

# Glen St. Intersections Pedestrian Study

Memo To: Mr. Aaron Frankenfeld, Director  
Adirondack/Glens Falls Transportation Council (A/GFTC)  
11 South Street, Suite 203  
Glens Falls, NY 12801

Date: 8/27/2021

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File: 1896.002.001

## I. Introduction

A/GFTC and the City of Glens Falls initiated the Glen St. Intersections Pedestrian Study to evaluate pedestrian circulation, pedestrian safety, and provide improvement recommendations to the intersections of Glen St. at South St./Bay St. (Intersection # 1) and Glen St. at Sherman Ave. (Intersection #2). The study is administered through the A/GFTC Transportation Planning and Engineering Assistance Program.

This Report summarizes the existing conditions of the two intersections, provides observations of the intersection operations, and provides recommended next steps to implement improvements.



Figure 1 – Project Location Map

## II. Existing Conditions

A site visit was conducted to observe and inventory existing field conditions. Video cameras were deployed for one 24-hour, weekday period at each intersection to identify pedestrian traffic patterns, safety concerns and/or vehicular conflicts, and any confusion that was observed when pedestrians were accessing the intersection(s).

Glen Street at South Street/Bay Street: This is a four leg signalized intersection with pedestrian signals that is centrally located in the City of Glens Falls and surrounded by +local businesses, restaurants, and the Crandall Library. Sidewalks are located on all intersection roadway approaches with sidewalk ramps and crosswalks.

Glen St. (Rt. 9) is a mainline route in the east/west direction with one through lane in each direction, a two-way left turn lane, and parking along each side of the street. Approaching the intersection in the westbound direction, the parking lane and center median end 80 feet before the intersection to allow for a dedicated right and left turn lane. The eastbound approach maintains a parking lane all the way to the intersection with a through-right lane adjacent and the median ending/transitioning to a left turn lane 130 ft. back from the intersection. Mid-block crossings are located 200 ft. and 330 ft. to the west and east of the intersection respectively.

The northbound South Street approach to the intersection features one travel lane in each direction with adjacent parallel parking. A mid-block crossing with curb bump-outs is located 200 ft. south of the approach. Just north of the bump-outs the northbound travel lane transitions into a left turning lane and what was a parking lane becomes a through-right lane for shared movements.

Bay St. has a curbed median at the approach to the intersection with a monument and landscaping. The southbound approach has a left turn lane and through-right shared lane. The opposing direction is a single lane with no parking on either side.



Figure 2.1 – Glen St. at South St./Bay St. Intersection

The intersection is four way signalized with two mast arm signal poles located at the northwest and southeast corners. There are ADA pedestrian signals/push buttons at all approaches with the button for each direction mounted on the same signal pole with the heads above. Curb ramps were previously installed to ADA standards at each corner of the intersection.

Glen St. at Sherman Ave./Washington St.: This intersection is located west of the South St./Bay St. intersection. It is four way signalized for vehicles and does not include pedestrian signal equipment. This intersection is also centrally located in the City of Glens Falls, surrounded by local businesses. There are sidewalks on each corner of the intersection with curb ramps that do not meet current ADA requirements.



Figure 2.2 – Glen St. at Sherman Ave./Washington St.

Glen St. (Rt. 9) is a mainline route in the east/west direction. The westbound approach consists of one travel lane in each direction, a two-way left turn lane in the middle and no parking on either side of the street. The two-way left turn lane converts to a left turn lane 175 ft. from the intersection. The eastbound approach consists of one travel lane and parking lane in each direction. The parking lane in the eastbound direction transitions to a right turn lane with the through-left lane adjacent.

Washington Street, the southbound approach, features a travel lane and parking lane in the northbound direction and two travel lanes in the southbound direction that transition into a right turn lane and a through-left lane on approach to the intersection. The northbound approach, Sherman Avenue, consists of two travel lanes (one in each direction) with no provisions for turning lanes or on-street parking. An entrance to Stewart's is located on the east side of Sherman Ave. with the driveway in front of the stop bar on the northbound approach.

### III. Site Assessment and Observations

#### Glen Street at South Street/Bay Street:

1. Pavement striping – Existing striping is faded and not visible in some locations. Please see Figure 3.1 below.
2. Curb ramps – Several of the ramps are showing signs of deterioration with damaged sections of concrete, curb, detectable warning units, and ponding water, as shown in Figure 3.1. Several pedestrians with strollers were witnessed having a difficult time traversing the existing ramps.



Figure 3.1 – Glen/South/Bay intersection striping and sidewalk ramp condition

3. Many of the pedestrians did not press the push button when crossing. This was more common during non-peak hours or at early hours in the morning when vehicle traffic was lighter. Many of these pedestrians would cross without hesitation, in some instances caused conflict between vehicles with the green light having to wait on pedestrians.



Figure 3.2 – Pedestrians crossing without using the push button

Figure 3.2 was captured during the video recordings. The two pedestrians were attempting to cross South St. without using the push button. The vehicle in the left turn lane had the left turn green arrow but had to wait for the pedestrians to cross in this instance.

4. The pedestrian refuge island at the Bay St. crossing was also problematic causing people to get trapped on the island for one of two reasons.
  - a. Some would stop to read the Civil War monument
  - b. Pedestrians traveling westbound (on Glen St.) that did not use the push button and wait for the "walk" light; would begin to cross, and southbound vehicles would get the green light, trapping them at the island.

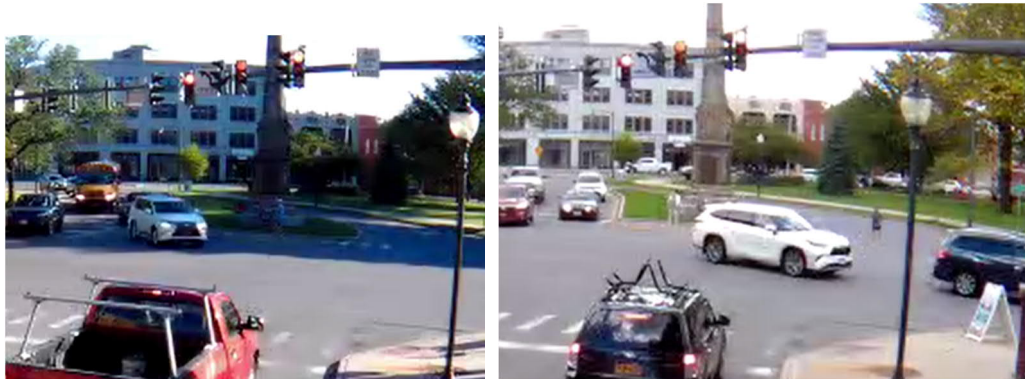


Figure 3.3 – Pedestrians stopped in the Bay St. Median

5. There were numerous occurrences of turning vehicles having to stop and wait for pedestrians in the crosswalk. In this scenario the pedestrians had the right of way with the walk symbol activated while the same direction vehicular movement was green. The City notified us of several public comments citing this same scenario where there was heightened tension between the driver and pedestrian. The observations for this study did not witness any frustrated or "road rage" type interactions. However, it is noted that this could be a safety concern if there were an inattentive driver or pedestrian.
6. Several bicyclists were observed utilizing the sidewalk, sidewalk ramps, and crosswalks to travel through the intersection.

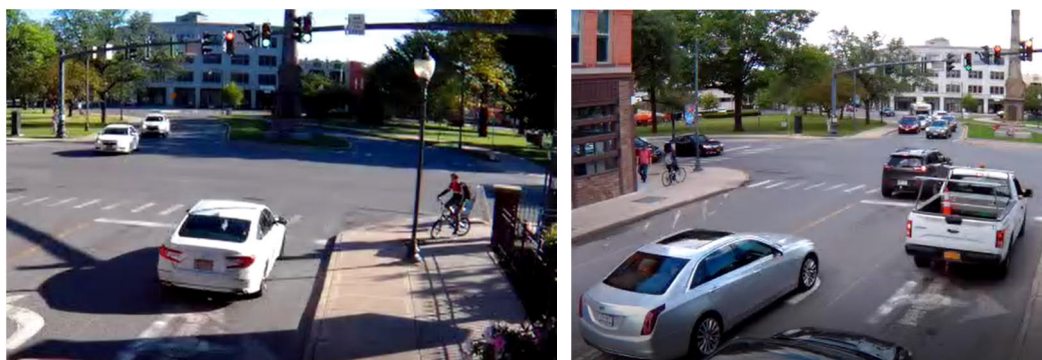


Figure 3.4 – Bicyclists using the sidewalk

7. There were many instances of pedestrian confusion when looking for the push button to cross South St on both sides of South St. At the southeast corner, the push buttons to cross Glen St. and South St. are both located on the traffic signal pole that is adjacent to the Glen St. crosswalk, this pole is 15 ft. away from the South St. sidewalk ramp which may contribute to the confusion. At the southwest corner both push buttons to cross Glen St. and South St. are located on the same pedestrian signal pole that is adjacent to the Glen St. sidewalk ramp and 14 ft. away from the South St. sidewalk ramp.

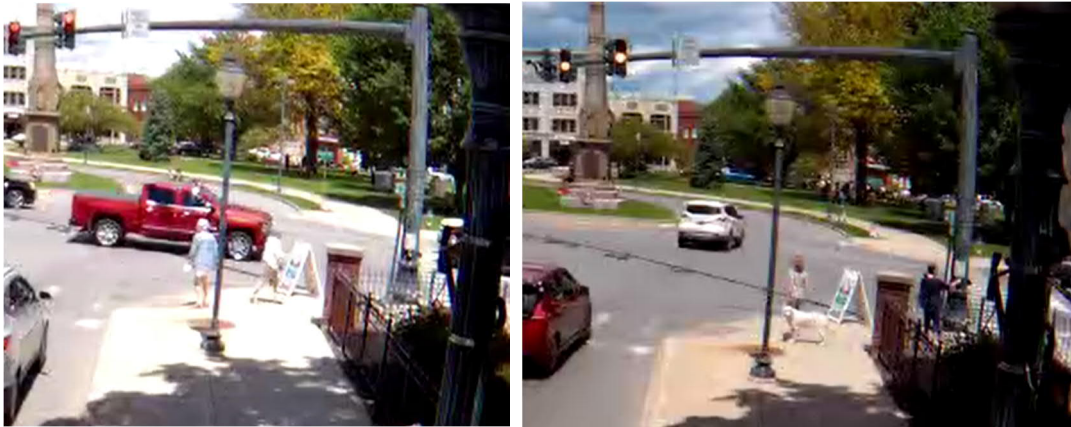


Figure 3.5 – Pedestrians searching for the push button

Glen Street at Sherman Avenue/Washington St.:

1. Pedestrian volume overall was lower than at the Glen St. and South St./Bay St. intersection.
2. Pavement striping – Existing striping is faded and not visible in some locations. Please see Figure 3.6 below.
3. The existing curb ramps do not meet current ADA requirements. The ramps do not include detectable warning units, there are drainage structures located at the base of the ramp, and the positioning of the ramps do not line up with the crosswalk direction. Please see Figure 3.6 below for a close-up view of the south side ramps.



Figure 3.6

4. Pedestrians were observed to be hesitant to cross the street at this location. This appears to be due to the lack of pedestrian signals to guide them. Pedestrians were observed to run to cross the street when there was a gap in vehicle traffic and others would avoid crossing at the intersection completely and defer to crossing mid-block.
5. There were numerous occurrences of turning vehicles having to stop and wait for pedestrians in the crosswalk. The observations for this study did not witness any frustrated or “road rage” type interactions. However, as noted at the other intersection in the study, this could be a safety concern if there were an inattentive driver or pedestrian.
6. The existing signal system is operating satisfactorily. Longer queues of vehicles were witnessed on Sherman Ave. and Washington St. as a result of separate phases being utilized in the signal cycle in lieu of concurrent phases (which is currently restricted due to the one lane approach of Sherman Ave.).
7. Pedestrians were observed to walk through Stewart’s parking lot and cross the street mid-block behind the crosswalk. This crossing pattern is most likely due to the stop bar being located behind the Stewart’s driveway.



Figure 3.7 – Pedestrians crossing at the Stewart’s driveway

#### IV. Recommendations

Recommended improvements to each intersection are provided below that will address the safety and operational issues that were observed. Most of the recommendations are low cost improvements that could be completed by the City or through contracted services. The recommendations are presented as standalone improvements that could be completed one at a time or all at once, dependent on available funding.

##### Glen Street at South Street/Bay Street:

1. Install Turning Vehicles Yield to Pedestrians (MUTCD # R10-15) signs on all intersection approaches, see Figure 4.4 below. Overhead installation on the signal mast arm will be most effective and should be placed in direct view of drivers in the left turn lanes.

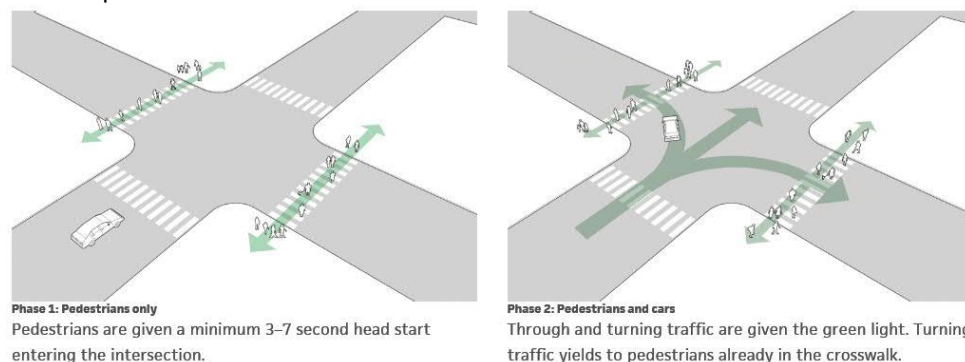


Figure 4.4

An analysis of the existing traffic signal poles was completed based on the as-built record plans. It was determined that the existing signal pole footings have enough moment capacity to support the installation of these four (4) additional overhead signs on the mast arms.

Probable Cost to Implement = \$1,000 Each x 4 Signs = \$ 4,000. Installation includes bracket and mounting hardware, bucket truck, traffic control, and sign panel.

2. Adjust the signal phasing and timing to include a Leading Pedestrian Interval (LPI). A LPI is typically a 3-7 second head start for pedestrians when entering an intersection with a corresponding green signal in the same direction of travel. LPI's are recommended at intersections where high vehicular turning volumes come into conflict with higher volumes of crossing pedestrians during their shared phase of the signal cycle. Coupled with recommendation #1, the Yield to Pedestrian sign, these two items would increase driver awareness of pedestrians at this intersection.



Source: *National Association of Transportation Officials*

Figure 4.3 – LPI Phasing Diagram

Probable Cost to Implement = N/A. The LPI can be implemented at no cost through modifications to the signal phasing and timings.



3. Re-Striping the pavement would aid in guiding vehicles through the intersection and bring attention to the crosswalks.
  - a. High Visibility Crosswalks should be installed at this intersection to provide improved driver awareness of the pedestrian crossing locations. The crosswalks include the addition of two transverse lines to the perpendicular ladder bars that are on site currently as shown in the figure below. The pavement markings should be Epoxy paint with glass bead for retro-reflectivity or retro-reflective thermoplastic pavement marking tape.

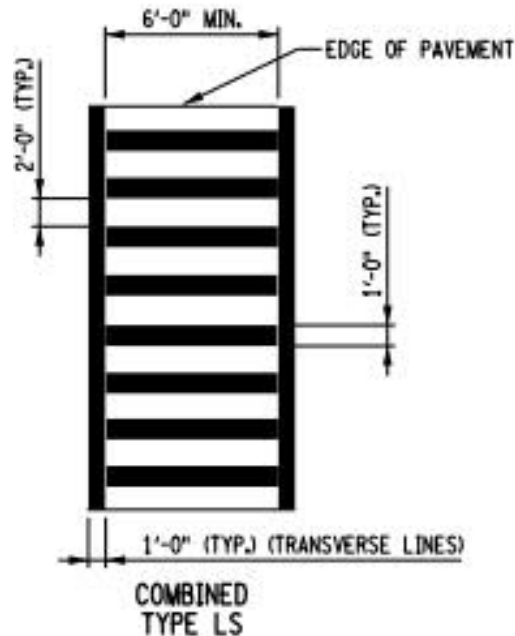


Figure 4.1 – High Visibility Crosswalk Striping

Probable Cost to Implement = \$ 10,000

- b. It is suggested that all other intersection pavement markings are also replaced with Epoxy based retro-reflective paint.

Probable Cost to Implement = \$ 5,000

4. Provide an additional push button only pole at the southeast and southwest corners for pedestrians looking to cross South St.

Probable Cost to Implement = \$ 7,000. Installation includes standard push button, pole, pedestrian crossing sign, conduit, and wiring.

5. Replace the existing pedestrian push buttons with Latching Pedestrian Push Buttons. The Latching pedestrian push button assembly provides visual confirmation with a red LED light that the button was activated and the call was placed to the signal controller. The button itself can be fabricated with an arrow for direction of travel or even upgraded to include the City logo or a theme for the area.



Figure 4.2 – Latching Pedestrian Push Buttons

Probable Cost to Implement = \$900 Each x 8 locations = \$ 6,000

6. Replace the existing static No Turn on Red signs with Overhead No Turn on Red Variable Message Signs (MUTCD # R10-11), please see Figure 4.5. These dynamic signs provide a dual benefit by allowing the no turn restriction when the pedestrian push button is activated and also improves vehicular efficiency by allowing right turns when pedestrians are not present. The signs are installed overhead in line with the right turn movement, wired directly into the signal controller, and activated through the pedestrian push button. When the push button is not activated, the sign is blacked out, allowing right turn movements.



Figure 4.5

An analysis of the existing traffic signal poles was completed based on the as-built record plans. It was determined that the existing signal pole footings have enough moment capacity to support the installation of these four (4) additional overhead signs on the mast arms, as well as the four (4) Yield to Pedestrian signs recommended in #1 above.

Probable Cost to Implement = \$4,500 Each x 4 locations = \$ 18,000. Installation includes removal of existing signs, bracket and mounting hardware, new signs, and wiring to the signal cabinet.

7. Reconstructing the curb ramps to provide new detectable warning units, address the areas of ponding water, and provide a continuous smooth transition between the sidewalk and road surface.

Probable Cost to Implement = \$ 50,000. Installation includes excavation, subbase, concrete, pavement restoration and grading, and detectable warning units.

8. Install Shared Lane Markings (also known as “Sharrows”) to notify vehicles and bicyclists to share the roadway and help deter bicyclists from using the sidewalk.

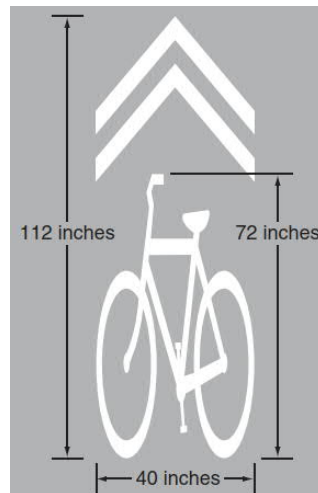


Figure 4.6 – Shared Lane Marking

Probable Cost to Implement = \$200 Each

Glen Street at Sherman Avenue/Washington St.:

1. Install Pedestrian Cross Only on Green sign (MUTCD # R10-1).



Figure 4.8

Probable Cost to Implement = \$ 100 Each x 8 Locations = \$800

2. Re-Striping the pavement would aid in guiding vehicles through the intersection and bring attention to the crosswalks.
  - a. High Visibility Crosswalks should be installed at this intersection to provide improved driver awareness of the pedestrian crossing locations. The crosswalks include the addition of two transverse lines to the perpendicular ladder bars that are on site currently as shown in the figure below. The pavement markings should be Epoxy paint with glass bead for retro-reflectivity or retro-reflective thermoplastic pavement marking tape.

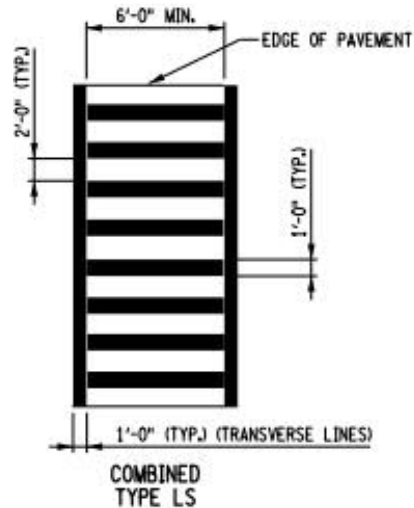


Figure 4.7 – High Visibility Crosswalk Striping

Probable Cost to Implement = \$ 11,000

- b. It is suggested that all other intersection pavement markings are also replaced with Epoxy based retro-reflective paint.

Probable Cost to Implement = \$ 3,000

3. Install Turning Vehicles Yield to Pedestrians (MUTCD # R10-15) signs on all intersection approaches, see Figure 4.4 below. Overhead installation on the signal mast arm will be most effective. Due to the unknown foundation conditions and age of the signal equipment an analysis of the moment capacity of the footings could not be completed. It is suggested that these signs are installed on the signal poles or roadside rather than installed overhead. If the traffic signal is replaced in the future, these signs can be relocated overhead.



Figure 4.9

Probable Cost to Implement = \$1,000 Each x 4 Signs = \$ 4,000.

4. Reconstructing the curb ramps to meet current ADA requirements, provide new detectable warning units, relocate drainage structures, and provide a continuous smooth transition between the sidewalk and road surface.

Probable Cost to Implement = \$ 60,000

5. An additional intersection traffic study could be conducted to evaluate vehicle and pedestrian operation at this intersection, including a pedestrian signal warrant analysis. The study could also analyze the potential benefits of constructing a turn lane on Sherman Ave., increased optimization of the traffic signal, and improved pedestrian measures (such as some or all of the individual items included above).