ACTIVE TRANSPORTATION PLAN

Village of Warsaw

Wyoming County, NY

February 2024

FINAL PLAN

PASSERO engineering architecture

INGALLS PLANNING & DESIGN

SRF ASSOCIATES

(UPWP Task # 8752)

Plan Support by the Genesee Transportation Council (GTC)

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While the New York State Department of Transportation (NYSDOT) participated on the steering committee, this does not necessarily reflect the official views or policy of NYSDOT.

Acknowledgments

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Introduction

The Village of Warsaw, in cooperation with the Wyoming County Planning Department and the Town of Warsaw, sought to create an innovative, yet practical plan that reflects the community's need to increase pedestrian/bicyclist mobility through a safe, comfortable, and interconnected multi-modal network for people of all ages and abilities. This Active Transportation Plan (ATP) encompassed the Village limits as well as a portion of NY-19 (N Main Street) from Old Buffalo Road to CR-7 (Saltvale Road).

The primary objective of this plan is to develop a set of strategies that rebalances the transportation network through a combination of active transportation and safety improvements, increased connectivity, and promotion of healthy and active lifestyles, and development of Complete Streets. These components should improve safety for all users, while enhancing the economic vitality, preserving the history, and elevating the overall sense of place for the "Village in the Valley." Under guidance from the project's partners, the plan's recommendations sought to provide the following benefits:

1. Increase healthy & active lifestyles for village residents by increasing mobility and connections to jobs, shopping, and recreation.
2. Improve safety, access, and connectivity for all modes of travel.
3. Promotion and protection of the historic built environment of the Village.
4. Enhance pedestrian/bicycle infrastructure.
5. Mitigation of the likelihood and severity of traffic conflicts.
6. Opportunities to capitalize on connections to the natural environment.
7. A potential future trail network with connections to other major trail systems.

Community Engagement

Plans and studies of any kind in the modern era of planning (late 20th century and beyond) rely on meaningful and informative community engagement. Local government, businesses, residents, students, and other local organizations have a vested interest in seeing their communities thrive and be sustainable for future generations. These entities and individuals become shareholders and partners to ensure the recommendations highlighted in this plan are implemented.

Prior to the authorization of this study, a well-rounded, energetic, and passionate Project Advisory Committee (PAC) was formed featuring a diverse cross section of individuals living and/or working within the Village of Warsaw. This committee was comprised of representatives from the Village, Town, Wyoming County, emergency services, health departments, the school district, local business, local pedestrian and cycling advocates, the Genesee Transportation Council (GTC), and New York State Department of Transportation (NYSDOT).

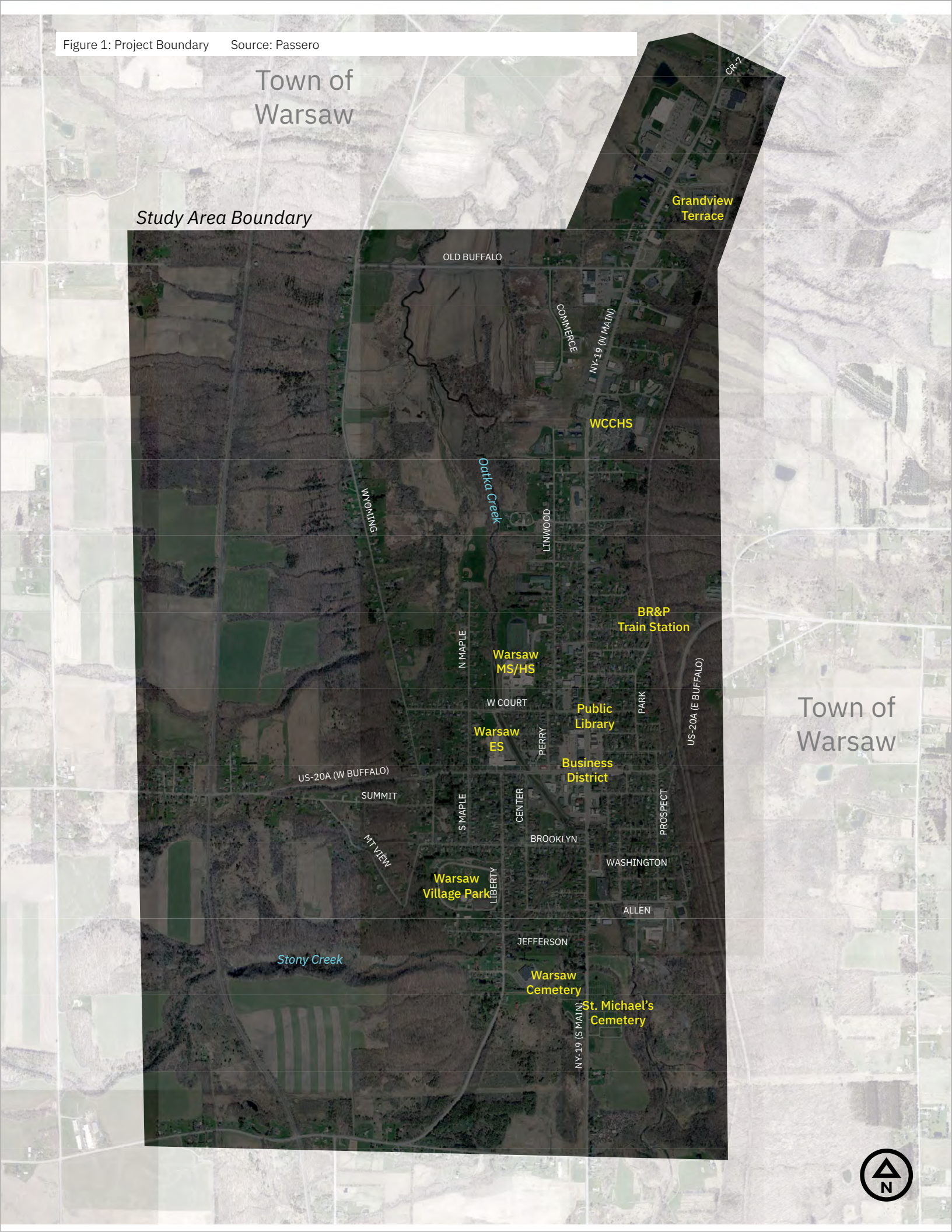
The project team also held multiple rounds of public engagement during the plan's development. These meetings were open to the general public and provided an opportunity for Warsaw residents, business owners, property owners, and others to offer meaningful feedback. These meetings are detailed in Section 3.

Study Area

The study area generally consists of the Village of Warsaw and a small portion of the Town of Warsaw north of the Village along US-19. **Figure 1** illustrates the study area and notable landmarks throughout the community.

Major thoroughfares bisect the Village which provide local and regional access. The four corners of NY-19 and US-20A represent the heart of the Village. The areas just outside this center generate civic and social activity that oftentimes conflicts with the travel demands inherent to the roadway's travel function. In this role, there is a demanding need to re-balance the functional and safety aspects to better serve all users, particularly pedestrians and bicyclists. There are a number of challenges and existing conditions that were considered throughout the study area including - but not limited to - a lack of safe pedestrian crossings and connections, truck traffic and travel through the corridor, and speed concerns.

Figure 1: Project Boundary Source: Passero



Benefits of Active Transportation

"Active transportation" refers to human-powered mobility, primarily walking and biking. It can affect both a community and an individual in profound ways. The promotion of active transportation is important to the Warsaw community, as evidenced by the number of streets with sidewalks, its grid-like development pattern, and its desire to develop this plan to enhance alternative transport. There are significant benefits of active transportation in regard to the economy, health, the environment, and in consideration of social and human safety. The benefits can lead to a more sustainable and thriving community.

Economic

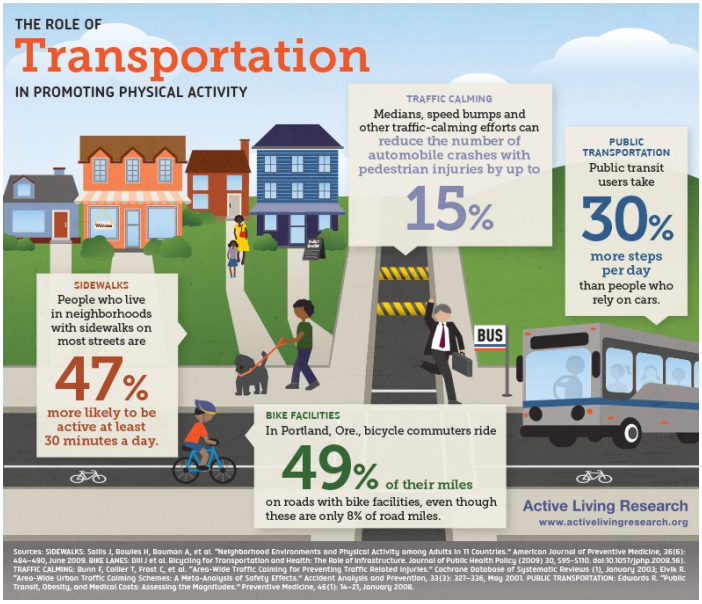
Active transportation has measurable economic benefits for communities. A multi-modal system offers mobility choices for all income levels. It can also be cheaper, when compared to road capacity improvements, to install and maintain producing greater returns on investment. Other benefits include:

- Can save money by diverting costs of vehicle ownership to low to no cost options, like walking and bicycling.
- Can decrease vehicle trips, thus providing a maintenance savings to communities.
- Improving one's health via active transportation networks can reduce healthcare costs.
- A more walkable community can help raise property values and increase tax-based revenues that can be used for place-based improvements.

Health

Most notably, individuals getting out of their vehicles and into walking shoes or on bicycles can provide many health benefits. Important benefits include:

- Children are more likely to perform better academically in school.
- Reduce risk of depression, cardiovascular diseases, and respiratory problems.
- Stress reduction.
- Increase in overall personal well being.



Social

The more people walk and bike, the more likely they are to interact with one another. Recent trends indicate young adults prefer compact, walkable communities where they live, work, and recreate. Places that are designed around an active lifestyle can lead to people lingering amongst public spaces, thereby benefiting local businesses and encouraging social interaction. Other benefits include:

- Walking, bicycling, and using transit as modes of transportation gives the user a choice of the routes they choose to take. This freedom can help reduce stress and health related impacts that stems from traffic congestion and other vehicle related impacts.
- Active transportation can reduce the frequency of pedestrian and bicycle related accidents resulting in a more livable community.
- The versatility of such networks mean that people of all ages, abilities, and income levels benefit from them.

Environmental

In 2013, greenhouse gas emissions from transportation accounted for about 27% of total U.S. greenhouse gas emissions. Active transportation can reduce traffic congestion, thereby reducing harmful greenhouse gas emissions.

- Walking and bicycling produce no greenhouse gases.
- 60% of vehicle pollution is created in the first few minutes of operation.
- A four-mile by bicycle keeps about 15 pounds of pollutants out of the air.

Warsaw is an aging community and meets the criteria as a HUD Disadvantaged Community. A significant population of students walk and bike to school. The heavily traveled roads of NY-19 and US-20A can act as barriers between individuals and their destinations. Warsaw is also the County seat, providing important government, social service, public safety, and commercial functions for Wyoming County. These conditions represent a need for planning enhanced mobility approaches for everyone living, working, and visiting the community.

Existing Conditions Assessment

Previous Plans & Studies

Village of Warsaw Comprehensive Plan

Warsaw's comprehensive plan was last updated in 1994. While this plan is dated, it does reveal some important insights into transportation along major corridors in the Village. Moreover, future land use analysis and mapping helped the project team understand possible opportunities for future development. Some of these opportunities have been pursued, but others remain possibilities for future development. These opportunities are identified as 'Areas Best Suited for Development' and have implications on needs and possibilities for active transportation facilities, including possible bicycle and pedestrian connections at the terminus of Linwood Avenue.

The 1994 plan contained relevant policies and recommendations that informed the analysis and development of the active transportation plan. One of these policies stressed the importance of pedestrian safety and comfort while ensuring connectivity to downtown locations.

The project team further analyzed the walkability and the quality-of-service (QOS) associated with existing pedestrian facilities and corridors.

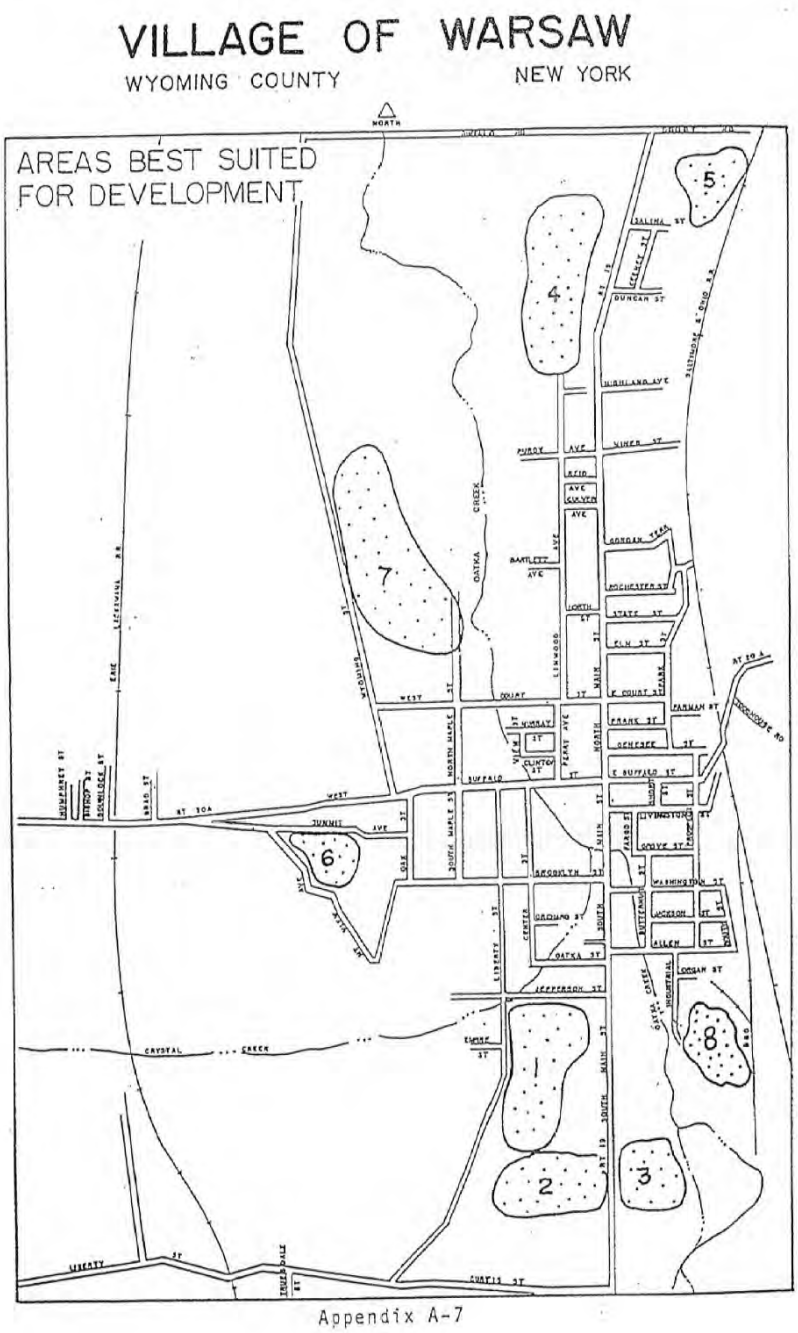


Figure 2: Village of Warsaw Development Areas Source: Village of Warsaw, IPD

Existing Land Use

The existing land uses in Warsaw are similar to many Villages in New York State. Warsaw has a compact downtown area starting centered at the intersection of Buffalo Street and Main Street. This area of the Village contains most of the commercial land uses in Warsaw. From that point outward, land use becomes more residential in nature with a mixture of single-unit, two-unit, and multi-unit homes closer to the Village downtown.

There are a few large agricultural properties, which may be uncommon for an urban Village but is common for Wyoming County communities.

Downtown Warsaw

Land use in downtown Warsaw is mostly comprised of existing commercial land uses with multi-unit residential uses just outside the prominent commercial uses along both Buffalo Street and Main Street. The buildings closer to the downtown center are ones that are traditional to a urban Village in New York. They are 2-3 stories in height and contain a mix of uses with ground-floor retail uses and office or residential uses on the upper floors.

Residential Land Uses

Most of the residential properties in the Village of Warsaw are single-unit homes. There are two-unit and multi-unit homes in the Village as well, many of which are located near the Village's center on side streets near Main Street.

There are also a few larger apartment complexes in the Village including Pine Wood Apartments on Linwood Avenue and Humphrey's Hollow Apartments on Oak Street. These properties are appropriately identified as multi-unit residential properties in the Village's property information file.

Agricultural Uses

There are more than 1,000 acres of agricultural land in Warsaw with 10 parcels of at least 50 acres. This is somewhat uncommon for a compact urban Village, but these existing properties are productive and active uses of existing farmland.

Agricultural land is likely to continue to be an important component of the Village's land use fabric.

Vacant Parcels

There are a few notable vacant or under-utilized properties in the Village that may present some unique opportunities for active transportation improvements.

One of these parcels is the abandoned train station at the end of Park Street. This existing structure could be a place of interest for both pedestrians and bicyclists. Currently, there are no connections for either.

One of the other significant underutilized areas is at the terminus of Linwood Avenue. There is some vacant land in close proximity to this area, but some of the potential of this area lies with a possible connection for bicyclists and pedestrians between Commerce Way and Linwood Avenue. This possible connection was further explored in this study as a potential new active transportation facility for Warsaw.

Rails and Creek Corridors

There are two active rail lines that run through the Village of Warsaw, indicated in dark gray on the map to the right. While these rail lines may not have significant implications on future active transportation planning, there may be opportunities to better connect pedestrians and bicyclists to some important areas near the rail lines, including the former train station and parkland and/or green space.

Oatka Creek flows in a northwesterly direction through the center of the Village. Warsaw's community members often hike and walk the creek recreationally. Residents and visitors often seek out the Warsaw Falls, though it is impossible to locate the falls without trespassing through private property. There may be opportunities to work with existing property owners to identify an accessible trail that can be made available for public use.

Land North of the Village

The project boundary line contains several parcels north of the Village's municipal boundary. Many of

these parcels are along NYS Route 19/Main Street. There are some significantly large commercial uses along this stretch of the corridor, including a Tops and a Walmart. There is also a senior living community on the eastern side of the corridor that serves as an important pedestrian and bicycle connection into the Village. Improvements to existing pedestrian and bicycle facilities in this area should be considered. This connection should be safe and comfortable, which will be difficult to blend with the existing land uses. Additional recommendations to Town zoning may be necessary to better blend the public and private realms with an eye toward safe pedestrian and bicycle facilities.

Existing Zoning - District Assessment

The existing zoning for the Village includes two residential districts, three commercial districts and a light industrial district. There is also a floodplain overlay district in proximity to the Oatka Creek, which crosses through the Village.

R-1 District

The R-1 District was established to provide opportunities for single-unit residential development at medium-density in areas of the Village with existing infrastructure connections including drinking water, sewer, and streets.

Many of the existing neighborhoods and streets that fall within the R-1 District contain single-unit homes on narrow but deep lots, including those along Wyoming Street. Lots on both sides of Wyoming Street, particularly north of W Court Street, contain single homes on parcels that are otherwise covered by forested land and green space.

The community has expressed interest in pursuing trails and walking paths and one possible opportunity could include regulations for public open space requirements in future redevelopment projects. This could apply to all districts, but it could be useful on redevelopment of some of these aforementioned parcels that contain few buildings or structures with a large portion of forested land and open space.

R-2 District

The existing R-2 District differs from the R-1 in that it provides two-unit and multi-unit housing as well as single-unit and cluster development. This area has developed with a wider mixture of housing just outside the Village's downtown core. Homes in this district are generally on smaller lots and are on lower-traffic streets with consistent sidewalk. Pedestrian and bicycle use on these streets should continue to be prioritized and should be complemented through development and design regulations that encourage a compact and walkable environment.

C-B District

The heart of the Village downtown lies within the C-B District. Buildings in this district present as those traditional to an urban village. They have minimal front setbacks, front entrances that face the street, and tuck surface parking behind the buildings. This is desirable for a walkable urban community. However, these design and development components are not required in the Village's zoning code.

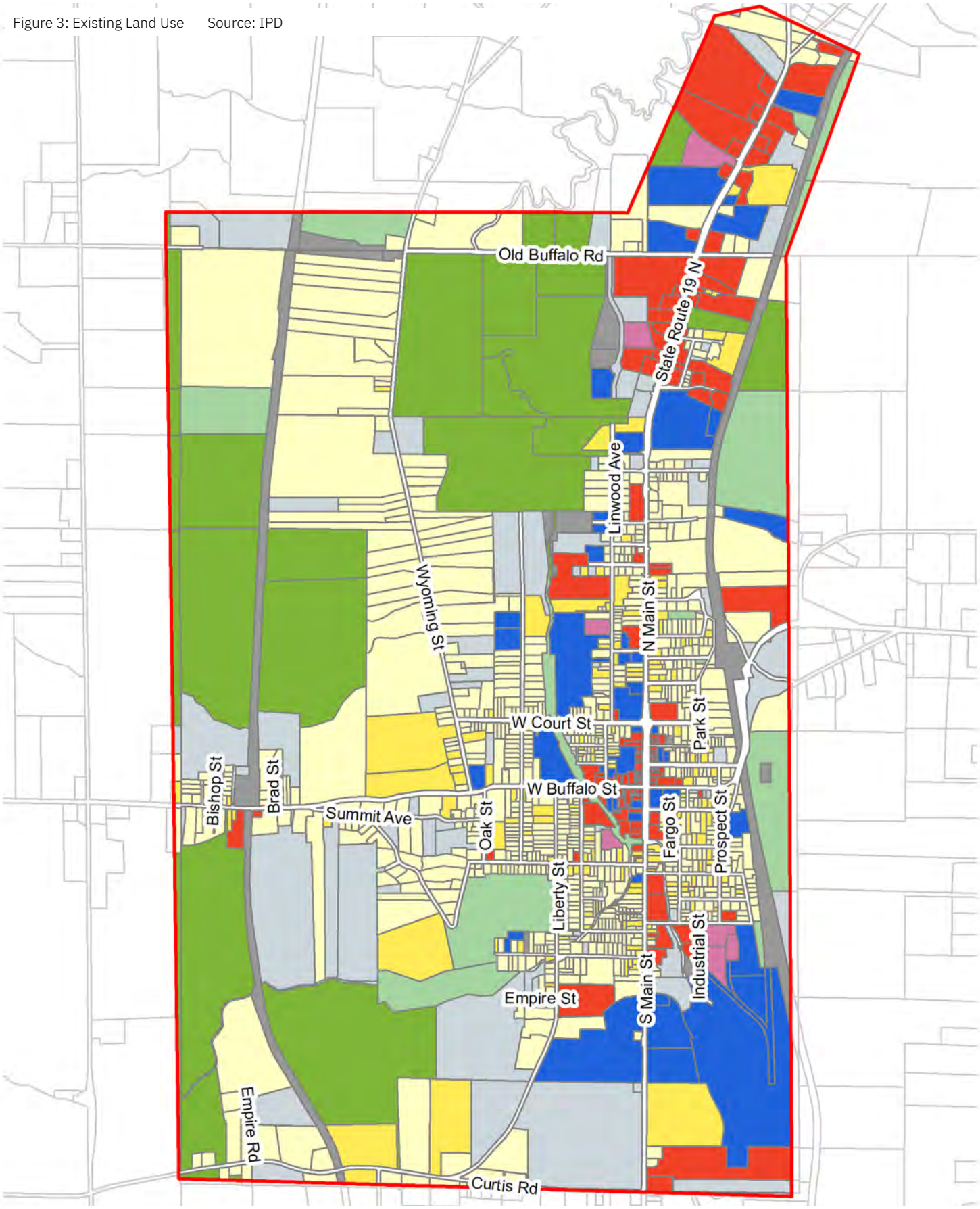
Warsaw should strongly consider codifying some of these design standards in an update to the zoning code. In this way, Warsaw can ensure that their traditional urban village and Main Street can continue to develop in the same way.

G-B District

The General Business District is located in the northern part of the Village along New York State Route 19/N Main Street. Commercial uses in this district have developed as auto-dependent uses that are more typical of suburban development and are less desirable or compatible with a walkable and bikeable urban village like Warsaw.

While redevelopment is not immediate and pressing in this area, it would still behoove the Village to consider zoning changes to the G-B District to position it more as a suburban retrofit with reduced setbacks, rear and side yard parking requirements, and buildings that orient to the streets and engage pedestrians and bicyclists.

Figure 3: Existing Land Use Source: IPD



Legend

- Agriculture
- Single-unit Residential
- Multi-unit Residential
- Commercial
- Community Services
- Parks and Recreation
- Vacant and Under-utilized Land
- Public Utilities

Restricted Business District (R-B)

Additionally, there is a restricted business district which is intended to provide suitable areas for professional office and administrative land uses that have lower volumes of traffic compared to uses permitted in the remaining commercial districts.

Business District (B-D1)

The Town's zoning district just north of the Village along NY-19/Main Street is one of the Town's commercial districts, which permits a variety of retail and service uses. Future collaboration with the Town may be necessary to ensure that development and design regulations for the Business District align with the Village's G-B District to the south. Both districts would ideally include regulations that help foster a safe and walkable environment for pedestrians.

Existing Zoning - Dimensional Regulations

The Village's zoning schedule conveys certain dimensional requirements for its zoning districts. Relevant regulations were included in a table on the next two pages. These include lot size, yard setbacks and building heights. The Village's zoning schedule contains more dimensional regulations, but they were not analyzed for this study.

The analysis on these pages examines these select dimensional regulations under the lens of walkability and bikeability in the Village. As such, the focus of the analysis is on those districts which are closest to Warsaw's walkable downtown core.

Minimum Lot Size

The size of a lot can have an immense impact on comfort and safety of pedestrians and bicyclists. Development on smaller lots leads to a denser and more compact environment, which can contribute to a more active street. In general, smaller lots are more desirable for an urban village like Warsaw, especially within districts that are near and at the Village's core.

Minimum lot sizes for Warsaw's zoning districts vary greatly. A commercial property in the C-B District is only required to develop on 5,000 square feet, which is adequate for a compact urban village. However, the two residential districts, including the R-2 District which lies adjacent to the C-B District, require far more square footage for single-family dwellings, which are the smallest permitted land use in the residential districts.

This is meaningful because the R-2 District abutting Warsaw's downtown currently has small lots and compact residential development that would not be replicable under the existing minimum lot size requirements. Under the current zoning requirements, 60 of the residential parcels in the Village cannot redevelop as a two-family dwelling. Furthermore, 34 of these parcels cannot even redevelop as single-family homes without an area variance. The minimum lot sizes should be reconsidered in a future zoning code update. Smaller lot requirements will not only encourage a wider variety of redevelopment for many parcels in the Village, but they will also help contribute to a walkable Village.

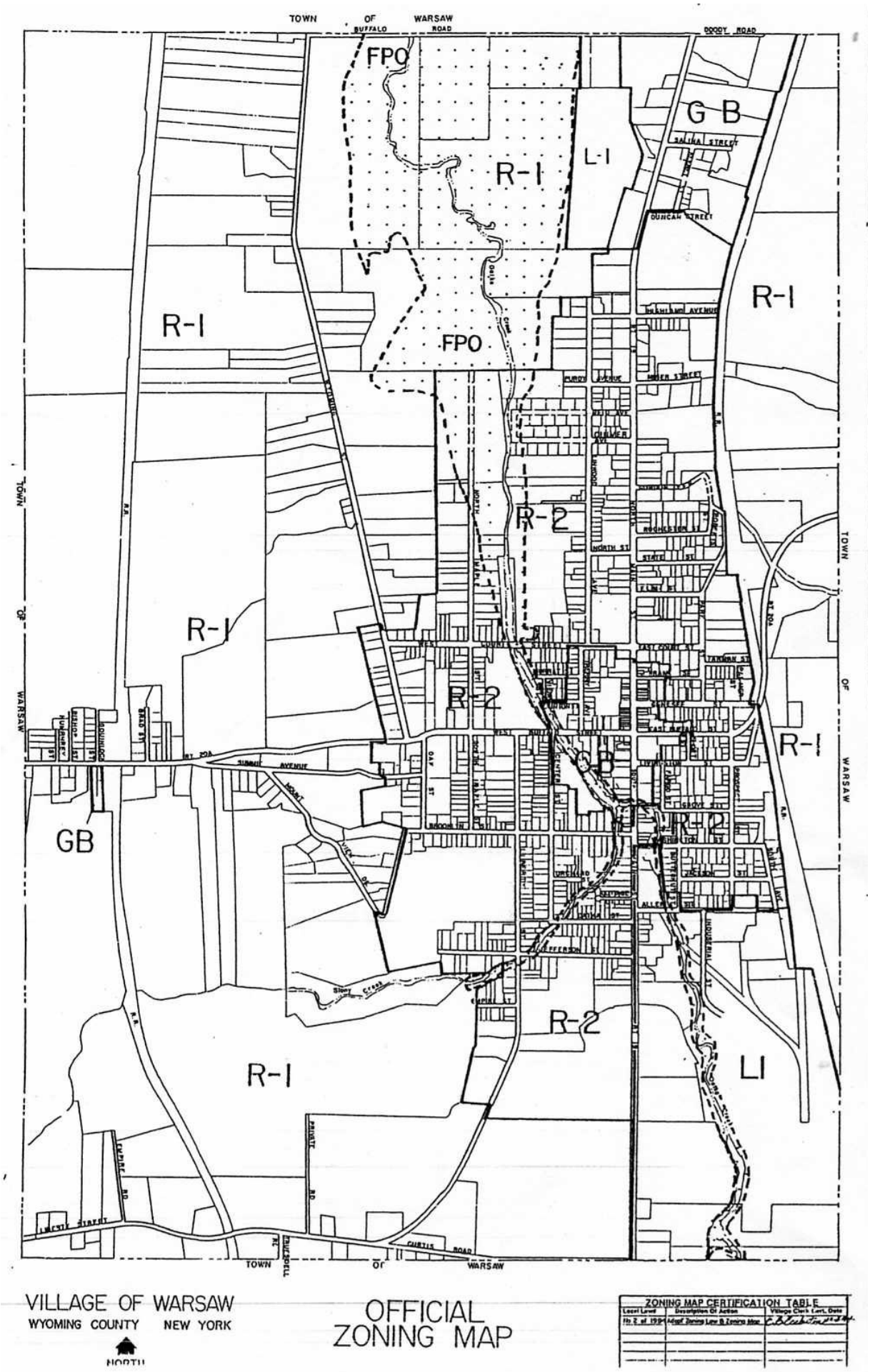
Front Yard Setbacks

The depth to which a building is set back from the street can also determine whether that street or neighborhood is walkable. A street with minimal setbacks can help to create a more defined interface between the public and private realms. Rather than making a pedestrian feel isolated and far from developed land, buildings with smaller setbacks help to create a more enclosed space for pedestrians.

Most of the front setbacks in these districts are excessive when compared with similar requirements for other New York urban villages. All residential uses in these districts are required to have a front yard setback of 60 feet.

This distance is also incompatible with existing residential streets, particularly in the R-2 District. Homes on Center Street between Brooklyn Street and W Buffalo Street, for example, have an average front yard setback of 25.86 feet. Other residential streets in the R-2 District have similar setbacks to Center Street and none of them approach 60 feet, the required minimum.

Figure 4: Existing Zoning Source: Village of Warsaw, IPD



The minimum front setback requirements for most land uses in the C-B District - including all commercial retail uses - is 25 feet. While this may be an appropriate setback for residential districts, it is too excessive for the Village's densest core district. Many existing building setbacks in this district are 0 feet and some are a bit higher at 10-15 feet.

The Village should consider reducing minimum front setbacks for all districts, but especially for the R-2 and C-B Districts that are currently the most walkable and representative of the core urbanized area of Warsaw.

Maximum Building Height

Building heights also have a significant effect on the walkability of a street or neighborhood. Existing buildings at the center of the Village are 2-3 stories and help to enclose the adjacent pedestrian realm. The C-B District should allow for the most flexibility regarding building heights. The current zoning limits height to 2 stories for all districts, including the C-B. Some of the most important buildings in the C-B are currently 3 stories and their positive impact on the pedestrian realm cannot be overstated. The Village should consider expanding minimum building heights in the C-B to accommodate existing heights and ensure that a similar level of development can occur in any future redevelopment of Warsaw's downtown.

Table 1 Dimensional Regulations by District and Select Land Uses

Zone	Land Use	Lot Size (min)	Front Setback (min)	Building Height (max)	Lot Width (min)
R-1	Single-family dwelling	15,000 sf[1]	60 ft	2 stories	100 ft
R-2	Single-family dwelling	12,000 sf	60 ft	2 stories	80 ft
R-2	Two-family dwelling	20,000 sf	60 ft	2 stories	100 ft
R-2	Multiple-family dwelling	2 acres[2]	60 ft	None[3]	None
C-B	Retail and service	5,000 sf	25 ft	2 stories	50 ft
C-B	Office building	10,000 sf	25 ft	2 stories	100 ft
C-B	Multiple-family dwelling	2 acres	60 ft	None	None
G-B	Retail and service	15,000 sf	50 ft	25 ft	100 ft
G-B	Office building	15,000 sf	50 ft	2 stories	100 ft

Source: Village of Warsaw Zoning Code; Village of Warsaw Zoning Schedule

1 If the lot is a corner lot, the minimum lot size is 22,500 sf and minimum lot width is 150 ft for both frontages
2 This minimum lot size is coupled with a maximum gross density of 12 dwelling units per acre with no more than 12 dwelling units per building
3 While multiple-family dwellings do not currently have a maximum height requirement, their permission is subject to Planning Board approval

Walkability Assessment

The quality of the pedestrian experience is equally, if not more, important than pedestrian level-of-service (PLOS). This is especially true for denser and urban environments like the Village of Warsaw. People are less likely to use pedestrian ways when they look and feel uninviting or if they are perceived to be unsafe. In village downtowns that are substantially built out, there is often no need nor is it physically and/or financially possible to increase the capacity of the pedestrian ways without acquiring additional right-of-way. Therefore, rather than solely focusing on PLOS, the consultant team, in collaboration with the project steering committee, focused on evaluating the quality-of-service (QOS) for pedestrian ways in the Village of Warsaw.

Quality-of-service analysis utilizes several qualitative factors that are not addressed in customary level-of-service analyses. The steering committee can identify specific recommendations for improvement based on the careful evaluation of each pedestrian way. For example, if a street scored a very low score of "1" on shade trees, then the planting of trees is a promising course of action.

The pedestrian routes were evaluated using the following 7 qualitative factors:

Enclosure/Definition – The degree to which the edges of the pedestrian realm are well defined. Excellent enclosure focuses a pedestrian's eyes along the street and has positive impacts on safety by conveying a feeling of narrowness to motorists, slowing vehicular traffic.

Transparency – The ability to see through the transition between private and public space.

Interface – The interaction and blending between the public and private realms that clearly defines the space as pedestrian-friendly.

Shade Trees - The presence of street trees improves the comfort level of pedestrians by providing protection from harsh weather and helps to define the pedestrian realm.

Buffer from Street – A "buffer zone" between pedestrians and moving vehicles enhances pedestrian safety and increases the level of comfort.

Connectivity/Crossings – The ability of the pedestrian to have the option to cross at a dedicated crosswalk and/or connect to another pedestrian way.

Amenities – The presence of benches, trash receptacles, and other street furniture.

Scoring

Routes were divided into route segments, which were comprised of one or two blocks. Each side of the street was rated based on the 7 factors. Route segments were rated on a scale of 1 to 5 where a score of 1 is 'Very Poor' and a score of 5 is 'Excellent.' The maps on the following pages show the average scores for the rated street segments in Warsaw.

Scored Streets

Not every street in the Village was assessed and scored for the 7 walkability factors. After discussing important streets and pedestrian corridors with the project steering committee, the project team selected NY-19/Main Street, US-20A/Buffalo Street and Court Street.

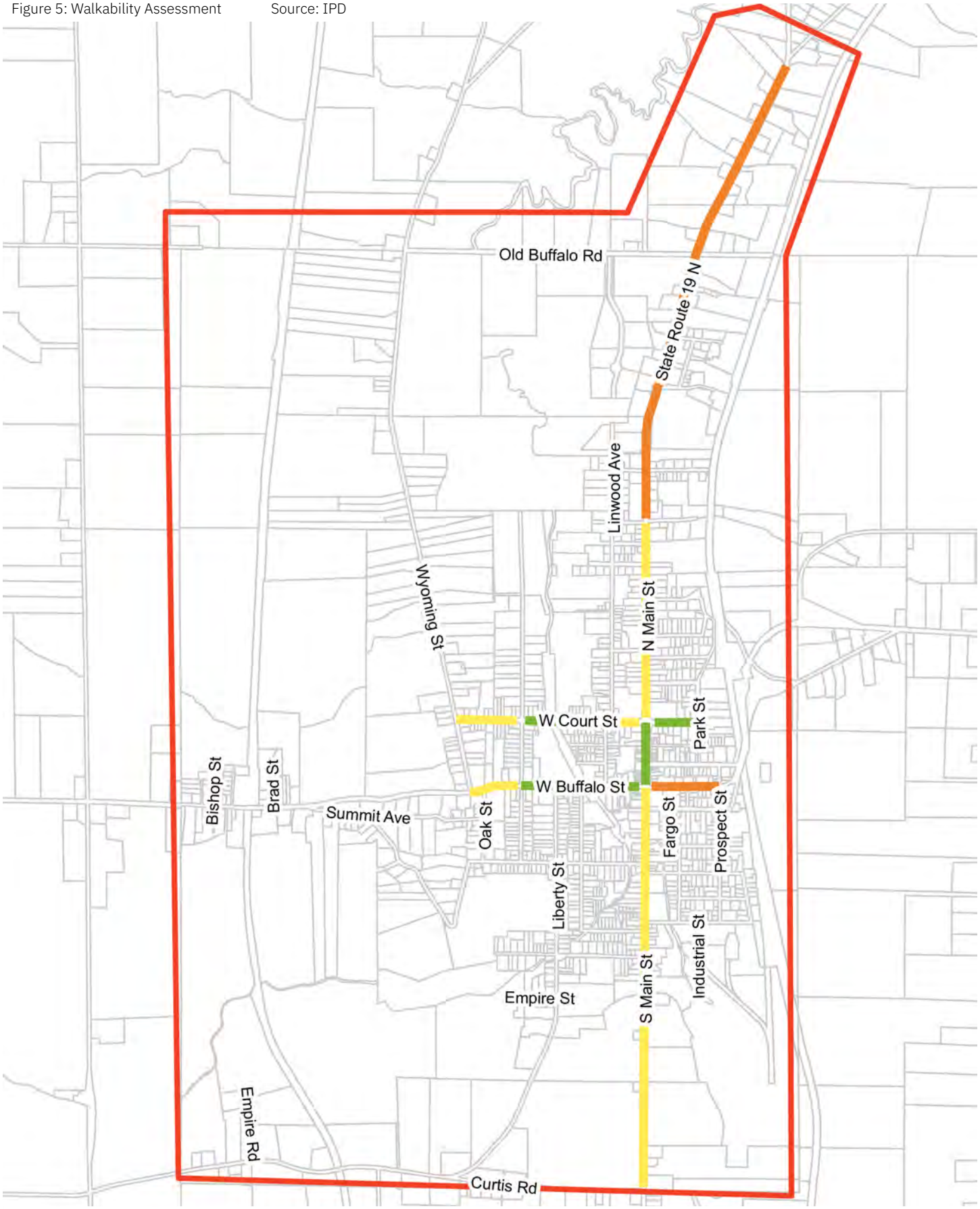
Walkability is important for all streets in the project boundary, but these three streets were determined to be the three where attention was most needed regarding improvements. These streets were included after discussions with the project steering committee and during gathering and analysis of all relevant data.

The map to the right shows the average score for each street segment that was assessed for the three identified streets. While many of the street segments rated out as either 'Fair' or 'Good,' there are still opportunities to improve walkability for all streets and segments. The analysis on the following pages includes more detailed assessments for each street as well as more detail scoring for all street segments.

It's important to keep in mind that the context for the assessed streets and street segments will

inevitably vary. For example, the transparency and interface are likely to be more impactful and meaningful for NY-19/Main Street, especially for segments that are within the heart of the Village downtown. Land uses on these segments is more mixed - with residential, retail, service, and office uses blended together. As such, the need for more ground-floor transparency will be higher for NY-19/ Main Street than it will be for certain segments along Court Street and Buffalo Street.

Figure 5: Walkability Assessment Source: IPD



Legend

- Very Poor (0.0-0.9)
- Poor (1.0-1.9)
- Fair (2.0-2.9)
- Good (3.0-3.9)
- Very Good (4.0-5.0)

Representative Walkability Photos

US-20A facing east

US-20A near Yummies

NY-19 facing north

Court Street facing west

US-20A facing west

NY-19 facing north

NY-19/Main Street Walkability

NY-19 may be the most important corridor for pedestrian connectivity in Warsaw. It serves as the Village's Main Street and carries the heaviest traffic in Warsaw. Existing land use and development along Main Street help contribute to a strong pedestrian enclosure, particularly at and near the intersection of NY-19/Main Street and US-20A/Buffalo Street. The segment from Court Street to US-20A/Buffalo Street was the highest-scoring segment for NY-19/Main Street. Along with strong enclosure, this segment also has a plethora of amenities, a wide buffer from vehicular traffic, and consistent street trees. These components combine to provide a safe, comfortable and interesting experience for pedestrians.

The lowest-scoring segments along NY-19/Main Street were from the project's boundary line to E Highland Avenue. This area is replete with auto-oriented uses and while there are consistent sidewalks, they are often adjacent to sprawling parking lots. This results in a poor transition between the public and private realms with little to no interface between the two realms. Additionally, neither of these segments have street trees along either side of NY-19/Main Street. Street trees provide important shade and comfort to pedestrians and give a sense of enclosure to the pedestrian realm. This area within the project boundary includes a significant senior housing community. Many of these residents have indicated that they both walk and bike into the Village. Providing a safer environment for these vulnerable users should be a priority for Warsaw.

Table 2 Walkability Assessment - NY-19, North Village Line to South Village

Qualities for High-Level Pedestrian Experience	Project Boundary to Village Line		Village Line to E Highland Ave		E Highland Ave to North St		No
Side of Street	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*	*East Side*	*West Si*
Enclosure/Definition	1	1	2	2	2	2	3
Transparency	1	1	1	1	1	1	3
Interface	1	1	1	1	2	3	3
Buffer from Street	3	2	2	2	2	3	4
Shade Trees	1	1	1	1	3	2	2
Connectivity/Crossings	2	2	3	2	2	2	3
Amenities	3	3	3	3	3	3	2
Average Score	**1.7**	**1.6**	**1.9**	**1.7**	**2.1**	**2.3**	**2.9**

Source: Ingalls Planning & Design, Pedestrian Quality-of-Service Assessm

Legend

- Very Poor (0.0-0.9)
- Poor (1.0-1.9)
- Fair (2.0-2.9)
- Good (3.0-3.9)
- Very Good (4.0-5.0)

e Line									
orth St to Court St		Court St to Buffalo St		Buffalo St to Brooklyn St		Brooklyn St to Jefferson St		Jefferson St to Village Line	
de	*East Side*	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*	*East Side*	*West Side*	*East Side*
	3	4	3	3	2	3	2	2	2
	3	3	3	3	1	2	1	2	2
	3	3	3	3	2	3	2	3	2
	3	4	4	4	4	4	3	3	3
	2	4	4	2	2	3	2	1	1
	3	5	5	3	3	2	2	2	2
	2	4	4	3	2	2	2	2	2
	2.7	**3.9**	**3.7**	**3.0**	**2.3**	**2.7**	**2.0**	**2.1**	**2.0**

ment

US-20A/Buffalo Street Walkability

US-20A/Buffalo Street runs east-to-west through the center of the Village of Warsaw and carries a significant amount of vehicle traffic. It is an important pedestrian corridor and connection to Warsaw's Main Street. The existing land use and development along W Buffalo Street is similar in character to Main Street, although any compact mixed-use development steeply decreases on E Buffalo Street.

The segments from Maple Street to Main Street graded out with the highest walkability marks for US-20A/Buffalo Street. Both of these segments have very wide buffers for pedestrians. The segment from Maple Street to Perry Avenue is mostly tree-lined, which provides enclosure and shade for pedestrians. Street trees are not, however, consistently planted east of Center Street and while the pedestrian buffer is still wide in this area, there is less enclosure. Existing buildings in this segment do provide enclosure from side of the private realm. While these segments graded as 'Good,' there is still room to improve. They would both benefit from consistent pedestrian connectivity and crossings. In general, all pedestrian crossings should be high-visibility treatments rather than standard crossings with two parallel lines. While the sidewalk is consistent in these segments, there are a few areas where it nearly blends with adjacent surface parking lots. This not only speaks to unclear connectivity, but also indicates poor interface between the public and private realms. At a minimum, Warsaw should consider screening surface lots from the pedestrian realm.

The lowest-scoring segment along US-20A/Buffalo Street is between Main Street and Prospect Street. The interface throughout this segment is poor on both sides due to unscreened surface parking lots, inconsistent sidewalk that does not continue through vehicle ingress/egress points, and buildings with large setbacks. This provides an ambiguous and uncomfortable environment for pedestrians. In addition to a weak interface, this segment has no street trees and limited crossings. The Village should consider pursuing street trees for segments like this one where there are few or none. Additional considerations to design and development standards for the private realm may also help to improve walkability in future redevelopment scenarios.

Legend

Very Poor (0.0-0.9)
Poor (1.0-1.9)
Fair (2.0-2.9)
Good (3.0-3.9)
Very Good (4.0-5.0)

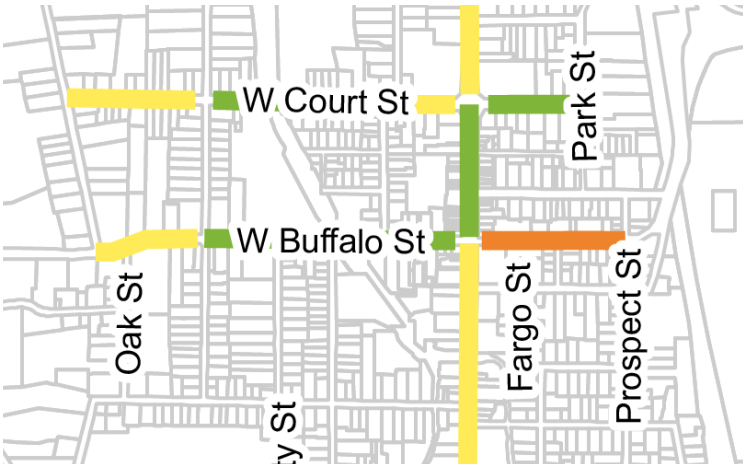


Table 3 Walkability Assessment - Buffalo Street from Wyoming Street to Prospect Street

Qualities for High-Level Pedestrian Experience	Wyoming St to Maple St		Maple St to Perry Ave		Perry Ave to Main St		Main St to Prospect St	
Side of Street	*North Side*	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*
Enclosure/Definition	3	3	3	3	3	4	2	2
Transparency	2	3	4	3	3	4	1	1
Interface	2	3	3	3	3	3	1	1
Buffer from Street	3	3	3	3	4	4	2	3
Shade Trees	2	2	3	4	2	2	1	1
Connectivity/Crossings	3	3	3	3	3	3	2	2
Amenities	3	3	3	4	4	4	3	3
Average Score	**2.6**	**2.9**	**3.1**	**3.3**	**3.1**	**3.4**	**1.7**	**1.9**

Source: Ingalls Planning & Design, Pedestrian Quality-of-Service Assessment

Court Street Walkability

Court Street intersects with NY-19/Main Street at a small traffic circle with a monument at the center of the intersection. This street is an important pedestrian connector to Main Street that is close to the Village core. Additionally, this is a necessary and common pedestrian route for students attending Warsaw High School, located on W Court Street. While this street scored fair-to-good for all segments, it is important to note that the crossings at Main Street have been identified as needing improvements, particularly given the student pedestrian traffic.

All of the segments grade at either 'Fair' or 'Good' for Court Street. Each segment has wide buffers from vehicle traffic, most of which are planted, which provides an added visual buffer from motorists. The strongest segment is between Maple Street and Perry Avenue. This stretch of Court Street has consistent street trees in addition to wide buffers.

Crossings and pedestrian connectivity could be improved throughout all Court Street segments. There are few crossings, and most of the existing crossings are of a standard design and are not high-visibility crosswalks. Additionally, there are a few locations on Court Street where vehicle access to surface parking takes place without consistent pedestrian access. Future sidewalk and crosswalk improvements should continue through vehicle ingress/egress points to provide obvious and visual pedestrian access that motorists will be able to easily recognize.

Legend

Very Poor (0.0-0.9)
Poor (1.0-1.9)
Fair (2.0-2.9)
Good (3.0-3.9)
Very Good (4.0-5.0)

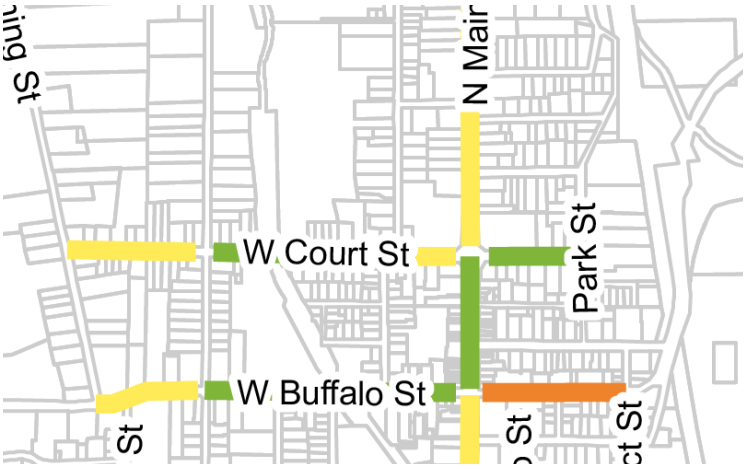


Table 4 Walkability Assessment - Court Street from Wyoming Street to Park Street

Qualities for High-Level Pedestrian Experience	Wyoming St to Maple St		Maple St to Perry Ave		Perry Ave to Main St		Main St to Park St	
Side of Street	*North Side*	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*	*North Side*	*South Side*
Enclosure/Definition	2	2	3	3	1	2	2	3
Transparency	3	3	3	3	3	3	3	3
Interface	3	3	3	3	2	2	2	3
Buffer from Street	4	4	5	5	5	5	5	5
Shade Trees	4	4	3	4	1	1	3	3
Connectivity/Crossings	1	1	1	1	3	3	2	2
Amenities	3	3	3	3	3	3	3	3
Average Score	**2.9**	**2.9**	**3.0**	**3.1**	**2.6**	**2.7**	**2.9**	**3.1**

Source: Ingalls Planning & Design, Pedestrian Quality-of-Service Assessment

Transportation Analysis

The information utilized for the transportation component of this study was obtained from a variety of available sources including the Genesee Transportation Council (GTC), New York State, and Wyoming County. Additional data were collected in the field, such as turning movement counts, roadway cross section, vehicle speeds, and sidewalks.

As noted, the primary roadways are NY-19 and US-20A. Other roadways included in the study are also Wyoming Street, Center Street, Court Street, Linwood Avenue, Liberty Street. These roadway segments provide local and regional access. There is a varying mix of land uses making up a unique context along each roadway. For example, Liberty Street and Wyoming Street are primarily lined with residential homes while NY-19 functions as a mixed-use corridor.

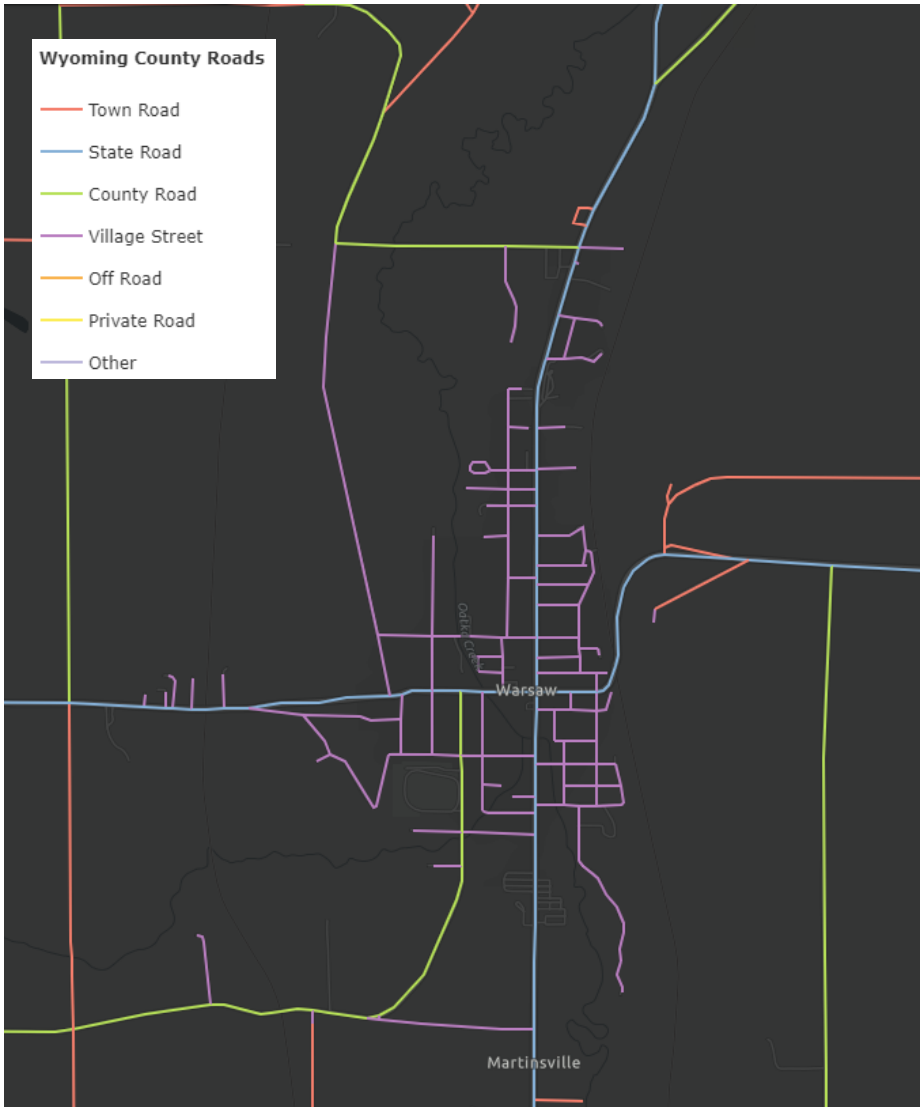


Figure 6: Roadway Jurisdictions Source: Wyoming County

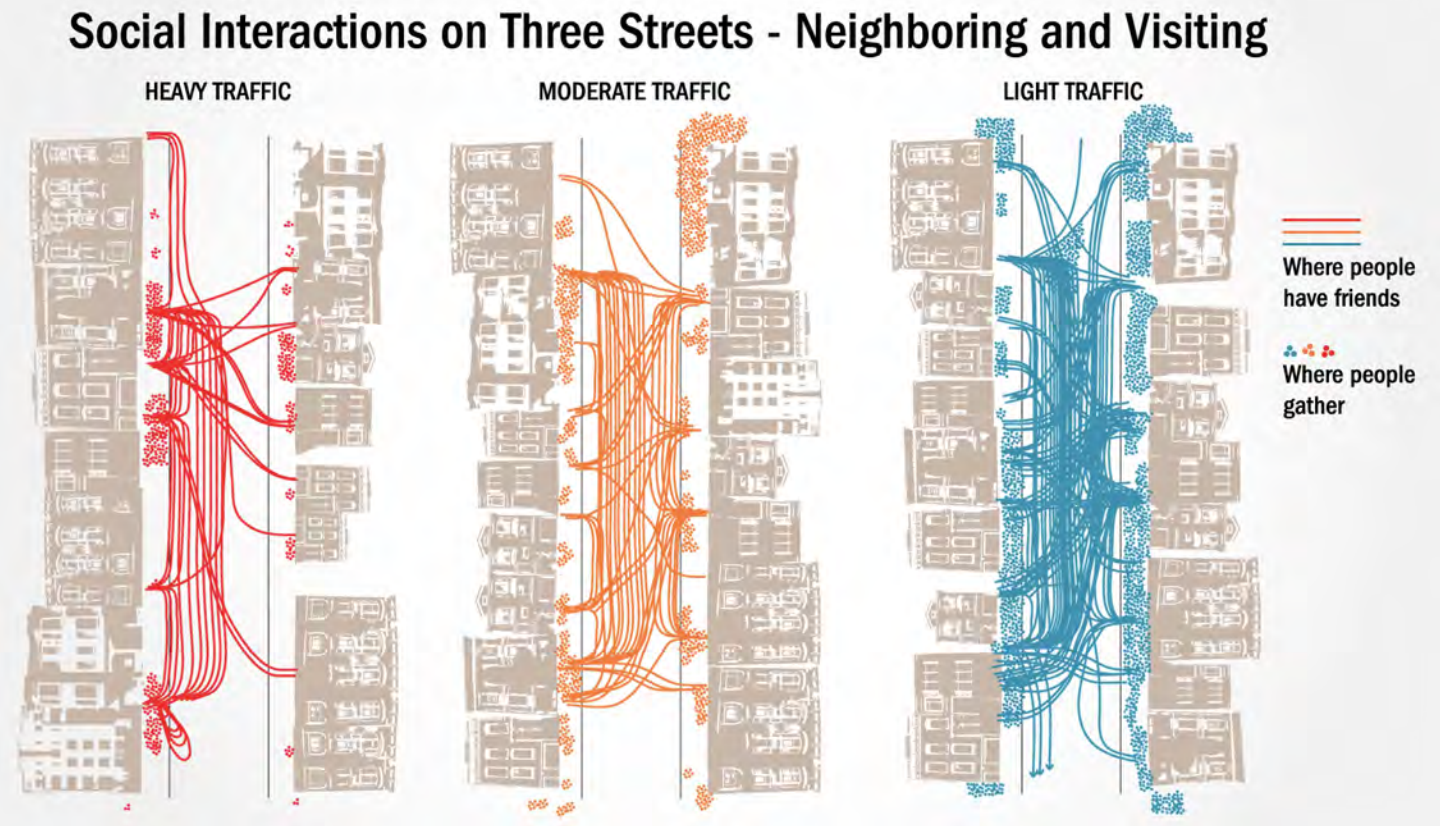
Roadway Jurisdictions

This section provides a jurisdictional assessment of all roadways within the study area. Warsaw has an inventory of state, county, and local roadways. It is important to know the distinction between roadway jurisdictions in relation to bicycling facilities, as transportation agencies may have differing policies on marking and signing. **Figure 6** illustrates the types of roadways. Maintenance of each of these roadways is generally left to the care of the owning-agency. When the Village begins to implement the recommendations contained within this Plan, coordination with the appropriate agency will be necessary to determine the extent of bicycle and pedestrian facility improvements as well as individual maintenance responsibilities.

Traffic Volumes

Using data collected by the NYSDOT, **Figure 7** illustrates the Annual Average Daily Traffic (AADT) along the study area's roadways, measured in vehicles per day (vpd). Areas with higher traffic volumes can affect the safety and friendliness of the environment for pedestrians and bicyclists. NY-19 has some of the highest traffic volumes in Warsaw, as well as the highest incidence of pedestrian and bicycle-related crashes (these are illustrated later in the report).

The image on the following page shows how traffic volumes affect a street's livability and social interactions (Donald Appleyard, 1960s San Francisco). As traffic volumes decrease,



the interactions between residents increases. Conversely, as traffic volumes increase, the space one considers as their "territory" decreases. This can start to show how traffic can act as a barrier between families, friends, and destinations. Improvements to the active transportation network to achieve a more human-scaled Warsaw can lead to higher interactions amongst residents and visitors.

Vehicle Speeds

Roadway speeds play a critical role in the safety of motorized and non-motorized users. Higher speeds generally are associated with higher risks for injuries and fatalities. Pedestrian mortality rates increase as vehicle speeds do the same. As speeds increase by 10 mph, the chance a pedestrian survives a crash decreases significantly.

The Federal Highway Administration (FHWA) classifies speeds along roadways as the posted speed limit, operating speeds, design speeds (the speed established as part of the geometric design process for a specific segment of roadway), and inferred speeds. For a posted road of 35 mph, the inferred speed (the maximum speed for which all critical design-speed-related criteria are met at a particular location) may be as high as 50 mph based on factors such as road design, scale, setback, etc. of land uses and other fixed objects (e.g., trees) surrounding the road.

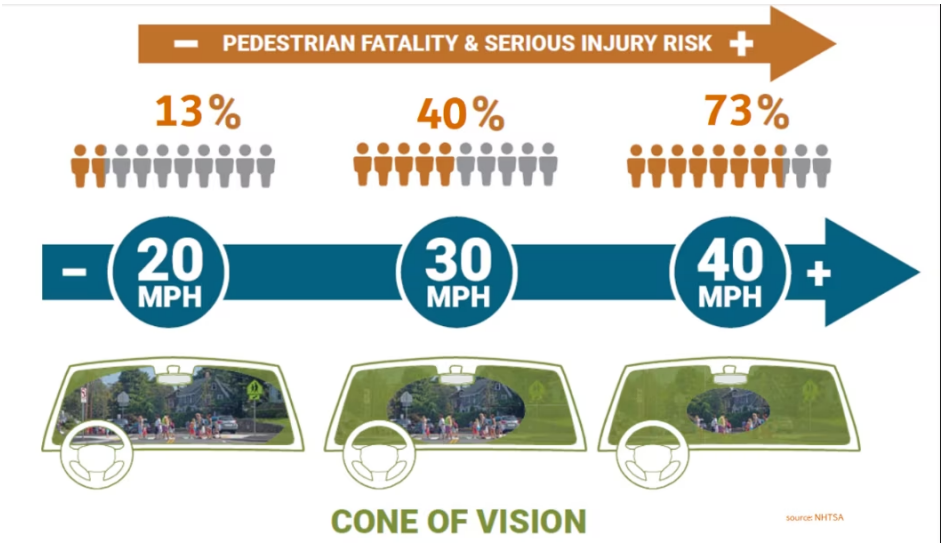
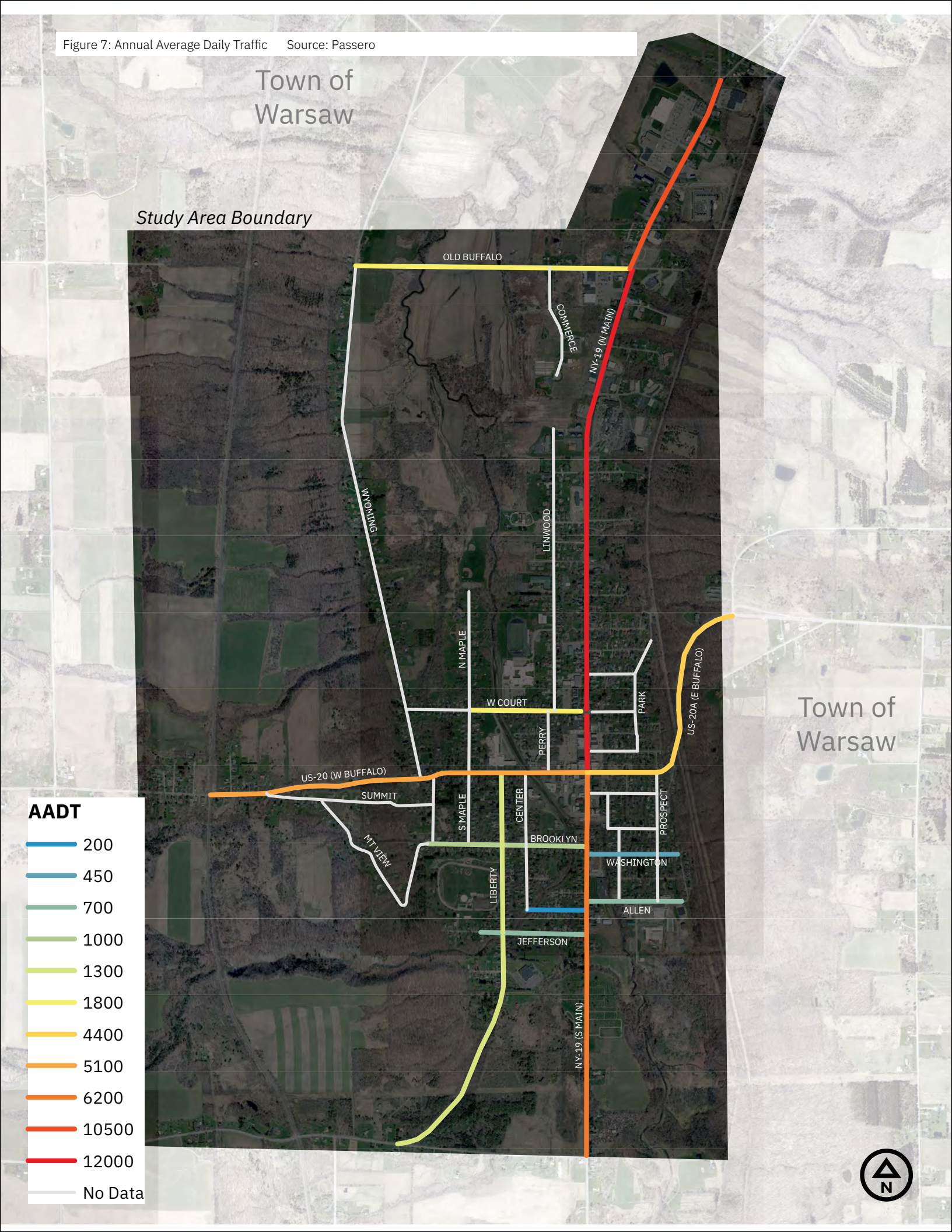


Figure 7: Annual Average Daily Traffic Source: Passero



However, a speed classification more human-scaled that seeks to enhance streets for use by all modes of travel is a road's target speed (as described in the Institute of Transportation Engineers' Designing Walkable Urban Thoroughfares: A Context Sensitive Approach). A target speed differs from operating speed – the speed at which vehicles are observed operating during free flow conditions – in that it is the speed designers and community members intend for drivers to go. On streets within compact, walkable areas, the 85th percentile of observed speeds should fall between 10-30 mph or less. As illustrated in the speed graphic on the previous pages, as vehicle speed increases, the field of view decreases. Additionally, as speeds increase, so do the required stopping distances. In areas where walkability, bikeability, and transit friendliness are desired, slower speeds should be designed for through context sensitive solutions.

More communities both within the United States and in Europe are moving towards lowering their speed limits. New York State recently allowed cities and villages to lower their areawide speed limits to 25 mph along their local streets. Towns may also do so long as stipulated criteria are met. Seattle has 20 mph zones, as well as Portland. In the United Kingdom, a non-profit organization called "20's Plenty for Us" was formed in 2007 to help communities set a mandatory 20 mph speed limit for most roads. These initiatives are aimed at reducing, if not eliminating all together, pedestrian and bicycle-related traffic fatalities; all the while creating livelier, people-friendly, high quality of life places.

Posted speeds are 30 mph within the Village. To get a better understanding of actual vehicle speeds, this study collected vehicle speed data at the locations illustrated in **Figure 8**. The first speed illustrated on the map is the 85th percentile speed at the location. That is, 85 percent of drivers are traveling at that speed or less. Transportation agencies generally post speed limits based on this indicator. Should a slower speed be desired, appropriate speed management solutions need to be employed to reduce the operating speed of vehicles. Strictly reducing the speed limit will not have an impact on drivers choice of speed and is not an effective speed management solution.

Functional Classification

Functional classification of roadways is determined by the NYSDOT and the FHWA. All functional classification is separated into rural or urban categories. States assign functional classification based on how roadways are currently operating. As stated by the FHWA, "Functional classification carries with it expectations about roadway design, including its speed, capacity and relationship to existing and future land use development. Federal legislation continues to use functional classification in determining eligibility for funding under the Federal-aid program." Sub-categories are divided into arterials (principal and minor), collectors (major and minor), and local roadways.

Within the study area, all roadways are classified as rural. NY-19 and US-20A are minor arterials while Old Buffalo Road (CR-1) is a minor collector. All other roadways are locals.

According to the FHWA, the following characteristics are representative of each class.

Minor Arterial (FC 06)

- Link cities, larger towns, and major destinations and form an integrated network of interstate and inter-county service.
- Provide service to corridors with greater trip lengths and travel density than collectors and generally with higher travel speeds than higher access roadways.

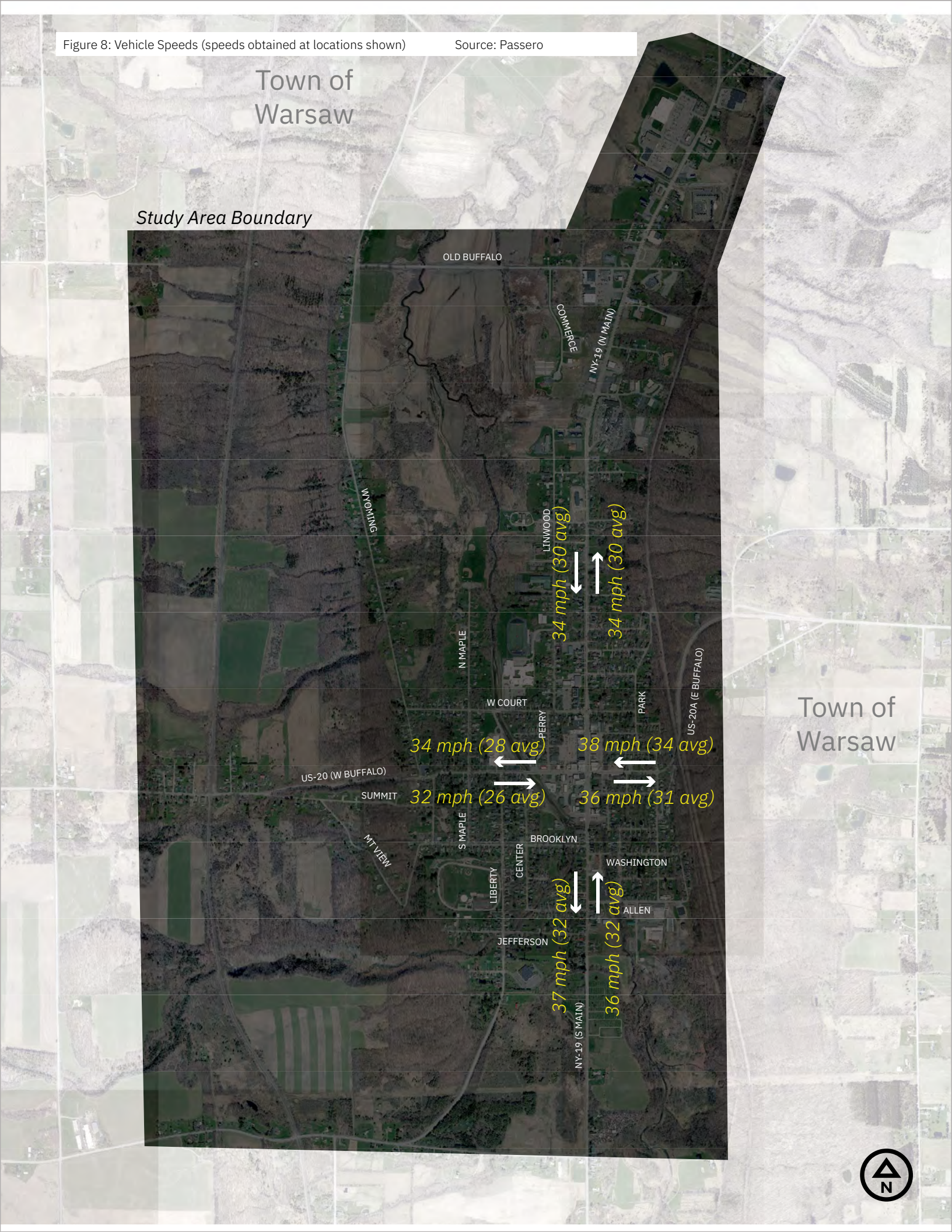
Minor Collector (FC 08)

- Collects traffic from local roads to bring into developed areas.
- Provide service to smaller communities.
- Link traffic generators to rural hinterlands.

Local (FC 09)

- Typically provides service directly to adjacent land.
- Generally shorter travel lengths when compared to higher classification roads.
- Does not typically provide through traffic access.
- Highest mileage of roadway system.

Figure 8: Vehicle Speeds (speeds obtained at locations shown) Source: Passero

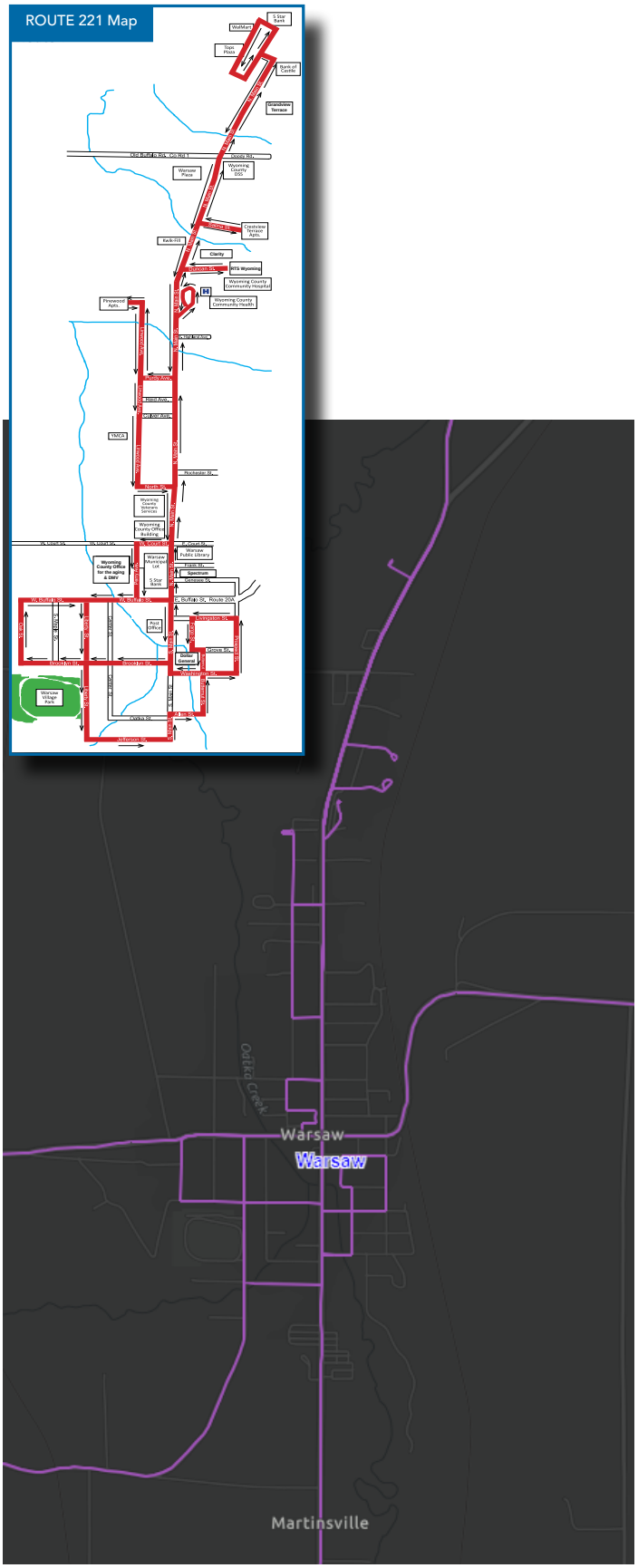


Transit

Transit plays a critical role in completing a fully integrated transportation network. The most successful cities and communities typically have high quality active transportation networks that incorporates transit as a key link between home, work, and service/commercial based destinations.

Bus service is provided via Regional Transit Service (RTS) and Routes 220, 221, 222, 223, 224, 226, 227, 228, and 229. Some of these routes merely provide pass-through service while Route 221 provides intra-village service, as shown in the following graphics.

Sheltered bus stop



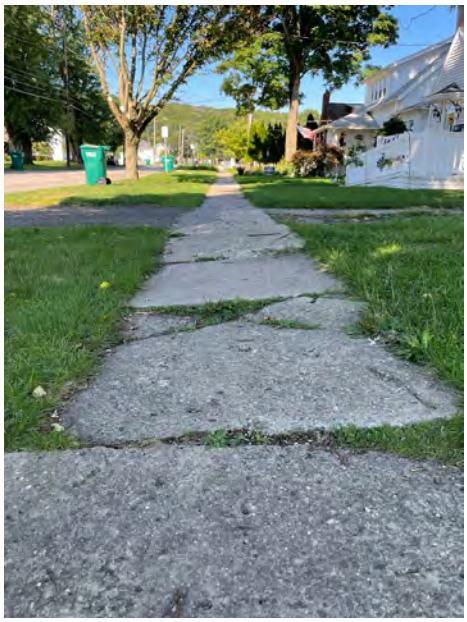
Sidewalk Network

The Village features an extensive sidewalk network, with only a few public streets lacking them. The sidewalk network provides connections from the these streets to the business district, schools, and Warsaw Village Park. Notably, there are sidewalks along NY-19 between the heart of the Village to the commercial uses to the north. These connections provide important mobility options for the community.

Business district sidewalks

Sidewalks losing their presence

The quality of the sidewalks varies between overgrown with vegetation and cracking to newly replaced sections. Maintenance will be an important strategy to utilize to ensure a well kept multi-modal network for all users.



Heaving and cracking

Marked crosswalks can also be found at many intersections throughout the study area, as indicated on **Figure 9**. However, some marked crossing opportunities for those crossing NY-19, for example, may be greater than 1,200 feet between one another. Desirable distances between crosswalks in central business/walking districts is 325-500 feet according to the NYSDOT. In urban or suburban residential/retail areas based upon density/land use, distances are not to exceed 1,320 feet.

The NYSDOT recently performed a resurfacing project and ensured all crosswalks are Type LS. NYSDOT crosswalk types are illustrated below. Enhanced crosswalks, such as Type L and Type LS increase the visibility for approaching drivers. High visibility crosswalks are preferred at uncontrolled locations. However, a high visibility crosswalk would not be installed on a stop controlled approach. High visibility crosswalks are installed at signalized locations.

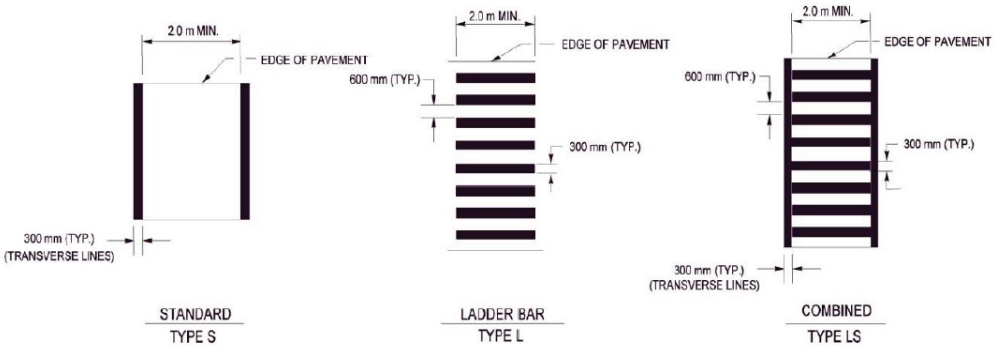
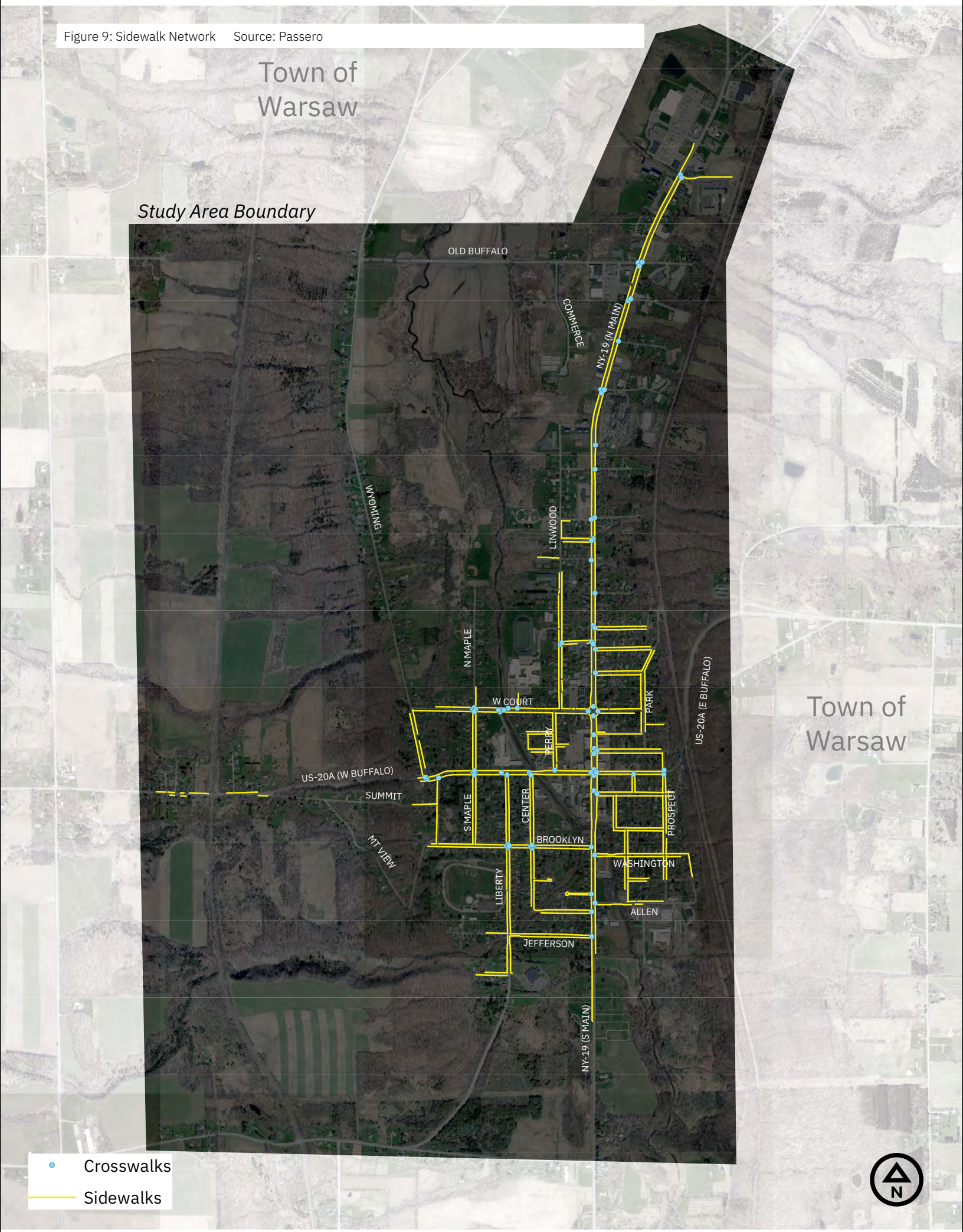


Figure 9: Sidewalk Network Source: Passero



Roadway Cross Sections

Roadway conditions are generally good throughout. Travel lanes range from 10 to 12 feet wide depending on the roadway. **Figure 10** shows the travel way conditions.

Intersections

Within the study area, there were three major intersections identified early in the planning process by the PAC and the consultant team. These intersections are NY-19 at Old Buffalo Road, NY-19 at Court Street, and NY-19 at US-20A. For the most part, all roadways are one travel lane in each direction, aside from auxiliary turn lanes at select intersections. NY-19 between Court Street and just north of Brooklyn Street consists of two travel lanes in each direction with turn lanes at select intersections.

Intersection Conditions

How one experiences an intersection can be viewed through two lenses: one as a motorist and one as an active transportation user (pedestrian, bicyclist or other wheeled user, and transit). In regard to the latter cohort, intersection conditions are measured in terms sidewalk presence, curb ramps, pedestrian crossing signals, lighting, and overall compliance with the Americans with Disabilities Act (ADA).

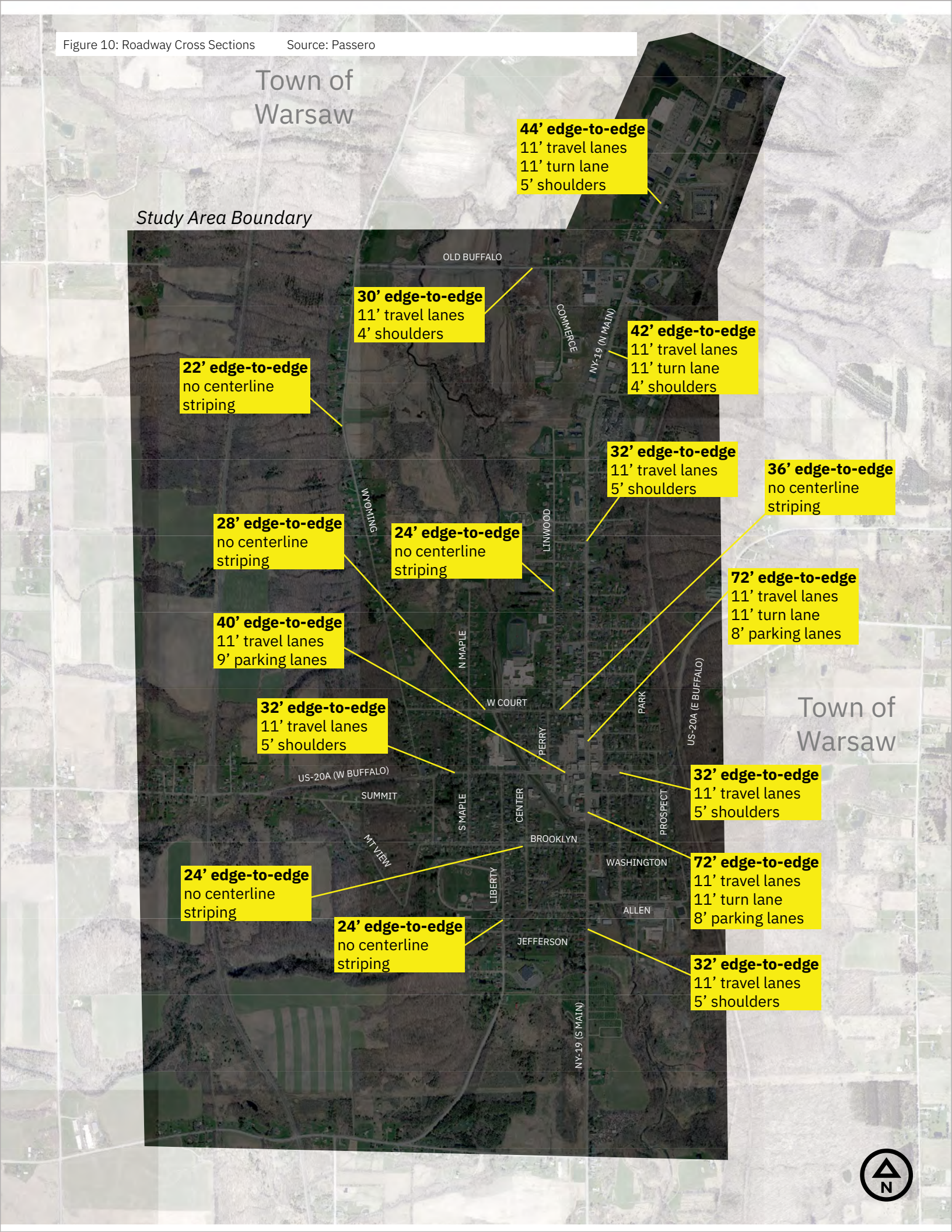
It is important that pedestrian-related facilities be provided in areas that experience frequent pedestrian traffic (e.g., sidewalks, street furniture, lighting, crosswalks, and curb ramps). Pedestrian facilities can encourage a more active lifestyle leading to improved health, lower transportation related costs, and reduced roadway congestion. Focusing investments on pedestrian improvements can improve safety for children and adults alike. Taking from Gil Penalosa, a worldwide adviser on creating vibrant and healthy communities, “if everything we do in our cities is great for an 8 year old and an 80 year old, then it will be great for all people (www.880cities.org).” This evaluation focuses on the select study intersections. A transportation network cannot truly be complete unless it consists of a well-connected and inclusive system of amenities for all users, regardless of age or ability.

NY-19 facing north


Old Buffalo Road facing west


US-20A facing west

Figure 10: Roadway Cross Sections Source: Passero



INTERSECTION	SIGNALIZED/ UNSIGNALIZED	CROSSWALKS	CURB RAMPS W/ DETECTABLE PADS	PEDESTRIAN SIGNAL	PEDESTRIAN BUTTON	PEDESTRIAN COUNTDOWN TIMERS	LIGHTING	SIDEWALKS
NY-19 at Conable Way	U	●	●	○	○	○	○	●
NY-19 at Old Buffalo Road	U	●	●	○	○	○	●	●
NY-19 at Salina Street	U	●	●	○	○	○	○	●
NY-19 at WCCHS Signal	S	●	●	●	●	●	●	●
NY-19 at Highland Avenue	U	●	●	○	○	○	●	●
NY-19 at Purdy Avenue and Miner Street	U	●	●	○	○	○	●	●
NY-19 at Reid Avenue	U	●	●	○	○	○	●	●
NY-19 at Culver Avenue	U	●	●	○	○	○	●	●
NY-19 at Gordon Terrace	U	●	●	○	○	○	○	●
NY-19 at Rochester Street	U	●	●	○	○	○	○	●
NY-19 at North Street	U	●	●	○	○	○	●	●
NY-19 at State Street	U	●	●	○	○	○	○	●
NY-19 at Elm Street	U	●	●	○	○	○	●	●
NY-19 at Court Street	U	●	●	○	○	○	●	●
NY-19 at Frank Street	U	●	●	○	○	○	●	●
NY-19 at Genesee Street	U	●	●	○	○	○	●	●
NY-19 at US-20A	S	●	●	●	●	●	●	●
NY-19 at Livingston Street	U	●	●	○	○	○	○	●
NY-19 at Brooklyn Street	U	●	●	○	○	○	○	●
NY-19 at Washington Street	U	●	●	○	○	○	○	●
NY-19 at Allen Street	U	●	●	○	○	○	●	●
NY-19 at Otaka Street	U	●	●	○	○	○	●	●
NY-19 at Jefferson Street	U	●	●	○	○	○	●	●
NY-19 at Cherry Street	U	○	○	○	○	○	●	○
US-20A at Prospect Street	U	●	●	○	○	○	●	●
US-20A at Short Street	U	●	●	○	○	○	●	●
US-20A at Perry Avenue	U	●	●	○	○	○	○	●
US-20A at Center Street	U	●	●	○	○	○	●	●
US-20A at Liberty Street	U	●	●	○	○	○	●	●
US-20A at Maple Street	U	●	●	○	○	○	●	●
US-20A at Oak Street	U	●	●	○	○	○	○	●
US-20A at Wyoming Street	U	●	●	○	○	○	○	●

Key

○ No feature present

● Feature present on some corners/approaches

● Feature present on all corners/approaches

NY-19 at US-20A

NY-19 at Frank Street

Existing Intersection Operations

Weekday evening vehicular turning movement counts were collected via video data collection at NY-19/Old Buffalo Road, NY-19/Court Street, and NY-19/US-20A on Thursday, December 1, 2022, from 3:00-6:00 PM. Generally, the peak hour was 3:45-4:45 PM. **Figure 11** illustrates the 2022 existing traffic volumes. Throughout the corridors, heavy vehicle traffic constituted less than 6.5% of total vehicle traffic with some movements experiencing percentages as high as 9%, such as the eastbound through movement at NY-19/US-20A.

All turning movement count data was collected on a typical weekday while local schools were in session. No adverse weather conditions impacted the traffic counts. The traffic volumes were reviewed for seasonality and to confirm the accuracy and relative balance of the collective traffic counts. This study applied a seasonality factor to the collected volumes due to the classification of the roadways as either "commuter dominated" or "non-commuter dominated" routes. Any differences in traffic volumes can be attributed to temporal variations in traffic volumes as well as activity related to driveways located in the segments between the study intersections. NYSDOT signal timings were used to model the signalized NY-19/US-20A intersection.

Data was collected to assess the quality of traffic flow for the existing PM peak hour conditions. Capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis typically focuses on intersections, as opposed to highway segments.

The standard procedure for capacity analysis of signalized and unsignalized intersections is outlined in the *Highway Capacity Manual* (HCM) 6th Edition published by the TRB. Traffic analysis software, Synchro 11, which is based on procedures and methodologies contained in the HCM, was used to analyze operating conditions at study area intersections. The procedure yields a level of service based on the HCM as an indicator of how well intersections operate.

Six levels of service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the conditions with little to no delay, and LOS "F" conditions with very long delays. LOS "C" or better is desirable, but LOS "D" for signalized locations and LOS "E" for unsignalized locations are generally thresholds of acceptable operation during peak periods so long as the volume to capacity ratio (v/c) is below 1.0. The following table depicts LOS criteria for both signalized and unsignalized intersections.

LEVEL OF SERVICE	SIGNALIZED CONTROL DELAY PER VEHICLE (in seconds)	STOP CONTROL DELAY PER VEHICLE (in seconds)
A	< 10	< 10
B	10 - 20	10 - 15
C	20 - 35	15 - 25
D	35 - 55	25 - 35
E	55 - 80	35 - 50
F	> 80	> 50

LOS for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15-minute analysis period. LOS for unsignalized intersections, however, are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable than they are at signals.

The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the

v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur.

This report performed traffic simulation modeling using an extension of Synchro called SimTraffic. During simulation modeling, vehicles are individually tracked, and statistics are recorded on a second-by-second basis to determine the delays each vehicle experiences. Since SimTraffic simulation modeling is microscopic and stochastic, meaning car movement parameters vary randomly within a set distribution based on an initial seed number, the same traffic volume may result in slightly different results depending on the random seed used. Therefore, simulation results are reported based on an average value of multiple simulation runs to reduce the variability in results.

The intersection of NY-19 and Court Street has some features of a roundabout but does not function like one. That is, the Court Street approaches are stop controlled. Roundabouts typically feature yield controls on their approaches to the center circle. Additionally, drivers traveling on NY-19 do not need to slow down in the manner a typical roundabout would be designed to do.

Future No-Build Conditions

A review of historical traffic volumes obtained from the NYSDOT shows traffic has fluctuated since 2014. To account for normal increases in areawide growth, a traffic volume growth rate of 1.0% per year was applied to the 2022 existing volumes for a 10-year traffic forecast period. The LOS table on the previous page depicts the results of both existing and future ETC conditions. **Figure 12** illustrates the 2032 ETC traffic volumes.

All intersection movements generally operate at LOS "C" or better under existing conditions with short to moderate delays. Between 2022 and 2032

	2022 EXISTING BASE CONDITIONS		2032 ETC CONDITIONS	
INTERSECTION	LOS	DELAY	LOS	DELAY
1. NY-19 / US-20A				
Eastbound - US-20A	B	13.4	B	16.3
Westbound - US-20A	A	8.8	B	10.5
Northbound left - NY-19	B	18.7	B	19.7
Northbound thru - NY-19	B	10.1	B	10.6
Northbound thru/right - NY-19	A	4.2	A	4.1
Southbound left - NY-19	B	19.0	C	20.3
Southbound thru - NY-19	A	9.9	B	10.5
Southbound thru/right - NY-19	A	9.3	A	9.4
Overall LOS	**B**	**11.3**	**B**	**12.4**
v/c Ratio	**0.56**		**0.73**	
2. NY-19 / COURT STREET				
Eastbound - Court Street	C	22.5	E	36.6
Westbound - Court Street	B	14.2	C	20.6
Northbound - NY-19	A	3.2	A	3.6
Northbound - NY-19	A	1.5	A	1.8
3. NY-19 / OLD BUFFALO ROAD				
Eastbound - Old Buffalo Road	C	22.6	E	35.9
Westbound - Doody Street	C	23.7	D	31.1
Northbound left - NY-19	A	5.0	A	5.5
Northbound thru/right - NY-19	A	1.2	A	1.3
Southbound left - NY-19	A	1.3	A	1.6
Southbound thru/right - NY-19	A	2.3	A	2.5

conditions, the southbound left movement at NY-19/US-20A is projected to change from "B" to a borderline "C". At NY-19/Court Street, the eastbound movement is projected to change from "C" to a borderline "E". However, the projected increase in delay is 14.1 seconds per vehicle. This also does not factor in the potential for drivers to leverage the grid-like network of Warsaw and utilize alternate routes to mitigate their delays.

Safety Evaluation

Providing safe routes of travel for pedestrians, bicycles, and vehicles is a responsibility and priority for all communities.

A safety evaluation was performed using 10 years (2012-2022) of crash data obtained from the Genesee Transportation Council (GTC) and the Accident Location Information System (ALIS). Pedestrian and bicycle crash locations were identified and mapped to illustrate locations where crashes have occurred. The crashes at these locations should be further analyzed to determine if there are opportunities for safety enhancements. **Figure 13** shows these locations. Areas with notable crash events are:

- NY-19 between US-20A and Court Street (pedestrian-oriented).
- NY-19 between Elm Street and Rochester Street (bicycle-oriented).

Of the 22 reported events, eight were bicycle-related and 14 were pedestrian-related. Nine of the 22 crashes were classified as "injury", two were classified as "serious injury", and the rest were "possible injury." One of the serious injuries resulted from a drunk driver. Of the pedestrian incidents, seven were at intersections and were generally attributed to a vehicle failing to yield the right of way.

These areas have a combination of high foot and two-wheeled traffic and vehicle traffic due to popular destinations and notable generators from the adjacent neighborhoods. The areas should not be assumed to be inherently unsafe taken at face value. However, these areas should be high priority areas for further detailed analysis to determine the appropriate course of action. The appropriate treatment could be an education, enforcement, engineering, and/or combination of the three solutions.

Bicycle Level of Traffic Stress

Transportation options are important to all communities. People should have the opportunity to walk, bike, take transit (if available), or drive their automobile. The roadways or corridors on which people bicycle can have varying levels of stress from traffic. Residential streets with slow speeds are considered low-stress routes while multi-lane roadways with higher speeds and traffic volumes are considered higher-stress routes.

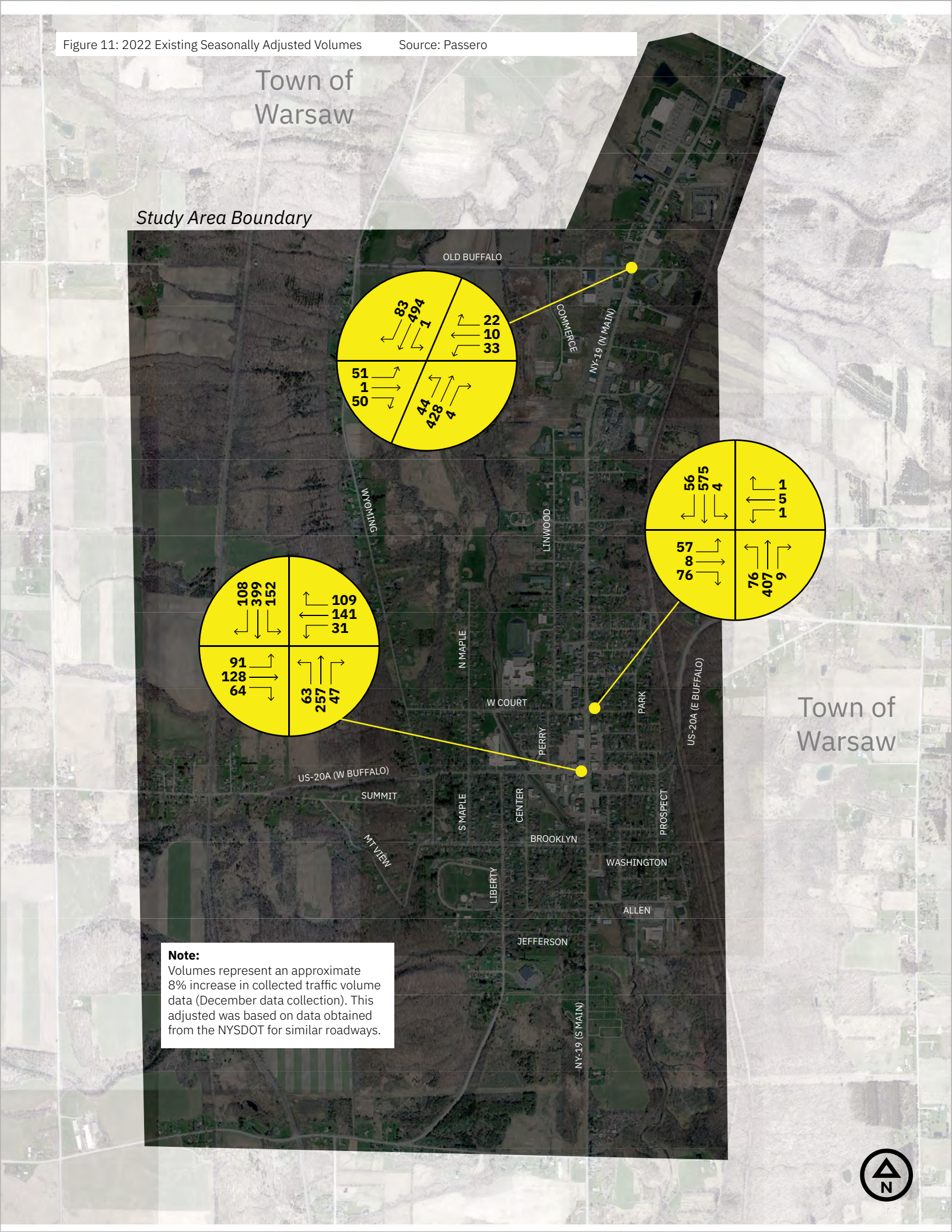
Level of traffic stress (LTS) is an approach developed by the Mineta Transportation Institute (MTI) and San Jose State University in 2012 which quantifies the amount of discomfort people may feel bicycling on segments of roadways. The report discusses aspects affecting LTS, such as traffic volumes, traffic characteristics (road width, traffic speed and the presence of a parking lane), and where bikes are traveling (mixed with traffic, in bike lanes, or on segregated paths). Streets are ranked under four stress levels:

- **LTS 1** - is meant to be a level that most children can tolerate
- **LTS 2** - the level that will be tolerated by the mainstream adult population
- **LTS 3** - the level tolerated by American cyclists who are "enthused and confident" but still prefer having their own dedicated space for riding
- **LTS 4** - a level tolerated only by those characterized as "strong and fearless"

The graphic on the following pages show these four rider groups and the associated LTS scoring. Our approach built on the MTI methodology and used aspects of Florida DOT's LTS scoring. Using the LTS methodology helps to inform communities and transportation agencies the appropriate countermeasures to use to improve the overall bicycling condition for all users.

Bicycle facilities (i.e., dedicated lanes or minimum 4-5' shoulders) within the study area are limited, except for significant segments of NY-19 and US-20A. The results of the LTS assessment are shown in **Figure 14**.

Figure 11: 2022 Existing Seasonally Adjusted Volumes Source: Passero



Note:
Volumes represent an approximate 8% increase in collected traffic volume data (December data collection). This adjusted was based on data obtained from the NYSDOT for similar roadways.

Figure 12: 2032 ETC Volumes Source: Passero

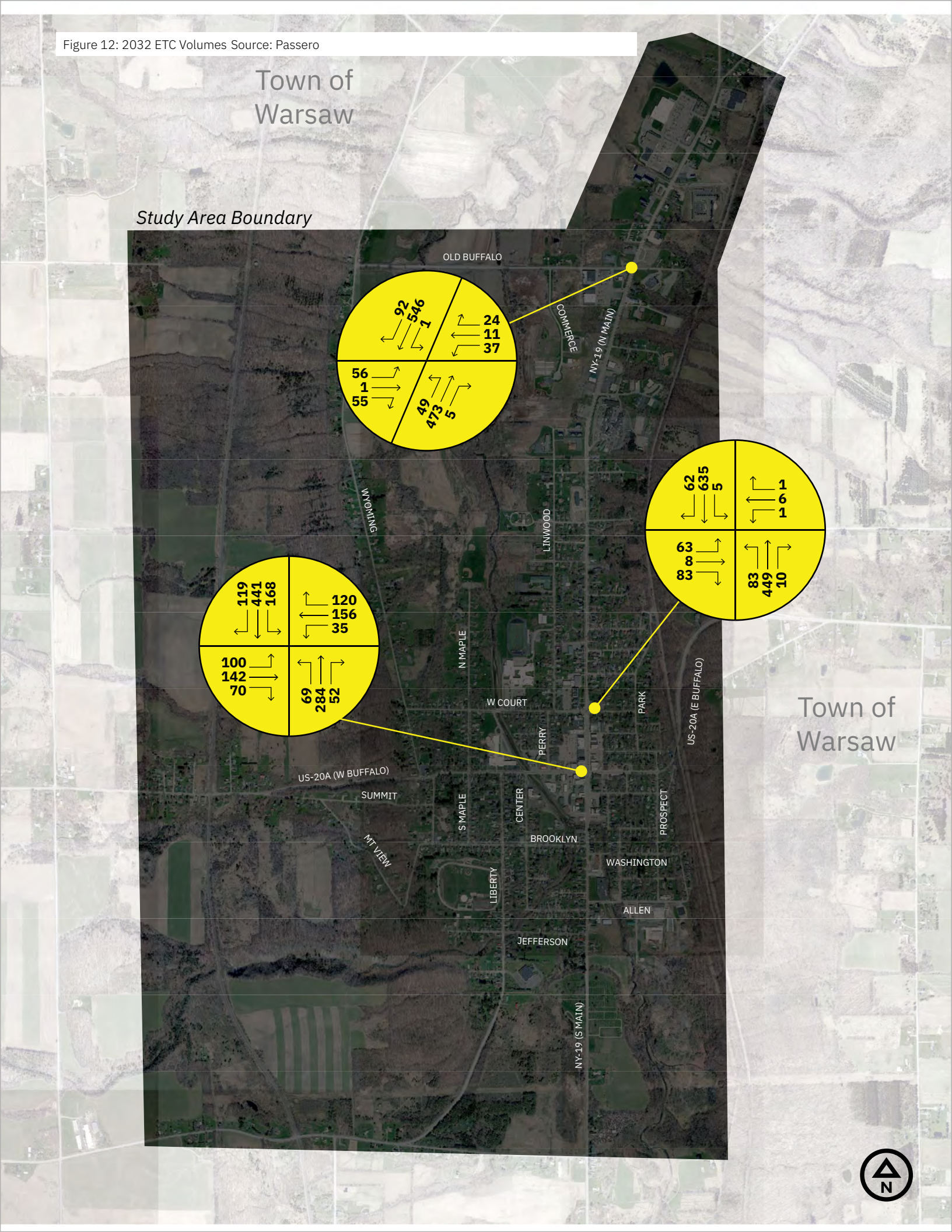
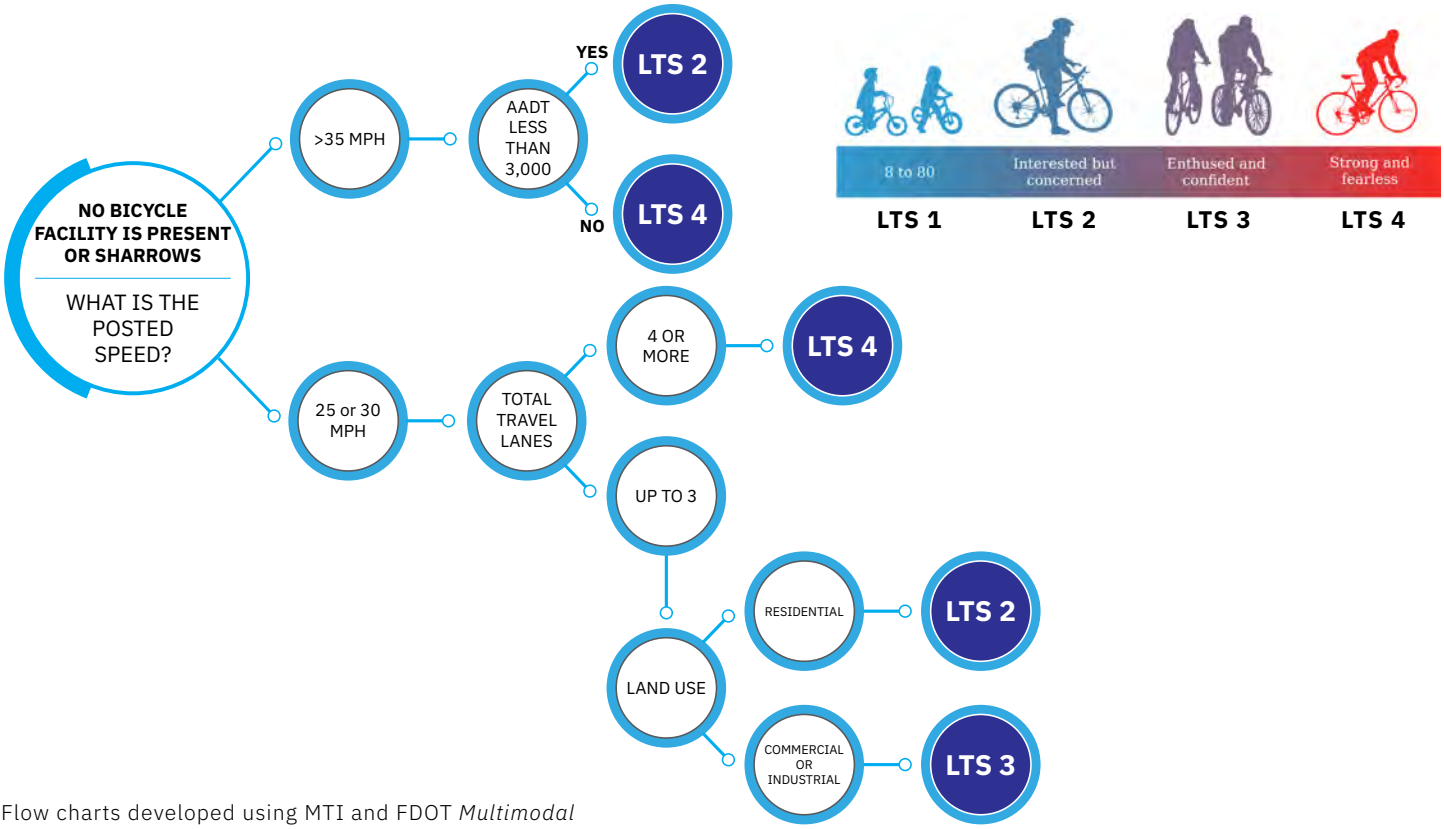


Figure 13: Existing Crash Locations Source: GTC, NYSDOT, and Passero



Flow charts developed using MTI and FDOT *Multimodal Quality/Level of Service* LTS scoring methodology.

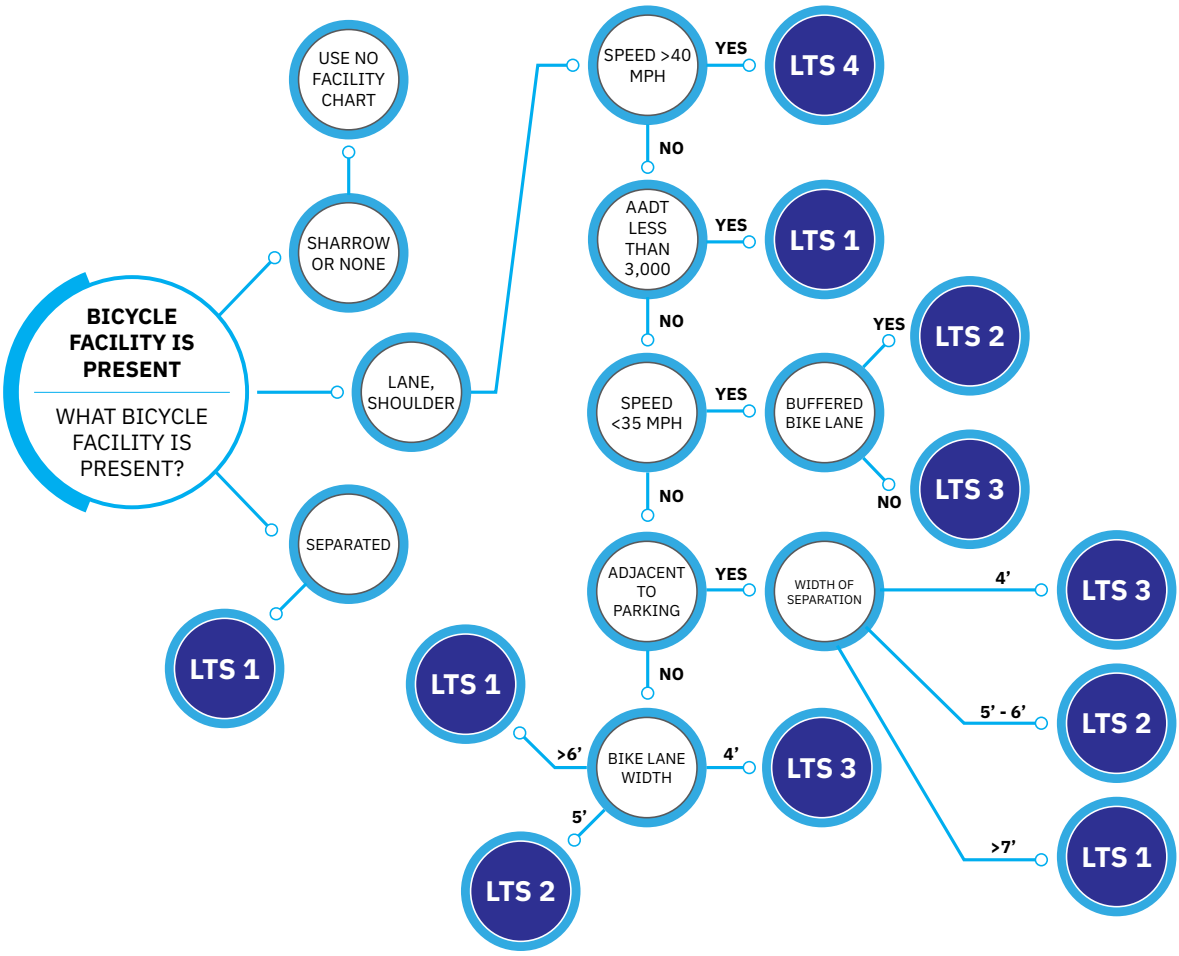
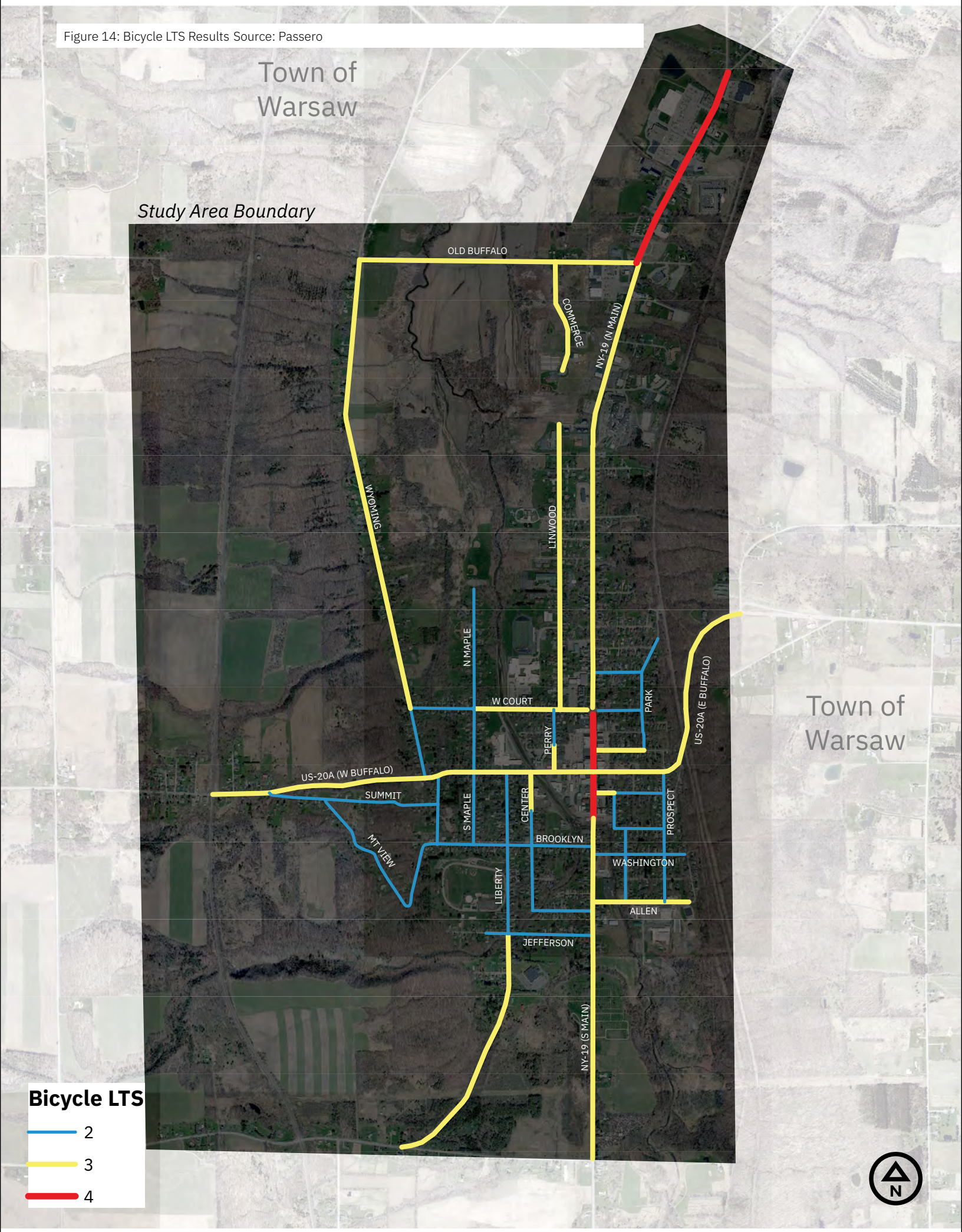


Figure 14: Bicycle LTS Results Source: Passero



Public Engagement

The project team sought input and feedback from the Warsaw community throughout the planning process, which has included one round of engagement thus far.

Public Engagement Round 1

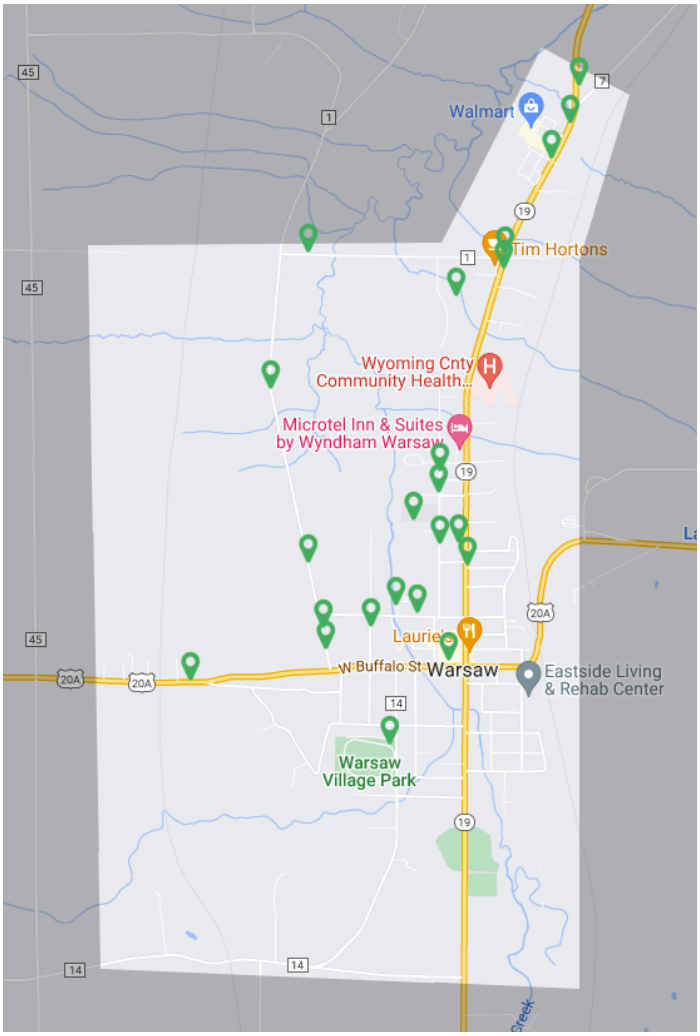
Online engagement is becoming an effective tool in getting community members to participate in the planning process. It is especially useful in identifying key issues, opportunities and assets early in the process. The first round of public engagement took place between May and June of 2023 using an online engagement platform called PublicInput, hosted by the GTC. PublicInput allows respondents to utilize web-based engagement and phone-based engagement using voicemail and text messaging.

A project website was developed that contained project background information, a community forum for engaged discussion between community members, and a collaborative map soliciting geographically-specific input regarding important Village issues, opportunities, and assets. This first round of engagement resulted in more than 1,100 responses by more than 40 unique visitors to the site.

Salient feedback gleaned from the survey are:

- Almost 50% choose to use a car to get around Warsaw, with 41% choosing to walk.
- Most cyclists view their cycling ability and comfort level as novice to basic.
- Rated by level of impact affecting walking or biking habits, the following responses were noted as having major impact: vehicle speeds, lack of caution by driver, poor sidewalk conditions, weather, lack of sidewalks/trails, shoulder width.
- Nearly 50% of respondents said they walk more than one mile.
- Nearly 45% of respondents said they bike less than one mile.
- To increase walking, respondents said that additional sidewalks, improved sidewalk maintenance, off-road paths, better lighting, better crossings, more education, and slower traffic would increase frequency of walking.
- To increase biking, respondents said that additional more trails, signed routes, bike lanes, protected bike lanes, wider shoulders, more bike parking, more education, bike boulevards, sharrows, and slower traffic would increase frequency of biking.
- Over 30% choose to walk or bike to work either daily or weekly.
- Over 50% choose to walk or bike for shopping, dining, or errands either daily or weekly.

The following image shows the results from the collaborative map and form where some of these comments were generated. These thoughtful comments will help establish the Plan's vision and identify areas of priority improvements throughout the remainder of this process.



Collaborative Map results

A Vision for Warsaw

It can often be difficult for community members to envision what they want their community to be like in the future, especially without a graphic depiction. The intent of visioning session is to encourage people to think about the future of their community in a positive way. Visioning helps communities make important decisions regarding future development. Aligning projects, development, and policies with a community-developed vision statement can help remove some of the guess work involved in decision-making for Warsaw while also moving the Village's vision forward.

The results from the public engagement and visioning exercise with the Project Advisory Committee informed the vision statement. The vision statement provides Warsaw with coherent guidelines for decision-making. It is specific to the Village and that level of specificity should help Warsaw determine if a project or policy is appropriate for the Village area. In this regard, the vision should be seriously considered for all future decisions in Warsaw.

Village of Warsaw ATP Vision Statement

Warsaw is a friendly and diverse community with people who are proud to call the Village home. Residents and visitors of Warsaw enjoy an accessible, comfortable, and safe community; active parks; and expansive walking, biking, and trail facilities connecting their neighborhoods to the Village's thriving business district and non-residential areas. People of all ages gather on NY-19 and US-20A to socialize and enjoy unique restaurants and shops. The low-speed streets throughout the Village are walkable and bikeable while offering safe and accessible routes to nearby parks, trails, schools, and other popular Village, Town, and regional destinations.

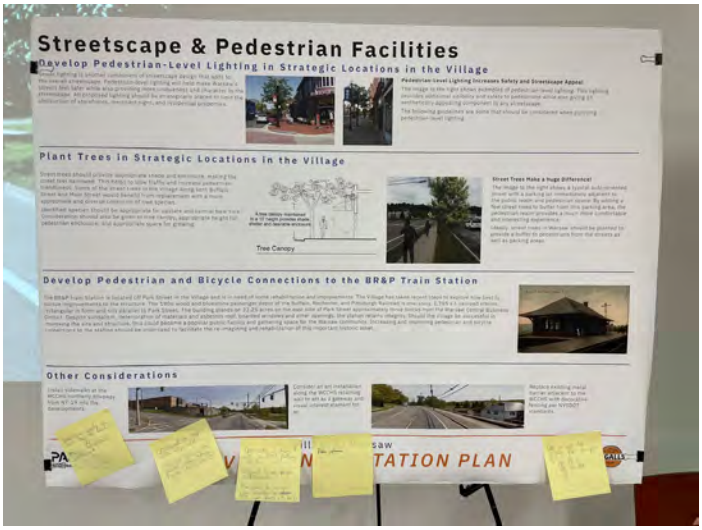
Public Engagement Round 2

On September 20, 2023, a Public Open House was hosted at the Ag and Business Center whereby all preliminary alternatives and recommendations were presented. A total of eight stations were set up, each with their own topic:

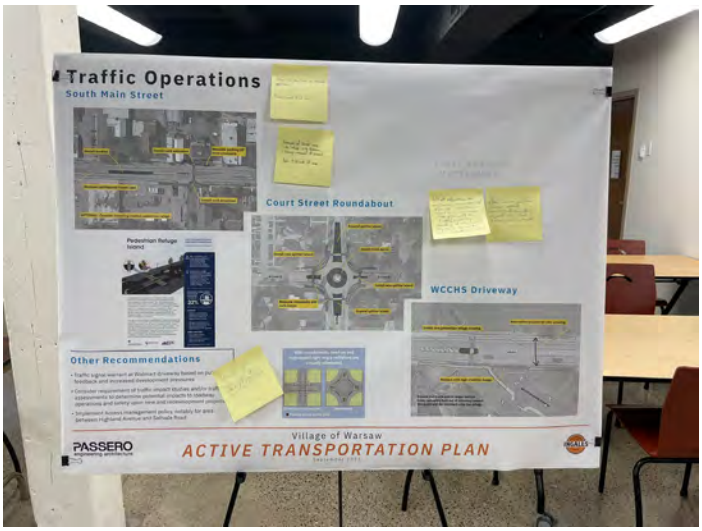
- Project Vision
- Land Use and Development
- Trails and Recreation - Warsaw Park
- Trails and Recreation - Warsaw Falls
- Streetscape and Pedestrian Facilities
- Pedestrian and Bicycle Safety
- Programs, Policies, and Procedures
- Traffic Operations

Nearly 20 community members attended and provided invaluable feedback on each of the topics. Notable comments included:

- Tradeoffs of bike lanes versus accommodations for larger vehicles, such as tractor trailers and farm machinery.
- Attention desired at the four corners of NY-19 and US-20A, such as eastbound/westbound left-turn lanes and truck accommodations.
- Overall pedestrian/streetscape improvements were supported.
- A desire for public restrooms.
- Wayfinding.
- Support for a formal roundabout at NY-19/Court Street.
- Support for formal trail system to Warsaw Falls.
- Support for pedestrian improvements at WCCHS.
- Support for crosswalk enhancements.



The following pages describe the recommendations presented to the public with refinements based on community and PAC feedback.



Land Use and Regulatory Recommendations

Establish Design Standards that Cultivate a Strong Relationship Between the Private and Public Realms

Walkability is imperative to urban villages such as Warsaw and a high level of walkability can have positive impacts on public health and safety while also contributing to active Main Street corridors. Dimensional and design standards can require development to occur in a way that helps cultivate a walkable environment. These standards should guide development that is desired in the Village's commercial and mixed-use districts. They should encourage development that both engages the public realm and contributes to pedestrian-friendly streets.

Standards can address building placement, building height, window transparency and street-facing entrances, and other building requirements. Additionally, detailed design standards should help the Village address other site standards including parking location, landscaping, screening, fences and walls, and signage.

Develop Mixed-Use Districts that Include Properties Along Main Street and Buffalo Street

Mixed-use districts can both enhance the economic vitality and the walkability in Warsaw. This district should be located along Main Street and Buffalo Street at the heart of Warsaw's downtown. A new mixed-use district will require new development to engage the public realm, create pedestrian-friendly streets, and include a combination of vertical and horizontal mixing of retail, service, office, and residential uses. The Village of Warsaw should consider this mixed-use district as part of a larger update to the Village's zoning code.

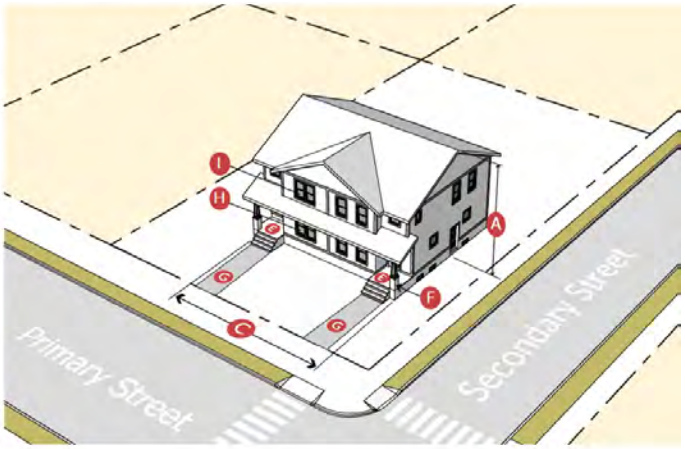
Mixed-use development can occur either vertically or horizontally, as shown in the graphics below. Vertical mixed-use includes several uses within the same structure and is most commonly manifested with an active commercial ground-floor and residential apartments on the upper floors. Horizontal mixed-use includes several structures or buildings on a single site that are a mix of commercial, residential, office and other land uses.

Update the Village of Warsaw's Zoning Code

Zoning code updates should always follow community-wide planning efforts. State law requires zoning to be based on a comprehensive or master planning effort. The Village of Warsaw updated their comprehensive plan in 2023-2024. This update included specific regulatory recommendations that necessitate an update to the Village zoning code. Warsaw's existing zoning code is dated and includes many dimensional regulations that cater more to an auto-oriented and suburban community. The Village should strive to amend many of these regulations to ensure that Warsaw's Main Street will retain its character as an urban village in the future.

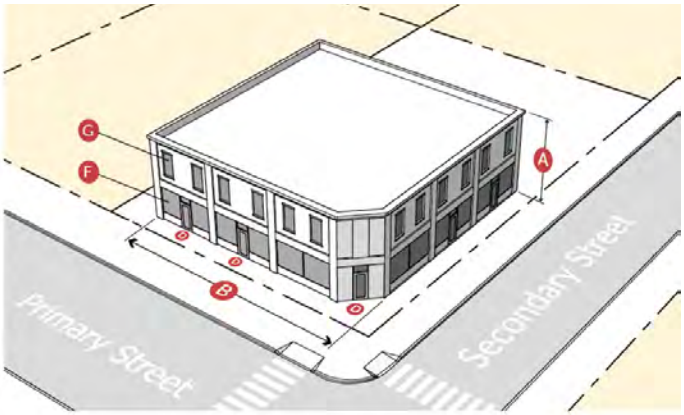
Warsaw should seek to pursue a comprehensive zoning update that incorporates recommended actions from this plan as well as the comprehensive plan. This update should also consider and account for similar recommended actions from other recent Village plans and studies.

From a multimodal standpoint, bicycle parking facilities should be provided at major destinations throughout Warsaw. A secure bike parking spot deters thieves and vandals, giving cyclists peace of mind knowing their bicycles are safe. Adequate and convenient parking options motivate people to choose bikes over cars for errands, commutes, and leisure rides. Facilities can create more orderly parking, reducing impacts on other streetscape features, and improving the aesthetic value. Bike parking can even be branded as public art to showcase community character.



HEIGHT	
A Primary building height [max]	3 stories/40'
B Accessory Building/Structure [max]	20 ft
LENGTH	
C Primary street facing building length [max]	60 ft
D Blank wall length	20 ft
ENTRANCE	
E Primary street facing entrance	Required
F Porch or portico	Encouraged
G Sidewalk from entrance to public sidewalk	5' min. width
WINDOWS[1]	
H Ground story (min)	20%
I Upper story (min)	20%

Residential Design Standards
The illustration above is an example of how development and design standards could apply to a residential district in a zoning code. These standards can provide certainty to applicants while helping to cultivate a walkable environment in mixed-use and commercial districts.



HEIGHT	
A Primary building height	
Maximum	3 stories/40'
Minimum	22 ft
Accessory Building [max]	20 ft
LENGTH	
B Primary street facing building length [max]	60'
C Blank wall length	20'
ENTRANCE	
D Primary street facing entrance	Required
E Sidewalk width - entrance to public sidewalk [min]	5'
WINDOWS	
F Ground story (min)	60%
G Upper story (min)	25%

Mixed-Use Design Standards
The illustration above is an example of how development and design standards could be implemented into a zoning code. These standards can provide certainty to applicants while helping to cultivate a walkable environment in mixed-use and commercial districts.

Figure 15: Example Design Standards for Residential and Mixed-use Districts
Source: Ingalls Planning & Design

Streetscape & Pedestrian Recommendations

Develop Pedestrian-Level Lighting in Strategic Locations in the Village

Street lighting is another design component that adds to the overall streetscape. Pedestrian-level lighting will help make Warsaw's streets feel safer while also providing more uniqueness and character to the streetscape. All proposed lighting should be strategically placed to limit the obstruction of storefronts, merchant signs, and residential properties.

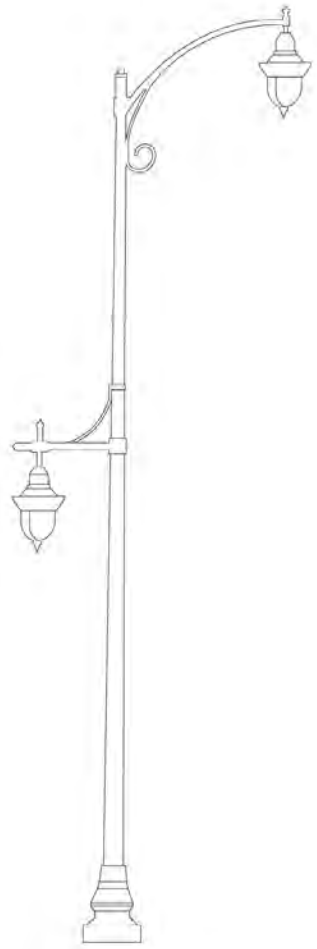
The map in **Figure 16** should be used as a reference to implement pedestrian-level lighting in the Village. This will allow Warsaw to pursue lighting on a corridor-by-corridor approach, affording the Village time to secure funding in installments rather than an all-at-once approach. Streets and street segments are marked according to their priority-level for pedestrian-level lighting (high, medium, low).

This analysis was carried out through a visual assessment of existing lighting and utilities on the included streets and corridors. Most of the existing street lighting in the Village is represented by existing "cobrahead" lighting, which is auto-oriented in nature and generally attached to existing utility poles. These types of street lights are too high to provide much visibility or comfort to pedestrians. Pedestrian-level lighting should be closer to the ground at around 10-14 feet in height. There is some pedestrian-oriented lighting in Warsaw near and around the intersection of Buffalo Road and Main Street. This is represented by the green oval on the map in **Figure 16**.

Beyond the existing street lighting, the prioritization of streets in **Figure 16** was developed through analysis of important pedestrian destinations and streets. Main Street , Buffalo Street and Court Street all include significant shopping and civic destinations, including Warsaw Central School. They were, thus, included in Phase 1 as streets in need of pedestrian-level lighting. Liberty Street and Brooklyn Street were similarly categorized due to their proximity to Warsaw Park.

Lighting Guidelines:

- Fixtures should have shielding, limiting light trespass and directing light to surfaces needing illumination.
- Fixtures should be dark sky-friendly, with top-side and house-side shields.
- Fixtures should have sufficient strength to support signs, banners or flower baskets.
- Light poles should be installed at least 3 feet behind the curb. This will provide clearance for vehicles and snowplows.
- There should be at least 3 feet of clearance from the pole to any adjacent structure.
- Polycarbonate glass should not be used. The material becomes yellow over time, losing the desired aesthetic.
- Acorn-style light fixtures should be considered due to their timeless design that fits well in a Village Main Street aesthetic.
- Fluted poles and bases should be considered to match the gateway and signage design.



Dual poles could be considered containing two light fixtures that provide lighting that is appropriately-scaled for both pedestrians and motorists. This could be more appropriate for non-residential corridors.

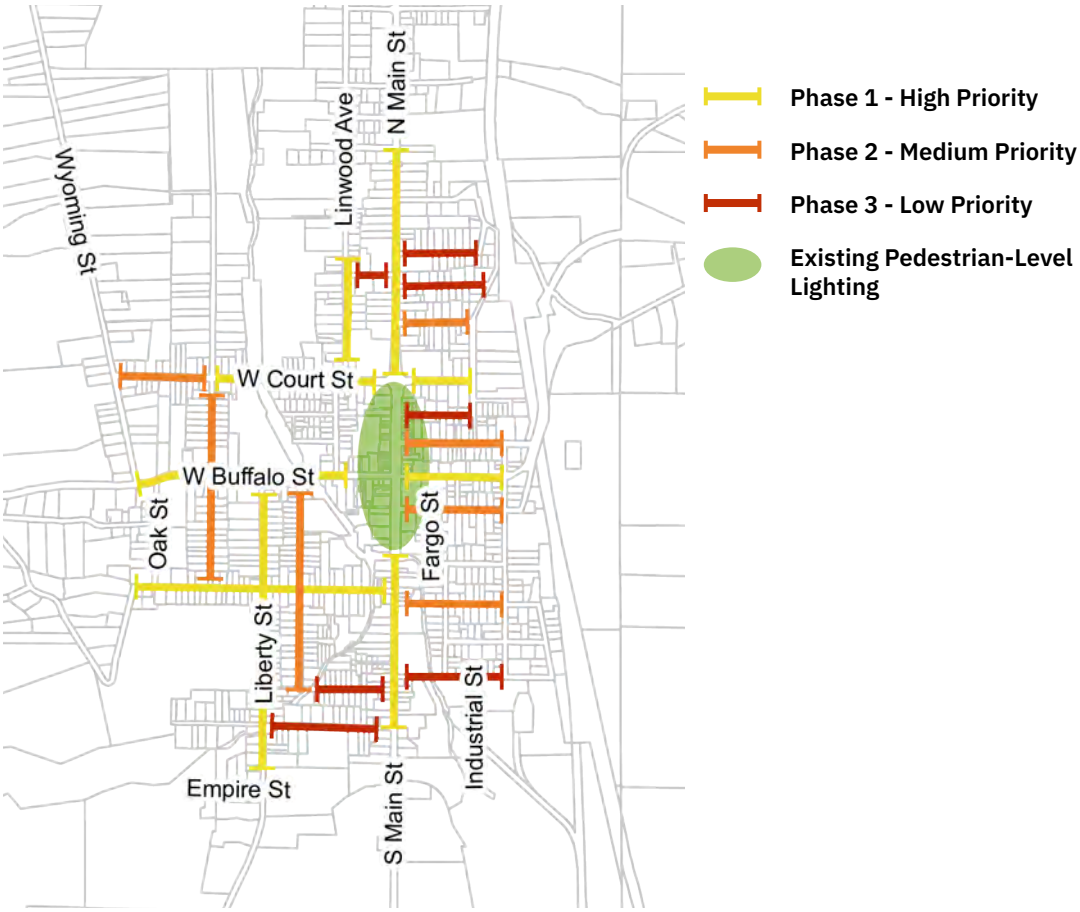
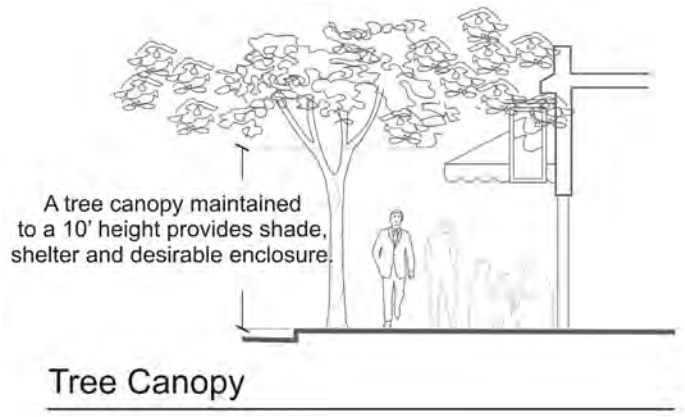


Figure 16: Pedestrian-level Lighting Priority Map
Source: Ingalls Planning & Design

Plant Trees in Strategic Locations in the Village

Street trees should provide appropriate shade and enclosure, making the street feel narrowed. This helps to slow traffic and increase pedestrian-friendliness. Some of the street trees in the Village along both Buffalo Street and Main Street would benefit from replacement with a more appropriate and diverse collection of tree species.

Identified species should be appropriate for upstate and central New York. Consideration should also be given to tree canopy, appropriate height for pedestrian enclosure, and appropriate space for growing.



The image above shows a typical auto-oriented street with a parking lot immediately adjacent to the public realm and pedestrian space. By adding a few street trees to buffer from this parking area, the pedestrian realm provides a much more comfortable and interesting experience. Ideally, street trees in Warsaw should be planted to provide a buffer to pedestrians from the streets as well as parking areas.

Bringing it all Together

Individual streetscape improvements accomplish little. Attention to a wide variety of these improvements is necessary to make transformative progress to a corridor. Having sidewalks is necessary to cultivating a walkable community, but it is only one component. Moreover, a sidewalk will function more highly with adjacent street trees that protect and buffer pedestrians from vehicle traffic and highly-visible crosswalks.

All of the streetscape recommendations within this study should be pursued collectively, whenever practical. At a minimum, there should be a plan in place to gradually implement a variety of streetscape improvements including sidewalk improvements, pedestrian-level lighting, street trees, highly-visible crosswalks, roadway improvements, etc.

The effects of design and development standards on walkability are significant, although they will not be felt immediately. In fact, it may take years before the built environment and streetscape begin to take shape and transform areas along Warsaw's downtown corridors into interesting and engaging spaces for pedestrians.

However, it is important for Warsaw to put all the pieces in place to allow for any future redevelopment to occur in ways that reflect an ideal vision for Village corridors. These pieces include streetscape improvements along with regulatory changes, including an overhaul to the Village's zoning code with an emphasis on development and design. If hard work, collaboration and effort from the Warsaw community can combine with market conditions and demands, the Village will realize ideal outcomes for their important streets and corridors.

Figure 17: Warsaw Streetscape Improvements - 3D Perspective
Source: Ingalls Planning & Design

The graphic above shows detailed attention to streetscape improvements. Street trees, pedestrian-level lighting, continuous sidewalk and curbs, curb extensions around the Main Street crossing, and highly-visible crosswalks establish a precedent that Warsaw's transportation system will be oriented toward safety for all users, including those who are most vulnerable.

Additionally, this graphic shows roadway improvements including a landscaped median, the removal of one northbound travel lane south of Livingston Street and on-street parking. Taken together, these roadway improvements combine with previously listed streetscape improvements help to calm vehicle traffic and improve safety and comfort for pedestrians and bicyclists.

This image is a planning level depiction of the possible enhancements. Any improvements would need to be reviewed and approved by NYSDOT.

Trails and Recreation Recommendations

Develop Public Access to Warsaw Falls

Trails are an important component to active transportation, but they can often be overlooked in communities with more pressing transportation challenges and needs. There are few existing and maintained trails within the Village of Warsaw, which is a missed opportunity for a community with such significant natural beauty. Stony Creek, in particular, is a tranquil natural waterbody that runs close to the Town's public park, Warsaw Park.

The creek includes Warsaw Falls, a popular destination for hikers. Problematically, accessing the falls requires people to traverse across several privately-owned properties. The Village maintains some land adjacent to the creek - as shown on the figure to the right. However, Warsaw Falls is entirely surrounded by private land that is, accordingly, not maintained in a manner suitable for public access. Consequently, hikers have gotten lost looking for the falls and there are additional safety concerns for hikers seeking out the destination.

The Village should consider how best to provide public access to Warsaw Falls. This will likely require coordination with existing landowners to establish the access - possibly in the form of an easement. There are several additional challenges beyond land ownership that the Village will need to navigate to develop a trail to the falls. The land on the north of the creek includes steep slopes that may make trail construction difficult. The creek is bordered to the north by a steep rock cliff and any trail along the ridge above the cliff's edge would need to be signed and marked accordingly to protect pedestrians. These challenges will need to be considered and addressed during the development of any trail.

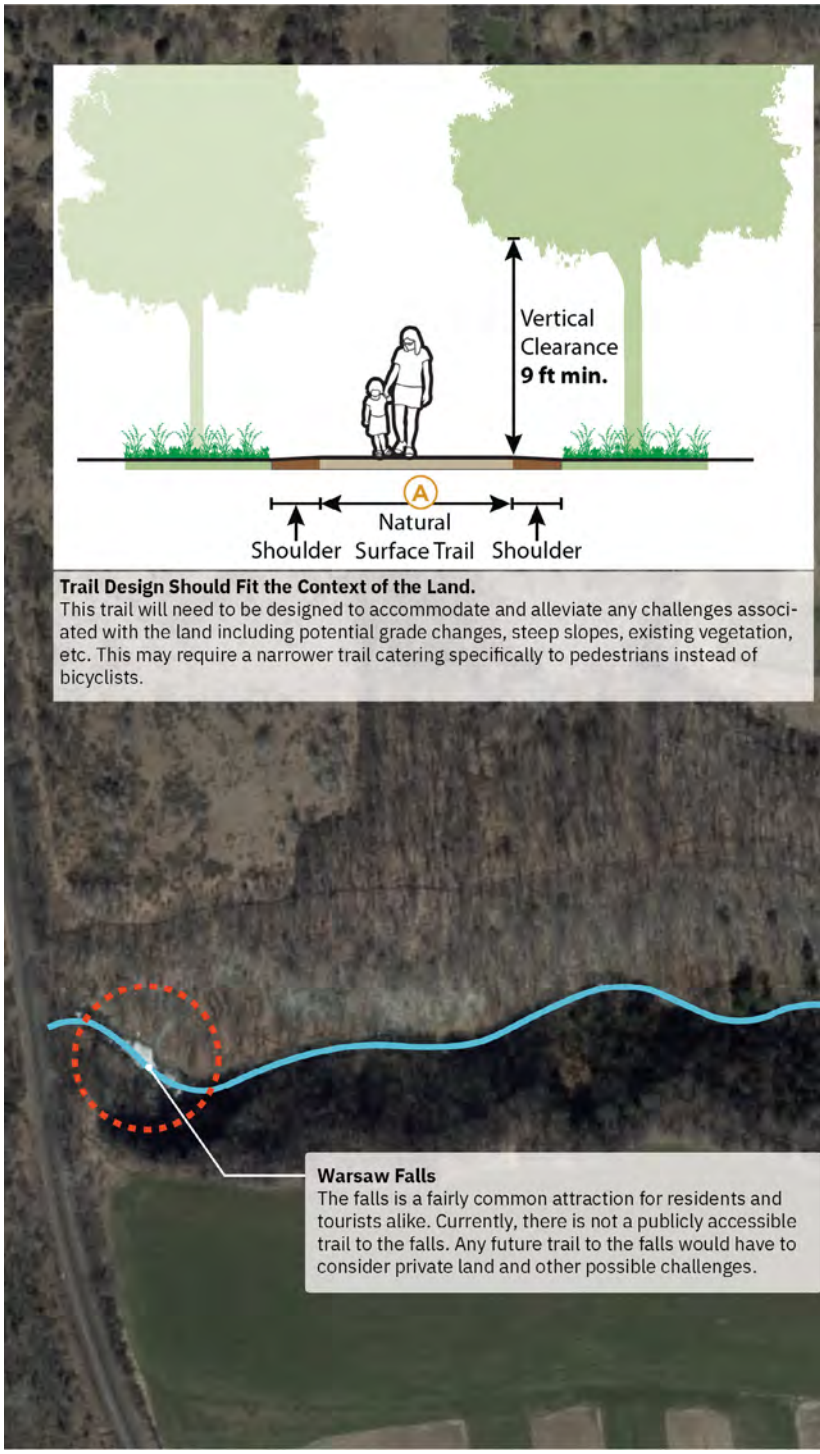


Figure 18: Warsaw Falls Public Access
Source: Ingalls Planning & Design


Brooklyn Street
Publicly-Owned Land
Land within this area is public land which is owned and controlled by the Village of Warsaw. This land provides the best opportunity to connect a future trail from Warsaw Park to Stony Creek to the south, and possibly eventually to Warsaw Falls.
Boundary of Village-Owned Land
All of the land to the west of this line is privately-owned land. Land adjacent to the creek west of the boundary line is most likely to be needed to provide eventual access for a public trail to Warsaw Falls. In order to provide eventual public access to Warsaw Falls along Stony Creek, the Village will need to coordinate with land-owners to determine an optimal path.
Warsaw Park
Liberty Street
Jefferson Street
Stony Creek

Develop a Multi-Use Trail to Main Street

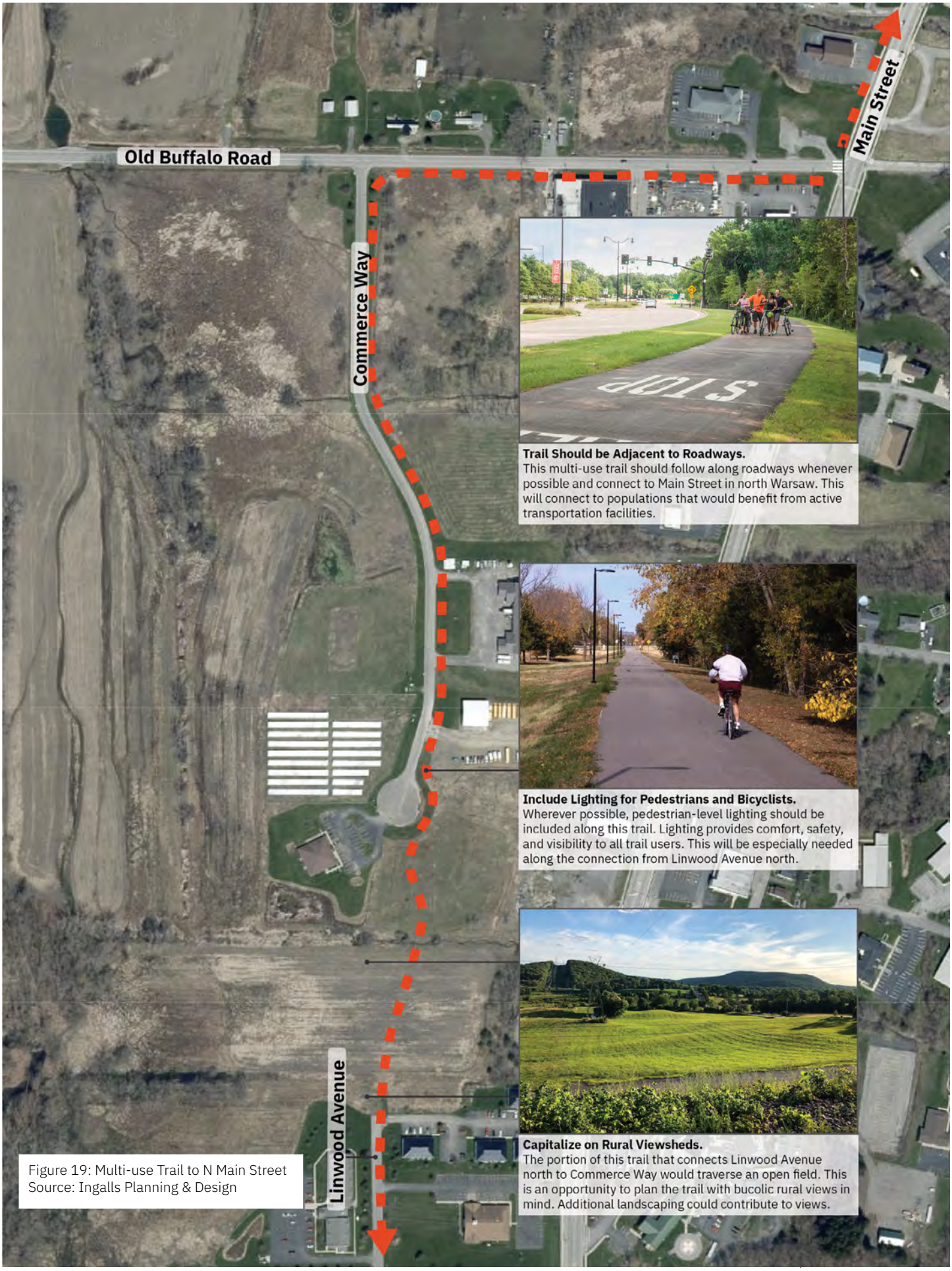
Past plans and studies have looked at possible connections between Linwood Avenue and Commerce Way. The Warsaw community have also expressed an interest in improved and increased bicycle and pedestrian facilities to and on North Main Street. A trail like this could accommodate passive and active recreation with space for both pedestrians and bicyclists. There are scores of under-served pedestrians on north Main Street in Warsaw and this trail would provide a safe and interesting route into the heart of the Village.

The feasibility of a trail/ multi-use path along Main Street will need to be further explored during the scoping and design process. While the trail/ multi-use path is likely to be perceived as more comfortable for a wider range of users, the frequency of driveways along Main Street present challenges that will need to be addressed to reduce the potential conflicts between trail/ multi-use path users and motorists.

This recommendation provides a potential trail route along with design details and guidelines to best provide a multi-use facility in this area of the Village. **Figure 19** on the opposite page outlines the general route of the trail and also includes additional design guidelines. This multi-use trail should be at least 10’ in width, which can be accommodated within the existing right-of-way along the trail corridors including Main Street.

The majority of this trail should be designed as a multi-use trail that comfortably accommodates pedestrians and bicyclists. A portion of this proposed trail would extend beyond roadways into open space and farmland north of Linwood Avenue. This segment of the trail would also need to cross over a small creek. Materials in this area may need to shift to a boardwalk structure composed of wood.

Once a trail is developed, future work should include regular and needed maintenance. Moving forward, the Village should consider a regular maintenance schedule for the trail system.



Trail Should be Adjacent to Roadways.
This multi-use trail should follow along roadways whenever possible and connect to Main Street in north Warsaw. This will connect to populations that would benefit from active transportation facilities.

Include Lighting for Pedestrians and Bicyclists.
Wherever possible, pedestrian-level lighting should be included along this trail. Lighting provides comfort, safety, and visibility to all trail users. This will be especially needed along the connection from Linwood Avenue north.

Capitalize on Rural Viewsheds.
The portion of this trail that connects Linwood Avenue north to Commerce Way would traverse an open field. This is an opportunity to plan the trail with bucolic rural views in mind. Additional landscaping could contribute to views.

Figure 19: Multi-use Trail to N Main Street
Source: Ingalls Planning & Design

Improve Pedestrian Facilities at Warsaw Park

Warsaw Park is a neighborhood park serving several adjacent and nearby residential streets and neighborhoods. The park has some unique features, including a loop encircling the park that is predominantly used and designed for motorists and vehicle traffic. This presents a challenge to pedestrian connectivity and access to and within the park.

During discussions with both the project steering committee and community members, it became clear that pedestrian improvements were needed for the park. The annotated map to the right (**Figure 20**) indicates several important improvements that the Village should pursue including improved landscaping, gateway treatments and a consistent pedestrian path or facility throughout the park.

Beyond the improvements detailed on this map, the Village should consider a future master plan for Warsaw Park that can include more detailed design treatments for needed improvements. A future master plan should re-consider the existing vehicle access and parking in a way that promotes multi-modal connectivity and - above all - comfort and safety for all users, particularly pedestrians and bicyclists.

Figure 20: Warsaw Park Improvements
Source: Ingalls Planning & Design

Enhance and Develop Access to Oatka Creek

Oatka Creek is an important natural asset that runs through the heart of the Village of Warsaw. While already a popular fishing destination, the creek does not currently have consistent or obvious public access. Any future access could capitalize on significant natural landscapes, viewsheds, and wildlife.

There are challenges to developing physical access to Oatka Creek in Warsaw. Much of the land on either side of the creek is land which was acquired by New York State as 'Permanent Easement' for flood control purposes. Most of the land here is also privately-owned. While this does not expressly prohibit the development of trails and walking paths near the creek, it would require Warsaw to obtain proper permitting with the State and easements with property owners.

Passive recreation and activity should be prioritized for Oatka Creek. Beyond fishing, common current activities include birdwatching, hiking and walking and scenic views and natural landscapes. Active use of the creek should be limited to fishing, as there is not substantial depth to the creek for more active recreation activities such as swimming, kayaking, etc.

The Village should consider several different areas along the creek to begin developing both physical and visual access to the creek. When considering a location for future creek access, Warsaw should consider land ownership, existing access ways, existing parking, pedestrian and bicycle connections, and other environmental conditions.

Some possible locations include:

- The County-owned property on Center Street;
- The Warsaw Central School properties on Linwood Avenue and at the end of N Maple Street; and
- W Buffalo Street property across from Warsaw Development Storage on the south side of the street.

Pedestrian and Bicycle Safety Recommendations

Guidance for pedestrian and bicycle improvements comes from Complete Streets principles with best practices from the Federal Highway Administration (FHWA), NYSDOT Highway Design Manual, NACTO's Urban Street Design Guide and Bikeway Design Guide, and the New York State Pedestrian Safety Action Plan.

Pedestrian Safety Enhancements

Pedestrian safety enhancements are incredibly important for several reasons:

Strive for Zero: The most critical reason is to save lives and prevent injuries. Pedestrians are part of the vulnerable road user (VRU) cohort. Enhancements aim to reduce both the frequency and severity of pedestrian crashes, ultimately protecting people's lives and wellbeing.

Creating Livable and Walkable Communities: Safe and accessible streets encourage walking and other forms of active transportation. This promotes healthier lifestyles, reduces reliance on cars, and contributes to a more vibrant and livable community. Additionally, it makes it easier for everyone, including older adults and people with disabilities, to move around freely and independently.

Economic Benefits: Pedestrian-friendly areas often attract businesses and residents, leading to increased economic activity. Studies have shown that pedestrian-friendly design can boost property values and revitalize neighborhoods.

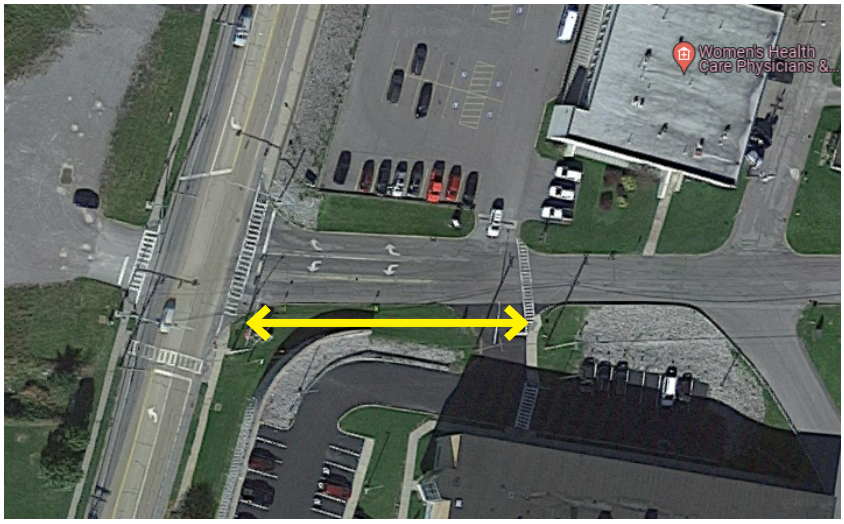
Environmental Benefits: Reducing car dependence lowers air pollution and greenhouse gas emissions, contributing to a cleaner environment and combating climate change.

Sidewalk Network Gaps

Gaps in sidewalks often force pedestrians to walk on or near the road, increasing the risk of being hit by vehicles, especially at intersections or driveways. Even if a sidewalk is present, its condition may not also present itself to a pedestrian or wheel user as comfortable to use. A complete sidewalk network can encourage safe crossing at designated points like marked crosswalks. Closing these gaps are essential to a multimodal network.

Warsaw should continue to allocate budget resources for construction, maintenance, and ongoing expansion of the sidewalk network. Sidewalks should be a minimum five feet in width. The Village can also explore various funding sources like government grants, public-private partnerships, and community development initiatives to enhance the network. Routine maintenance should be performed and public awareness should be raised about the importance of safe and accessible sidewalks throughout the year, with critical importance during winter months.

Two notable locations where sidewalk gaps exist and were mentioned as important for the community are shown in the following images.



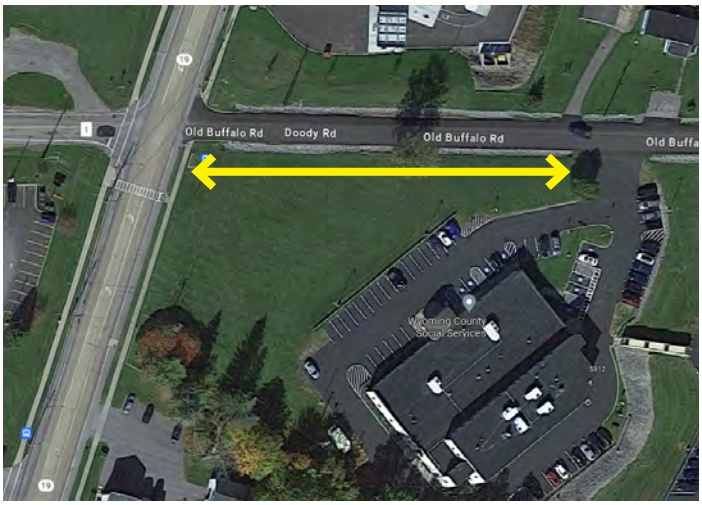
WCCHS northerly driveway.

The first notable gap is at the WCCHS northerly driveway between NY-19 and the adjacent health buildings. There may be challenges involved with implementing a new connection, such as grades, drainage, location of utilities, and location of existing

WCCHS signage. Further engineering is required with consideration of advancing this recommendation.

Potential challenges of new sidewalk.

The other location is a new sidewalk from NY-19 to the County Services Building. Challenges for installing sidewalk consist of grading, drainage ditch location, and possible utilities. Again, further engineering is required.



Lack of sidewalk at County Services Building.

Bus Stop Accessibility

Bus stops should be accessible by all users. This can include an adequate waiting area, connections between the sidewalk and waiting area, seating, and lighting.

Crossing Improvements

Pedestrian intersection crossing and mid-block crossing treatments can be used in select locations to help enhance pedestrian safety. Enhanced crosswalks also improve driver awareness of such locations. Such treatments are divided into controlled and uncontrolled approaches:

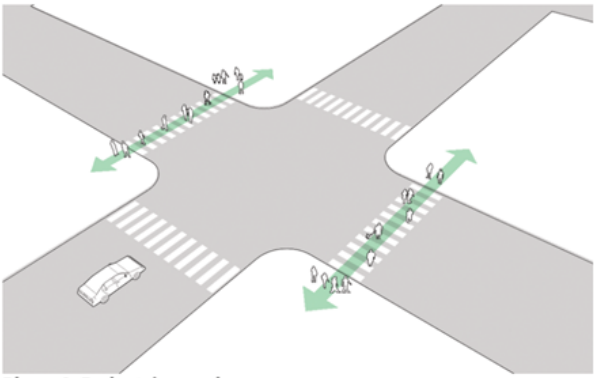
Signalized control

- ***Accessible pedestrian signals (APS)***
  APS devices are installed on poles at sidewalk corners near crosswalks. The device plays a low locator tone to help pedestrians locate the APS. Each APS has a button with a raised arrow pointing in the direction of the crosswalk.

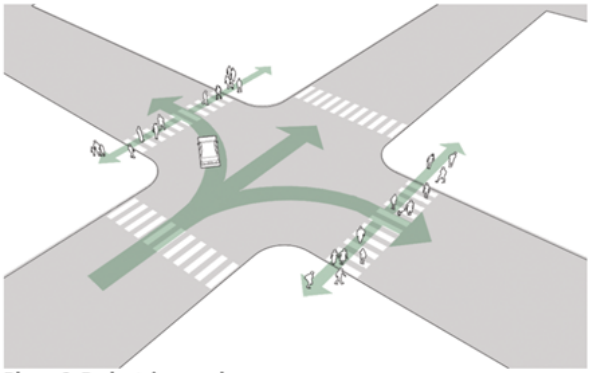
  When a person presses the APS button and the Don't Walk signal is displayed, a voice message will say "wait" followed by a slow audible beep. When the walk interval begins the button vibrates and a rapid beep or voice lets the pedestrian know that the Walk signal is illuminated (NYCDOT).

APS assembly

- ***Leading pedestrian intervals (LPI)***
  A leading pedestrian interval illuminates the "Walk" signal for a few seconds prior to stopped through-vehicles receiving a green light. Allowing pedestrians a head start into the intersection can reduce conflicts between pedestrians and turning vehicles and makes crossing pedestrians more visible. The Manual on Uniform Traffic Control Devices (MUTCD) recommends that leading pedestrian intervals be at least three seconds in duration. This treatment could be considered at the NY-19/US-20A intersection.



Phase 1: Pedestrians only
Pedestrians are given a minimum 3–7 second head start entering the intersection.



Phase 2: Pedestrians and cars
Through and turning traffic are given the green light. Turning traffic yields to pedestrians already in the crosswalk.

- ***Signal timing***
  Evaluate pedestrian crossing times to determine if there is sufficient crossing time for all pedestrian types.

- ***Restrict parking***
  Parking should be not be allowed within 20 feet of a signalized intersection. Likewise, at uncontrolled locations, parking should be restricted to 20 feet from the crossing. These parking restrictions help improve pedestrian and motorist sightlines through an intersection.

Uncontrolled intersections

Pedestrian crossing locations at uncontrolled locations or unsignalized intersections typically considers number of lanes, vehicle speeds, and traffic volumes. Using NYS guidelines, "uncontrolled marked pedestrian crosswalks include locations where there is a marked mid-block crosswalk or an intersection with a marked crosswalk across the through street where the side street is controlled and the through street is not."

Treatments for uncontrolled crossing locations based on volumes, speeds, and lanes can be found in **Figure 21** as produced by the FHWA. Safety issues addressed by uncontrolled crossing treatments is found in **Figure 22**.

- ***Crosswalk enhancements***
  The NYSDOT finished a maintenance project along NY-19 and US-20A which consisted of a new surface application and bringing all marked crosswalks up to the latest standards. Aside from this, enhancements at uncontrolled locations can include high visibility crosswalks (e.g., type LS by NYSDOT standards), pedestrian warning signs, and Rectangular Rapid Flashing Beacons (RRFB). RRFB are user-actuated flashing lights on a pedestrian warning sign that provide a supplemental crossing enhancement. Applications are provided in pairs and feature the same display on the reverse side. They have a driver yield rate of 96% according to the FHWA, while reducing crashes up to 47%.

RRFB (left, Monroe County DOT)

RRFB push button (top, TAPCO)

- ***Curb extensions through the Central Business District (CBD)***
  Curb extensions, also called bulb-outs, bump-outs, or neckdowns, are extensions of the sidewalk into the roadway, typically at

Roadway Configuration	Speed Limit								
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
2 lanes*	❶ 2 3 4 5 6	❶ ❸ 5 6 7	❶ ❸ 5 6 ❼	❶ 3 4 5 6	❶ ❸ 5 6 7	❶ ❸ 5 6 ❼	❶ 3 4 5 6 7	❶ ❸ 5 6 7	❶ ❸ 5 6 ❼
3 lanes with raised median*	❶ 2 3 4 5	❶ ❸ 5 7	❶ ❸ 5 ❼	❶ 3 4 5 7	❶ ❸ 5 ❼	❶ ❸ 5 ❼	❶ ❸ 4 5 7	❶ ❸ 5 ❼	❶ ❸ 5 ❼
3 lanes w/o raised median†	❶ 2 3 4 5 6 7	❶ ❸ 5 6 7	❶ ❸ 5 6 ❼	❶ 3 4 5 6 7	❶ ❸ 5 6 ❼	❶ ❸ 5 6 ❼	❶ ❸ 4 5 6 7	❶ ❸ 5 6 ❼	❶ ❸ 5 6 ❼
4+ lanes with raised median‡	❶ ❸ 5	❶ ❸ 5 7	❶ ❸ 5 ❼	❶ ❸ 5 7	❶ ❸ 5 ❼	❶ ❸ 5 ❼	❶ ❸ 5 ❼	❶ ❸ 5 ❼	❶ ❸ 5 ❼
4+ lanes w/o raised median‡	❶ ❸ 5 6 7 8	❶ ❸ 5 ❻ 7 8	❶ ❸ 5 ❻ ❼ 8	❶ ❸ 5 ❻ 7 8	❶ ❸ 5 ❻ ❼ 8	❶ ❸ 5 ❻ ❼ 8	❶ ❸ 5 ❻ ❼ 8	❶ ❸ 5 ❻ ❼ 8	❶ ❸ 5 ❻ ❼ 8

*One lane in each direction †One lane in each direction with two-way left-turn lane ‡Two or more lanes in each direction

Given the set of conditions in a cell,

❶ Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.

\# Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restriction on crosswalk approach, adequate nighttime lighting levels
2 Raised crosswalk
3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
4 In-Street Pedestrian Crossing sign
5 Curb extension
6 Pedestrian refuge island
7 Pedestrian Hybrid Beacon
8 Road Diet

This table was developed using information from: Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. J. (2005), Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines (No. FHWA-HRT-04-100); Manual on Uniform Traffic Control Devices, 2009 Edition, Chapter 4F. Pedestrian Hybrid Beacons; the Crash Modification Factors (CMF) Clearinghouse website (http://www.cmfclearinghouse.org/); and the Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE) website (http://www.pedbikesafe.org/PEDSAFE/).

Figure 21: Treatments for pedestrian crossings at uncontrolled locations.
Source: FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/ visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement	✓	✓	✓	✓	✓
High-visibility crosswalk markings*	✓		✓	✓	
Parking restriction on crosswalk approach*	✓		✓	✓	
Improved nighttime lighting*	✓		✓		
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*	✓		✓	✓	✓
In-Street Pedestrian Crossing sign*	✓	✓	✓	✓	
Curb extension*	✓	✓	✓		✓
Raised crosswalk	✓	✓	✓	✓	
Pedestrian refuge island	✓	✓	✓		✓
Pedestrian Hybrid Beacon	✓			✓	
Road Diet	✓	✓	✓		✓

*These countermeasures make up the STEP countermeasure "crosswalk visibility enhancements." Multiple countermeasures may be implemented at a location as part of crosswalk visibility enhancements.

Figure 22: Safety issues addressed by uncontrolled treatments.
Source: FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

intersections or mid-block. They physically narrow the road, creating a more pedestrian-friendly environment and promoting traffic calming. Pedestrians have to cross less distance to reach the other side, minimizing their exposure to traffic. Drivers can see pedestrians more easily, as they are positioned closer to the travel lane. Curb extensions create more waiting space for pedestrians, especially those with disabilities or using mobility aids. They can accommodate benches, plantings, street trees, and stormwater infrastructure, beautifying the streetscape and providing environmental benefits. **Figure 23** illustrates where curb extensions are recommended. Further evaluations are needed to determine impact on bicycle accommodations

- ***Consider new marked crosswalks*** New marked crosswalks should be considered and fully evaluated at the intersections of Cottage Court and Washington Street. These are locations where new crossings can bridge the gaps between the adjacent neighborhoods, Warsaw Park, and promote walkability and accessibility. These locations should feature enhancements, such as signage and high visibility crosswalks.

An additional crossing location is recommended at the WCCHS southerly driveway on the south side of the intersection, as shown in **Figure 24**. A pedestrian refuge island can be utilized to reduce the crossing exposure for a pedestrian. An alternative location for the crosswalk is on the northern side of the intersection, per NYSDOT feedback. Further engineering analysis is required before implementation to determine most feasible location considering turning movements and vehicle tracking.

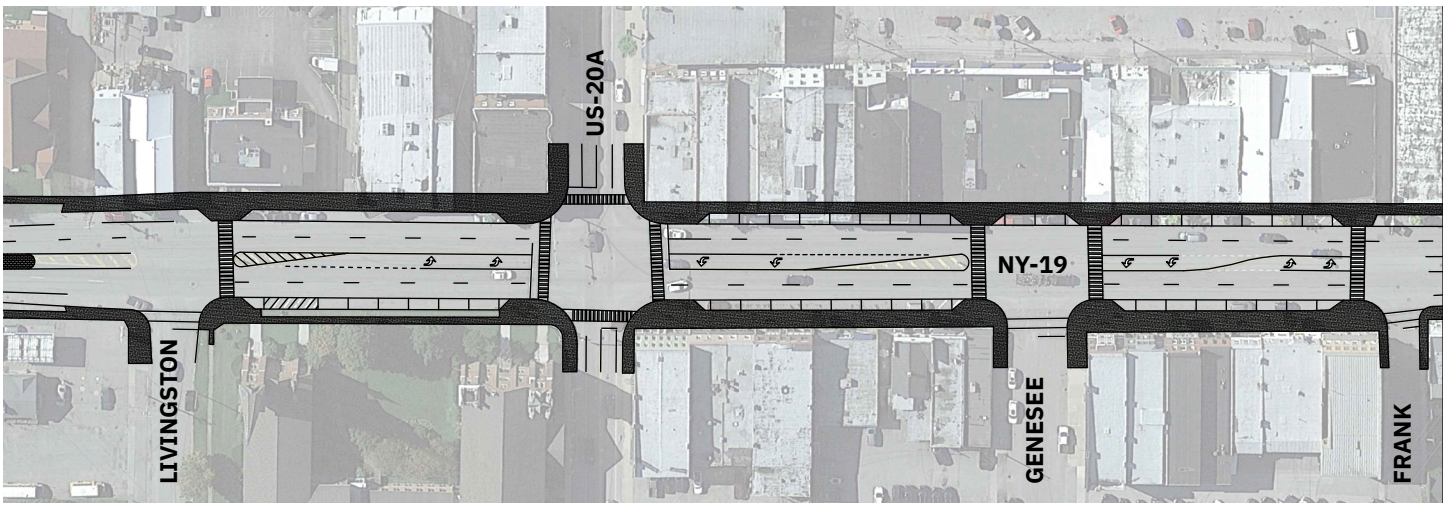


Figure 23: New curb extensions at Livingston, Genesee, and Frank

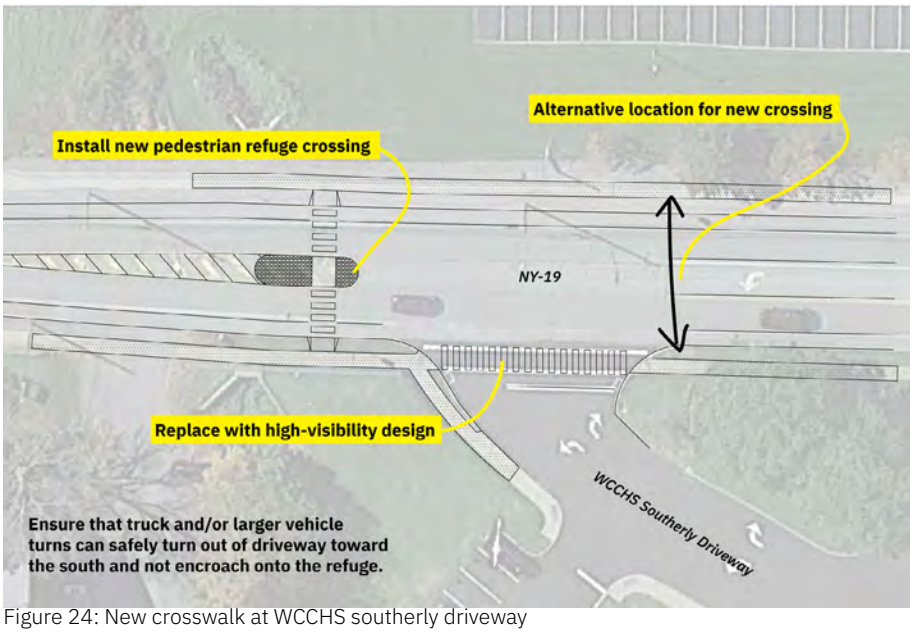


Figure 24: New crosswalk at WCCHS southerly driveway

Other Considerations

Within the area of influence between the public and private realm, two considerations arose during the planning process. One included the pedestrian experience along the westerly side of NY-19 adjacent to the WCCHS and the existing bar-type barrier between the sidewalk and grade change. The current condition presents exudes a feeling of coldness. Consideration should be given to elevating the aesthetic appeal while maintaining the required buffer between the sidewalk and drop-off.

Retaining wall fencing along sidewalk

The other consideration is introducing an artful element on the WCCHS retaining wall along the east side of NY-19. The hospital would be responsible for advancing this idea, if desired. A public contest could be created for local artists to commission a feature highlighting the areas history or something to act as a gateway to the Village.

Retaining wall fencing along sidewalk

Bicycle Safety Enhancements

Bicycle safety enhancements are crucial for several reasons, impacting both individual cyclists and the community as a whole:

Reduced Crashes and Injuries: Enhancements like bike boulevards, traffic calming measures, and proper signage can separate cyclists from high-volume roadways, significantly reducing the risk of crashes and injuries. This is especially vital for vulnerable groups like children and older adults.

Increased Confidence and Comfort: A safer cycling environment encourages more people to ride, leading to improved physical and mental health. Feeling secure on the road fosters a sense of freedom and enjoyment, promoting cycling as a viable transportation option.

Reduced Traffic Congestion: More people choosing bikes translates to fewer cars on the road, easing congestion and improving air quality. This benefits everyone, not just cyclists, by reducing commuting times and pollution levels.

Economic Boost: A thriving cycling culture attracts businesses and jobs related to bike rentals, repairs, and infrastructure projects. This stimulates local economies and creates new opportunities.

Environmental Sustainability: Cycling emits zero carbon emissions, contributing to a greener environment and tackling climate change. Promoting cycling as a transportation choice aligns with sustainability goals and reduces dependence on fossil fuels.

Proposed Bicycle Network

The proposed network was developed considering existing gaps and opportunities for implementing a network friendly for all users. As noted earlier, NY-19 and US-20A generally feature striped shoulder space which can be utilized by bicyclists. These roadways are higher volume than the Village's neighborhood streets and may be utilized by riders more tolerant to traffic stressors. However, the Village is blessed with a grid-like street layout offering parallel family-friendly routes. Resources used to develop Warsaw's

bicycle network include the FHWA Bikeway Selection Guide, NACTO Designing for All Ages & Abilities, and NYSDOT Highway Design Manual.

The facility recommendations can be categorized between treatments for local roads and State highways, as indicated.

Related to the LTS system and types of bicyclists, the following images illustrate bicycle facilities based on roadway type and rider type.

Interested but Concerned

Enthused and Confident

Strong and Fearless

Bicycle facilities by rider type
Source: Town of Perinton Pedestrian & Bicycle Master Plan

Facility design should consider motor vehicle volume, vehicle speeds, traffic mix, on-street parking, and sight distance. Generally, bicycle facility types can be separated into the following types. A description of each is provided afterwards.

- Shared lanes
- Bicycle boulevards
- Conventional bike lanes and shoulders
- Buffered bike lanes
- Multi-use paths and/or cycle tracks

Shared Lanes (State): While bicyclists navigate mixed traffic in shared lanes, their comfort can depend heavily on traffic speed and volume. When planned properly and used appropriately, shared lanes offer an effective and budget-friendly option.

Bicycle Boulevard (Local): Prioritizing cyclist safety and comfort, bicycle boulevards weave through neighborhoods on low-traffic, low-speed streets. Dedicated lane markings, clear signage, and strategic traffic calming measures create a parallel network that minimizes interactions with high-volume arterials. Compared to these often-lacking context-appropriate infrastructure, the result is a demonstrably safer cycling experience with fewer bike-involved crashes.

Conventional Bike Lanes and Shoulders (State and Local): In terms of traffic flow and cyclist behavior, dedicated bicycle lanes and continuous paved shoulders offer virtually indistinguishable operational experiences. Visually, bike lanes offer cues, such as bicycle pavement markings whereas a striped shoulder typically does not. From a formal standpoint, bike lanes can only be used as such and must be maintained as a travel lane.

Buffered Bike Lanes (State): Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. It can have a physical barrier separating the bike lane from the traffic lane, such as concrete curbs, bollards, or planters. It can attract more people to choose cycling, boosting active transportation and sustainability.

Example of shared lane markings
Source: NACTO

Example of bicycle boulevard. 20 mph streets are not allowed in the Village.
Source: NACTO

Multi-use Paths, Cycle Tracks (State and Local):

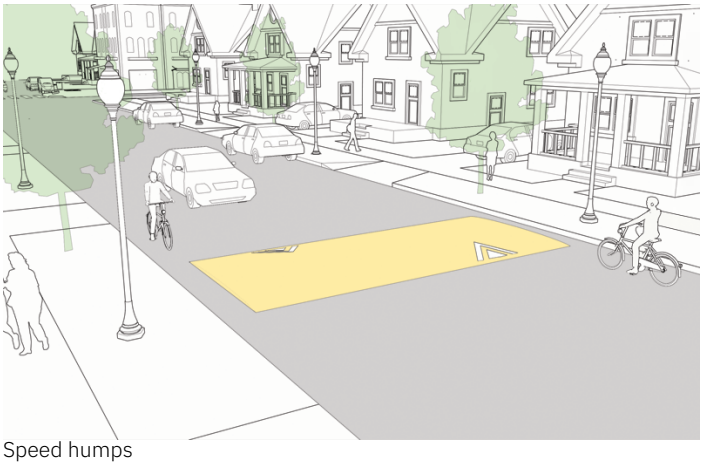
These facilities are dedicated pathways specifically designed for bicycles and other forms of non-motorized transport. They are separate from roadways used by cars and trucks, creating a safer and more comfortable environment for cyclists. These spaces vary in width depending on usage and intended users. Wider paths cater to high-volume traffic or allow for passing, while narrower ones may be suitable for quieter areas.

To develop the bike network, several contributing factors were high-demand destinations, origin locations, low-volume roadways, and existing facility characteristics. **Figure 25** shows the proposed bike network. The network will need to be endorsed by the presiding agency and engineering staff before implementation.

Recommended treatments which compliment this network and can also provide traffic calming effects are the following:

- **Radar speed signs** where drivers are observed frequently traveling above the speed limit.
- **Speed cushions.** These are well suited on streets with a desire to maintain emergency access. They can be offset to allow unimpeded passage by emergency vehicles and are typically used on key emergency response routes. This treatment is not to be used on State highways
- **Curb extensions**, as noted earlier, visually and physically narrow the roadway.
- **Speed humps** are similar to speed cushions but differ in that the raised area extends all the way across the travel lanes. This treatment is not to be used on State highways and is better suited on routes not designated emergency routes or on local streets.
- **Reduced speed limits** are effective on local streets. Lowering speed limits does not necessarily lower operating speeds, thus, roadway design is crucial to compliment this treatment. Policy changes are required before implementation and an engineering assessment provides quantitative and qualitative data to support this application.

Speed cushions
Source: NACTO



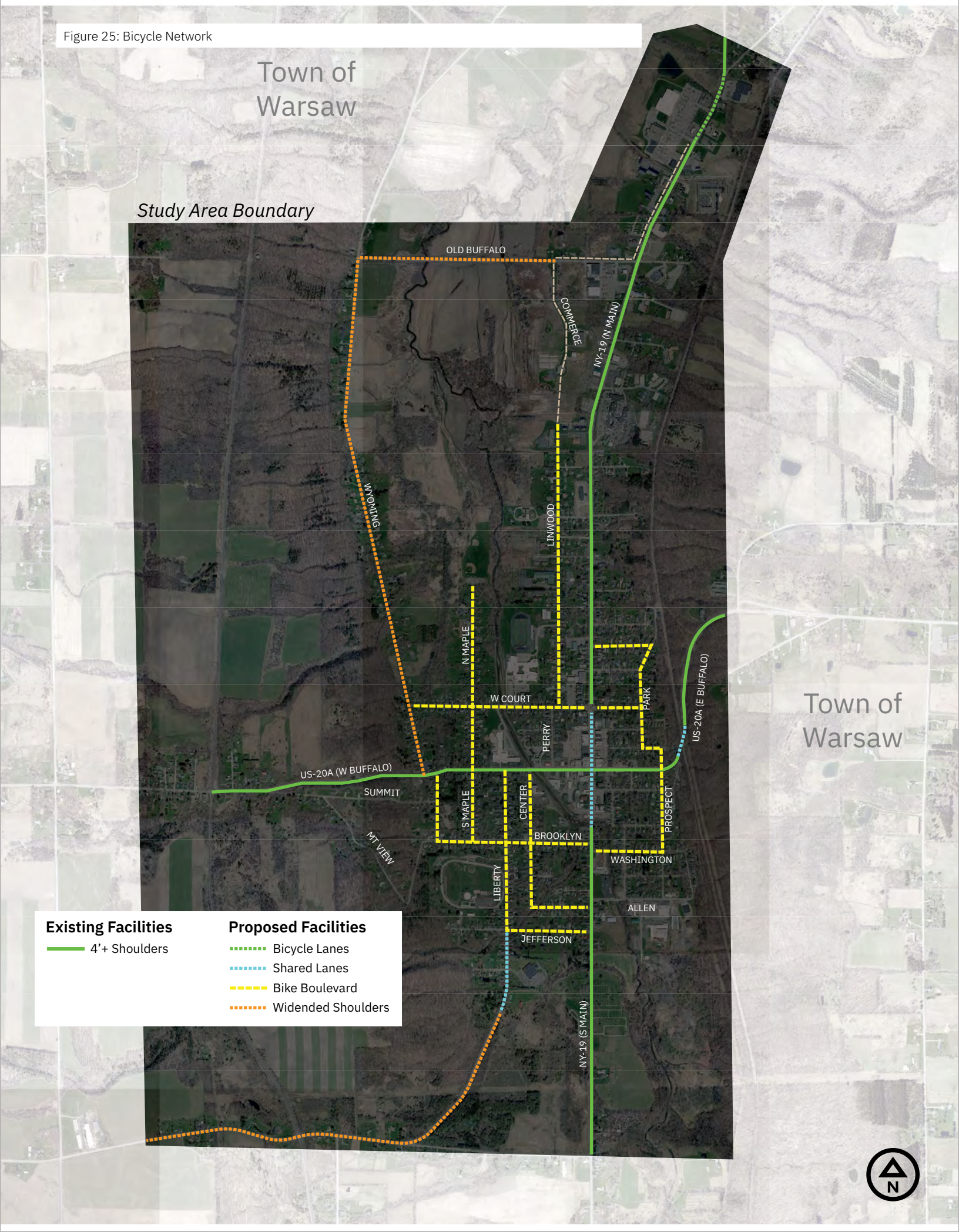
Speed humps
Source: NACTO

The image comes from Strava data on bicycle use. The above map shows areas of bike demand, with more trips associated with whiter segments. Although this is a useful tool in seeing where cyclists prefer to ride, it does not encapsulate the entire Warsaw population as Strava is an opt-in app. However, this map did help inform where alternative routes should be planned to develop a complete bike network.

Photosimulation of Linwood Avenue as a bike boulevard

Bike boulevard signage

Figure 25: Bicycle Network



Traffic Operations Recommendations

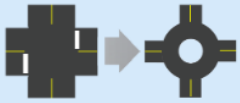
Main Street at Court Street

Throughout the planning process, highlighted by discussions with community members and the PAC, the Main Street at Court Street intersection was noted as challenging and sometimes confusing. Its appearance gives a senses that it is a roundabout, as noted earlier, but does not function as one.

Due to the importance of this intersection from a gateway perspective, the recommendation is to reconstruct the intersection as a single-lane roundabout shown in **Figure 26**.

Roundabouts, by and large, can enhance intersection operations and safety conditions. At intersections with speed related crashes, roundabouts seek to slow approach speeds, reduce the number of potential conflict points (when compared to a conventional intersection), reduce the severity of potential crashes, enhance pedestrian crossing opportunities, and function as a gateway treatment. Additionally, visitors to the community and drivers traveling through the Village will better understand how to use a formal roundabout compared to a feature that is more well-known by locals.

Two-Way Stop-Controlled Intersection to a Roundabout



82%

Reduction in fatal and injury crashes[1]

Source: FHWA

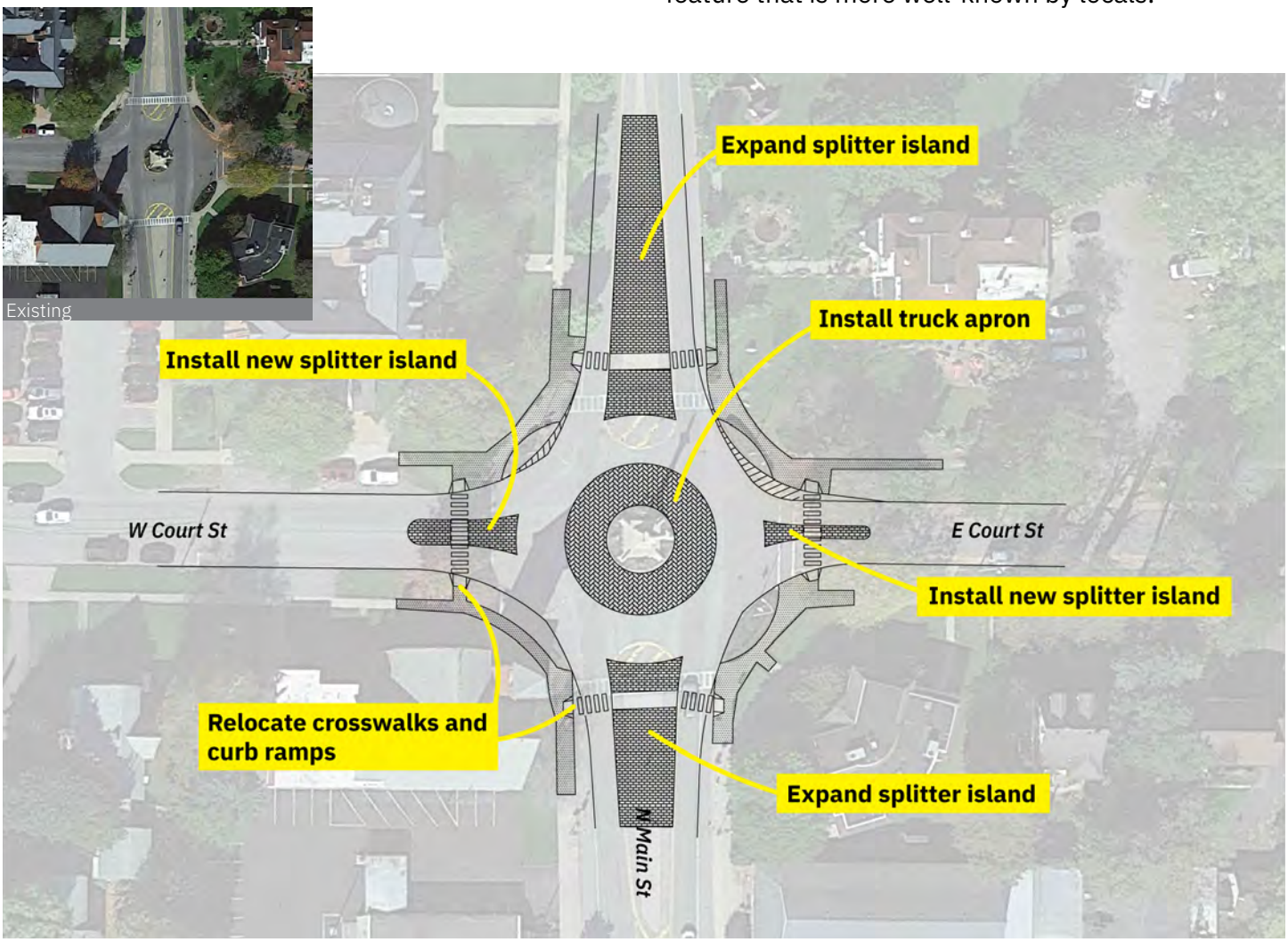


Figure 26: Roundabout at Main Street/Court Street

Consider Restriping South Main Street

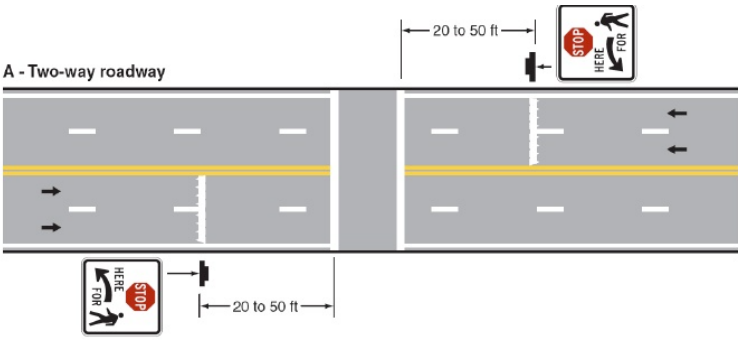
Currently, the segment of South Main Street is four lanes across with parking on both sides. The curb-to-curb width is 72 feet at the existing crosswalk at Livingston Street.

Pedestrians have a wide range of walking speeds depending on age and health. Generally, a speed of 3.5 feet per second is considered acceptable, unless localized conditions dictate a slower speed. In this case, it will take a pedestrian over 20 seconds to cross South Main Street and will be exposed to two lanes of oncoming traffic in each direction.

Therefore, restriping this segment of South Main Street can provide several benefits:

- Reduce crossing exposure
- Reduce vehicle speeds
- Promote Complete Streets

Should restriping not occur, then advance yield lines could be considered in advance of the crosswalk to indicate where vehicles are required to stop in compliance with pedestrians crossing the street. Further evaluation in coordination with NYSDOT is required.



Sample signing and pavement marking plan for advance yield/stop lines

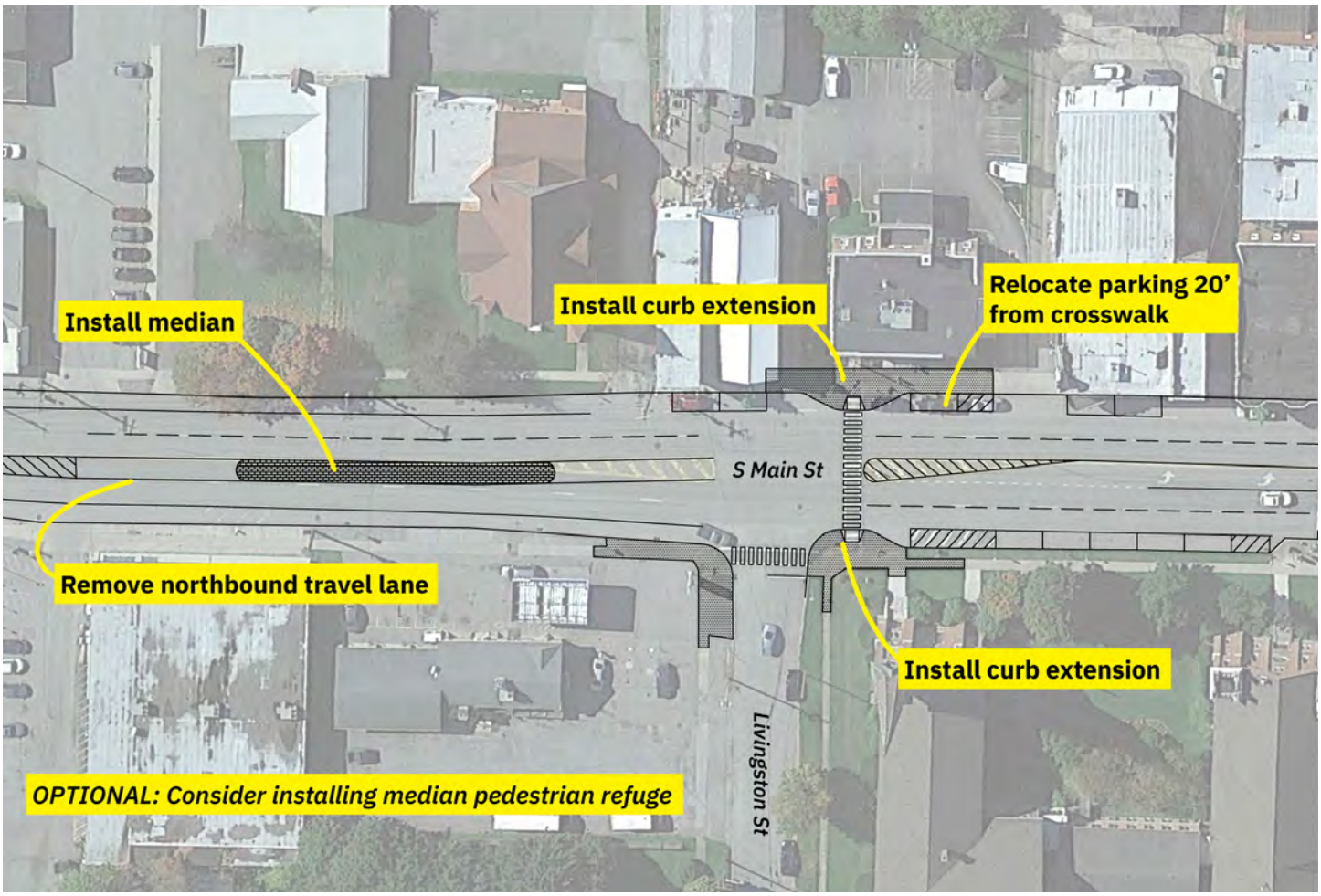


Figure 26: Roundabout at Main Street/Court Street

Traffic Signal Warrant at Walmart

While the community desires a traffic signal at the plaza's main driveway due to concerns they have raised regarding congestion and safety, the planned plaza expansion which would have required the installation of a signal has not materialized. As the plaza is privately owned, the owner is responsible for any improvements to the entrance. Any proposed upgrades to the intersection, such as the installation of a signal, would require the plaza owner to conduct an updated Traffic Impact Study (TIS). The purpose of the TIS would be to analyze existing traffic volumes, crash patterns, signal warrants, etc. and identify potential mitigation measures for NYSDOT review and approval. The plaza owner would be responsible for implementing any mitigation measures approved by NYSDOT under a highway work permit. The cost to perform both the study and associated permit work is the responsibility of the plaza owner.

Other Considerations

Left-turn Lanes at NY-19/US-20A

Eastbound and westbound left-turn lanes were considered for the intersection of NY-19 and US-20A, as long vehicle queues have become a common sight. However, a preliminary evaluation has revealed potential alignment concerns, meaning the new lanes might not fit neatly into the existing infrastructure. Additionally, their implementation could impact available on-street parking and potentially require adjustments to the curbing on the east side of the intersection.

Further engineering evaluations are recommended to determine the feasibility of adding these left-turn lanes and to address any potential drawbacks. These evaluations will likely involve detailed traffic studies, analysis of the impact on parking and pedestrian flow, and the development of potential lane configurations that minimize disruption to the existing layout.

Relocate Stop Bars at NY-19/US-20A

Additionally, consideration may be given relocating the existing stop bars further back from the crosswalks to provide more space for turning radii of larger vehicles. Further engineering evaluations are recommended to determine the feasibility.

Program and Policy Recommendations

While expanding bike lanes and sidewalks is crucial, truly shaping the future of active transportation in Warsaw requires a multi-pronged approach. Policy and programmatic strategies can play an equally important role, influencing how people move and shaping a community where walking, biking, and rolling are not just options, but thriving elements of daily life.

There are several distinct policy and program recommendations; however, the following list of initiatives is based on best practices and has relevance to the Village of Warsaw:

- Design future infrastructure with current maintenance equipment in mind.
- Develop a strategic snow removal priority policy.
- Ensure snow is removed at bus stops.
- Clear snow piles from curb ramps after road plowing is finished.
- Develop standards for sidewalk maintenance.
- Develop and strengthen relationships with partner agencies.
- Encourage demonstration projects to promote new ideas.
- Ensure traffic studies or traffic generation letters are prepared for all new or redevelopment projects.
- Evaluate parking needs for new and redevelopment projects to right-size parking and reduce vehicle demands.
- Participate in Safe Routes to School programs.
- Develop bike rodeo program.
- Support shared mobility.
- Support bicycle and pedestrian awareness training and education programs.
- Encourage community groups that support active transportation.

- Advocate for a Safe Systems Approach and Vision Zero policies.
- Encourage roadway design that reduces operating speeds and review of speed limits.
- Coordinate with Wyoming County and NYSDOT on routine maintenance of active transportation facilities.
- Advocate for regional trails connectivity.
- Encourage use of NYSDOT's Complete Streets checklist on projects.
- Ensure all parking is restricted within 20 feet of crosswalks.
- Develop ongoing contacts with agencies to identify funding sources.
- Emphasize development of pedestrian and bicycle facilities on private projects.
- Develop a wayfinding system geared towards pedestrian and bicycle travel.
- Develop Access Management language as part of updated zoning codes.
- Develop performance measures to understand active transportation needs.

Speed Limits

On August 12, 2022, Governor Hochul signed a new law empowering municipalities like the Village of Warsaw to change their area speed limit to 25 mph in accordance with engineering considerations. This development paves the way for slower streets, potentially reducing traffic-related injuries and fatalities, especially in areas frequented by pedestrians and cyclists.

Previously, the minimum allowable area speed limit for municipalities in New York was 30 mph. The minimum allowable linear speed limit remains 25 mph. By dropping this area threshold to 25 mph, Governor Hochul's legislation empowers local communities like Warsaw to tailor speed limits to their specific needs and prioritize pedestrian and cyclist safety. It is important to note that the law did not change who has authority to set speed limits, as NYSDOT sets speed limits on all State highways.

Complete Streets

According to the FHWA, Complete Streets are streets designed and operated to enable safe use and support mobility for all users. Those include people of all ages and abilities, regardless of whether they are traveling as drivers, pedestrians,

Complete Streets graphic from California Bike Coalition showing benefits for all users.

bicyclists, or public transportation riders. The concept of Complete Streets encompasses many approaches to planning, designing, and operating roadways and rights of way with all users in mind to make the transportation network safer and more efficient. Complete Street policies are set at the state, regional, and local levels and are frequently supported by roadway design guidelines.

In New York, the Complete Streets Act (Chapter 398, Laws of New York) was signed into law on August 15, 2011 and requires state, county, and local agencies to consider the convenience and mobility of all users when developing transportation projects that receive state and federal funding.

According to the National Complete Streets Coalition, there is no singular design prescription for Complete Streets. Each one is unique and responds to its community context. A complete street may include: sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crosswalks, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more.

The context and needs of users are different in rural, suburban, and urban communities, and streets will look different as a result, even when using a Complete Streets approach.

Implementation and Funding

The implementation section identifies prioritized recommendations that should be pursued first. Prioritized recommendations are detailed in the implementation matrix. The project's advisory committee reviewed and prioritized the recommendations from the previous section after hearing feedback from community members. Committee members completed a ranking exercise which determined prioritized recommendations. The project steering committee identified 12 priority recommendations.

The remainder of this implementation matrix describes cost estimates, involved parties for all recommendations, and possible project timelines for each recommendation. There are also various implementation tools that could apply to different recommendations.

In order to facilitate the implementation of the Village of Warsaw Active Transportation Plan, it is recommended that the municipality utilize existing regulatory tools and development review procedures to evaluate public and private investments. This includes:

- Ensuring the Boards utilize this study as a guide for development standards during their site plan review process;
- Referencing this study when planning public maintenance and improvement projects and coordinating with the NYSDOT and Wyoming County; and
- Updating Zoning Codes based on the recommendations from this plan.

In addition to these implementation tools, the recommendations in this study will require varying levels of involvement from State and County agencies, including but not limited to:

- New York State Department of Transportation
- Town of Warsaw
- Wyoming County Planning

Some projects will need to be included on the Transportation Improvement Program (TIP) in order to be funded and implemented. Other efforts will need to be made to identify projects that are eligible or that would require other State, Federal, or County approvals and/or funding.

Available funding sources at the Federal and State levels is shown in the Appendix, as obtained from the FHWA. Additional State, regional, private and local funding is available.

State Funding

Consolidated Local Street and Highway Improvement Program (CHIPS): CHIPS provides State funds to municipalities to support the construction and repair of highways, bridges, highway-railroad crossings, and other facilities that are not on the State highway system.

Consolidated Funding Application (CFA): The CFA represents a significant improvement in state resource allocation, streamlining and expediting the grant application process. This innovative approach reduces administrative burden and enhances efficiency, enabling applicants to access multiple funding sources through a single, user-friendly platform. Consequently, the CFA has facilitated quicker application turnaround times and fostered more productive project development, ultimately translating to improved outcomes in addressing local needs.

Transportation Alternatives Program (TAP): Provides up to 80 percent of project-related cost for the funding of programs and projects defined as transportation alternatives.

PAVE-NY: The PAVE-NY Program provides State funds to municipalities to support rehabilitation and reconstruction of local highways and roads. PAVE-NY follows all the programmatic and reimbursement requirements of CHIPS, with one exception, eligible project activities are limited to Highway Resurfacing and Highway Reconstruction.

Pave Our Potholes (POP): The Pave Our Potholes (POP) Program provides State funds to municipalities

to support the rehabilitation and reconstruction of local highways and roads. Similar to PAVE-NY, POP follows all the programmatic and reimbursement requirements of CHIPS, eligible project activities are limited to Highway Resurfacing and Highway Reconstruction. Additionally, variations in eligible project activities for POP verses PAVENY are noted in the eligible project activities list.

NYS Downtown Revitalization Initiatives: This funding initiative awards each winning community with $10 million and provides them with an opportunity to improve their downtowns; the program states that "companies are increasingly seeking to relocate and invest in vibrant, walkable downtowns".

Transportation Improvement Program (TIP): The United States Department of Transportation (USDOT) requires that the metropolitan transportation planning process include the cooperative development of a TIP – a staged, multi-year program of projects. The TIP identifies the timing and funding of all highway, bridge, transit, intelligent transportation system, bicycle, and pedestrian transportation projects scheduled for implementation in the region during the next four years using federal transportation funds.

The 2023-2027 TIP includes transportation projects funded with approximately $540 million of federal aid, supplemented by other state and local sources of funds.

Recreational Trails Grant Program: The Recreational Trails Program (RTP) provides funds to the States to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. The RTP is an assistance program of the FHWA. In New York State, the RTP is administered by the Office of Parks, Recreation and Historic Preservation (OPRHP).

The RTP legislation requires that States use 30% of funds for non-motorized recreation, 30% for motorized recreation, and 40% for diverse recreational trail use.

Private Funding

PeopleForBikes' Industry Community Grant Program: The program supports bicycle infrastructure projects and targeted initiatives that make it easier and safer for people of all ages and abilities to bike. Grant amounts range from $5,000 to $10,000.

American Hiking Society's National Trails Fund: The Fund is the only privately funded, national grants program dedicated solely to building and protecting hiking trails. Created in response to the growing backlog of trail maintenance projects, the National Trails Fund has helped hundreds of grassroots organizations acquire the resources needed to protect America's cherished hiking trails. Award amounts range from $500 to $3,000.

Robert Wood Johnson Foundation: The Robert Wood Johnson Foundation seeks to improve the health and health care of all Americans. One of the primary goals of the Foundation is to "promote healthy communities and lifestyles." Specifically, the Foundation has an ongoing "Active Living by Design" grant program that promotes the principles of active living, including non-motorized transportation. Other related calls for grant proposals are issued as developed, and multiple communities nationwide have received grants related to promotion of trails and other non-motorized facilities.

Local Funding

To comprehensively address pedestrian and bicycle infrastructure needs, the Village of Warsaw can strategically utilize both external and internal funding sources. By incorporating project priorities into capital improvement plans, dedicating a portion of the municipal budget, and actively seeking grant opportunities with local matching requirements, the Village can secure vital funding. Furthermore, if community support is secured, innovative mechanisms like sidewalk district fees can generate dedicated funding for such initiatives.

Cost Estimation

The implementation of pedestrian and bicycle safety infrastructure exhibits significant cost variations across state, city, and project-specific contexts. While bicycle facility costs demonstrate notable sensitivity to urban context and project complexity, they frequently represent a more cost-effective investment compared to constructing new roads.

For example, constructing an urban road incurs expenses ranging from $3 million to $5 million per mile, with existing road repaving averaging $1 million per mile. In contrast, the creation of a two-way, protected bike lane typically requires an investment of $0.5 million per mile. Notably, bicycle facilities often present opportunities for integration with existing roadway improvement projects, such as planned maintenance or restriping initiatives. This approach leverages economies of scale, typically adding only $8,000-$25,000 per mile to the project cost (excluding right-of-way acquisition and engineering expenses).

The following table provides cost estimate information for pedestrian, bicycle, and transit infrastructure from a variety of sources, including NYSDOT projects in Upstate New York, Safe Routes to School Projects, and *Costs for Pedestrian and Bicycle Infrastructure Improvements (2013)*. Under full design and engineering, a 30% contingency is assumed. Additionally, a 5% escallation factor is assumed if there is a gap of more than one year between concept development and constuction.

Abbreviations are:
LF = Linear Foot
SF = Square Foot
EA = Each

Item	Unit	Unit Cost
Pedestrian Costs - Signs and Pavement Markings		
Pavement Markings - Paint	SF	$9
Pavement Markings - Thermoplastic	SF	$17
Crosswalks - Paint	LF	$5
Crosswalks - Thermoplastic	LF	$9
Signs	EA	$810
Speed Feedback Sign - Portable	SF	$9,450
Speed Feedback Sign - Fixed	EA	$7,425
Speed Trailer	EA	$20,250
Pedestrian Costs - Intersection		
New Traffic Signal with Pedestrian Signals	EA	$405,000
Mini Roundabout	EA	$101,250
Formal Roundabout	EA	Variable - up to $2 million based on actual design
Rectangular Rapid Flashing Becon (2 signs)	EA	$27,000
Curb Extensions - Simple, no drainage modifications	EA	$8,100
Curb Extensions - Complex, drainage modifications	EA	$27,000
Pedstrian Refuge Island	EA	$5,400
Pedestrian Costs - Paths and Sidewalks		
Shared Use Path - Asphalt	LF	$203
Shared Use Path - Crushed Stone	LF	$81
Sidewalk - Concrete (4" thick, 5' wide)	LF	$101
Detectable Warning Surface (curb in place)	EA	$439
Curb Ramps	EA	$2,025
Brick Sidewalk, 5' wide	LF	$122
Bollards on Sidewalk	EA	$1,688
Bicycle Costs - Roadway		
Bicycle-friendly Stormwater Drainage Grates	EA	$1,080
Bicycle Racks (two spaces)	EA	$540
Bicycle Locker (two spaces)	EA	$5,400
Bicycle Costs - Signs and Pavement Markings		
Signs	EA	$810
Shared Lane Marking	SF	$9
Bike Symbol	SF	$9
Traffic Calming and Streetscaping		
Street Lighting	EA	$8,100
Street Trees	EA	$1,215
Tree Grate	EA	$2,025
Litter (Trash) Recptacle	EA	$2,430
Bench	EA	$2,700
Prefabricated Bus Shelter	EA	$27,000
Rumble Strips	LF	$14
Speed Cushions	EA	$4,050
Speed Humps	EA	$6,750
Raised Crosswalk	EA	$13,500
Raised Intersection	EA	$135,000
General per Mile Costs		
One Standard (4 Inch wide) white line to delineate the Bike lane	Mile	$2,481.60
Bicycle symbols (ONLY) no chevrons or arrows.	Mile	$1,575.00
Bike lane, using a hatched Buffer Zone (2 FT Wide) and a 6 Inch white strip on the bicycle lane side of the buffer zone. (Estimated Cost Inch Hatching AND both edge lines.)	Mile	$13,596.00
"SHARROW" = Combination of Bicycle symbol and chevrons	Mile	$3,675.00
Arrows, used along "lane" at 250 FT spacing	Mile	$1,575.00
One Standard (4 Inch wide) dashed yellow line to delineate the Bike lane	Mile	$550.00

$ = Less than $10K, $$ = $10K-50K, $$$ = $50K-150K, $$$$ = Greater than $150K

ID	Recommendation	Page	Priority	Estimated Cost	Primary Stakeholder(s)	Other Stakeholders	Desired Timeline
REGULATORY							
1-2	Land use and zoning updates	50-51		**$**	Village, Town	County, Private	2-4 years
TRAILS AND RECOMMENDATIONS							
3	Trail from Warsaw Park to Stony Creek	56-57		**TBD based on feasibility planning and engineering and design**	Village, County	State, Private	3-5 years
4	Trail to Waraw Falls	56-57	**Yes!**	**TBD based on feasibility planning and engineering and design**	Village, County, Private	State	3-5 years
5	Improve pedestrian facilities at Warsaw Park	60-61		**$$-$$$**	Village	Private	1-3 years
6	Develop a multi-use trail from Linwood Avenue to Main Street via Commerce Way and Old Buffalo Road	58-59	**Yes!**	**$$$-$$$$**	Village, Private	County	3-5 years
7	Develop a multi-use trail from Old Buffalo Road to area around Walmart	58-59		**$$$-$$$$**	State, Town, Village, Private	County	3-5 years
8	Enhance and develop access to Oatka Creek	62	**Yes!**	**$$$-$$$$**	County, Village, Private	State	3-5 years
STREETSCAPE AND PEDESTRIAN FACILITIES							
9	Install pedestrian-level street lighting in strategic locations throughout the Village	52-53	**Yes!**	**$$-$$$**	Village	State, County	2-4 years
10	Plant street trees in strategic locations throughout the Village	53		**$**	Village	State, County, Private	1-3 years
11	Art installation at WCCHS retaining wall	69		**$**	Private	State, Village	1-3 years
12	Replace existing metal barrier with more decorative feature	69		**$$-$$$**	State		3-5 years
13	Prohibit parking closer than 20 feet from crosswalks	65	**Yes!**	**$**	Village	State, County	0-1 years
PEDESTRIAN AND BICYCLE							
14	Close existing sidewalk gaps and strengthen connections to existing attractions ensuring 5' sidewalks widths at a minimum	63	**Yes!**	**$$-$$$**	Village, Private	State, County	3-5 years
15	Leading pedestrian interval at Four Corners	65		**$**	State	Village	1+ years
16	New crosswalks at Cottage and Washington	68		**$$**	Village	State, County	1+ years
17	Curb extensions through CBD	68		**$$-$$$**	Village	State	2-4 years
18	New crosswalk at WCCHS southerly driveway	68		**$$**	Village, Private	State	1-3 years
19	New sidewalk at WCCHS northerly driveway	63-64		**$$-$$$**	Village, Private	State	1-3 years
20	Crosswalk enhancements (ongoing work by NYSDOT)	65	**Yes!**	**$-$$**	State	Village	Ongoing
21	Develop bicycle boulevards on identified low-speed, low-volume streets	69-73	**Yes!**	**$**	Village	Private	1+ years
22	Add or widen paved shoulders along routes desired for bicycling	69-73		**$$-$$$**	County, Village	Private	4-6 years
23	New sidewalk from NY-19 to County Services building	64		**$$-$$$**	Village, Private	State	1-3 years
TRAFFIC OPERATIONS							
24	Formalize roundabout at Main/Court	74	**Yes!**	**$$$-$$$$**	Village	State, County	3-5 years
25	Restripe S. Main and install curb extensions	75	**Yes!**	**$$-$$$**	Village	State	1-3 years
26	Traffic signal warrant investigation at Walmart driveway	76	**Yes!**	**$**	Private	State, Town	0-1 years

27	EB/WB left-turn lanes at Four Corners	76		**$$$-$$$$**	State		1+ years
28	Relocate EB stop bar on US-20A back to avoid truck encroachment	76		**$**	State		1+ years
PROGRAMS, POLICIES, AND PROCEDURES							
29	Ensure traffic studies or trip generation memos are prepared for all new projects	76-78		**$**	Town, Village	County	Ongoing
30	Implement Access Management language	76-78		**$**	County, Town, Village	State	Ongoing
31	Develop bike and pedestrian encouragement and education programs	76-78		**$**	County, Village	Town	Ongoing
32	Establish a Vision Zero or policy	76-78		**$**	County, Village	Town	Ongoing
33	Draft and adopt a Complete Streets policy	76-78		**$**	County, Village	State, Town	Ongoing
34	Evaluate parking requirements	76-78		**$**	Village	County, Town	Ongoing
35	Prioritize funding for pedestrian and bicycle infrastructure	76-78	**Yes!**	**$**	County, Village	State, Town	Ongoing
36	Evaluate posted speed limit reduction on Village streets	76-78		**$**	Village	State	Ongoing
37	Regular maintenance of pedestrian and bicycle infrastructure	76-78		**Dependent on work required and staff time.**	State, Village	County, Town, Private	Ongoing

Appendix

Pedestrian and Bicycle Funding Opportunities: U.S. Department of Transportation Highway, Transit, and Safety Funds

November 16, 2023

This table indicates likely eligibility for pedestrian and bicycle activities and projects under U.S. Department of Transportation surface transportation funding programs. Activities and projects need to meet program eligibility requirements. See notes and basic program requirements below, with links to program information. Project sponsors should integrate the safety, accessibility, equity, and convenience of walking and bicycling into surface transportation projects.

	Pedestrian and Bicycle Funding Opportunities: Highway, Transit, and Safety Funds **Key:** $ = Activity likely eligible. Restrictions may apply, see program notes and guidance. ~$ = Eligible, but not competitive unless part of a larger project.																													
	Federal Highway Administration														**Federal Lands**			**OST Grant**						**OST Loan**		**FTA**			**NHTSA**	
Activity or Project Type	ATIIP	BRI	CRP	CMAQ	HSIP	RHCP	NHPP	PROT	STBG	TASA	RTP	SRTS	PLAN	NSBP	FLTTP	TTP	TTPSF	INFRA	RAISE	RCN	SS4A	SMART	Thrive	RRIF	TIFIA	FTA	AoPP	TOD	402	405
Access enhancements to public transportation (benches, bus pads, lighting)	$		$	$			$	$	$	$				$	$	$		$	$	$	~$			~$	~$	$				
Americans with Disabilities Act (ADA)/504 Self Evaluation / Transition Plan	$		$						$	$	$		$		$	$					$		TA				$	~$		
Barrier removal for ADA compliance	$	$	$				$	$	$	$	$	$		$	$	$		$	$	$	~$			~$	~$	$				
Bicycle plans	$		$					$	$	$		$	$		$	$	$			~$	$					$	$	~$		
Bicycle helmets (project or training related)	~$				$				$	$SRTS		$				$													$	
Bicycle helmets (safety promotion)	~$				$				$	$SRTS		$				$														
Bicycle lanes on road	$		$	$	$	$	$	$	$	$		$		$	$	$	$	~$	~$	$	$			~$	~$	$				
Bicycle parking (see Bicycle Parking Solutions)	$		$	$			$		$	$	$	$		$	$	$		~$	~$	$	~$			~$	$	$				
Bike racks on transit	$		$	$					$	$					$	$			~$	$	~$				~$	$				
Bicycle repair station (air pump, simple tools, electric outlets)	$		$						$	$					$	$			~$	$	~$			~$	~$	$				
Bicycle share (capital and equipment including charging stations and outlets; not operations)	$		$	$			$		$	$					$	$		~$	~$	$	~$			~$	~$	$				
Bicycle storage or service centers (e.g. at transit hubs) including charging stations and outlets; not operations)	$		$	$					$	$					$	$			~$	$	~$			~$	$	$				
Bridges / overcrossings for pedestrians and/or bicyclists	$	$	$	$	$	$	$	$	$	$	$	$			$	$	$	$	$	$	$			~$	~$	$				
Bus shelters and benches	$		$	$			$	$	$	$				$	$	$		$	$	$	~$			~$	~$	$				
Charging stations for electric bicycles and scooters NEW	$		$	$					$	$	$				$	$						~$		~$	~$					
Coordinator positions: State/local (CMAQ/STBG limited)				$					$	$SRTS		$				$					~$									
Community Capacity Building (develop organizational skills and processes)	~$												$			$				NAE	~$		TA				~$	~$		
Crosswalks for pedestrians, pedestrian refuge islands (new or retrofit)	$		$	~$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$	$				
Curb ramps	$	$	$	~$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$	$				
Counting equipment	$				$	$	$		$	$	$	$	$		$	$	$	$		$	~$				~$	$				
Data collection and monitoring for pedestrians and/or bicyclists	$		$		$	$	$		$	$	$	$	$		$	$	$	$	$	$	$				~$	$	~$	~$		
Emergency and evacuation routes for pedestrians and/or bicyclists	$		$				$	$	$	$	$	$			$	$		$	$	$	~$				$	$	~$	~$		
Encouragement and education activities related to safe access for bicyclists and pedestrians NEW	~$			$	$				$	$SRTS	$	$	$			$					~$	~$								
Historic preservation (pedestrian, bicycle, transit facilities)	~$		$						$	$				$	$	$			~$	~$	~$			~$	~$	$				
Landscaping, streetscaping (pedestrian/bicycle route; transit access); related amenities (benches, lighting, shade, trees, water fountains); usually part of larger project	$		$				~$	$	$	$					$	$		~$	~$	~$	~$			~$	~$	$				
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	$		$	~$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$	$				
Maps (for pedestrians and/or bicyclists) (see Idea Book)	$		$	$					$	$		$	$	$		$					$					$				
Micromobility projects, including scooter share (capital and equipment, including charging stations and outlets; not operations)	$		$	$					$	$					$	$			$	$	~$	~$		~$	~$					
Paved shoulders for pedestrian and/or bicyclist use	$	$	$	$	$	$	$	$	$	$		$		$	$	$	$	~$	$	$	$			~$	~$					
Pedestrian plans	$		$					$	$	$		$	$		$	$	$	~$	$	~$	$					$	$	$		
Public education and awareness programs to inform motorists and nonmotorized road users on nonmotorized road user safety NEW	~$				$				$	$SRTS		$				$													$	$

Pedestrian and Bicycle Funding Opportunities: Highway, Transit, and Safety Funds

Key: $ = Activity likely eligible. Restrictions may apply, see program notes and guidance. ~$ = Eligible, but not competitive unless part of a larger project.

	Federal Highway Administration														Federal Lands			OST Grant						OST Loan		FTA			NHTSA	
Activity or Project Type	ATIIP	BRI	CRP	CMAQ	HSIP	RHCP	NHPP	PROT	STBG	TASA	RTP	SRTS	PLAN	NSBP	FLTTP	TTP	TTPSF	INFRA	RAISE	RCN	SS4A	SMART	Thrive	RRIF	TIFIA	FTA	AoPP	TOD	402	405
Rail at-grade crossings	$		$		$	$	$	$	$	$	$	$			$	$	$	$	$	$	~$			$	$	$				
Recreational trails	$							$	$	$	$			$	$	$			$	$	~$				~$					
Resilience improvements to pedestrian and bicycle facilities or to protect or enhance use. REVISED	$	~$	~$	~$			$	$	$	$	$	$	note	$	$	$		$	$	$	~$	~$		~$	~$					
Road Diets (pedestrian and bicycle portions)	$		$	$	$		$	$	$	$		$			$	$	$	$	$	$	$			~$	$					
Road Safety Assessment for pedestrians and bicyclists	$				$	$			$	$			$		$	$	$			$	$		TA		~$		~$			
Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike traffic safety laws	~$				$				$	$SRTS		$	$			$					$						~$	~$	$	$
Safety education positions					$				$SRTS	$SRTS		$				$					$								$	
Safety enforcement (including police patrols)					$				$SRTS	$SRTS		$				$					$								$	$
Safety program technical assessment (for peds/bicyclists)	~$				$				$SRTS	$SRTS		$	$		$	$				$	$		TA						$	
Separated bicycle lanes	$	$	$	$	$	$	$	$	$	$		$		$	$	$	$	$	$	$	$			~$	~$	$				
Shared use paths / transportation trails	$		$	$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$	$				
Sidewalks (new or retrofit)	$	$	$	$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$	$				
Signs, signals, signal improvements (incl accessible pedestrian signals) see note	$		$	$	$	$	$	$	$	$		$		$	$	$	$	$	$	$	$	$		~$	~$	$				
Signing for pedestrian or bicycle routes	$		$	$	$		$	$	$	$		$		$	$	$	$	$	$	$	$			~$	~$	$				
Spot improvement programs (programs of small projects to enhance pedestrian and bicycle use) REVISED	$		$	~$	$	$	$		$	$	$	$			$	$	$	$	$	~$	$	~$		~$	~$	$				
Stormwater mitigation related to pedestrian and bicycle project impacts REVISED	$				$	$	$	$	$	$	$	$	note		$	$	$	$	$	$	~$			~$	~$	$	note	note		
Technical Assistance (see Cross-cutting notes) NEW	~$			~$	$				$	$	$	$	note			$	$			~$	~$	~$	TA							
Traffic calming	$		$		$		$	$	$	$		$			$	$	$	$	$	$	$			~$	~$	$				
Trail bridges	$		$	~$	$	$	$	$	$	$	$	$			$	$	$	$	$	$	~$			~$	$					
Trail construction and maintenance equipment	$		$						$	$	$				~$	~$	~$				~$			~$	~$					
Trail/highway crossings and intersections	$	$	$	~$	$	$	$	$	$	$	$	$		$	$	$	$	$	$	$	$			~$	~$					
Trailside/trailhead facilities (restrooms, water, but not general park amenities)	$		~$						$	$	$			$	$	$			~$					~$	~$					
Training	~$			$	$				$	$	$	$	$			$					$		TA				~$	~$	$	
Training for law enforcement on ped/bicyclist safety laws	~$			~$	$				$SRTS	$SRTS		$				$					$						~$	~$	$	$
Tunnels / underpasses for pedestrians and/or bicyclists	$		$	$	$	$	$	$	$	$	$	$			$	$	$	$	$	$	$			$	$	$				
Vulnerable Road User Safety Assessment	$				$				$	$		$	$			$	$			$			TA				~$	~$		

Abbreviations (alphabetical order)

ADA/504: Americans with Disabilities Act of 1990 / Section 504 of the Rehabilitation Act of 1973
AoPP: Areas of Persistent Poverty Program
ATIIP: Active Transportation Infrastructure Investment Program [web link under development]
BIL: Bipartisan Infrastructure Law (Infrastructure Investment and Jobs Act (Pub. L. 117-58)
BRI: Bridge Programs, including: BFP: Bridge Formula Program; BIP: Bridge Investment Program; BRR: Bridge Replacement and Rehabilitation Program
CMAQ: Congestion Mitigation and Air Quality Improvement Program
CRP: Carbon Reduction Program
FLTTP: Federal Lands and Tribal Transportation Programs: Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program, Federal Lands Planning Program and related programs for Federal and Tribal lands such as the Nationally Significant Federal Lands and Tribal Projects program
FTA: Federal Transit Administration Capital Funds
PLAN: Statewide Planning and Research (SPR) or Metropolitan Planning funds (FHWA and/or FTA funding)
PROTECT: Promoting Resilient Operations for Transformative, Efficient, and Cost Saving Transportation
RAISE: Rebuilding American Infrastructure with Sustainability and Equity
RCN: Reconnecting Communities and Neighborhoods Grant Program (includes Reconnecting Communities Pilot Program (RCP) and Neighborhood Access and Equity programs)
RHCP: Railway-Highway Crossings (Section 130) Program
RRIF: Railroad Rehabilitation and Improvement Financing (loans)
RTP: Recreational Trails Program
SMART: Strengthening Mobility and Revolutionizing Transportation (SMART) Grants Program
SRTS: Safe Routes to School Program (and related activities)
SS4A: Safe Streets and Roads for All
STBG: Surface Transportation Block Grant Program

HSIP: Highway Safety Improvement Program IIJA: Infrastructure Investment and Jobs Act (Pub. L. 117-58), also known as the Bipartisan Infrastructure Law INFRA: Infrastructure for Rebuilding America Discretionary Grant Program NAE: Neighborhood Access and Equity Program NHPP: National Highway Performance Program NHTSA 402: National Highway Traffic Safety Administration State and Community Highway Safety Grant Program NHTSA 405(g): National Highway Traffic Safety Administration National Priority Safety Programs (Nonmotorized safety) NSBP: National Scenic Byways Program	TASA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program, Transportation Enhancements) Thrive: Thriving Communities Initiative (TA: Technical Assistance) TIFIA: Transportation Infrastructure Finance and Innovation Act (loans) TOD: Transit-Oriented Development TTP: Tribal Transportation Program TTPSF: Tribal Transportation Program Safety Fund

Cross-cutting notes

This table indicates likely eligibility for pedestrian, bicycle, and micromobility activities and projects under U.S. Department of Transportation surface transportation funding programs. Activities and projects must meet program eligibility requirements. See notes and links to program information below. Although the primary focus of this table is stand-alone activities and projects, programs can also fund pedestrian and bicycle facilities as part of larger projects. Project sponsors are encouraged to consider Complete Streets and Networks that routinely integrate the safety, accessibility, equity, and convenience of walking and bicycling into surface transportation projects. The Federal-aid eligibility of the pedestrian and bicycle elements are considered under the eligibility criteria applicable to the larger highway project. Pedestrian and bicycle activities also may be characterized as environmental mitigation for larger highway projects, especially in response to impacts to a Section 4(f) property or work zone safety, mobility, and accessibility impacts on bicyclists and pedestrians.

- See FHWA's Policy on Using Bipartisan Infrastructure Law Resources to Build a Better America.
- See FHWA Bicycle and Pedestrian Planning, Program, and Project Development (Guidance), Publications, Pedestrian and Bicyclist Safety, and Bicycle transportation and pedestrian walkways statute at 23 U.S.C. 217.
- Bicycle Project Purpose: 23 U.S.C. 217(i) requires that bicycle facilities "be principally for transportation, rather than recreation, purposes". However, 23 U.S.C. 133(b)(7) and 133(h) authorize recreational trails under STBG and TASA, therefore, 23 U.S.C. 217(i) does not apply to trail projects (including for bicycle use) using STBG or TASA funds. Section 217(i) applies to bicycle facilities other than trail-related projects, and section 217(i) applies to bicycle facilities using other programs (NHPP, HSIP, CMAQ). The transportation requirement under section 217(i) only applies to bicycle projects, not to any other trail use or transportation mode.
- Signs, signals, signal improvements includes ensuring accessibility for persons with disabilities. See Accessible Pedestrian Signals. See also Proven Safety Countermeasures, such as Crosswalk Visibility Enhancements, Leading Pedestrian Interval signals, Lighting, Pedestrian Hybrid Beacons, and Rectangular Rapid Flashing Beacons.
- Technical Assistance includes assisting local agencies and other potential grantees to identify pedestrian and bicycle safety and infrastructure issues, and to help them develop and implement successful projects. Technical assistance may be authorized under a program or sometimes as a limited portion of a program. See FHWA links to Technical Assistance and Local Support.
- The DOT Navigator is a resource to help communities understand the best ways to apply for grants, and to plan for and deliver transformative infrastructure projects and services.
- Aspects of DOT initiatives may be eligible as individual projects. Activities above may benefit safe, comfortable, multimodal networks; environmental justice; and equity.
- Occasional DOT or agency incentive grants may be available for specific research or technical assistance purposes.
- Operation costs: In general, ongoing and routine operation costs (such as ongoing costs for bike sharing or scooter sharing) are not eligible unless specified within program legislation. See links to program guidance for more information.

Program-specific notes

DOT funding programs have specific requirements that activities and projects must meet. Eligibility must be determined on a case-by-case basis. See links to program guidance for more information.

FHWA Programs

- ATIIP (IIJA § 11529): Subject to appropriations. Projects costing at least $15,000,000 to develop or complete active transportation networks and spines, or at least $100,000 to plan or design for active transportation networks and spines.
- BRI: BFP, (IIJA, Div. J, title VIII, para. (1)), BIP (23 U.S.C. 124), BRR (Department of Transportation Appropriations Act, 2022): For specific highway bridge projects and highway bridge projects that will replace or rehabilitate a bridge; project must consider pedestrian and bicycle access as part of the project and costs related to their inclusion are eligible under these programs.
- CRP (23 U.S.C. 175): Projects should support the reduction of carbon dioxide emissions from on-road highway sources.
- CMAQ (23 U.S.C. 149): Projects must demonstrate emissions reduction and benefit air quality. See the CMAQ guidance for a list of projects that may be eligible for CMAQ funds. CMAQ funds may be used for shared use paths, but not for trails that are primarily for recreational use.
- HSIP (23 U.S.C. 148): Projects must be consistent with a State's Strategic Highway Safety Plan and (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem. Certain noninfrastructure safety projects can also be funded using HSIP funds as specified safety projects.
- RHCP (23 U.S.C. 130): Projects at all public railroad crossings including roadways, bike trails, and pedestrian paths.
- NHPP (23 U.S.C. 119): Projects must benefit National Highway System (NHS) corridors and must be located on land adjacent to any highway on the National Highway System (23 U.S.C. 217(b)).
- PROTECT (23 U.S.C. 176): Funds can only be used for activities that are primarily for the purpose of resilience or inherently resilience related. With certain exceptions, the focus must be on supporting the incremental cost of making assets more resilient.
- STBG (23 U.S.C. 133): Broad eligibility for pedestrian, bicycle, and micromobility projects under 23 U.S.C. 206, 208, and 217 (23 U.S.C. 133(b)(7)). Activities marked "$SRTS" means eligible only as an SRTS project benefiting schools for kindergarten through 12th grade. Nonconstruction projects related to safe access for bicyclists and pedestrians (such as bicycle and pedestrian education) are eligible under STBG (23 U.S.C. 217(a)).

- TASA (23 U.S.C. 133(h)): Broad eligibility for pedestrian, bicycle, and micromobility projects. Activities marked "$SRTS" means eligible only as an SRTS project benefiting schools for kindergarten through 12th grade.
- RTP (23 U.S.C. 206): Projects for trails and trailside and trailhead facilities for any recreational trail use. RTP projects are eligible under TA Set-Aside and STBG.
- SRTS (23 U.S.C. 208): Projects for any SRTS activity. FY 2012 was the last year for dedicated - funds, but funds are available until expended. SRTS projects are eligible under TA Set-Aside and STBG.
- PLAN (23 U.S.C. 134 and 135): Funds must be used for planning purposes, for example: Maps: System maps and GIS; Safety education and awareness: for transportation safety planning; Safety program technical assessment: for transportation safety planning; Training: bicycle and pedestrian system planning training. Transportation planning associated with activities would be eligible, SPR and PL funds are not available for project implementation or construction.
- NSBP (23 U.S.C. 162): Discretionary program subject to annual appropriations. Projects must directly benefit and be located on or near an eligible designated scenic byway.

FHWA Federal Lands Programs

- FLTTP (23 U.S.C. 201-204): Projects must provide access to or within Federal or Tribal lands. Programs include: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Federal Lands Planning Program) and related programs for Federal and Tribal lands such as the Nationally Significant Federal Lands and Tribal Projects (NSFLTP) program.
  - Federal Lands Transportation Program (23 U.S.C. 203): For Federal agencies for projects that provide access within Federal lands.
  - Federal Lands Access Program (FLAP) (23 U.S.C. 204): For State and local entities for projects that provide access to or within Federal or Tribal lands.
- TTP (23 U.S.C. 202): For federally recognized Tribal governments for projects within Tribal boundaries and public roads that access Tribal lands.
- TTPSF (23 U.S.C. 202(e)(1) and 23 U.S.C. 148(a)(4)): Grants available to federally recognized Indian Tribes through a competitive, discretionary program to plan and implement transportation safety projects.

OST Grant Programs

- INFRA (IIJA § 11110): Funds projects that improve safety, generate economic benefits, reduce congestion, enhance resiliency, and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements.
- RAISE (IIJA § 21202): Funds capital and planning grants to help communities build transportation projects that have significant local or regional impact and improve safety and equity.
- RCN: Combines RCP (IIJA § 11509 and div. J, title VIII, Highway Infrastructure Programs, para. (7)), which provides funds for planning grants and capital construction grants that relate to a transportation facility that creates a barrier to community connectivity and Neighborhood Access and Equity Grant Program, Inflation Reduction Act (IRA) § 60501; enacted as Pub. L. 117-169, 23 U.S.C. 177, which provides funds for projects that improve walkability, safety, and affordable transportation access and funding for planning and capacity building activities in disadvantaged or underserved communities.
- SMART (IIJA § 25005): Provides grants to eligible public sector agencies to conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.
- SS4A (IIJA § 24112): Discretionary program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries. Projects must be identified in a comprehensive safety action plan (§ 24112(a)(3)).
- Thrive (Department of Transportation Appropriations Act, 2022 (Pub. L. 117-103, div. L, title I): Technical assistance, planning, and capacity-building support in selected communities.

OST Loan Programs

- RRIF (Chapter 224 of title 49 U.S.C.): Program offers direct loans and loan guarantees for capital projects related to rail facilities, stations, or crossings. Pedestrian and bicycle infrastructure components of "economic development" projects located within ½-mile of qualifying rail stations may be eligible. May be combined with other grant sources.
- TIFIA (Chapter 6 of title 23 U.S.C.): Program offers secured loans, loan guarantees, or standby lines of credit for capital projects. Minimum total project size is $10 million; multiple surface transportation projects may be bundled to meet cost threshold, under the condition that all projects have a common repayment pledge. May be combined with other grant sources, subject to total Federal assistance limitations.

FTA Programs

- FTA (49 U.S.C. 5307): Multimodal projects funded with FTA transit funds must provide access to transit. See Bicycles and Transit, Flex Funding for Transit Access, the FTA Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law, and FTA Program & Bicycle Related Funding Opportunities.
  - Bicycle infrastructure plans and projects must be within a 3-mile radius of a transit stop or station. If more than 3 miles, within a distance that people could be expected to safely and conveniently bike to the particular stop or station.
  - Pedestrian infrastructure plans and projects must be within a ½ mile radius of a transit stop or station. If more than ½ mile, within a distance that people could be expected to safely and conveniently walk to the particular stop or station.
  - FTA funds cannot be used to purchase bicycles for bike share systems.
- FTA AoPP (Further Consolidated Appropriations Act, 2020 (Pub. L. 116-94); Consolidated Appropriations Act, 2021 (Pub. L. 116-260)): Promotes multimodal planning, engineering, and technical studies, or financial planning to improve transit services, facilities, and access in areas experiencing long-term economic distress, not for capital purchases.
- FTA TOD: Provides planning grants to support community efforts to improve safe access to public transportation, services, and facilities, including for pedestrians and cyclists. The grants help organizations plan for transportation projects that connect communities and improve access to transit and affordable housing, not for capital purchases.

NHTSA Programs

- NHTSA 402 (23 U.S.C. 402): Project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details.
- NHTSA 405 (23 U.S.C. 405): Funds are subject to eligibility, application, and award. Project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details. The Bipartisan Infrastructure Law expanded the eligible use of funds for a Section 405 Nonmotorized Safety grant beginning in FY 2024. See 23 U.S.C. 1300.26. For prior year grant awards, FAST Act eligible uses remain in place.
- Project agreements involving safety education, or any other positions must specify hours of eligible activity required to perform the project. Project agreements may not be expressed in terms of full or part time positions.

Village of Warsaw

Active Transportation Plan

February 2024