Glens Falls, New York: Healthy Community Design Recommendations

Prepared for: Glens Falls, NY; the Open Door Mission; and the North Country Population Health Improvement Program, Adirondack Health Institute.
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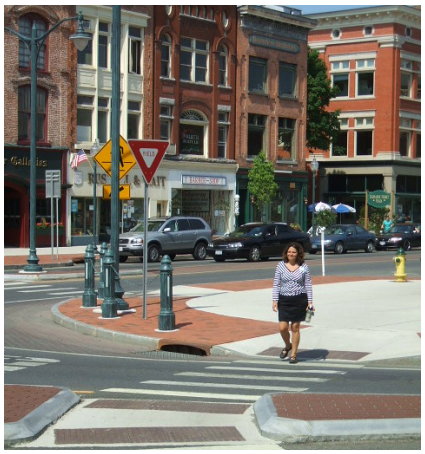
Modeling a human curb extension on Glen St. during a walk audit, Sept. 2019.

Recommendations Supporting Healthy Community Design

On September 17, community leaders, staff, and residents of Glens Falls, NY, took part in a healthy community design walk audit sponsored by the North Country Population Health Improvement Program of Adirondack Health Institute and the Open Door Mission. The group convened with facilitator Mark Fenton at the Crandall Public Library for a brief discussion of the attributes of a community that encourages routine walking, bicycling, and transit use. Then all joined a facilitated walk audit to the Open Door Mission to explore some typical conditions in the community on foot, followed by a discussion of specific recommendations for action.
During these activities Mark summarized an overview of the key research into what creates a more walkable community, and settings that encourage increased walking, bicycling, and more routine "active transportation." This included exploring the growing evidence that these factors not only support public health through increased physical activity, but also economic vibrancy, environmental sustainability, and quality of life. Four key characteristics of such a thriving community are as follows:

A. Mixed land use patterns: Compact development with different land uses and activities intermingled and close together, allowing for varied types of destinations within walking, cycling, and transit distance, while preserving open land and agricultural space.

B. Active transportation facilities: A comprehensive and connected network of pedestrian, bicycle, and transit facilities, such as sidewalks, bicycle lanes, and non-motorized pathways, as well as frequent, affordable, quality transit services appropriate to the community scale, from dial-a-ride to scheduled buses.



C. Functional site designs: Destinations and routes are designed to reward, not punish, those who arrive on foot, by bike and transit, such as buildings at the sidewalk, with parking on-street or behind, and elements such as street trees and landscaping; street furnishings such as benches, planters, and awnings; human scale lighting and way-finding signs; safe and appealing transit stops with cover, benches, and schedule information; and quality, plentiful bicycle parking.

D. Safety and access: for people of all ages, incomes, physical abilities and disabilities, including quality street crossings (e.g. highly-visible markings, countdown timers on pedestrian signals), fully ADA-compliant design, and appropriately applied state-of-the-art traffic calming such as curb extensions, median islands, roundabouts and mini-circles, and lane reductions and narrowing.

Recommendations and priorities

Glens Falls is making great progress in supporting active transportation, and the city overall appears to recognize the importance of improving the walk-, bike-, and transit-friendliness of the community as an explicit economic development priority. This is demonstrated by the downtown district's wide sidewalks, bicycle lanes, progressive roundabout design, and the Warren County Bikeway (photo at right), among many other pedestrian- and bicycle-, and transit-friendly features. However, there are still a number of areas in which simple design and policy changes can positively impact the health and vitality of the community. The following is a summary of particular areas of focus that came out of a walk audit from the library, up Ridge Street, east on Lawrence Street, along a section of the Warren County Bikeway trail, and down Platt Street to the Open Door Mission. Though the recommendations are limited to this First Ward neighborhood, they are likely to be relevant to similar locations throughout the community.

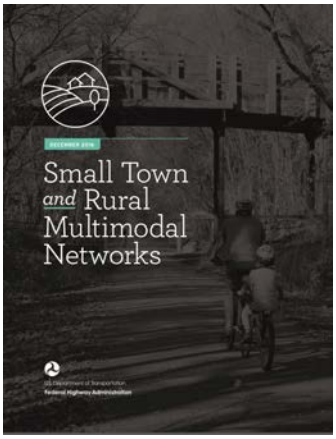
1. Glen Falls should fully apply Complete Streets principles to all future road work.

A Complete Streets (CS) policy states that every time a roadway is touched—new construction, repaving, or just routine maintenance and painting—consideration should be given to accommodating all users: pedestrians, bicyclists, transit riders, and drivers of all ages, incomes, abilities and disabilities. The accommodation and design should be based not just on the volume and intended speed of the traffic, but also transit use, adjoining land uses, particular safety concerns, and potential *best-case* pedestrian and bicycle traffic.

- Complete Street policies should specifically require routine accommodation – the inclusion of CS design elements during other work, such as when roads are torn up for utility work, or when private entities are seeking development and construction permits and site plan review.

- Projects should specifically provide as a matter of course pedestrian and bicycle facilities, safe crosswalks, bicycle parking, and even street furnishings such as benches and planters whenever feasible.

Adopt Complete Streets design guidance. Design guides are great references for engineering and infrastructure staff and consultants, and can be adopted by the city for reference. They provide detailed design treatments, images, and practical examples for a broad range of conditions, based on existing best practices:



- The National Association of City Transportation Officials *Urban Street* and *Urban Bikeway* and *Transit Street Design Guides* (nacto.org).

- The Federal Highway Administration's *Small Town and Rural Multi-Modal Networks* design guide (FHWA, 2017).

Adopt the *Guidebook for Developing Bicycle and Pedestrian Performance Measures,* (FHWA 2016). This details measures of roadway performance beyond simply moving the maximum number of motor vehicles in the minimum time. It recommends considering impacts on economic activity and business access, safety for all users, mobility for at-risk residents, health and environmental outcomes, and others.

Place curb extensions at mid-block crosswalks. Curb extensions, or "bump outs" widen the sidewalk for most of the width of the parking lane at intersections and crosswalks, providing the following benefits to pedestrians *and* drivers:

- Increases the ability of pedestrians to see and be seen by vehicles, and shortens the crossing time for pedestrians (which also benefits drivers).
- Precludes cars from parking illegally and dangerously close to crosswalks, side streets, driveways, and fire hydrants.
- Appropriately slows (or calms) traffic in the busiest crossing zones.

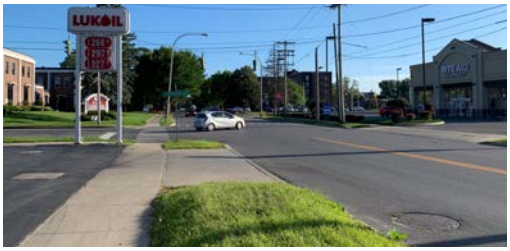
Mid-block crossings can greatly benefit from curb extensions as it is common for vehicles to park too close to the crosswalk, creating a situation where a pedestrian is essentially stepping out from behind a parked car. This was the case with the crosswalk near Lapham Place (cover photo) and would be an ideal location for curb extensions on both sides of the street. A "yield to pedestrian in crosswalk" sign can then be placed at the centerline, or on the curb extension (example at left).

Street Furnishing. Street furnishings such as benches, shade trees and structures (e.g. gazebo, pergolas), bike parking, planters, and trash receptacles, increase the functionality, appeal, and often safety of the streetscape. Local businesses, artists, and students (e.g. welding and carpentry students in BOCES programs) can all be partners in creating and maintaining street furnishings. For example, the bike rack at right was designed and built by high school welding students in Scituate, MA for the community library.

Pedestrian and bicycle way-finding system. Many important destinations are within walking distance of the library and downtown district where the audit started, but there is relatively little way-finding information for pedestrians and bicyclists. A simple first step would be to direct pedestrians and bicyclists to key destinations such as the library, post office, museums and theaters, schools, parks and the Warren County Bikeway, shopping districts, and businesses. Signs should indicate walk and bike times to destinations (based on 3 mph walking speed, and 10-12 mph for bicycling). This can be tried inexpensively by making signs through the *WalkYourCity.com* website (example at left).

2. Ridge Street Complete Street improvements, between E. Washington and May Streets.

The section of Ridge Street between E. Washington and May Streets briefly widens to four lanes, including the section directly in front of the Rite Aid. This appears done to provide a left turn lane for northbound traffic turning from Ridge onto E. Washington, and a right turn lane for southbound traffic (photo at right). However, it was observed that this makes this segment of Ridge Street quite challenging for pedestrians to cross and bikes to ride along. It's also challenging for northbound drivers who must suddenly merge when there is a reduction from two lanes to one just past Lawrence Street (photo at left). Also Rite Aid has multiple driveways, one of which empties directly into the southbound right turning lane. The crossing danger posed to pedestrians, lack of bike facilities, and challenges for drivers suggest several positive design changes that can be implemented to improve this on a trial basis, and if successful, these can be made permanent.



Lane reduction between E. Washington and Lawrence Street. The section of road between E. Washington and Lawrence Streets can be reduced to one travel lane in each direction, with a center turn lane and a bike lane on each side of the road. This could initially be demonstrated with cones, but ideally by repainting this short section of the road.

Close the south exit from the Rite Aid parking lot onto Ridge Street. It was observed that few drivers use this exit because it empties directly into the right turn lane for E. Washington Street. Planters and benches can be used to close this off temporarily while providing functional seating for pedestrians and allowing observation of the impacts of this change before it is made permanent.

Median pedestrian crossing island. There is no left turn possible off of Ridge Street between E. Washington and Lawrence Street, so the center lane can actually be marked off as a median island. Initially this can be demonstrated with temporary paint, cones, vertical delineators (above, right), or even hay bales or other unique materials. But it should eventually be created with permanent paint, and ideally at least textured pavement or preferably a raised median, with a high visibility ladder style crosswalk painted through the island (at right). Note that the youngsters from the Head Start program on Pearl Street routinely visit the fire department on Ridge Street and will greatly benefit from these crosswalk improvements at Lawrence and Ridge.

Median island with high-visibility crosswalk

3. Pearl Street Safety Improvements.

The Intersection of Pearl Street and Lawrence was identified by the group as needing significant improvement. It is frequently used by pedestrian and bicyclists as well as by Head Start, which regularly walks children for field trips and must cross this intersection. A major challenge is that it is very wide allowing vehicles to carry high speeds turning onto Pearl Street and resulting in a long crossing distance for pedestrians. The one stop sign at this intersection on Pearl Street is placed so far back from the corner that drivers at the stop line cannot see pedestrians, bicyclists, and other motorists coming from the east. There are a variety of low-cost treatments that can be temporarily demonstrated, and subsequently made permanent when either funding is available or during routine, scheduled paving and maintenance:

a. High visibility crosswalk paint. Ensure that all of the crosswalks are marked with high visibility, ladder style painted crosswalks.

b. Curb extensions. A large curb extension on the southwest corner of the intersection would slow traffic turning south onto Pearl Street, and would dramatically shorten the pedestrian crossing distance across Pearl Street. An inexpensive initial curb extension can be created with paint and vertical delineators, as shown at right.

c. Median Island. A raised or textured island in the center of Pearl street would both slow traffic and divide the crossing task for the pedestrian. Combined with curb extensions this would vastly improve pedestrian safety.

d. Advance the stop line on Pearl Street. Relocating the stop sign closer to Lawrence Street would provide much better sight lines for drivers, but it would require the pedestrian crosswalk to be marked one vehicle-length back from the line, so pedestrians would cross *behind* a vehicle that is stopped at the intersection. This is reasonable if there is a median island to act as a center refuge for pedestrians.

e. Mini-circle. This is a very small roundabout, often used to replace an all-way stop intersection. There is typically a raised center but tapered, mountable curb so that the rear tires of larger vehicles can easily roll over the edge of the circle (right). A mini-circle might best be combined with small curb extensions to assure vehicles must deflect around the circle to have a traffic calming effect. A small median splitter island could be added to Pearl Street to separate vehicles entering and exiting the circle, and to divide the crossing task for pedestrians, providing a mid-crossing refuge point (picture at left). This may be the ideal solution here as there is plenty of space and it would act as traffic calming for vehicles entering Lawrence street from the west, improve pedestrian crossing safety, but also reduce vehicle idling in the neighborhood, as cars don't have to stop if there's no cross traffic.

f. Reverse diagonal parking on Pearl Street. The parking on the west side of Pearl Street is head in angled parking (at right). This is not uncommon for similar streets in communities of this size. Unfortunately, it means that cars are often backing blindly out into the active southbound travel lane (photo at right), which is dangerous for the vehicles and especially bicyclists traveling in the adjacent lane. When children exit the back seat of vehicles, they often move toward the street because the open car door is between them and the sidewalk. Also users must stand in the street to load the trunk, rear hatch, or bed of a vehicle. Back-in or reverse angled parking solves all of these problems while providing essentially the same number of spaces as pull-in parking. The specific advantages of back-in angled parking over head-in diagonal parking (picture below, left):

Back-in-angle parking

- Open car doors direct passengers back toward the sidewalk.
- The rear of the vehicle is loaded from the sidewalk, keeping pedestrians out of the street.
- Drivers are looking at the street as they pull out of the space.
- It reduces sudden disruptions to traffic flow; a car backing into a spot, as with parallel parking, slows and signals its intention to back into a space. This is much better than a vehicle suddenly, and often unexpectedly, backing out from behind another parked vehicle (this occurs with front-in parking).

During a low-traffic time period (e.g. a weekend versus mid-week) the town can host a back-in angled parking demonstration, with lots of education and outreach. The parking can be marked and signed temporarily, and participants should be asked three questions after trying it:

- Was diagonal back-in parking easier or harder than parallel parking?
- Did it feel more or less safe pulling forward, rather than backing out, into the travel lane?
- Would you feel more safe if you (or your children) were riding bikes in front of backed-in cars, or behind cars pulled in frontwards?

Ideally this demonstration and answering these questions can help build support for the installation of low cost back-in angled parking as an extended demonstration (using paint, signs, and associated promotion and education).

4. Lawrence Street Bicycle Boulevard

A bicycle boulevard is a shared, low- to medium-use roadway, with a number of traffic calming treatments designed to slow vehicle speeds and prioritize use for bicyclists and pedestrians. Benefits of bicycle boulevard include safety and access for bicyclists and pedestrians by slowing traffic speeds and reducing cut-through traffic, improved overall pedestrian environment, and networking dense residential areas to destinations including the Rite Aid, Poopie's, Grey Ghost Bicycles, the Post-Star newspaper, the Shirt Factory, Wing Elementary School, and East Field Park. It's also a connector to the Warren County Bikeway. Lawrence Street is an excellent candidate and could be a model bicycle boulevard for the city and region. There are a variety of design elements that can be applied, and first tried out by using low-cost materials. Consider an event demonstrating Lawrence Street as a bicycle boulevard for a trial period. Use this event to gather user feedback and collect data for any adjustments. The following design elements are treatments commonly used for bicycle boulevards:

Bike boulevard signs. It is essential to make clear to drivers that this is a designated "bicycle boulevard" both with pole mounted signs and pavement markings (right).

Traffic calming. There are seven intersections along Lawrence Street that are currently all-way stop signs, creating a great deal of stop and go traffic and vehicle idling in the neighborhood. Many of these can instead be traffic calming treatments. Adding a variety of treatments along the corridor lends itself to more effective traffic calming, as it requires drivers to be alert to changing conditions:


"Pop-up" mini-circle

a. Mini-circles. A mini-circle will slow vehicle speeds, but allow them to proceed without stopping if there is no other vehicle in the circle, and it reduces the miscommunication with other vehicles and bicyclists that can occur at a four-way stop ("Who's turn is it to go?"). Mini-circles can also decrease the total time it takes a vehicle to get down a roadway even though it reduces the peak speed, because there is less starting/stopping delay. It is quite possible to create a pop-up mini-circle as part of a short-term traffic calming demonstration, as pictured above. A more permanent but low-cost circle with paint and signs is shown at right.

b. Median islands. A raised island in the center of the street at crosswalks will slow traffic and divide the crossing task for pedestrians, providing a mid-street crossing refuge. A median can also be created with textured surface (at left), in an area where it is too narrow for a raised island; the roughened texture itself tends to slow drivers somewhat.

c. Curb extensions. As discussed previously, these make pedestrian crossings safer by increasing visibility and shortening crossing times, and they act as traffic calming by narrowing the street at the crosswalk.

d. Speed tables. A crosswalk or entire intersection can be raised like a speed bump but less abruptly, so that it still slows traffic while being easier for snow plowing (photo above). The incline on the table is gradual, not steep, and the height also serves to make pedestrians more visible (particularly children) when they are walking across on the "table." A treatment like this can be tested as shown at right for reasonable cost. Rochester NY used temporary raised tables entering the intersection along the busier street, and brightly painted the interior of the intersection to give the impression that the full intersection is raised, though it is actually just the temporary black humps seen above.

e. Mid-block chicanes. A chicane is a curvature in the travel lane that slows traffic by creating modest changes in direction (photo at left). Chicanes are often created with two offset curb extensions on opposite sides of the roadway. Signs and pavement markings (such as sharrows) reinforce to drivers that bicycles will be riding in the travel lane, and the intended design speed for the street is often 20 mph.

Lawrence Street appears to be an ideal corridor for a bicycle boulevard as it is an east-west connector that is heavily residential but with a wide variety of important community destinations. All-way stop signs at numerous intersections make clear there is a desire to calm traffic on this important street. So the design should vary the traffic calming treatments to slow and discourage cut-through traffic: perhaps mini-circles at Pearl and Platt Streets to act as gateways, slowing traffic as it enters the neighborhood. The remaining intersections could have a mix of speed tables; curb extensions and median islands; perhaps one or two chicanes; and even stop signs at the cross street with the greatest traffic.

5. Sidewalk construction and repair program.

A notable challenge in Glens Falls and in many cities of a similar age, particularly in older wards, is an incomplete or aging sidewalk network and related maintenance challenges. Participants identified filling in gaps, repairing damaged sidewalks, and upgrading sidewalks to a five-foot minimum width as a community priority, especially approaching schools, parks, and retail clusters. The first step is therefore to inventory sidewalks and gaps as well as important destinations and

trip generators such as schools, parks and playgrounds, retail and business clusters, residential areas, and senior housing and services. Then the community can set priorities as to which gaps to fill and sidewalks to repair and upgrade first. There are myriad funding mechanisms that cities around the country are using to fund this work; some are already be in place in Glens Falls (the 50/50 program). The most successful communities often use a combination of these approaches:

- **Owner repair requirement.** Require property owners to repair or complete sidewalk gaps on their property. The city can help facilitate this through creating an inventory and priority areas, coalescing projects, and creating joint contracts to gain economies of scale and reduce costs for all.

• **Shared city/owner funding.** Property owners and the city split construction costs, such as 50% each. Again, coalescing projects can yield substantial cost efficiencies in this approach.

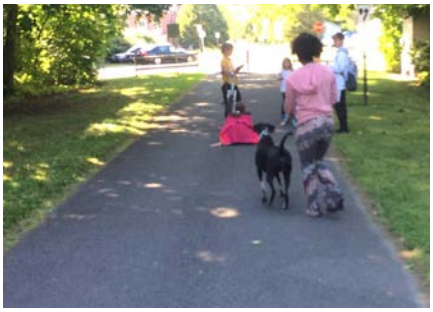
• **Sidewalk Improvement Districts (SID).** This would define an area in which all property owners choose to contribute to a collective fund for sidewalk repair and construction. Some communities require a super majority of properties to support this before it is put in place.

• **Create a sidewalk improvement fund.** Develop a general sidewalk improvement fund through a community referendum such as a 1/2% sales tax surcharge, small public utility fee, development impact fees, or other mechanisms.

- **Grants and other funding.** Pursue unique funding streams such as grants from historic preservation, environmental mitigation, economic development, community health, and other funding streams. Ward 1 is apparently eligible to use HUD funding for sidewalk repair, which should certainly be pursued as a resource.
- **Snow removal district (SRD)**. A more complete sidewalk and trail network can encourage more year round walking. But this also requires reliable snow clearing, which often is inconsistent if left to individual property owners. A snow removal district can be modeled after SIDs, in which property owners all pool funds to support the city or a contractor professionally clearing all of the sidewalks in the district.

6. Complete Prospect and Platt Street on-road links for the Warren County Bikeway.

The Warren County Bikeway generally follows a rail corridor from northeast to southwest through this area (at right), connecting with the Feeder Canal Trail south of Warren Street. However, in two locations the separated trail ends and users must travel on Leonard and Platt Streets. In each case it is only for about one block, but it takes riders from an outstanding, protected bike facility onto a fairly narrow neighborhood street with parking on both sides and little to no indication to drivers that they



may encounter bicyclists. A series of steps are proposed to create links on these two streets that are safe enough for the younger and less skilled, experienced, or confident riders who might choose to ride on a separated trail but not in shared spaces with vehicles. (The cyclists at right were seen on Leonard Street, riding to the bikeway.)

Phase I: Add sharrows and signs indicating shared use. Shared-use arrows and "Share the Road" signs with bicycle images can be added inexpensively and quickly. Though not sufficient for all riders, it will at least create awareness that bicyclists are likely to be encountered on these roadway sections of the bikeway.

Phase II: Create a protected bike lane between the trail segments. On Leonard Street the trail intersects the road from the west about a half block north of Lawrence Street, and then about a half block to the south of Lawrence the trail continues to the east. On Platt Street it intersects from the west about a half block north of Warren Street. On both streets there is on-street parking on both sides of the street. In both cases the parking lane on just one side of the street could be eliminated and turned into a protected two-way bike lane (or cycle track). On Leonard Street this would be just for the distance between the two trail intersections; on Platt it would extend from the trail south to Warren Street. It is likely residents will be concerned about losing some on-street parking, so it's important that this first be tried as a temporary demonstration, marking the bike lane with paint and cones. This could be done for just a weekend or week, as a special event. Then after getting feedback, a demonstration with vertical delineators could be installed (at right is an example from Colorado Springs). It is very important that the demonstration be left up long enough for both residents and trail users to become accustomed to it, as it's quite possible they would find eliminating parking on just one side of the street for the short distance between the trail intersections would not create an undue hardship. And many are likely to find that they enjoy the traffic calming affect of having the cycle track on the street, the trail access they gain, and perhaps even the enhanced value of their homes due to the trail connectivity.

Phase III: Create a permanent cycle track. Based on the feedback during the demonstration, make the bike lane permanent. Ideally add curb extensions at each end of the on-street portion of the cycle track to assure cars can't enter the bike lane. Define it with permanent vertical delineators. Also create a high visibility ladder style crosswalk at the location where users will cross from the on-street lane back onto the rail-trail corridor.

7. Reinvigorate Safe Routes to School efforts at the Abraham Wing School.

As more pedestrian and bicycle infrastructure and safety measures are added to the network in this district of Glens Falls, it will be increasingly realistic to encourage those students living close enough to the Abraham Wing Elementary School to walk and bike to school. Adopting a formal Safe Routes to School (SRTS) program will help to promote students walking and bicycling to school and should engage students in additional educational programs, especially creating and testing some of the possible traffic calming demonstrations on Lawrence Street. Following are possible elements of a program:

Educational and encouragement programs. Incorporate pedestrian and bicycle safety skills training into the curriculum ensuring that students know the proper and safe way to use existing sidewalks, crosswalks, trails, bicycle lanes, and other infrastructure. Many schools have incorporated this into physical education curricula: pedestrian safety for grades K-2; bike skills for grades 3-6. Program elements can also include the following:

- **Promote walking and bicycling.** At every opportunity continually reiterate the goal of having the maximum number of students possible walking to school, emphasizing the health, academic performance, and behavioral benefits to students, and safety benefits to absolutely everyone.

- **Institutionalize school support** and provide teachers with ways to recognize students who are frequent walkers – modest prizes, recognition at assemblies, etc.

- **Implement a five-minute safety delay.** A five-minute safety delay can be imposed on the motor vehicle pick-up areas at the school, allowing walking and bicycle students to clear the school area with limited motor vehicle conflicts at crossings. This greatly eases the task of crossing guards, ensures safety for students on foot or bicycle, and provides an incentive for students to consider walking or bicycling.

- **Engage the students in measuring impacts of SRTS.** It is most effective to collect before and after data to assess the effectiveness of an SRTS program. Show-of-hands surveys during morning attendance can assess the number of children walking, biking, taking the bus, and arriving by car. But students can validate this by doing actual counts during morning arrival. They can also assess other outcomes: Are cars better about yielding for students at an improved crosswalk? Are students more likely to cross at a high visibility crosswalk, or do they just cross anywhere? Are there dangerous vehicle movements: Dropping off students away from the curb or across the street and encouraging crossing away from a crosswalk? Mid-block U-turns? Cutting off other vehicles? Students can also survey their peers and adults for reactions and recommendations.

- **Walking school bus.** Walking school buses encourage parents to rotate the task of walking groups of students to school through neighborhoods, or from locations near the school used as satellite drop-off/pick-up locations. A district heat map can indicate where there are clusters of students in surrounding neighborhoods, and suggest to parents and caregivers logical spots for informal walking school buses. Possible locations for satellite drop-off/pick-up might be the Shirt Factory or the East Field parking.

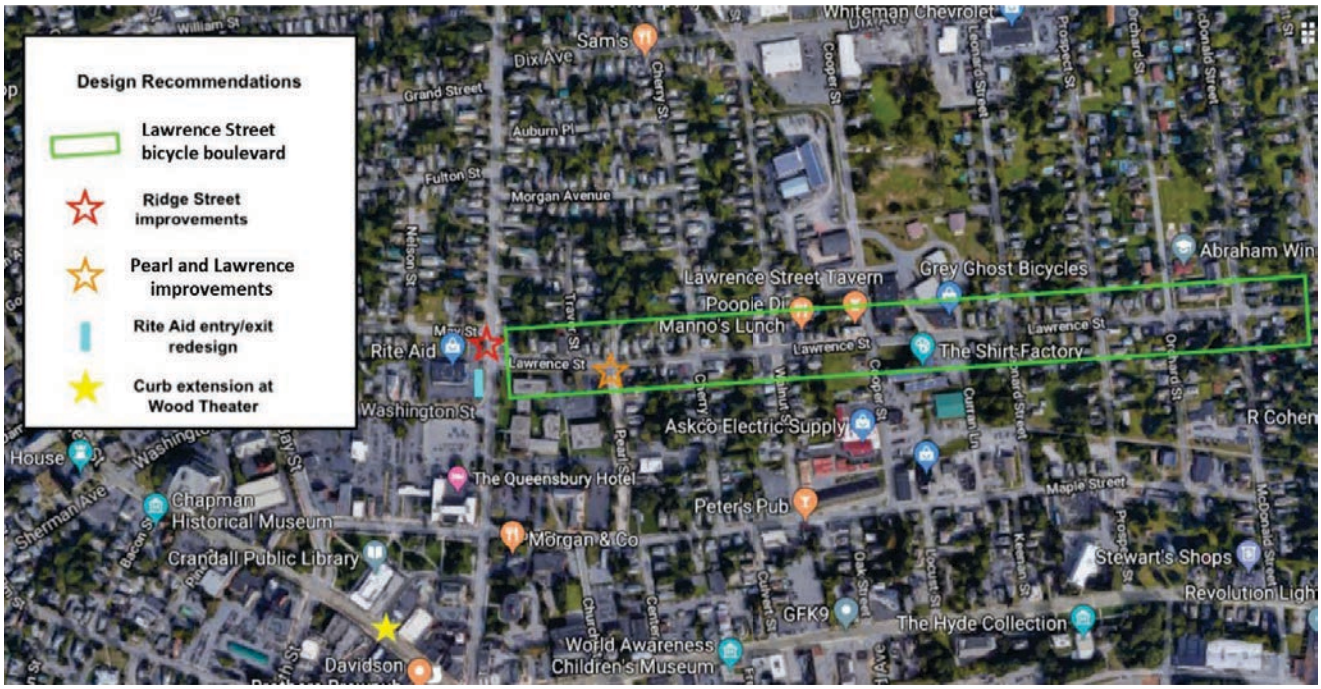
Integrate a student led beautification program into the Safe Routes to School program. Partner with students to build benches, planters, bike racks, parklets, and other functional design elements to enhance frequently used streets by pedestrians, school routes, and other areas of Glens Falls. This program should include giving students the responsibility to build and maintain any elements that they construct.

Launch pilot safety improvements at key intersections. Students will benefit from high quality pedestrian crossings and traffic calming measures to slow vehicles and make drivers aware of the pedestrians. Many of the measures recommended as part of a Lawrence Street bicycle boulevard (#4) would offer an ideal opportunity for the students to participate in installing and measuring the effectiveness of pop-ups and trial demonstrations. (Example at left, Middle School students and teachers in Malone NY.) These measures can be tested with large vehicles including school buses before being made permanent. Feedback can be gathered from users, and ideally data collection could be integrated into the school curriculum.

“Experience Glens Falls with 2020 Vision” — 2020 Walk Audit Series. As a way to better engage students and the community, develop a walk audit series highlighting areas that may be prime for similar assessment and improvement. A logical way to organize these walk audits is to do them for each ward, engaging the city council member representing the ward to join for at least one, or preferably two walk audits. Make these community events, inviting students from the neighborhood to co-host with city officials and other stakeholders to boost neighborhood participation.

These recommendations are based on the feedback of participants in the discussion and walk audit. Consider multiple additional walk audits open to residents, officials, and any other key stakeholders to build public interest and support and assure that the very best ideas move forward.

Design Recommendation Locations:



References and resources:

The *National Center for Safe Routes to School*; lots of practical information and downloadable resources: www.saferoutesinfo.org

The *Safe Routes Partnership*; coalition of organizations and experts providing great safe routes implementation support to schools & communities: www.saferoutespartnership.org

Complete Streets: National coalition working for streets that work for pedestrians, bicyclists, transits riders, and drivers of all ages, incomes, and abilities: http://www.completestreets.org

Urban Street Design Guide, *Urban Bikeway Design Guide*, and *Transit Street Design Guide* by the National Association of City Transportation Officials (NACTO).
https://nacto.org/publication/urban-street-design-guide/

Small Town and Rural Multi-Modal Networks, FHWA 2017. Lots of relevant images, information, and practical case examples of low cost traffic calming, bicycle, & pedestrian facilities (free). https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/

Slow Your Street: A How-to Guide for Pop-Up Traffic Calming. Detailed, practical information on implementing low-cost short- and long-term demonstration projects. Available from Trailnet. https://trailnet.org

The Tactical Urbanist's Guide to Materials & Design, by the Streets Plan Collaborative. Detailed materials and implementation recommendations on demonstration traffic calming projects. Downloadable for free. http://tacticalurbanismguide.com

Guidebook for Developing Bicycle and Pedestrian Performance Measures, FHWA 2016; with detailed guidance on efficiency, safety, economic, health, equity, environmental, and quality of life measures of roadway and corridor performance. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/performance_measures_guidebook/pm_guidebook.pdf

Costs for Pedestrian & Bicycle Infrastructure Improvements, Pedestrian & Bicycle Information Center (PBIC), 2013. Average estimates of costs for typical implementation tools & approaches. http://www.pedbikeinfo.org/cms/downloads/Countermeasure_Costs_Summary_Oct2013.pdf

Bethel VT Better Block demonstration includes pop-up traffic calming, bike lanes, and retail stores, organized with the AARP. https://www.youtube.com/watch?v=5KE5UGY6uso (4:40)

Better Block: educates, equips, and empowers communities and their leaders to reshape and reactivate built environments to promote the growth of healthy and vibrant neighborhoods: www.betterblock.org

Walk [Your City] assists with creating low cost way-finding signs for pedestrian and bike routes: www.walkyourcity.org

Bicycle parking guidelines. Mike On Traffic.
http://www.mikeontraffic.com/bicycle-parking-guidelines/

Bicycle parking ordinances for top bicycle friendly cities.
http://www.groundcontrolsystems.com/resources/tools-assets/bicycle-parking-ordinances/