Reconnecting the West Side

Recommendations Technical Memorandum

May 2023

CDTC / CDRPC Technical Assistance Program

Introduction

This Technical Memorandum contains recommendations for creating safe walking and bicycling routes in a neighborhood that currently lacks connected walking and bicycling facilities. These recommendations are route and facility planning concepts that require additional site-by-site engineering analysis. The City of Saratoga Springs requested assistance in developing these concepts through the joint Capital District Transportation Committee (CDTC) and Capital District Regional Planning Commission (CDRPC) Technical Assistance Program. The recommendations were developed after a review of infrastructure, mobility, and safety data, site visits, and meetings that included city officials, residents, and other neighborhood stakeholders.

Key Recommendations

- There is sufficient right-of-way to construct a sidepath on the north sides of Church and Washington Streets.
- The Saratoga Springs Complete Streets Plan should be updated to assign Grand Avenue as a "neighborhood street" rather than "county road and highway."
- Based on the data collected for this study, it is feasible to build sidewalks and bike lanes on Grand Avenue using the right-of-way, but additional engineering analysis is needed.
- Given the limited right-of-way available on Kirby/Pine Road, only a sidewalk and a shared street (bicycle boulevard) is feasible.
- Traffic calming measures should be implemented in conjunction with the construction of new bicycle and/or pedestrian facilities.
- The City should evaluate the feasibility of reducing speed limits on appropriate city-owned roadways within the study area, in accordance with recently passed legislation (S2021A) that affords cities, towns and villages the option to set their maximum speed limit at 25 mph.

Next Steps

As previously mentioned, the concepts presented in this memorandum require additional site-by-site engineering analysis. Below are suggestions for city officials to evaluate in order to move the Complete Streets types of concepts forward:

- Pilot low-cost traffic calming measures, such as temporary speed humps or chicanes.
- Prepare for upcoming funding opportunities, such as the Transportation Alternatives Program / Congestion Mitigation and Air Quality (TAP/CMAQ) programs that will make funding available in Spring/Summer 2023.
- Coordinate with State agencies to implement Complete Streets projects on state-owned facilities.
- Update the Saratoga Springs Complete Streets Plan to reflect the recommendations in this Technical Memorandum, including changing the assigned street typology for Grand Avenue (West Ave. to Western City Border) to "Neighborhood Street."
- Install traffic control devices such as stop signs to provide pedestrians with safer crossing opportunities.
- Install mini roundabouts at minor intersections to encourage safe speeds.
- Start the engineering analysis and design to implement Complete Streets recommendations for Grand Avenue.

Background

Objective

The purpose of this project is to identify the safest pedestrian and bicycling route to connect residential, commercial, and other development along sections of Church Street (NY 9N), Washington Street (NY 29), Kirby Road, Pine Road and Grand Avenue with an emphasis on safety and potential traffic calming improvements to the Grand Avenue corridor. This memo provides recommendations for the city to accomplish these goals. Both short-term and long-term recommendations are presented together with their paths to implementation.

Previous Planning Efforts

This memo builds upon previous planning work that the city has completed, especially the Complete Streets Plan and Saratoga Greenbelt Trail Plan. The Complete Streets Plan provides detailed information about types of roadways in the city and respective treatments. The Saratoga Greenbelt Trail Plan proposed a trail circling the city with a downtown section creating two loops. Within the study area of this project the Plan proposes building a trail along the rail right-of-way that cross under Church Street, Washington Street, and Grand Avenue. The trail would provide a mostly off-road walking and bicycling facility with access to most of the city however, there are substantial challenges to implementing a trail following the rail line.

Figure 1. Study Area Roadway Classification, Ownership, & Complete Streets Recommendations

Street Name	Functional Class	Jurisdiction	Street Typology	Pedestrian Level	Bicycle Level	Transit Level
Church St (Route 9N)	16 (Minor Arterial)	NYSDOT	Transit Corridor & Thoroughfare	B	B	B
Washington St. (Rt 29)	14 (Principal Arterial)	NYSDOT	Transit Corridor & Thoroughfare	B	B	B
Grand Ave.	17 (Major Collector)	City	County Road & Highway	S	S	N/A
Pine / Kirby Rd.*	19 (Local Road)	City	N/A	N/A	N/A	N/A
W Circular St	17 (Major Collector)	City	Neighborhood Street / School Zone	S/G	S/G	N/A

Key: "G" refers to "gold," "S" refers to "silver, and "B" refers to the bronze levels of Complete Streets described in the city's Complete Streets Plan
**not included in Saratoga Springs Complete Streets Plan Street Typologies*

Needs Assessment

The Existing Conditions Memorandum documented infrastructure, mobility, and safety data, site visit observations, and feedback received from residents, city officials, and other stakeholders. One of the takeaways from the assessment is the conflict between the existing and desired function of the major corridors in the study area. An example is Grand Avenue, which is classified as a "Major Collector" road and on account of its classification was assigned the "County Road and Highway" typology in the Saratoga Springs Complete Streets Plan. Roadways are classified based on their context or surrounding land uses, and livability factors like safety, community connectivity, and mode integration. However, as development patterns change, the roadway context may change and so may its desired function.

Mobility needs in the study area, particularly Grand Avenue, have changed because of infill and new development that has attracted more residents, changed traffic patterns, and increased conflicts between mobility and livability. Based on stakeholder feedback, the desired function of Grand Avenue and other roadways within the study area is to provide more opportunities for access and safe travel for pedestrians and bicyclists, as well as enhanced safety for vehicular traffic.

Figure 2and Figure 3 show how roadway classification can impact design, including the assigned speed limit and integration of Complete Streets infrastructure. The photos on the next page show how other "County Roads and Highways" in the city are different, contextually, than Grand Avenue. Mainly, there are fewer driveways and bigger setbacks of residences.

Figure 2. Access vs. Mobility - The Functional Class Concept

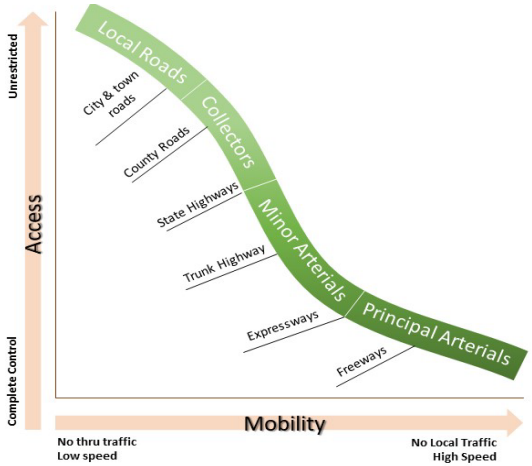
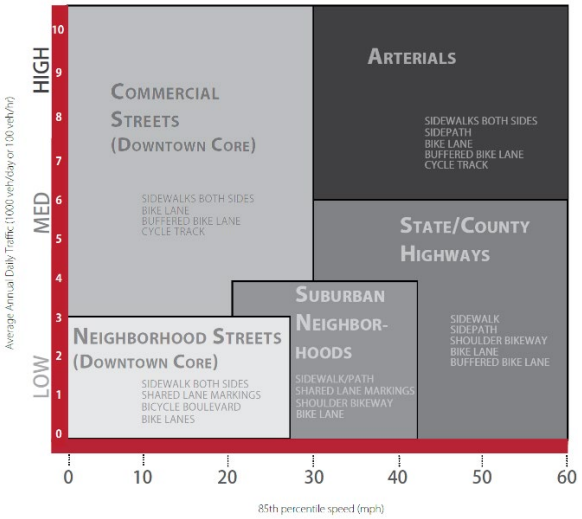


Figure 3. Saratoga Springs Complete Streets Strategy



Source: Saratoga Springs Complete Streets Plan, p. 1.2

Figure 4. Examples of "County Roads and Highways" compared to Grand Avenue

Crescent Avenue

Grand Avenue at Round Table Road

Henning Road

Grand Avenue at Robin Hood Ct

Denton Road

Grand Avenue at Glenmore Ave

Vehicle speeds and driver behaviors have also been identified as issues in the study area that conflict with creating connected, walkable, and bike-friendly routes. The corridors in the study area have served as connector routes to/from destinations in downtown Saratoga Springs. As development has occurred in the area, Complete Streets elements have not been comprehensively integrated into the roadway design(s). The area requires multiple, standalone Complete Streets projects, -such as new sidewalks, trails, and sidepaths. Other improvements, including bike lanes and improved pedestrian crossings can be integrated into the City's annual paving cycle schedule. New bicycle and pedestrian infrastructure on state-owned facilities like Church and Washington Streets will require additional agency coordination.

There is consensus on the barriers to walking and bicycling in the study area, but less agreement on the solutions. Implementing Complete Streets requires a multi-prong approach which includes constructing new infrastructure that provides designated spaces for people to walk and/or bike, but also slows traffic. Traffic-calming can be achieved by changing roadway design and/or the installation of traffic control devices. The other critical elements of a Complete Streets approach include maintenance of infrastructure for use during all seasons, traffic safety education, and enforcement of traffic laws. These elements require partnerships including City departments, County and State agencies, schools, businesses, and residents. Creating a safety culture required for successful Complete Streets implementation in the study area should include coordination and partnership with the City's police department and the school district.

Recommendations

Overview

The recommendations for the study area are summarized in the map in Figure 5 and focus on filling gaps in the existing network and reducing vehicle speeds on Grand Avenue. The recommendations highlight the preferred treatment for each corridor, but other concepts are available if an engineering analysis determines the preferred treatment is not feasible. The preferred treatments aim for what is referred to as the "gold" level of quality in the Saratoga Springs Complete Streets Plan. In addition to the recommendations map, Table 1 includes a range of traffic calming and walking and bicycling infrastructure concepts and how they address safety issues identified in the Existing Conditions Memorandum.

As mentioned above, implementing Complete Streets requires additional measures not featured in the map in Figure 5. Additional traffic-calming measures should be explored for Church and Washington Streets, Kirby/Pine Road, and Grand Avenue. Strategic application of traffic-calming measures, such as speed humps, curb extensions, or chicanes, can also influence traffic circulation. Focusing traffic-calming measures on Grand Avenue can discourage through-traffic. The appropriate traffic calming measures should balance mobility and maintaining a livable and safe environment for bicyclists, pedestrians and other on-street adjacent users. Entities such as snowplow drivers, waste management, fire departments and other first responders may be affected by traffic calming and should be consulted in the design process. A traffic engineering analysis can determine the feasibility for all such vehicles to operate safely.

Figure 5: Recommended Facilities Map

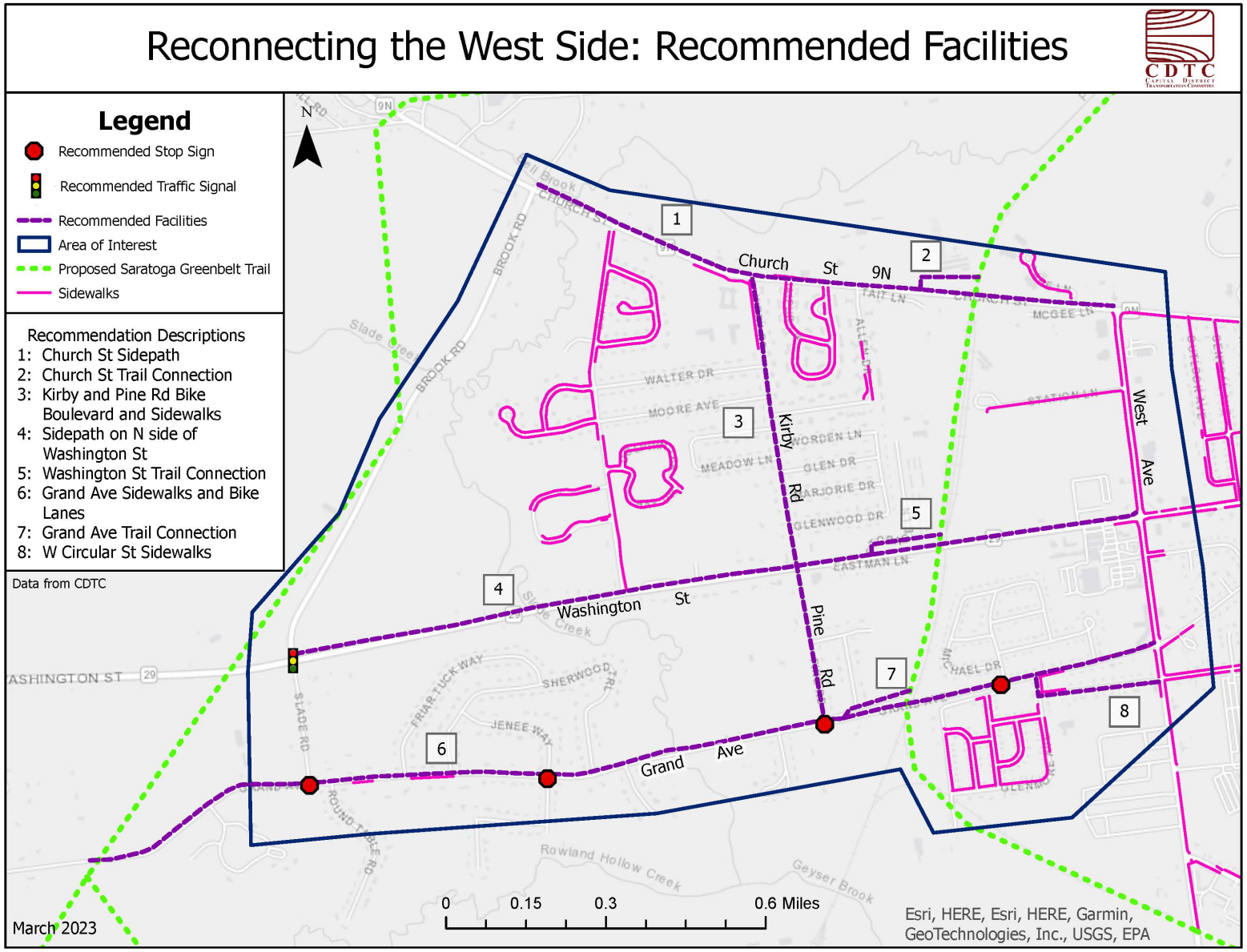


Table 1. Safety Issues Addressed by Recommendations

Recommendation	Excessive vehicle speed	Insufficient separation from traffic	Inadequate visibility	Pedestrian conflicts at crossing locations	Drivers not yielding to pedestrians in crosswalks
Crosswalk visibility enhancement	●	●	●	●	●
High-visibility crosswalk markings			●	●	●
Improved nighttime lighting			●	●	
Advanced Yield to Pedestrians sign/markings		●	●	●	●
In-Street Pedestrian Crossing sign	●	●	●	●	●
Curb extension	●	●	●	●	
Pedestrian refuge island	●	●	●	●	
HAWK signal at uncontrolled pedestrian crossing				●	●
Sidewalk		●	●		
Bike facility	●	●	●		
Conventional bike lane	●		●		
Buffered bike lane	●	●	●		
Separated bike lane	●	●	●		
Sidepath or Multi-use Trail		●	●		
Traffic calming	●				
Speed Humps	●				
Speed Table / Raised Crosswalk	●		●	●	●
Mini Roundabout	●				
Reduced speed limit	●				

Sources: FHWA, Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

Traffic calming and speed limit reduction.

"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users."[1] Higher driving speeds increase the probability of death or serious injury resulting from a motor vehicle crash. The 2019 Local Road Safety Action Plan found that between 2011 and 2016, approximately 20% of fatal and serious injury crashes and 38% of all fatalities in the Capital District were related to speed. Furthermore, young drivers (under 20 years old) contribute to 25% of the overall speed related fatal and serious injury crashes. Traffic-calming measures reduce vehicle speeds and the potential for conflict between vehicles and other road users, like pedestrians and bicyclists.

The National Highway Traffic Safety Administration (NHTSA) lists "reduce and enforce speed limits" as a low-cost, likely effective countermeasure to increase pedestrian safety. Actual vehicle speeds are reduced by only a fraction by speed limit reduction alone, however even a 1-2 mph reduction in average speed yield substantial fatal and injury crash reductions overall, with higher percentage reductions on streets with lower initial speeds. For maximum effectiveness, reductions should be accompanied by a compelling communication strategy, engineering changes to the roadway, traffic calming, and speed enforcement.[2]

New York State passed legislation authorizing municipalities to reduce speed limits to 25 mph in 2022 (A.1007-A/S.2021-A). The legislation was passed to give municipalities local control to reduce vehicle speed, improve public safety, and prevent pedestrian fatalities. Some Capital Region municipalities have begun assessing the feasibility and strategic application of lower speed limits. Reducing the speed limit on local roads like Grand Avenue and Pine/Kirby Road may be feasible under the new legislation which goes into effect May 1, 2023. Any speed limit reduction will require the installation of updated signage and should be implemented in conjunction with extensive public outreach.

Traffic Calming Examples

Description (from top): chicane demonstration in Kalamazoo, MI; chicanes in New York, NY; a rubber speed hump/table by Traffic Logix.

[1] Lockwood, Ian. *ITE Traffic Calming Definition*. ITE Journal, July 1997, pg. 22.
[2] National Highway Traffic Safety Administration. *A Highway Safety Countermeasure Guide for State Highway Safety Offices*, 10th Edition, 2020.

GRAND AVENUE

The recommended build out of Grand Avenue includes sidewalks, protected bike lanes, traffic control devices, and traffic calming. The right-of-way for Grand Avenue is 49.5 feet which provides enough space for two sidewalks and protected bike lanes on each side of the road. In the case that it is determined there is insufficient space for sidewalks and bike lanes, it is recommended that sidewalks are built on both sides of the roadway and traffic calming measures are used liberally to slow vehicle speeds. These treatments would allow Grand Avenue to become a bike boulevard.

The recommendations for Grand Avenue include building sidewalks on both sides of the roadway. The sidewalks are recommended along the entire study area corridor from West Avenue to Rowland Hollow Preserve. A planting strip between the sidewalk and roadway should include lighting and street trees. Another concept is constructing a sidepath on one side of the road that can accommodate both bicyclists and pedestrians and use the least amount of right-of-way.

Along with making Grand Avenue a safe and comfortable corridor for pedestrians and bicyclists the city can create a connection to the proposed Saratoga Greenway Trail. Further study can be done to determine whether there is sufficient right-of-way between Pine Road and the rail tracks to make this connection.

Grand Avenue Bridge

Grand Avenue has a wide right-of-way but is constrained on the bridge over the rail tracks. There is an estimated 28 feet of bridge deck available between the guardrails. It is recommended that the vehicle lanes be painted 10 feet wide leaving 5-6 feet for a protected sidewalk on one side of the bridge. The modern guardrails would need to be moved near the curb line to provide this space. Installing crosswalks with traffic control devices and/or traffic calming at Grand Avenue and Pine Road and Grand Avenue and Lee Drive would help pedestrian access this sidewalk. A stop sign and traffic calming devices, such as mini roundabouts or speed humps at the intersection would slow vehicles ahead of the narrowed overpass and improve safety for other road users.

RECOMMENDATIONS

Concept 1

- Build sidewalks on both sides of road.
- Build bike lanes (preferably protected).
- Install stop signs at intersections with Kirby Road/Pine Road, Glenham Road/Lee Drive, Jenee Way/Knight Way, and Slade Road.
- Install traffic calming devices such as raised crosswalks, speed humps, and chicanes.
- Rebuild bridge at end of useful life wide enough for pedestrian and bicycle facilities.

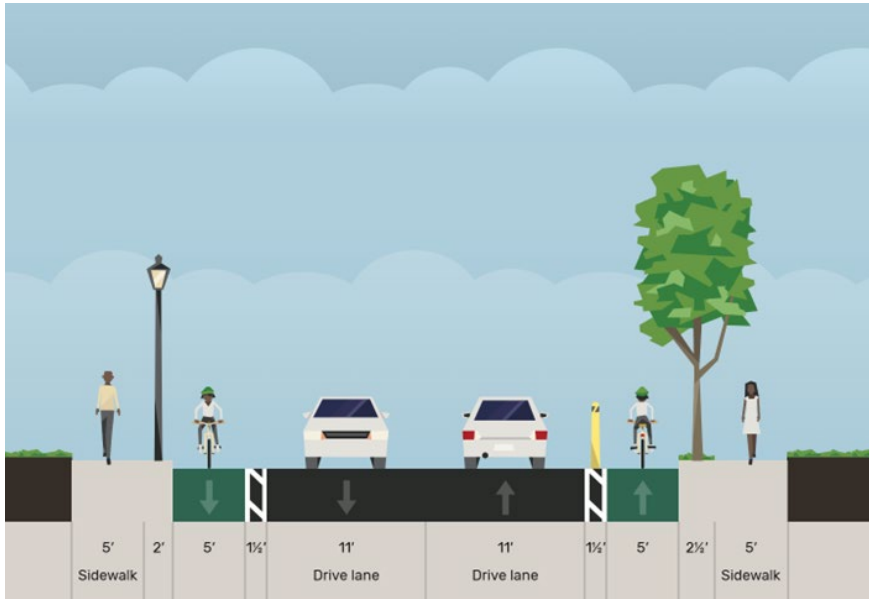
Concept 2

- Construct a sidepath on north side of road
- Install mini-roundabouts at intersections + traffic calming recommendations above.

Grand Avenue: Other Recommendations

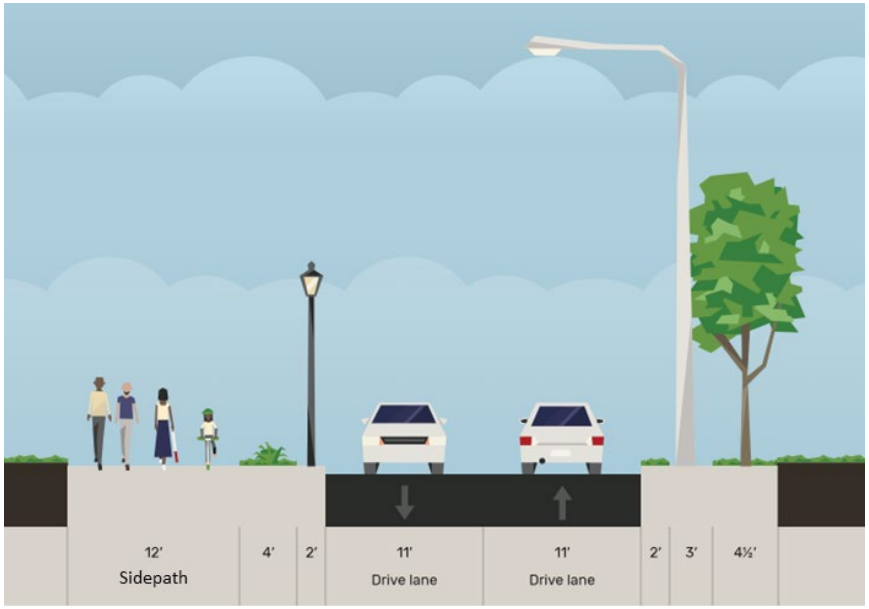
Grand Avenue is classified as “County Road & Highway” in the Complete Streets Plan, however it better fits within the “Neighborhood Streets” classification. Homes have been built along most of the road in our study area and there are fewer than 5,000 vehicles using the road daily. The road is narrow with no shoulders and does not serve regional destinations. The Complete Streets Plan sets a goal for Grand Avenue to be at a “Silver” level of service. For neighborhood streets this entails sidewalks on both sides of the road, street trees and lighting along most of the roadway, crosswalks and curb ramps at all crossings, and traffic calming. Gold level facilities have trees and lighting along the entire corridor, high visibility crosswalks at all crossings, and traffic calming.

Figure 6: Grand Avenue Concept 1



According to the Capital District Complete Streets Design Guide, a sidewalk zone must be a minimum of 5 feet. A buffer or separation between the travel lane and bike lane can increase comfort and reduce stress for bicyclists. Because this type of bike facility is a new one for the city, a low-cost and easily modified design is preferred. This graphic shows both a flexible delineator post and striping used to create separation but amore permanent material like curbing is also an option.

Figure 7. Grand Avenue Concept 2



If funding and right-of-way constraints arise, a sidepath on the north side of Grand Avenue should be constructed to accommodate both pedestrian and bicycle users. According to the Capital District Complete Streets Design Guide, a multi-use trail or sidepath should be no less than 10 feet, but preferably 12 feet wide. This design concept would reduce the number of trees that need to be removed and utility poles that need to be relocated.

PINE/KIRBY RD, W CIRCULAR ST

The recommendation for Kirby Road and Pine Road is to create a bike boulevard from Church Street to Grand Avenue. The Complete Streets Plan provides examples of what features a bike boulevard should include. Some features are mini-roundabouts, speed humps, chicanes, raised crosswalks and bulb outs. A combination of lowering the speed limit and installing traffic calming measures would improve safety for all users. See the Saratoga Complete Streets Plan page 2-18 for features of a shared street.

The recommendation for W Circular Street is to fill in the remaining sidewalk gaps. Additionally, the turning radii at the intersection of West Avenue and W Circular Street should be tightened with engineering approval.

Other Recommendations

The Complete Streets Plan provides recommendations for neighborhood streets. These include completing sidewalks, planting trees, installing lights and calming traffic. The plan also gives the option of creating a bike boulevard on neighborhood streets.

Traffic Calming Examples

From left: Raised crosswalk (FHWA), Mini Roundabout (NACTO)

RECOMMENDATIONS

- Create a bike boulevard from Church Street to Grand Avenue.
- Build sidewalks on both sides of the roadway.
- Build raised crosswalks at intersections.
- Install speed humps.
- Fill gaps in tree cover.
- Reduce speed limit to 25 mph.

CHURCH STREET

Church Street (NY 9N) is owned and maintained by the New York State Department of Transportation (NYSDOT). The recommendations for this roadway include a shared use sidepath on the north side and a sidewalk on the south side. If a sidepath is not feasible based on an engineering analysis, then sidewalks can be built on both sides of the roadway. In this scenario physically protected bike lanes could be built alongside vehicle lanes.

RECOMMENDATIONS

- Build shared use sidepath on north side of roadway.
- Build sidewalks on the south side of the road.
- Add street trees.
- Install pedestrian lighting.

Other Recommendations

The proposed Saratoga Greenway Trail intersects the study area, following the railroad tracks. The feasibility of implanting this section of Greenway has not been determined. A connection to the proposed trail can be made from Church Street, in the future, by building a shared use path along the driveway to Sunnyside Gardens.

Streetscape improvements, like street trees and lighting would help make Church Street more comfortable for pedestrians and bicyclists. Since Church Street has higher traffic volumes, Rectangular Rapid Flashing Beacons (RRFBs) would be appropriate at non-signalized crosswalks. An engineering analysis is needed for any intersection or mid-block crossing improvements.

Saratoga Springs Complete Streets Plan Streetscape Example: Street Trees & Lighting

WASHINGTON STREET

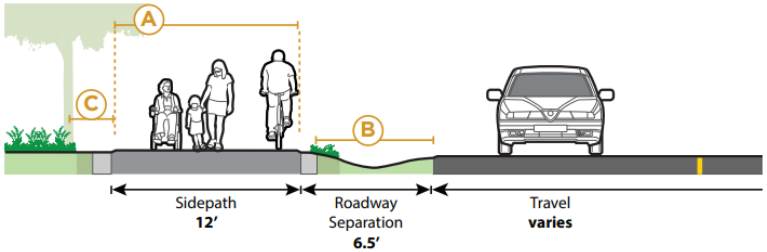
Washington Street is similar in character and function to Church Street. It is NY Route 29 and owned and maintained by NYSDOT. The recommendations are for a sidepath to be built on the north side of the roadway and a sidewalk on the south side. This sidepath is proposed in the Complete Streets Plan. Additional traffic engineering analysis should be conducted to determine the feasibility of reducing the curb radius at both Kirby Road / Slade Road and installing a traffic signal at the intersection at Brook Road / Slade Road.

Other Recommendations

Like other east-west corridors in the study area, Washington Street bisects the proposed Saratoga Greenbelt Trail corridor. As the trail is developed, a connection can be made from Washington Street via Storage Lane. Developing the proposed Saratoga Greenbelt Trail will create a useful north-south connection for bicyclists and pedestrians and connect to the regional trail system.

Similar to other study area roadways, additional street trees and enhanced lighting would also make Washington Street more attractive and comfortable for bicyclists and pedestrians. And Rectangular Rapid Flashing Beacons (RRFBs) might be appropriate at midblock crossings, for example creating safe access to the proposed future trail connection at Storage Lane.

Sidepath Illustration



Source: Empire State Trail Design Guidelines

RECOMMENDATIONS

- Build shared use sidepath on north side of roadway.
- Build sidewalks on the south side of the road.
- Add street trees.
- Install pedestrian lighting.

Saratoga Greenbelt Trail

The Saratoga Greenbelt Trail is identified as a "Core Trail" in the Capital District Trails Plan. The proposed route of the Saratoga Greenway Trail intersects the study area. The trail is envisioned to be built on the west side of the tracks. To make the trail accessible to as many people as possible the recommendation in this memo suggests building connections at each of the cross streets, Church Street, Washington Street and Grand Avenue. Each of these streets have bridges which cross the tracks giving trail users access to the east side of the city. Further study is required to determine whether an at-grade crossing can be built at the Amtrak Station providing both direct access for intercity travel from the trail as well as a safe pedestrian connection across the rail line.

Example of a Bike Trail next to Train Tracks (Boston, MA)

The proposed trail builds connections to the regional trail network, which already totals over 100 miles. The future trail would create an almost entirely off-road route that connects to Railroad Run, east of the study area and Geyser Road Trail, south of the study area. These proposed routes would provide residents of the study area access to regional destinations, like Saratoga High School, Pitney Meadows Farm, Saratoga Spa State Park, and the YMCA. The CDTC has prioritized investments in the regional trail network in its long-range plan. Completing trail and active transportation networks connecting people to routine destinations by foot and bike are among the quickest and most affordable ways to increase low carbon transportation options.

Pedestrian Crossings

Intersections

The NYS Pedestrian Safety Action Plan and CDTC Local Road Safety Action Plan both call for a systemic approach to proactively address safety issues and minimize the potential for crashes by implementing low-cost countermeasures throughout the roadway. The low-volume corridors in the study area, such as Grand Avenue, Pine Road, Kirby Road, West Circular Street can be enhanced and improved for pedestrians by installing high-visibility crosswalks. Further safety improvements which would slow traffic for safer crossings include, raised crosswalks, speed humps, or mini roundabouts. High-volume roads in the study area, including Church and Washington Streets, can be improved for pedestrians by installing high-visibility crosswalks in conjunction with other countermeasures, like advance yield to pedestrian sign/markings, curb extensions, pedestrian refuge islands, rectangular rapid-flashing beacons (RRFB), curb radii reductions, or Leading Pedestrian Interval (LPI). Church and Washington Streets are both state-owned facilities and any changes must be evaluated and approved by NYSDOT.

Two traffic fatalities occurred at the intersection of Washington Street at Brook /Slade Road (2017-2022). Brook Road provides access for large trucks and the intersection must be designed to accommodate them. However, Slade Road is a minor street which only provides access to a few

homes. The entrance to Slade Road can be redesigned to match this. Tight turn radii can be designed with paint and as part of regular repaving. This intersection should be assessed for traffic signal installation. There is low visibility traveling east on Washington Street due to steep grades. Changes to this intersection require an engineering analysis, in cooperation with NYSDOT.

This intersection of W Circular Street and West Avenue is the point where W Circular becomes a local road. The entrance from West Avenue can be designed to signal this change to drivers. Some possibilities include a raised crosswalk, tighter turn radii, light posts close to the roadway, and sidewalks on the northern side.

Other Recommendations

Bike Storage

One of the leading factors limiting bicycling as a form of transportation besides for safe routes is access to secure parking. Secure, weather protected bike parking can be provided publicly and be required at private developments. The Amtrak station is an ideal location for secure bike parking. Secure bike parking would allow train, intercity bus customers, and CDTA customers to confidently bike to the station knowing they can leave their bikes for days without concern.

Example of bike parking: bike lockers & rack (Albany, NY)

Wayfinding & Signage

Signage can be installed together with facility improvements to help bicyclists and pedestrians find local attractions. This is especially important for helping visitors find their way around the city. Wayfinding works best as a city-wide or regional system. Signs can help direct people to attractions and neighborhoods. As the Saratoga Greenbelt Trail continues to be built out, wayfinding will be increasingly important to help direct trail users to different parts of the city.

Education & Enforcement

Much of the recommendations for creating safe walking and bicycling routes in the study area focus on engineering-types of improvements. Education and enforcement are the other 2 “Es” of traffic safety and should be implemented alongside any engineering improvements. Law enforcement, the school district, and neighborhood and traffic safety advocacy groups can work with the City to enforce speed limits, encourage walking, bicycling, and carpooling to school, and encourage safe driving behaviors. Driver education programs, school parking policies and/or incentives, and safety campaigns are potential tools for advancing traffic safety education.

Implementation

The recommendations in this memo are for redesigning roadways and reconfiguring intersections. Since these can take time while waiting for design and funding there are short-term efforts the city can take while waiting for full implementation. This section provides limited information on cost estimates, and potential funding opportunities. Additional site-by-site assessments must be done to determine final design, engineering, and cost information.

Short-term

Short term options to improve safety and comfort to all roadway users include actions that can be implemented within 1-2 years. Traffic calming pilots can use low-cost and temporary materials to test and demonstrate the effectiveness of various treatments. Speed humps can be implemented as a pilot measure until the roadway is resurfaced. Prefabricated speed humps can be bolted down to the roadway surface. This is a quick and cheap effort to quickly slow traffic in problem areas. Together with installation, road signs are required to let road users know about the speed humps. Painted curb extensions can be installed relatively quickly depending on the capacity of the city's Department of Public Works. Paint is a cheap option for short-term improvements. Painted roadways help guide drivers towards safer operation of their vehicles.

Liberty Street traffic calming demonstration, Schenectady, NY (2018)

Recently the New York State legislature passed a law which allows municipalities to set speed limits to 25 mph, whereas before municipalities could not set speed limits lower than 30 mph. Research has shown that the risk of severe injury or death for a pedestrian struck by a vehicle decreases as vehicle speeds decrease. In locations where it is not feasible to build physical separation between vehicles and pedestrians and bicyclists, limiting traffic speeds is critical to reducing risks. CDTC is currently waiting for further guidance before solidifying next steps for reducing speed limits in accordance with the recently passed legislation. Even if the city does not plan to reduce speed limits across the city, it may consider reducing the speed limit on Grand Avenue, Kirby Road, and Pine Road.

Strict speed limit enforcement can begin right away. Long-term, law enforcement should develop a strategy for consistent presence and speed limit enforcement on Grant Avenue. Temporary or pilot measures can be implemented in the short-term while engineering analysis, design and construction of recommended improvements move forward. The following are potential pilot measures that can be implemented as interim improvements to measure the feasibility and effectiveness of more permanent changes:

Grand Avenue

- Temporary speed humps with an emphasis on the bridge ramps.
- Painted shoulders and/or narrowed intersections with curb extension and enhanced crosswalks.

W Circular Street Pine/Kirby Road

- Temporary speed humps
- Traffic cones or paint to mark out tighter turn radii before permanently reconfiguring the roadway

Henry Street Cycle Track Pilot, Saratoga Springs (2019)

Long-term

Additional Analysis Needed on Grand Ave

The long-term recommendation of building sidewalks and bike lanes will require the city to survey the right-of-way first. The right-of-way for Grand Avenue is 49.5 feet wide, however the current roadway is unlikely to be directly in the middle. Therefore, a new alignment would need to be designed to ensure enough space for sidewalks and bike lanes on both sides of the vehicle lanes. Funding then needs to be allocated for an engineering design of the corridor before construction can start. Depending on the funding source it may be advantageous to design the new roadway before requesting funding. This design will most likely include designs for when the bridge gets rebuilt with enough deck area for all improvements. Being that bridge construction is much more expensive, it is recommended that such a project be considered on its own at the end of the useful life of the current bridge. Project design may take this into consideration and design long-term improvements for the roadway over the current bridge.

Pedestrian Safety Pilot, Watervliet (2018)

Cost Estimates

CDTC used the NYSDOT Quick Cost Estimator Reference Tool to estimate the approximate cost for many of the facilities and infrastructure recommendations included in this memo. However, the recommendations include a scale of projects which is beyond the scope of individual treatments. These cost estimates are based on cost information collected by NYSDOT for similar projects across Upstate New York in 2019. Local costs may vary and be affected by ongoing economic trends, like inflation, labor shortages, and other uncertainties.

Table 2. Cost Estimates

Facility Type/Item	Materials	Cost	Note
5 ft sidewalk	Concrete	$160 per linear foot	Includes excavation, disposal, subbase material, compaction, construction of sidewalk and finish work. Does not include, sawcutting driveways, excavation to additional depth for driveways, curbing, grading, or turf establishment.
10 ft sidepath	Asphalt	$59 per linear foot	Includes all prep of subgrade, sawcutting and tack coat. Doesn't include curbing, grading or turf establishment. NOTE: Prices have been volatile over the past 3 years.
Ladder Crosswalk	Paint	$800 each	Assume 700 LF of 4-inch striping per crosswalk
Raised Crosswalk		$15,000 each	
ADA Curb Ramp	Concrete	$3,900 each	Includes site survey, demolition, saw cutting, excavation, disposal, fill, subbase material, compaction, construction of ramp, landings and associated curbing, detectable warning units, repairs to affected asphalt topsoil, establishing turf (to disturbed areas), and finish work.
Mini Roundabout	Concrete	$175,000 each	
Bollard	Wood	$250 each	Includes the cost of excavation and backfill and furnishing all labor, materials, and equipment necessary to complete the work
Hatched buffer zone to delineate bicycle lane	Paint	$14,250 per mile	2 ft wide hatched buffer with 6 in wide stripe on the bicycle lane side of the buffer and 4 in wide stripe on the opposite side.
Solar powered radar speed sign		$7,000 each	

Funding

One of the core functions of the CDTC is the development and maintenance of the Transportation Improvement Program (TIP). The TIP is the 5-year capital plan for the Capital Region that implements the products of the planning process described in New Visions 2050. The TIP is funded by a collection of transportation programs outlined in the 2021 Bipartisan Infrastructure Law (BIL). CDTC must update its TIP every four years as an integral element of a Statewide Transportation Improvement Program (STIP). CDTC recently adopted the 2022-2027 TIP so some of the funding programs outlined below may not be available until the next TIP update (anticipated in late 2024). Other programs are administered by New York State agencies.

Table 3 on the next page provides information on potential funding sources for some of the facility types recommended in this study. It is not an exhaustive list, and it does not include Federal Discretionary Grant Programs that are being released. The BIL created numerous federal transportation program and grant opportunities, many of which are being announced on an ongoing basis. Information regarding these discretionary funding programs can be found at www.cdtcmpo.org/BIL. As development continues within the study area, there may be opportunities to include new bicycle and pedestrian friendly infrastructure or other amenities that would enhance this trail connection.

Table 3. Potential Funding Sources

Facility Type	FUNDING PROGRAM						
	Transportation Alternatives (TAP)	Congestion Mitigation & Air Quality (CMAQ)	Recreational Trail Program (RTP)	Surface Transportation Program (STP)*	National Highway Performance Program (NHPP)**	Consolidated Local Street & Highway Improvement Program (CHIPS)	Empire State Economic Development Fund Program
Bicycles lanes on road	X	X		X	X		X
Crosswalks (new or retrofit)	X	X		X	X		X
Curb cuts & ramps	X	X	X	X	X		X
Landscaping, streetscaping, etc.	X		X	X	X		X
Lighting	X			X	X		X
Separated bicycle lanes	X	X		X	X		X
Shared use paths / transportation trails	X	X	X	X	X		X
Sidewalks (new or retrofit)	X	X	X	X	X	X	X
Signs / signals / signal improvements	X	X		X	X	X	X
Traffic calming	X			X	X		X

Design References:

There are a range of resources available to municipalities to guide engineering and design of bicycle and pedestrian infrastructure. The Highway Design Manual, MUTCD, and NYS Supplement include guidance on all facility types recommended in this study. However, that does not eliminate the need for other references. Below are additional guides that have been developed with the collective experience of transportation planners, engineers, and bicycle and pedestrian infrastructure users. Many have been recently released and may reflect a more current state of practice for creating safe and invite bicycle and pedestrian facilities. CDTC encourages municipalities to participate in bicycle and pedestrian design training opportunities as they occur.

New York State & Local Guidelines

- Capital District Complete Streets Design Guide
- New York State Highway Design Manual
- Manual on Uniform Traffic Control Devices
- New York State Supplement to the Manual on Uniform Traffic Control Devices for Streets and Highways (2009 Edition)
- Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities, National Association of City Transportation Officials
- Small Town and Rural Multimodal Networks, U.S. Department of Transportation Federal Highway Administration
- Empire State Trail Design Guide, Hudson River Valley Greenway, New York State Canal Corporation, New York State Department of Transportation, and NYS Office of Parks, Recreation, and Historic Preservation
- Green Infrastructure Toolkit, Capital District Regional Planning Commission

National Guidelines & Best Practices

- The United States Access Board's Proposed Rights-of-Way Accessibility Guidelines (PROWAG), Federal Highway Administration, May 2012

Other

- Quick Cost Estimator Reference, NYSDOT
- NYS Pedestrian Safety Action Plan, NYSDOT
- NYS Pedestrian Safety Corridor Evaluation Guidelines, NYSDOT
- Road and Trail Intersection Safety, Parks & Trails New York
- Capital District Trails Plan, CDTC
- Local Road Safety Action Plan
- New Visions 2050, CDTC
- City of Saratoga Springs Complete Streets Plan (2016)
- New York State Complete Streets Act