VILLAGE OF SOUTH GLENS FALLS

Route 9 Corridor
Adaptive Signal Control Technologies

FEASIBILITY STUDY

Final

Issue Date: 07/08/2026

Prepared by:

akrf

Barton&Loguidice

Project Sponsor:

A/GFTC

Adirondack/Glens Falls Transportation Council

Table of Contents

A. EXECUTIVE SUMMARY

The Route 9 corridor in South Glens Falls, NY serves as the primary business district for the Village, providing access to the local school campuses as well as commuter and visitor traffic to/from Interstate-87. The corridor experiences traffic congestion throughout the day due to the multimodal demands including midblock pedestrian crossings and high vehicle volumes. The Village and Adirondack/Glens Falls Transportation Council (A/GFTC) have been evaluating and upgrading signal and pedestrian infrastructure along the corridor and now seek to evaluate further solutions to congestion management specifically Adaptive Signal Control Technology (ASCT) compared to traditional signal timing strategies. As most signals along the corridor are under New York State Department of Transportation (NYSDOT) jurisdiction, close coordination for construction and ongoing operations and maintenance will be required for ASCT operations.

The corridor contains four signalized intersections and two flashing signal intersections. All signals are under NYSDOT jurisdiction except the intersection of Route 9 and Mohican Street/Oakland Avenue, which is operated by the City of Glens Falls. Although several signals have been upgraded, the lack of corridor-wide coordination reduces traffic progression efficiency and contributes to peak-period congestion, most notably during the weekday PM peak hour. The corridor experiences consistent pedestrian activity due to surrounding walkable land uses. No designated bicycle facilities are provided, though shared roadway signage is present.

Although sidewalks are generally present and largely ADA-compliant, gaps in pedestrian connectivity, inconsistent crossing treatments, and the absence of dedicated bicycle facilities limit safe and efficient multimodal travel. Safety analysis identified 112 reportable crashes between 2022 and 2024, including two fatalities and multiple pedestrian and bicycle crashes, with the Glen Street/Main Street/Mohican Street intersection meeting the criteria for a high-crash location. To address these issues, the study recommends a variety of Complete Streets improvements. Proposed pedestrian enhancements include closing sidewalk gaps, installing high-visibility crosswalks, deploying Rectangular Rapid Flashing Beacons (RRFBs), and implementing targeted curb extensions to improve sight distance and reduce crossing lengths. Bicycle accommodations were evaluated, with on-street bike lanes on Main Street identified as feasible but requiring trade-offs such as removal of on-street parking, while other bicycle facility options were determined to be impractical due to traffic volumes and right-of-way constraints.

Existing traffic operational analysis of the weekday PM peak hour indicates that the corridor experiences congested conditions, with average travel speeds of approximately 19 miles per hour, frequent vehicle stopping, and more than 60 vehicle-hours of delay systemwide. Southbound travel is particularly affected, exhibiting longer travel times and less reliable operations than the northbound direction. Two traffic signal improvement alternatives were evaluated using microsimulation modeling: a fully actuated coordinated signal system along Main Street and a software-based Adaptive Signal Control Technology (ASCT) system. Both alternatives provide measurable operational improvements over existing conditions, including reduced delay, fewer stops, and shorter travel times, particularly in the southbound direction. The coordinated signal system offers substantial benefits at a relatively low cost, while ASCT delivers the greatest overall performance improvements by dynamically adjusting signal timing in response to real-time traffic conditions.

Coordinated signal optimization produces the highest benefit–cost ratio, making it the recommended option.

A benefit–cost analysis conducted in accordance with U.S. Department of Transportation guidance demonstrates that both signal improvement alternatives yield strong returns on investment. Although safety and emissions benefits were conservatively excluded from the quantitative analysis, both alternatives are expected to further enhance safety and reduce fuel consumption. While ASCT generates the greatest total mobility benefits over the project lifecycle, implementation would be more costly and complex. Signal optimization through coordination produces the highest benefit–cost ratio, reflecting its cost effectiveness and ease of implementation; as such, the coordinated signal alternative is the recommended option. Overall, the Route 9 Corridor Study establishes a clear, data-driven case for advancing coordinated signal optimization and multimodal improvements, positioning the corridor for implementation funding and near-term delivery of meaningful mobility and safety benefits.

B. INTRODUCTION

The Adirondack/Glens Falls Transportation Council (A/GFTC) on behalf of the Village of South Glens Falls conducted the Route 9 Corridor Study to investigate opportunities to improve traffic congestion, safety and multimodal access. The Route 9 corridor includes a portion of Glens Street in the City of Glens Falls as well as Main Street and Saratoga Avenue within the Village of South Glens Falls (see **Figure 1**). A/GFTC in coordination with the Village of South Glens Falls and the New York State Department of Transportation (NYSDOT) developed a plan for future multimodal corridor improvements best suited for the Route 9 corridor including project phasing, concept-level designs and cost estimates. In addition, the study is intended to position the involved agencies to apply for implementation funding.

C. BACKGROUND

The Route 9 corridor between Mohican Street/ Oakland Avenue and Feeder Dam Road/ William Street is classified as an Urban Principal Arterial with an average of approximately 17,500 to 18,500 Vehicles per Day (vpd), based on 2022 NYSDOT data. Route 9 within the area of study is divided into two segments: Main Street to the north, approximately 3,100 feet in length and Saratoga Avenue to the south, approximately 5,600 feet long. These two segments intersect at 5th Street. Land use along the corridor includes a mix of commercial properties, civic institutions, and residential areas including driveways along the corridor as well as local intersecting streets for neighborhood access.

Route 9 in the study area includes four signalized intersections, and two intersections with flashing signals. All signals are under the jurisdiction of NYSDOT except for the intersection of Route 9 and Mohican Street/ Oakland Avenue which is owned and operated by the City of Glens Falls. Although many of the signals have been recently upgraded, the signals do not operate as one cohesive system which contributes to the high levels of congestion observed, particularly in the weekday PM peak hour. Smooth traffic flow along Route 9 is further limited by the presence of five midblock crossings, parking along the east side of the roadway and a two-way left-turn lane with frequent driveways.

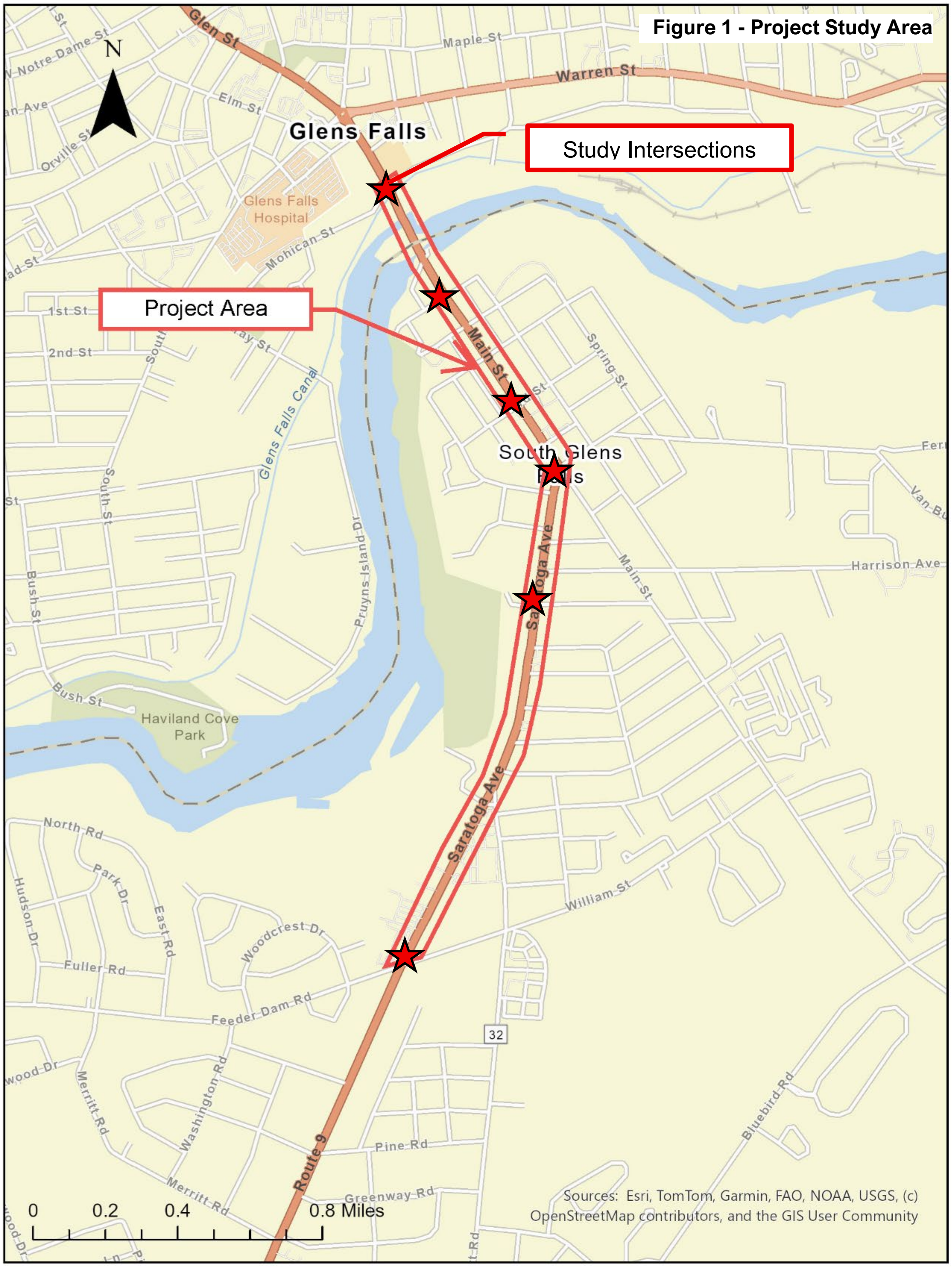
Due to the walkability of the surrounding land uses, the existing pedestrian infrastructure including the midblock crossings experience regular pedestrian demand. However, although pedestrian demand exists, there are insufficient pedestrian crosswalks in areas of the corridor such as south of the intersection of Main Street and 5th Street. In addition, there are no designated bicycle facilities along Route 9, although shared roadway signs are present.

As this roadway corridor is owned and maintained by NYSDOT, a Highway Work Permit (HWP) from NYSDOT is required for any work considered on the roadway, and within the ROW, of Route 9. Additionally, the proposed work will need to meet the current published NYSDOT design standards and directives at the time of application for the permit. This includes all signals, sidewalks, shoulders, pavement striping, signage, lane widths, and RRFB’s.

D. EXISTING CONDITIONS

STUDY AREA

This corridor assessment focused on Route 9 between Mohican Street/Oakland Avenue and Feeder Dam Road/William Street. The following critical intersections were identified in coordination with A/GFTC as the primary intersections for evaluation:



- Route 9 / Glen Street and Mohican Street / Oakland Avenue
- Main Street and River Street
- Main Street and 3rd Street
- Main Street and 5th Street / Saratoga Avenue
- Saratoga Avenue and Marion Avenue / West Marion Avenue
- Saratoga Avenue and William Street / Feeder Dam Road

ROADWAY CHARACTERISTICS

The following is a brief description of the major roadways within the study area.

The Route 9 corridor has a typical cross-section from River Street to Saratoga Avenue that includes two 14-foot-wide travel lanes, an 11-foot-wide center two-way left-turn lane which transitions to a dedicated left-turn lane at signalized intersections, and a 9-foot-wide parking lane on the east side. No shoulders are present along Main Street aside from the parking lane. Sidewalks are present on both sides of the corridor, with an approximate 3-foot buffer area between the edge of the roadway and the sidewalk. There are no designated bicycle facilities along Main Street, although shared roadway signs are present. The posted speed limit is 30 miles per hour (mph) and the recorded 85th percentile speed for this segment is approximately 31 mph.

On the Saratoga Avenue segment, the typical cross-section includes three 12-foot-wide lanes, two travel lanes and a center two-way left-turn lane, with 3-foot shoulders on each side. Sidewalks are present directly adjacent to the edge of roadway on both sides of the roadway until Beach Road where the west sidewalk discontinues. There are no designated bicycle facilities along Saratoga Avenue, although shared roadway signs are present in the southbound direction. The posted speed limit between Route 32 and Main Street is 30 mph and the 85th percentile speed along this segment was recorded at approximately 38 mph.

EXISTING INFRASTRUCTURE EVALUATION

On June 10, 2025 a field visit was conducted to inventory the signal equipment at each study intersection. The inventory included identifying the controller hardware, software, and controller programming at each signal as well as the presence of vehicle detection, the type of signal installation (span wire or mast arm) and general condition of the signal equipment. The inventory sheets are provided in Appendix A.

An additional field inventory of the Route 9 corridor using ArcGIS Survey123 to document baseline pedestrian conditions was conducted on July 7, 2025. Data collection included pavement characteristics, sidewalk presence and accessibility, roadside obstructions, signage, and pedestrian crossings. GPS coordinates and photographs were recorded to support field observations.

Sidewalks are generally present along both sides of the corridor. Along Saratoga Avenue, sidewalks extend continuously along the east side for approximately 5,300 feet, while the west side includes approximately 3,670 feet of sidewalk, with a gap between Feeder Dam Road and Beach Road. On Main Street, sidewalks are provided along both sides for approximately 2,400 feet north of the Main Street intersection to the Glen Street Bridge. All sidewalk segments were evaluated for ADA compliance and overall, sidewalks were determined to be mostly compliant with ADA accessibility criteria.

Pedestrian crossing facilities were also inventoried. Five midblock crossings were identified, along with 15 marked crosswalks at signalized intersections, five crosswalks at flashing signal intersections, and 14 additional crossings at sidewalk connection points, for a total of 34 crossings. All crossings were equipped with ADA-compliant curb ramps and pavement markings. Signage and pedestrian amenities varied by location, with some crossings lacking dedicated pedestrian signing or enhancements.

TRAFFIC DATA COLLECTION

Existing vehicular turning movement and pedestrian counts were collected on Wednesday, May 14, 2025, when schools were in session, during the weekday PM (4:00 PM to 6:00 PM) peak period. Automatic Traffic Recorder (ATR) counts were collected on each approach of the intersection of Saratoga Avenue and Marion Avenue/West Marion Avenue for the same day, to collect traffic data necessary to conduct volume-based warrants in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) for evaluating potential improvements. The results of the signal warrant analysis are provided in Appendix B.

Based on a review of the traffic count data, the vehicular traffic peak hour for the weekday PM period was determined to be 4:15 PM to 5:15 PM.

EXISTING TRAFFIC OPERATIONS

Utilizing the Synchro/SimTraffic software, a microsimulation model for the weekday PM peak hour was developed. As SimTraffic is a stochastic model where multiple simulation runs will generate different driver behaviors (i.e. acceptable available gaps for turns, changing lanes, etc.) and system results, an average of 10 runs was used to achieve confidence in the simulation results and to obtain the following measures of effectiveness (MOEs):

- ***Percent Demand Served*** – is a measure of the total throughput of the system. This measure takes into consideration the actual volume served versus the demand. When the system is over capacity, this measure provides a better understanding of overall traffic operations than delay or level of service.
- ***Average Travel Speed*** – is a measure of the overall travel speed through the system. The average travel speed calculation considers the average delay throughout the system and vehicle queues.
- ***Number of Stops*** – the total number of stops for vehicles during the peak hour of analysis on the full study area.
- ***Vehicle Hours of Delay*** – is the amount of delay incurred during the peak hour as a result of congestion.
- ***Travel Time*** – is the time needed to traverse study area segment.
- ***Buffer Time Index*** – The buffer index represents extra time that travelers must add to the average travel time when planning trips to ensure on-time arrival.

RESULTS

Systemwide performance measures indicate that the corridor operates under congested conditions during the weekday PM peak period. The network serves 100 percent of modeled demand, with an average travel speed of approximately 19 mph. Operations are characterized by frequent stopping and delay, with approximately 4,600 stops and 61 vehicle-hours of delay recorded across the system. Travel times along the Main Street/Saratoga Avenue corridor are longer in the southbound direction compared to the northbound direction. As seen from the higher Buffer Time Index, the southbound direction experiences more variability and less predictable operations during the PM peak period. These results are presented in **Table 1**.

Table 1
Systemwide Measures of Effectiveness (MOE)

Measure of Effectiveness	Weekday PM Peak
Percent Demand Served	100.0%
Average Travel Speed	19 mph
Number of Stops	4,598
Vehicles Hours of Delay	61 hrs
Trave Time (mm:ss)	
Main Street/Saratoga Avenue Northbound	4:00
Main Street/Saratoga Avenue Southbound	5:47
Buffer Time Index (%)	
Main Street/Saratoga Avenue Northbound	3.8%
Main Street/Saratoga Avenue Southbound	12.1%
Notes: Based on 10 simulation runs	

EXISTING CRASH HISTORY AND SAFETY ASSESSMENT

Crash data for the study area was obtained from NYSDOT for the three-year period between January 1, 2022, and December 31, 2024. The data obtained quantifies the total number of reportable crashes (involving fatality, injury, or more than $1,000 in property damage), fatalities, and injuries during the study period, as well as a yearly breakdown of vehicular crashes with pedestrians and bicycles at each location.

During this period, there were a total of 112 reportable crashes with 2 fatalities, 17 injuries, four crashes involving pedestrians, and one involving a bicyclist.

Table 2 depicts total crashes by intersection during the study period, as well as a breakdown of pedestrian and bicycle crashes by year and location.

Table 2
Crash Summary

Intersection		Vehicular Crashes					Pedestrian and Bicycle Crashes					
North-South Roadway	East-West Roadway	All Crashes by Year			Total Fatalities	Total Injuries	Pedestrian Crashes			Bicycle Crashes		
		2022	2023	2024			2022	2023	2024	2022	2023	2024
Glen Street/Main Street	Mohican Street/Oakland Avenue	24	9	15	1	1	0	0	0	0	0	0
Main Street	River Street	8	6	6	0	8	1	1	0	0	0	1
Main Street	3rd Street	2	4	2	0	2	0	0	0	0	0	0
Main Street	Saratoga Avenue/5th Street	9	7	8	1	5	1	0	0	0	0	0
Saratoga Avenue	Marion Avenue	0	3	1	0	1	0	0	0	0	0	0
Saratoga Avenue	Feeder Dam Road/William Street	3	4	1	0	8	1	0	0	0	0	0

Source: Crash data from NYSDOT for January 2022 through December 2024
Note: Bold intersections are high crash locations, defined as intersection having ten or more crashes in a 12-month period.

High crash locations are generally defined as intersections experiencing more than ten crashes within a consecutive 12-month period. Based on NYSDOT crash data, the intersections of Glen Street/Main Street and Mohican Street/Oakland Avenue meet this threshold and are therefore considered high crash locations. One fatal crash occurred at this intersection within the past three years when a northbound vehicle traveling across the Glen Street Bridge at an unsafe speed disregarded the traffic signal and struck an eastbound vehicle on Mohican Street, resulting in a right-angle collision. Five additional right-angle crashes were also reported at this location during the same period, indicating a recurring conflict pattern.

At Main Street and River Street, one bicycle-related crash and two pedestrian crashes were recorded. The bicycle crash involved a vehicle making a right turn on red and striking a bicyclist traveling from the sidewalk against the flow of traffic. Brake failure was noted as a possible contributing factor. The pedestrian crashes involved turning vehicles striking pedestrians within the intersection, with nighttime and unlit conditions noted as potential contributing factors in at least one instance.

Two additional pedestrian crashes were documented along the corridor. At Saratoga Avenue/5th Street and Main Street, a northbound vehicle struck a pedestrian crossing Main Street, resulting in serious injury and then death. Lighting and winter conditions were noted as possible factors. Another pedestrian crash occurred at Saratoga Avenue and Feeder Dam Road/Williams Street when a northbound vehicle struck a pedestrian crossing Saratoga Avenue.

Across the study area, rear-end (48) collisions are found to be the predominant crash type, followed by overtaking (17), right-angle (11), and left-turn crashes (8). Rear-end crashes are primarily associated with distracted driving and following too closely. Right-angle crashes are generally linked to failure-to-yield or signal violations, while left-turn crashes are commonly associated with improper turning maneuvers and may be influenced by factors such as sight distance, signal timing, and gap acceptance. Sideswipe and overtaking crashes are consistent with congested traffic conditions, lane changes, and driver inattention

E. PEDESTRIAN AND BICYCLE IMPROVEMENTS

Improvement opportunities in the study area along Route 9 were evaluated in collaboration with A/GFTC and the Village. The following recommended alternatives emphasize providing a complete ADA-compliant sidewalk networks, improving pedestrian crossings through high-visibility markings and Retroreflective Flashing Beacons (RRFBs), implementing curb extensions, and introducing bicycle facilities where feasible. Recommended improvement options are as follows:

- **Sidewalk Connections** – The recommended improvement is the installation of an ADA-compliant 5-foot-wide sidewalk with a 3-foot-wide buffer to enhance pedestrian safety and accommodate snow storage, along the west side of Saratoga Avenue between Feeder Dam Road and Beach Road. Based on the available ROW mapping from GIS, the design of the proposed sidewalk and buffer space would be accommodated within the existing roadway dimensions and curbline by repurposing the driveway islands to sidewalks. Temporary easements may be required for grading and driveway restoration. Utility poles are not expected to constrain the design due to adequate offsets for ADA compliance. Minor relocations or removals of features such as mailboxes, signage, and trees would likely be necessary.

- **High Visibility Crosswalks** - New pedestrian crosswalks should be considered at three locations along Saratoga Avenue: Wilson Avenue (to improve access to adjacent commercial uses), across from the Common Roots Bierhall & Barrel House, and the Saratoga Avenue/Hannaford Driveway intersection. These locations present opportunities to strengthen pedestrian connectivity and provide more clearly defined crossing points along the corridor.

  At existing signalized intersections, pedestrian facilities are generally ADA-compliant and in good condition. At the intersection of Main Street/River Street, pedestrian signals, crosswalks, and curbs are ADA-compliant and crosswalk marking should be replaced. At the intersection of Saratoga Avenue/NYS Route 32, crosswalk markings should be replaced. At Main Street/5th Avenue/Saratoga Avenue, the intersection operates with ADA-compliant and well-maintained pedestrian infrastructure.

  Upgrading and installing crosswalk markings in addition to “Pedestrian Ahead” signs, would enhance driver awareness of pedestrian activity and reinforce designated crossing locations. High-visibility ladder-style pavement markings using durable materials such as epoxy paint or thermoplastic with glass beads are recommended. As an alternative, imprinted asphalt thermoplastic treatments may be considered to provide a more visually prominent crossing surface, if approved for use on the State Highway System.

- **Install Rectangular Rapid Flashing Beacons (RRFBs)** - Installation of RRFBs should be considered at proposed and existing crosswalks along Saratoga Avenue and at the existing midblock crossing on Main Street to enhance pedestrian visibility and driver yielding. RRFBs are well suited for multilane roadways with moderate-to-high traffic volumes and speeds under 40 mph, consistent with Saratoga Avenue conditions. The corridor’s traffic volumes and observed speeds present challenges for pedestrian crossings; RRFBs can improve conspicuity by providing an additional visual queue for drivers.

- **Bump-outs/Curb Extensions** - Curb extensions should be considered to improve pedestrian safety by reducing crossing distances, enhancing visibility, and calming traffic. For this project, a bump-out is recommended at the existing midblock crossing on the east side of Main Street within the parking lane to address sight distance limitations caused by parked vehicles. If a bump-out is not implemented, restricting parking within 20 feet of the crosswalk is recommended to maintain adequate visibility. Bump-outs are not recommended on the west side of Main Street or along Saratoga Avenue due to the absence of parking lanes and limited shoulder width.

The following alternatives for improvements to bicycle facilities in the existing study area were considered:

- **Bike Lane** - A potential bicycle accommodation along Main Street would consist of a 4.5-foot bike lane on each side of the roadway. Implementation would require repurposing the existing east-side parking lane and shifting roadway striping to create the necessary width, resulting in the removal of on-street parking and shoulders along this segment. No crown modification is anticipated based on existing roadway geometry.

  Bike lanes are not recommended along Saratoga Avenue due to physical constraints, including narrow shoulders and the need to maintain minimum lane widths to accommodate traffic volumes and truck activity.

- **Shared Roadway** - A shared roadway typically maintains the existing roadway configuration while designating travel lanes for use by both motorists and cyclists through signage and pavement markings. Based on guidance from FHWA, this treatment is appropriate on streets with speeds 25mph or lower and traffic volumes of 3000 vehicles per day or less. Due to the high traffic volumes on both Main Street and Saratoga Avenue, this alternative is not recommended.

- **Side Path -** A shared use path provides a separate facility for pedestrians and cyclists, typically requiring an 8 to 12-foot-wide path and minimum separation of 5 feet from the roadway. While this alternative offers a low-stress environment for nonmotorized users, it is not recommended for this corridor as its implementation would require relocation of utility poles, numerous conflict points at driveways and side street crossings, and right-of-way acquisition.

The recommended complete streets alternatives are presented in Appendix B.

F. SIGNAL COMPARISON

COORDINATED SIGNAL SYSTEM TRAFFIC OPERATIONS

Using the calibrated existing conditions Synchro/SimTraffic model, a fully actuated coordinated signal system was developed to evaluate opportunities for improving traffic progression along Main Street without reliance on advanced or adaptive signal technologies. This coordination strategy assumes vehicle detection on all approaches, a common cycle length among coordinated intersections, and synchronization through GPS clock or wireless communication.

Infrastructure upgrades are needed at the intersection of Main Street and Mohican Street/Oakland Street to support coordinated operations, including enhanced vehicle detection, controller, cabinet, and wireless communication. The remaining Main Street intersections, under NYSDOT jurisdiction, were recently upgraded to have the necessary detection and communication systems to be capable of coordinated operations.

Coordination along Saratoga Avenue was evaluated but determined to be impractical due to the spacing between key intersections. Specifically, the distance between Saratoga Avenue at Feeder Dam Road/William Street and Main Street at Saratoga Avenue/5th Street limits the effectiveness of progression-based timing and could introduce unnecessary delays on side streets if operated with a fixed cycle length as compared to current free operations. As such, the Feeder Dam Road/William Street intersection was modeled under free operation, while the remaining signals were coordinated.

Weekday PM peak timing plans were developed, including optimized cycle lengths, offsets, and phase splits to improve corridor progression and reduce delay. Simulation results indicate corridor travel time reductions of approximately 14 percent northbound and 28 percent southbound, with an overall reduction in vehicle-hours of delay of approximately 10 percent and improved travel time reliability. These results are presented in **Table 3**.

Table 3
Coordinated Signal System Alternative
Systemwide Measures of Effectiveness (MOEs)

Measure of Effectiveness	Weekday PM Peak
Percent Demand Served	100%
Average Travel Speed	10 mph
Number of Stops	4,445
Vehicles Hours of Delay	55.4 hrs
Trave Time (mm:ss)	
Northbound	
Main Street (From 5th Street to Oakland Avenue)	2:37
Saratoga Avenue (From Feeder Dam Road to 5th Street)	2:37
Southbound	
Main Street (From Oakland Avenue to 5th Street)	3:19
Saratoga Avenue (South of Main Street to Feeder Dam Road)	1:36
Buffer Time Index (%) for Total Travel Time	
Main Street/Saratoga Avenue Northbound	3.8%
Main Street/Saratoga Avenue Southbound	5.0%
Notes: Based on 10 simulation runs	

ADAPTIVE SIGNAL CONTROL TECHNOLOGY

To assess whether ASCT could provide additional operational benefits along Main Street and at the intersection of Saratoga Avenue and Feeder Dam Road/Williams Street, the SynchroGreen Software-in-the-Loop Simulation Tool was applied in conjunction with the Synchro/SimTraffic model. SynchroGreen was selected for evaluation due to its compatibility with NYSDOT's existing ATMS.now central management platform. Evaluation of SynchroGreen does not preclude consideration of alternative ASCT capable of delivering comparable optimization benefits.

SynchroGreen is a software-based, real-time adaptive signal control system designed to dynamically optimize cycle lengths, phase splits, and offsets based on existing traffic conditions. The system's optimization algorithms seek to minimize total network delay while maintaining reasonable mainline progression. Detection data are used to estimate green time phase demand and the degree of saturation. These are then evaluated globally for all phases at all intersections to determine optimal signal timing parameters that are applied in the field. Offsets are optimized based on user-defined travel paths and known travel times.

SynchroGreen allows the user to customize the algorithm to accommodate a variety of scenarios and test different scenarios prior to deployment. The adaptive system allows the user to select the Balanced, Progression, or Critical Movement mode to minimize overall network delay, promote mainline bandwidth, or favor critical movements.

Implementation of an ASCT was determined to be generally consistent with the infrastructure requirements identified for the fully actuated coordinated signal system. No substantial additional roadside hardware is anticipated beyond vehicle detection and wireless communications. Communications infrastructure, including wireless connectivity, is necessary to enable controller-to-server data exchange and maintain systemwide synchronization. Existing NYSDOT-operated intersections are equipped with 360-degree video detection systems suitable for adaptive operation. Supplemental detection improvements at Main Street and Mohican Street/Oakland Street would be required, consistent with upgrades necessary for coordinated control. Controller hardware requirements include 2070E or ATC controllers operating Naztec firmware. The older controller at the intersection of Main Street/Mohican Street would require replacement.

Controller and cabinet hardware compatibility is a critical consideration for ASCT deployment. SynchroGreen requires the use of 2070E or ATC controllers operating Naztec firmware (v76 or higher) to support adaptive timing logic and central system integration. Older models of traffic controllers including 170/179s present at the intersection of Main Street and Mohican Street/Oakland Street, lack the processing capability and software support required for adaptive control and would require replacement. Other study intersections are already equipped with Naztec-compatible hardware.

Software-based ASCT deployment also requires software licenses and a central system license to enable adaptive optimization engines, data management, and system monitoring functions. The central license may be hosted on a physical server or cloud-based environment. As NYSDOT currently operates several SynchroGreen systems, maintains a physical server, and has central licensing, many foundational components necessary for system implementation are already established.

ASCT OPERATIONS

A Software-in-the-Loop simulation utilizing actual signal controller databases was developed to evaluate adaptive traffic operations. To ensure statistical reliability, the analysis incorporated an average of ten simulation runs using different random seeds. This approach is particularly important for adaptive systems, which dynamically adjust signal timings in response to real-time traffic conditions and may vary by cycle.

The five intersections were separated into two SynchroGreen systems, one along Main Street from Mohican Street/ Oakland Street to 5th Street/ Saratoga Avenue comprising of four signalized intersections, and a separate system for the intersection of Saratoga Avenue at Feeder Dam/William Street. This allows for the intersection of Saratoga Avenue and Feeder Dam/ William Street to run a cycle length independent of Main Street given their distance from one another and will help to minimize unnecessary delays to side street traffic.

Tables 4 summarizes the travel times and systemwide MOEs with adaptive traffic operations. Two ASCT scenarios are presented:

1. All five study area intersections operating ASCT as described above
2. With the four Main Street signals operating as an ASCT and the intersection of Saratoga Avenue and Feeder Dam/ Willams Street operating with existing free operations

The primary difference between the two ASCT scenarios is the systemwide vehicle hours of delay which are notably reduced (from 57.2 hours to 46.4 hours) with the intersection of Saratoga Avenue and Feeder Dam/Williams Street operating with free operations. Number of stops also decreased from 4,102 to 4,052 stops. Based on the results, the ASCT along Main Street only is recommended and further comparison between coordinated and ASCT systems was based on this configuration.

Table 4
Adaptive Signal Control Technology Alternatives
Systemwide Measures of Effectiveness (MOEs)

Measure of Effectiveness	Weekday PM Peak	
	All Intersections with ASCT	Main Street Only ASCT
Percent Demand Served	100%	100%
Average Travel Speed	21 mph	21 mph
Number of Stops	4,102	4,052
Vehicles Hours of Delay	57.2 hrs	46.4 hrs
Trave Time (mm:ss)		
Northbound		
Main Street (From 5th Street to Oakland Avenue)	2:43	2:40
Saratoga Avenue (From Feeder Dam Road to 5th Street)	2:27	2:30
Southbound		
Main Street (From Oakland Avenue to 5th Street)	2:54	2:47
Saratoga Avenue (South of Main Street to Feeder Dam Road)	1:34	1:36
Buffer Time Index (%) for Total Travel Time		
Main Street/Saratoga Avenue Northbound	1.3%	3.3%
Main Street/Saratoga Avenue Southbound	3.3%	6.2%
Notes: Based on 10 simulation runs		

COORDINATED AND ASCT MEASURES OF EFFECTIVENESS COMPARISON

Based on the comparisons shown in **Tables 5** and **6**, both the coordinated signal system and the ASCT provide measurable operational benefits relative to the existing conditions, including reductions in delay, stops, and corridor travel times. The ASCT alternative provides further reduction in vehicle hours of delay due to its ability to reduce overall cycle lengths, thereby minimizing unnecessary delays to side street traffic. The ASCT scenario also produces the most favorable performance along the critical southbound Main Street movement during the weekday PM peak hour.

Table 5
Systemwide Measures of Effectiveness (MOEs) Alternatives Comparison

Measures of Effectiveness	Existing	Main Street Coordinated System	Percent Change[1] (%)	Main Street ASCT	Percent Change[2] (%)
Weekday PM Peak Hour					
Percent Demand Served	100.0%	100.0%	N/A	100%	N/A
Average Travel Speed	19 mph	20 mph	+4.0%	21 mph	+5.9%
Number of Stops	4,573	4,445	-2.8%	4,102	-7.7%
Vehicle Hours of Delay	61.7 hrs	55.4 hrs	-10.2%	46.4 hrs	-16.2%

Notes:
(1) Percent Change compares the existing condition to the coordinated signal system condition
(2) Percent Change compares the coordinated signal system condition to the ASCT condition.

Table 6
Alternatives Travel Time Comparison

Arterial	Travel Time (mins)				
	Existing (mm:ss)	Main Street Coordinated System (mm:ss)	Percent Change[1] (%)	Main Street ASCT (mm:ss)	Percent Change[2] (%)
Weekday PM Peak Hour					
Northbound					
Main Street (From 5th Street to Oakland Avenue)	3:08	2:37	-16.1%	2:40	+1.4%
Saratoga Avenue (From Feeder Dam Road to 5th Street)	2:58	2:37	-11.9%	2:30	-4.2%
Southbound					
Main Street (From Oakland Avenue to 5th Street)	5:03	3:19	-34.4%	2:47	-16.0%
Saratoga Avenue (South of Main Street to Feeder Dam Road)	1:45	1:36	-9.1%	1:36	0%

Notes:
(1) Percent Change compares the existing condition to the coordinated signal system condition
(2) Percent Change compares the coordinated signal system condition to the ASCT condition.

G. ESTIMATED COSTS

Both Capital and Operation and Maintenance Costs are heavily dependent on the agencies that will operate and maintain the system and their current infrastructure and staffing. As four of the five signals located in the study area are currently owned and operated by NYSDOT, the following estimated costs assume all five intersections will be operated and maintained by NYSDOT.

CAPITAL COSTS

To facilitate either the coordinated or ASCT signal system summarized above the existing signal equipment will require similar capital improvements. Equipment necessary to operate either signal system alternative is described below. This list should not be considered exhaustive as the compatibility of the existing devices can vary by ASCT system. Ongoing expenses including subscription models are accounted for under operational costs below.

- **Stop bar Detection** – Additional signal detection will be necessary for operations of both signal system alternatives. Coordinated signal systems best operate with full actuation, with detectors at the stop bar for each lane or phase. ASCT best operates with detectors for each lane at the stop bar and advanced detection where the nearest adjacent intersection is 1,000 feet or more. Available signal detection technology includes loops, video detection (either directional or 360 degree) and radar. It should be noted that NYSDOT is moving away from in ground detection including loops and has existing 360 degree video detection for their intersections along the corridor. The ASCT can work with any of these detection solutions; however, camera technology is the preferred option and is represented in the costs presented in **Table 7** below.
- **Communications** – The existing conditions inventory identified cellular modems at the NYSDOT operated traffic signals. As this type of communication is in place and most cost effective for expansion, a cellular modem was assumed to be the primary communication infrastructure for capital and ongoing cost comparisons. As the wireless modem can maintain time sync between the adjacent intersections, supplemental technology such as GPS clocks are not necessary.
- **Traffic Signal Controllers** – Traffic signal controllers along the corridor range from an older 179 model to common 2070 models. Older model 179 controllers should be replaced to best operate a coordinated system with 2070 or newer controllers. To facilitate ASCT, 2070 or higher models are required. In particular, 2070 controllers must have a 1C module, which includes an ethernet port, to operate the ASCT. Presently, the 2070 controllers operated by NYSDOT along the corridor are 2070E and would not require additional equipment upgrades. To operate the ASCT NYSDOT currently employs all

controllers will require Naztec v76 software. However, as the State is in the process of migrating their existing central system and controller firmware, the firmware necessary to operate the desired ASCT solution should be determined at the time of installation. For the purposes of this study Naztec v76 software was assumed. In addition, it is recommended that the cabinet at the intersection of Route 9 / Glen Street and Mohican Street / Oakland Avenue be upgraded from a standard 330 cabinet to 330 stretch-type for additional space for necessary equipment.

- **Central Software** – The SynchroGreen ASCT requires installation in a central location such as the Cloud or a local server. NYSDOT currently hosts local servers through OITS to maintain existing ASCT systems. As such, it was assumed that while an additional central license may be required, the necessary local server was previously established by NYSDOT. SynchroGreen currently operates their ASCT as a one-time software purchase rather than part of a software-as-a-service model with a reoccurring fee. As such, the initial deployment fee is included in **Table 7** below and no ongoing subscription costs are assumed under Operational Costs in **Table 8**.
- **Local Intersection Software** - The SynchroGreen ASCT requires software licensing at each intersection to operate ASCT. SynchroGreen currently operates their ASCT intersection licenses as a one-time software purchase rather than part of a software-as-a-service model with a reoccurring fee. As such, the initial deployment fee is included in **Table 7** below and no ongoing subscription costs are assumed under Operational Costs in **Table 8**.

Table 7 summarizes the necessary signal equipment upgrades with order-of-magnitude cost estimates.

Table 7
Capital Cost Summary

Component	Price per Unit	Quantity	Total
Coordinated Signal System			
Traffic Signal Controller	$5,250	1	$5,250
Traffic Signal Cabinet	$12,000	1	$12,000
Communication Equipment	$4,430	1	$4,430
360 Degree Video Detection System	$23,140	1	$23,140
Install Optimized Traffic Signal Programming and Rewiring	$2,000	4	$8,000
		EQUIPMENT SUBTOTAL	**$52,820**
% WZTC based on project complexity		10%	$5,280
% for Incidentals, Inflation and Contingencies		20%	$10,564
% for Mobilization		5%	$2,641
		TOTAL ESTIMATED CONSTRUCTION COST	**$71,307**
% for Survey		10%	$7,130.70
$10,000 + 10% for Design (adjust for project complexity)		10%	$17,130.70
% for Construction Inspection (adjust for project complexity)		15%	$10,696.05
		TOTAL ESTIMATED PROJECT COST	**$106,264.45**
Adaptive Signal Control Technology			
Traffic Signal Controller	$5,250	1	$5,250
Traffic Signal Cabinet	$12,000	1	$12,000
Communication Equipment	$4,430	1	$4,430
360 Degree Video Detection System	$23,140	1	$23,140
Install Optimized Traffic Signal Programming and Rewiring	$2,000	4	$8,000
Software and One-Time Deployment Costs			
Central Software (Including installation, configuration and training)	$21,145	1	$21,145
Intersection Licensing	$26,185	4	$38,556
		EQUIPMENT SUBTOTAL	**$178,705**
% WZTC based on project complexity		10%	$17,870.50
% for Incidentals, Inflation and Contingencies		20%	$35,741
% for Mobilization		5%	$8,935.25
		TOTAL ESTIMATED CONSTRUCTION COST	**$241,251.75**
% for Survey		10%	$24,125.18
$10,000 + 10% for Design (adjust for project complexity)		10%	$34,125.18
% for Construction Inspection (adjust for project complexity)		15%	$36,187.76
		TOTAL ESTIMATED PROJECT COST	**$335,689.86**

OPERATIONAL COSTS

Coordinated and ASCT signal systems require effective operation and maintenance to maintain improved operations. Both the coordinated and ASCT systems require increased detection; this additional equipment can result in increased maintenance. Other equipment such as the upgraded controllers do not require additional maintenance; however, if the user is unfamiliar with the equipment, training may be necessary to continue to properly operate the equipment. As all of the NYSDOT operated intersection currently have the necessary detection, communication and controller infrastructure, additional equipment for maintenance is anticipated to be limited to the City of South Glens Falls if they continue to maintain the signal with a coordinated signal system.

There are two primary differences in operation and maintenance of a coordinated system compared to an ASCT. A coordinated system is based on time-of-day plans designed around current traffic conditions. These plans need to be updated on a regular basis every 3 to 5 years or whenever a notable change in traffic occurs along a corridor to maintain optimal operations. ASCT is actively adjusting to traffic over time so while the adaptive parameters may need to be adjusted, the effort would be less frequent and less intensive than a full-scale retiming. With these communications an ASCT is viewed as less maintenance intensive and more operational intensive, knowing when and how to adjust adaptive parameters.

It is noted that NYSDOT currently utilizes a local server for ASCT operations. As any future ASCT is anticipated to be hosted by NYSDOT, reoccurring fees for maintenance of the local server was not included as they are already present and being maintained.

Table 8
Operational Cost Summary

Component	Price per Unit	Term	Quantity	Total
Coordinated Signal System				
General O&M for signal coordination (5% of capital costs)	$5,313	10 years	1	$5,313
Reoccurring wireless communication fees	$180	Per year	10	$1,800
			Total Fee	**$7,113**
Coordinated Signal System				
General O&M for signal coordination (75% of coordination costs)	$3,985	10 years	1	$3,985
Reoccurring wireless communication fees	$180	Per year	10	$1,800
			Total Fee	**$5,785**
Note: General O&M Costs obtained from Virginia Transportation Research Council, Quantifying the Benefits of Coordinated Actuated Traffic Signal Systems: A Case Study, September 2010				

H. BENEFIT COST ANALYSIS

The BCA conducted for the Route 9 Corridor Study was prepared using the latest available guidance from U.S. DOT, which includes the following documents which are contained in Appendix C:

- U.S. DOT. “A Guide for Leveraging ITS Evaluation Tools for Benefit-Cost Analysis (BCA) and Return-on-Investment (ROI)”. July 2022.
- U.S. DOT. “Use Case: Adaptive Signal Control Benefit-Cost Analysis”. July 2022.
- U.S. DOT. “Benefit-Cost Analysis Guidance for Discretionary Grant Programs”. May 2025.

PROJECT ALTERNATIVES

The following signal system alternatives were evaluated in the BCA:

- Baseline (Existing/No Build Alternative): This alternative assumes the signal system is not upgraded. The baseline alternative is used to measure the incremental benefits and costs associated with the proposed signal system upgrades.
- Coordinated Signal System (Signal Optimization): This alternative assumes the existing signal system for intersections 1 through 4 above[1] will be upgraded to allow for operation of a fully actuated coordinated signal system.

[1] The intersection of Saratoga Avenue at Feeder Dam/William Street was maintained as free operations as coordination is not anticipated to improve vehicle progression along Saratoga Avenue due to the distance to the nearest signal.

- ASCT: This alternative assumes the existing signal system will be upgraded to a software-based adaptive system for intersections 1 through 4 above[2].

GENERAL ASSUMPTIONS

The BCA measures benefits and costs throughout a period of analysis beginning at the base year and ending after the expected useful service life of an upgraded signal system. Using U.S. DOT guidance, the following assumptions were made to avoid overestimating expected project benefits and underestimating expected project costs:

- All costs are expressed in 2023 dollars. This year, also known as the base year, represents the latest year where dollar values for costs and benefits are available.
- The BCA analysis period begins in 2023 and ends in 2037. It assumes that construction will take place from 2026 through 2027 and upgraded signal systems will be implemented in 2028. The estimated service life (lifecycle) for either a coordinated signal system or an ASCT system is assumed to be 10 years.
- A real discount rate of 7 percent per year is assumed in the analysis to convert expected future revenue streams of benefits and costs to the same present value (2023 dollars) and remove the effects of inflation over time.
- Recommended Complete Streets improvement options detailed within the *SGF Route 9 Corridor Study Recommended Options Technical Memorandum* dated September 19, 2025, were conservatively omitted from the BCA. Qualitatively, it's expected that Complete Streets improvement measures would yield additional benefits to bicyclists and pedestrians along the corridor.
- Safety and emissions improvements associated with the proposed signal system upgrades were conservatively omitted from the BCA. Qualitatively, it's expected that both the signal optimization and ASCT alternatives would yield additional benefits to safety (reduced crashes) and emissions (reduced fuel consumption).

ESTIMATION OF SIGNAL SYSTEM UPGRADE BENEFITS

It is expected that the proposed signal system upgrades will enhance mobility in the study area. This section provides a summary of monetized benefits, along with key findings. Refer to Appendix E for detailed calculations of expected benefits associated with the proposed signal system upgrades.

The BCA conservatively assumes that benefits associated with the proposed signal system upgrades will begin to accrue the first year after the estimated time of construction completion, which is 2028.

[2] Systemwide vehicle hours of delay are notably reduced with the intersection of Saratoga Avenue and Feeder Dam/Williams Street operating with free operations. Based on the results, the ASCT only along Main Street is recommended and further comparison between systems was based on this system.

MOBILITY (TRAVEL TIME) BENEFITS

Proposed signal upgrades are expected to optimize traffic flow and reduce peak hour travel times, particularly during the weekday PM peak hour. MOEs for each signal alternative were obtained from the *Signal Coordination and ATCS Comparison Memorandum* dated October 21, 2025. Using May 2025 traffic data and U.S. DOT recommended values, peak hour travel time savings were monetized according to U.S. DOT guidance.

Monetized mobility benefits are summarized in **Table 9**. ASCT is expected to generate a higher mobility benefit and is expected to generate approximately $11.6 million over the project lifecycle, when discounted at seven percent. Signal optimization is expected to generate approximately $10.1 million over the project lifecycle, when discounted at seven percent.

Table 9
Expected Mobility (Travel Time) Benefits

Alternatives	Estimated Benefits over the Project Lifecycle (Discounted at 7 Percent[1])
Signal Optimization	$10,114,539
ASCT	$11,592,992
Note: [1] This discount rate is applied to convert expected future revenue streams of benefits to the same present value (2023 dollars) and remove the effects of inflation over time.	

ESTIMATION OF SIGNAL SYSTEM UPGRADE COSTS

The proposed signal system upgrades require different levels of investment depending on the technology deployed. Refer to **Section G** for detailed cost estimates incorporated into the BCA and **Appendix F** for detailed calculations.

The BCA assumes that any capital costs associated with the proposed signal system upgrades will be spread out evenly over the duration of construction (2026 through 2027). Operations and Maintenance (O&M) costs were assumed to be spread out annually over the service life of the upgraded signal system (2028 through 2036).

For purposes of this BCA, capital costs account for all equipment expenses assumed to be necessary to upgrade the signal system and O&M costs account for all expenses required to maintain a state of good repair once the signal system is upgraded. Signal Optimization is expected to be the least expensive alternative.

SUMMARY OF FINDINGS AND BCA OUTCOMES

The Benefit Cost Ratio (BCR) is a method to evaluate the return on investment for an alternative. In this measure, the total value of expected benefits is placed in the numerator of the ratio and the value of expected costs is placed in the denominator. For example, an alternative with total expected benefit of $2 million and a total expected cost of $1 million would result in a BCR of 2.0 ($2 million/$1 million = 2.0). This indicates that the alternative is expected to bring twice the amount of benefits to the public when compared to the cost. A BCR greater than or equal to 1.0 indicates that an alternative's benefits outweigh the costs.

It should also be noted that no analysis is performed for the No Build Alternative since it does not provide any benefits (a theoretical BCR of 0.00).

The findings of the BCA are summarized in **Table 10**. Considering monetized mobility benefits and costs (Capital and O&M), all alternatives would provide a positive return on investment with net present values ranging from $10.0 million for Signal Optimization to $11.3 million for an ASCT system. Signal Optimization provides the best return on investment and is a more cost-effective alternative when compared to an ASCT

Signal Optimization provides the best return on investment and is the recommended option.

system, with a BCR of approximately 116.94. As such, signal optimization through coordination is the recommended option for the purposes of this evaluation.

Table 10
BCA Results

Alternatives	Signal Optimization	ASCT
Total Discounted Benefits	$10,114,539	$11,592,992
Total Discounted Costs	$86,491	$267,872
Net Present Value (Benefits – Costs)	$10,028,047	$11,325,120
BCR	116.94	43.28
Note: [1] This discount rate is applied to convert expected future revenue streams of benefits to the same present value (2023 dollars) and remove the effects of inflation over time.		

APPENDIX A: EXISTING CONDITIONS MEMORANDUM

120 Defreest Drive, Suite 140
Troy, NY 12180
tel: 518.720.7020
www.akrf.com

Memorandum

To:	Jack Mance, AICP, Adirondack | Glens Falls Transportation Council
From:	Marissa Tarallo, PE, PTOE and Sanam Lakhwara, AKRF, Inc.
Date:	July 28, 2025
Re:	Village of South Glens Falls Route 9 Corridor Study - Existing Conditions Technical Memorandum
cc:	Daniel Rourke, PE, Barton & Loguidice

INTRODUCTION

This memorandum summarizes the existing transportation conditions along the Route 9 corridor in the Village of South Glens Falls, NY. The study focuses on traffic operations, pedestrian and bicycle infrastructure, and traffic control devices within the study area. The findings from this analysis will guide the assessment of corridor needs and improvement opportunities, including a calibrated simulation model that assesses improved signal coordination plans with and without Adaptive Signal Control Technology (ASCT). The memorandum also identifies opportunities for multimodal improvements, including pedestrian and bicycle infrastructure enhancements.

STUDY AREA

This corridor assessment is focused on Route 9 between Mohican Street/Oakland Avenue and Feeder Dam Road/William Street. The following is a brief description of the major roadways within the study area.

The study area encompasses approximately 1.6 miles of Route 9 including four signalized intersections, two intersections with flashing signals, and five midblock pedestrian crossings. Route 9 within the area of study is divided into two segments: Main Street to the north, approximately 3,100 feet in length, and Saratoga Avenue to the south, approximately 5,600 feet long. These two segments intersect at 5th Street. Land use along the corridor includes a mix of commercial properties, civic institutions, and residential areas including driveways along the corridor as well as local intersection streets for neighborhood access.

Route 9 Looking South Near 2nd St.

Route 9 is classified as an Urban Principal Arterial throughout the corridor. Along Main Street, the Annual Average Daily Traffic (AADT) is 18,522 vehicles per day (vpd), based on 2022 NYSDOT data. The posted speed limit is 30 miles per hour (mph) and the recorded 85th percentile speed for this segment is approximately 31 mph. The typical cross-section from River Street to Saratoga Avenue includes two 14-foot-wide travel lanes, an 11-foot-wide center two-way left-turn lane which transitions to a dedicated left-turn lane at signalized intersections, and a 9-foot-wide parking lane on the east side. No shoulders are present along Main Street aside from the parking lane. Sidewalks are present on both sides of the corridor, with an approximate 3-foot buffer area between the edge of the roadway and the sidewalk. There are no designated bicycle facilities along Main Street, although shared roadway signs are present. On the Saratoga Avenue segment, the AADT is 17,682 vpd, based on 2022 NYSDOT data. The posted speed limit between Route 32 and Main Street is 30 mph and the 85th percentile speed along this segment was recorded at approximately 38 mph. The typical cross-section includes three 12-foot-wide lanes, two travel lanes and a center two-way left-turn lane, with 3-foot shoulders on each side. Sidewalks are present directly adjacent to the edge of roadway on both sides of the roadway until Beach Road where the west sidewalk discontinues. There are no designated bicycle facilities along Saratoga Avenue, although shared roadway signs are present in the southbound direction.

EXISTING CONDITIONS FIELD INVENTORY

On July 7, 2025, B&L staff conducted a field inventory using ArcGIS Survey123 to document roadway features, pedestrian infrastructure, and the location of signal equipment along the corridor. Data collected includes pavement width and condition, sidewalk presence and accessibility, drainage infrastructure, obstructions, signage, signal equipment and the location and condition of midblock crosswalks. Photos and GPS coordinates were used to support the inventory.

Roadside Conditions

The corridor transitions between residential and commercial land uses throughout, with multiple driveways and building frontages located close to the roadway. In many areas, the sidewalk is directly adjacent to buildings or fenced property lines. Utility poles are primarily located along the east side of the corridor and are often positioned immediately behind the sidewalk. Additional obstructions beyond the sidewalk include mature trees, traffic control and business signage, and landscaping features. Several drainage structures, including catch basins and manholes, are in conflict areas, such as directly in front of curb ramps or within marked crosswalks. There is also a cemetery that is located adjacent to the sidewalk on the Saratoga Avenue segment between Harrison Avenue and New Street.

Typical Roadside Condition Near 3rd St.

Existing Sidewalks

Sidewalks are present along both sides of the Route 9 corridor. On the Saratoga Avenue segment, the east side includes sidewalk for the whole length, approximately 5,300 feet of sidewalk extending from the Feeder Dam Road intersection to the Main Street intersection. The west side has about 3,670 feet of sidewalk, with a gap from Feeder Dam Road to Beach Road. On the Main Street segment, north of the Main Street intersection, sidewalks continue on both sides of the road for approximately 2,400 feet to the Glen Street Bridge.

Existing Sidewalk Adjacent to Stewarts

All existing sidewalk segments were evaluated for compliance with the Americans with Disabilities Act (ADA), based on key criteria such as missing panels, panel heaving, obstructions, and width. Each segment was analyzed individually, with a segment representing one block, unless interrupted by features such as large driveways or unusually long stretches. While most segments were generally accessible, some sections exhibited minor deficiencies such as small cracks, creeping vegetation, slight panel heaving and areas of minor curb erosion. These issues may affect long-term accessibility and maintenance but do not currently constitute major barriers to pedestrians. All sidewalks were mostly to fully accessible, resulting in an overall compliant condition with ADA standards.

Signage

The existing signage along Route 9 corridor was documented, including details on sign type, location, and proximity to the roadway edge. A total of 95 signs were recorded along the corridor, with their distances from the edge of the roadway ranging from 1 to 9 ft.

Pedestrian Crossings

The survey identified a total of five midblock (between intersections and not signal controlled) pedestrian crossings across Main Street/Saratoga Avenue within the study area. At intersections controlled by standard three-color traffic signals, 15 marked crosswalks were identified. An additional five crosswalks were found at intersections with flashing traffic signals and 14 more crosswalks were located where sidewalks intersect with crossing points (driveways/ side streets) along the corridor, bringing the total number of crosswalks to 34.

Pedestrian Crossing at 3rd St.

All midblock and intersection crossings were equipped with ADA-compliant curb ramps. All crosswalks were marked with pavement striping, and curb ramps were provided on both ends. However, several of the crosswalk markings were faded and in need of repainting which is typical of heavily travelled roadways such as Route 9.

Pedestrian amenities such as Walk/Don't Walk signals, push buttons, countdown timers, and pedestrian signal heads were present at locations with standard three-color traffic signals. Of the five midblock crossings, three had pedestrian signs, while only two of the five crosswalks at flashing signal intersections included pedestrian crossing signs. The 14 additional crosswalks at sidewalk connections lacked pedestrian crossing amenities.

Table 1
Existing Mid-Block Crossings

Mid-Block Crossings		
Road	ADA Compliant?	Location
Main St	Yes	1st St Intersection
Main St	Yes	2nd St Intersection
Main St	Yes	Between 2nd St and 3rd St
Saratoga Ave	Yes	St Michaels Church
Saratoga Ave	Yes	St Michaels Church

Right of Way

The right-of-way (ROW) is a critical factor when evaluating the feasibility of expanding, or introducing new, multi-modal facilities along the corridor. Adequate ROW ensures that such facilities can be integrated into the existing transportation network while minimizing the need for timely and costly land acquisition or reconfiguration existing roadway footprint. It should be noted that the Saratoga County GIS Web Map Parcel Viewer was referenced and is based on tax mapping data and should not be used as a replacement for a formal property boundary survey. Based on field observations of utility locations and comparisons with parcel boundaries from the GIS Parcel Viewer, the average ROW width along Saratoga Avenue is estimated at 63 feet. The distance from the edge of pavement to the edge of the ROW is about 9 feet centered evenly on both the east and west sides. On Main Street, the ROW is slightly wider, averaging 65 feet, with an estimated 8.5 feet from the edge of pavement to the ROW on both sides of the roadway.

Aerial maps, identifying opportunities and constraints relating to existing conditions in the study area are presented in **Figures 1** and **2**.

Legend

ROW

1:24,000

akrf | A/GFTC Adirondack Glens Falls Transportation Council | South Glens Falls The Village at Cooper's Cave Est. 1895 | Barton & Loguidice

Village of South Glens Falls
Route 9 Corridor Study
Existing Conditions Opportunities & Constraints Map

Figure 1

Project 2197.004.001

7/28/2025

Legend

ROW

N
W E
S

1:24,000

akrf

A/GFTC Adirondack Glens Falls Transportation Council

SOUTH GLENS FALLS THE VILLAGE AT COOPER'S CAVE EST. 1895

Barton & Loguidice

Village of South Glens Falls
Route 9 Corridor Study
Existing Conditions Opportunities & Constraints Map

Figure 2

Project 219.004.001

7/28/2025

EXISTING INTERSECTION TRAFFIC OPERATIONS

To assess the existing traffic operations, the following intersections were identified for analysis in coordination with A/GFTC:

- Route 9/Glen Street and Mohican Street/Oakland Avenue
- Main Street and River Street
- Main Street and 3rd Street
- Main Street and 5th Street/Saratoga Avenue
- Saratoga Avenue and Marion Avenue/West Marion Avenue
- Saratoga Avenue and William Street/Feeder Dam Road

Figure 3 presents the study area and intersections.

DATA COLLECTION

Existing vehicular turning movement and pedestrian counts were collected on Wednesday, May 14, 2025, when schools were in session, during the weekday PM (4:00 PM to 6:00 PM) peak period. Automatic Traffic Recorder (ATR) counts were collected on each approach of the intersection of Saratoga Avenue and Marion Avenue/West Marion Avenue for the same day, to collect traffic data necessary to conduct volume-based warrants in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) for evaluating potential improvements. Additionally, AKRF conducted field visits to observe traffic operations during the peak period, as well as to inventory the signal equipment and timing parameters along the corridor in coordination with the City of Glens Falls and the New York State Department of Transportation (NYSDOT).

SIGNAL INVENTORY

On June 10, 2025 a field visit was conducted to inventory the signal equipment at each study intersection. The inventory included identifying the controller hardware, software, and controller programming at each signal as well as the presence of vehicle detection, the type of signal installation (span wire or mast arm) and general condition of the signal equipment. In addition, it was noted if pedestrian signal heads and pedestrian push buttons were provided and were ADA compliant. The inventory sheets are provided in **Attachment A**.

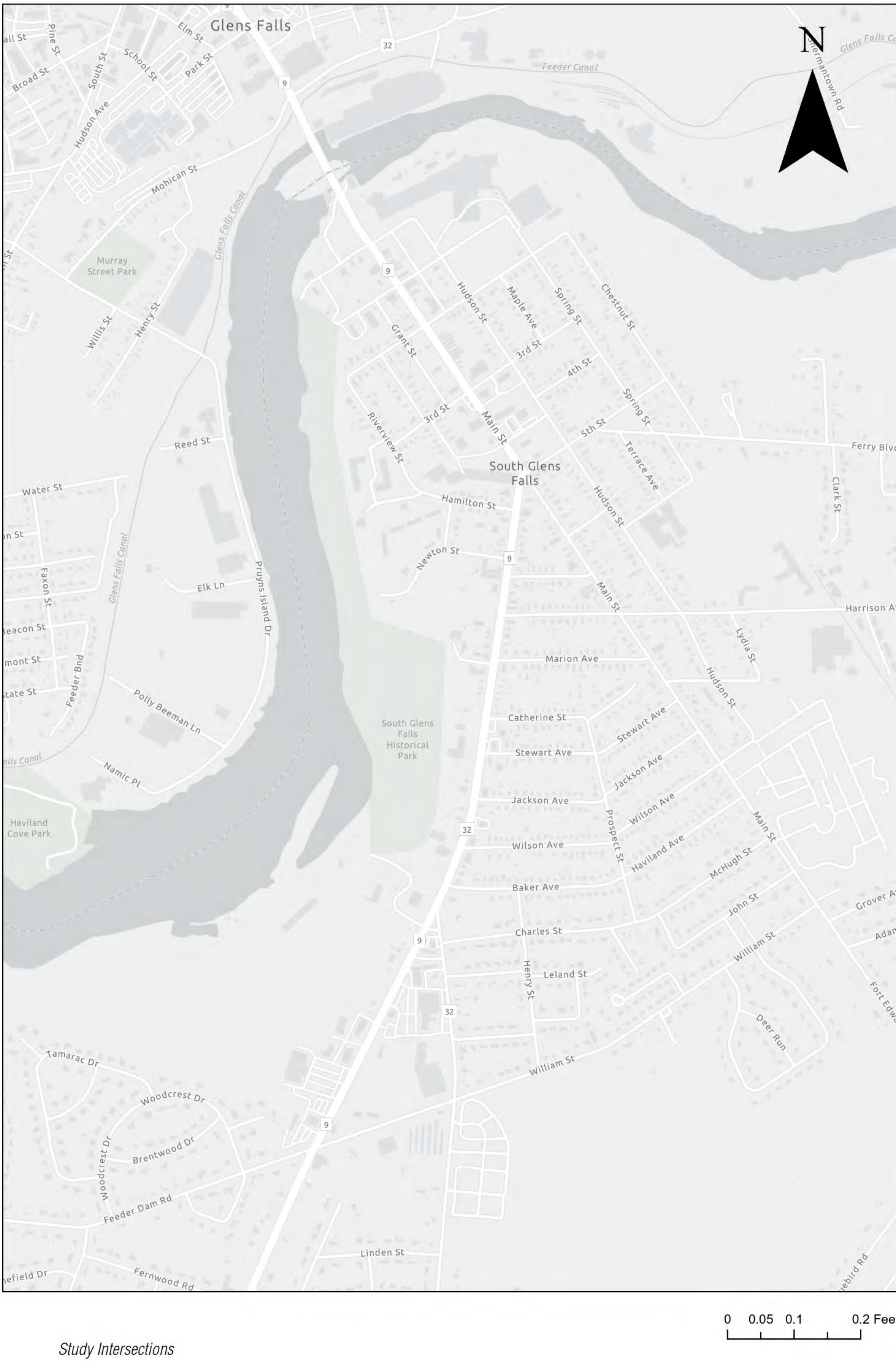
MEASURES OF EFFECTIVENESS

Utilizing the Synchro/SimTraffic software, a microsimulation model for the weekday PM peak hour was developed. As SimTraffic is a stochastic model where multiple simulation runs will generate different driver behaviors (i.e. acceptable available gaps for turns, changing lanes, etc.) and system results, an average of 10 runs was used to achieve confidence in the simulation results and to obtain the following measures of effectiveness (MOEs):

- ***Percent Demand Served*** – is a measure of the total throughput of the system. This measure takes into consideration the actual volume served versus the demand. When the system is over capacity, this measure provides a better understanding of overall traffic operations than delay or level of service.
- ***Average Travel Speed*** – is a measure of the overall travel speed through the system. The average travel speed calculation considers the average delay throughout the system and vehicle queues.
- ***Number of Stops*** – the total number of stops for vehicles during the peak hour of analysis on the full study area.
- ***Vehicle Hours of Delay*** – is the amount of delay incurred during the peak hour as a result of congestion.
- ***Travel Time*** – is the time needed to traverse study area segment.
- ***Buffer Time Index*** – The buffer index represents extra time that travelers must add to the average travel time when planning trips to ensure on-time arrival.

RESULTS

Table 2 summarizes the systemwide MOEs in the study area during the weekday PM peak period. The simulation reports presented in **Attachment B**. The average speed is 19 mph, below the 30 mph posted



Study Intersections

Study Area

Figure 3

speed limit indicating congestion and the Buffer Time Index notes a degree of variation in the travel time with notably less reliability in the southbound direction.

Table 2
Systemwide Measures of Effectiveness (MOE)

Measure of Effectiveness	Weekday PM Peak
Percent Demand Served	100.0%
Average Travel Speed	19 mph
Number of Stops	4,598
Vehicles Hours of Delay	61 hrs
Trave Time (mm:ss)	
Main Street/Saratoga Avenue Northbound	4:00
Main Street/Saratoga Avenue Southbound	5:47
Buffer Time Index (%)	
Main Street/Saratoga Avenue Northbound	3.8%
Main Street/Saratoga Avenue Southbound	12.1%
Notes: Based on 10 simulation runs	

CRASH HISTORY AND SAFETY ASSESSMENT

Crash data for the study area was obtained from NYSDOT for the three-year period between January 1, 2022, and December 31, 2024 (representing post COVID-19 conditions). The data obtained quantifies the total number of reportable crashes (involving fatality, injury, or more than $1,000 in property damage), fatalities, and injuries during the study period, as well as a yearly breakdown of vehicular crashes with pedestrians and bicycles at each location.

During this period, there were a total of 112 reportable crashes with 2 fatalities, 17 injuries, four crashes involving pedestrians, and one involving a bicyclist.

Table 5 depicts total crashes by intersection during the study period, as well as a breakdown of pedestrian and bicycle crashes by year and location.

Table 5
Crash Summary

Intersection		Vehicular Crashes					Pedestrian and Bicycle Crashes					
North-South Roadway	East-West Roadway	All Crashes by Year			Total Fatalities	Total Injuries	Pedestrian Crashes			Bicycle Crashes		
		2022	2023	2024			2022	2023	2024	2022	2023	2024
Glen Street/Main Street	Mohican Street/Oakland Avenue	24	9	15	1	1	0	0	0	0	0	0
Main Street	River Street	8	6	6	0	8	1	1	0	0	0	1
Main Street	3rd Street	2	4	2	0	2	0	0	0	0	0	0
Main Street	Saratoga Avenue/5th Street	9	7	8	1	5	1	0	0	0	0	0
Saratoga Avenue	Marion Avenue	0	3	1	0	1	0	0	0	0	0	0
Saratoga Avenue	Feeder Dam Road/William Street	3	4	1	0	8	1	0	0	0	0	0

Source: Crash data from NYSDOT for January 2022 through December 2024
Note: Bold intersections are high crash locations, defined as intersection having ten or more crashes in a 12-month period.

High crash locations are generally considered intersections with more than ten crashes over a consecutive 12-month period. Based on the crash data provided by NYSDOT, Glen Street/Main Street and Mohican Street/Oakland Avenue would be considered a high crash location. One fatal crash has occurred at the intersection in the past three years when a vehicle travelling northbound across the Glen Street Bridge at unsafe speeds, disregarded the traffic signal and collided with another vehicle travelling eastbound on Mohican Street in a right-angle crash. Five additional right-angle collisions have occurred at the intersection in the past three years.

One bicycle crash occurred at the intersection of Main Street and River Street with a vehicle making an eastbound right turn on red and striking the bicyclist as they came off the sidewalk travelling against the flow of traffic towards the west crosswalk. The failure of the bike brakes was noted as a possible contributing factor to this crash. Two pedestrian crashes also took place at this intersection. One occurred when a vehicle travelling westbound on River Street hit a pedestrian on a motorless scooter while making a right-turn onto Main Street. The second pedestrian crash occurred when a vehicle travelling southbound on Main Street was making a left-turn onto River Street and hit a pedestrian in the crosswalk. This crash occurred at 11:20 PM when the road was unlighted. Lack of visibility at the intersection could be a contributing factor.

The pedestrian crash at the intersection of Saratoga Avenue/5th Street and Main Street occurred when a vehicle was travelling northbound on Main Street and struck a pedestrian crossing Main Street resulting in serious injury then death. The crash occurred at 7:20 PM during winter conditions when the road was noted as being unlit and may have been a contributing factor. The fourth pedestrian crash occurred at the intersection of Saratoga Avenue and Feeder Dam/Williams Street when a vehicle travelling northbound on Saratoga Avenue hit a pedestrian crossing Saratoga Avenue.

The most common crash types occurring in the study area are rear-end crashes (48), followed by overtaking crashes (17), right angle crashes (11) and left-turn crashes (8). Distracted driving and following too closely were the leading cause of rear-end crashes. Right-turn crashes at non-signalized intersections may be improved through the installation of a traffic signal where warranted. One of the right-angle crashes occurred at the flashing only signalized intersection of Saratoga Avenue and Marion Avenue. Left-turn crashes are typically caused during improper turns where drivers fail to yield to oncoming traffic and at times can be attributed to inadequate sight distance, inadequate clearance times (yellow and red time) or aggressive driving due to minimal gaps in conflicting traffic. The sideswipes and overtaking crashes typically occur due to inattentive driver behavior, congested conditions or during lane changes.

APPENDIX B: COMPLETE STREETS RECOMMENDATIONS MEMO

Village of South Glens Falls Route 9 Corridor Study
Complete Streets Improvements

Memo To: Jack Mance, AICP
Senior Transportation Planner
A|GFTC

Date: October 16, 2025

Cc: AKRF, Inc.

From: Barton & Loguidice, D.P.C. (B&L)

File: 2197.004

I. INTRODUCTION

On behalf of the Village of South Glens Falls and the Adirondack/Glens Falls Transportation Council (A/GFTC), Barton & Loguidice, in collaboration with AKRF, has prepared this Technical Memorandum to evaluate improvement opportunities along Route 9 within the Village of South Glens Falls, NY. The study area extends from Mohican Street/ Oakland Avenue to Feeder Dam Road/ William Street and encompasses two main segments: Main Street to the north and Saratoga Avenue to the south, which intersect at 5th Street. Land use along the corridor includes a mix of commercial properties, civic institutions, and residential areas. The corridor also serves as a primary business district and is frequently used by pedestrians and cyclists. This memorandum provides an overall assessment of the corridor's conditions and provides recommendations to enhance safety, accessibility, and mobility, including installing continuous ADA-compliant sidewalks, improving pedestrian crossings with high-visibility markings and Rectangular Rapid Flashing Beacons (RRFBs), adding curb extension, and providing dedicated bicycle facilities where feasible.

Route 9 - South Glens Falls, NY

Figure 1- Project Area Map

II. COMPLETE STREETS IMPROVEMENT OPTIONS

The Village of South Glens Falls has identified the need to improve safety, accessibility, and mobility along Main Street and Saratoga Avenue. The recommendations focus on filling pedestrian mobility gaps, enhancing crossing safety, and exploring bicycle mobility improvements while considering the physical and operational constraints of the corridor.

A. Recommended Improvements to Pedestrian Facilities:

1. Sidewalk Connections

   Install an ADA-compliant sidewalk that connects to the existing curb ramps at each end of the segment between Feeder Dam Road and Beach Road along the west side of Saratoga Avenue. This corridor currently lacks a continuous sidewalk, creating a gap in pedestrian connectivity. The proposed improvement would involve constructing a 5 ft. wide sidewalk along the roadway, with a 3 ft. buffer to enhance pedestrian safety and provide space for snow storage. The design would maintain the existing roadway dimensions and curbline and repurpose the driveway islands to accommodate the sidewalk.

Figure 2. Segment between Feeder Dam Road and Beach Road

   Although the proposed sidewalk and buffer space generally fits within the existing right-of-way, temporary construction easements will likely be required for grading activities and driveway restoration. Based on the available ROW mapping from GIS, the ROW appears to be sufficient to install a sidewalk in this location without acquiring property. Utility poles are generally 4-5 ft. from the edge of the driveway island and will not be a constraint as there is adequate clearance to meet ADA standards (4 ft. min). However, some mailboxes, signage, and trees would need to be relocated or removed to accommodate the design.

2. High Visibility Crosswalks

   New pedestrian crosswalks should be considered at three locations crossing Saratoga Avenue: at Wilson Avenue to connect to Dollar General, across from the Common Roots Bierhall & Barrel House, and at the Saratoga Avenue/Hannaford Driveway intersection (see Figure 3). These locations are recommended to strengthen pedestrian connections to nearby businesses.

   In addition, existing conditions at the corridor's signalized intersections should be addressed as noted below:

   - Main Street/River Street intersection: pedestrian signals, crosswalks, and curb ramps are ADA-compliant, although the crosswalk markings should be replaced.
   - Main Street/5th Avenue/Saratoga Avenue intersection: pedestrian facilities are ADA-compliant and in good condition.
   - Saratoga Avenue/NYS Route 32 intersection: pedestrian signals are absent, though pedestrian crossing signs and marked crosswalks are in place; however, the crosswalk markings should be replaced.

The installation of new crosswalk markings will improve driver awareness of pedestrian activity and provide clearly defined crossing points. All crosswalks should use highly visible ladder-bar pavement markings with epoxy paint or thermoplastic with glass beads for retro-reflectivity.

Figure 3. Recommended Locations for Crosswalk Installation

An alternative treatment may include imprinted asphalt thermoplastic surface treatments, which heat and stamp the asphalt pavement with a contrasting color and pattern to provide a durable and visually prominent crossing (see Figure 4).

Figure 4. Imprinted Thermoplastic Crosswalks. Source: Harbour Roads and Ennis-Flint

3. Install Rectangular Rapid Flashing Beacons (RRFB'S)
   To enhance pedestrian safety, (RRFBs) should be installed at the proposed and existing crosswalk locations along Saratoga Avenue and the existing midblock on Main Street. According to FHWA, RRFBs are particularly effective at multilane crossings with posted speeds under 40 mph and moderate-to-high traffic volumes, which align with conditions in this corridor. Saratoga Avenue consists of two travel lanes and one two-way left-turn lane (TWTL), with an AADT of 17,682 vehicles per day and an 85th percentile speed of approximately 38 mph. These factors pose a challenge to pedestrians crossing at Saratoga Avenue. RRFBs will enhance visibility and encourage driver yielding at these locations. Push button activated rapid flashing beacons are mounted on both sides of the crosswalk below the pedestrian crossing sign and above the diagonal downward arrow plaque to alert drivers that there is a pedestrian that wants to cross the roadway (see Figure 5).

Figure 5. RRFBs Used at a Crossing. Source: FHWA

4. Bump-outs / Curb extensions
   Curb extensions, or bumpouts, extend the sidewalk or curb line into the roadway at intersections or midblock locations to enhance pedestrian safety, reduce crossing distances for pedestrians, and calm traffic. They are generally recommended at intersections with full-time parking lanes and can also be used at midblock crossings (see Figure 6).

   For this project, a bumpout is recommended at the existing midblock crossing on the east side of Main Street within the existing parking lane. Sight distance for pedestrians is currently limited by parked vehicles. If a bumpout is not installed, a "No Parking" signs should be established on the east side of Main Street within 20 ft. from the crosswalk. This will help ensure adequate sight distance for both drivers and pedestrians. Bumpouts are not recommended on the west side of Main Street or along Saratoga Avenue due to the absence of parking lanes and adequate shoulder width.

Figure 6. Mid-Block Curve Extension. Source: NYC Street Design Manual

B. Considerations for Bicycle Facilities:

While not a primary consideration of this project, the feasibility of providing dedicated bicycle facilities was analyzed to determine if improvements could be made given existing curb-to-curb width of the roadway. It is important to note that, even when dedicated facilities cannot be accommodated, cyclists are permitted to ride in the travel lane or seek alternate routes. Should a large-scale roadway reconstruction project be proposed in the future, consideration should be given to adjusting the curb location to provide additional space for dedicated bicycle facilities.

<u>Additional Bicycle Facility Options Investigated But Not Progressed</u>

1. Bike Lane
   A potential bicycle facility accommodation along Main Street is a 4.5 ft. bike lane on each side of the roadway. However, this falls short of the AASHTO minimum standard of 5 ft. lane when the bike lane is adjacent to the curb. In addition, to achieve these narrow bike lanes, the existing on-street parking and shoulders would need to be eliminated. Given that many of the businesses on Main Street rely solely on the on-street parking, the recommendation for bike lanes along Main Street is not supported at this time.

Bike lanes are not recommended along Saratoga Avenue due to physical constraints such as the existing shoulders, which are about 3 ft. wide. Narrowing the road is also not feasible because of high traffic volumes and a truck percentage of 5%, which requires a minimum 12 ft. lane for safe operation.

2. Shared Roadway

   The shared roadway alternative involves a design where travel lanes are shared between motorists and cyclists, while a sidewalk used for pedestrians. This option maintains the existing roadway configuration but includes signage designating the road as a shared roadway, along with pavement markings to alert motorists of the potential presence of cyclists. According to FHWA this alternative is suitable in urban areas on streets with low speeds, 25 mph or less, or low traffic volumes (3,000 vehicles per day or less, depending on speed and land use). Due to the high AADT volume of 18,522 vehicle per day at Main Street and 17,682 vehicle per day at Saratoga Avenue this alternative is not recommended for either segment. The segment of Saratoga Avenue between Feeder Dam Road and Beach Road is a 14 ft. wide lane and unstriped, which meets the standards for a wide curb shared roadway and allows motorists to pass cyclists without entering the adjacent lane. However, given the noted high traffic volume along Saratoga Avenue, a shared roadway is not a feasible option.

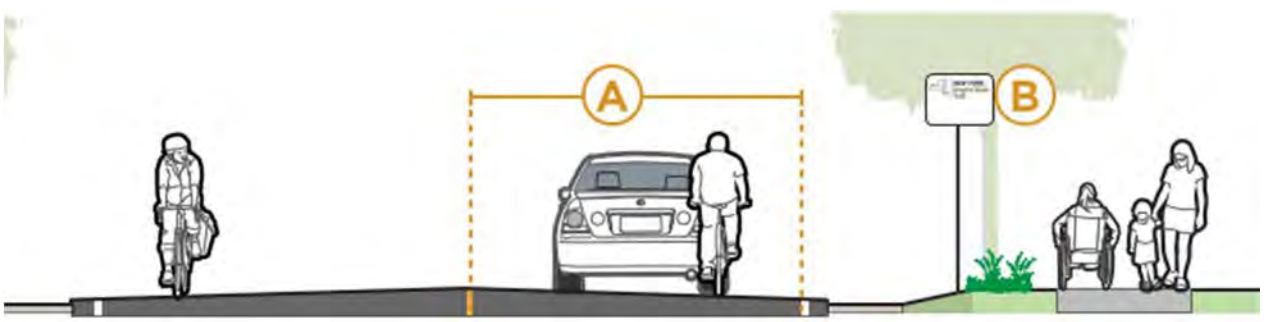


Figure7: Shared Roadway. Source: Empire State Trail Guide

3. Side Path

   A shared use path (also known as a side path) is an 8-12 ft. path designed for use by both cyclists and pedestrians along the east side of the roadway, as shown in Figure 8. By providing a paved asphalt facility separate from non-motorized traffic, shared use paths create a low-stress experience and comfortable environment for users of every age and ability. A 2 ft. shoulder/clear zone is recommended on either side of the path to facilitate drainage and user safety; however, this may be reduced in constrained environments. In addition, the minimum recommended separation from the roadway is 5 ft.

This alternative is not recommended for either segment since it would require the relocation of numerous utility poles to create the necessary space for the construction of a side path, as a minimum of 2 ft. between a utility pole and trail edge is required. Additionally, this option would involve the largest right-of-way acquisition on one side of the roadway, likely requiring multiple property acquisitions. In several locations, buildings are immediately adjacent to the existing sidewalk, creating substantial constraints. The current sidewalks on both sides of the roadway are in good condition and already provide pedestrian connectivity.

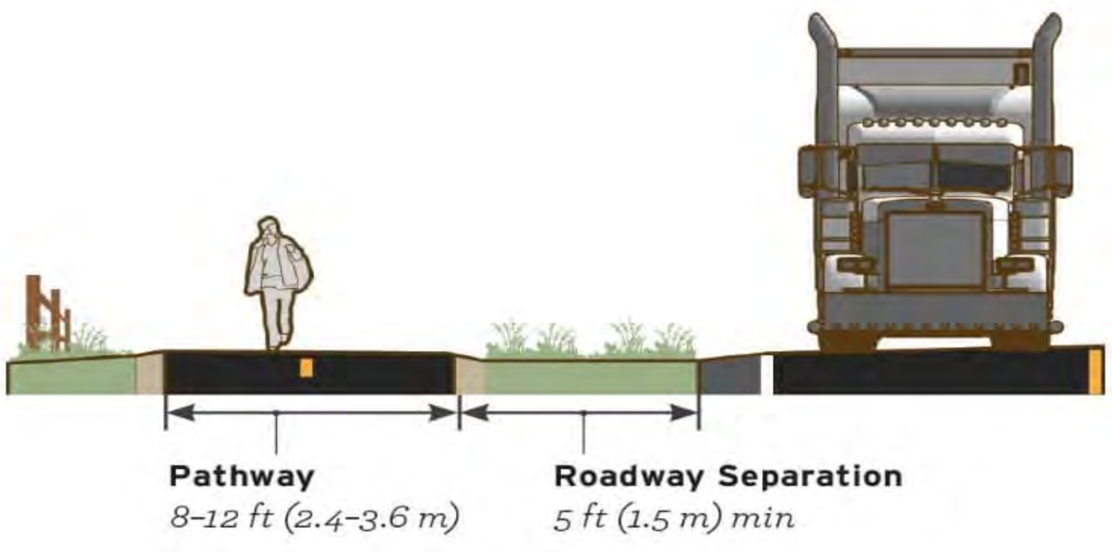
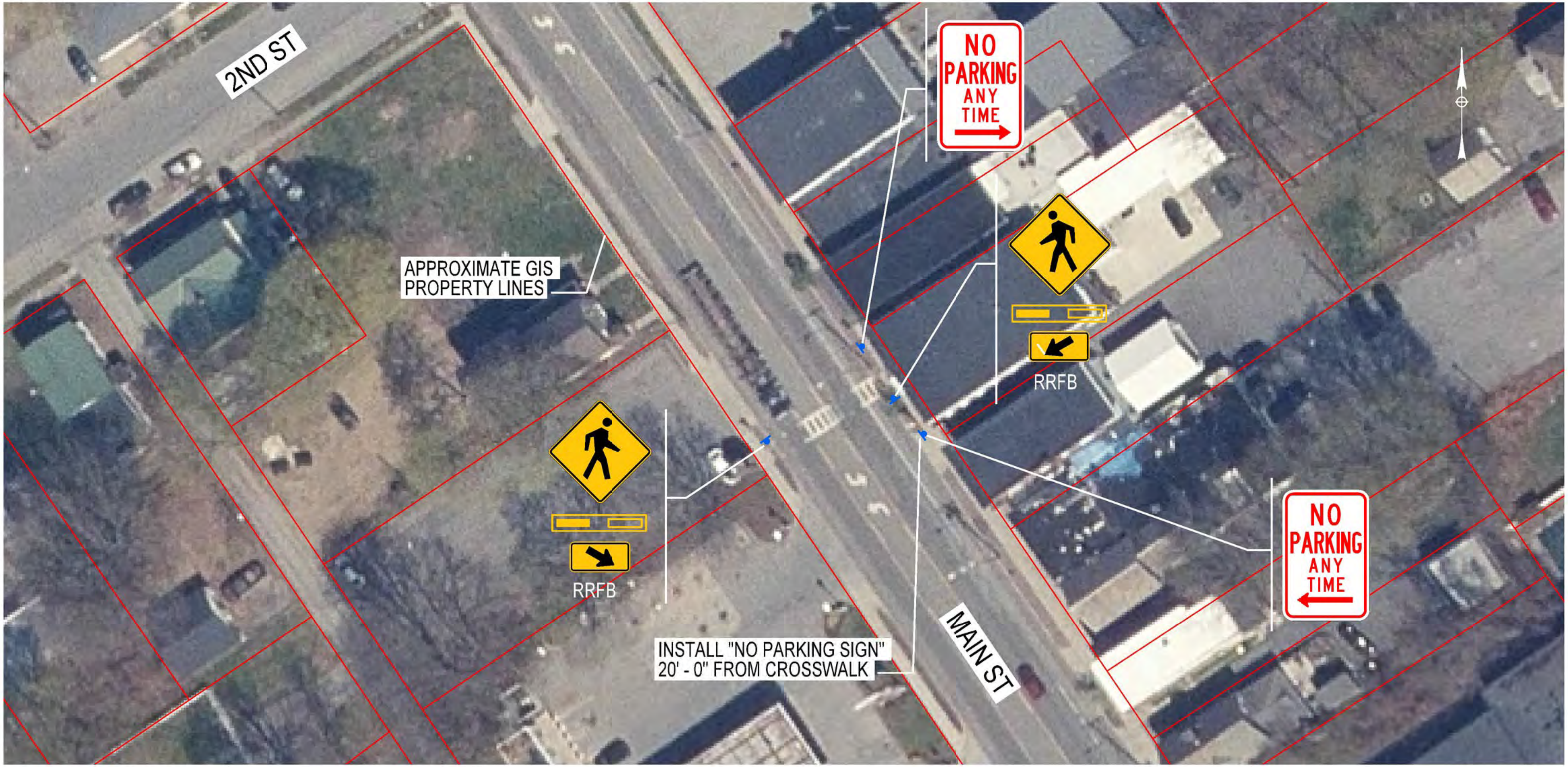


Figure 8 - Typical Shared Use Path configuration. Source: FHWA



CONCEPT 1 - MIDBLOCK CROSSING AND RRFB LAYOUT ON MAIN ST
OPTION WITH NO PARKING AREA

0 20 40

SCALE: 1"=40'

akrf

Barton & Loguidice

A/GFTC

OCTOBER 2025

CONCEPT 2 - MID-BLOCK CROSSING, RRBF, AND BUMPOUT LAYOUT ON MAIN ST
OPTION WITH CURB BUMPOUT

0 20 40
SCALE: 1"=40'

akrf
Barton & Loguidice
A/GFTC

OCTOBER 2025

CONCEPT 3 - SIDEWALK, CROSSWALK AND RRFB
LAYOUT ON SARATOGA AVE

0 25 50
SCALE: 1"=50'

akrf
Barton & Loguidice
A/GFTC

OCTOBER 2025

CONCEPT 4 - CROSSWALK AND RRFB LAYOUT ON SARATOGA AVE

0 25 50

SCALE: 1"=50'

OCTOBER 2025

CONCEPT 5 - CROSSWALK AND RRFB
LAYOUT ON SARATOGA AVE

0 25 50
SCALE: 1"=50'

akrf
Barton & Loguidice
A/GFTC

OCTOBER 2025

APPENDIX C: SIMTRAFFIC ANALYSIS

Summary of All Intervals

Run Number	1	10	2	4	5	6	7
Start Time	6:45	6:45	6:45	6:45	6:45	6:45	6:45
End Time	7:55	7:55	7:55	7:55	7:55	7:55	7:55
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	55	55	55	55	55	55	55
# of Intervals	5	5	5	5	5	5	5
# of Recorded mScheduledIntervals	4	4	4	4	4	4	4
Vehs Entered	3050	2936	3001	3019	3031	2972	2995
Vehs Exited	3048	3005	3009	2970	3028	2945	2960
Starting Vehs	201	221	166	150	181	148	176
Ending Vehs	203	152	158	199	184	175	211
Denied Entry Before	3	2	0	2	1	2	1
Travel Distance (mi)	3307	3215	3233	3245	3290	3225	3224
Travel Time (hr)	174.9	196.7	166.7	170.7	165.7	169.5	174.8
Total Delay (hr)	65.0	89.9	59.8	62.8	56.4	62.4	68.0
Total Stops	4923	4730	4329	4474	4605	4605	4593
Fuel Used (gal)	122.5	125.0	118.6	119.4	119.8	118.5	120.6

Summary of All Intervals

Run Number	8	9	Avg
Start Time	6:45	6:45	6:45
End Time	7:55	7:55	7:55
Total Time (min)	70	70	70
Time Recorded (min)	55	55	55
# of Intervals	5	5	5
# of Recorded mScheduledIntervals	4	4	4
Vehs Entered	3021	2941	2997
Vehs Exited	3008	2993	2996
Starting Vehs	158	212	176
Ending Vehs	171	160	180
Denied Entry Before	1	1	1
Travel Distance (mi)	3290	3185	3246
Travel Time (hr)	169.9	174.1	173.7
Total Delay (hr)	60.6	68.2	65.9
Total Stops	4538	4612	4598
Fuel Used (gal)	120.6	119.3	120.5

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	10	2	4	5	6	7
Vehs Entered	761	783	764	800	815	772	786
Vehs Exited	812	812	771	761	827	731	778
Starting Vehs	201	221	166	150	181	148	176
Ending Vehs	150	192	159	189	169	189	184
Denied Entry Before	3	2	0	2	1	2	1
Travel Distance (mi)	885	932	838	840	909	817	892
Travel Time (hr)	45.6	54.5	41.3	43.3	43.9	40.4	44.0
Total Delay (hr)	16.3	23.8	13.6	15.2	13.8	13.2	14.6
Total Stops	1320	1367	1064	1124	1124	1160	1172
Fuel Used (gal)	32.7	35.6	30.6	31.0	32.4	29.6	32.4

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	Avg
Vehs Entered	774	788	783
Vehs Exited	772	833	788
Starting Vehs	158	212	176
Ending Vehs	160	167	170
Denied Entry Before	1	1	1
Travel Distance (mi)	846	918	875
Travel Time (hr)	42.6	47.3	44.8
Total Delay (hr)	14.5	16.9	15.8
Total Stops	1197	1305	1200
Fuel Used (gal)	30.3	33.7	32.0

Interval #2 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	10	2	4	5	6	7
Vehs Entered	825	820	775	773	766	757	788
Vehs Exited	811	813	735	795	781	763	799
Starting Vehs	150	192	159	189	169	189	184
Ending Vehs	164	199	199	167	154	183	173
Denied Entry Before	0	1	1	1	1	1	1
Travel Distance (mi)	882	886	850	876	839	867	852
Travel Time (hr)	44.7	46.8	47.8	46.2	40.7	45.8	45.0
Total Delay (hr)	15.2	17.4	19.6	17.2	12.8	17.1	16.8
Total Stops	1272	1297	1157	1231	1136	1153	1198
Fuel Used (gal)	32.1	32.4	31.9	32.2	30.0	31.7	31.6

Interval #2 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	Avg
Vehs Entered	834	786	790
Vehs Exited	774	781	784
Starting Vehs	160	167	170
Ending Vehs	220	172	174
Denied Entry Before	0	1	0
Travel Distance (mi)	895	843	866
Travel Time (hr)	45.6	42.2	45.0
Total Delay (hr)	15.9	14.1	16.2
Total Stops	1184	1175	1201
Fuel Used (gal)	32.5	30.7	31.7

Interval #3 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	10	2	4	5	6	7
Vehs Entered	917	859	912	901	931	953	881
Vehs Exited	884	875	909	871	882	914	841
Starting Vehs	164	199	199	167	154	183	173
Ending Vehs	197	183	202	197	203	222	213
Denied Entry Before	1	2	2	2	1	1	1
Travel Distance (mi)	910	890	920	941	934	976	897
Travel Time (hr)	51.3	52.6	46.0	49.5	48.7	53.6	47.6
Total Delay (hr)	21.0	22.9	15.7	18.2	17.6	21.2	17.7
Total Stops	1459	1326	1304	1358	1397	1496	1341
Fuel Used (gal)	34.6	34.6	33.3	34.7	34.7	36.4	33.2

Interval #3 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	8	9	Avg
Vehs Entered	882	897	899
Vehs Exited	893	865	883
Starting Vehs	220	172	174
Ending Vehs	209	204	203
Denied Entry Before	3	0	1
Travel Distance (mi)	941	922	926
Travel Time (hr)	49.4	48.7	49.7
Total Delay (hr)	18.2	17.8	18.9
Total Stops	1257	1394	1368
Fuel Used (gal)	35.0	34.1	34.5

Interval #4 Information Recording

Start Time	7:45
End Time	7:55
Total Time (min)	10

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	10	2	4	5	6	7
Vehs Entered	547	474	550	545	519	490	540
Vehs Exited	541	505	594	543	538	537	542
Starting Vehs	197	183	202	197	203	222	213
Ending Vehs	203	152	158	199	184	175	211
Denied Entry Before	1	54	2	0	5	0	22
Travel Distance (mi)	630	507	624	589	608	565	583
Travel Time (hr)	33.3	42.8	31.6	31.7	32.4	29.7	38.2
Total Delay (hr)	12.5	25.8	10.8	12.2	12.3	10.9	18.8
Total Stops	872	740	804	761	948	796	882
Fuel Used (gal)	23.2	22.3	22.8	21.5	22.7	20.8	23.5

Interval #4 Information Recording

Start Time	7:45
End Time	7:55
Total Time (min)	10

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	8	9	Avg
Vehs Entered	531	470	519
Vehs Exited	569	514	542
Starting Vehs	209	204	203
Ending Vehs	171	160	180
Denied Entry Before	0	3	9
Travel Distance (mi)	608	500	579
Travel Time (hr)	32.3	36.0	34.2
Total Delay (hr)	12.0	19.4	15.0
Total Stops	900	738	829
Fuel Used (gal)	22.8	20.8	22.3

1: Saratoga Ave & Feeder Dam Rd/William St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.3	0.3	0.0	0.0	0.0
Total Del/Veh (s)	32.8	29.0	22.7	30.6	29.1	22.5	24.4	11.9	6.4	24.9	12.0	12.8
Stop/Veh	0.90	0.80	0.86	0.86	0.84	0.86	0.92	0.35	0.40	0.88	0.22	0.42
Travel Time (hr)	1.4	0.9	0.2	1.6	1.3	0.3	0.2	3.7	0.5	0.6	12.7	2.9
Avg Speed (mph)	11	12	13	13	14	15	20	29	29	28	32	31
Fuel Used (gal)	0.7	0.4	0.1	0.8	0.7	0.2	0.1	2.9	0.3	0.5	12.1	2.6
Fuel Eff. (mpg)	23.1	23.5	26.1	26.4	27.0	27.7	34.2	37.6	39.5	35.2	33.5	35.4
HC Emissions (g)	3	2	0	3	5	1	1	71	2	2	156	19
CO Emissions (g)	135	98	18	134	142	29	38	1903	119	91	3966	564
NOx Emissions (g)	10	7	1	11	14	2	3	220	10	13	572	83
Vehicles Entered	95	64	14	99	87	21	13	386	47	24	676	119
Vehicles Exited	95	64	14	98	86	21	13	387	48	23	677	120
Hourly Exit Rate	104	70	15	107	94	23	14	422	52	25	739	131
Input Volume	105	69	13	104	90	23	15	431	51	28	742	128
% of Volume	98	101	115	103	104	99	93	98	102	90	100	102

1: Saratoga Ave & Feeder Dam Rd/William St Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	16.2
Stop/Veh	0.43
Travel Time (hr)	26.4
Avg Speed (mph)	27
Fuel Used (gal)	21.3
Fuel Eff. (mpg)	33.3
HC Emissions (g)	265
CO Emissions (g)	7237
NOx Emissions (g)	950
Vehicles Entered	1645
Vehicles Exited	1646
Hourly Exit Rate	1796
Input Volume	1801
% of Volume	100

2: Saratoga Ave & Marion Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.6	0.3	0.5	0.2	0.1	0.2	0.2
Total Del/Veh (s)	42.3	27.8	14.9	52.8	19.6	15.4	7.0	6.6	7.5	2.7	2.1	5.2
Stop/Veh	1.00	1.00	1.00	1.00	0.80	0.70	0.00	0.06	0.60	0.00	0.00	0.03
Travel Time (hr)	0.1	0.0	0.1	0.1	0.1	0.3	15.9	0.5	0.1	8.7	0.2	25.9
Avg Speed (mph)	3	4	7	10	15	25	27	26	21	25	23	26
Fuel Used (gal)	0.0	0.0	0.0	0.0	0.0	0.2	12.9	0.3	0.1	8.1	0.2	21.9
Fuel Eff. (mpg)	12.4	16.1	23.5	24.0	29.7	33.0	33.3	34.0	26.1	26.4	28.9	30.7
HC Emissions (g)	0	0	0	0	0	1	190	24	0	115	1	331
CO Emissions (g)	2	0	2	5	4	21	3287	363	12	2873	38	6607
NOx Emissions (g)	0	0	0	0	0	3	516	59	1	355	4	939
Vehicles Entered	6	2	10	5	5	10	650	18	5	812	18	1541
Vehicles Exited	6	2	10	5	4	10	652	18	5	812	18	1542
Hourly Exit Rate	7	2	11	5	4	11	711	20	5	886	20	1682
Input Volume	7	1	10	5	5	13	713	18	5	892	20	1690
% of Volume	89	171	107	107	86	82	100	107	109	99	98	100

3: Saratoga Ave & Main St & 5th St Performance by movement

Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	39.3	42.3	27.3	172.8	46.5	39.5	48.8	43.1	12.6	30.5	1.8	22.8
Stop/Veh	0.80	0.82	0.85	1.00	0.72	0.78	1.00	0.77	0.38	0.65	0.00	0.60
Travel Time (hr)	0.3	1.9	0.2	0.1	2.5	0.1	0.2	3.1	6.3	8.5	0.6	1.4
Avg Speed (mph)	12	12	15	2	6	7	7	8	16	15	27	17
Fuel Used (gal)	0.1	0.9	0.1	0.0	1.0	0.1	0.1	1.4	3.3	4.4	0.5	0.7
Fuel Eff. (mpg)	25.8	25.4	26.9	7.6	16.1	17.3	18.1	19.0	30.1	28.5	33.8	30.1
HC Emissions (g)	2	14	1	0	8	0	0	6	35	65	5	5
CO Emissions (g)	39	298	20	1	279	13	8	222	817	1189	89	136
NOx Emissions (g)	5	36	2	0	23	1	1	27	114	166	14	15
Vehicles Entered	14	93	13	1	148	9	8	187	691	465	111	83
Vehicles Exited	14	92	13	1	147	9	8	186	691	463	110	82
Hourly Exit Rate	15	100	14	1	160	10	9	203	754	505	120	89
Input Volume	17	102	14	1	164	11	8	201	759	513	118	91
% of Volume	88	98	99	109	98	91	109	101	99	99	102	98

3: Saratoga Ave & Main St & 5th St Performance by movement

Movement	NER2	All
Denied Del/Veh (s)	0.0	0.1
Total Del/Veh (s)	26.1	25.1
Stop/Veh	0.50	0.54
Travel Time (hr)	0.1	25.2
Avg Speed (mph)	16	13
Fuel Used (gal)	0.0	12.6
Fuel Eff. (mpg)	28.2	26.8
HC Emissions (g)	0	140
CO Emissions (g)	6	3119
NOx Emissions (g)	1	404
Vehicles Entered	4	1827
Vehicles Exited	4	1820
Hourly Exit Rate	4	1985
Input Volume	4	2003
% of Volume	109	99

4: Main St & 3rd St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	4.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.1	23.4	15.1	24.9	24.7	11.4	30.3	9.0	3.5	25.9	14.2	12.7
Stop/Veh	0.79	0.80	0.95	0.75	0.71	0.92	1.00	0.29	0.00	1.00	0.37	0.40
Travel Time (hr)	0.4	0.1	0.2	0.1	0.2	0.1	0.0	4.9	0.0	0.1	11.3	0.1
Avg Speed (mph)	9	10	12	12	12	17	10	18	18	15	20	20
Fuel Used (gal)	0.2	0.1	0.1	0.0	0.1	0.1	0.0	3.8	0.0	0.0	7.0	0.1
Fuel Eff. (mpg)	21.6	21.6	22.0	26.8	25.4	31.9	21.1	23.0	22.4	31.4	32.5	32.8
HC Emissions (g)	1	0	2	0	0	0	0	67	0	0	57	0
CO Emissions (g)	38	17	50	7	17	9	4	1618	1	3	1084	7
NOx Emissions (g)	3	1	5	1	1	1	0	216	0	0	172	1
Vehicles Entered	38	15	20	8	17	12	3	624	1	4	897	10
Vehicles Exited	38	15	20	8	17	12	3	626	1	4	901	10
Hourly Exit Rate	41	16	22	9	19	13	3	683	1	4	983	11
Input Volume	43	17	18	7	19	12	4	689	1	5	991	12
% of Volume	97	97	122	122	96	108	82	99	109	87	99	89

4: Main St & 3rd St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	12.8
Stop/Veh	0.37
Travel Time (hr)	17.6
Avg Speed (mph)	19
Fuel Used (gal)	11.5
Fuel Eff. (mpg)	28.9
HC Emissions (g)	129
CO Emissions (g)	2855
NOx Emissions (g)	402
Vehicles Entered	1649
Vehicles Exited	1655
Hourly Exit Rate	1805
Input Volume	1818
% of Volume	99

5: Main St & River St Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	49.6	18.5	28.0	12.0	25.2	7.0	4.5	13.5	7.4	5.8	8.6
Stop/Veh	1.00	1.00	1.00	0.94	1.00	0.10	0.00	0.62	0.07	0.00	0.22
Travel Time (hr)	0.1	0.0	0.0	1.0	0.0	6.8	0.0	2.9	9.4	0.1	20.4
Avg Speed (mph)	6	10	4	10	15	24	24	19	22	22	22
Fuel Used (gal)	0.0	0.0	0.0	0.4	0.0	5.5	0.0	2.1	8.3	0.1	16.4
Fuel Eff. (mpg)	18.0	25.3	13.7	23.7	27.9	30.0	34.1	25.8	25.4	28.5	27.0
HC Emissions (g)	1	0	0	1	0	85	0	19	82	0	189
CO Emissions (g)	25	3	0	88	2	1615	3	633	2232	12	4613
NOx Emissions (g)	3	0	0	8	0	253	0	67	299	1	633
Vehicles Entered	8	5	1	159	2	632	3	232	913	7	1962
Vehicles Exited	8	5	1	159	2	633	3	231	912	7	1961
Hourly Exit Rate	9	5	1	173	2	691	3	252	995	8	2139
Input Volume	10	5	1	173	3	694	2	251	1011	9	2159
% of Volume	86	105	109	100	73	100	164	100	98	82	99

6: Main St & Mohican St/Oakland Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.4	3.5	3.7	0.3	0.4	0.0	0.0	0.0	11.2	23.0	13.2
Total Del/Veh (s)	58.3	55.6	30.8	45.2	26.2	17.5	30.4	32.9	28.0	206.8	63.2	55.2
Stop/Veh	1.10	0.95	0.96	0.86	0.64	0.69	0.84	0.62	0.64	1.38	0.93	0.75
Travel Time (hr)	0.4	1.7	4.7	3.4	0.5	0.1	3.1	8.3	2.6	0.5	17.4	0.1
Avg Speed (mph)	6	7	10	5	8	10	13	13	14	2	5	6
Fuel Used (gal)	0.2	0.7	2.0	1.3	0.2	0.0	1.6	4.2	1.3	0.1	5.9	0.0
Fuel Eff. (mpg)	16.0	16.5	21.1	12.6	19.2	21.7	25.4	26.1	26.7	6.1	11.7	14.8
HC Emissions (g)	1	11	15	14	9	2	29	30	28	0	20	2
CO Emissions (g)	36	263	539	450	177	47	635	933	558	15	890	28
NOx Emissions (g)	3	27	48	38	22	6	75	99	70	1	83	4
Vehicles Entered	20	82	318	203	46	13	180	479	152	8	615	4
Vehicles Exited	20	80	316	202	46	13	180	482	152	7	614	4
Hourly Exit Rate	22	87	345	220	50	14	196	526	166	8	670	4
Input Volume	20	89	335	217	51	14	198	528	165	7	695	5
% of Volume	109	98	103	102	98	99	99	100	101	109	96	87

6: Main St & Mohican St/Oakland Ave Performance by movement

Movement	All
Denied Del/Veh (s)	7.8
Total Del/Veh (s)	43.5
Stop/Veh	0.82
Travel Time (hr)	42.8
Avg Speed (mph)	9
Fuel Used (gal)	17.6
Fuel Eff. (mpg)	19.0
HC Emissions (g)	161
CO Emissions (g)	4570
NOx Emissions (g)	475
Vehicles Entered	2120
Vehicles Exited	2116
Hourly Exit Rate	2308
Input Volume	2323
% of Volume	99

Total Network Performance

Denied Del/Veh (s)	5.8
Total Del/Veh (s)	69.1
Stop/Veh	1.45
Travel Time (hr)	173.7
Avg Speed (mph)	19
Fuel Used (gal)	120.5
Fuel Eff. (mpg)	26.9
HC Emissions (g)	1533
CO Emissions (g)	39889
NOx Emissions (g)	4873
Vehicles Entered	2997
Vehicles Exited	2996
Hourly Exit Rate	3268
Input Volume	14491
% of Volume	23

Arterial Level of Service: NB Saratoga Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
William St	1	11.9	34.6	0.3	30	32	9.7
Marion Ave	2	7.4	82.8	0.8	33	33	7.3
Main St	3	30.5	64.5	0.3	15	15	33.9
Total		49.8	181.9	1.3	26	26	50.9

Arterial Level of Service: NB Saratoga Ave

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
William St	30	11.6	31	10.5	29	12.9	30
Marion Ave	33	7.3	33	7.1	33	8.4	32
Main St	16	29.3	16	30.4	15	32.7	17
Total	27	48.2	27	48.0	26	53.9	27

Arterial Level of Service: NB Saratoga Ave

Cross Street	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay	Run 8 Speed	Run 8 Delay
William St	12.2	29	12.6	30	12.6	29	12.6
Marion Ave	8.2	34	7.5	33	6.9	33	7.3
Main St	26.2	15	31.3	16	30.1	17	24.5
Total	46.7	26	51.4	26	49.6	27	44.4

Arterial Level of Service: NB Saratoga Ave

Cross Street	Run 9 Speed	Run 9 Delay
William St	30	12.3
Marion Ave	34	6.7
Main St	14	36.7
Total	26	55.6

Arterial Level of Service: SB Saratoga Ave

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Marion Ave	2	2.8	39.2	0.3	25	25	2.8
Feeder Dam Rd	1	11.9	66.2	0.8	41	41	11.4
Total		14.7	105.4	1.0	35	35	14.2

Arterial Level of Service: SB Saratoga Ave

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Marion Ave	26	2.7	26	2.9	25	2.8	25
Feeder Dam Rd	43	10.7	42	12.2	42	11.7	42
Total	36	13.3	36	15.1	36	14.5	36

Arterial Level of Service: SB Saratoga Ave

Cross Street	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay	Run 8 Speed	Run 8 Delay
Marion Ave	2.9	25	2.9	26	2.6	25	2.9
Feeder Dam Rd	12.1	41	11.7	40	13.1	41	12.3
Total	15.0	35	14.7	35	15.8	35	15.2

Arterial Level of Service: SB Saratoga Ave

Cross Street	Run 9 Speed	Run 9 Delay
Marion Ave	26	2.7
Feeder Dam Rd	40	12.2
Total	35	15.0

Arterial Level of Service: NB Main St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
5th St	3	46.5	59.7	0.1	7	9	32.1
3rd St	4	8.8	25.3	0.1	20	17	13.6
River St	5	7.2	38.1	0.3	24	24	8.8
Oakland Ave	6	32.5	59.7	0.2	14	14	33.7
Total		94.9	182.9	0.8	15	16	88.2

Arterial Level of Service: NB Main St

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
5th St	7	52.1	8	37.9	4	84.7	8
3rd St	18	11.7	25	3.5	25	4.1	20
River St	24	7.0	25	6.5	25	5.8	24
Oakland Ave	13	38.7	15	29.1	15	28.7	14
Total	14	109.4	17	77.1	13	123.3	15

Arterial Level of Service: NB Main St

Cross Street	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay	Run 8 Speed	Run 8 Delay
5th St	36.8	5	73.5	8	39.2	10	28.2
3rd St	8.0	18	11.6	21	6.9	20	9.9
River St	8.5	25	6.5	25	7.2	25	6.7
Oakland Ave	34.2	15	30.1	15	30.0	14	32.7
Total	87.5	13	121.7	16	83.3	16	77.5

Arterial Level of Service: NB Main St

Cross Street	Run 9 Speed	Run 9 Delay
5th St	9	31.7
3rd St	19	10.0
River St	24	7.5
Oakland Ave	14	34.7
Total	16	84.0

Arterial Level of Service: SB Main St

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed	Run 1 Speed	Run 1 Delay
Mohican St	6	63.2	99.9	0.1	6	7	44.6
River St	5	9.5	37.3	0.2	23	22	11.1
3rd St	4	14.3	44.5	0.3	21	19	18.1
Saratoga Ave	3	43.2	59.6	0.1	9	9	40.2
Total		130.2	241.4	0.8	13	13	114.1

Arterial Level of Service: SB Main St

Cross Street	Run 10 Speed	Run 10 Delay	Run 2 Speed	Run 2 Delay	Run 4 Speed	Run 4 Delay	Run 5 Speed
Mohican St	3	115.4	6	58.9	6	62.8	9
River St	23	9.3	23	10.3	23	10.3	23
3rd St	18	20.7	25	7.4	25	7.0	21
Saratoga Ave	8	46.7	9	41.5	8	45.6	8
Total	10	192.1	13	118.2	13	125.8	14

Arterial Level of Service: SB Main St

Cross Street	Run 5 Delay	Run 6 Speed	Run 6 Delay	Run 7 Speed	Run 7 Delay	Run 8 Speed	Run 8 Delay
Mohican St	34.3	6	57.0	5	80.6	6	59.1
River St	10.0	23	9.7	24	8.8	24	7.6
3rd St	15.2	20	17.2	23	9.4	19	19.6
Saratoga Ave	47.1	9	42.4	8	47.5	11	30.7
Total	106.6	13	126.3	12	146.3	13	117.0

Arterial Level of Service: SB Main St

Cross Street	Run 9 Speed	Run 9 Delay
Mohican St	5	67.1
River St	24	8.3
3rd St	21	13.8
Saratoga Ave	8	46.3
Total	12	135.5

Intersection: 1: Saratoga Ave & Feeder Dam Rd/William St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	192	216	45	184	73	241
Average Queue (ft)	90	104	4	68	10	101
95th Queue (ft)	161	183	28	150	38	204
Link Distance (ft)	829	1118		1440		3902
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			110		90	
Storage Blk Time (%)				2		9
Queuing Penalty (veh)				0		2

Intersection: 2: Saratoga Ave & Marion Ave

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	55	51	24	218	28
Average Queue (ft)	17	10	4	8	3
95th Queue (ft)	46	38	18	219	17
Link Distance (ft)	226	1162		3902	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		50
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 3: Saratoga Ave & Main St & 5th St

Movement	WB	NB	SB	SB	NE	NE
Directions Served	<LR	LTR	LT	R	L	R>
Maximum Queue (ft)	183	299	174	486	274	496
Average Queue (ft)	89	94	120	180	222	138
95th Queue (ft)	159	242	197	392	314	398
Link Distance (ft)	1321	548		684		1357
Upstream Blk Time (%)		0		0		
Queuing Penalty (veh)		0		0		
Storage Bay Dist (ft)			150		250	
Storage Blk Time (%)			7	5	9	0
Queuing Penalty (veh)			54	10	9	0

Intersection: 4: Main St & 3rd St

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	91	70	76	23	366	51	469
Average Queue (ft)	38	16	24	2	131	4	224
95th Queue (ft)	78	52	63	15	313	28	441
Link Distance (ft)	506		752		684		1312
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50		80		80	
Storage Blk Time (%)	8	1			10		19
Queuing Penalty (veh)	1	1			0		1

Intersection: 5: Main St & River St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	65	125	30	254	187	264
Average Queue (ft)	15	59	2	53	75	51
95th Queue (ft)	49	103	15	177	149	175
Link Distance (ft)	528	308		1312	1142	1142
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			0	5		
Queuing Penalty (veh)			1	0		

Intersection: 6: Main St & Mohican St/Oakland Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	L	TR	L	TR	LT	TR
Maximum Queue (ft)	406	150	315	212	229	570	185	601
Average Queue (ft)	153	120	146	45	90	300	172	367
95th Queue (ft)	379	178	264	150	185	495	215	632
Link Distance (ft)	699			418	1142	1142		583
Upstream Blk Time (%)	0			0				14
Queuing Penalty (veh)	0			0				0
Storage Bay Dist (ft)		125	325				160	
Storage Blk Time (%)	4	17	1	0			21	36
Queuing Penalty (veh)	14	20	1	0			75	128

Network Summary

Network wide Queuing Penalty: 318