and Need

1.3.1 Project Study Area

The Study Area was chosen based on the location of the existing truck route and the origin/destinations of through truck traffic traveling through the City of Hudson. An origin-destination study was performed, and the data / results of that study are located in **Appendix A: Data Summary Report.**

The Study Area was selected to encompass enough area surrounding the City to be able to use suitable federal, state, and county roads as potential alternate routes. As a result, an area encompassing 33.3 square miles was chosen to investigate potential alternative truck routes. See **Figure 1.1** located in **Appendix B** for the Project Study Area map.

1. Route numbers and road names within the Study Area are identified below in **Table 1-1**:

Table 1-1
Roadways Located Within the Study Area

Name	Description	Name	Description
US Route 9	(Worth Avenue, Warren Street, Park Place, Fairview Avenue)	North 2nd Street	-
US Route 9/NY Route 23B	(Columbia Street, Green Street)	Prospect Avenue	-
NY Route 9G/23B	(Columbia Street & South 3rd Street)	Healy Boulevard	-
NY Route 23B	(Green Street)	State Street	-
NY Route 66	(Union Turnpike)	Carrol Street	-
NY Route 23	-	Short Street	-
NY Route 9H	-	Harry Howard Avenue	-
Spook Rock Road	(County Route 29)	Joslen Boulevard	-
Fingar Road	-	Fish and Game Road	County Route 18
Hiscox Road	-	Atlantic Avenue	County Route 20
South Bay Causeway	-	Hill Street	-
Front Street	-	Stottville Road	-
Dock Street	-		-

2. US/State Highway (SH) number and official highway description:

Table 1-2
US/State Highway (SH) Designations

US Route / State Route	State Highway (SH) Number	Functional Classification	Description
US Route 9	SH 5073	Principal Arterial	NY Route 9H and NY Route 82 to end of US Route 9/NY Route 23 overlap
US Route 9	SH 5073	Minor Arterial	US Route 9/NY Route 23 overlap to the South City line
US Route 9	City Street	Minor Arterial	South City line to the North City line/Greenport Town line
US Route 9	SH 341	Minor Arterial	North City Line/Greenport Town Line to Greenport and Stockport Town Lines
US Route 9	SH 649	Minor Arterial	Greenport and Stockport Town Lines to Atlantic Avenue (CR 20)
NY Route 9G	SH 8341	Minor Arterial	End of NY Route 9G/NY Route 23 Overlap to the south City Line
NY Route 9G	City Street	Minor Arterial	South City Line to end of NY 9G/NY Route 23B overlap
NY Route 23B	SH 8341	Minor Arterial	Start of NY Route 9G/NY Route 23B Overlap to South City Line
NY Route 23B	City Street	Minor Arterial	From North City line to NY Route 66
NY Route 23B	SH 650	Minor Arterial	From NY Route 66 to end of NY Route 23B
NY Route 66	SH 9087	Minor Arterial	From NY Route 23B to NY Route 9H
NY Route 23	SH 57-10	Principal Arterial	From end of NY Route 9G/NY Route 23 Overlap to start of US Route 9/NY Route 23 Overlap
NY Route 23	SH 5073	Principal Arterial	From start of US Route 9/ NY Route 23 Overlap to NY Route 9H & NY Route 82
NY Route 9H	SH 1919	Principal Arterial	From US Route 9 and NY Route 82 to Town of Claverack and Town of Ghent Line
NY Route 9H	SH 8497	Principal Arterial	From Town of Claverack and Town of Ghent Line to Old Mill Road

3. Municipalities:
    - City of Hudson
    - Town of Claverack
    - Town of Greenport
    - Town of Livingston
4. Counties:
    - Columbia County

1.3.2 Need for the Study

The City of Hudson initiated this Truck Route Traffic Study to assess the through truck traffic patterns, volumes, and destinations through the City and determine whether suitable alternate routes could be developed that would bypass the City of Hudson.

Needs for the study:

- Existing excessive truck traffic through the City.
- Safety concerns for pedestrians, cyclists, and other motorists due to truck traffic.
- Health and environmental concerns due to truck exhaust.
- Comfort and welfare concerns due to heavy vibrations and loud noise along the truck corridor.
- Infrastructure concerns for subterranean pipes and structures such as the water lines, sanitary sewer, and storm sewer systems.
- Economic impacts to local businesses due to noise and unsightliness of trucks using the existing route.
- Improve the quality of life for the City residents.

Truck Traffic:

Currently, truck traffic traveling along the existing designated truck route, south through the City along US Route 9 or west to the Rip Van Winkle Bridge along NY Route 9G/ NY Route 23B pass directly through the City. The presence of trucks passing through the City or making trips between the quarry and docks has created a general disruption along the existing designated truck route as well as economic, environmental, and health consequences for the adjacent neighborhoods.

Existing truck data was collected utilizing Automatic Traffic Recorders (ATRs) at fifteen key locations throughout the City as a part of this Study. See **Appendix A** for the Data Summary Report Final Technical Memorandum which describes in detail the data collection methods and findings. The truck percentages collected from the traffic study are higher than the NYSDOT Region 8 average truck percentages at four locations within the City of Hudson. Shown below are the comparison of truck percentages at these four locations and the NYDSOT Region 8 average truck percentages for roadways with the same functional class (in parentheses).

- NY 23B (Green Street): 4.6% (3.7%)
- US 9/NY 23B (Green Street): 4.0% (3.7%)
- US 9 (Warren Street): 4.7% (3.7%)
- NY 9G/NY 23B (Columbia Street): 5.0% (3.7%)

The existing truck percentages along the existing truck route in the City of Hudson is between 8% and 35% higher than the regional averages for roadways with the same functional classifications.

Summary of Harms and Risks Associated with the Existing Tuck Route:

1. Health Implications from the Truck Traffic:
    a. Diesel exhaust is a component of the particulate matter air pollution and has been linked to asthma, lung diseases, and heart disease.
    b. It has been found that diesel exhaust causes an increased risk of death from heart attacks and stroke, premature birth, and adverse pregnancy outcomes.
    c. The substances found in diesel exhaust has the potential to contribute to mutations in cells that could become cancerous.
    d. Immediate health effects include coughing, headaches, lightheadedness, nausea, and irritated eyes, nose, throat, and lungs.
    e. Diesel exhaust is a fine-particle pollution. Fine particle pollution effects the elderly and people with emphysema, asthma, and chronic heart and lung disease. Studies have found, in areas of elevated particle levels, there has been an increase in hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.
    f. Children are at a higher risk of seeing health effects from diesel exhaust because their lungs and respiratory systems are still developing. It is especially detrimental to children's health if the children are around truck traffic for an extended period (living near or attending school near truck traffic).
2. Impact of truck traffic on subterranean infrastructure:
    a. The truck traffic vibrations and weight have the potential to damage subterranean infrastructure that could cause damage to the surrounding area and properties.
    b. The impact from subterranean infrastructure damage could result in future damage to utilities, sidewalks, and properties, resulting in significant costs for the City.
3. Effects of truck traffic through dense City population, pedestrian and commercial zones:
    a. There is a high volume of truck traffic that exists on the narrow streets of the City. Trucks are sometimes not able to make the sharp corners, causing damage to curbs/sidewalks. This situation is also dangerous for pedestrians in proximity of these turns.
    b. Truck traffic produces noxious fumes and can be very unpleasant and unhealthy for pedestrians.
4. Impacts on economic activity, tourism and quality of life:
    a. Noxious influences of high truck volumes contribute to noise, odors, dust, congestion, and visual degradation in the community. This situation can potentially prohibit tourism and people from traveling to the city.
    b. The preferred alternate truck route options will improve the quality of life for the City residents and businesses by reducing vehicular emissions and noise pollution, providing an increase in safety and travel for vehicles and pedestrians, and reducing the impact to existing infrastructure. As a result, the quality of life within the City will be improved by reducing the volume of truck traffic traveling through the City.

Summary of On-line Survey No.1 regarding economic impacts with the Existing Tuck Route:

1. Below are a summary of comments received from the public on-line meeting No. 1 regarding economic impacts as a result of the existing truck route.

a. The safety and enjoyment of pedestrians in the City is the biggest concern with the community. Many opinions were that people do not come to visit businesses in the city because it is not enjoyable, pleasant, and safe to walk around the area. The community feels the presence of trucks takes away from the walking experience in the City.

b. Another major complaint was the noise, air pollution, and dust that comes with truck traffic. Again, this makes it less enjoyable and at times unhealthy for people coming to the City to shop or dine.

c. Congestion and traffic in the narrow streets are other concerns the community has. The congestion makes it hard to navigate the streets and can be dangerous. It also makes it difficult to find parking. If it is too difficult to park, the community fears there would be no point of trying to shop and dine in the City.

Based on the truck percentages that exist today, the truck volumes through the City of Hudson are moderately higher than the average in Region 8 for roads of the same functional classification. Coupled with the effects the existing truck traffic has on the surrounding environment, the citizens and the City of Hudson, there is a need to study alternate locations for the truck route.

Crash Data Related to Truck Traffic at Intersections:

Crash data from the most recent 5-year period of available data was received from NYSDOT for the roads along the existing truck route within the City of Hudson and at major intersections within the study area.

The crash analysis shows that there are a high number of crashes occurring on Green Street, Columbia Street, and 3rd Street with a total of 68, 50, and 46 crashes, respectively. Of those crashes, the number involving trucks are 6, 6, and 5, respectively. The percentage of crashes involving trucks along these segments is 8.8%, 12%, and 10.9%.

The crash analysis at intersections outside of the city shows a high number of crashes occurring at the intersection of US Route 9 (Fairview Avenue) and Healy Boulevard with 44 total crashes, however, none involved trucks. The intersection of NY Route 23, NY Route 23B, NY Route 9H, and NY Route 9H/NY Route 23 in the Town of Claverack has the greatest number of crashes involving trucks within the study area with 4 out of a total of 31 (12.9%) crashes at the intersection from the most recent 5-year period of data.

Due to the narrow city streets and intersections with sharp curb radii along the existing truck route, trucks find it difficult navigating through the City of Hudson contributing to some of the crashes. Reducing the truck traffic traveling along the existing truck route in the City has the potential to reduce crashes involving trucks and total crashes. Crashes involving trucks at locations outside of the city areas are comparable to the number occurring within the City, however, the existing federal and state highways outside of the City have wider travel lanes and the intersections are constructed with larger turn radii, making it easier for trucks to safely navigate those turns. The effect of rerouting truck traffic to the existing intersections located outside of the City would not result in a significant increase to truck crashes at those locations.

The confined nature of the roads and intersections within the City of Hudson make travel difficult for trucks. The crash data indicates that relocating existing truck traffic to alternate routes outside of the City of Hudson would increase the safety and potentially reduce the number of crashes within the City. Developing an alternate truck route would also improve the safety for motorists, pedestrians, and bicyclists within the City of Hudson.

The confined nature of the roads and intersections within the City of Hudson make safe navigation difficult for trucks posing a risk to the other motorists, pedestrians, and bicyclists that share the roads with these trucks. The crash analysis indicates that there is a high rate of crashes within the City of Hudson that could be potentially reduced by studying alternate route for truck traffic outside of the City of Hudson.

Health and Environmental Concerns

Under existing conditions, the truck traffic utilizes the roadways through the City of Hudson. Emissions, dust, and debris will be reduced within the City with an alternative truck route that sends trucks around the City thus reducing impacts on residents. It is also anticipated that an alternative truck route would remove approximately 36 to 41% of the total through traffic from the City, including trucks from the quarry. Both the reduced air emissions and the removal of a significant percentage of traffic from the City would create beneficial impacts to air quality and increase the overall health and welfare of the residents in the City of Hudson.

The health and environmental factors present along the existing route within the City creates an additional basis to study alternate roadway locations for this traffic in order to improve air quality within the City.

Noise Impacts and Concerns

Impacts from noise and vibrations caused by trucks is worsened by the dense, urban development with numerous buildings close to the road, placing residents very close to the trucks utilizing the route. The alternate truck route options considered would remove the through truck traffic from the existing designated truck route within the populated City limits, therefore, reducing noise impacts along the existing truck route corridor.

The residents within the City neighborhoods along the designated truck route are affected by the noise caused by the truck traffic and as such, warrants consideration of alternate truck routes distanced from sensitive receptors.

Infrastructure Concerns

The City of Hudson is one of Hudson Valley's historical cities with aging underground infrastructure that is sensitive to damage from heavy vibrations caused from trucks driving over them. The existing truck traffic vibrations and weight has a potential to damage water lines, storm sewer lines, or sanitary sewer lines that could cause leaks and damage to the surrounding area and properties. Truck loading contributes significantly more to the degradation of pavement than passenger vehicles. Current roadway geometry in certain locations along the existing designated truck route does not provide proper turning radii or travel lane widths so when trucks take turns at these geometrically deficient

intersections, damage occurs at the curbs and sidewalks. Alternate through truck routes should be considered to reduce the damage caused to the City's infrastructure.

The impacts to the subterranean infrastructure caused by truck traffic could result in future damage to utilities, sidewalks and properties resulting in significant costs to repair and replace. Reducing the potential damage to the City infrastructure is an additional reason to investigate an alternate truck route around the City of Hudson.

1.3.3 Objectives of the Study

The objectives of this study are to:

1. To determine the truck traffic travel patterns, volumes, and types traveling through the City of Hudson using a combination of ATR and Origin-Destination data collection.
2. Identify and assess alternative truck routes that may provide a cost-effective and safe alternate designated truck route(s) around the City of Hudson.
3. Assess possible alternate through truck routes that will reduce the amount of truck traffic traveling through the City, not including local delivery trucks.
4. Assess options that meet the project objectives and evaluate potential impacts and benefits of the alternative routes as well as improve the overall environmental quality of life for the residents and business owners in the City of Hudson affected by the existing truck traffic.
5. Assess options that provide safer travel for pedestrians and vehicles within the city affected by the existing truck traffic.

1.3.4 Goals of the Study

The goals of this study are to:

1. Identify a preferred alternate route for through truck traffic to utilize outside of the City of Hudson limits that would:
    a. Minimize stop-and-go travel for existing trucks traveling through the City of Hudson.
    b. Reduce through truck traffic traveling within the City of Hudson and along the existing designated truck route.
    c. Coordinate with the surrounding towns, Columbia County, New York State, and stakeholders to build consensus for modification and improvement to the existing truck route.
2. Improve quality of life for the city residents and businesses:
    a. Reduce vehicular emissions & noise pollution.
    b. Provide safer travel for vehicles and pedestrians.
    c. Reduce impact to existing infrastructure.

1.3.5 Lead Agency

If an option is chosen for design and the project achieves funding, it is anticipated that the City of Hudson will be the lead agency. The potential new truck route is anticipated to follow a combination of state highways and county roads. Any option chosen for design will be designed to current NYSDOT / County standards. Once / if an option is chosen and is funded for construction, it is anticipated that the City of Hudson will advertise and award the construction contract with appropriate Highway Work Permits obtained from the respective regulatory agencies. It is anticipated that the alternate truck route will not change ownership and be maintained by the respective roadway owner.

Further coordination with the NYSDOT will be required in the future phases of the project to coordinate details of the anticipated lead agency responsibilities.

1.4 Types of Options Considered

1.4.1 No-Build

This option assesses the effects of continued use of the existing designated truck route network without any improvements and is used as a comparison to the other options considered.

1.4.2 No-Build with Improvements (NBI)

This option (NBI) assesses the effects of utilizing the existing designated truck route network with required improvements to enhance the existing truck route network within the City to current design criteria standards and is used as a comparison to the other alternate truck route options considered.

1.4.3 Alternate Truck Route Options

Initially, the study reviewed and analyzed a total of twelve (12) options for alternative through truck routes. See **Figure 3.3** in **Appendix B** for the alternate truck route options considered. The twelve (12) alternate truck route options selected were analyzed within the Study Area for comparison. The options considered used various combinations of new and existing roads within the study area. See **Chapter 3** for a description of all the alternate options considered. Coordination with the City of Hudson and project stakeholders took place for all options considered that ultimately resulted in selecting five (5) preferred alternate truck route options. The five (5) preferred options were then analyzed and compared to each other along with the No-Build with Improvements (NBI) option with the intent to identify one or more potential feasible options for consideration. See **Figure 3.4** located in **Appendix B** and **Exhibit 1.1** below for the five (5) preferred alternate truck route options selected for analysis. The five (5) preferred options were evaluated for compliance with NYSDOT design criteria, environmental, social, and economic impacts.

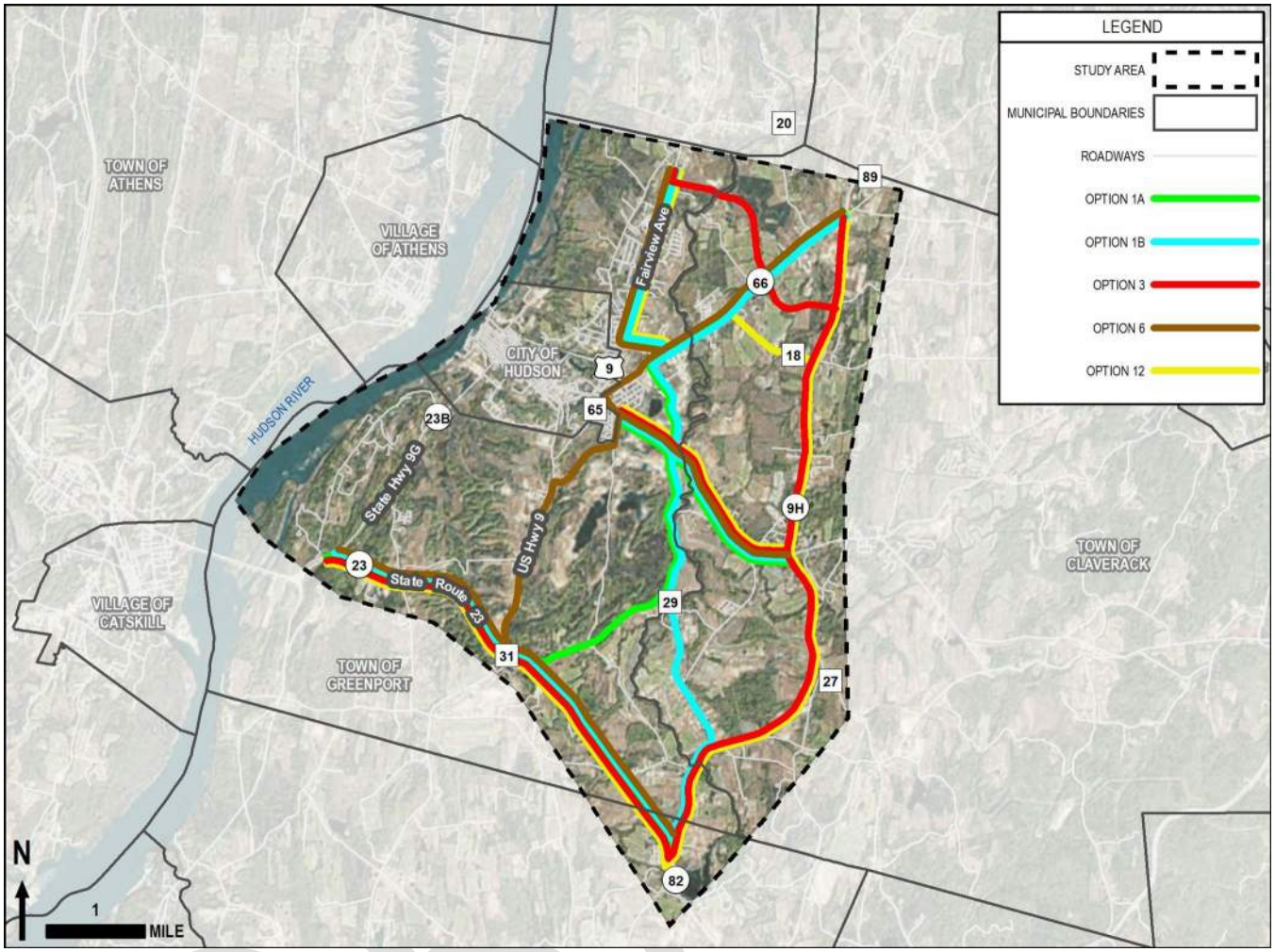


Exhibit 1.1 Alternate Truck Route Preferred Options

1.4.4 Preferred Options Selected

For the purposes of this study, the term "preferred" is defined as an option, that meets or partially meets the project needs/goals and was determined, by analysis to be warranted for further study in future design study phases. Preferred options will not be deemed feasible for construction until further detailed engineering analysis is completed in the preliminary design phases of the project.

Options 1A, 1B, 3, 6 and **12** have been identified as preferred options for further consideration. Refer to **Figure 3.4** located in **Appendix B** for a graphical diagram illustrating the alternate truck route summary of preferred options.

1.4.6 Comparison of Preferred Options

The following table includes a comparison summary of the impacts associated with each of the five (5) preferred alternate truck route **Options** (**1A**, **1B**, **3**, **6** and **12**) with the No-Build with Improvements (NBI) option.

Table 1-3
Comparison of Preferred Options

Comparison Criteria	Preferred Options					
	NBI	1A	1B	3	6	12
Meets Project Objectives	N	Y	Y	Y	Y	Y
Engineering Considerations						
Improved geometry and intersections	Y	Y	Y	Y	Y	Y
No. of new roads	0	0	0	2	1	0
Potential accident reduction / safety benefits	Y	N	Y	N	Y	Y
Roadway length (centerline lane mile)	4.8 to 9.5	5.1 to 9.4	5.1 to 12.9	5.2 to 14.0	5.6 to 9.0	6.0 to 14.8
No. of existing bridges crossed	7	3	5	4	3	5
No. of new bridges/culverts required	0	0	0	3	0	0
No. of at-grade railroad intersections	2	1	1	0	1	0
No. of at-grade non-signalized intersections	78	34	37	35	35	52
No. of at-grade signalized intersections	17	6	7	4	7	9
Average Estimated Truck driving time (min:sec)	10:09 to 18:14	10:20 to 17:28	11:02 to 21:24	8:02 to 18:59	10:31 to 17:23	10:06 to 23:46
Avg. Percentage Truck Traffic Reduction Along Route	0.0%	0.9%	0.9%	0.9%	0.8%	0.9%
Opinion of Project Cost (2021) (Millions)	$2.2	$7.0	$7.9	$25.8	$3.1	$1.4
Opinion of Project Cost (Escalated to 2026) (Millions)	$2.5	$7.8	$8.9	$29.2	$3.5	$1.5
Social & Economic Consequences						
Positive impact on residences / businesses	N	Y	Y	Y	Y	Y
Improved travel patterns and accessibility	N	Y	Y	Y	Y	Y
Potential Relocation effects	Y	N	N	N	N	N
No. of properties crossed	4	10	9	8	2	0
No. of property owners	4	6	6	6	2	0
No. of commercial properties crossed[1]	2	8	7	0	1	0
No. of residential properties crossed[1]	2	0	0	0	0	0
No. of commercial business relocations[1]	2	0	0	0	0	0
No. of residential home relocations[1]	0	0	0	0	0	0
Estimated total right-of-way acquisition cost	TBD	TBD	TBD	TBD	TBD	TBD
Environmental Consequences						
Potential Groundwater Quality Impacts	N	Y	Y	Y	N	Y
Potential Effects to Threatened or Endangered Species	N	Y	Y	Y	Y	Y
Potential Effects to Wildlife	N	Y	Y	Y	Y	Y
Potential Effects to Historical and Cultural Resources	N	Y	Y	N	N	N
Potential Visual Effects	N	N	N	Y	Y	N
Potential Air Quality Effects	N	Y	Y	Y	Y	Y
Potential Noise Impacts	N	N	N	Y	Y	N
Potential Energy Impacts	N	Y	Y	Y	Y	Y
Potential State wetland impact	N	Y	Y	Y	Y	Y
Potential Federal wetland impact	N	Y	Y	N	Y	N
Potential Class A stream impact	N	N	N	N	N	N
Potential Class B stream impact	N	N	N	N	N	N

Table 1-3
Comparison of Preferred Options

Comparison Criteria	Preferred Options					
	NBI	1A	1B	3	6	12
Potential Class C stream impact	N	Y	Y	N	Y	Y
Potential Class D stream impact	N	N	N	N	N	N
Potential Trout stream impact	N	N	Y	Y	N	N
Potential Flood zone impacts	N	Y	Y	Y	Y	Y
Potential Agricultural District No. 3 impact	N	Y	Y	Y	N	Y
Potential Agricultural District No. 7 impact	N	Y	N	N	Y	N
Potential Prime farmland soils impacted	N	N	N	Y	N	N

Notes:

1. Further study is required during future design phases in order to determine/quantify effects or impacts.
2. Historic resource impacts are not anticipated. Archaeological studies will be required in future design phases to determine whether resources are present.

Preliminary evaluations conducted as part of the study have determined that **Options 1A, 1B**, **3**, **6** and **12** are preferred options, which meet the project objectives.

1.5 Environmental Review and Stakeholder Coordination

1.5.1 National Environmental Policy Act (NEPA)

1.5.2 State Environmental Quality Review Act (SEQRA)

This project is anticipated to be classified as a SEQR Type I Action in accordance with 17 NYCRR Part 15.

1.5.3 Anticipated Permits and Coordination

The following is a list of the anticipated permits required for the future project at the time of construction.

- NYSDEC Article 15
- NYSDEC Article 24
- USACE Section 10
- USACE Section 401
- USACE Section 404
- NYSDEC General Permit for Construction Activities (GP-0-20-001)

Coordination with the following entities is anticipated to be required for proposed project:

Federal:

- Federal Highway Administration
- US Fish and Wildlife Service
- U.S. Army Corps of Engineers

State:

- New York State Department of Transportation
- New York Natural Heritage Program

- Office of Parks, Recreation and Historic Preservation (OPRHP)
- New York Department of Environmental Conservation

Local:

- City of Hudson
- Town of Claverack
- Town of Greenport
- Columbia County
- Town of Livingston

1.5.4 Local Stakeholder Coordination:

Stakeholder coordination for this project included:

- NYSDOT Region 8
- Columbia County
- Local adjacent municipalities (Towns of Claverack, Greenport and Livingston)
- Local Businesses
- Local Residents / property owners
- Public Meetings

In outreach to the local municipalities (towns neighboring the City of Hudson), people indicated they would more likely support alternative routes if those alternate routes don't significantly increase truck traffic in residential areas in the neighboring towns.

In addition, there is a sentiment from neighboring towns that if the City of Hudson is committed to reducing trucks from residential streets, the City would approve Colarusso's application to the Planning Board. The objective of this study is focused on truck traffic that does not have local deliveries and therefore isn't directly related to, or making recommendations to, that application in front of the Planning Board application. To the extent that implementation of an alternate route depends on regional consensus, it may be helpful to understand regional viewpoints.

1.6 Opinion of Probable Costs and Schedules

The following are the comparison of probable costs for the year 2021:

Table 1-4
Comparison and Opinion of Probable Costs (Year 2021)

	Preferred Options					
Activities	**NBI**	**1A**	**1B**	**3**	**6**	**12**
Construction Cost (Highway Elements)	$1,331,000	$4,292,000	$4,805,000	$5,374,000	$1,869,000	$830,000
Construction Cost (Structural Elements)	$0	$0	$0	$10,346,881	$0	$0
Subtotal	$1,331,000	$4,292,000	$4,805,000	$15,720,881	$1,869,000	$830,000
Feasibility Level Estimate Contingency (20%)	$400,000	$1,288,000	$1,442,000	$4,717,000	$561,000	$249,000
Professional Services (Preliminary Design)	$107,000	$344,000	$385,000	$1,258,000	$150,000	$67,000
Professional Services (Final Design)	$80,000	$258,000	$289,000	$944,000	$113,000	$50,000
Construction Inspection (20%)	$267,000	$859,000	$961,000	$3,145,000	$374,000	$166,000
Right-of-Way (Incl. Environmental Mitigation)	$0	$0	$0	$0	$0	$0
Subtotal	$854,000	$2,749,000	$3,077,000	$10,064,000	$1,198,000	$532,000
Estimated Option Cost	$2,185,000	$7,041,000	$7,882,000	$25,784,881	$3,067,000	$1,362,000

The following are the comparison of probable costs escalated to the year 2026 (5-year projection) using an escalation rate of 2.5% per year from 2021:

Table 1-5
Comparison and Opinion of Probable Costs (Escalated to Year 2026 @ 2.5% per year)

	Preferred Options					
Activities	**NBI**	**1A**	**1B**	**3**	**6**	**12**
Construction Cost (Highway Elements)	$1,506,000	$4,857,000	$5,437,000	$6,081,000	$2,115,000	$940,000
Construction Cost (Structural Elements)	$0	$0	$0	$11,707,000	$0	$0
Subtotal	$1,506,000	$4,857,000	$5,437,000	$17,788,000	$2,115,000	$940,000
Feasibility Level Estimate Contingency (20%)	$453,000	$1,458,000	$1,632,000	$5,337,000	$635,000	$282,000
Professional Services (Preliminary Design)	$122,000	$390,000	$436,000	$1,424,000	$170,000	$76,000
Professional Services (Final Design)	$91,000	$292,000	$327,000	$1,069,000	$128,000	$57,000
Construction Inspection (20%)	$303,000	$972,000	$1,088,000	$3,559,000	$424,000	$188,000
Right-of-Way (Incl. Environmental Mitigation)	$0	$0	$0	$0	$0	$0
Subtotal	$969,000	$3,112,000	$3,483,000	$11,389,000	$1,357,000	$603,000
Estimated Option Cost	$2,475,000	$7,969,000	$8,920,000	$29,177,000	$3,472,000	$1,543,000

1.7 Feasible Alternate Truck Route Option(s)

A feasible alternate truck route option or option(s) will be selected after all project stakeholder and public input is received and the preferred alternate truck route options comparison and analysis has been completed.

1.8 Public Involvement Plan Schedule of Milestone Dates

Table 1-6
Public Involvement Plan Schedule of Milestone Dates

Activity	Date Occurred/Tentative
Public Information Meeting No.1	December 10, 2020
Public Information Meeting No. 2	April 15, 2021

Project Contact: **Mr. Michael Chameides**
Mayor's Aide
City of Hudson Truck Route Traffic Feasibility Study

Questions or comments: E-mail: mayoralaide@cityofhudson.org
Telephone: (518) 828-7217

Mailing Address: **City of Hudson**
520 Warren Street
Hudson, NY 12534

This Feasibility Report contains supporting technical evaluations of the existing conditions, proposed options and impacts of the options considered, copies of technical reports and plans and other supporting information.

CHAPTER 2 – PROJECT INFORMATION

2.1 Local Plans for the Project Area

The following projects are being investigated / actively pursued within the project study area:

- Downtown Revitalization Initiative (DRI) Complete Streets Improvements
- Green Street and Fairview Avenue Intersection Improvements
- Haul Road Expansion
- Various Americans with Disability Act (ADA) projects within the City
- Sanitary sewer line improvements along NY Route 66

2.2 Abutting Highway Segments and Future Plans for Abutting Highway Segments

2.2.1 Abutting Highway Segments

The primary roadways abutting the project include:

1. US Route 9
2. NY Route 9G
3. NY Route 9H
4. NY Route 23
5. NY Route 23B
6. NY Route 66

Outside of the Hudson City limits, these federal and state highways are primarily two-lane undivided roads except for turning lanes at various intersections. Within the City limits, US Route 9 (Worth Avenue, Warren Street, Park Place, Fairview Avenue), US Route 9/NY Route 23B (Green Street), and NY Route 9G/NY Route 23B (Columbia Street, and 3rd Street) are urban in nature with curbs and sidewalks, no striping, narrow travel lanes, parking lanes, and minimal turning radii at the intersections.

2.2.2 Future Plans for Abutting Highway Segments

Below is a brief summary of the future projects in development for the City of Hudson along the abutting highways:

a. Downtown Revitalization Initiative (DRI) - Complete Streets Improvements:

The City of Hudson is proposing to implement, design and construct a phased Complete Streets Initiative through the DRI area to provide safe access, aesthetic improvements, and separation of truck traffic from pedestrians and bicyclists. Some of the improvements that would be made include safe and functional at-grade railroad crossings, streetscape improvements, pedestrian stairs, and signage.

b. Intersection Improvements:

The City of Hudson is in the process of developing plans and specifications for intersection improvements, including traffic signal and curb ramp improvements, at the intersection of Green Street and Fairview Avenue.

c. Haul Road Expansion:

There is a proposal by a local industrial firm to renovate and expand an existing haul road between the firm's limestone and shale mine in the Town of Greenport to the Hudson River Waterfront Docks located in the City of Hudson. The majority of the project consists of upgrading the existing haul road including grading the roadway to reestablish the crown, placing and compacting new gravel and crusher run, and

cleaning out drainage swales and installing check dams. The purpose of the project is to route Hudson River dock truck traffic associated with the quarry more directly from the quarry to the Hudson River Dock and off City of Hudson Streets.

The completed haul road would consist of 2.33 miles of roadway and would consist of three sections. The first section would require construction of a new road within the quarry connecting to US Route 9. The second section would be improvements of the existing haul road located between US Route 9 and NY Route 9G/NY Route 23B. The work on the third section would include realignment of the haul road currently in use that crosses the South Bay causeway. All intersections with the state and federal routes will be paved and constructed to NYSDOT standards. Work in sections one and two of the haul road would occur primarily in the Town of Greenport and work on the third section would occur within the City of Hudson.

d. Various Americans with Disability Act (ADA) projects within the City

The City of Hudson is currently progressing various ADA projects within the City limits.

e. Sanitary sewer line improvements along NY Route 66

The City of Hudson is currently progressing sanitary sewer line improvements along NY Route 66.

f. New York State Department of Transportation (NYSDOT):

Discussions were held with the NYSDOT (Main Office and Region 8) representatives regarding future plans for the state roadways in the vicinity of the study area. As a result of this discussion with the NYSDOT, there are no foreseeable changes programmed for these roadways within the next 20 years.

2.3 Study Area Data Collection and Methodology

Both existing Geographic Information System (GIS) datasets, as well as data collected in the field, were used to review and analyze existing site conditions. Existing GIS datasets generated by multiple agencies were compiled and used to provide the characteristics of the study area. Mapped characteristics included environmental features, municipal and property boundaries, and historic resources. Refer to **Figure 1.1** located in **Appendix B** for the limits of the project study area.

2.3.1 Wetlands

New York State Department of Environmental Conservation (NYSDEC) State Regulated Wetlands:

NYSDEC regulated wetlands in the study area were presented using an existing NYSDEC GIS data set and through a desktop environmental analysis. The NYSDEC generally limits the wetlands they regulate to being at least 12.5 acres or larger, and therefore are not inclusive of all potential wetlands in an area.

United States Army Corps of Engineers (USACE) Federal Regulated Wetlands:

USACE regulated wetlands in the study area were presented using The National Wetland Inventory (NWI) and USACE digital inventories of federally regulated wetlands.

Wetland locations identified in this study are preliminary and will ultimately need to be verified by the regulatory agencies during future design phases of the project. Approximate wetland locations within the study area are included in **Figure 2.1** located in **Appendix B**.

2.3.2 Environmental, Historic and Cultural Resource Features

Environmental, historic, and cultural features across the study area are presented using existing GIS datasets sourced from NYSDEC, SHPO, FEMA, and USGS. Environmental and agricultural features mapped included streams and water bodies, watersheds, floodplains, and agricultural district boundaries. Historic and cultural features, such as National Register of Historic Places sites, are mapped as well. Historic and Cultural Resource extents are shown in **Figure 2.2** located in **Appendix B**.

2.3.3 Existing Property Boundaries and Land Use

Tax map accuracy property boundaries and land uses within the study area are presented using existing GIS datasets sourced from Columbia County. Tax parcel data with ownership and land use information provided the information needed to display approximate property lines and municipal boundaries, assess public / private ownership, and analyze the various land uses across the study area.

Table 2-1 below identifies and summarizes the data sources and information used to be analyzed for this project.

Table 2-1
Data Sources Utilized

	Dataset	Data Type	Source	Description
1	Aerial Imagery	Ortho Imagery	US Department of Agriculture (USDA) - National Agricultural Imagery Program (NAIP)	ESRI World Imagery
2	Agricultural Districts	Environmental	NYS Department of Agriculture and Markets (NYSDAM)	Agricultural district boundaries
3	Archaeologically Sensitive Areas	Cultural / Historic Resources	NYS Historic Preservation Office (SHPO)	Archaeologically sensitive areas
4	Topographic Contours	Topographic	Feature Extraction from Mobile Mapping, Bathymetric Field Survey, & Aerial LiDAR DEM	USGS DEM, 20-foot Contours
5	Flood zones	Environmental	Federal Emergency Management Agency (FEMA)	Flood zone boundaries
7	Municipal Boundaries	Cadastral	Columbia County	Municipal boundaries
8	National Register Sites	Cultural / Historic Resources	NYS Historic Preservation Office (SHPO)	National Register of Historic Places sites
9	NYS Classified Streams	Environmental	NYS Department of Environmental Conservation (NYSDEC)	NYS stream lines with classifications
10	NYS Regulatory Wetlands	Environmental	NYS Department of Environmental Conservation (NYSDEC)	NYS regulatory wetland boundaries
11	Federal Jurisdictional Wetlands	Environmental	National Wetland Inventory (NWI)	Federal regulatory wetland boundaries
12	Railroads	Transportation	NYS Department of Transportation (NYSDOT)	CSX Railroad lines
13	Soils	Environmental	US Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS)	Soil type boundaries and classifications organized in the Soil Survey Geographic Database (SSURGO)
14	Streets and Highways	Transportation	NYS Office of Information Technology Services (NYSITS)	Street and highway lines
15	Tax Parcels	Cadastral	Columbia County	Tax parcel boundaries
16	Water Bodies	Environmental	US Fish and Wildlife Service (USFWS) - National Wetland Inventory (NWI)	Water body boundaries

2.4 Transportation Conditions, Deficiencies and Engineering Considerations

2.4.1 Traffic, Safety and Maintenance Operations

2.4.1.1 Functional Classification and National Highway System (NHS)

Table 2-2
Classification Data of Existing Routes

Route(s)	Functional Classification	National Highway System (NHS)	Designated Truck Access Route	Qualifying Highway	Within 1 mile of a Qualifying Highway	Within the 16 ft Vertical Clearance Network
US Route 9	Urban Minor Arterial	No	Yes	No	No	No
US Route 9/NY Route 23 Overlap	Urban Principal Arterial	Yes	Yes	No	No	No
US Route 9/NY Route 23B Overlap	Urban Minor Arterial	No	Yes	No	No	No
NY Route 9G/NY Route 23B	Urban Minor Arterial	Yes[1]	Yes	No	No	No
NY Route 23B	Urban Minor Arterial	No	Yes	No	No	No
NY Route 66	Urban Minor Arterial	No	Yes	No	No	No
NY Route 23	Urban Principal Arterial	Yes	Yes	No	No	No
NY Route 9H	Urban Principal Arterial	Yes	Yes	No	No	No
NY Route 9H/NY Route 23	Urban Principal Arterial	Yes	Yes	No	No	No
Spook Rock Road	Urban Local	No	No	No	No	No
Fingar Road	Urban Local	No	No	No	No	No
Hiscox Road	Urban Local	No	No	No	No	No
Healy Boulevard	Urban Minor Arterial	No	Yes	No	No	No
Fish and Game Road (CR 18)	Major Collector	No	No	No	No	No
Merle Avenue	Urban Local	No	No	No	No	No
Lone Star Road	Urban Local	No	No	No	No	No
Newman Road	Urban Local	No	No	No	No	No

Notes:

1. NY Route 9G/NY Route 23B from the end of the NY Route 9G/NY Route 23 overlap to Allen Street is a part of the National Highway System as an intermodal connector to the Hudson Amtrak station.

2.4.1.2 Terrain

Outside of the City of Hudson, the terrain consists generally of rolling farmland and rural residential neighborhoods. Similarly, the City of Hudson also has rolling terrain and the streets are generally sloped downward to the west towards the Hudson River. Refer to **Figure 2.3** in **Appendix B** for the project study area existing topography.

2.4.1.3 Roadway Segment Designations

For the purpose of this study, the existing truck route was divided into roadway segments. Roadway segments and major intersections along the existing route and along the preferred options are identified in **Table 2-3** below and will be used in this report as identifiers. Intersections with minor streets will be referred to separately by the intersection streets and are not identified with a specific intersection letter.

There are multiple existing designated truck routes with various destinations outside of the City limits. See **Figure 3.1** in **Appendix B** for the existing roadway segment designation map.

Table 2-3
Existing Roadway Segment Designations

Segment	Description	Segment Length
E-1A	US Route 9 (Intersection V to Intersection B)	2.28
E-1B	US Route 9 (From Intersection B to Intersection C)	0.50
E-1C	US Route 9 (From Intersection C to Intersection F)	2.90
E-2	NY Route 66 (Intersection Q to Intersection K)	3.08
E-3A	NY Route 23B (Intersection S to intersection K)	2.65
E-3B	NY Route 23B (Intersection K to Intersection B)	0.10
E-4A	NY Route 9G/NY Route 23B (Intersection C to Intersection G)	0.59
E-4B	NY Route 9G/NY Route 23B (Intersection G to Intersection H)	2.85

The following origin and destination routes have been identified and are quantified in **Table 2-4** below:

Table 2-4
Existing Truck Route Designations

Route Identifier	Origin (into City)	Routes Used	Destination (Existing City)	Total Route Length
E1	Intersection V	US Route 9 Healy Boulevard NY Route 66 NY Route 23B	Intersection S	5.03
E2	Intersection V	US Route 9 Green Street Columbia Street Park Place Warren Street US Route 9 US Route 9/NY Route 23	Intersection U	8.43
E3	Intersection V	US Route 9 Green Street Columbia Street NY Route 9G/NY Route 23B	Intersection H	6.22

Table 2-4 Existing Truck Route Designations				
Route Identifier	**Origin (into City)**	**Routes Used**	**Destination (Existing City)**	**Total Route Length**
E4	Intersection Q	NY Route 66 Green Street Columbia Street NY Route 9G/NY Route 23B	Intersection H	7.12
E5	Intersection S	NY Route 23B Green Street Columbia Street NY Route 9G/NY Route 23B	Intersection H	6.69

2.4.1.4 Intersection Designations

The following intersections are the major intersections located on the existing roads within the study area. These intersections, their designations and the type of control can be viewed in **Table 2-5** below. See **Figure 3.1** in **Appendix B** for the intersection designations.

Table 2-5 Existing Intersection Designations		
Designation	**Intersection Description**	**Intersection Control**
A	US Route 9 (Fairview Avenue) and Healy Boulevard	Signalized
B	US Route 9 (Fairview Avenue), NY Route 23B, and US Route 9/NY Route 23B (Green Street)	Signalized
C	US Route 9 (Park Place) and NY Route 9G/NY Route 23B (Columbia Street)	Stop Controlled on Park Place
D	US Route 9 (Park Place) and Warren Street	Stop Controlled on Park Place
E	US Route 9 (Warren Street & Worth Avenue), Prospect Avenue, and Worth Alley	All Way Stop Controlled
F	US Route 9, US Route 9/NY Route 23, NY Route 23, and Blue Hill Road (CR 31)	Signalized
G	US Route 9G/NY Route 23B (Columbia Street) and N 3rd Street	Signalized
H	NY Route 9G/NY Route 23B, NY Route 9G/NY Route 23, and NY Route 23	Stop Controlled on NY Route 9G/NY Route 23B
I	NY Route 66 (Union Turnpike) and Fish and Game Rd. (CR 18)	Stop Controlled on Fish and Game Road (CR 18)
J	NY Route 66 (Union Turnpike) and Healy Boulevard	Signalized
K[1]	NY Route 66 (Union Turnpike), NY Route 23B, and Columbia Street	Signalized
L	NY Route 23B and Newman Road	Stop Controlled on Newman Road
M	NY Route 23B and Spook Rock Road (CR 29)	Stop Controlled on Spook Rock Road (CR 29)
N	Spook Rock Road (CR 29) and Hiscox Road	Stop Controlled on Hiscox Road
O	Hiscox Road and Fingar Road	All Way Stop Controlled
P	US Route 9/NY Route 23 and Fingar Road	Stop Controlled on Fingar Road
Q	NY Route 66 (Union Turnpike) and NY Route 9H	Signalized
R	NY Route 9H and Fish and Game Road (CR 18)	Signalized

Table 2-5 Existing Intersection Designations		
Designation	**Intersection Description**	**Intersection Control**
S	NY Route 9H, NY Route 23, NY Route 23B, and NY Route 9H/NY Route 23	Signalized
T	NY Route 9H/NY Route 23 and Spook Rock Road (CR 29)	Stop Controlled on Spook Rock Road (CR 29)
U	NY Route 9H/NY Route 23, US Route 9/NY Route 23, US Route 9, NY Route 82	Signalized
V[2]	US Route 9 (Fairview Avenue) and Segment N1-3	Stop controlled on Segment N1-3

Notes:

1. Intersection K has pedestrian signal heads and push buttons.
2. Intersection V is designated to identify the northern project extent on US Route 9 (Fairview Avenue) and is used for the purposes of route length and travel time determinations. Intersection V is not an existing intersection.

The following intersections are the remaining existing signalized intersections within the project study area that are not identified in **Table 2-5** above as they are located at side streets and commercial driveways. in which the truck traffic does not utilize the side street and continues on the designated truck route:

1. NY Route 9G/NY Route 23B (S 3rd Street) and Allen Street
2. NY Route 9G/NY Route 23B (S 3rd Street) and Union Street
3. NY Route 9G/NY Route 23B (3rd Street) and Warren Street
4. NY Route 9G/NY Route 23B (Columbia Street) and 4th Street
5. NY Route 9G/NY Route 23B (Columbia Street) and 5th Street
6. NY Route 9G/NY Route 23B (Columbia Street) and 6th Street
7. US Route 9/NY Route 23 (Green Street) and State Street
8. US Route 9 (Fairview Avenue) and Joslen Boulevard
9. US Route 9 (Fairview Avenue) and Livingston Parkway
10. US Route 9 (Fairview Avenue), Fairview Plaza, and Shoprite Driveways

The remaining intersections along the existing and preferred routes within the project limits are currently controlled by stop and/or yield signs.

2.4.1.5 Control of Access

Access Control - As defined in the NYSDOT Highway Design Manual (HDM), **Section 2.6.15**, control of access is defined as the regulated limitation of access rights to and from properties abutting the highway facilities. Control of access is measured by the degree to which access is controlled, that is, fully controlled, partially controlled or uncontrolled.

All federal and state highways exhibit uncontrolled access within the study area. Each roadway intersects local roadways and both residential and commercial driveways within the study area.

2.4.1.6 Existing Speeds

The existing posted speed limits will be retained to the existing roadways upon completion of the project. See **Table 2-6** for existing speed limits.

Table 2-6 Existing Speeds		
Route	**Location**	**Posted Speed Limit (mph)**
All Roads within the City of Hudson	All Roads within the City of Hudson	30
NY Route 9H/NY Route 23	S to U	40 / 55
NY Route 9H	Q to S	40 / 55
US Route 9/NY Route 23	F to U	55
NY Route 23	H to F	55
NY Route 9G/NY Route 23B	South city limits to Intersection H	55
US Route 9	F to south City of Hudson line	45 / 55
US Route 9 (Fairview Avenue)	B to V	30 / 40
NY Route 66	K to Bridge Street	30 / 35
NY Route 66	Bridge Street to Q	45 / 55
NY Route 23B	L to S	35 / 40 / 55
Healy Boulevard	A to J	30
Fish and Game Road (CR 18)	I to R	45
Spook Rock Road (CR 29)	M to T	Not posted
Hiscox Road	N to O	30
Fingar Road	O to P	40
Merle Avenue	NY Route 66 to Lone Star Road	Not posted
Lone Star Road	Merle Avenue to M	Not posted
Newman Road	Intersection L to Intersection with Segment N1-6	35

2.4.1.7 Existing Truck Traffic Volumes

Traffic Count Methodology Used for this Study:

A combination of traffic counts and the origin destination study were performed along the existing truck route within the City of Hudson. Automatic Traffic Recorders (ATRs) were placed along the existing route at 15 locations to collect data on vehicle volumes and type.

An origin-destination study was performed to determine the travel patterns of trucks through the city along the existing truck route. The time, license plate number, number of axles, and direction were recorded on voice recorders and this data was transcribed prior to performing the matching process to determine the origin and destination of the trucks. Refer to **Appendix A** for the Data Summary Report – Final Technical Memorandum for a summary of the data collected.

Table 2-7 shown below compare the traffic and truck AADT volumes and the percentages of trucks traveling along the established routes to the NYSDOT Region 8 average truck percentages for roads with the same functional class.

A detailed summary of the traffic and truck data that was collected along with the data collection plan can be found in the truck traffic data summary report in **Appendix A**.

Table 2-7
Existing Traffic Volumes for Existing Traffic Patterns

ATR No.	Roadway	All Vehicles			Trucks		Statewide Average Truck Percentage
		Daily Avg. Vol.	Peak Hour Avg.		Daily Average		
			AM	PM	Vol.	% Trucks	
1	NY 9G/23B, S 3rd Street	8,009	723	1,181	84	1.1%	3.7%
2	US 9, Worth Avenue	7,333	718	1,024	154	2.1%	3.7%
3	NY 23B, Columbia Turnpike	8,303	850	1,120	207	2.5%	3.7%
4	NY 66, Union Turnpike	9,582	1,058	1,238	164	1.7%	3.7%
5	US 9, Fairview Avenue	12,956	1,172	1,811	117	0.9%	3.7%
6	Columbia Street	1,439	98	215	47	3.1%	3.7%
7	Columbia Turnpike	2,582	285	350	5	0.2%	3.7%
8	NY 23B, Green Street	4,582	488	612	172	3.8%	3.7%
9	Columbia Street	5,121	587	670	20	0.4%	3.7%
10	US 9, Green Street	7,082	676	936	270	3.8%	3.7%
11	Prospect Avenue	8,761	923	1,162	31	0.3%	3.7%
12	US 9, Warren Street	3,137	236	423	139	4.7%	3.7%
13	US 9, Columbia Street	2,794	238	376	125	4.5%	3.7%
14	Port Access Road	84	21	0	52	62.0%	-
15	State Street (300 Block)	4,288	290	199	91	2.1%	3.7%

Note: AADT is Average Annual Daily Traffic

2.4.1.8 Safety Considerations, Crash History and Analysis

A crash analysis was performed in accordance with NYS Highway Design Manual Chapter 5. Crash data was requested from NYSDOT Region 8 for the most recent 5-year period of available data from October 31, 2015 to October 31, 2020. The crash data included information about the locations and the types of vehicles involved. The data received was for the roadway segments and intersections along the existing route within the City of Hudson as well as for the major intersections being considered for use as part of the alternate truck route options. These include intersections along US Route 9, NY Route 23, NY Route 9H, and NY Route 66.

Table 2-8 below provides the total number of crashes that occurred along the segments of the existing truck route within the city and additionally, the crashes at all major intersections within the study area. The crash totals for roadway segments within the City of Hudson includes all linear and intersection crashes.

Table 2-8
Crash History Summary

Location	Total Crashes	Crashes Involving Trucks	Applicable Options[1]
Roadway Segments Within City of Hudson			
Segment E-1A - US Route 9 (Graham Avenue to Intersection B)	24	1	Ex
Segment E-1B - US Route 9 (From Intersection B to Intersection C)	68	6	Ex
Segment E-1C – From Intersection C to South City Line	37	1	Ex
Segment E-2 - NY Route 66 (Graham Avenue to Intersection K)	15	0	Ex, 6
Segments E-3A & E-3B – Columbia Turnpike to Intersection B	33	2	Ex
Segment E-4A – Intersection C to Intersection G	50	6	Ex
Segment E-4B – Intersection G to South City Line	46	5	Ex
Intersections Within City of Hudson			
NY Route 23B (Green Street) and Columbia Turnpike	1	0	Ex, 6
Intersection K	9	0	Ex, 6
Intersection B	16	1	Ex
US Route 9/NY Route 23B (Green Street) and State Street	6	0	Ex
US Route 9/NY Route 23B (Green Street) and Columbia Street	2	0	Ex
Intersection C	7	1	Ex
Intersection D	5	1	Ex
US Route 9 (Warren Street) and 8th Street	1	0	Ex
Intersection E	12	1	Ex
NY Route 9G/NY Route 23B (Columbia Street) and N 6th Street	16	1	Ex
NY Route 9G/NY Route 23B (Columbia Street) and N 5th Street	4	1	Ex
NY Route 9G/NY Route 23B (Columbia Street) and N 4th Street	18	2	Ex
Intersection G	5	0	Ex
NY Route 9G/NY Route 23B (N 3rd Street) and Prison Alley	1	0	Ex
NY Route 9G/NY Route 23B (3rd Street) and Warren Street	8	2	Ex
NY Route 9G/NY Route 23B (S 3rd Street) and Cherry Alley	3	0	Ex
NY Route 9G/NY Route 23B (S 3rd Street) and Union Street	7	2	Ex
NY Route 9G/NY Route 23B (S 3rd Street) and Partition Street	3	1	Ex
NY Route 9G/NY Route 23B (S 3rd Street) and Allen Street	6	1	Ex
NY Route 9G/NY Route 23B (S 3rd Street) and Montgomery Street	1	0	Ex
Intersections Outside of the City of Hudson			
Intersection A	44	0	Ex, 1A, 1B, 6, 12
Intersection F	35	3	1A, 6
Intersection H	12	0	Ex, 1A, 6

Table 2-8 Crash History Summary			
Location	**Total Crashes**	**Crashes Involving Trucks**	**Applicable Options[1]**
Intersection I	9	1	Ex, 3, 12
Intersection J	16	2	Ex, 1A, 1B, 6, 12
Intersection L	4	0	Ex, 1A, 1B, 3, 6, 12
Intersection P	1	0	1A
Intersection Q	33	3	Ex, 3 ,12
Intersection R	14	0	3, 12
Intersection S	31	4	Ex, 3, 12
Intersection T	8	2	1B, 3, 12
Intersection U	35	0	3, 12

Note:

1. Ex stands for the existing route and represents the No Build with Improvements (NBI) Option

The crash analysis shows the segments within the City of Hudson with the highest number of crashes involving trucks within the five-year period are along segments E-1B, E-4A, and E-4B on Green Street, Columbia Street, and S 3rd Street, respectively.

The intersection with the greatest number of crashes is Intersection A with 44 crashes, however, none involved trucks. The intersection with the greatest number of crashes involving trucks is Intersection S in the Town of Claverack with 4 crashes involving trucks.

The analysis and information show that the only intersection where trucks comprised a significant portion of the crashes was Intersection T with a total of eight (8) crashes and two (2) involving trucks. The low number of total truck crashes at this intersection indicates that the addition of trucks to this intersection would not contribute to a significantly higher crash rate.

Existing crash data is located in **Appendix C.**

2.4.1.9 Ownership and Maintenance Jurisdiction

Table 2-9 below summarizes the existing ownership and maintenance jurisdiction within the study area.

Table 2-9 Existing Ownership and Maintenance Jurisdiction				
Route	**Limits**	**Feature(s) being Maintained**	**Maintaining Agency**	**Authority**
US Route 9 (Fairview Avenue)	Intersection B to north city limits	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
NY Route 23B (Green Street)	Intersection K to Intersection B	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c

Table 2-9
Existing Ownership and Maintenance Jurisdiction

Route	Limits	Feature(s) being Maintained	Maintaining Agency	Authority
US Route 9/NY Route 23B (Green Street)	Intersection B to Intersection C	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
US Route 9 (Park Place)	Intersection C to Intersection D	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
US Route 9 (Warren Street)	Intersection D to Intersection E	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
US Route 9 (Worth Avenue)	Intersection E to south city limits	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
NY Route 9G/NY Route 23B (Columbia Street)	Intersection C to Intersection G	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	City of Hudson	Highway Law Section 349-c
NY Route 9G/NY Route 23B (3rd Street)	Intersection G to south city limits	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, bridges	City of Hudson	Highway Law Section 349-c
US Route 9 (Fairview Avenue)	Intersection V to North City Limits	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	NYSDOT	Highway Law Section 12
NY Route 9G/NY Route 23B	South city limits to Intersection H	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	NYSDOT	Highway Law Section 12
NY Route 23	Intersection H to Intersection F	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, culverts	NYSDOT	Highway Law Section 12
US Route 9	South city limits to Intersection F	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	NYSDOT	Highway Law Section 12
US Route 9: BIN 2005410 Over US Route 9	-	Superstructure, Substructure	Colarusso Greenport Ventures	N/A
US Route 9/NY Route 23	Intersection F to Intersection U	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, bridges	NYSDOT	Highway Law Section 12
NY Route 66 (Union Turnpike)	Intersection Q to Intersection K	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, bridges	NYSDOT	Highway Law Section 12
NY Route 23B	Intersection K to Intersection S	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, bridges	NYSDOT	Highway Law Section 12
NY Route 9H	Intersection Q to Intersection S	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, culverts	NYSDOT	Highway Law Section 12
NY Route 9H/NY Route 23	Intersection S to Intersection U	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, culverts, bridges	NYSDOT	Highway Law Section 12

Table 2-9
Existing Ownership and Maintenance Jurisdiction

Route	Limits	Feature(s) being Maintained	Maintaining Agency	Authority
Healy Boulevard	Intersection A to Intersection J	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	Town of Greenport	Highway Law Section 10, Subsection 25
Spook Rock Road (CR 29)	Intersection M to Intersection T	Pavement, Shoulders, Drainage System, Signs and Pavement Markings, bridges	Columbia County	Highway Law Section 129
Fish and Game Road (CR 18)	Intersection I to Intersection R	Pavement, Shoulders, Drainage System, Signs and Pavement Markings	Columbia County	Highway Law Section 129
Hiscox Road	Intersection N to Intersection O	Pavement, Shoulders, Drainage System, Signs, Pavement Markings	Town of Greenport	Highway Law Section 10, Subsection 25
Fingar Rd.	Intersection O to Intersection P	Pavement, Shoulders, Drainage System, Signs, Pavement Markings	Town of Greenport	Highway Law Section 10, Subsection 25
Merle Avenue	NY Route 66 to Lone Star Rd.	Pavement, Shoulders, Drainage System, Signs, Pavement Markings	Town of Greenport	Highway Law Section 10, Subsection 25
Lone Star Rd.	Merle Avenue to Intersection M	Pavement, Shoulders, Drainage System, Signs, Pavement Markings	Colarusso Greenport Ventures (to be verified)	To be verified

2.4.2 Multimodal

2.4.2.1 Pedestrians

Pedestrian accommodations exist along US Route 9, NY Route 23B and NY Route 9G within the City of Hudson and on NY Route 66 west of Healy Blvd. (Intersection J). Accommodations consist of sidewalks of varying widths on one or both sides of the roadway. Sidewalks along Fairview Avenue (Segment E-1A), Green Street (Segment E-1B), and Worth Avenue (Segment E-1B) are typically 4'-0" to 5'-0" in width. The sidewalks are wider along the primary commercial and residential areas within the City of Hudson. Sidewalks along Columbia Street (Segment E-4A), 3rd Street (Segment E-4B) and Park Place and Warren Street (Segment E-1B) are wider ranging from 6'-0" to 14'-0" wide.

There is evidence of sidewalk damage along the existing route, specifically to the curb lines at Intersections C, D, G, and K on Green Street and Columbia Street. This damage is likely caused by tractor trailers making turns along the existing truck route where the existing geometry does not adequately accommodate the large turning radii of these vehicles.

Currently, there are no sidewalks along US Route 9, NY Route 23, NY Route 23B, NY Route 9H outside of the City of Hudson, however, pedestrian can use the existing shoulders. There is not expected to be a high volume of pedestrian traffic outside of the City of Hudson.

2.4.2.2 Bicyclists

There are three (3) signed bicycle routes that travel through the project study area:

1. **Bicycle Route 9** travels north-to-south from Intersection U to Intersection E where it turns right onto Prospect Avenue and continues along US Route 9 at Fairview Avenue.

2. **Bicycle Route 23** travels east-to-west starting on the Rip Van Winkle Bridge and travels east along NY Route 23 from Intersection H to Intersection F. It turns north onto US Route 9 and travels concurrently with Bicycle Route 9. From Intersection E, Bicycle Route 23 continues straight along Prospect Avenue and turns right onto NY Route 23B (Segment E-3A) at Intersection K. Bicycle Route 23 continues straight along NY Route 23B and through NY Route 9H at Intersection S. There are no plans for a separate bicycle route within the project limits. Bicyclists may legally use the paved shoulder of these uncontrolled highways.
3. **The Empire State Trail** is a bike trail that spans east-to-west from Albany to Buffalo and north-to-south from the Canadian border north of Plattsburgh to New York City. The bike trail utilizes a mix of on road and off-road segments. Within the project study area, the Empire State Trail travels primarily north-to south entering NY Route 23 from the south on Middle Road. The trail continues west towards the Rip Van Winkle Bridge and loops around the roundabout at the east bridge approach, returning north to Intersection H. The trail follows NY Route 9G/NY Route 23B north into the city of Hudson where it turns left onto Allen Street and heads towards the waterfront on Front Street. The trail then continues onto Dock Street, and Mill Street, past the Charles Williams Park along an off-road paved path that connects to Harry Howard Avenue. The Empire State Trail continues north past the Hudson High School on Harry Howard Avenue and through residential neighborhoods on Joslen Boulevard, Livingston Parkway, Washington Boulevard, and Delaware Avenue. Bicyclists will cross over US Route 9 (Fairview Avenue) to continue along an off-road segment of the trail that continues north to Stottville and beyond.

2.4.3 Infrastructure

2.4.3.1 Existing Highway Information

The design criteria for this project is based on the NYSDOT HDM, Chapter 2. The design criteria standards used for comparison to existing conditions were determined using the classification of the road or the character of the roadway itself, context class or character of the surrounding area, and whether the road is on the National Highway System (NHS). The functional classification for a road describes the importance of the road based on the traffic volumes, the types of vehicles using the road, and key characteristics of the road such as lane and shoulder width. The context class is determined as one of five following:

- Rural
- Rural Town
- Suburban
- Urban
- Urban Core

Factors that determine the context class for a road include development density, land use, availability of street parking, building setbacks, driveway densities, and pedestrian/bicyclist activity.

Rural contexts would have a low level of development with widely dispersed residential, commercial, or industrial land, and agricultural land uses. Rural town, suburban, urban, and urban core context classes would all have higher development densities with mixed land uses and large commercial driveways, high driveway and cross street densities, crosswalks, and pedestrian traffic, on street parking and high traffic volumes. The third factor that determines the design criteria standards for a road are if the road is a part of the NHS network. The NHS is a strategic network of roads that are built to higher standards and connect major transportation facilities such a ports, airports, and public transportation centers.

Table 2-10 below provides the range of standard design criteria for the Urban Minor Arterial functional classification for roads within the study area:

Function Classification: Urban Minor Arterial
Context Class: Urban
Terrain: Rolling

Table 2-10
Highway Element Standards: Urban Minor Arterial

Design Speed (mph)	Lane Width (ft)	Shoulder Width (ft)	Horizontal Curve Radius (ft)	Maximum Grade (%)	Bridge Roadway Width (ft)	Vertical Clearance (ft)
30-45	13-15 Desirable 11-12 Min.	Curbed: 0-4 Uncurbed: 5-6	188-466	7-9	Approach Roadway Width	14'-0" (min)

Table **2-11** below lists the existing geometric elements for each of the roadway segment within the Urban Minor Arterial functional classification within the study area.

Function Classification: Urban Minor Arterial
Context Class: Urban
Terrain: Rolling

Table 2-11
Existing Highway Geometric Elements: Urban Minor Arterial

Roadway Segment	Posted Speed (mph)	Lane Width (ft)	Shoulder Width (ft)	Horizontal Curve Radius (ft)	Approximate grade (%)	Bridge Roadway Width (ft)	Vertical Clearance (ft)
E-1A (US Route 9 to Graham Avenue)	40	12-13	6-8	1,375	2%	40	N/A
E-1A (Graham Avenue to Intersection B)	30	14-15	0 (curbed)	N/A	2%	N/A	N/A
E-1B (Fairview Avenue to Park Place)	30	12-16	0 (curbed)	325	2%	N/A	N/A
E-1C (Park Place)	30	15	0 (curbed)	N/A	2% +/-	N/A	N/A
E-1C (Park Place to Prospect Avenue)	30	12	0 (curbed)	N/A	2%	N/A	N/A
E-1C (Prospect Avenue to South City Line)	30	11-12	0 (curbed)	2,740	4%	N/A	N/A
E-2 (10 Broeck Avenue to Intersection K)	30/35	11-12	1-2 (curbed)	N/A	2%	N/A	N/A
E-3A (Intersection L to Intersection K)	35	12-13	2-6	1,340	2%	N/A	N/A
E-3B (Intersection K to Intersection B)	30	15	0-2 (curbed)	N/A	3%	N/A	N/A
E-4A (7th Street to Intersection G)	30	10-11	0 (curbed)	N/A	3%	N/A	N/A
E-4B (Intersection G to Allen Street)	30	10-11	0 (curbed)	N/A	2% +/-	N/A	N/A
Healy Boulevard (Intersection A to Intersection J)	30	12-22	2-6 (curbed) 3-12	320	2% +/-	N/A	N/A

Table 2-12 below provides the range of standard design criteria for the Rural Minor Arterial functional classification for roads within the study area:

Function Classification: Rural Minor Arterial
Context Class: Rural
Terrain: Rolling

Table 2-12
Highway Element Standards: Rural Minor Arterial

Design Speed (mph)	Lane Width (ft)	Shoulder Width (ft)	Horizontal Curve Radius (ft)	Maximum Grade (%)	Bridge Roadway Width (ft)	Vertical Clearance (ft)
45-60	11-12 Min.	4 Min. 6 Desirable	409-800	4-6	Existing Travelway + 4' (min) Shoulders	14'-0" (min)

Table **2-13** below lists the existing geometric elements for each of the roadway segment within the Rural Minor Arterial functional classification within the study area.

Function Classification: Rural Minor Arterial
Context Class: Rural
Terrain: Rolling

Table 2-13
Existing Highway Geometric Elements: Rural Minor Arterial

Roadway Segment	Posted Speed (mph)	Lane Width (ft)	Shoulder Width (ft)	Horizontal Curve Radius (ft)	Approximate grade (%)	Bridge Roadway Width (ft)	Vertical Clearance (ft)
E-1C (South City Line to Intersection F)	40	12-13	2-7	935	2%	N/A	14'-4"
E-2 (Intersection Q to 10 Broeck Avenue)	30	11-12	4-10	1,485	3%	35 ft	N/A
E-3A (Intersection L to Intersection S)	30	12-13	2-8	1,035	6%	40 ft	N/A
E-4B (Allen Street to Intersection H)	30	11-13	3-8	725	8%	35 ft	N/A

Table 2-14 below provides the range of standard design criteria for the Rural Major Arterial functional classification for roads within the study area:

Function Classification: Rural Major Arterial
Context Class: Rural
Terrain: Rolling

Table 2-14 Highway Element Standards: Rural Major Arterial						
Design Speed (mph)	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Maximum Grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
45-60	12	8	587-1200	4-6	Existing Travelway + 4' (min) Shoulders	14'-0" (min)

Table **2-15** below lists the existing geometric elements for each of the roadway segment within the Rural Major Arterial functional classification within the study area.

Function Classification: Rural Major Arterial
Context Class: Rural
Terrain: Rolling

Table 2-15 Existing Highway Geometric Elements: Rural Major Arterial							
Roadway Segment	**Posted Speed (mph)**	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Approximate grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
Intersection H to Intersection F	55	12-13	7-9	1,945	5%	N/A	N/A
Intersection F to Intersection U	55	12-13	7-9	1,355	6%	42 ft	N/A
Intersection Q to Intersection S	40/55	11-13	3-12	1,090	3%	N/A	N/A
Intersection S to Intersection U	40/55	12	2-10	870	7%	39 ft	36 ft

Table 2-16 below provides the range of standard design criteria for the Non-NHS Major Collector functional classification for roads within the study area:

Function Classification: Non-NHS Major Collector
Context Class: Rural
Terrain: Rolling

Table 2-16 Highway Element Standards: Non-NHS Major Collector						
Design Speed (mph)	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Maximum Grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
40-60	11	4	314-800	6-8	Approach Roadway Width	14'-0" (min)

Table **2-17** below lists the existing geometric elements for each of the roadway segment within the Non-NHS Major Collector functional classification within the study area.

Function Classification: Non-NHS Major Collector

Context Class: Rural
Terrain: Rolling

Table 2-17 Existing Highway Geometric Elements: Non-NHS Major Collector							
Roadway Segment	**Posted Speed (mph)**	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Approximate grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
Intersection I to Intersection R	45	10-11	2-5	795	7%	N/A	N/A

Table 2-18 below provides the range of standard design criteria for the Non-NHS Local Rural Road functional classification for roads within the study area:

Function Classification: Non-NHS Local Rural Road
Context Class: Rural
Terrain: Rolling

Table 2-18 Highway Element Standards: Non-NHS Local Rural Road						
Design Speed (mph)	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Maximum Grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
30-55	9-11	2	167-651	7-11	Approach Roadway Width	14’-0” (min)

Table **2-19** below lists the existing geometric elements for each of the roadway segment within the Non-NHS Local Rural Road functional classification within the study area.

Function Classification: Non-NHS Local Rural Road
Context Class: Rural
Terrain: Rolling

Table 2-19 Existing Highway Geometric Elements: Non-NHS Local Rural Road							
Roadway Segment	**Posted Speed (mph)**	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Approximate grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
Intersection M to Intersection T	55	10	2-4	465	4%	28 ft	N/A
Intersection N to Intersection O	30	9-10	0	220	8%	N/A	N/A
Intersection O to Intersection P	40	10-11	0	225	2% +/-	N/A	N/A
M-1	Not Posted	12-14	0	N/A	2% +/-	N/A	N/A
LS-1	Not Posted	7-19	0	105	2% +/-	N/A	N/A
NE-6	35	12-13	0	485	2%	N/A	N/A

2.4.3.2 Other Design Parameters

The Design Vehicle for this study us a WB-67 (53-ft Tractor Trailer).

2.4.3.3 Existing Bridge Structure Information

There are nine (9) existing bridges located within the project study area that have varying impacts upon the alternate truck route options. **Table 2-20** below summarizes the bridges existing conditions and proposed improvement (if required) with preliminary associated costs.

Table 2-20 Existing Bridge Structure Information						
BIN (Feature Carried / Feature Crossed)	**Truck Route Option**	**General Rec.**	**Existing Out to Out Width (ft)**	**Horizontal / Vertical Clearance Restrictions (ft)**	**Current Load Posting (if applicable)**	**Required Improvements**
2006470 (US Route 9 9G/CSX)	Existing Truck Route	5/7	38	30.2 / None	None – Level III Rated	None
1005420 (US Route 9 9G/CSX)	Existing Truck Route	5/7	56.3	40 / None	None – 64 Ton (HS 20)	None
2005410 (Atlas Cement Co/ US Route 9)	6	6/7	10	38 / 14.33	None - Overpass	None
1005400 (US Route 9 /Mud Creek)	1A/1B/3/ 6/12	5/7	52	36 / None	None – 33 Ton (HS 20)	None
1029010 (NY Route 66 /Claverack Creek)	Existing/12	7/7	37.3	34 / None	None – 112 Ton (HS 20)	None

1018050 (NY Route 23B /Claverack Creek)	Existing/1A/1B/ 3/6/12	5/7	43.4	40 / None	None – 41 Ton (HS 20)	None
1006490 (NY Route 9H /Claverack Creek)	3/12	6/7	43.4	40 / None	None – 47 Ton (HS 20)	None
1006480 (NY Route 9H/Taghkanic Creek)	1B/3/12	6/7	39.3	36 / None	None – 92 Ton (HS 20)	None
3342280 (CR 29 /Taghkanic Creek)	1B	6/7	30	28 / None	None – 38 Ton (HS 20)	None

Though there is no required work on the structures to support the alternate truck routes, additional fatigue may occur with the increased truck traffic. This will be monitored and reported with the normal biennial bridge inspection process.

2.4.3.4 Existing Pavement and Shoulder Conditions

The existing pavement condition on the federal and state highways within the project area is generally fair to good. There is longitudinal and transverse cracking in many locations. The majority of these cracks have not been sealed thus there is potential for pavement damage to increase in severity.

The pavement condition along Fish and Game Road (CR 18), Spook Rock Road (CR 29), Hiscox Road, Fingar Road, and Newman Road is generally in good to excellent condition. There are a few cases of longitudinal and transverse cracking along Fish and Game Road, Newman Road, and Fingar Road. These cracks are mostly located along the centerline of the roadway and are minor in severity with narrow crack widths.

The pavement condition of Healy Boulevard is in fair condition. There are frequent cases of transverse, longitudinal, and block cracking, particularly near each of the ends at Intersection A and J.

Merle Avenue is in poor condition. Severe levels of pavement stress are evident with widespread transverse, longitudinal, block, and spider cracking. There are potholes located near the edges of the travel way. These pavement distresses indicate that there is a significant drainage problem that is causing damage to the pavement subgrade. The resulting loss in structural support for the top course of asphalt is what caused these pavement distresses.

Lone Star Road is paved for approximately 250 ft from the intersection of Merle Avenue and Industrial Tract. The remainder is an unpaved gravel road which varies in width. This road is mostly abandoned but still may occasionally see use by industrial truck traffic. There are frequent potholes along the length of the road.

Pavement Condition ratings for the various federal and state highways discussed above, per the NYSDOT Region 8 Pavement Data Report (2017) are tabulated in **Table 2-21** below. A review of the pavement condition was conducted to verify the pavement ratings. In some cases, the pavement condition may have been improved since the 2017 Pavement Data Report if the road was resurfaced since that survey was conducted.

Table 2-21
Existing Pavement Condition Ratings

Roadway	Begin	End	2017 Rating	Pavement Condition Verification
US Route 9 (Fairview Avenue)	Intersection A	Intersection B	6-7	Agree with Rating
US Route 9/NY Route 23 Overlap	Intersection B	Intersection C	5-7	Agree with Rating
US Route 9	Intersection C	South Hudson City Line	7	Agree with Rating
US Route 9	South Hudson City Line	Intersection F	6	Condition Improved
NY Route 9G/NY Route 23B	Intersection C	Intersection G	6	Agree with Rating
NY Route 9G/NY Route 23B	Intersection G	South Hudson City Line	6-8	Agree with Rating
NY Route 9G/NY route 23B	South Hudson City Line	Intersection H	6-7	Agree with Rating
NY Route 23	Intersection H	Intersection F	7	Agree with Rating
US Route 9/NY Route 23	Intersection F	Intersection U	6	Condition Improved
NY Route 66	Intersection Q	Intersection K	6-9	Agree with Rating
NY Route 23B	Intersection B	Intersection K	7	Agree with Rating
NY Route 23B	Intersection K	Intersection S	6-7	Agree with Rating
NY Route 9H	Intersection Q	Intersection S	7-8	Agree with Rating
NY Route 9H/NY Route 23	Intersection S	Intersection U	7-8	Agree with Rating

Notes:

1. Information obtained from the NYSDOT Region 8 Pavement Data Report (2017)
2. Rating description as follows:
   - 9–10: Excellent, no significant surface distress
   - 7-8: Good, surface distress beginning to show
   - 6: Fair, surface distress is clearly visible
   - 1-5: Poor, distress is frequent and severe
   - U: Under construction, not rated due to ongoing work

2.4.3.5 Utilities

From visual inspections, various aerial and underground utilities have been identified along the existing roadways as a mixture of telephone, cable TV, communications, primary / secondary electric, sanitary sewer, storm sewer, and water utilities. National Grid owns several acres of property with the study area that support aerial and underground transmission lines. Individual utilities and the corresponding utility owners along the existing Right-of-Way have not been identified in this study.

Additionally, the City of Hudson provided utility shape files containing locations for subterranean infrastructure such as waterlines, waterline valves, storm sewer pipes and structures, sanitary sewer pipes and structures, and combined sewer pipes and structures. The shape files indicate that water lines and valves, storm sewer lines and structures, and combined sanitary sewer lines and structures are located beneath the roadway along the truck route within the City. The underground utilities run parallel with the truck route along Green Street, Park Place, Warren Street, Worth Avenue, Columbia Street, Fairview Avenue, and 3rd Street. The continued seismic loading from the trucks on the existing truck route will cause further damage to the aging and fragile underground infrastructure due to the repetitive vibrations

associated with the weight and frequency of the current truck traffic. Reductions in the amount and weight of truck traffic will aid in maintaining these facilities in good working order and reduce the frequency of emergency repairs associated with damage due to vibrations from said truck traffic.

2.4.3.6 Railroads

There is an existing active CSX Railroad bed within the study area. The tracks run primarily north to south along the Hudson River passing the waterfront. The track primarily services freight, however, there is also an Amtrak station that services passenger rail line travel between New York City and Albany with further destinations to the north, east, west. There is a branch of the tracks that travels east from Front Street and turn north to pass by the Hudson City Court. The tracks run through 7th Street and travels through the public Square. The tracks continue north of the city and turn east where they split. One branch terminates behind the train yard at ADM Milling and the other crosses and terminates at Claverack Creek. The railroad crossings are summarized below:

At grade railroad crossings:

- Broad Street
- Front Street
- Intersection of Union Street and S 7th Street
- Runs parallel with 7th Street
- Intersection of 7th Street and Cherry Alley
- Intersection of Warren Street and S 7th Street
- NY Route 9G/NY Route 23B between 7th Street and Park Place
- Long Alley between N 7th Street and US Route 9/NY Route 23B (Columbia Street)
- State Street between N 7th Street and US Route 9/NY Route 23B (Green Street)
- NY Route 66 (Union Turnpike) between 10 Broek Avenue and Merle Avenue
- Lone Star Rd.

Grade separated crossings:

- Ferry Street
- NY Route 9G/NY Route 23B (S 3rd Street) south of Montgomery Street
- E Court Street
- US Route 9 (Fairview Avenue) between Spring Street and Graham Avenue

The only at grade crossing that has railroad gates is the crossing on NY Route 66.

2.4.3.7 Right-of-Way

The majority of the existing Right-of-Way consists of residential, commercial and farmland properties.

2.5 Parking Lanes

There are parking lanes throughout the City along the existing truck route. **Table 2-22,** shown below summarizes the locations of the parking lanes along the existing route as well as the parking lane width and the number of sides that parking is allowed on at each location.

Table 2-22
Existing Parking Lanes

Road	Location	Number of Parking Lanes	Parking Lane Width
US Route 9 (Fairview Avenue)	B to Graham Avenue	1	Nondelineated
US Route 9/NY Route 23 (Green Street)	B to C	2	Nondelineated
US Route 9 (Park Place)	C to D	1	8 ft
US Route 9 (Warren Street)	D to E	2	8 ft
US Route 9 (Worth Avenue)	E to south City of Hudson line	1	9 ft
US Route 9/NY Route 23B	Columbia Street to C	2	8 ft
NY Route 9G/NY Route 23B (Columbia Street)	C to G	1	Nondelineated
NY Route 9G/NY Route 23B (3rd Street)	G to Allen Street	1	Nondelineated

Currently, it is difficult for trucks to navigate through Columbia Street (Segment E-4A) with the narrow travel way and the presence of street parking as there is not adequate space for a truck to pass another vehicle going the other direction. This is especially true in the 500 block of Columbia Street where trucks were observed stopping in the road to allow the passage of passenger vehicles in the opposite direction.

There is a municipal parking lot with metered parking located on Columbia Street (Segment E-4A) between 5th Street and 6th Street.

CHAPTER 3 – OPTIONS AND ANALYSIS

3.1 Evaluation of Alternate Truck Route Options

3.1.1 Study Area Considerations and Constraints

Multiple site considerations and constraints within the study area influenced the layout of the alternate truck options.

The overall study area covers approximately 33.3 square miles across Columbia County, including the Towns of Greenport and Claverack and Livingston. See **Figure 1.1** located in **Appendix B** for a depiction of the study area. In the study area, development is concentrated in and around the more densely populated areas, with the remainder of the study area consisting of mostly rural residential development, agricultural fields, and undeveloped lands.

Proposed alternate truck route options within the study area would be located within multiple municipalities. Major transportation facilities exist within in the study area and need to be evaluated in relation to the proposed Connector Road alignments. These transportation facilities include:

- US Route 9
- US Route 9/NY Route 23
- NY Route 9G/NY Route 23B
- NY Route 9H/NY Route 23
- NY Route 9H
- NY Route 23B
- NY Route 66

Alternate truck route options ideally would be routed through undeveloped or unoccupied agricultural lands to minimize impacts on property, farmland, and environmentally sensitive areas. Existing tax parcel data, land use data, and aerial imagery were utilized to assess and develop the alternate truck route options in order to factor in the above-mentioned considerations and constraints.

If an alternative truck route option is eventually chosen and the project moves forward into the design phase and the project achieves the required funding, it is anticipated that the City of Hudson will be the lead for the design of the chosen option. The potential alternate truck route will be a NYS designated truck route and any option chosen for design will be designed to current NYSDOT standards. Once / if an alternate truck route is chosen and funded for construction, it is anticipated that the City of Hudson will bid and award the construction contract.

3.1.2 Environmental Constraints

Numerous environmental constraints exist within the study area. Proposed alternative truck route options were analyzed to avoid these sensitive areas as much as practical. For a full list of environmental considerations see **Chapter 4** of this report.

3.2 Types of Options Considered

3.2.1 No-Build Option

This option will evaluate the effects of keeping the existing designated truck route in use with no proposed improvements. This option will look at the on-going issues and affects it may have on the existing system if no improvements were to take place.

3.2.2 No-Build with Improvements Option

This option will evaluate the effects of utilizing the existing designated truck route with various improvements based on a review of the existing conditions, effects on the existing subsurface utilities, and updates / improvements required to the existing system in order to meet current design standards.

3.2.3 Alternate Truck Route Options

These options will assess the use of portions of the existing transportation network in conjunction with various upgrades and in some cases a new connector road supplementing the existing network.

3.3 Design Criteria

3.3.1 Design Standards

1. NYSDOT Highway Design Manual (HDM) Chapter 2
2. NYSDOT Bridge Manual (BM) Chapter 2
3. CSX Public Policy Manual (CSX)
4. AASHTO A Policy on Geometric Design of Highways and Streets, 2011

3.3.2 Critical Design Elements

Any potential alternate truck route options will be a designated NYS Truck Route and any option chosen for future design development will be designed to current NYSDOT and AASHTO standards. Once / if an option is chosen and is funded for construction, the City of Hudson will bid and award the construction contract. The new feasible alternate designated truck route(s) roadway will be owned and maintained by the individual roadway owners. Any new roadways not currently on the NYS List of Access Highways must, at a minimum, be added to the list. A request to NYSDOT would be required to add a new road to the official list.

The critical design elements were developed using the NYSDOT Highway Design Manual (HDM) Chapter 2 design criteria standards for a non-NHS minor arterial. Any new roads or upgrades to existing roads would be constructed using the critical design elements. In some cases, it may be infeasible to reconstruct the existing roadways to the critical design elements due to physical constraints.

Critical Design Elements for Urban and Rural criteria are listed below in **Table 3-1** and **Table 3-2**. Refer to **Chapter 2** for the highway functional classifications for the limits designated by the NYSDOT.

Table 3-1 Critical Design Elements: Urban						
Design Speed (mph)	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Maximum Grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
30	11 ft	Curbed: 0 ft Uncurbed: 4 ft	188	9	Approach Roadway Width	14’-6”
35	11 ft	Curbed: 0 ft Uncurbed: 4 ft	263	8	Approach Roadway Width	14’-6”
40	11 ft	Curbed: 0 ft Uncurbed: 4 ft	356	8	Approach Roadway Width	14’-6”
45	11 ft	Curbed: 0 ft Uncurbed: 4 ft	466	7	Approach Roadway Width	14’-6”

Table 3-2 Critical Design Elements: Rural						
Design Speed* (mph)	**Lane Width (ft)**	**Shoulder Width (ft)**	**Horizontal Curve Radius (ft)**	**Maximum Grade (%)**	**Bridge Roadway Width (ft)**	**Vertical Clearance (ft)**
45	12 ft	4 ft	409	6	Approach Roadway Width	14’-6”
50	12 ft	4 ft	521	5	Approach Roadway Width	14’-6”
55	12 ft	4 ft	651	5	Approach Roadway Width	14’-6”
60	12 ft	4 ft	800	4	Approach Roadway Width	14’-6”

Notes:

1. The design speed is not the same as the posted speed limit. The design speed is selected to determine the geometric characteristics of the road that is being designed. The design speed is typically determined by using the 85th percentile speed along a road or the maximum design speed for the road classification, whichever is less. The posted speed limit is always less than the design speed.

3.3.3 Other Controlling Parameters

The design vehicle for this study was a WB-67 (53-foot tractor-trailer).

3.3.4 Truck Classifications

The FHWA vehicle classifications are based on the size and number of axles. The truck classification chart as defined by FHWA is presented in **Exhibit 3-1** below. For the purposes of this feasibility study, only **Truck Classifications 6 through 13** are considered truck traffic.

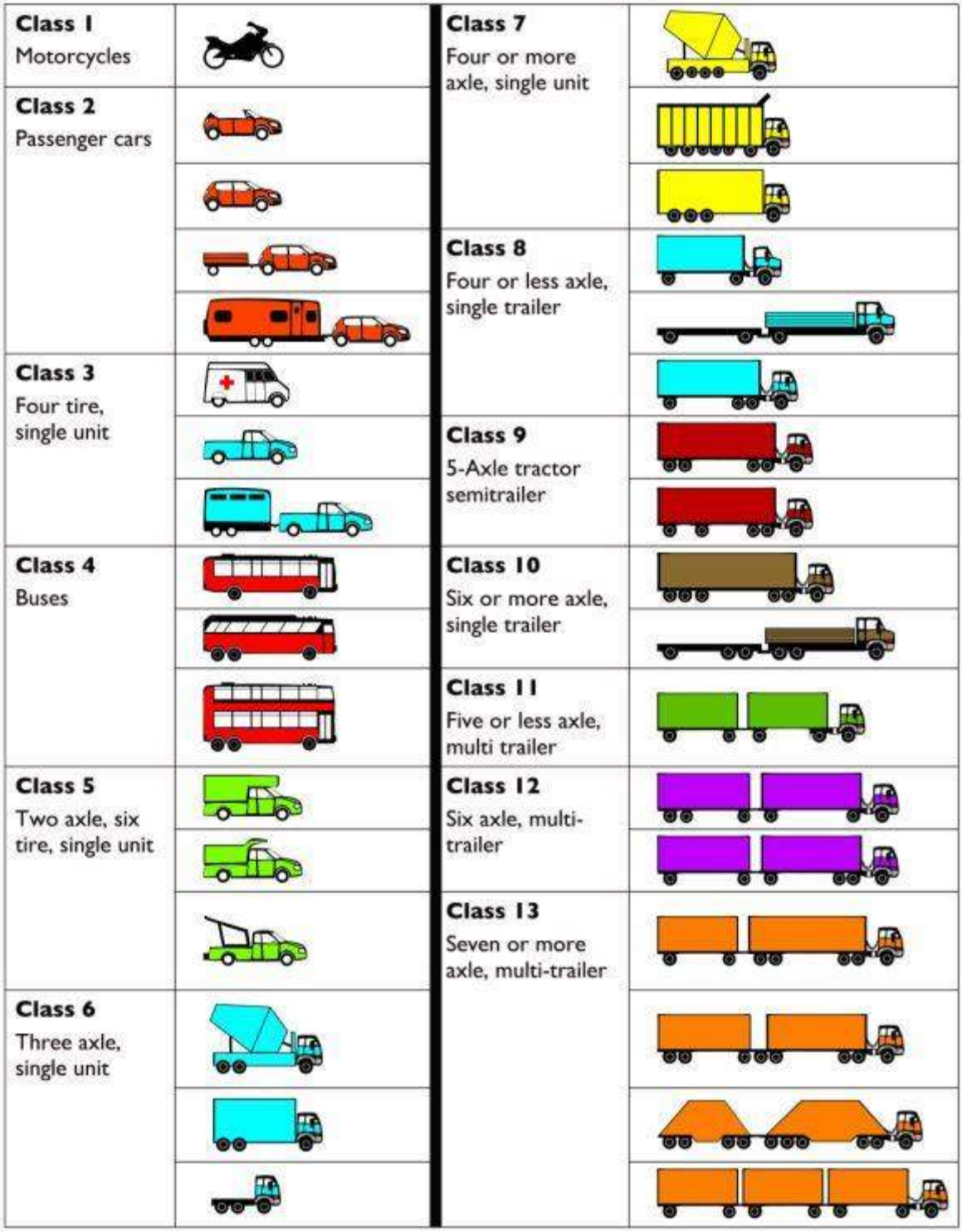


Exhibit 3-1: Truck Classification Chart

3.4 Alternate Truck Route Option Descriptions

Project options were developed with the intent to meet the project objective and goals. These options were analyzed based on the NYSDOT critical design elements criteria shown in **Section 3.3** of this report. Refer to **Figure 3.3** located in **Appendix B** for a graphical diagram illustrating the alternate truck route options considered.

The options considered include:

3.4.1. No-Build Option:

The No-Build Option provides for continued maintenance of the existing facility between the project termini, resulting in an increasing amount of maintenance time and money required to keep the facility open to traffic. The operational efficiency of the project area intersections will continue to deteriorate over time.

This option does not meet the project objective, or goals. It fails to address local community and regional issues such as problems related to the intrusion of truck traffic traveling through the City of Hudson as well as noise, pollution, and pedestrian safety within the community. The majority of the existing roadway configurations through the City of Hudson are narrow in width which does not easily accommodate the truck traffic that currently utilize this route. Parking lanes exist adjacent to the travel lanes causing a potential un-safe situation when trucks are passing by on the narrower roadways. The existing roadway section would need to be brought up to required standards for the design classification. However, based on the proximity of the existing residences and businesses along the existing designated truck route, there would be noticeable effects on numerous properties.

For the purpose of this study, the No-Build Option does not meet the project objectives. However, since it is the baseline condition of which all other options will be compared, it will be retained for comparison purposes only.

3.4.2 No-Build with Improvements Option:

This option includes upgrading the existing route to meet the current NYSDOT design standards and provide improved width, access, and mobility for the existing designated truck route. In general, the existing route features nondelineated travel lanes of various widths ranging from 10 ft to 15 ft. Current NYSDOT standards for an Urban Minor Arterial require minimum 11 ft travel lanes.

Refer to **Chapter 2** for descriptions of the existing designated truck route segments and refer to **Figure 3.1** located in **Appendix B** for the location of the segments identified as part of this study.

There are eight bridges located along the existing truck route within the City of Hudson and outside of the City limits. All the structures on the existing truck route meet the design criteria for roadway width and vertical clearance. See chapter 2 for the existing conditions of the bridges within the study area. No new structures or modifications to existing structures will be required. The existing bridge identification numbers (BIN) along with the features they carry and cross are listed below.

- BIN 2006470 Carries NY Route 9G/NY Route 23B over CSX railroad
- BIN 1005420 Carries US Route 9 over CSX railroad
- BIN 2005410 Atlas Cement Company Conveyor over US Route 9
- BIN 1005400 US Route 9/NY Route 23 over Mud Creek
- BIN 1029010 Carries NY Route 66 over Claverack Creek

- BIN 1018050 Carries NY Route 23B over Claverack Creek
- BIN 1006490 Carries NY Route 9H/NY Route 23 over Claverack Creek
- BIN 1006480 Carries NY Route 9H/NY Route 23 over Taghkanic Creek

Proposed Improvements to the Existing Designated Truck Route within the City Limits by roadway segment: (refer **to Chapter 2**, **Table 2-3, Table 2-4** for roadway and intersection designations)

Segment E-1A: US Route 9 (Fairview Ave. to Intersection B)

Existing Conditions:

US Route 9 (from Intersection V to the intersection with Graham Avenue)

- 12-13 ft travel lanes
- 6-8 ft shoulders
- BIN 1005420 carries US Route 9 over a CSX railroad between Spring Street and Graham Avenue. The bridge has 12 ft travel lanes and 8 ft shoulders.

US Route 9 (From the Intersection with Graham Avenue to Intersection B)

- Approximately 14-15 ft travel lanes
- 4-6 ft sidewalks on both sides of the road beginning at Spring Street and continuing to Intersection B.
- Utility strips located between the curbs and sidewalks.

Improvements Required: No improvements are required for the bridge. Increase curb radius on SE corner of Intersection B.

Segment E-1B: US Route 9/NY Route 23B (from Intersection B to Intersection C)

Existing Conditions:

Green Street (Intersection B to Intersection of Green Street and Columbia Street)

- Approximately 12-13 ft travel lanes
- Nondelineated parking on both sides of the street
- 5 ft (+/-) sidewalks on both sides with utility strips

Improvements Required: No improvements are required.

Existing Conditions:

Columbia Street (Intersection of Green Street and Columbia Street to Intersection C)

- Approximately 13 ft travel lanes
- 8 ft delineated parking lanes on both sides of the street
- 5-6 ft sidewalks on the north side and 10 ft sidewalks on the south side

Improvements Required: No improvements are required.

Segment E-1C: US Route 9 (From Intersection C to Intersection F)

Existing Conditions:

Park Place (Intersection C to Intersection D)

- Approximately 15 ft travel lanes
- 8 ft delineated parking on the west side of the street
- 6 ft sidewalks on the west side and 14 ft wide sidewalks on the east side

Improvements Required: Increase curb radius on SE corner at Intersections C & D.

Existing Conditions: **Warren Street** (Intersection D to Intersection E)

- Approximately 12-13 ft travel lanes
- 8 ft parking lanes on both sides from between 8th Street and Park Place
- No delineated parking lanes on both sides from 8th Street to Worth Avenue
- 10-12 ft sidewalks on both sides

Improvements Required: No improvements are required.

Existing Conditions: **Worth Avenue** (from intersection E to south city line)

- 11-12 ft travel lanes
- 9 ft parking lane on the east side of the road
- 4-6 ft sidewalks

Improvements Required: No improvements are required.

Existing Conditions: **US Route 9** (South city line to Intersection F)

- 11-12 ft travel lanes
- 2-7 ft shoulders
- BIN 2005410 carried over US Route 9 with unposted 14'-3" clearance.

Improvements Required: Add a 14'-4" vertical clearance posting to BIN 2005410.

Segment E-2: NY Route 66 (Intersection Q to Intersection K)

Existing Conditions: **NY Route 66** (Intersection Q to Intersection with 10 Broeck Avenue)

- 11-12 ft travel lanes
- 4-10 ft shoulders
- 12 ft turn lanes at intersection J
- 13 ft two way left turn lane median between Maple Avenue and Healy Boulevard
- 4-5 ft sidewalk west of Healy Boulevard on the south side of the road
- At grade rail crossing 200 feet east of 10 Broeck Avenue
- BIN 1029010 has 12 ft travel lanes and 5 ft shoulders

Improvements Required: No improvements are required to the road or BIN 1029010.

Existing Conditions: **NY Route 66** (Intersection with 10 Broeck Avenue and Intersection K)

- 11-12 ft travel lanes
- 1-2 ft shoulders with curb
- 5 ft sidewalks on the south side of the road.
- 5 ft sidewalks on the north side of the road between Graham Avenue and Intersection K.
- 11 ft two way left turn lane median between Graham Avenue and 10 Broeck Avenue

Improvements Required: Increase curb radius on N corner at Intersections K.

Segment E-3A: NY Route 23B (Intersection S to intersection K)

Existing Conditions:
- 12-13 ft travel lanes
- 2-8 ft shoulders
- BIN 1018050 carries NY Route 23B over Claverack Creek and has 12 ft travel lanes and 8 ft shoulders

Improvements Required: No improvements are required for the road or the bridge.

Segment E-3B: NY Route 23B (Intersection K to Intersection B)

Existing Conditions:
- Approximately 15 ft travel lanes
- 0-2 ft curbed shoulders
- 4-5 ft sidewalks on both sides of the street

Improvements Required: No improvements are required.

Segment E-4A: NY Route 9G/NY Route 23B (Intersection C to Intersection G)

Existing Conditions:
- Approximately 10-11 ft travel lanes
- Nondelineated parking lane on north side of the road
- Sidewalk of varying widths (6-14 ft) along north and south sides of the street
- Low building setbacks
- Underground water supply lines and combined sewer lines

Improvements Required:
- Widen road to create minimum 11 ft travel lanes or restrict on-street parking to provide more room for passing vehicles.
- Stripe centerline and parking lanes to clearly define separation of traffic.

Segment E-4B: NY Route 9G/NY Route 23B (Intersection G to Intersection H)

Existing Conditions:

Intersection G to Intersection with Allen Street
- Approximately 11 ft travel lanes
- 5-10 ft sidewalks
- Nondelineated parking lane on the west side of the road
- Low building setbacks
- Underground water supply lines and combined sewer lines

Improvements Required: No improvements are required.

Existing Conditions:

Intersection with Allen Street to Intersection H
- 11-13 ft travel lanes
- 3-8 ft shoulders (4 ft or greater south of BIN 2006470)
- BIN 2006470 has 3 ft shoulders on the west side and 9 ft shoulders on the east side of the segments

Improvements Required: No improvements required for the road or BIN 2006470

Photo Location: Columbia Street (West of the intersection of Columbia Street and N 6th Street)

A truck is shown traveling east past another vehicle with parked cars on the north side of the 500 block of Columbia Street. Note the limited room available to safely pass.

Photo Location: Columbia Street (West of the intersection of Columbia Street and 7th Street)

A quarry truck is traveling east along Columbia Street towards Park Place. Notice that the truck is driving very close to the curb.

Proposed improvements to the existing designated truck route within the City of Hudson by Intersection:

Improvements and repairs will only need to be made to intersections where through truck traffic frequently make turns onto other sections of the route. Improvements that would need to be made to intersections with side streets where through truck traffic Is not expected to turn onto is included in the existing route segment improvements. The following intersections are located on the existing designated truck route within the City of Hudson:

1. Intersection B
2. Intersection C
3. Intersection D
4. Intersection E
5. Intersection G
6. Intersection K

Intersection B:

Existing Conditions:

- The eastbound and westbound approaches of Green Street are at an unusual offset that affects intersection operations.
- The stop bars are located far back from the center of the intersection on all four approaches which limits sight distance
- There is a right turn lane on southbound approach of the intersection that is separated from the rest of the traffic flow by a flush median
- The traffic signal heads have unusual signal display configurations due to the intersection phasing
- The traffic signal heads are mounted to aging wood and steel poles

Improvements Required:

- Increase the radius on the southeast corner of the intersection.

Photo Location: Intersection B

The southeast corner at Intersection B (Fairview Avenue and Green Street) has a tight curb radius for trucks to safely navigate. The east and west approaches to the intersection are offset approximately 12 to 13 ft. The photo was taken looking at the northwest corner of the intersection.

Photo Location: Intersection B

A dump truck makes a right turn at the west approach to the intersection. Notice how close the truck is to the curb while turning. Photo was taken from the northwest corner of the intersection.

Photo Location: Intersection B

A photo of the sidewalk and curb ramp at the southeast corner of Intersection B. Notice the damage to the sidewalk and curb. There are tire tread marks on the asphalt ramp and in the buffer space between the sidewalk and curb caused by trucks turning right from eastbound Green Street onto northbound Fairview Avenue.

Intersection C:

Existing Conditions:

- Tight turn radius for trucks making a right turn from Park Place onto Green Street and for truck making a right turn onto Park Place from Columbia Street.
- There is damage to the curb that is in the southwest quadrant of the intersection from truck turning movements.

Improvements Required:

- Increase the curb radius on the southeast corner of the intersection.
- May not be feasible due to proximity of the building to the intersection.

Photo Location: Intersection C

A tractor trailer makes a right turn at Intersection C from Park Place onto Columbia Street. The truck is unable to avoid turning into the opposing lane of traffic due to the proximity of the curb and signs at the southeast corner of the intersection. Photo taken near the southwest corner of the intersection.

Intersection D:

Existing Conditions:

- Tight turn radius for trucks making a right turn onto Park Place from Warren Street.
- There is damage to the curb in the northeast quadrant of the intersection from truck maneuvers.

Improvements Required:

- Increase the curb radius on the northeast corner of the intersection.
- May not be feasible due to proximity of the building to the intersection.

Photo Location: Intersection D

Due to the proximity of the building on the southeast corner of Intersection D to the road, it would be difficult to modify the curb radius and still meet sidewalk standards for ADA compliance. Photo taken from the northwest corner of the intersection.

Intersection E:

Existing Conditions:

- The intersection is all-way stop-controlled.
- There are crosswalks on the west approach and south approach of the intersection.
- The intersection has recently been repaved.

Improvements Required:

- There are no improvements required at this intersection.

Intersection G:

Existing Conditions:

- Four-legged intersection with a traffic signal
- Crosswalks on the northwest and northeast approaches
- The sidewalk and curb line are rounded and have a large radius to allow for trucks to navigate the turn more easily from N 3rd St. and Columbia St.
- There is damage to the curb from trucks running over it.

Improvements Required:

- There are no improvements required at this intersection.

Intersection K:

Existing Conditions:

- Four-legged signalized intersection
- Crosswalks on all four approaches with sidewalks and ramps at all corners of the intersection
- Pedestrian signal heads and push buttons for all crosswalks
- Tight curb radius on the north corner of the intersection for trucks turning right from NY Route 66 onto Green Street.

Improvements Required:

- Increase the curb radius on the north corner of the intersection.

Photo Location: Intersection K

Damage of to the sidewalk and curb at the north corner of Intersection K (NY Route 66, Green Street, and Columbia Street). Notice the marks left on the curb caused from vehicles running over it.

Refer to **Figure 3.2** located in **Appendix B** for a graphical diagram illustrating improvements required.

The No-Build with Improvements Option was determined not to be feasible due to the potential impacts to residential and commercial properties, and utilities. This option fails to meet the project objectives of reducing through truck traffic from City Streets. While the improvements to the roads and intersections along the existing truck route might marginally improve the safety to pedestrians and other motorists, through truck traffic would continue to degrade the above and below grade infrastructure and impact the health and welfare of the City residents.

The potential improvements required along the existing designated truck route were analyzed in order to provide an order of magnitude of the potential effects to upgrade the existing route. Refer to **Tables 3-16 and 3-17 for** the comparison and Opinion of Probable Costs for this option.

For the purpose of this study, the No-Build with Improvements Option does not meet the project objectives. However, since it is a baseline condition of which all other options will be compared, it will be retained for comparison purposes only.

3.4.3 Alternate Truck Route Options Considered:

Multiple alternate truck route options were considered. To determine concept level routing of a potential new alternate truck route, some initial considerations were made. In general, options were developed to the greatest extent possible, to avoid disturbing areas with a higher relative population density, such as residential neighborhoods along existing roads. Alternative truck routes were also developed with strong regard to avoid residential / commercial displacement as well as avoidance of environmental sensitive areas and farmlands, where practical.

Where options intersect with existing roads, perpendicular intersections are proposed to minimize disturbances and maximize intersection safety. Where practical, the potential alternate truck route options, when located outside of an existing roadway or highway, utilized undeveloped land to minimize the number of developed properties impacted and to promote the potential for future development along the Connector Road. Where undeveloped land or farmland was utilized, effort was made to place the alignment along the property line to maintain the property into one (1) or more larger parcels, as opposed to two (2) smaller parcels, to allow for continued use by the current property owner(s). Consideration was made to ensure that alternate truck route options would maintain access to the project termini at the Rip Van Winkle Bridge west of the City, US Route 9 north of the city, NY Route 66 northeast of the city, NY Route 23B east of the city, and US Route 9 south of the city.

The following alternate truck route options were developed using the engineering design criteria listed in **Section 3.3** of this report. Refer to **Figure 3.2** located in **Appendix B** and **Exhibit 3-2** below for a graphical diagram illustrating all alternate truck route options considered.

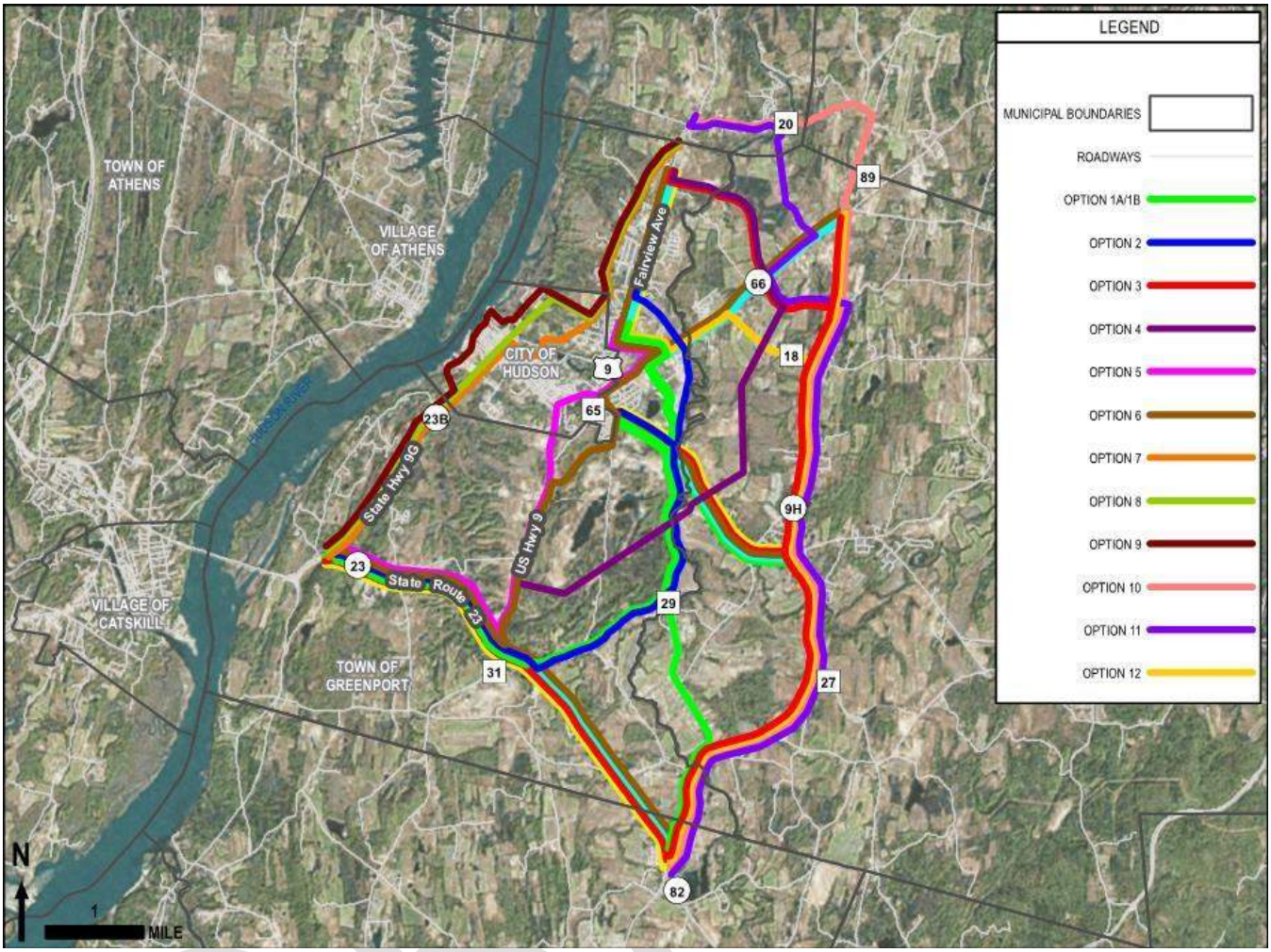


Exhibit 3-2: Alternate Truck Route Options Considered

Table 3-3
Alternate Truck Route Options Considered

Truck Route Option	Description	Retained for Further Analysis
1A	Trucks traveling southbound on US Route 9 will turn left onto Healy Boulevard to the intersection with NY Route 66 where trucks would turn right onto NY Route 66. Trucks would then turn left onto the industrial road, Merle Avenue, that continues onto a gravel road, Lone Star Road, connecting to the intersection of NY Route 23B and Spook Rock Road. Trucks could turn east onto NY Route 23B to travel towards Claverack or continue south onto Spook Rock Road, Hiscox Road, and Fingar Road where it would intersect with US Route 9. Trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9/NY Route 23.	Yes
1B	Trucks traveling southbound on US Route 9 would turn left onto Healy Boulevard to the intersection with NY Route 66 where trucks would turn right onto NY Route 66. Trucks would then turn left onto the industrial road, Merle Avenue, that continues onto a gravel road, Lone Star Road, connecting to the intersection of NY Route 23B and Spook Rock Road. Trucks could turn east onto NY Route 23B to travel towards Claverack or continue south onto Spook Rock Road where it would intersect with NY Route 9H/NY Route 23. The route continues to US Route 9 to the south. Trucks traveling towards the Rip Van Winkle Bridge will turn north onto US Route9/NY Route 23.	Yes

Table 3-3
Alternate Truck Route Options Considered

Truck Route Option	Description	Retained for Further Analysis
2	Trucks southbound on US Route 9 would turn left onto a new alignment roadway to the intersection with NY Route 66 where trucks would continue straight onto an extension of the new alignment roadway north of the Greenport Police Department and courthouse. The new road alignment intersects with NY Route 66 and continues south between Country Living Garden Center and Claverack Creek. The new road alignment ties into the industrial gravel road, Lone Star Road, connecting to the intersection of NY Route 23B and Spook Rock Road. Trucks could turn east onto NY Route 23B to travel towards Claverack or continue south onto Spook Rock Road, Hiscox Road, and Fingar Road where it would intersect with US Route 9. Trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9/NY Route 23.	No
3	Trucks southbound on US Route 9 would turn left onto a new alignment roadway south of Greenport Commons that would travel east, to the intersection with NY Route 66. Trucks would continue straight onto another extension of the new alignment roadway to the intersection with NY Route 9H. Trucks would turn right onto NY Route 9H and continue south to the intersection with NY Route 23, NY Route 23B, and NY Route 9H/NY Route 23. Trucks traveling east through Claverack would turn right, otherwise, trucks would continue south on NY Route 9H/NY Route 23B to the intersection of NY Route 9H/NY Route 23, US Route 9/NY Route 23, US Route 9, and NY Route 82. At the intersection, trucks could either continue south or turn right to travel on US Route 9/NY Route 23 and NY Route 23 towards the Rip Van Winkle Bridge. Alternatively, trucks starting from the intersection of NY Route 66 and NY Route 9H could continue south on the route as described above.	Yes
4	Trucks southbound on US Route 9 would turn left onto a new alignment roadway south of Greenport Commons that would travel east, to the intersection with NY Route 66. Beyond NY Route 66, the new alignment roadway would continue south, and intersect NY Route 23B. Trucks traveling east to Claverack could turn right and continue NY Route 23B. Otherwise, the route continues onto the intersection with US Route 9 north of NY Route 23. The route would continue south along US Route 9 to the intersection with NY Route 23. Trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9/NY Route 23.	No
5	Trucks southbound on US Route 9 would turn left onto Healy Boulevard to the intersection with NY Route 66 where trucks would turn right onto NY Route 66. Trucks would continue southwest along NY Route 66 to the intersection with NY Route 23B. Trucks could turn east onto NY Route 23B to travel towards Claverack or continue south onto Columbia Street, Prospect Avenue and US Route 9. At the intersection of US Route 9 and NY Route 23, trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9/NY Route 23.	No
6	Trucks southbound on US Route 9 would turn left onto Healy Boulevard to the intersection with NY Route 66 where trucks would turn right onto NY Route 66. Trucks would continue southwest along NY Route 66 to the intersection with NY Route 23B where truck would turn left heading east toward Newman Road. Truck could then continue east on NY Route 23B towards Claverack or Trucks or would turn right onto Newman Road and continue onto a new alignment roadway that intersects with US Route 9 south of the City. Trucks would turn left onto US Route 9 and continue south. At the intersection of US Route 9 and NY Route 23, trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9/NY Route 23.	Yes

Table 3-3
Alternate Truck Route Options Considered

Truck Route Option	Description	Retained for Further Analysis
7	Trucks southbound on US Route 9 would turn right onto Joslen Boulevard and continue south and continue onto Harry Howard Avenue and Carrol Street. Trucks would then turn right onto State Street make the left on North 3rd Street and continue south onto the existing truck route on NY Route 9G/NY Route 23B. At the intersection with NY Route 23, trucks could either turn right toward the Rip Van Winkle Bridge or left to continue along NY Route 23 and US Route 9/NY Route 23. Trucks traveling southwest on NY Route 66 would take Stottville Road north to Atlantic Avenue. Trucks would then turn west to US Route 9 and continue along the route as described above. Trucks traveling west on NY Route 23B would be redirected south onto NY Route 9H and use the established NY Routes 82, 23 and US Route 9 to their destination.	No
8	Trucks southbound on US Route 9 would turn right onto Joslen Boulevard and continue onto Harry Howards Avenue. Trucks would turn right, between the FASNY Firemen's Home and the Hudson City School District, onto a new roadway alignment that would turn onto connect to N 3rd Street then onto the existing truck route on NY Route 9G and 23B. At the intersection with NY Route 23, trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along NY Route 23 and US Route 9/NY Route 23. Trucks traveling southwest on NY Route 66 would take Stottville Road north to Atlantic Avenue. Trucks would then turn west to US Route 9 and continue along the route as described above. Trucks traveling west on NY Route 23B would be redirected south onto NY Route 9H and use the established NY Routes 82, 23 and US Route 9 to their destination.	No
9	Trucks southbound on US Route 9 would turn right onto Joslen Boulevard and continue onto Harry Howards Avenue. Trucks would turn right, between the FASNY Firemen's Home and the Hudson City School District, onto a new roadway alignment that would connect with N 2nd Street next to the Harney & Sons Tea Factory. Trucks would continue along the route by turning right onto Dock St., Front St., then use the South Bay Causeway to return to the existing truck route on NY Route 9G and 23B. At the intersection with NY Route 23, trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9. Trucks traveling southwest on NY Route 66 would take Stottville Road north to Atlantic Avenue. Trucks would then turn west to US Route 9 and continue along the route as described above. Trucks traveling west on NY Route 23B would be redirected south onto NY Route 9H and use the established NY Routes 82, 23 and US Route 9 to their destination.	No
10	Trucks southbound on US Route 9 would turn left onto Atlantic Avenue (CR 20) and continue to the intersection with NY Route 9H where trucks would turn right onto NY Route 9H and continue south to US Route 9. Trucks would turn right onto NY Route 9H and continue south to the intersection with NY Route 23, NY Route 23B, and NY Route 9H/NY Route 23. Trucks traveling east through Claverack would turn right, otherwise, trucks would continue south on NY Route 9H/NY Route 23B to the intersection of NY Route 9H/NY Route 23, US Route 9/NY Route 23, US Route 9, and NY Route 82. At the intersection, trucks could either continue south or turn right to travel on US Route 9/NY Route 23 and NY Route 23 towards the Rip Van Winkle Bridge.	No
11	Trucks southbound on US Route 9 would turn left onto Atlantic Avenue (CR 20) to the intersection Hill Street where trucks would turn right and continue south to NY Route 66 and turn right continuing south for a short distance to the intersection with a new alignment roadway. Trucks would turn left onto the new alignment roadway and cross over to NY Route 9H. to the intersection with NY Route 9H and continue south to the intersection of US Route 9, NY Route 82, NY Route 9H, and NY Route 23. An alternate route to US Route 9 could	No

Table 3-3 Alternate Truck Route Options Considered		
Truck Route Option	**Description**	**Retained for Further Analysis**
	consist of using portions of Stone Mill Road and Yates Road or a new alignment roadway to connect further west on US Route 9 and eliminate the difficult turning radius for the right turn at the intersection of US Route 9, NY Route 82, NY Route 9H, and NY Route 23. Trucks could either turn right toward the Rip Van Winkle Bridge or left to continue south along US Route 9. Alternatively, trucks starting from the intersection of NY Route 66 and NY Route 9H could continue south on the route as described above.	
12	Trucks southbound on US Route 9 would turn left onto Healy Boulevard to the intersection with NY Route 66 where trucks would turn left. Trucks would then turn right onto Fish and Game Road (CR 18) and continue to the intersection with NY Route 9H. Trucks would turn right onto NY Route 9H to continue south to the intersection of US Route 9, NY Route 82, NY Route 9H, and NY Route 23. Trucks would turn right onto NY Route 9H and continue south to the intersection with NY Route 23, NY Route 23B, and NY Route 9H/NY Route 23. Trucks traveling east through Claverack would turn right, otherwise, trucks would continue south on NY Route 9H/NY Route 23B to the intersection of NY Route 9H/NY Route 23, US Route 9/NY Route 23, US Route 9, and NY Route 82. At the intersection, trucks could either continue south or turn right to travel on US Route 9/NY Route 23 and NY Route 23 towards the Rip Van Winkle Bridge. Alternatively, trucks starting from the intersection of NY Route 66 and NY Route 9H could continue south on the route as described above.	Yes

Truck Route Options Removed from Consideration:

During the preliminary analysis, alternate truck route **Options 2, 4, 5, 7, 8, 9, 10, 11** do not meet the project objectives and have been dismissed from further consideration. For each option, the environmental, social, and physical impacts and the overall feasibility were considered when determining which options to consider deeming as a preferred option.

Several of the alternate truck route options considered would have had excessive environmental impacts wetland areas within the study area if constructed. For example, alternate truck route **Option 9** would construct a paved and widened road over the causeway that passes through the large wetland area.

Alternate truck route options that exhibited physical property constraints and that would have required a fee acquisition and purchase of a residential or commercial building due to limited space for improvements or new roads were removed from consideration. **Option 5** would likely require destruction of the building on the corner of Fairview Avenue and Prospect Avenue to provide adequate space for a tractor trailer to complete the turn.

While all the alternate route options reroute trucks from traveling down Columbia Street, which is a narrow street, several of the options utilized 3rd Street and streets along the waterfront where the noise and noxious fumes from trucks would still impact the many businesses and residents living there. Some of these same routes would introduce new truck traffic through neighborhoods and past schools in areas outside of the City of Hudson where truck route traffic may have not been there previously.

For an alternate truck route option to be considered for further evaluation, it also had to maintain access to the five project termini within the study area and be practical for truck drivers to navigate without causing excessive backtracking for trucks to reach their destinations. For example, several of the alternate truck route options required trucks traveling southwest along NY Route 66 to divert north

onto Stottville Road and Atlantic Avenue (CR 20) adding more distance of travel for trucks attempting to access the Rip Van Winkle Bridge.

For some alternate truck route options, geographical limitations such as significant elevation differences between the beginning and end of new connector road alignments would make it unfeasible and prohibitively expensive to construct for use as part of the alternate designated truck route.

Truck Route Options Retained for Further Consideration:

Based on the information presented above and the result of preliminary analyses, it was determined that alternate truck route **Options 1A, 1B, 3, 6**, and **12** meet the project objectives and have been selected for further consideration.

The alternate truck route options selected would either partially or completely satisfy the project goals. They would all avoid entering the City of Hudson and thus would reduce noise, health, and infrastructure impacts on the City while avoiding communities where there was not already an established truck route. These alternate truck route options would not require displacement of any residential or commercial buildings, are not limited by constraints that would make them unfeasible and provide relatively direct connections to the destinations at the project study area limits.

3.5 Preferred Alternate Truck Route Options

Definition of "Preferred":

For the purposes of this study, the term "preferred" is defined as an alternate truck route option that partially or completely meets the project needs/goals and was determined to be warranted for further study in future design study phases. A preferred alternate truck route option (or options) will be selected to become a feasible alternate truck route option (or options) based on comparing the data for the five (5) preferred alternate truck route options presented in this report and then selecting the option (or options) that best satisfy the project goals. Refer to **Chapter 5** for a discussion on the feasible alternate truck route options.

After reviewing and analyzing all the alternate truck route options noted in **Section 3.4**, the following alternate truck route options have been determined to be a preferred alternate truck route option and warrant further studies. See **Figure 3.4** in **Appendix B** and **Exhibit 3-3** below for a map showing the alternate truck route summary of preferred options.

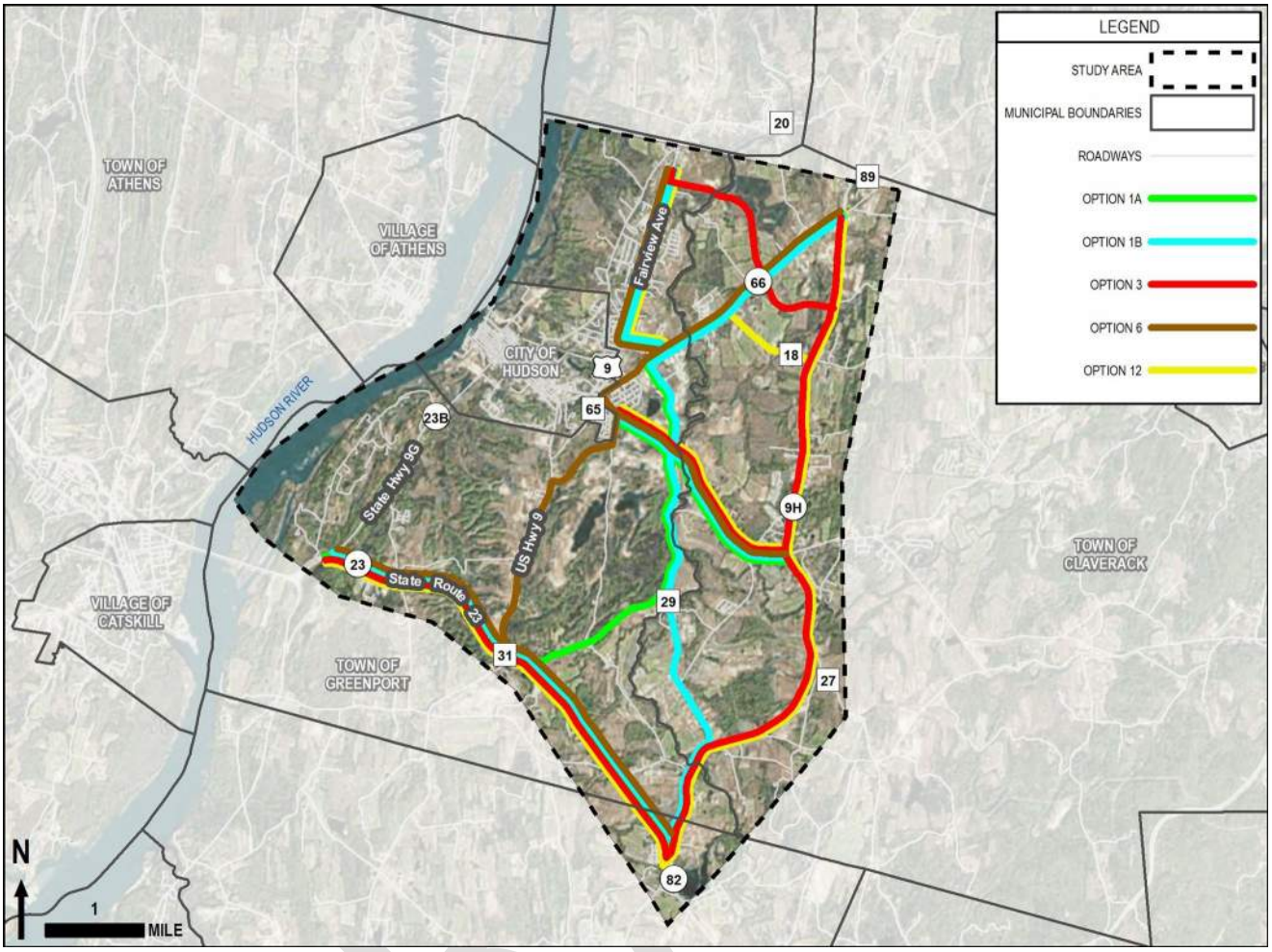


Exhibit 3-3: Alternate Truck Route Preferred Options

For the purpose of this study, preferred alternate truck route options were divided into roadway segments. Roadway segments and major intersections along the preferred options are identified in **Table 3-4** below and will be used further in this report as identifiers. Refer to **Table 2-5** in **Chapter 2** of this report for intersection designations and descriptions.

Table 3-4
Preferred Option Roadway Segment Designations

Segment	Description	Segment Length (mi)	Total Route Length (mi)
Option 1A			
9-1	US Route 9 (Fairview Ave. to intersection A)	1.70	5.1 to 9.4
H-1	Healy Boulevard (Intersection A to Intersection J)	0.50	
66-1A	NY Route 66 (Intersection Q to Segment J)	2.32	
66-1B	NY Route 66 (Intersection J to Segment M-1)	0.21	
M-1	Merle Avenue (Intersection of Segment 66-1 and M-1 to Segment LS-1)	0.22	
LS-1	Lone Star Rd. (Segment M-1 to Intersection M)	0.70	

Table 3-4 Preferred Option Roadway Segment Designations			
23B-1A	NY Route 23B (Intersection L to Intersection M)	0.63	
23B-1B	NY Route 23B (Intersection M to Intersection S)	1.78	
SP-1	Spook Rock Road (Intersection M to Intersection N)	1.52	
HS-1	Hiscox Road (Intersection N to Intersection O)	1.00	
F-1	Fingar Road (Intersection O to Intersection P)	0.70	
23-1A	NY Route 23/US Route 9 (Intersection P to Intersection U)	2.75	
23-1B	NY Route 23/US Route 9 (Intersection P to Intersection H)	2.19	
Option 1B			
Segment	**Description**	**Segment Length (mi)**	**Total Route Length (mi)**
9-1	US Route 9 (Fairview Ave. to intersection A)	1.70	5.1 to 12.9
H-1	Healy Boulevard (Intersection A to Intersection J)	0.50	
66-1A	NY Route 66 (Intersection Q to Intersection J)	2.32	
66-1B	NY Route 66 (Intersection J to Segment M-1)	0.21	
M-1	Merle Avenue (Intersection of Segment 66-1 and M-1 to Segment LS-1)	0.22	
LS-1	Lone Star Road (Segment M-1 to Intersection M)	0.70	
23B-1A	NY Route 23B (Intersection L to Intersection M)	0.63	
23B-1B	NY Route 23B (Intersection M to Intersection S)	1.78	
SP-1A	Spook Rock Road (Intersection M to Intersection N)	1.52	
SP-1B	Spook Rock Road (Intersection N to Intersection T)	1.79	
9H-1	NY Route 9H/NY Route 23 (Intersection T to Intersection U)	1.18	
23-1A	NY Route 23/US Route 9 (Intersection U to Intersection F)	2.75	
23-1B	NY Route 23/US Route 9 (Intersection F to Intersection H)	2.19	
Option 3			
Segment	**Description**	**Segment Length (mi)**	**Total Route Length (mi)**
9-3	US Route 9 (Fairview Avenue to Segment N1-3)	0.00	5.2 to 14.0
N1-3	New Road Alignment 1-3 (Intersection of Segment 9-3 and Segment N1-3 to Intersection of N1-3 and NY Route 66)	1.56	
N2-3	New Road Alignment 2-3 (Intersection of Segment N1-3, Segment N2-3, and NY Route 66 to Intersection of Segment N2-3 and NY Route 9H)	0.90	
9H-3A	NY Route 9H (Intersection Q to Intersection R)	1.53	
9H-3B	NY Route 9H (Intersection R to Intersection S)	2.01	
23B-3	NY Route 23B (Intersection L to Intersection S)	2.41	
9H-3C	NY Route 9H/NY Route 23 (Intersection S to Intersection T)	2.70	
9H-3D	NY Route 9H/NY Route 23 (Intersection T to Intersection U)	1.18	

Table 3-4 Preferred Option Roadway Segment Designations			
23-3A	NY Route 23/US Route 9 (Intersection U to Intersection F)	2.75	
23-3B	NY Route 23/US Route 9 (Intersection F to Intersection H)	2.19	
Option 6			
Segment	**Description**	**Segment Length (mi)**	**Total Route Length (mi)**
9-6A	US Route 9 (Fairview Ave. to Intersection A)	1.70	5.6 to 9.0
H-6	Healy Boulevard (Intersection A to Intersection J)	0.50	
66-6A	NY Route 66 (Intersection Q to Intersection J)	2.32	
66-6B	NY Route 66 (Intersection J to Intersection K)	0.75	
23B-6A	NY Route 23B (Intersection K to Intersection L)	0.25	
23B-6B	NY Route 23B (Intersection L to Intersection S)	2.41	
NE-6	Newman Road (Intersection L to Intersection of Newman Road and Segment N1-6)	0.37	
N1-6	New Road Alignment 1-6 (Intersection of Newman Rd. and Segment N1-6 to Intersection of N1-6 and US Route 9	0.75	
9-6B	US Route 9 (Intersection of N1-6 and US Route 9 to Intersection F)	1.85	
23-6A	NY Route 23/US Route 9 (Intersection F to Intersection U)	2.75	
23-6B	NY Route 23 (Intersection F to Intersection H)	2.19	
Option 12			
Segment	**Description**	**Segment Length (mi)**	**Total Route Length (mi)**
9-12	US Route 9 (Fairview Avenue to Intersection A)	1.70	6.0 to 14.8
H-12	Healy Boulevard (Intersection A to Intersection J)	0.50	
66-12	NY Route 66 (Intersection J to Intersection I)	0.77	
FG-12	Fish and Game Road (CR 18) (Intersection I to Intersection R)	1.01	
9H-12A	NY Route 9H (Intersection Q to Intersection R)	1.53	
9H-12B	NY Route 9H (Intersection R to Intersection S)	2.01	
23B-12	NY Route 23B (Intersection L to Intersection S)	2.41	
9H-12C	NY Route 9H (Intersection S to Intersection T)	2.41	
9H-12D	NY Route 9H (Intersection T to Intersection U)	2.70	
23-12A	NY Route 23/US Route 9 (Intersection U to Intersection F)	1.18	
23-12B	NY Route 23/US Route 9 (Intersection F to Intersection H)	2.75	

3.6 Preferred Alternate Truck Route Improvements Required

Below is description of the preferred alternate truck route option improvements required (by roadway segment) in order to update the roadway segment to current truck route standards. Refer to **Figure 3.4** in **Appendix B** for the alternate truck route summary of preferred options.

3.6.1 Option 1A (refer to **Figure 3.5, Appendix B)**

Option 1A proposes a potential connector road that utilizes existing roads and reconstruction of existing roads where needed.

Starting on the existing truck route on Segment 9-1 (US Route 9) north of the City of Hudson, **Option 1A** travels south and turns east onto Segment H-1 (Healy Boulevard) at Intersection A and then south onto Segment 66-1 (NY Route 66) at Intersection J. Trucks can also enter from NY Route 66 on Segment 66-1A and would continue south at Intersection J.

Option 1A turns east onto an industrial road, Segment M-1 (Merle Avenue) which continues straight onto Segment LS-1 (Lone Star Road), an abandoned gravel road. Lone Star Road would need to be fully reconstructed, widened, and paved to be suitable for the alternate truck route. This route will cross at grade with the CSX railroad north of the ADM Milling property. The railroad is not expected to see much use and would likely not interfere with truck traffic. Coordination with CSX would be required to determine the supplemental safety features required at this crossing.

Option 1A continues to Segment LS-1 until reaching its terminus at Intersection M with NY Route 23B and Spook Rock Road (CR 29) where the route branches. Trucks that want to travel east towards Claverack will turn east onto Segment 23B-1 (NY Route 23B) which continues to the east terminus. Trucks traveling west to the Rip Van Winkle Bridge or south towards US Route 9 will continue straight onto Segment SP-1 (Spook Rock Road (CR 29)). The route travels west onto Segment HS-1 (Hiscox Road) at Intersection N and continues to US Route 9/NY Route 23 on Segment F-1 (Fingar Road). At Intersection P, the route either continues west on Segment 23-1B (NY Route 23) towards the Rip Van Winkle Bridge or turns east onto Segment 23-1A (US Route 9/NY Route 23) towards the terminus at Intersection U.

Option 1A would remove through truck traffic from within the City of Hudson limits. The route primarily travels through industrial and rural land uses including along the abandoned Lone Star Road. The beginning of **Option 1A** travels past residential areas on the west side of Segment 9-1 (Fairview Avenue), however, this segment of US Route 9 exhibits a commercial nature with several shopping centers located along the route within the study area. Additionally, Fairview Avenue has characteristics of an arterial road and is already constructed to handle truck traffic. Considering this segment is already a portion of the existing truck route, it is not expected that additional truck traffic will be added to US Route 9 (Fairview Avenue) north of the city. Therefore, it should not negatively impact these residents to use Segment 9-1A as a part of this alternate truck route option.

Option 1A would require reconstruction of the entire length of segment LS-1 including widening and paving this road; approximately 0.70 miles in length. Lone Star Road on the west end is an extension of Merle Avenue at the intersection with Industrial Tract. Lone Star road is bound on its east end by NY Route 23B just east of the City of Hudson. A portion of Segment LS-1 north of the ADM Milling facility is located on undeveloped land and reconstruction of Lone Star Road into an alternate truck route could potentially encourage development along the road.

Segment SP-1 (Spook Rock Road (CR 29)) is a county road and would require minor widening of the travel way to accommodate truck traffic. Segment HS-1 and F-1 are located on rural, local town owned roads that would require substantial improvements to be included as part of the truck route including widening of the travel lanes and the addition of shoulders and realignment of the intersection of Hiscox Road with Fingar Road and Newman Road to improve the geometry at Intersection O.

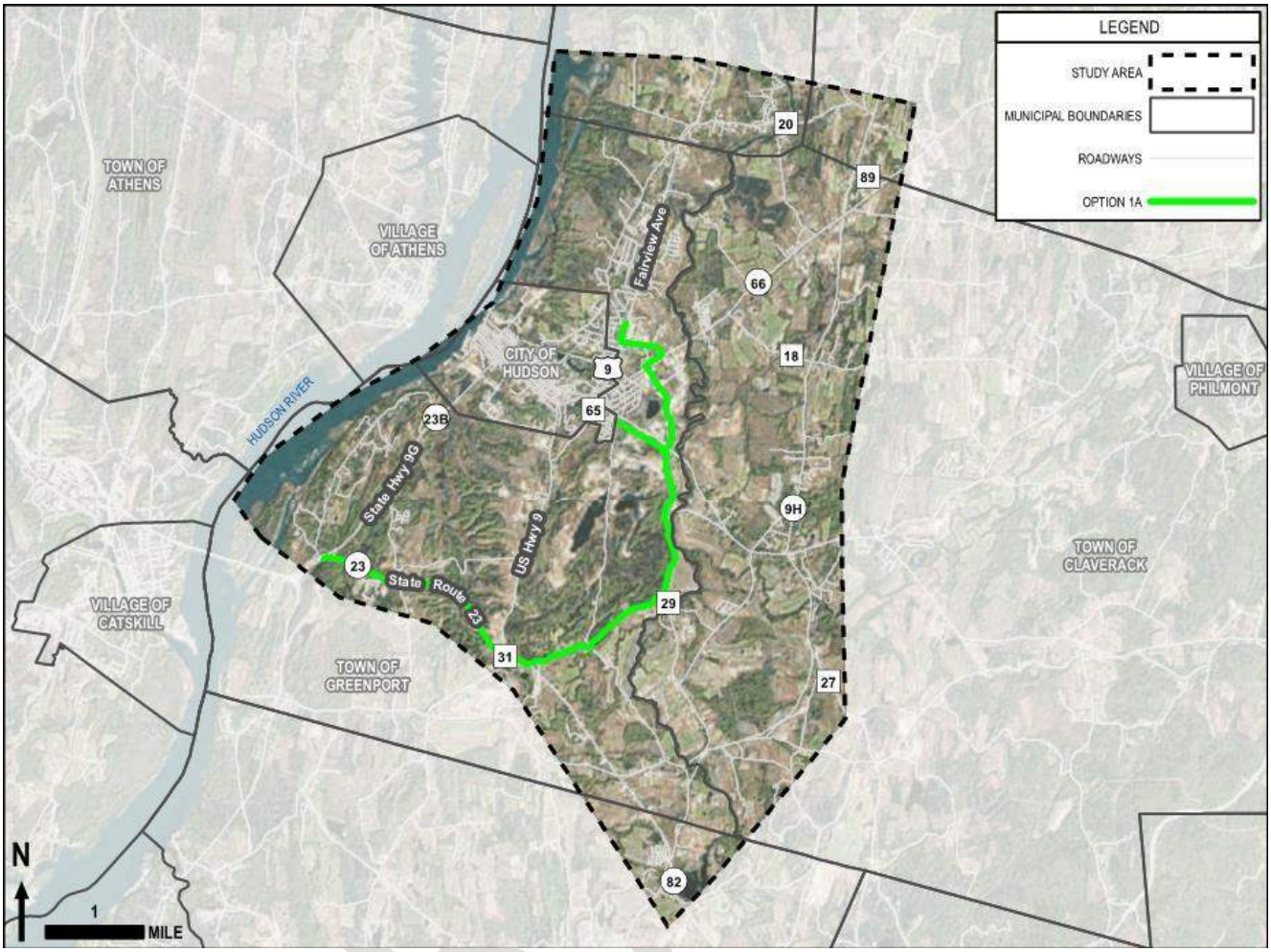


Exhibit 3-4: Alternate Truck Route Preferred **Option 1-A**

Table 3-5 below, identifies and summarizes the improvements required for **Option 1A**. Refer to **Chapter 2** for a description of the existing conditions along each segment of the alternate truck route option.

Table 3-5
Option 1A – Summary of Roadway Improvements Required

Segment	Improvements Required
9-1	No improvements required
H-1	No improvements required
66-1A	No improvements required
66-1B	No improvements required
M-1	Full depth reconstruction of the road to fix pavement distresses and widen the road to provide for shoulders.
LS-1	Full depth reconstruction to replace existing gravel road. The travel lanes and shoulders would be constructed to 12 ft and 4 ft in width respectively.
23B-1A	No improvements required
23B-1B	No improvements for the road or bridge are required

Table 3-5 Option 1A – Summary of Roadway Improvements Required	
Segment	**Improvements Required**
SP-1	Widen the travel lanes to 12 ft / Widen the shoulders to 4 ft
HS-1	Widen the travel lanes to 12 ft / Widen the shoulders to 4 ft
F-1	Widen the travel lanes to 12 ft / Widen the shoulders to 4 ft
23-1A	No improvements for the road or bridge are required
23-1B	No improvements required

3.6.2 **Option 1B** (refer to **Figure 3.6, Appendix B**)

Option 1B was created as an alternative to **Option 1A** and utilizes the **Option 1A** alignment until reaching Intersection N. **Option 1B** continues south along Segment (SP-1B) to the end of Spook Rock Road at Intersection T instead of turning west onto Hiscox Road. **Option 1B** continues south on Segment 9H-1 (NY Route 9H/NY Route 23) to the southern terminus at Intersection U. Trucks that are traveling west to the Rip Van Winkle Bridge will turn on Segment 23-1A (US Route 9/NY Route 23) and continue straight on Segment 23-1B to the bridge.

Segment SP-1A and Segment SP-1B (Spook Rock Road (CR29)), as is with **Option 1A**, would require widening of the travel lanes so that trucks could safely use the route. **Option 1B** does not utilize Hiscox Road or Fingar Road in the route so no improvements will need to be made to them or Intersection O.

Option 1B utilizes the same segment on US Route 9 (Fairview Avenue), Merle Avenue, and Lone Star Road as **Option 1A**. See Section 3.6.1 above for a discussion of those segments.

Refer to **Figure 3.6** located in **Appendix B** and **Exhibit 3-5** below for a graphical diagram illustrating **Option 1B**.

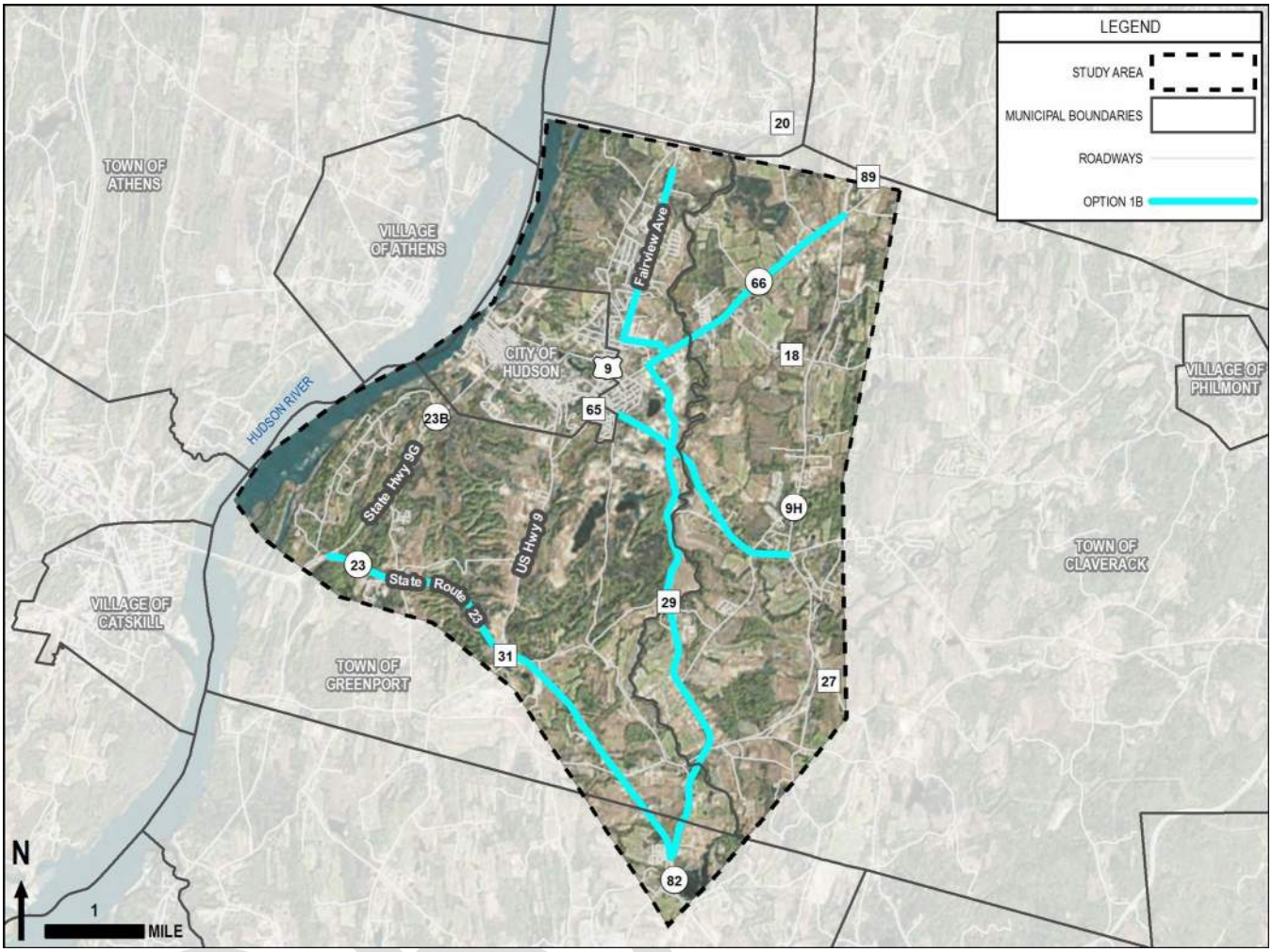


Exhibit 3-5: Alternate Truck Route Preferred **Option 1B**

Table 3-6 below, identifies and summarizes the improvements required for **Option 1B**. Refer to **Chapter 2** for a description of the existing conditions along each segment of the alternate truck route option.

Table 3-6
Option 1B – Summary of Roadway Improvements Required

Segment	Improvements Required
9-1	No improvements required
H-1	No improvements required
66-1A	No improvements required
66-1B	No improvements required
M-1	Full depth reconstruction of the road to fix pavement distresses and widen the road to provide for shoulders.
LS-1	Full depth reconstruction to replace existing gravel road. The travel lanes and shoulders would be constructed to 12 ft and 4 ft width, respectively.
23B-1A	No improvements required
23B-1B	No improvements for the road or bridge are required

Table 3-6 Option 1B – Summary of Roadway Improvements Required	
Segment	**Improvements Required**
SP-1A	Widen the travel lanes to 12 ft / Widen the shoulders to 4 ft
SP-1B	Widen the travel lanes to 12 ft / Widen the shoulders to 4 ft
9H-1	No improvements required
23-1A	No improvements for the road or bridge are required
23-1B	No improvements required

3.6.3 Option 3 (refer to **Figure 3.7, Appendix B)**

Option 3 begins on Segment 9-3 (US Route 9) and turns right onto a new road alignment (Segment N1-3) that would intersect with US Route 9 just south of Greenport Commons. The new road segment would travel east and crossover Claverack Creek with a new bridge structure located just south of the Walmart in Greenport Commons. Segment N1-3 would turn southeast crossing over an unknown stream and require another new bridge or culvert structure before intersection with NY Route 66. Segment N2-3 would be a second new road alignment that would be constructed directly across from the intersection of Segment N1-3 and NY Route 66 and connect NY Route 66 to NY Route 9H. Another new bridge or culvert structure would be required to cross Mud Creek on this segment.

Trucks would turn south along Segment 9H-3B (NY Route 9H) towards Intersection S. Alternatively, trucks could join the route by entering onto Segment 9H-3A at Intersection Q and continuing south towards Intersection S. Quarry trucks would enter the route onto Segment 23B-3 from Newman Road and travel east towards Intersection S. Trucks that are traveling east of the City through the Town of Claverack would turn east onto NY Route 23 at Intersection S.

The route continues south along Segment 9H-3C to Intersection T and Segment 9H-3D to Intersection U where trucks could continue south along US Route 9 or NY Route 82 or turn northwest to travel to the Rip Van Winkle Bridge along Segment 23-3A and Segment 23-3B.

Segment 9-3 along US Route 9 travels through a mixed residential and commercial area with Greenport Commons on the east side of the segment and a residential area with several houses located across from Greenport Commons. Similar to **Option 1A**, this area of US Route 9 is along the route that trucks currently use. Construction of the new roads between US Route 9, NY Route 66, and NY Route 9H is not expected to increase truck traffic along Segment 9-3.

The new connector roadways were conceptually aligned to reduce wetland, farmland and property impacts along Segments N1-3 and N2-3. Any new connector roadway will be designed to the parameters established under **Section 3.3.2** of this report. Segments N1-3 and N2-3 cross a total of five (5) privately owned properties. Each of the property owners whose lands that would be potentially affected by the new connector roadways have been individually contacted to discuss the potential affect on their properties associated with this option as well as receive input on the potential new roadway in relation to their individual property.

Option 3 will require the construction of:

Segment N1-3:

- Approximately 1.56 miles of new road

- 2 new structures to cross Claverack Creek and the unknown stream

Segment N2-3:

- Approximately 0.90 miles of new road
- 1 new structure to cross Mud Creek

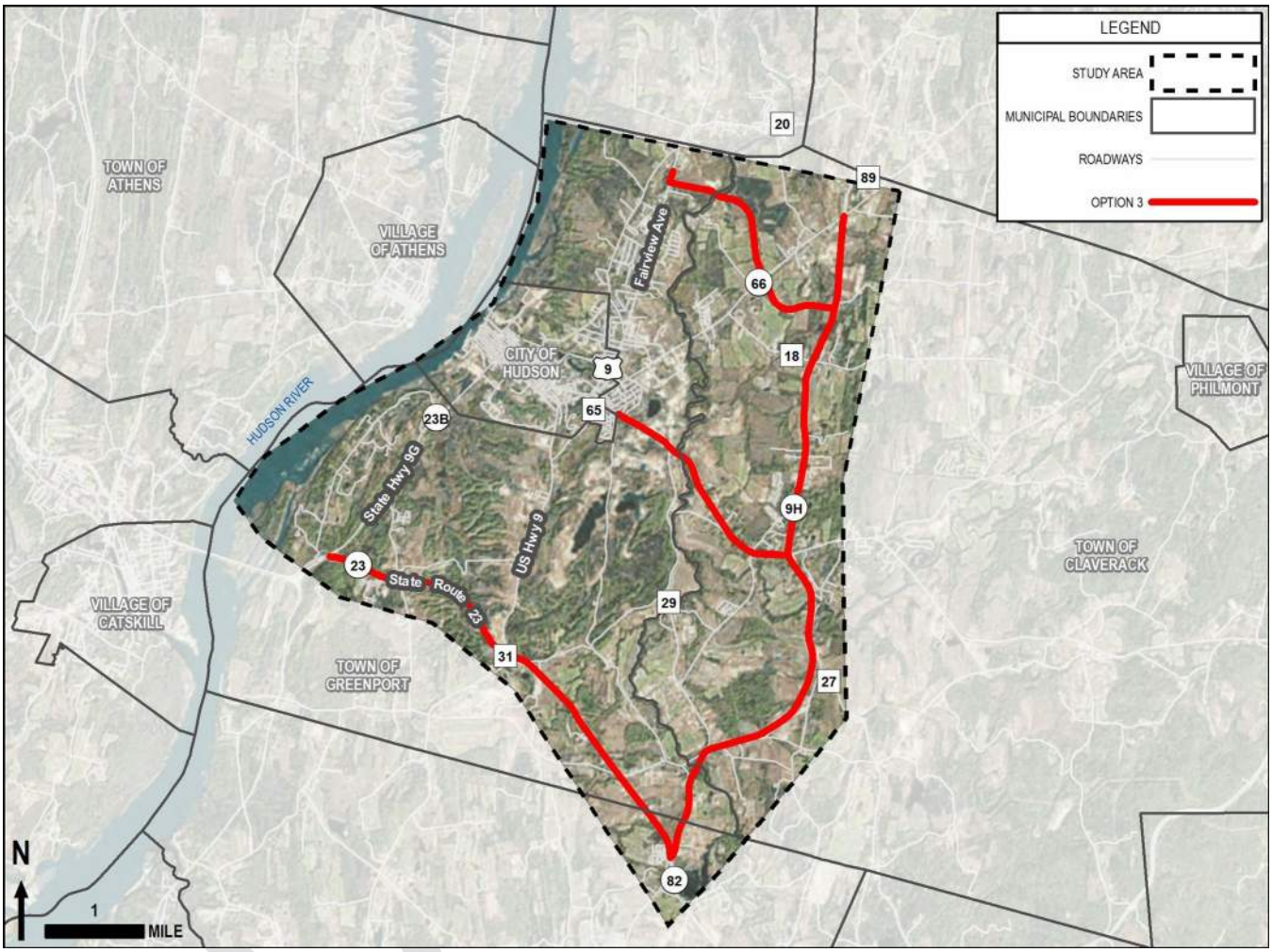


Exhibit 3-6: Alternate Truck Route Preferred **Option 3**

Table 3-8 below, identifies and summarizes the improvements required for **Option 3**. Refer to **Chapter 2** for a description of the existing conditions along each segment of the alternate truck route option.

Table 3-7
Option 3 – Summary of Roadway Improvements Required

Segment	Improvements Required
9-3	No improvements required
N1-3	• Construction of a new road, designed to NYSDOT design criteria standards, between US Route 9 and NY Route 66 • Construction of two new structures to cross Claverack Creek and the unknown stream
N2-3	• Construction of a new road, designed to NYSDOT design criteria standards, between NY Route 66 and NY Route 9H

Table 3-7 Option 3 – Summary of Roadway Improvements Required	
Segment	**Improvements Required**
	• Construction of a new structure to cross Mud Creek
9H-3A	No improvements required
9H-3B	No improvements required
23B-3	No improvements required
9H-3C	No improvements required
9H-3D	No improvements for the road or bridge are required
23-3A	No improvements required
23-3B	No improvements for the road or bridge are required

3.6.4 Option 6 (refer to **Figure 3.8, Appendix B)**

Starting on the existing truck route on Segment 9-6A (US Route 9) north of the City of Hudson, **Option 6** travels south and turns east onto Segment H-6 (Healy Boulevard) at Intersection A and then south onto Segment 66-6 (NY Route 66) at Intersection J. Trucks can also enter from NY Route 66 on Segment 66-1A and would continue south at the intersection of Healy Boulevard and NY Route 66 (Intersection J).

The route continues south along Segment 66-6B to Intersection K. The route avoids entering the City of Hudson by turning east onto Segment 23B-6A and either continues east to the Town of Claverack or continues south onto Segment NE-6 at Intersection L. Segment NE-6 would intersect with a new alignment roadway approximately 0.37 miles south of Intersection L and in front of the quarry.

The new road alignment (Segment N1-6) would connect Newman Road and US Route 9 and would be bounded by Cedar Park cemetery to the north, the quarry to the south and the state wetland to the west. Any new connector roadway will be designed to the parameters established under **Section 3.3.2** of this report. At the intersection of segment N1-6 and US Route 9, **Option 6** turns south onto US Route 9 to Intersection F. Trucks can either turn east to travel on Segment 23-12A towards the project terminus at intersection U or turn west to travel on Segment 23-12B towards the Rip Van Winkle Bridge.

Option 6 utilizes the same segment on US Route 9 (Fairview Avenue) as **Option 1A**. See **Section 3.6.1** above for a discussion for that segment. Along Segment 66-6B, south of the intersection with 10 Broeck Avenue, the truck route travels through a suburban, residential community with numerous homes. This segment might see greater impacts related to increased truck traffic as **Option 6** proposes to shift truck traffic that currently would enter the City of Hudson along Segment E-1 (US Route 9) over to NY Route 66 via Segment H-6 (Healy Boulevard). However, NY Route 66 south of the intersection with 10 Broeck Avenue has 11-12 ft travel lanes and no street parking so trucks can navigate the route unlike the roads that exist within the City of Hudson.

Option 6 will require construction of:

Segment N1-6:

- Approximately 0.75 miles of new road

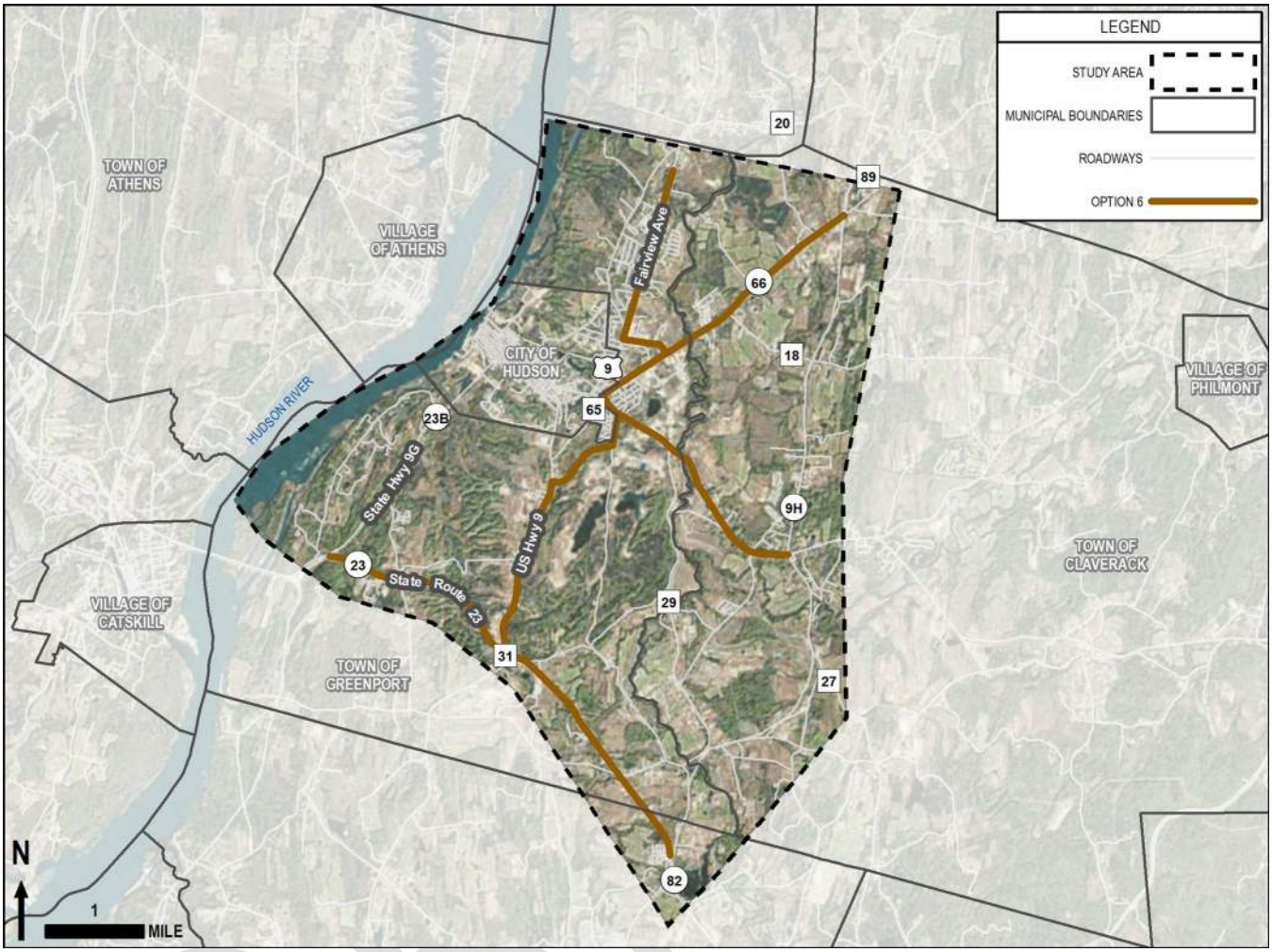


Exhibit 3-7: Alternate Truck Route Preferred **Option 6**

Table 3-8 below, identifies and summarizes the improvements required for **Option 6**. Refer to **Chapter 2** for a description of the existing conditions along each segment of the alternate truck route option.

Table 3-8
Option 6 – Summary of Roadway Improvements Required

Segment	Improvements Required
9-6A	No improvements required
H-6	No improvements required
66-6A	No improvements required
66-6B	No improvements required
23B-6A	No improvements required
23B-6B	No improvements required
NE-6	Widen the road 8 ft to construction 4 ft shoulders between Intersection L and the Intersection of Segment NE-6 and Segment N1-6.
N1-6	Construction of a new road, designed to NYSDOT design criteria standards, connecting Newman Road and US Route 9.

Table 3-8 Option 6 – Summary of Roadway Improvements Required	
Segment	**Improvements Required**
9-6B	Add a 14'-4" clearance sign to BIN 2005410
23-6A	No improvements for the road or bridge are required
23-6B	No improvements required

3.6.5 Option 12 (refer to **Figure 3.9, Appendix B)**

Starting on the existing truck route on Segment 9-12 (US Route 9) north of the City of Hudson, **Option 12** travels south and turns east onto Segment H-12 (Healy Boulevard) at Intersection A and then north onto Segment 66-12 (NY Route 66) at Intersection J. The route travels north and turns east onto Segment FG-12 (Fish and Game Road (CR18)) and continues to Intersection R. Alternatively, trucks could enter the route by turning south onto Segment 9H-12A at Intersection Q. The route continues south on Segment 9H-12B to Intersection S.

Quarry trucks would enter the route onto Segment 23B-12 from Newman Road and travel east towards Intersection S. Trucks that are traveling east of the City of Hudson through the Town of Claverack would turn east onto NY Route 23 at Intersection S.

The route continues south along Segment 9H-3C to Intersection T and Segment 9H-3D to Intersection U where trucks could continue south along US Route 9 or NY Route 82 or turn northwest to travel to the Rip Van Winkle Bridge along Segment 23-3A and Segment 23-3B.

Option 12 utilizes the same segment on US Route 9 (Fairview Avenue) as **Option 1A**. See **Section 3.6.1** above for a discussion of those segments. **Option 12** would require widening of the travel lanes and shoulders to of Segment FG-12.

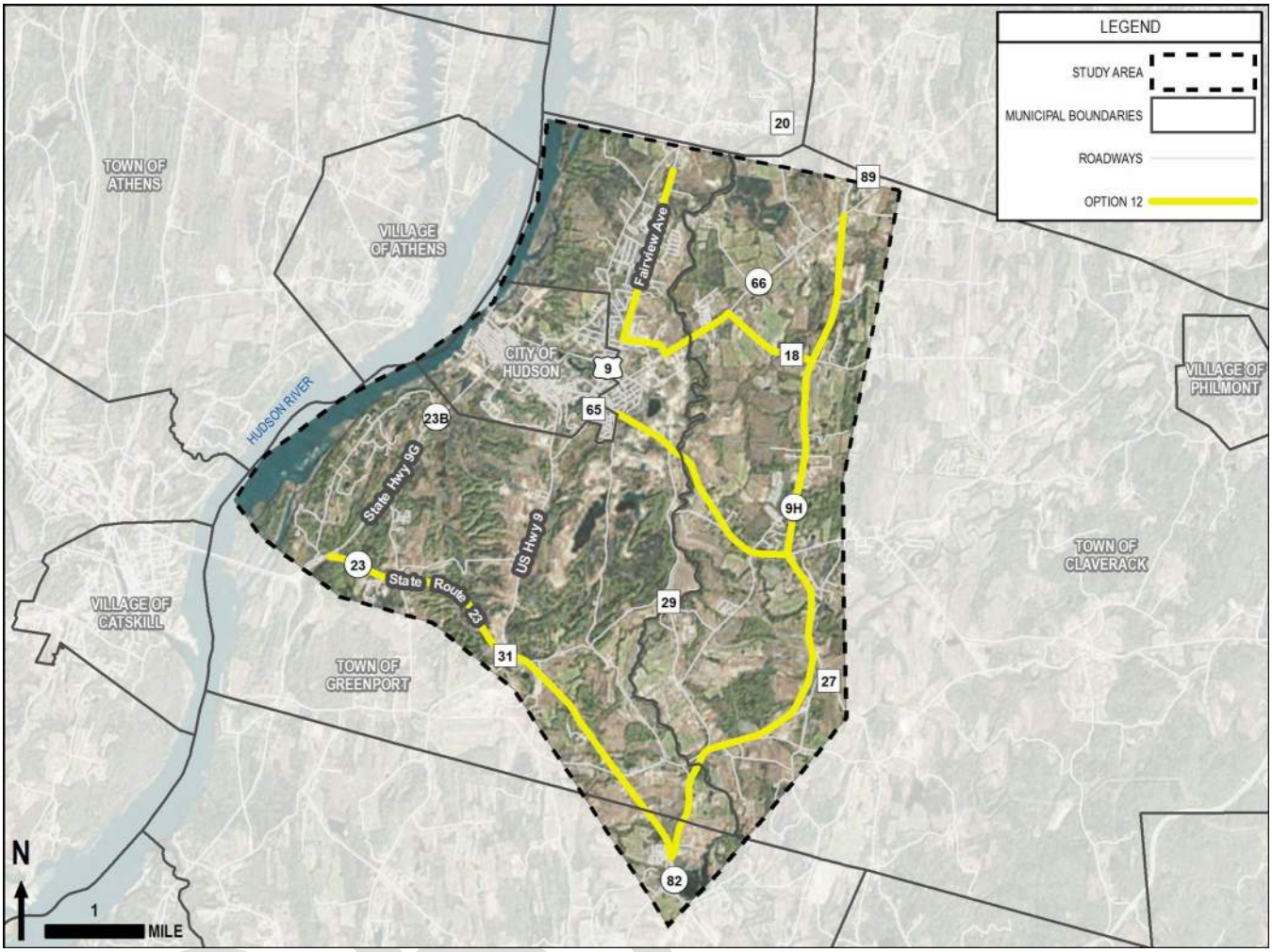


Exhibit 3-8: Alternate Truck Route Preferred Option 12

Table 3-9 below, identifies and summarizes the improvements required for **Option 12**. Refer to **Chapter 2** for a description of the existing conditions along each segment of the alternate truck route option.

Table 3-9
Option 12 – Summary of Roadway Improvements Required

Segment	Improvements Required
9-12	No improvements Required
H-12	No improvements required
66-12	No improvements required
FG-12	Widen travel lanes to 12 ft / Widen shoulders to a minimum of 4 ft
9H-12A	No improvements required
9H-12B	No improvements required
23-12B	No improvements required
9H-12C	No improvements required
9H-12D	No improvements for the road or bridge are required

23-12A	No improvements required
23-12B	No improvements for the road or bridge are required

3.7 Feasible Alternate Truck Route Options

Definition of Feasible Options:

For the purposes of this study, the term "feasible" is defined as a preferred alternate truck route option that has been selected from the preferred options defined under **Section 3.6** and is warranted for further study in future design phases. Feasible options will not be deemed feasible for construction until further detailed engineering analysis is completed in the preliminary design phases of the project.

Preferred Alternate truck route **Options X** and **X** have been identified as feasible options under consideration. Refer to **Figure 3.11** located in **Appendix B** and **Exhibit 3-9** below for a graphical diagram illustrating the feasible options considered.

Exhibit 3-9 to be inserted when feasible alternative truck routes are determined

Exhibit 3-9: Feasible Alternative Truck Route Options

It is anticipated that the alternate truck route will not change ownership and be maintained by the respective owner.

3.8 Engineering Considerations and Evaluation of Feasible Alternative Truck Route Options

3.8.1 Functional Classification and National Highway System (NHS)

The functional classifications of the existing roads will not be affected by the construction of any proposed alternate truck route option, however any existing segment of road that would be used that is not currently part of an existing truck route would need to be added to the NYS list of Access Highways. Coordination would be necessary with NYSDOT to determine the amount process and timeframe for adding an existing or new connector road to the list of designated access highways.

The new connector roads proposed under alternate truck route **Option 3** and **Option 6** would be designed using the critical design elements parameters for a rural minor arterial (See **Table 3-2**). It is anticipated that the new connector road functional classifications will be as follows:

It is anticipated that the proposed connector road functional classifications will be as follows:

Table 3-10 Classification Data of Proposed New Roadways			
Locations	**Option 3**	**Option 3**	**Option 6**
Functional Classification	Rural Minor Arterial	Rural Minor Arterial	Rural Minor Arterial
National Highway System (NHS)	No	No	No
Designated Truck Access Route	Yes	Yes	Yes
Qualifying Highway	No	No	No
Within 1 mile of a Qualifying Highway	No	No	No
Within the 16 ft Vertical Clearance Network	No	No	No

3.8.2 Control of Access

Access to the preferred alternate truck route options is anticipated to be uncontrolled.

Access Control - As defined in Highway Design Manual (HDM) Section 2.6.15, control of access is defined as the regulated limitation of access rights to and from properties abutting the highway facilities. Control of access is measured by the degree to which access is controlled, that is, fully controlled, partially controlled or uncontrolled.

Access to the preferred truck route options would be uncontrolled with no grade separation or controlled access points to the truck route. Each of the preferred alternate truck route options will have five (5) primary access points where through truck traffic can enter/exit the truck route. The access locations are summarized as below for all options:

- US Route 9 at Intersection V
- NY Route 66 at Intersection Q
- NY Route 23B at Intersection S
- US Route 9/NY Route 23 at Intersection U
- NY Route 23 at Intersection H

Quarry truck traffic traveling to the docks within the City of Hudson will be able to access the alternate truck route for **Options 1A**, **1B**, **3**, and **12** on NY Route 23B. For alternate truck route **Option 6**, quarry trucks would enter the route via the new road alignment (Segment N1-6) connecting Newman Road and US Route 9.

Trucks making local deliveries within the City of Hudson would continue to be permitted to enter the City along the existing truck routes.

3.8.3 Proposed Highway Section

The proposed roadway typical section for the new connector roads proposed under alternate truck route **Option 3** and **Option 6** include:

- Two (2) 12 ft travel lanes
- Two (2) 4 ft shoulders
- Two (2) 2.25 ft buffer strips

3.8.4 Traffic Control Devices

Traffic Signals: No new traffic signals are proposed for any of the existing or newly formed intersections.

Signs: Existing signs will be evaluated to determine whether relocation, replacement, or new signs will be added as necessary to comply with required design standards for existing roads and the proposd alternate truck route. The applicability of warning signs for curves will be evaluated and included where appropriate.

3.8.5 Speeds and Delay

Proposed Speed Limit – The proposed speed limits on the existing roads will be retained upon completion of the project.

Anticipated posted speed limits along the alternate truck routes options are anticipated as follows:

- **Existing Route:** 30 mph, 35 mph, 40 mph, 45 mph, and 55 mph
- **Option 1A:** 30 mph, 35 mph, 40 mph, 45 mph, and 55 mph
- **Option 1B:** 30 mph, 35 mph, 40 mph, 45 mph, and 55 mph
- **Option 3:** 40 mph, and 55 mph
- **Option 6:** 30 mph, 35 mph, 40 mph, 45 mph, and 55 mph
- **Option 12:** 30 mph, 35 mph, 40 mph, 45 mph, and 55 mph

Existing Travel Time Estimates: Travel times from origin and destination points outside of the City were calculated and account for both directions of travel. These travel time runs were calculated using the posted speed limit for each segment, segment distance, deceleration and acceleration times for signalized intersections, and turns at stop-controlled intersections. For purposes of this study and to provide a consistent comparison, it has been assumed that all trucks traveling along a given route will experience time lost at each signalized intersection for a period of 40 seconds.

The anticipated travel times for the alternative truck route options were calculated using the same methodology as noted above to estimate the anticipated future travel times for the preferred alternate truck route **Options 1A**, **1B**, **3**, **6** and **12**. The length of routes along with the anticipated travel time data are shown in **Tables 3-11A and 3-11B** below for the existing and preferred alternate route options.

Table 3-11A
Anticipated Travel Time Route Lengths

Origin	Destination	Option Travel Route Lengths (miles)					
		Existing	Option 1A	Option 1B	Option 3	Option 6	Option 12
Intersection V	Intersection H	6.21	8.74	12.76	14.00	8.36	14.81
Intersection V	Intersection U	8.61	9.30	7.82	9.06	8.92	9.87
Intersection V	Intersection S	4.84	5.11	5.11	5.18	5.61	5.99
Intersection Q	Intersection H	7.12	8.86	12.88	12.36	8.48	12.36
Intersection Q	Intersection U	9.51	9.42	7.94	7.42	9.04	7.42
Intersection S	Intersection H	6.69	7.19	11.21	8.82	7.57	8.82

Table 3-11B Anticipated Travel Time Data							
Origin	Destination	Option Travel Times (minutes:seconds)					
		Existing	Option 1A	Option 1B	Option 3	Option 6	Option 12
Intersection V	Intersection H	18:14	17:28	21:24	18:59	16:06	23:46
Intersection V	Intersection U	16:03	17:25	15:20	12:56	17:23	17:43
Intersection V	Intersection S	10:09	11:02	11:02	8:02	12:57	12:49
Intersection Q	Intersection H	16:26	14:07	18:02	16:09	13:24	16:09
Intersection Q	Intersection U	14:14	14:04	11:59	10:06	14:41	10:06
Intersection S	Intersection H	15:45	10:20	14:15	10:57	10:31	10:57

Note: All travel times also represent travel in the reverse direction.

Table 3-12 below, shows the estimated truck percentages that travel along the existing route and compares those percentages to expected reductions in truck traffic as a result of the proposed preferred options along each roadway segment identified.

Table 3-12 Anticipated Percentage of Truck Reduction Along the Existing Route				
Segment	Location	Existing Route	Options 1A, 1B, 3, 12	Option 6
E-4B	US 9G / NY 23B (3rd Ave)	1.6%	1.1%	1.1%
E-4A	US 9G / NY 23B Columbia Street)	3.2%	0.8%	0.8%
E-1B	US 9 / NY 23B (Green Street)	4.2%	2.9%	2.9%
E-3B	NY 23B (Green Street)	2.8%	1.1%	1.1%
E-3A	NY 23B (Columbia Turnpike)	1.0%	0.7%	1.0%
E-2	NY 66 (Union Turnpike)	0.6%	0.3%	0.8%
E-1A	US 9 (Fairview Ave)	0.6%	0.5%	0.5%
E-1C	US 9 (Worth Ave)	1.6%	1.2%	1.2%
	Avg. Percentage Truck Traffic Expected Along Route	1.9%	1.1%	1.2%
	Avg. Percentage Truck Traffic Reduction Along Route	**0%**	**0.9%**	**0.8%**

3.8.6 Truck Distribution

Truck traffic currently uses different routes when traveling through the City of Hudson depending on their origin and destination. The existing routes are defined in **Tables 3-12A and 3-12B** above. For Preferred **Options 1a**, **1B**, **3**, and **12**, the truck volume adjustments along the existing route range from -23 to -96. For Preferred Option 6, the truck volume adjustments range from +23 to -96. **Table 3-13A** below details the adjustment in trucks along segments of the existing route and **Figure 3.10** in **Appendix B** depicts the adjustments. It is anticipated that the preferred alternate truck route options would see an increase in truck traffic. The increases are detailed in **Table 3-13B** below.

Table 3-13A Anticipated Truck Volume Adjustments Along the Existing Route			
Segment	**Location**	**Options 1A, 1B, 3, 12**	**Option 6**
E-4B	US 9G / NY 23B (3rd Ave)	-46	-46
E-4A	US 9G / NY 23B Columbia Street)	-74	-74
E-1B	US 9 / NY 23B (Green Street)	-96	-96
E-3B	NY 23B (Green Street)	-88	-88
E-3A	NY 23B (Columbia Turnpike)	-25	0
E-2	NY 66 (Union Turnpike)	-31	+23
E-1A	US 9 (Fairview Ave)	-23	-23
E-1C	US 9 (Worth Ave)	-26	-26

Table 3-13B Anticipated Truck Volume Adjustments Along Alternate Truck Route Options		
Segment	**Description**	**Adjustment**
Option 1A		
9-1	US Route 9 (Fairview Ave. to intersection A)	-
H-1	Healy Boulevard (Intersection A to Intersection J)	22
66-1A	NY Route 66 (Intersection Q to Segment J)	-
66-1B	NY Route 66 (Intersection J to Segment M-1)	26
M-1	Merle Avenue (Intersection of Segment 66-1 and M-1 to Segment LS-1)	50
LS-1	Lone Star Rd. (Segment M-1 to Intersection M)	50
23B-1A	NY Route 23B (Intersection L to Intersection M)	57
23B-1B	NY Route 23B (Intersection M to Intersection S)	-
SP-1	Spook Rock Road (Intersection M to Intersection N)	37
HS-1	Hiscox Road (Intersection N to Intersection O)	37
F-1	Fingar Road (Intersection O to Intersection P)	37
23-1A	NY Route 23/US Route 9 (Intersection P to Intersection U)	-
23-1B	NY Route 23/US Route 9 (Intersection P to Intersection H)	17
Option 1B		
9-1	US Route 9 (Fairview Ave. to intersection A)	-
H-1	Healy Boulevard (Intersection A to Intersection J)	22
66-1A	NY Route 66 (Intersection Q to Intersection J)	-
66-1B	NY Route 66 (Intersection J to Segment M-1)	26
M-1	Merle Avenue (Intersection of Segment 66-1 and M-1 to Segment LS-1)	50
LS-1	Lone Star Road (Segment M-1 to Intersection M)	50

Table 3-13B Anticipated Truck Volume Adjustments Along Alternate Truck Route Options		
Segment	**Description**	**Adjustment**
23B-1A	NY Route 23B (Intersection L to Intersection M)	57
23B-1B	NY Route 23B (Intersection M to Intersection S)	-
SP-1A	Spook Rock Road (Intersection M to Intersection N)	37
SP-1B	Spook Rock Road (Intersection N to Intersection T)	37
9H-1	NY Route 9H/NY Route 23 (Intersection T to Intersection U)	37
23-1A	NY Route 23/US Route 9 (Intersection U to Intersection F)	37
23-1B	NY Route 23/US Route 9 (Intersection F to Intersection H)	17
Option 3		
9-3	US Route 9 (Fairview Avenue to Segment N1-3)	-
N1-3	New Road Alignment 1-3 (Intersection of Segment 9-3 and Segment N1-3 to Intersection of N1-3 and NY Route 66)	23
N2-3	New Road Alignment 2-3 (Intersection of Segment N1-3, Segment N2-3, and NY Route 66 to Intersection of Segment N2-3 and NY Route 9H)	23
9H-3A	NY Route 9H (Intersection Q to Intersection R)	32
9H-3B	NY Route 9H (Intersection R to Intersection S)	50
23B-3	NY Route 23B (Intersection L to Intersection S)	-
9H-3C	NY Route 9H/NY Route 23 (Intersection S to Intersection T)	37
9H-3D	NY Route 9H/NY Route 23 (Intersection T to Intersection U)	37
23-3A	NY Route 23/US Route 9 (Intersection U to Intersection F)	15
23-3B	NY Route 23/US Route 9 (Intersection F to Intersection H)	15
Option 6		
9-6A	US Route 9 (Fairview Ave. to Intersection A)	-
H-6	Healy Boulevard (Intersection A to Intersection J)	22
66-6A	NY Route 66 (Intersection Q to Intersection J)	-
66-6B	NY Route 66 (Intersection J to Intersection K)	24
23B-6A	NY Route 23B (Intersection K to Intersection L)	48
23B-6B	NY Route 23B (Intersection L to Intersection S)	-
NE-6	Newman Road (Intersection L to Intersection of Newman Road and Segment N1-6)	35
N1-6	New Road Alignment 1-6 (Intersection of Newman Rd. and Segment N1-6 to Intersection of N1-6 and US Route 9	17
9-6B	US Route 9 (Intersection of N1-6 and US Route 9 to Intersection F)	17
23-6A	NY Route 23/US Route 9 (Intersection F to Intersection U)	15
23-6B	NY Route 23 (Intersection F to Intersection H)	17
Option 12		
9-12	US Route 9 (Fairview Avenue to Intersection A)	-

Table 3-13B Anticipated Truck Volume Adjustments Along Alternate Truck Route Options		
Segment	**Description**	**Adjustment**
H-12	Healy Boulevard (Intersection A to Intersection J)	22
66-12	NY Route 66 (Intersection J to Intersection I)	22
FG-12	Fish and Game Road (CR 18) (Intersection I to Intersection R)	22
9H-12A	NY Route 9H (Intersection Q to Intersection R)	28
9H-12B	NY Route 9H (Intersection R to Intersection S)	48
23B-12	NY Route 23B (Intersection L to Intersection S)	-
9H-12C	NY Route 9H (Intersection S to Intersection T)	35
9H-12D	NY Route 9H (Intersection T to Intersection U)	35
23-12A	NY Route 23/US Route 9 (Intersection U to Intersection F)	35
23-12B	NY Route 23/US Route 9 (Intersection F to Intersection H)	17

3.8.7 Safety Considerations, Accident History and Analysis

It is anticipated that crashes involving heavy vehicles will be reduced in the City of Hudson with the reduction of heavy vehicles in the traffic flows along the existing truck route. From the past five-year available crash data, Intersection A was determined to have the highest number of crashes within the study area with 44 crashes. None of the crashes at Intersection A involved trucks which indicates that trucks are not contributing to the crash rate at this location and that additional truck traffic at this intersection is not anticipated to result in additional crashes.

Intersection S had the highest number of crashes involving trucks at a signalized intersection. There were 31 total crashes and 4 crashes involving trucks which is 12.9% of total crashes that occurred at the intersection. All the preferred alternate truck route options being considered would utilize Intersection S as part of the route. Intersection T had the highest percentage of crashes involving trucks at a stop-controlled intersection at 25%. There were 8 total crashes and 2 crashes with truck in the last five years of data.

The anticipated increase in truck traffic at these intersections may result in a slight increase in crashes. Mitigative measures should be investigated to determine if they would be effective at reducing the crash rate at these locations during the future design phases.

3.8.8 Ownership and Maintenance Jurisdiction

No changes are proposed for the existing roadway ownership and maintenance as noted in **Chapter 2**.

Alternate truck route options not currently on the designated list of Access Highways will require addition to the list. NYSDOT has been contacted regarding ownership and maintenance jurisdiction responsibility for new alignment roadways and existing roadways owned by either the Town or County municipalities. Each Town or County owned road will remain the responsibility and ownership of that municipality.

3.9 Multimodal

3.9.1 Pedestrians

Current pedestrian facilities along the existing roadways will be maintained or constructed in accordance with requirements set forth by the Americans with Disabilities Act (ADA). Separate pedestrian facilities are not anticipated for the preferred alternative truck route options at this time. Pedestrians may legally use the paved shoulder of the routes.

3.9.2 Bicyclists

The existing Bicycle Route 9 and Bicycle 23 within the study area will continued to be maintained. New bicyclist facilities are not anticipated for the Connector Road at this time. Bicyclists may legally use the paved shoulder of any new and existing roadways along the preferred alternative truck route options.

3.10 Infrastructure

3.10.1 Pavement and Shoulders

Proposed pavement section for all proposed options, excluding any proposed bridges, shall meet the requirements of the NYSDOT Comprehensive Pavement Design Manual. Pavement and shoulders are expected to be constructed with Hot Mix Asphalt (HMA).

The travel lane widths are sufficient on US Route 9, NY Route 9G, NY Route 9H NY Route 23, NY Route 23B, and NY Route 66 outside of the City of Hudson and do not require any improvements to the existing cross section to be incorporated as part of a new truck route. The pavement will be continued to be maintained by the NYSDOT.

3.10.2 Guide Railing, Median Barriers and other Barrier Systems

Bridge railing (Type TL-5) shall be provided on all proposed bridges. Guide railing shall be provided when a fixed object, roadside obstacle, or non-conforming cross-sectional feature cannot be removed from the clear zone or when slopes are greater than 1 (V) on 3 (H) or if a 1 on 3 slope has a height greater than 5 ft. Median barriers are not proposed for any of the preferred options. All types of railings and barriers shall be developed during final design and shall comply with current design standards.

3.10.3 Drainage/Stormwater Management Systems

Proposed drainage systems will be designed according to current standards and engineering practices included in the NYSDOT HDM, Standard Specifications and the Roadside Design Guide, etc. Drainage for the proposed new roadways within the preferred options will primarily be comprised of an open system with ditches on either side of the roadway corridor. Drainage berms should be constructed to create a ditch in fill situations. Stormwater from the proposed roadway will run off the edge of pavement onto the vegetated side slopes and conveyed to Stormwater treatment areas along the roadway ditches, treated and eventually drain to natural features.

3.10.4 Soil and Foundation Considerations

For the purposes of this Feasibility Study, a geotechnical program was not progressed. Indicative Soil characteristics for the study area have been gathered from Natural Resources Conservation Service “Web Soil Survey” and reviewed. The soil types in the proximity of the preferred options are mostly silty and sandy loams within the first few feet of the soil profile, becoming more gravelly at larger depths.

A geotechnical study will be required during the future preliminary and final design phases of the project in order to further identify soil types, rock formations & locations, bearing capacity, etc.

3.10.5 Structures

3.10.5.1 Existing Bridges

It has been determined that the existing bridges within the study area will not need to be modified for use with an alternate truck route. The existing bridges and the features they carry, and cross are listed below.

- BIN 2006470 Carries NY Route 9G/NY Route 23B over CSX railroad
- BIN 1005420 Carries US Route 9 over CSX railroad
- BIN 2005410 Atlas Cement Company Conveyor over US Route 9
- BIN 1005400 US Route 9/NY Route 23 over Mud Creek
- BIN 1029010 Carries NY Route 66 over Claverack Creek
- BIN 1018050 Carries NY Route 23B over Claverack Creek
- BIN 1006490 Carries NY Route 9H/NY Route 23 over Claverack Creek
- BIN 1006480 Carries NY Route 9H/NY Route 23 over Taghkanic Creek
- BIN 3342280 Carries Spook Rock Road (CR 29) over Taghkanic Creek

3.10.5.2 Proposed Bridges or Culverts

For preferred alternate truck route **Option 3**, due to the new connector roadway proposed to be constructed to connect NY Route 9H and US Route 9 to bypass the truck traffic through the City of Hudson the construction of three (3) structures to carry the road over existing water courses will be required.

Should this Option become a feasible alternate truck route option, it should be known that each structure will be designed using AASHTO LRFD Bridge Design Specifications and the NYSDOT Bridge Design Manual. **Table 3-14** below summarizes the location, preliminary type of structure, and the estimated cost for the bridge structure. Roadway costs are provided separately for the new connector road.

Table 3-14
Preferred Option 3 Alternate Truck Route Bridge Structure Information

Structure Location	Superstructure Type	Substructure Type	Preliminary Structure Cost
Segment N1-3 o/Claverack Creek	Two span Steel Multi-Girder – 39'-4" Out to Out with Steel Bridge Rail	Integral Abutments on Steel Piles, single concrete cast-in-place pier on piles	**$8.4 M**
Segment N1-3 o/Unnamed Stream	Buried Precast Three-Sided Frame	Footers assumed to be supported upon Steel Piles	**$0.96 M**
Segment N2-3 o/Mud Creek	Buried Precast Three-Sided Frame	Footers assumed to be supported upon Steel Piles	**$ 0.97 M**

The construction of this structures will require a floodplain investigation at the crossing over Claverack Creek and the Unnamed Stream. Hydraulic analyses will be required for each crossing to ensure that the structures are properly sized to meet the hydraulic requirements of NYSDOT, NYSDEC, and USACE.

3.10.6 Hydraulics of Bridges and Culverts

The proposed bridge configurations for preferred alternate truck route **Option 3** will need to be analyzed hydraulically utilizing the HEC-RAS program developed by the United States Army Corps of Engineers (USACE) in the future preliminary design phases. The purpose of the hydraulic analysis is to create a hydraulic model which will provide water surface elevations of the waterbodies during specific storm events in order to evaluate and define the vertical clearance requirements of the proposed bridge and culverts.

3.10.7 Utilities

Various existing utilities may be impacted by the preferred alternate option routes. Utility Conflicts will generally be localized to locations where a new connector road will interface with the existing roadway networks as the utilities are generally located within the existing highway boundary. The new connector roads proposed in alternate truck route **Option 3** will cross through easements for Niagara Mohawk high power transmission lines near where Segment N1-3 intersects with NY Route 66. Additional coordination would be required with the utility company. Also, any roadway that will need to be upgraded/widened may have a potential for utility conflicts and require relocations. Aerial and underground utility features may require relocation based on the spatial requirements and subgrade features of the alternate truck route option.

3.10.8 Railroads

There are several CSX railroad crossings within the study area and within the City of Hudson. See **Section 2.4.3.6** in **Chapter 2** for a list of the at grade and grade separated crossings.

Preferred alternate truck route **Options 3**, and **Option 12** have the least interaction with the existing railroad. As they avoid all railroad crossing including grade separated crossings.

Preferred alternate truck route **Option 6** would utilize the existing at grade crossing on Segment 66-6B located between 10 Broeck Avenue and Healy Boulevard. This crossing is already equipped with safety equipment such as crossing gates and flashing warning lights. As this crossing is located on a state highway that is already utilized by trucks, no additional coordination with CSX is anticipated.

Both preferred alternate truck route **Option 1A** and **Option 1B** would require upgrade of the at-grade railroad crossing on Lone Star Road. This section of track likely does not currently see much use, however, coordination with CSX and NYSDOT would be needed to determine whether safety equipment would need to be installed. As Lone Star Road would be reconstructed as part of Option 1A and 1B, coordination would be required to determine the procedure for constructing near the tracks.

3.10.9 Right of Way (ROW) Acquisition Requirements

All property acquisitions shown for this study are preliminary and are shown in concept only. If in the future design phases of the project, ROW acquisition is required for the project, it shall conform to “The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970”, otherwise known as the Uniform Act. Any property acquisition that may be required will also follow procedures outlined by the NYSDOT Engineering Division, Office of Right of Way.

Property acquisitions are anticipated for the new roadway segments associated with Option 3 and minor strip acquisitions along roadway frontage where widening is required. Below is a list of property addresses affected by new alignment roadways and private roads included in alternate routes.

- 17 Industrial Tract Road (Options 1A & 1B)

- 19 Industrial Tract Road (Options 1A & 1B)
- 4283 Route 9 (Options 1A & 1B)
- Pulcher Avenue (Option 3)
- NY Route 66 (Option 3)
- NY Route 9H (Option 3)
- 151 Humane Society Road (Option 3)
- 70 Humane Society Road (Option 3)

3.10.10 Opinions of Probable Cost

Table 3-15 depicts the comparison of probable costs for the year 2021:

Table 3-15
Comparison and Opinion of Probable Costs (Year 2021)

	Preferred Options					
Activities	**NBI**	**1A**	**1B**	**3**	**6**	**12**
Construction Cost (Highway Elements)	$1,331,000	$4,292,000	$4,805,000	$5,374,000	$1,869,000	$830,000
Construction Cost (Structural Elements)	$0	$0	$0	$10,346,881	$0	$0
Subtotal	$1,331,000	$4,292,000	$4,805,000	$15,720,881	$1,869,000	$830,000
Feasibility Level Estimate Contingency (20%)	$400,000	$1,288,000	$1,442,000	$4,717,000	$561,000	$249,000
Professional Services (Preliminary Design)	$107,000	$344,000	$385,000	$1,258,000	$150,000	$67,000
Professional Services (Final Design)	$80,000	$258,000	$289,000	$944,000	$113,000	$50,000
Construction Inspection (20%)	$267,000	$859,000	$961,000	$3,145,000	$374,000	$166,000
Right-of-Way (ROW) (Incl. Environmental Mitigation)	$0	$0	$0	See Note 2	$0	$0
Subtotal	$854,000	$2,749,000	$3,077,000	$10,064,000	$1,198,000	$532,000
Estimated Option Cost	$2,185,000	$7,041,000	$7,882,000	$25,784,881	$3,067,000	$1,362,000

Notes:

1. Costs for new bridge or culvert structures have been included for preferred Option 3 only.
2. ROW costs are not included at this level of study.

Table 3-16 depicts the comparison of probable costs escalated to the year 2026 using an escalation rate of 2.5% per year from 2021:

Table 3-16
Comparison and Opinion of Probable Costs (Escalated to Year 2026 @ 2.5% per year)

	Preferred Options					
Activities	**NBI**	**1A**	**1B**	**3**	**6**	**12**
Construction Cost (Highway Elements)	$1,506,000	$4,857,000	$5,437,000	$6,081,000	$2,115,000	$940,000
Construction Cost (Structural Elements)	$0	$0	$0	$11,707,000	$0	$0
Subtotal	$1,506,000	$4,857,000	$5,437,000	$17,788,000	$2,115,000	$940,000
Feasibility Level Estimate Contingency (20%)	$453,000	$1,458,000	$1,632,000	$5,337,000	$635,000	$282,000
Professional Services (Preliminary Design)	$122,000	$390,000	$436,000	$1,424,000	$170,000	$76,000
Professional Services (Final Design)	$91,000	$292,000	$327,000	$1,069,000	$128,000	$57,000
Construction Inspection (20%)	$303,000	$972,000	$1,088,000	$3,559,000	$424,000	$188,000
Right-of-Way (Incl. Environmental Mitigation)	$0	$0	$0	See Note 2	$0	$0
Subtotal	$969,000	$3,112,000	$3,483,000	$11,389,000	$1,357,000	$603,000
Estimated Option Cost	$2,475,000	$7,969,000	$8,920,000	$29,177,000	$3,472,000	$1,543,000

Notes:

1. Costs for new bridge or culvert structures have been included for preferred Option 3 only.
2. ROW costs are not included at this level of study.

3.10.11 Potential Funding Sources and Financing

The purpose of this section is to identify potential funding sources that can be considered to implement preferred alternate truck route **Options 1A**, **1B**, **3**, **6** and **12**.

The capital, operation and maintenance costs used in this section reflect the preliminary estimates.

Drawing upon the defined purpose and need for the City of Hudson Truck Route Traffic Feasibility Study project, this section describes key federal, state, and local funding sources that could be considered for the Project.

Federal and state funding and financing programs are expected to provide the majority of funding for the project. In order for a project to qualify for federal or state funds, the Project must be included in the Long-Range Transportation Plan, with proposed funding sources subsequently programmed in the State Transportation Improvement Program (STIP).

The federal and state programs being considered for funding and financing opportunities include:

- Key Federal Programs
  - Surface Transportation Program (STP)
  - National Highway System (NHS) – National Highway Performance Program (NHPP)
  - Highway Safety Improvements Program (HSIP)
  - Congestion Mitigation and Air Quality Program (CMAQ);

- Transportation Alternatives Program (TAP);
- Better Utilizing Investments to Leverage Development, or BUILD
- Transportation Infrastructure Finance and Innovation Act (TIFIA);
- State Infrastructure Banks (SIBs) & Section 129 Loan; and
- STIP: Grant Anticipation Revenue Vehicles (GARVEES).

In terms of federal and state level support, there are several cost reimbursement/matching programs authorized under Fixing America's Surface Transportation (FAST) Act. These formula-based programs include:

- National Highway Performance Program (NHPP)
- Surface Transportation Program (STP)
- Highway Safety Improvement Program (HSIP) and;
- Congestion Mitigation and Air Quality (CMAQ) Program.

All of these programs are administered by the Federal Highway Administration. While the funds allocated to New York State are by formula, the funds for individual projects are generally discretionary based on criteria established by the NYSDOT and/or the metropolitan transportation organizations.

The National Highway System under the NHPP provides funding for improvements to rural and urban roads that are part of the NHS, while the STP provides funds to be used on surface infrastructure projects in general. The HSIP aims to reduce traffic fatalities and serious injuries on all public roads.[1]

Lastly, the CMAQ Program targets projects that improve air quality and reduce congestion in areas that are designated as non-attainment areas for target air pollutants.

Due to the current pandemic, funding has been more difficult to obtain given the amount of application submitted for each round of funding. It is important to ensure the applications are chosen based on the specific project and are competitive to increase the chances.

Additionally, many of the federal programs listed above appear to be funded through 2020 with future funding unknown at this time due to the current pandemic. With the change in administration at the federal level, decisions on funding allocations will be made at some point in the near future. These programs must be carefully evaluated in the future project phases to determine which programs are currently active and the anticipated rounds of application reviews.

[1] The FHWA defines a highway safety improvement project as "any strategy, activity or project on a public road that is consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and corrects or improves a hazardous road location or feature or addresses a highway safety problem." MAP-21 provides an example list of eligible activities, but HSIP projects are not limited to those on the list.

CHAPTER 4 – SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS

4.1 Introduction

The purpose of this chapter is to identify potential social, economic, and environmental impacts that may result from the future construction of this project. Opportunities for avoidance and/or mitigation measures have been identified as appropriate have been identified. This chapter evaluates the applicable social, economic, and environmental laws and regulations and identifies the studies, permits and approvals necessary for this project. The existing truck routes within the City of Hudson include US Route 9 (Worth Avenue, Warren Street, Park Place, Fairview Avenue), US Route 9/NY Route 23B (Green Street), and NY Route 9G/NY Route 23B (Columbia Street, and 3rd Street). Abutting existing truck routes include US Route 9, NY Route 9G, NY Route 9H, NY Route 23, NY Rote 23B, and NY Route 66. The aforementioned roadways have not been screened for environmental impacts in this chapter since no change is proposed.

4.2 National Environmental Policy Act (NEPA)

The Federal Highway Administration (FHWA) will be consulted during the preliminary design phase of the project to confirm that the project would be classified as a Class III action in accordance with the definitions of the National Environmental Protection Act (NEPA), as identified in 23 CFR 771.115. Any action that is not classified as a Class I or Categorical Exclusion (CE) is considered a Class III. A Class III project will require development of an Environmental Assessment (EA). It is anticipated that the project will be progressed as a Class III in accordance with the NYSDOT "Project Development Manual" (PDM).

4.3 State Environmental Quality Review Act (SEQRA)

Each of the alternate truck route options are expected to be classified as Type 1 Actions in accordance with 6NYCRR Part 617, State Environmental Quality Review Act (SEQRA). The widening of existing roadways and the construction of new roadways is not listed as a Type II action, which is any action that does not significantly impact the environment or is otherwise precluded from environmental review under SEQR. Type 1 Actions include actions that are more likely to require the preparation of an Environmental Impact Statement (EIS). The City of Hudson would likely be the Lead Agency for SEQRA. The lead agency will be established during the future preliminary design phase.

4.4 NYS Smart Growth Infrastructure Policy Act (SGPIPA)

Pursuant to Environmental Conservation Law (ECL) Article 6, this project would be compliant with the New York State Smart Growth Public Infrastructure Policy Act (SGPIPA). The Act is intended to minimize the unnecessary cost of sprawl development.

To the extent practicable this project has met the relevant criteria as described in ECL § 6-0107. The Smart Growth Screening Tool was used to assess the project's consistency and alignment with relevant Smart Growth criteria; the tool was completed by M.J. Engineering and Land Surveying, P.C. and reflects the current project scope. The Smart Growth Screening Tool is located in **Appendix F**.

4.5 Environmental Considerations

4.5.1 Wetlands

Multiple alternate truck route options were examined in an effort to avoid wetland impacts. The preferred alternate truck route options include **Options 1A, 1B, 3, 6 and 12**. **Figure 2.1**, located in **Appendix B** illustrates the locations of the state and federal regulated wetlands on the site. The size and type of the wetlands within the project corridors have not been field verified. A wetland delineation

along the preferred alternate truck route options will be required during the preliminary design process to verify their locations and limits. Additionally, each impacted wetland will be evaluated based on wetland value. The alignments of the proposed roads within **Options 3 and 6** were positioned to avoid impacts to structures, utility lines, and wetlands to the greatest extent practicable; however, some impacts were unavoidable. It is possible that wetland impacts may be reduced through modifications to the alignments and to the wetland boundaries following formalized wetland delineations that will take place in the preliminary design phase for the project.

4.5.1.1 State Wetlands

Option 1A does not propose the construction of any new roads. Therefore, there are no anticipated impacts to state wetlands for this option. However, **Option 1A** will potentially be within the adjacent area of New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetlands HS-100, which is a 26.5-acre Class 2 wetland located adjacent to Fingar Road, and HS-8, which is a 54.2-acre Class 2 wetland located adjacent to Spook Rock Road. The wetland classes describe the quality of the wetland, with a Class 1 wetland being the highest quality and Class 4 being the lowest.

Option 1B does not propose the construction of any new roads. Therefore, there are no anticipated impacts to state wetlands for this option. However, **Option 1B** will potentially be within the adjacent area of NYSDEC Freshwater Wetlands HS-9 located adjacent to Spook Rock Road, which is a 23.3-acre Class 2 wetland and HS-8, which is a 54.2-acre Class 2 wetland located adjacent to Spook Rock Road.
There are no NYSDEC wetlands identified within the **Option 3** project corridor.

One (1) NYSDEC wetland is identified within the **Option 6** project corridor. HS-3 is located along the southern side of Ten Broeck Lane. This wetland is identified by the NYSDEC as a Class 2 wetland is 38.3 acres in size.

Option 12 does not propose the construction of any new roads. Therefore, there are no anticipated impacts to state wetlands for this option. However, **Option 12** will potentially be within the adjacent area of NYSDEC Freshwater Wetlands HS-4, which is a 226.4-acre Class 2 wetland located adjacent to Fish and Game Road.

If work within a state-regulated wetland or regulated adjacent area cannot be avoided, the project will require a NYSDEC Article 24 Freshwater Wetlands Permit.

4.5.1.2 Federal Wetlands

Two (2) federal freshwater emergent wetlands are identified within the **Option 1A** project corridor. Both are located adjacent to Fingar Road and are 10.91 and 2.55 acres in size.

Three (3) federal freshwater forested/shrub wetlands are identified within the **Option 1B** project corridor. All are located adjacent to Spook Rock Road and are 2.45, 0.44, 0.09 acres in size.

There are no federal wetlands identified within the **Option 3** project corridor.

Four (4) federal wetlands are identified within the **Option 6** project corridor. All are located along the proposed roadway between US Route 9 and Newman Road. Two (2) of the wetlands are classified as freshwater emergent wetlands and are 3.49 and 23.07 acres in size. The other two (2) wetlands are classified as freshwater forested/shrub wetlands and are 5.02 and 9.02 acres in size.

There are no federal wetlands identified within the **Option 12** project corridor.

In accordance with Executive Order 11990 – Protection of Wetlands, impacts should be minimized to the greatest extent practicable. Mitigation is required for any permanent impacts over 0.1 acres and should be planned for impacts that are deemed unavoidable with on-site mitigation considered first. If on-site mitigation is not feasible, off-site mitigation on properties within the same watershed should be evaluated. Sites should be evaluated for suitability based on hydrology, soil characteristics, topography, and effectiveness in replacing the unavoidable wetland impacts created by the proposed project. The impacts may include the loss of flood storage, stormwater filtering, groundwater discharge/recharge, and wildlife habitat.

If work within a federally regulated wetland cannot be avoided, the project will require a Nationwide Permit from the United States Army Corps of Engineers (USACE) and NYSDEC Section 401 Water Quality Certification.

Once the anticipated wetland impacts have been determined for the preferred alternate truck route option, a Joint Application would be submitted to the USACE and the NYSDEC during the detailed design process.

4.5.2 Surface Waterbodies and Watercourses

Existing Hydrography information is shown in **Figure 4.1** located in **Appendix B**.

The alternate truck route option alignments for the proposed project generally slope east to west with the existing landform. As a result, all surface water drains west, towards the Hudson River. Refer to **Table 4-1** for a list of all waterbodies and watercourses that are crossed. **Option 6** does not cross any waterbodies or watercourses and has not been included in the table.

Table 4-1
Surface Waterbodies and Watercourses

Waterbody/Watercourse	Feature Crossed	Option			
		1A	1B	3	12
Tributary to Mud Creek Class C	Fingar Road	X			
Tributary to Mud Creek Class C	Hiscox Road	X			
Tributary to Claverack Creek Class C	Spook Rock Road	X	X		
Tributary to Claverack Creek Class C	Healy Boulevard	X	X		X
Taghkanic Creek Class C(T)	Spook Rock Road		X		
Mud Creek C(T)	New Road from NY Route 9H to Union Turnpike			X	
Claverack Creek Class C	New Road from Union Turnpike to Fairview Avenue			X	
Tributary of Claverack Creek Class C	New Road from Union Turnpike to Fairview Avenue			X	
Mud Creek Class C	Fish and Game Road				X

According to the NYSDEC Stream Classification, as contained in 6 NYCRR 10, the best usage for Class C streams is fishing. Water quality is suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

According to the NYSDEC Stream Classification, as contained in 6 NYCRR 10, the best usage for Class C(T) streams is fishing. Water quality is suitable for trout propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Increased sediment and erosion control measures to prevent surface water impacts to the existing streams would be required during construction. These erosion and sediment control measures may include turbidity curtains, precast structural elements, and the utilization of dewatering measures during installation.

Stream and river crossings may require permits from the NYSDEC and USACE. Both agencies would require crossing designs that minimize temporary and permanent impacts to the waterbody. All regulated stream crossings would require a NYSDEC Article 15 permit, USACE Section 404 permit and a NYSDEC Section 401 Water Quality Certification to permit disturbance to the bed and banks of the waterbody. The purpose of a Section 401 Water Quality Certification is to verify that the project would not degrade waters of the state or otherwise violate water quality standards. The alternate truck route options would be designed utilizing Best Management Practices (BMPs) including the use of swales along the road rather than a closed drainage system.

It is anticipated that all alternate truck route options would involve the disturbance of greater than one (1) acre of land and will require a State Pollution Discharge Elimination System (SPDES) General Permit for Construction Activity (GP-0-20-001) from NYSDEC. Under this permit, Erosion and Sediment Control Plans and a full Stormwater Pollution Prevention Plan (SWPPP) would be developed during final design. Upon the City's approval of the SWPPP, a Notice of Intent would be submitted to the NYSDEC. The SWPPP would be required to ensure that the proposed project treats the required Water Quality Volume, reduces the required runoff reduction volume, and does not increase peak flow rates for the 1, 10, and 100-year storm events in comparison to existing conditions.

4.5.3 Wild, Scenic and Recreational Rivers

There are no listed wild, scenic or recreational rivers within or in the vicinity of the project.

4.5.4 Navigable Waters

The Hudson River is a state regulated navigable water, located in the vicinity of the project area. The Hudson River is used by both recreational boat traffic and cargo/commercial traffic. No new crossings of the river are proposed for any of the alternate truck route options and there would be no placement of fill in these waters. Navigability of the waters would not be affected.

4.5.5 Floodplains

4.5.5.1 State Flood Insurance Compliance Program

Actions funded from State sources must be evaluated and constructed in compliance with the requirements of 6 NYCRR Part 502 Flood Plain Management. The National Flood Insurance Program Flood Insurance Rate Map (FIRM), which includes the proposed alternate truck route option roadway corridors, was reviewed. Flood plains are defined as lowland areas adjoining inland and coastal waters

which are periodically inundated by floodwaters. The 100-year flood plain is an area which has a one (1) percent chance of being inundated in any one (1) year. FEMA Flood Zone information within Columbia County is shown in **Figure 4.2** located in **Appendix B**.

All alternate truck route options are situated within the 100-year floodplains of Mud Creek and Claverack Creek. In accordance with the provisions of 6 NYCRR 502 – Flood Plain Management for State Projects, this action would consider and evaluate the practicality of the alternate truck route options to any floodplain encroachments.

A floodplain hydraulic analysis should be performed during preliminary design and updated during the detailed design phase to verify that the preferred alternate truck route option will have no significant impact to floodplains.

4.5.5.2 Executive Order 11988

Executive Order (EO) 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a feasible alternate truck route option.

If it is determined during preliminary design that there will be impacts to the floodplains, the requirements of EO 11988 would apply.

4.5.6 Coastal Resources

The proposed alternate truck route options are all within the vicinity of the Hudson River, which is considered a New York Coastal Management Area. The City of Hudson also has a Local Waterfront Revitalization Program (LWRP). The existing truck route passes through the boundary area of LWRP; however, the proposed alternate truck route options do not fall within the boundary area of the LWRP. A coastal consistency review will not be required for any of the alternate truck route options.

4.5.7 Groundwater, Aquifers, and Resources

Options 1A, 1B, 3, and 12 are located within a State Designated Principal Aquifer as identified by Kantrowitz and Snavely (1982). Supplemental groundwater investigations would be required for the new roadway construction proposed in **Option 3**. The existing waterbodies in the project area are the Hudson River, Taghkanic Creek, Claverack Creek, Loomis Creek, Mud Creek, and multiple unnamed tributaries to the aforementioned creeks. A SPDES General Permit for Construction Activity (GP-0-20-001) would be required for all of the alternate truck route options since they would require the disturbance of greater than one (1) acre of land. Under this permit, erosion and sediment control plans and a full Stormwater Pollution Prevention Plan (SWPPP) would be developed during detailed design.

The City of Hudson and the Town of Claverack supplies municipal water to residences within the City and the Town and to some residences outside the City and the Town. Residences not served by municipal water supplies receive their water supply from drinking water wells. The alignments of **Options 3 and 6** should be designed to avoid impacts to private wells and their recharge areas. The Town of Claverack's water supply comes from the Town of Greenport, which lies in between the City of Hudson and the Town. The City of Hudson supplies their own water.

4.5.8 Soils

The United States Department of Agriculture (USDA) Soils Survey for Columbia County, New York was reviewed for each alternate truck route option. The drainage class and hydrologic soil group for each soil

unit was compiled to determine the general site conditions for each alternate truck route option. The USDA defines drainage class as the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not considered unless they have significantly changed the morphology of the soil.

Hydrologic Soil Group is defined by the USDA as a categorization of the soil's runoff potential, based on the soil's rate of water infiltration when the soil is not protected by vegetation, is thoroughly wet, and receives precipitation from long-duration storms. Soils are assigned to four (4) groups (A, B, C, and D) with group A having the highest rate of infiltration and group D having the slowest rate of infiltration. Soils that have a dual hydrologic soil group (A/D, B/D, or C/D) occur naturally in group D (undrained) conditions but have a different soil group under drained conditions. Refer to **Appendix D** for the USDA Soil Survey maps.

4.5.9 General Ecology and Wildlife Resources

Vegetation cover types along each of the five (5) proposed alternate truck route options were assessed and included upland plant communities and wetland plant communities. The upland plant communities included late successional forest, open successional shrub, agriculture field, early successional emergent field, residential lawn and developed/unvegetated. The wetland plant communities include emergent, scrub-shrub and forested.

The land in the area of all the proposed alternate truck route options is a mixture of cover types generally dominated by agricultural fields and late successional forests. This offers a diverse habitat for many species common to northern New York. The primary impact to wildlife could be a loss of habitat.

The project has been evaluated to assess the impact of the construction on various species within the project corridor such as deer, migratory birds, birds of prey, passerines, amphibians, and fish. Since the project would cross several drainage features within the corridor, bridges/ culverts would be required such that the hydraulic characteristics of the area is not altered. These culverts would need to be designed in accordance with the USFWS guidelines for animal passage through highway corridors.

Additionally, it is not anticipated that the project would remove a significant amount of cover to create abnormal warming of surface waters which could change the habitat of amphibians or fisheries in the project area.

The five (5) preferred alternate truck route alternate truck route options are located within three (3) data blocks of the NYSDEC Breeding Bird Atlas for 2000-2005. Block 5967D includes **Option 1A** and **Option 1B** and lists 84 species of birds. Of those species, 20 were possible, 10 were probably, and 54 were confirmed. Block 5967B includes all five (5) alternate truck route options and lists 86 species of bird. Of those species, 24 were possible, 14 were probably, and 48 were confirmed. Block 5968D includes **Option 3** and lists 90 species of bird. Of those species, 22 were possible, 27 were probably, and 41 were confirmed.

Tree clearing will be required in all three of the above-mentioned data blocks to facilitate the construction of the new roadways proposed in **Option 3** and **Option 6** and potential reconstruction in all five (5) alternate truck route options. Of the species identified, two (2) (Least Bittern, Bald Eagle) are listed as a threatened species and three (3) (Sharp-shinned Hawk, Cooper's Hawk, Osprey) are listed a species of special concern. **Option 3** and **Option 6** would impact stands of mixed forests within the three (3) data blocks. If a nesting site is encountered during clearing/construction, the NYSDEC would need to

be contacted to determine the best course of action for minimizing disturbance to the aforementioned species.

4.5.9.1 Endangered and Threatened Species

The USFWS online Information, Planning, and Conservation System (IPaC) was reviewed for the project area. Although the Northern Long Eared Bat was not listed as having the potential to be affected by any of the five (5) preferred alternate truck route options, it should be noted that the proposed alternate truck route options are approximately 5.6 and 5.0 miles from the nearest known bat hibernacula (Railroad Cave and Merlin's Cave). The Indiana Bat (federally endangered species) was identified as potentially being affected by all five (5) preferred alternate truck route options. There are many areas of late successional forests along the proposed alternate truck route options. The project's area of potential effect would be assessed during the preliminary design phase for potential summer roosting habitats. If a habitat is found, coordination with the USFWS would be necessary. All potential habitat removal (clearing of trees > 3"diameter at breast height) would need to be completed between October 1st and March 31st to avoid adverse impacts on either species. The IPaC listings are included in **Appendix D**. The NYSDEC Environmental Resource Mapper shows all five (5) alternate truck route options being located within areas having the potential for rare plants or animals. The New York Natural Heritage Program (NYNHP) should be contacted during preliminary design to determine if any state listed rare, threatened, or endangered species have the potential to exist within or near the project site.

4.5.9.2 Invasive Species

In accordance with Executive Order 13112 Invasive Species, the spread or introduction of invasive species to the project area would be prevented to the greatest extent practicable during construction. All areas of exposed soil would be seeded with non-invasive grass mixtures as soon as practicable and all plantings introduced along the roadway and in the created wetlands shall be native non-invasive plants. Other measures, including but not limited to, monitoring the swales for invasive species would also be implemented.

4.5.10 Critical Environmental Areas

Option 1A is partially located within the Town of Greenport Critical Environmental Area (CEA) at the intersection of Fingar Road and NY Route 23. Coordination with the NYSDEC would be required during preliminary design to determine whether or not the project would adversely affect the CEA.

4.5.11 Historic and Cultural Resources

Historical and Cultural Resource information is shown in **Figure 2.2** located in **Appendix B**.

4.5.11.1 National Heritage Areas Program

The proposed project is located within the Upper Hudson Valley region of the Maurice D. Hinchey Hudson River Valley National Heritage Area. The Hudson River Valley Greenway would need to be contacted during preliminary design to ensure that the project was consistent with the Heritage Area Management Plan.

4.5.11.2 National Historic Preservation Act (Section 106 / State Historic Preservation Act / Section 14.09)

There are four (4) historical properties along Spook Rock Road that are eligible or listed for inclusion in the National Register of Historic Places. They are located at 75 Spook Rock Road, 81 Spook Rock Road, 134 Spook Rock Road, and 644 Spook Rock Road (Conyn-Van Rensselaer House). The activities of **Option 1A** and **Option 1B** do not have the potential to adversely affect the historic properties. The undertaking

would not alter, directly or indirectly, any of the characteristics that qualify the property for inclusion in the National Register, in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. National Register Districts and sites are shown in **Figure 2.2** located in **Appendix B**.

They New York State Office of Parks, Recreation & Historic Preservation (NYS OPRHP) should be provided concept plans during the preliminary design phase and given the opportunity to comment.

4.5.11.3 Architectural Resources

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

4.5.11.4 Archaeological Resources

A Phase I archeological survey would need to be conducted during preliminary design to assess the presence of archeological resources for the selected feasible alternate truck route option(s). The archeological investigation would be conducted in areas that are indicated by OPRHP as being archeologically sensitive where prior disturbance cannot be established.

4.5.11.5 Historic Bridges

NYSDOT's Historic Bridge Inventory has no listing of any historic canal bridges within the project area of potential effect for each alternate truck route option. However, there is one (1) structure within the project limits that are more than 50 years old where new truck traffic is proposed. **Option 1B** crosses over BIN 3342280, which carries CR 29 over Taghkanic Creek. The structure was constructed in 1953. **Option 1B** is the only alternate truck route option that proposes new truck traffic over BIN 3342280. All other bridges currently operate with the existing truck traffic today.

4.5.11.6 Native American Involvement

The Section 106 of the National Historic Preservation Act (36 CFR 800) would be followed to ensure compliance with this Act.

4.5.11.7 Section 4(f) Involvement

If federal funding was utilized for the proposed project, an additional review of properties on, or eligible for inclusion on, the National Register of Historic Places, or properties over 50 years old that may be eligible within the project's area of potential effect would be required during preliminary design. A review of the alternate truck route options in the field (where accessible) and via aerial photographs does not indicate the presence of properties over 50 years old that may be eligible within the proposed alignments area of potential effect.

4.5.12 Parks and Recreational Resources

4.5.12.1 State Heritage Areas Program

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

4.5.12.2 National Heritage Areas Program

The proposed project is located within the Upper Hudson Valley region of the Maurice D. Hinchey Hudson River Valley National Heritage Area. Refer to **Section 4.5.11.1** for detailed information on the Heritage Area.

4.5.12.3 National Registry of Natural Landmarks

The Dr. Oliver Bronson House and Estate has been designated a significant natural area adjacent to the project area and is listed on the National Registry of Natural Landmarks. The house, constructed in 1811, is an important early example of the Hudson River Bracketed style by Alexander Jackson Davis. The house was added to the National Registry in 2003. The house currently sits immediately east of NY Route 9H approximately half a mile down the access road for the Hudson Correctional Facility. The proposed alternate truck route options would bring truck traffic away from the site and would not negatively impact it.

4.5.12.4 Section 4(f) Involvement

There are no publicly owned parks or recreational facilities, protected under Section 4(f) of the USDOT Act, in or adjacent to any of the proposed alternate truck route options. As such, no further action would be required under this section.

4.5.12.5 Section 6(f) Involvement

The alternate truck route options do not impact parklands or facilities that have been partially or fully federally funded through the United States Land and Water Conservation Act. As such, no further consideration under Section 6(f) would be required.

4.5.12.6 Section 1010 Involvement

The alternate truck route options do not involve the use of land from a park to which Urban Park and Recreation Recovery Program funds have been applied. As such, no further consideration under Section 1010 would be required.

4.5.13 Visual Resources

4.5.13.1 Effects Assessment

The proposed roadway corridors for all five (5) preferred alternate truck route options are located in areas that are largely wooded and farmed with intermittent rural residential and industrial properties. Vegetation along the proposed roadway corridors is a mixture of mature forested areas, lightly wooded areas, and agricultural/grassed areas. Physical impact to the proposed roadway corridor will be minimized to the greatest extent practicable to avoid disturbance and/or change to the character of the natural surroundings. Additionally, there are no identified natural landmarks within the proposed roadway corridors.

The major visual features for all alternate truck route options are primarily vacant forested parcels and farmland. Towards the southern end of the alignments near the City of Hudson limit, land use transitions to urban near the connection to the existing truck route. The primary viewer groups will be highway traffic users, residential occupants, and pedestrians.

Impacts to the visual environmental include the tree clearing that would be required to facilitate the new roadway construction in **Option 3** and **Option 6**.

4.5.14 Farmlands

Farmland soil information is shown in **Figure 4.3** located in **Appendix B**. Agricultural District boundaries are shown in **Figure 4.4** located in **Appendix B**.

4.5.14.1 State Farmland and Agricultural Districts

Options 1A, **1B**, **3**, and **12** are located in Columbia County Agricultural District #3. **Option 1A** and **Option 6** are located in Columbia County Agricultural District #7. **Option 3** will require land acquisition from within Agricultural District #3. The exact quantities and parcels affected will be determined during the preliminary design.

The New York Agriculture and Market Law, Article 25-AA, requires prior notice to the Commissioner of Agriculture and Markets for these right-of-way acquisitions in an Agricultural District. A Preliminary and Final Notice of Intent (PNOI and FNOI) must be filed with the New York State Commissioner of Agriculture and Markets and the Columbia County Agriculture and Farmland Protection Board. The FNOI must include a report justifying the proposed action including an evaluation of alternate truck route options that would not require action within the Agricultural District. After the FNOI is accepted by the NYS Agriculture and Markets; a certification is required; certifying that the project sponsor has met the requirements of State Agriculture and Market Law Section 305(4) and to the maximum extent practicable, adverse agricultural impacts revealed in the Final Notice of Intent will be avoided, minimized and mitigated.

4.5.14.2 Federal Prime and Unique Farmland

For **Option 3**, the acquisition of prime or unique farmland, or farmland of state or local significance will be required. The US Department of Agriculture Farmland Conversion Rating (Form AD 1006) will be required to be submitted to the Natural Resources Conservation Service (NRCS) during preliminary or detailed design.

4.5.15 Air Quality

4.5.15.1 Transportation Conformity

This project is located in Columbia County, which is considered an ozone attainment area. The project is considered an exempt project as per Table 2 in Section 93.126 of 40 CFR. In addition, this project is also exempt from Regional Emissions Analysis as per Table 3 in Section 93.127 of 40 CFR. Therefore, no additional analysis is required for this project.

4.5.15.2 Carbon Monoxide (CO) Microscale Analysis

A microscale air quality analysis is performed to assess carbon monoxide (CO) concentrations at various worse case receptors adjacent to the roadways in the project area. Based on the procedures outlined in the NYSDOT's Environmental Manual (TEM), worst case receptors are typically chosen at signalized intersections where a level of service D, E, or F exists for the build conditions. This criterion typically applies to signalized intersections. Unsignalized intersections do not typically warrant a detailed air quality analysis since the major-street high volume approaches at these intersections operate as free flow conditions. Intersections requiring a detailed air quality analysis, based on the level of service criteria, undergo additional screenings based on an analysis of the site conditions with respect to the reduction in source-receptor distances, traffic volume increases, vehicle emission increases, and speed reduction. The screening process is used to pinpoint locations where vehicle emissions would be the highest and would contribute to the background air quality. Detailed air quality analysis is conducted using CAL3QHC, Version 2.0, which is a computer-based air quality dispersion model. This model is based on traffic parameters from the Highway Capacity Manual (HCM) and is capable of analyzing intersection and free flow receptors.

A microscale air quality analysis was not performed at this level of study and will be required to be performed during the future preliminary design phase.

4.5.15.3 Mesoscale Analysis

A mesoscale air quality analysis is conceptually similar to the microscale air quality analysis; however, it covers a larger geographic area, typically larger than the immediate project area. In addition to carbon monoxide, a mesoscale air quality analysis monitors for volatile organic compounds (VOC) and nitrogen oxides (NO_x). The criteria for projects requiring a mesoscale air quality analysis is listed in Chapter 1 of the Environmental Procedures Manual (EPM) and includes projects providing the addition of a travel lane more than a mile in length, HOV lanes, large-scale signal coordination projects, and significant modification in interchanges. Although the preferred alternate truck route options are expected to service the traffic currently in the study area and would not change regional traffic patterns, the project meets the requirements for mesoscale analysis based on the criteria.

A mesoscale analysis was not performed at this level of study and will be required to be performed during the future preliminary design phase.

4.5.16 Noise

The proposed project provides an alternate truck route to remove unnecessary truck traffic in the city, decreasing the truck traffic volumes where sensitive noise receptors exist. Increases in travel will occur on along the new route, which is primarily located on rural roads with little to no residential homes or commercial businesses.

Option 3 and **Option 6** meet the classification requirements for a noise regulation Type I project as stated in the Noise Analysis Policy and Procedures (April 2011), outlined in The Environmental Manual (TEM) published by the NYSDOT due to the construction of new roadways. A noise analysis would be required for either of these alternate truck route options during preliminary design and if a traffic noise impact is identified, abatement measures listed within Section 4.4.18.5.3.1 of the Noise Analysis Policy and Procedures must be considered.

4.5.17 Energy

An energy analysis will be required for the proposed project due to the shift in traffic patterns and the construction of new roadways. The latest guidance for energy analysis procedures is outlined in the Draft Energy Analysis Guidelines for Project-Level Analysis published by NYSDOT dated November 25, 2003. The purpose of the energy analysis is to determine the direct and indirect energy consumption associated with the **No-Build Option** and the five (5) preferred alternate truck route options. In addition, greenhouse gas emissions will need to be calculated for the **No-Build** and the five (5) preferred alternate truck route options since energy related activities contribute greatly to greenhouse gas emissions.

It is expected that the energy consumption for the **No Build Option** is the lowest since this alternate truck route option does not require new construction. The maintenance energy for the five (5) preferred alternate truck route options is anticipated to be higher than the **No Build** condition due to the energy costs associated with maintenance of the existing roadways and the construction of new connector roadways for **Option 3** and **Option 6**.

An energy analysis was not performed at this level of study and will be required to be performed during the future preliminary design phase.

4.5.18 Hazardous Waste and Contaminated Materials

A Hazardous Waste/Contaminated Materials (HW/CM) Assessment will be required for this project. The primary objective of a HW/CM Assessment is to render an opinion as to whether sufficient or historical evidence indicates the presence of recognized environmental conditions that could result in the

presence of hazardous materials in the environment. The assessment shall be completed during the future preliminary design phase for lands along the preferred alternate truck route options. The HW/CM Assessment should be conducted prior to beginning any land acquisition tasks.

A general site reconnaissance should be conducted to make observations of surficial conditions and to observe possible evidence of recognized environmental conditions, which would result in the presence of hazardous materials in the environment. In addition to the potential environmental concerns identified through visual observation, published Federal and State databases should be reviewed to assess whether sites within or adjacent to the project corridor have a history of use and/or disposal of contaminated/hazardous wastes.

4.5.19 Social Impacts

This section identifies potential social impacts with respect to the following topics:

- Land use classification
- Community assets
- Neighborhood and community cohesion
- Socially vulnerable populations benefitted and harmed
- School districts, recreational areas, places of worship

4.5.19.1 Land Use

Existing Route

Within the city limits, the primary land use of the existing truck route is commercial, community & public services, industrial, and residential. As the existing route leaves the city, the primary land use becomes industrial, agricultural, residential, and vacant land. See **Figure 4.5** in **Appendix B** for a depiction of the respective adjacent land uses.

Option 1A

Option 1A links the existing truck routes along NY Route 23 and NY Route 23B by utilizing Fingar Road, Hiscox Road, and Spook Rock Road. The surrounding land is primarily agricultural, community & public services, industrial, and residential. **Option 1A** also links the existing truck routes along NY Route 23B, Union Turnpike, and Fairview Avenue by utilizing Lone Star Road, Merle Avenue, and Healy Boulevard. The surrounding land is primarily industrial and commercial.

Option 1B

Option 1B links the existing truck routes along NY Route 9H and NY Route 23B by utilizing Spook Rock Road. The surrounding land is primarily agricultural, community & public services, industrial, and residential. Like **Option 1A**, NY Route 23B, Union Turnpike, and Fairview Avenue are connected by utilizing Lone Star Road, Merle Avenue, and Healy Boulevard.

Option 3

Option 3 links the existing truck routes along NY Route 9H, Union Turnpike, and Fairview Avenue by constructing a new roadway beginning just north of Kittle Road and Route 9H and ending just north of US Route 9 and Pulcher Avenue. The surrounding land is primarily agricultural, residential, and vacant.

Option 6

Option 6 links the existing truck routes along US Route 9 and NY Route 23B by utilizing Newman Road and constructing a new roadway between US Route 9 and Newman Road just north of the quarry. The primary land use is industrial.

Option 12

Option 12 links the existing truck routes along NY Route 9H, Union Turnpike, and Fairview Avenue by utilizing Fish and Game Road and Healy Boulevard. The primary land uses are agricultural and residential.

4.5.19.2 Community Assets

Community assets may consist of places, services, or infrastructure networks that are often categorized as economic, health and social services, infrastructure systems, or natural and cultural resources. Community assets present in the City of Hudson, Town of Greenport, and Town of Claverack near the existing and proposed alternate truck route option routes are identified below.

Table 4-2
Community Assets

Community Asset	Asset Location	Community Asset Presence Along Routes					
		Existing	Opt. 1A	Opt. 1B	Opt. 3	Opt. 6	Opt. 12
Economic Development							
City of Hudson Commercial Businesses	City of Hudson	X					
Town of Greenport Commercial Businesses	Town of Greenport	X					
Holmquest Farms and Greenhouse	Town of Claverack			X			
Town of Claverack Commercial Businesses	Town of Claverack						
Health and Social Services							
Columbia County District Attorney	City of Hudson	X					
Mountainview Animal Hospital	Town of Greenport	X				X	
Capital Region Otolaryngology	City of Hudson	X					
Greenport Rescue Squad	Town of Greenport	X	X	X	X	X	X
Columbia-Greene Community College	Town of Greenport	X	X	X	X	X	X
Hudson Correctional Facility	City of Hudson	X					
Montgomery C. Smith Elementary School	City of Hudson	X					
Hudson Junior High School	City of Hudson	X	X	X	X	X	X
Hudson High School	City of Hudson	X	X	X	X	X	X

Table 4-2
Community Assets

Community Asset	Asset Location	Community Asset Presence Along Routes					
		Existing	Opt. 1A	Opt. 1B	Opt. 3	Opt. 6	Opt. 12
Hudson Area Library	City of Hudson	X					
Churchtown Firehouse	Town of Claverack				X		X
Claverack Library	Town of Claverack	X	X	X	X	X	X
Columbia Memorial Bone & Joint	Town of Claverack						X
Infrastructure							
BIN 1005400, US Route 9	Town of Greenport	X	X	X	X	X	X
BIN 1005420, US Route 9	City of Hudson / Town of Greenport	X					
BIN 1006480, NY Route 23	Town of Greenport / Town of Claverack	X		X	X		X
BIN 1006490, NY Route 23	Town of Claverack	X			X		X
BIN 1018050, NY Route 23B	Town of Greenport / Town of Claverack	X	X	X	X	X	X
BIN 1029010, NY Route 66	Town of Greenport / Town of Claverack	X					X
BIN 2005410, US Route 9	Town of Greenport	X				X	
BIN 2006470, NY Route 9G	City of Hudson	X					
BIN 3342280, CR 29	Town of Greenport / Town of Claverack			X			
Natural and Cultural Resources							
Olana State Historic Site	Town of Greenport	X					
First Reformed Church	City of Hudson	X					
Sacred Heart / Our Lady of Mt. Carmel Shrine	Town of Greenport	X			X		
St. Mark's Lutheran Church	City of Hudson	X				X	
People's Bible Church	Town of Claverack	X	X	X	X	X	X
Trinity Church	Town of Claverack	X	X	X	X	X	X
The Church of Jesus Christ of Latter-day Saints	Town of Claverack	X			X		X
Reformed Dutch Church	Town of Claverack	X			X		X

4.5.19.3 School Districts, Recreational Areas, Places of Worship

The following school districts, recreational areas, and places of worship are located near or adjacent to the existing route or the five (5) proposed preferred alternate truck route options:

- Columbia-Greene Community College (Town of Greenport – NY Route 23)
- Montgomery C. Smith Elementary School (City of Hudson – Harry Howard Avenue)
- Hudson Junior High School (City of Hudson – Harry Howard Avenue)
- Hudson High School (City of Hudson – Harry Howard Avenue)
- First Reformed Church (City of Hudson – Green Street)
- Sacred Heart / Our Lady of Mt. Carmel Shrine (Town of Greenport – Fairview Avenue)

- St. Mark's Lutheran Church (City of Hudson – Storm Avenue)
- People's Bible Church (Town of Claverack – NY Route 23B)
- Trinity Church (Town of Claverack – NY Route 23B)
- The Church of Jesus Christ of Latter-day Saints (Town of Claverack – NY Route 9H)
- Reformed Dutch Church (Town of Claverack – NY Route 9H)

Columbia-Greene Community College (Town of Greenport – NY Route 23) is located adjacent to all five (5) preferred alternate truck route options as well as the existing truck route. The college educates students pursing their associate degree or an undergraduate certificate. For the 2019-2020 academic year, there were approximately 1,460 undergraduate students enrolled at the college. No impacts to Columbia-Greene Community College are anticipated as NY Route 23 is already an existing truck route.

Montgomery C. Smith Elementary School (City of Hudson – Harry Howard Avenue) is located near the existing truck route. The elementary school educates students in grades K through 5. For the 2018-2019 academic year, there were approximately 809 students enrolled at the school. All alternate truck route options propose to direct traffic away from the city, making the area around the around the school safer for pedestrian traffic.

Hudson Junior and Senior High Schools (City of Hudson – Harry Howard Avenue) are both located in the same building near the existing truck route and the five (5) proposed preferred alternate truck route options. The junior high school educates students grades 6 through 8. For the 2018-2019 academic year, there were approximately 381 students enrolled at the school. The high school educates grades 9 through 12. For the 2018-2019 academic year, there were approximately 486 students enrolled at the school. The average graduating class is approximately 97 students. All alternate truck route options propose to direct traffic away from the city, making the area around the around the school safer for pedestrian traffic.

The First Reformed Church (City of Hudson – Green Street) is located adjacent to the existing truck route within the city. All five (5) proposed preferred alternate truck route options propose to direct traffic away from the city, making the area around the around the church safer for pedestrian traffic.

The Sacred Heart / Our Lady of Mt. Carmel Shrine (Town of Greenport – Fairview Avenue) is located along the existing truck route. All five (5) proposed preferred alternate truck route options propose to reroute traffic back onto Fairview Avenue before the church once outside the city. No impacts to the church are anticipated as Fairview Avenue is already an existing truck route.

St. Mark's Lutheran Church (City of Hudson – Green Street) is located along the existing truck route and **Option 6**. No impacts to the church are anticipated as Green Street is already an existing truck route.

People's Bible Church and Trinity Church (Town of Claverack – NY Route 23B) are located along the existing truck route and all five (5) proposed preferred alternate truck route options. No impacts to either church is anticipated as NY Route 23B is already an existing truck route.

The Church of Jesus Christ of Latter-day Saints and the Reformed Dutch Church (Town of Claverack – NY Route 9H) are located along the existing truck route and all five (5) proposed preferred alternate truck route options. No impacts to either church is anticipated as NY Route 9H is already an existing truck route.

4.5.20 Anticipated Permit Approvals

The following is a list of the anticipated permits required for the proposed project.

- NYSDEC Article 15 (Options 1A, 1B, 3, 12)
- NYSDEC Article 24 (Options 1A, 1B, 6, 12)
- NYSDEC Section 401 (Options 1A, 1B, 6)
- USACE Section 404 (Options 1A, 1B, 6)
- NYSDEC General Permit for Construction Activities (GP-0-20-001) (Options 1A, 1B, 3, 6, 12)

CHAPTER 5 – EVALUATION AND COMPARISON OF FEASIBLE OPTIONS

5.1 Comparison of Preferred Options

The previous chapters have presented information that evaluated five (5) preferred alternate truck route options, outlined potential advantages and disadvantages of five (5) options, and identified anticipated impacts that could result from the project completion. The five (5) preferred alternate truck route options presented in **Chapter 3** of this document are **Options 1A**, **1B**, **3**, **6** and **12**. The following table includes a summary of the costs, benefits and impacts associated with each of these options.

Table 5-1
Comparison of Preferred Alternate Truck Route Options

Comparison Criteria	Preferred Alternate Truck Route Options					
	NBI	1A	1B	3	6	12
Meets Project Objectives	N	Y	Y	Y	Y	Y
Engineering Considerations						
Improved geometry and intersections	Y	Y	Y	Y	Y	Y
No. of new roads	0	0	0	2	1	0
Potential accident reduction / safety benefits	Y	N	Y	N	Y	Y
Roadway length (centerline lane mile)	4.8 to 9.5	5.1 to 9.4	5.1 to 12.9	5.2 to 14.0	5.6 to 9.0	6.0 to 14.8
No. of existing bridges crossed	7	3	5	4	3	5
No. of new bridges/culverts required	0	0	0	3	0	0
No. of at-grade railroad intersections	2	1	1	0	1	0
No. of at-grade non-signalized intersections	78	34	37	35	35	52
No. of at-grade signalized intersections	17	6	7	4	7	9
Average Estimated Truck driving time (min:sec)	10:09 to 18:14	10:20 to 17:28	11:02 to 21:24	8:02 to 18:59	10:31 to 17:23	10:06 to 23:46
Avg. Percentage Truck Traffic Reduction Along Route	0.0%	0.9%	0.9%	0.9%	0.8%	0.9%
Opinion of Project Cost (2021) (Millions)	$2.2	$7.0	$7.9	$25.8	$3.1	$1.4
Opinion of Project Cost (Escalated to 2026) (Millions)	$2.5	$8.0	$8.9	$29.2	$3.5	$1.5
Social & Economic Consequences						
Positive impact on residences / businesses	N	Y	Y	Y	Y	Y
Improved travel patterns and accessibility	N	Y	Y	Y	Y	Y
Potential Relocation effects	Y	N	N	N	N	N
No. of properties crossed	4	10	9	8	2	0
No. of property owners	4	6	6	6	2	0
No. of commercial properties crossed[1]	2	8	7	0	1	0
No. of residential properties crossed[1]	2	0	0	0	0	0
No. of commercial business relocations[1]	2	0	0	0	0	0
No. of residential home relocations[1]	0	0	0	0	0	0
Estimated total right-of-way acquisition cost	TBD	TBD	TBD	TBD	TBD	TBD
Environmental Consequences						
Potential Groundwater Quality Impacts	N	Y	Y	Y	N	Y
Potential Effects to Threatened or Endangered Species	N	Y	Y	Y	Y	Y
Potential Effects to Wildlife	N	Y	Y	Y	Y	Y
Potential Effects to Historical and Cultural Resources	N	Y	Y	N	N	N

Table 5-1
Comparison of Preferred Alternate Truck Route Options

Comparison Criteria	Preferred Alternate Truck Route Options					
	NBI	1A	1B	3	6	12
Potential Visual Effects	N	N	N	Y	Y	N
Potential Air Quality Effects	N	Y	Y	Y	Y	Y
Potential Noise Impacts	N	N	N	Y	Y	N
Potential Energy Impacts	N	Y	Y	Y	Y	Y
Potential State wetland impact	N	Y	Y	Y	Y	Y
Potential Federal wetland impact	N	Y	Y	N	Y	N
Potential Class A stream impact	N	N	N	N	N	N
Potential Class B stream impact	N	N	N	N	N	N
Potential Class C stream impact	N	Y	Y	N	Y	Y
Potential Class D stream impact	N	N	N	N	N	N
Potential Trout stream impact	N	N	Y	Y	N	N
Potential Flood zone impacts	N	Y	Y	Y	Y	Y
Potential Agricultural District No. 3 impact	N	Y	Y	Y	N	Y
Potential Agricultural District No. 7 impact	N	Y	N	N	Y	N
Potential Prime farmland soils impacted	N	N	N	Y	N	N

Options X and **X** are feasible options which meet or partially meet the project objectives and should be carried further for more detailed studies in the future design phases of the project.

5.2 Feasible Option

The feasible options selected from the five (5) potential alternate truck route options are:

1. Xxxxx
2. Xxxxx

The feasible options selected will need to be analyzed further during the future preliminary design phases to determine a selected option to be designed and implemented in the future design phases.