Revised Draft Report

Hudson Avenue Pedestrian Safety Improvements

Prepared for:

Adirondack | Glens Falls Transportation Council

11 South Street, Suite 203
Glens Falls, New York 12801

And

City of Glens Falls

42 Ridge Street
Glens Falls NY 12801

Revision 1
April 2024

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1.0 INTRODUCTION

A/GFTC and the City of Glens Falls initiated the Hudson Avenue Pedestrian Safety Improvement Plan to study pedestrian infrastructure and safety at the Hudson Ave./South St. intersection and on School St. Both locations are in close proximity to the Village Green apartments, Big Cross Street School, U.S. Post Office, Glens Falls Hospital, on and off-street parking areas, and the multi-use building development at 14 Hudson Ave. These locations all generate and promote pedestrian use through the project area and along the existing sidewalk system which in turn, are increasing the volume of pedestrians travelling through the two study area locations. The catalyst for the project were safety concerns that have been brought to the City's attention including parents from Village Green expressing difficulty crossing Hudson Ave. at the South St. intersection when walking their children to school, and by the Glens Falls Hospital reporting that patrons of the Surgical Specialists of Glens Falls Hospital at 14 Hudson Ave. are crossing School St mid-block. This study includes observations of traffic and pedestrian movement through the study areas, engineering assessments including sight distance analysis, inventory of all existing transportation infrastructure, and prioritized recommendations to address any improvement needs that are identified. The study is being administered through the A/GFTC Transportation Planning and Engineering Assistance Program.

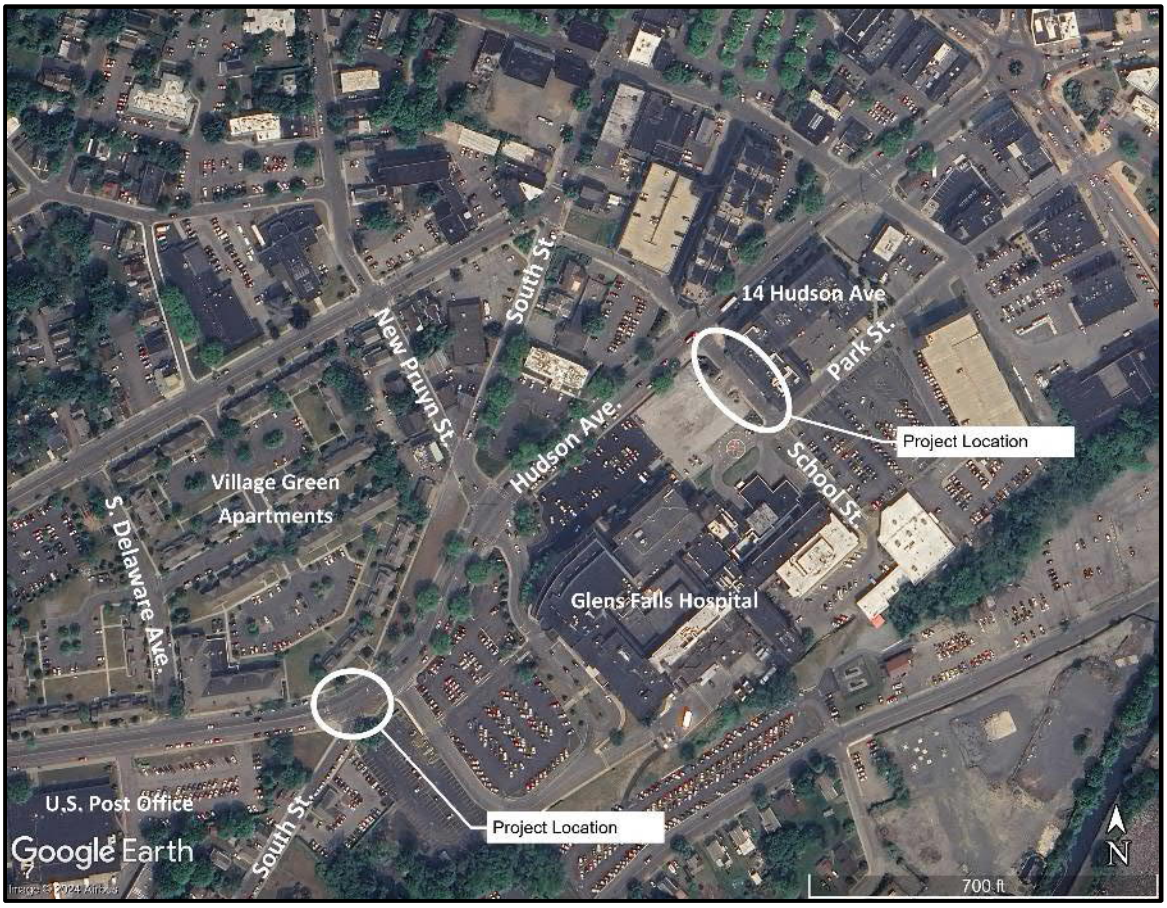


Figure 1-1: Project Location Map.

2.0 INVENTORY OF EXISTING CONDITIONS

Site visits of the project areas were conducted on November 8, 2023 and February 23, 2024 to inventory and document the project area conditions. The inventory included documentation of the existing signage, striping, pavement and travel lane widths, objects that may restrict sight distance, and existing pedestrian features. Additionally, video cameras were deployed for one 48-hour, weekday period from November 8, 2023 to November 10, 2023 at both locations to identify pedestrian and traffic patterns, safety concerns, vehicular conflicts, and/or any confusion that was observed when pedestrians (including students) were accessing the intersection.

2.1. Hudson Ave./South St. Intersection

This is a three-way intersection with stop control on the minor leg (South St.) and uncontrolled on Hudson Ave. Both roadways are included in the City-wide 30 mph speed limit as well as owned and maintained by the City. South St. intersects Hudson Ave. on a horizontal curve at a skew, with a sharp turn at the northern end of South St. to become nearly perpendicular with Hudson Ave. Surrounding land uses consist of the Village Green apartment complex to the north, a Post Office to the southwest of the intersection, and the Glens Falls Hospital to the east. South St. is classified as a Local Urban Minor Arterial with an Average Annual Daily Traffic (AADT) 2,766 vehicles per day (vpd), includes a curb-to-curb width of 28 ft., and sidewalks on both sides. Parking is permitted on the east side of the roadway, however, is prohibited by signage and pavement markings within 50 ft. of the intersection.

Figure 2-1: South St. & Hudson Ave. Project

Figure 2-2: Looking South on South St.

Figure 2-3: Hudson Ave./South St. Int.

Hudson Ave. is classified as an NHS Urban Principal Arterial with an AADT of 10,767 vpd and consists of two 11 ft. travel lanes, two 5 ft. bike lanes, an 11 ft. turn lane for vehicles turning left onto South St, and sidewalks on both sides. The pavement markings within the vicinity of the intersection are in fair condition but do exhibit wear especially within the vehicle travel lanes. Parking on Hudson Ave. is prohibited within the vicinity of the intersection and the pavement width narrows similar to a pedestrian "bump-out" to reduce the pedestrian crossing distance to approximately 42 ft. across Hudson Ave., located on the west side of the intersection with South St. The crossing distance across South St. is approximately 48 ft. Pedestrian warning signs are installed at the crosswalk on the right hand side of the roadway approaching either marked crosswalk. However, the signs do not include the diagonal downward pointing arrow as required by the 2009 MUTCD. The intersection is located approximately 1/2 mile from the Big Cross Street School and provides the most direct route from the Village Green apartments to the school.

Figure 2-4: Crosswalk crossing Hudson Ave at the intersection with South St.

Figure 2-5: Horizontal curve on Hudson Ave looking east

Figure 2-6: Pedestrian warning sign installed on the east approach to the Crosswalk

Figure 2-7: West approach to the Crosswalk on Hudson Ave.

The sight distance for westbound traveling vehicles to the crosswalk is limited by trees planted within the snow storage area between the curb and sidewalk on the inside of the horizontal curve on Hudson Ave. The measured stopping sight distance to the crosswalk for vehicles traveling west is 200 ft. which is below the minimum standard of 250 ft. for a design speed of 35 mph (posted speed limit plus 5 mph) in accordance with Exhibit 2-4a of the New York State Department of Transportation (NYSDOT) Highway Design Manual (HDM).

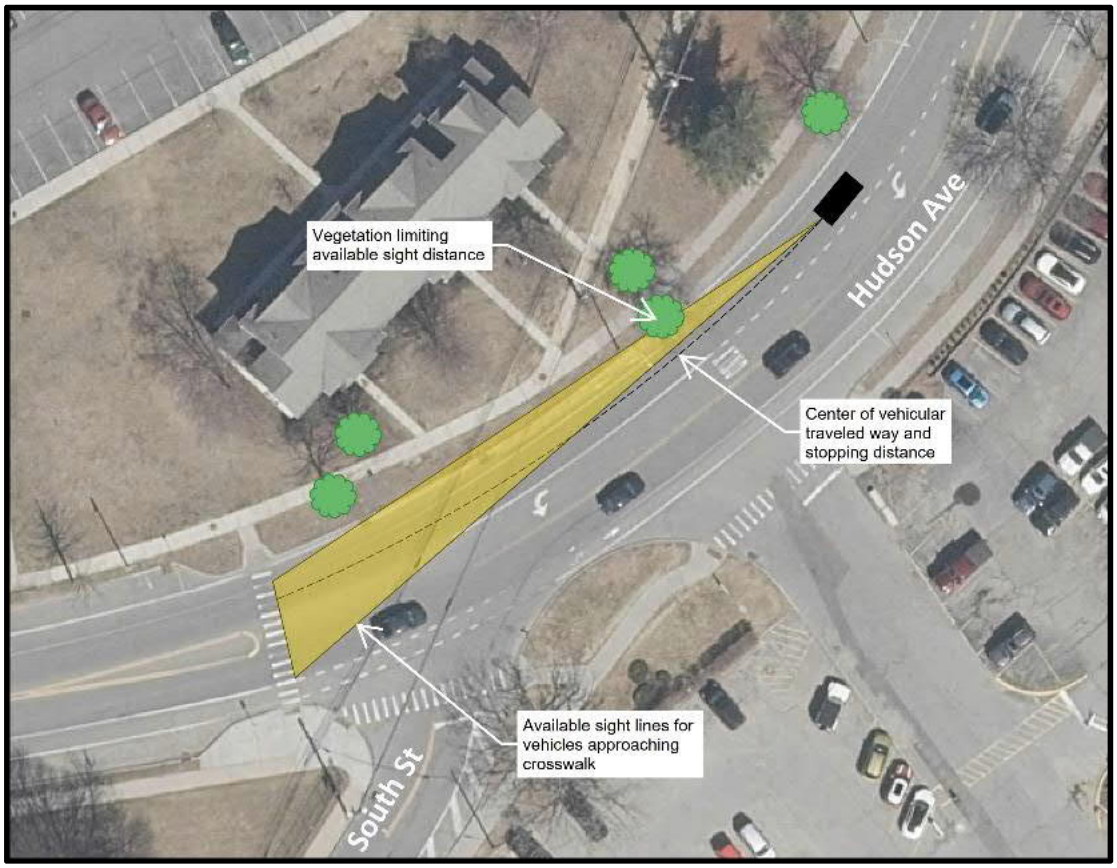


Figure 2-8: Available Sight Distance Figure

Crash data was obtained from the NYSDOT CLEAR website for the intersection from August 31, 2018, to August 31, 2023 to assess the safety of the intersection from a pedestrian perspective. Over this timeframe, no pedestrian/vehicular incidents or crashes associated with the crosswalk were reported. Overall, 9 vehicle/vehicle crashes were reported at this intersection and included various types of crashes such as sideswiping parked cars and rear-end incidents.

2.2. School St.

This section of School St. included in the study area is a short city block between Hudson Ave. (to the north) and Park St. (to the south) Within this block is the entrance to the Surgical Specialists of Glens Falls Hospital (14 Hudson Ave.) and the entrance to a large parking lot that services this building and the Glens Falls Hospital. The Hudson Ave. intersection is a 4-way intersection with stop control on the southern leg of School St. The northern leg of School St. is one-way controlled with traffic traveling to the north. Hudson Ave. is uncontrolled and consists of marked crosswalks across all four legs. However, no pedestrian warning signs are present on Hudson Ave. The intersection of School St. and Park St. is stop controlled on all but the west leg of the intersection, which serves as access to the Emergency Room drop off area and parking lot access for Glens Falls Hospital. The southern leg of School St. provides access to another parking area for the hospital and adjacent buildings. Crosswalks are present across both legs of School St.

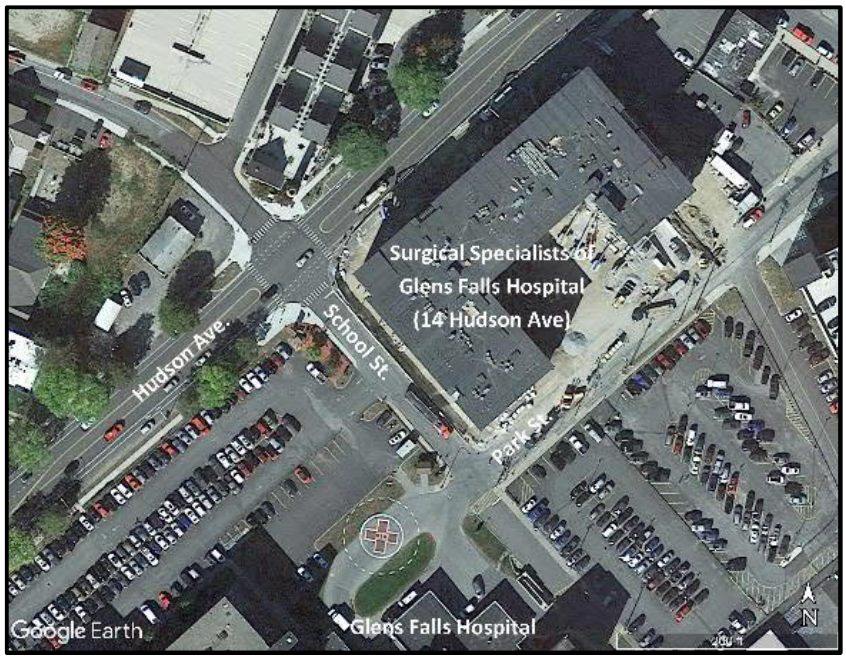


Figure 2-9: School St. Project Location Map.

Figure 2-10: Crosswalk crossing School St. at the intersection with Park St.

Figure 2-11: Crosswalk crossing School St. at the intersection with Hudson Ave.

School St. is classified as an Urban Local Road that is owned and maintained by the City with a curb-to-curb width of 28 ft., and sidewalks on both sides. An additional 10 ft. of pavement surface is provided in front of the entrance to the Surgical Specialists of Glens Falls Hospital for patient drop-off and pick-up. Traffic volumes on School St. are not available on the NYSDOT Traffic Data Viewer, however it is assumed to be low based on our site observations and review of the video footage. Pedestrian activity between the parking lot and this building entrance is high during working hours. There are currently no markings or signs consistent with a mid-block crossing here, although on School Street at the entrance to the Hospital parking lot, the wayfinding sign directs vehicles to park in the Hospital parking lot for the Surgical Specialists. Also, the sidewalks on either side of the parking lot entrance have a curb ramp and detectable warning units, giving the impression that this is a crossing location. Currently, to legally cross this street, pedestrians should utilize the sidewalks to walk to either the Park St. or Hudson Ave. sidewalk ramps and use the existing crosswalks at these intersections.

Figure 2-12: Crosswalk crossing School St. at the intersection with Park St.

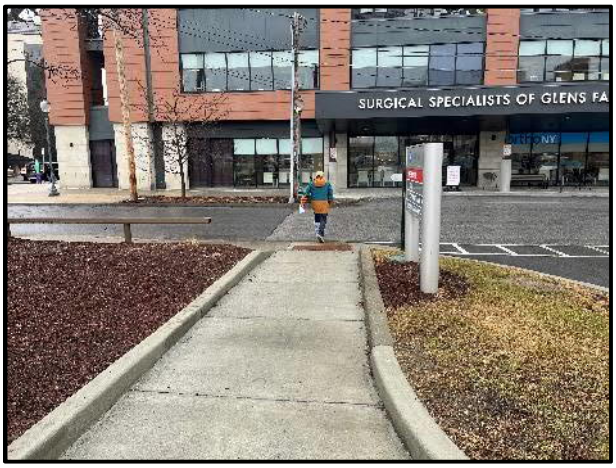


Figure 2-13: Patron of the Surgical Specialists crossing mid-block on School St.

Figure 2-14: Signage directing pedestrians to the sidewalks adjacent to the parking lot driveway.

3.0 SITE ASSESSMENT AND OBSERVATIONS

3.1. Hudson Ave./South St. Intersection

1. Hudson Ave. at the intersection with South St. is situated on a curve. This curved alignment creates poor sightlines for pedestrians crossing Hudson Ave. and drivers turning onto Hudson Ave. There were two observed instances of left-turning trucks from South St. accelerating in front of opposing left turning vehicles onto South St.

Figure 3-1: Left Turn Conflicts

2. The curve on Hudson Ave. also creates a shallow angle of approach to the intersection when travelling westbound. A regularly occurring issue was with vehicles making wide left turns onto South St. at excessive speeds and crossing through the opposing travel lanes. This is a safety concern since it could result in a head-on collision with vehicles or a collision with a pedestrian in the crosswalk who is not expecting a vehicle to make this maneuver.

Figure 3-2: Hudson Ave. wide left turn movements

3. Although most pedestrians crossed the intersection at the marked crosswalk, there were also instances where pedestrians crossed diagonally across Hudson Ave. This could be a safety concern since many of these crossings occurred at night, especially with an inattentive driver or pedestrian.

Figure 3-3: Pedestrian crossing outside the crosswalk

4. The lighting at the intersection is not focused on the crosswalks, especially on the southern half of the crosswalk. See Figure 3-3 above.

5. Some vehicles did stop and wait for pedestrians to cross the intersection, which is required by NYS Law when a pedestrian is within a marked crosswalk but is not always observed. These vehicles often had to stop abruptly, especially when traveling westbound, to let the pedestrians cross the roadway.

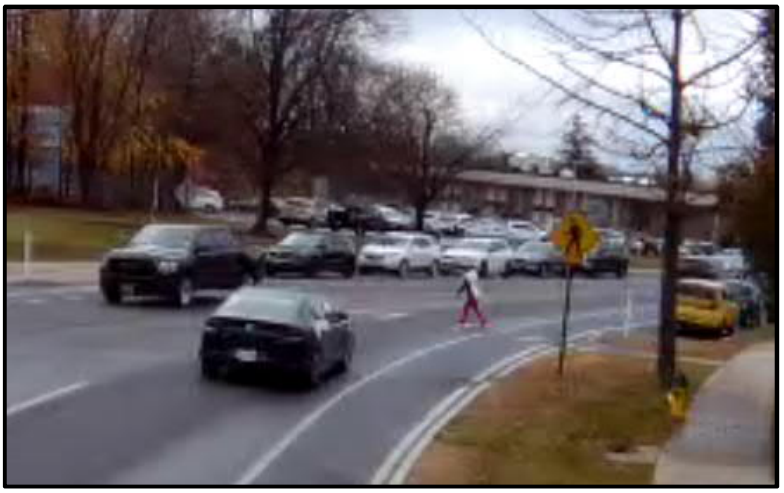


Figure 3-4: Car stopped to let pedestrians cross

6. The majority of the foot traffic through the intersection appears to be from employees of the hospital. Individuals are parking on Hudson Street and walking through the intersection towards the hospital in the morning and back to their parked cars in the evening.

7. There was a high volume of bicycle and other micromobility (E-bikes and scooters) traffic through the intersection during the observation period. Bicyclists often utilize the sidewalks, sidewalk ramps, and crosswalks to travel through the intersection. Although bicycles on sidewalks are not encouraged, most of these bicyclists may not be comfortable riding in the bike lanes on the road with vehicles.

8. Several instances were observed where vehicles on Hudson Ave did not stop when pedestrians were standing at the curb ramp waiting to cross. Vehicles typically only stopped when a pedestrian was already within the crosswalk in the roadway.

9. During the observation period, GGFT buses were observed travelling eastbound on Hudson Ave. approximately every two hours during peak periods. The GGFT schedule could not be verified since CDTA took over bus service between data collection and processing, though the bus route is now the 407, which matched with the bus timings. It was observed that the bus stop at South St. was not used.

3.2. School St.

1. On School St., most pedestrians were observed to cross mid-block from the parking lot to the Surgical Specialists of Glens Falls Hospital. Many crossers are assumed to be patients, with a significant majority of users in strollers, wheelchairs, and walkers.

Figure 3-5: Wheelchair user conducting a mid-block crossing

2. It was noted that pedestrian crossings were approximately bunched into 15-minute intervals during the hospital open hours, indicating that most pedestrians were patients, or employees of the hospital. Pedestrian mid-crossings outside of the hospital open hours were sparce.

3. A significant amount of traffic on School St. were ambulances, due to the emergency entrance for the main hospital situated behind this crossing. This could be a safety concern when an ambulance must pass while pedestrians are crossing.

4.0 CONCEPT ALTERNATIVES

4.1. Standards

The proposed design layouts and recommendations are based on the following standards:

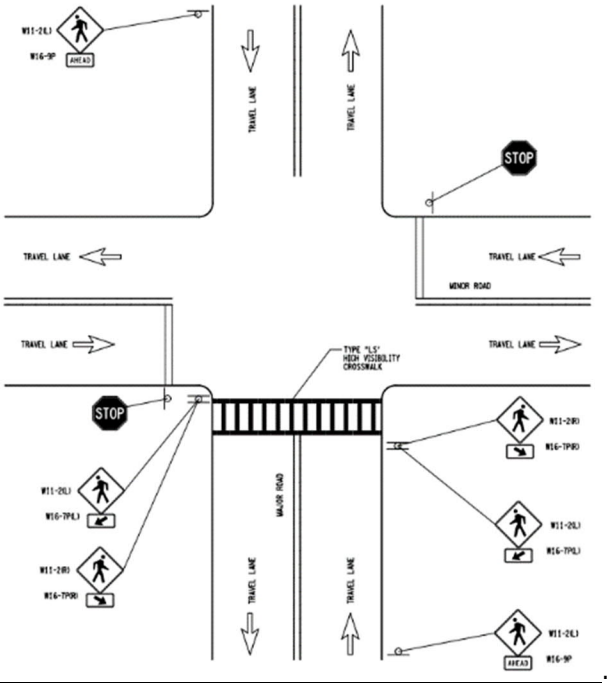
- NYSDOT Highway Design Manual (HDM),
- AASHTO Policy on Geometric Design of Highways and Streets 7th ed., 2018,
- FHWA Manual on Uniform Traffic Control Devices (MUTCD), 2009,
- NYS Supplement to the MUTCD,
- National Association of City Transportation Officials (NACTO) Urban Street Design Guide

4.2. Hudson Ave./South St. Intersection

4.2.1. Existing Intersection Control to Remain:

4.2.1.1 Install fluorescent yellow-green advanced pedestrian warning signs

As a minimum treatment, advanced pedestrian crossing signage should be installed on Hudson Ave. in accordance with Figure 4-1. The warning signs have the option to be yellow or fluorescent yellow-green. Fluorescent yellow-green is recommended for greater visibility and should include the retroreflective signpost strip to increase awareness to motorists. Pedestrian signs with the downward diagonal pointing arrow should be installed on both sides of the road at each approach to the crosswalk, and the pedestrian signs with "ahead" plaque below should be installed in advance of the crosswalk



Source: NYSDOT TSMI 17-07 PSAP Countermeasure Details

Source: Pexco

Figure 4-1: Sign plan for Uncontrolled Crosswalks at Intersections

Cost to Implement = $ 250 Ea. Post (4 posts) + $ 200 Ea. Sign (6 signs) = $2,200

In addition to the advanced pedestrian warning signs on the side of the roadway, an R1-6 sign, "State Law Yield to Pedestrians Within Crosswalk" sign should be installed to the west of the crosswalk in the median of Hudson Ave. The use of this sign within the roadway has been proven to increase driver compliance with state crosswalk laws. This sign should also have the fluorescent yellow-green background.

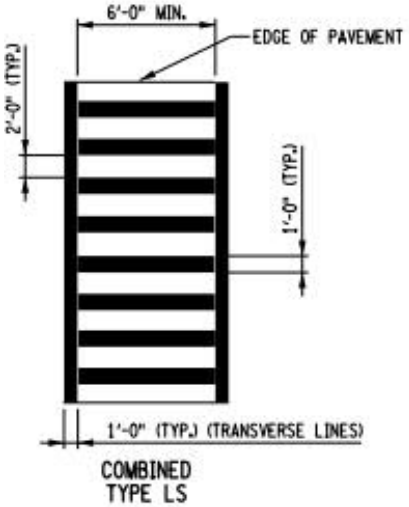
Cost to Implement = $600 Each Sign and Base

Source: MUTCD

Figure 4-2:
R1-6 Sign

4.2.1.2 Install High-Visibility Crosswalks

To increase awareness of the crosswalk, high-visibility crosswalks should be installed on Hudson Ave. to alert motorists of the potential for pedestrian activity at this location. The crosswalk should be "NYSDOT Type LS" that includes parallel stripes and ladder bars to enhance visibility. The pavement markings should be Epoxy paint with glass beads for retro-reflectivity or retro-reflective thermoplastic pavement markings. It is suggested that the South Street crossing is upgraded to the Type LS crosswalk as well.



Source: NYSDOT

Figure 4-3: High Visibility Crosswalk Striping

Cost to Implement = $5,000

4.2.1.3 Improve Sight Distance

Remove the trees between the curb and the sidewalk within 250 ft. of the westbound approach to the intersection. Currently, the trees between the curb and the sidewalk on the curve restrict the stopping sight distance of vehicles approaching the intersection and potentially cause a hazardous condition for pedestrians utilizing the crosswalk, or waiting to cross Hudson Ave.

Source: Google Street View

Figure 4-4: Restricted Sight Distance on Hudson Ave. approaching South St. from the east

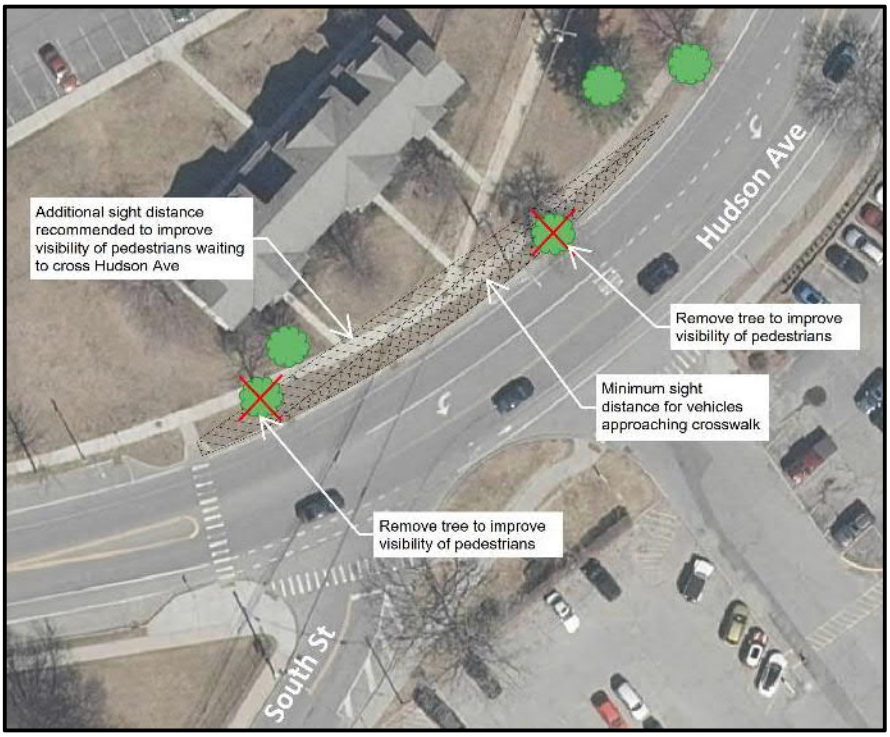


Figure 4-5: Recommended Tree Removals to Improve Sight Distance

Cost to Implement = $ 6,000

4.2.1.4 Improve Lighting

Install a new light pole on the southwest corner of the intersection to illuminate the southern side of the Hudson Ave. crosswalk, sidewalk ramp, and any pedestrians for vehicles approaching from the intersection. The existing light pole on the north side of the intersection currently illuminates the northern half of the crosswalk and should remain in operation.

Cost to Implement = $ 15,000 per pole

4.2.1.5 Install Rectangular Rapid Flashing Beacons (RRFB)

RRFB's consist of a rapid high intensity flashing yellow beacon mounted to a standard pedestrian warning sign installed just at a crosswalk of an uncontrolled approach to an intersection. The beacons are activated when a pedestrian pushes a button to cross the roadway. The installation of these are relatively low cost and have been proven to be highly effective at improving the yield rate of motorists at marked crosswalks. RRFB's can be solar powered or can be hard-wired into the electric grid to provide electrical power. In this installation scenario, two beacon assemblies would be installed, one on the north side, and one on the south side of Hudson Ave. The pedestrian warning signs and flashing beacons would be installed on both sides of the posts to provide two warning signs and flashing beacon assemblies for each approach to the crosswalk. Advanced pedestrian warning signs should also be installed as noted in section 4.2.1.1 on the sign plan for uncontrolled crosswalks.

Source: B&L Project Photo

Figure 4-6: Typical RRFB Installation at an Intersection

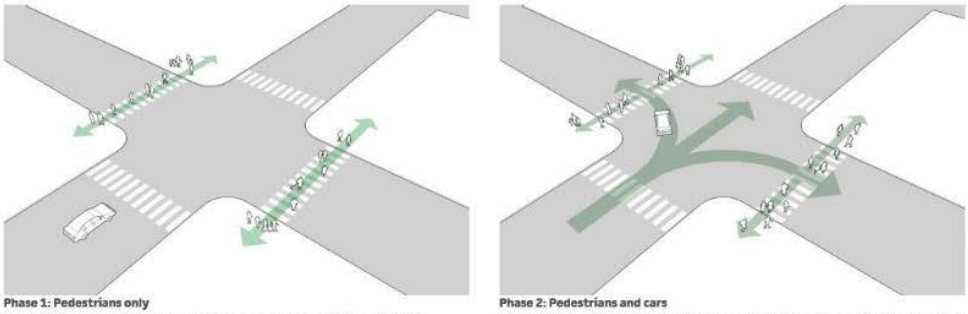
Cost to Implement = $ 12,000 per pole x 2 poles = $24,000

4.2.2. Change the Intersection Control

4.2.2.1 Design and Install a new Traffic Signal System

Install a new traffic signal at the intersection that will meet all of the current standards and technology requirements. A new traffic signal would include the highest level of both vehicular and pedestrian safety improvements to the intersection. A signal warrant analysis would need to be performed prior to progressing the installation of a traffic signal and a traffic study should be performed to assess the need to coordinate the new signal with existing signals at Murray St. and New Pruyn St.

A new traffic signal controller will also allow for a Leading Pedestrian Interval (LPI) to be programmed. 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 the Yield to Pedestrian sign, these two items would increase driver awareness of pedestrians at this intersection.



Source: National Association of Transportation Officials

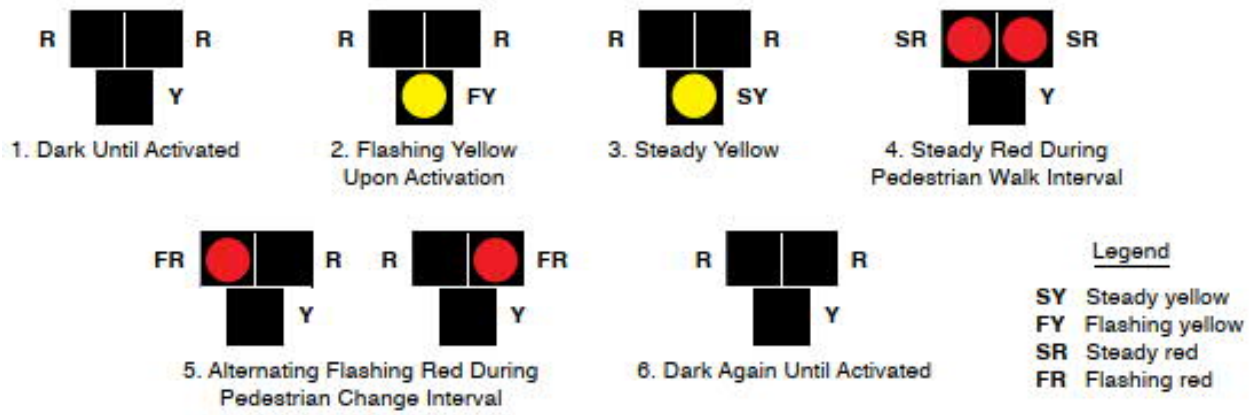
Figure 4-7: LPI Phasing Diagram

Cost to Implement = $ 250,000*

*Includes Design and Construction Costs

4.2.2.2 Install a High intensity Activated Crosswalk (HAWK) Signal.

If traffic signal warrants do not indicate that a full traffic signal is appropriate at this intersection, the MUTCD states that a HAWK signal may be installed to facilitate pedestrian crossings instead. A HAWK signal will have a similar effect as a traffic signal would by stopping vehicular traffic when activated by a pedestrian. Outside of the time the signal is activated, the signal heads will be dark allowing vehicles to travel through the intersection as they do now. Upon activation by a pedestrian, the stop sequence begins with flashing yellow beacons and ending as a solid red beacon for approaching vehicles and a walk symbol for pedestrians. See the figure below for the complete sequence of operations for a HAWK signal.



Source: MUTCD

Figure 4-8: HAWK Signal head Sequence

Source: FHWA

Figure 4-9: Example of a HAWK Signal in Tucson, Az.

Cost to Implement = $ 180,000*

*Includes Design and Construction Costs

4.2.3. Additional Options Not Progressed

Other options that were considered and not recommended were relocating the crosswalk to the east side of the intersection to improve sight distance to vehicles approaching from the east. The improvement in sight distance was not great enough to recommend this alternative. Removing the crosswalk at this intersection was also considered and discarded as pedestrians are not likely to walk the greater distance required to reach their destination on South St., or the School.

Relocating the intersection to the west by approximately 50 ft. was considered to address the skew that South St. intersects Hudson Ave. This option would improve the traffic flow and vehicular safety through the intersection. However, pedestrian safety would remain a concern as the sight distance restrictions that are present for vehicles approaching the crosswalk from the east will still be in place. The new location of South St. is still located on the horizontal curve on Hudson Ave. Additional constraints to constructing this option include approximately 5,000 sf. of right-of-way acquisition from the US Post Office and the cost of relocating the intersection is expected to be $150,000 to $200,000.

Another option that was considered and not progressed was the addition of a raised concrete curb median between the two travel lanes on Hudson Ave. The existing width between the pavement markings in the existing median are approximately 7 ft. The new concrete curb face should be installed with a 1 ft. minimum offset from the edge of the travel lane leaving 5 ft. in width for the new median to be installed. The NYSDOT HDM recommends that pedestrian refuge medians are at least 6 ft. wide (measured in the direction of pedestrian travel.) Additionally, larger vehicles (box trucks, garbage trucks or buses) making a left turn from South St. onto Hudson Ave would likely hit the median because of the skew of the intersection. This option would likely become a maintenance issue for the City and is not recommended to be pursued further.

4.3. School St.

As noted in section 2.6.2 of the AASHTO: A Policy on Geometric Design of Highways and Streets, "Pedestrians tend to walk in a path representing the shortest distance between two points." In this particular situation where the entrance to the Surgical Specialists of Glens Falls Hospital and the parking lot are located directly across School St. from one another, the shortest route between where patrons park their cars and their destination is at a point in the middle of this city block. Signage prohibiting pedestrian crossing and directing them to one of the already established crosswalks is an option in this situation since the distance to the nearest crosswalk is approximately 100 ft. or less. However, this signage may regularly get disobeyed as this is a low vehicular volume city roadway and a path of 30 ft. in length is much more inviting to most pedestrians than a path of 250 ft. Additionally, when considering the observed clients who

frequent this facility, patrons in wheelchairs, elderly, or physically impaired patrons are less likely to walk a further distance when a shorter option is available.

Given these considerations, the most prudent recommendation is to install a mid-block crosswalk and appropriate signage from the existing curb ramp on the north side of the parking lot driveway to the entrance to the Surgical Specialists of Glens Falls Hospital building. Due to the short distance from the nearest intersection to the proposed location of the crosswalk, the pedestrian warning sign with the downward diagonal arrow installed (back-to-back) on both sides of the crosswalk should be sufficient signage on the roadway. See figure 4-1 for the specific signs to be installed. High-visibility fluorescent yellow sign post strips should also be installed along with a high-visibility crosswalk as shown in figure 4-3. A double yellow centerline on School St may also be beneficial to delineate the travel lanes and visually narrow the roadway for vehicles. The roadway is currently unstriped and may appear to be wider than it is intended.

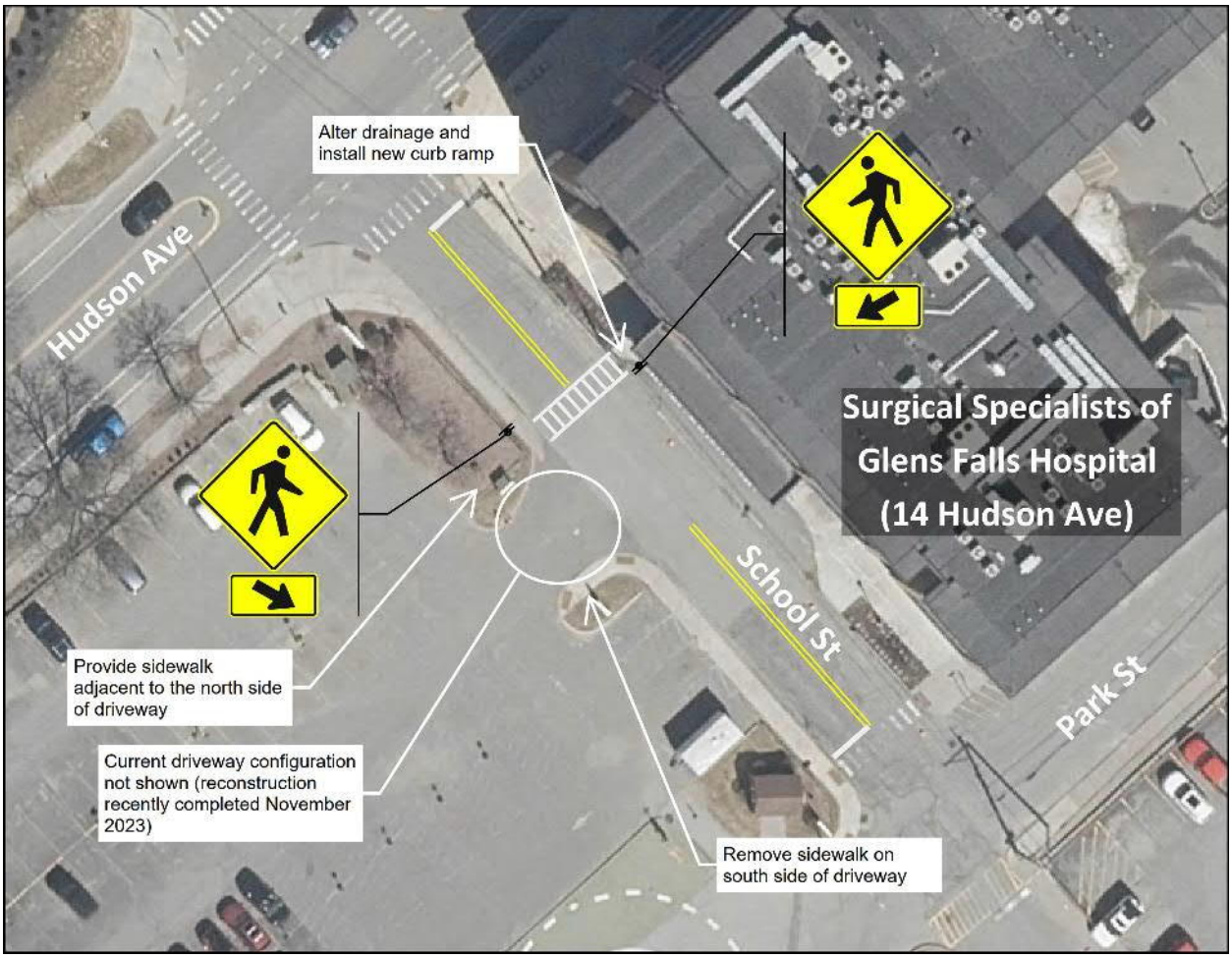


Figure 4-10: Concept plan for School St. Crossing.

5.0 PUBLIC INPUT AND NEXT STEPS

Public input will be scheduled in the near future and this section will be updated at that time.

6.0 FUNDING OPPORTUNITIES

This section will be provided in the Final Report following the public input stage and the City's review of the recommended strategies.