

6.0 ACTIVE TRANSPORTATION SYSTEMS

Streets are an integral part of our cities and towns, providing and facilitating the movement of people and goods. The road network in the Naugatuck Valley planning region is extensive, totaling about 2,580 miles. It serves to connect neighborhoods and provides access to businesses, jobs, schools, and a wide range of public and private services. Connections to neighboring cities and towns, regions, as well as interstate travel are facilitated by an expressway system consisting of I-84, I-691 and Route 8, and a network arterial street.

The goal of transportation improvement programs has usually been to make the highway and road networks operate more efficiently, with efficiency defined as improving the flow of traffic. Often, the needs of pedestrians, bicyclists, those rolling, and others who travel by non-traditional, motorized means have been ignored or minimally considered. In combination, these non-traditional ways of traveling are generally referred to as micromobility. Micromobility is defined as *any small, low-speed, human- or electric-powered transportation device, including bicycles, scooters, electric-assist bicycles (e-bikes), electric scooters (e-scooters), and other small, lightweight, wheeled conveyances*. In recent years, the popularity and use of electric-assisted devices has increased dramatically, expanding not only the type of device but also the number of people using them.



Figure 1 Different forms of micromobility

Road design standards, with the emphasis on moving traffic and vehicular safety, have made the street environment an intimidating place for anyone not in a car or other motorized vehicle. The focus of streets as the sole environment for motorized vehicles has changed with greater emphasis on travel needs of all users regardless of mode, age, and abilities, supported by and well connected to a strong public transportation system. Federal transportation acts have provided dedicated funding for active transportation projects and have required planners to consider all travelers. Connecticut state laws and policies also require transportation projects to consider the needs of bicyclists and pedestrians and promote bicyclist and pedestrian safety. In 2021, the state established the Vision Zero Council, an interagency work group tasked with developing statewide policy to eliminate transportation-related fatalities and severe injuries involving pedestrians, bicyclists, transit users, motorists, and passengers. In addition, the state has implemented a “complete streets” policy and promote “Share the Road” campaigns. The goal

of these federal and state actions is to create an interconnected, hierarchical network of safe, accessible, convenient, and protected transportation facilities that accommodate all users.

6.1 REGIONAL PEDESTRIAN PLAN

Walking is the most basic form of transportation. Most New England towns and cities were initially developed around walking, and many New England towns and cities retain basic elements supportive to pedestrians. Nearly all people are pedestrians of some form during all trips, whether it is walking to and from their car in a parking lot, walking to a transit stop, or walking to and from work. Walking also tends to be the most accessible form of transportation: no special equipment is typically required, provided the built environment is supportive. Of course, this does not apply to persons who are unable to walk. Special accommodations are needed to ensure people with a mobility impairment and those who are dependent upon wheelchairs or other means of physical assistance can travel safely. For that reason, these persons are also considered pedestrians in this plan.

In addition to transportation, walking, jogging, and running are healthy habits one can incorporate into daily routines. The US Department of Health and Human Services (HSS) recommends all adult Americans maintain thirty minutes of physical activity each day (*"PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS"*, DHHS 2008) and adding a short walk into one's day is for many the easiest way to accommodate this level of activity.

Research shows that people walking in business districts are more likely to spend more time and spend more money in local establishments, (*"CONSUMER BEHAVIOR AND TRAVEL MODE CHOICES,"* Clifton et al., 2012) because it is easier to make purchases at multiple stores and because users would otherwise need to change travel modes to reach destinations outside of the business district. Further, mixed use development often creates walkable environments that often leads to improved property values and increased small business profitability.

In the Naugatuck Valley planning region, only about 1.7% of commuters walk to work (*American Community Survey 5-year estimates 2016-2020*, US Bureau of the Census). This is lowest walk rate of any region in the state, including the non-urbanized regions.

The goals of the pedestrian safety program and plan area:

- To increase the safety and well-being of residents of the Naugatuck Valley planning region who walk to work or for any other purpose by improving infrastructure and transportation policies.
- To encourage more residents of the Naugatuck Valley planning region to walk to work or for any other reason by improving infrastructure, creating aesthetically pleasing and

safe street environments, and revise land use policies that promote mixed-use developments and pedestrian facilities and amenities.

- To build a more resilient, equitable, and economically vibrant transportation system by providing more balanced and accessible modal choice.
- To develop consistent policies for the future development and planning of pedestrian-related projects and programs.

PEDESTRIAN SAFETY

Crash data involving pedestrians in motor vehicle crashes were extracted from the CTDOT *Crash Data Repository* hosted and maintained by the University of Connecticut. The most recent crash data available (2019 through 2021) indicate that over the last couple of years the number of

crashes involving pedestrians has decreased. In 2019, a total of 195 pedestrians were involved in crashes with a motorized vehicle in the Naugatuck Valley planning region. By 2021, that number had declined to 140 crashes, a decrease of 28.2%. The annual average number of pedestrian crashes in the region is 163.7 per year.

The most critical concern with the incidence and frequency of crashes involving pedestrians is that a crash involving a pedestrian typically results in injury, and more likely a serious injury. Pedestrians hit by a vehicle are exposed to severe injury and death, especially when vehicle speeds are high. This exposure is illustrated by the fact that pedestrians are

overrepresented in fatal

crashes, not only in Connecticut but nationally. Over the three-year analysis period, about 20%

Municipality	2019	2020	2021	Total	Annual Average
Ansonia	6	4	3	13	4.3
Beacon Falls	0	0	0	0	0.0
Bethlehem	0	0	0	0	0.0
Bristol	19	20	16	55	18.3
Cheshire	1	2	4	7	2.3
Derby	3	3	3	9	3.0
Middlebury	0	2	0	2	0.7
Naugatuck	13	5	6	24	8.0
Oxford	1	0	1	2	0.7
Plymouth	2	4	1	7	2.3
Prospect	3	0	0	3	1.0
Seymour	6	5	3	14	4.7
Shelton	7	4	1	12	4.0
Southbury	1	1	2	4	1.3
Thomaston	0	0	0	0	0.0
Waterbury	131	101	96	328	109.3
Watertown	1	3	0	4	1.3
Wolcott	0	0	3	3	1.0
Woodbury	1	2	1	4	1.3
Total	195	156	140	491	163.7

Table 1 Pedestrian Vehicle Crashes within NVCOG region Source: CTDOT Crash Data Repository

of the pedestrian-involved crashes resulted in a fatality or serious injury, with 20 crashes resulting in a fatality. These statistics are unacceptable, and efforts need to focus not only on reducing these number but eliminating all fatal and serious injury pedestrian crashes. As the total number of pedestrian crashes decline, the incidence of these crashes causing death or serious injury also decline. Over the past three years, the number of pedestrians who died from injuries sustained in the crash or were seriously injured went from 38 in 2019 to 28 in 2021, a decrease of 26.3%. 2020 was an especially dangerous year as 10 pedestrians were killed in a crash with a vehicle. In 2021, four people died in a pedestrian-vehicle crash. A positive trend but that remains unacceptable.

Fatal and Serious Injury Pedestrian-Vehicle Crashes in Naugatuck Valley Region 2019 through 2021								
	2019		2020		2021		Total	
Municipality	Fatal	Serious Injury	Fatal	Serious Injury	Fatal	Serious Injury	Fatal	Serious Injury
Ansonia	0	2	0	0	0	1	0	3
Beacon Falls	0	0	0	0	0	0	0	0
Bethlehem	0	0	0	0	0	0	0	0
Bristol	1	4	1	5	1	3	3	12
Cheshire	0	0	1	1	0	0	0	1
Derby	1	1	0	1	0	1	1	3
Middlebury	0	0	1	0	0	0	1	0
Naugatuck	0	3	0	0	0	1	0	4
Oxford	0	0	0	0	0	0	0	0
Plymouth	0	1	0	1	0	0	0	2
Prospect	0	0	0	0	0	0	0	0
Seymour	0	1	0	1	1	1	1	3
Shelton	0	2	0	1	0	1	0	4
Southbury	0	0	0	0	1	0	1	0
Thomaston	0	0	0	0	0	0	0	0
Waterbury	4	18	6	10	1	14	11	42
Watertown	0	0	0	1	0	0	0	1
Wolcott	0	0	0	0	0	1	0	1
Woodbury	0	0	1	0	0	1	1	1
Total	6	32	10	21	4	24	20	77

Table 2 Fatal and Serious Injury Pedestrian Vehicle Crashes within NVCOG region Source: CTDOT Crash Data Repository

Not unexpectedly, the incident of pedestrian-involved crashes is highly correlated with urban density. Built-up areas, especially the downtowns of the region's cities, tend to experience

higher numbers of pedestrians and higher traffic volumes on streets. Urban centers also have various pedestrian safety elements, such as sidewalks, crosswalks, and pedestrian signals, that are designed to protect pedestrians and make the areas safer for people walking. Despite these features, pedestrians have greater exposure in downtown areas than more suburban locations.

The urban core area of Waterbury is a major concern. Over the three-year analysis period, 66.8% of the pedestrian-vehicle crashes occurred in Waterbury and over half of the pedestrian fatalities and serious injuries occurred in the city. Despite having pedestrian safety features, such as pedestrian signals, crosswalks and sidewalks, a disproportionately high number of pedestrian-related crashes are occurring in Waterbury. This suggests that the condition of pedestrian safety features may be poor – crosswalks that are no longer clearly marked or pedestrian signals that either are not functioning properly or do not meet current standards. Further, many of the streets in these core areas are in a state of disrepair that generally makes the transportation experience, regardless of mode choice, stressful.

There are two typical locations for a pedestrian crash in the region: suburban-style shopping streets and high-vehicle-traffic urban streets.

Suburban-style shopping centers, particularly ones with transit access, are overrepresented in the proportion of pedestrian crashes given their higher pedestrian activity. These areas typically have poor access management (high number of driveways, wider driveways) onto primary roadways, a lack of sidewalks and safe crosswalks, and high automobile crash volumes. Poor access management increases the exposure of pedestrians to conflicts with vehicles.

High-vehicle-traffic urban streets have high absolute numbers of pedestrian accidents, as well as the overwhelming majority of pedestrian activity in the region. Dangerous urban streets and their intersections typically have wide turning radii, confusing signalization, poorly marked transit stops, and poorly delineated road markings.

The CTDOT is presently installing curb ramps on several of their roadways with pre-existing sidewalks in the region as part of their *ADA12 Transition Plan* (A final draft of the state *ADA Transition Plan* can be found at: <https://portal.ct.gov/-/media/DOT/documents/ddbe/CTDOT-ADA-Transition-Plan-092019.pdf>). Implementation of the plan may be on hold due to the state budget. Several municipalities in the NVCOG region have ADA Transition Plans of their own, though implementation of these plans has been mixed with regards to pedestrian accessibility. While the NVCOG has not developed an ADA Transition Plan under federal law, the NVCOG is involved in funding capital projects that would trigger the need to ensure ADA compliance. Further, any pedestrian-related planning activity should be inclusive to all pedestrians, regardless of ability status.

Pedestrian Demand and Deficiencies in the Naugatuck Valley Planning Region

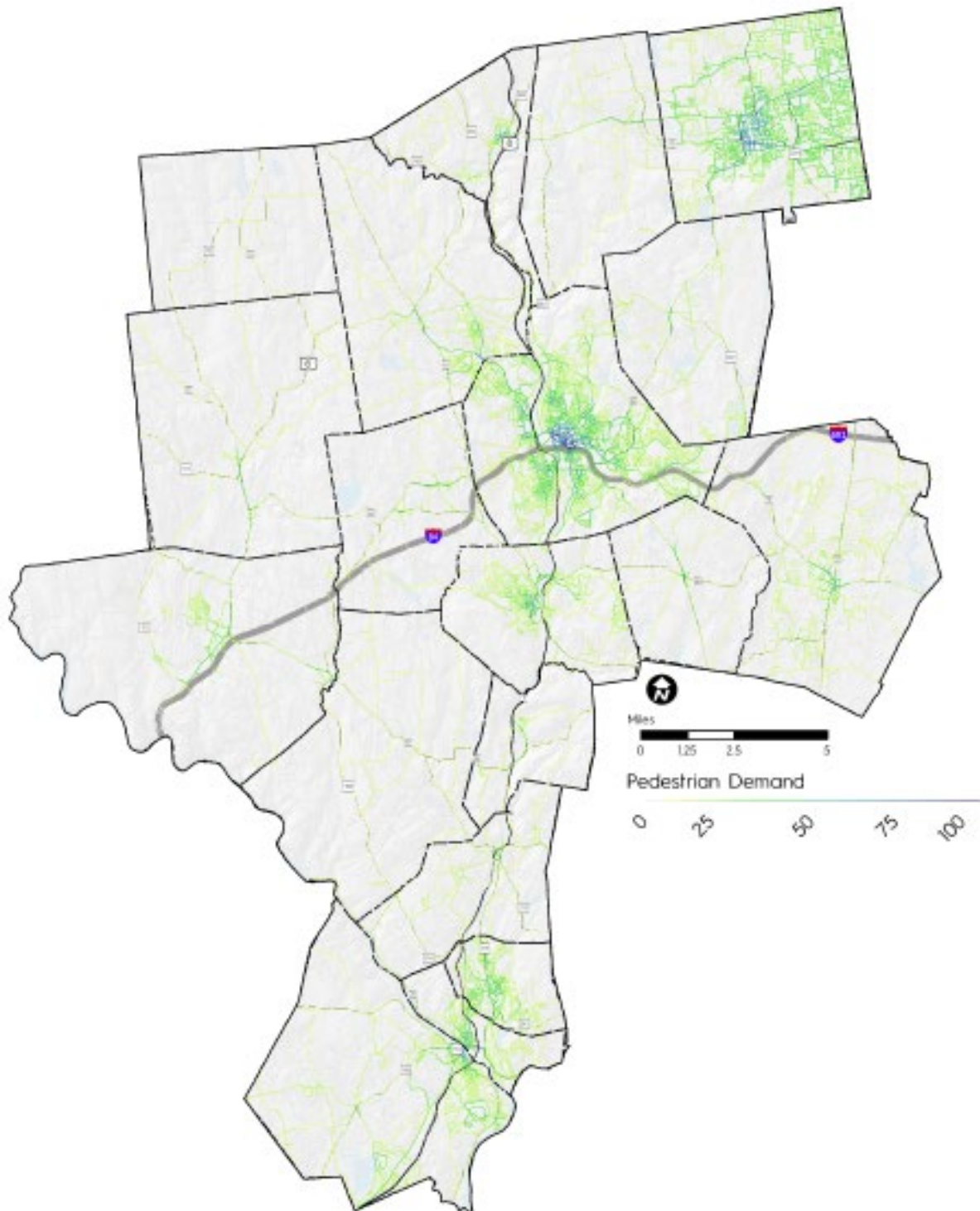
To determine pedestrian demand in the region and better understand which areas have the highest propensity for walking, the NVCOG used the methods adopted by the City of Portland, OR. Portland's approach developed *Pedestrian Potential* and *Pedestrian Deficiencies Indices* for identifying high pedestrian demand and safety-related barriers to walking. Under this framework, the NVCOG created two separate datasets: (1) a *Pedestrian Demand Index* to identify locations of high pedestrian demand or potential demand, and (2) a *Pedestrian Deficiencies Index* to identify locations with poor, incomplete, or unsafe pedestrian infrastructure or environments.

The *Pedestrian Demand Index* looks at various factors known to increase the likelihood of walking in order to identify roadways where there is a high demand for walking. The index will help NVCOG, municipal leaders, and local advocacy groups better understand where there are likely to be pedestrians currently, and where small improvements to the streetscape or the zoning code may increase the number of pedestrians.

Three factors are considered in the calculation of the *Pedestrian Demand Index*:

- Policy Factors: These relate to current state, municipal and regional policy that emphasizes pedestrian activity, such as local Plans of Conservation and Development.
- Proximity factors: These relate to areas where there are walkable destinations and infrastructure to support pedestrian activity.
- Environmental Factors: These relate to areas where existing land use densities are above a threshold to support pedestrian activity.

The NVCOG used its Geographic Information System (GIS) to map areas in the region relative to the above factors. The information was combined to create a regional map showing the *Pedestrian Demand Index*. The *Pedestrian Demand Index* indicates several high-priority pedestrian areas in the region, mostly in the historic downtown cores of NVCOG cities. Of particular note are the historic cores of Waterbury and Bristol, which score the highest and have multiple locations with a score of 100.



Map 1 Pedestrian Demand within NVCOG region

The complement to the *Pedestrian Demand Index* is the *Pedestrian Deficiencies Index*. This latter index looks at factors known to increase the danger of serious injury or death for pedestrians and is used to locate areas where there is a demonstrated need for safety improvements. The map combines areas with a high probability of people walking and a demonstrated need for safety improvements. The Pedestrian Deficiency Index is based on three factors that are considered primary dangers to pedestrians:

- **Speed Factors**: Travel speeds are depicted for all roads in the region, with higher travel speeds receiving higher negative scores.
- **Sidewalk Factors**: These relate to the availability and continuity of the sidewalk network, with areas with gaps in its sidewalk network receiving a higher negative score.
- **Safety Factors**: These factors are defined as proximity to pedestrian-related crashes.

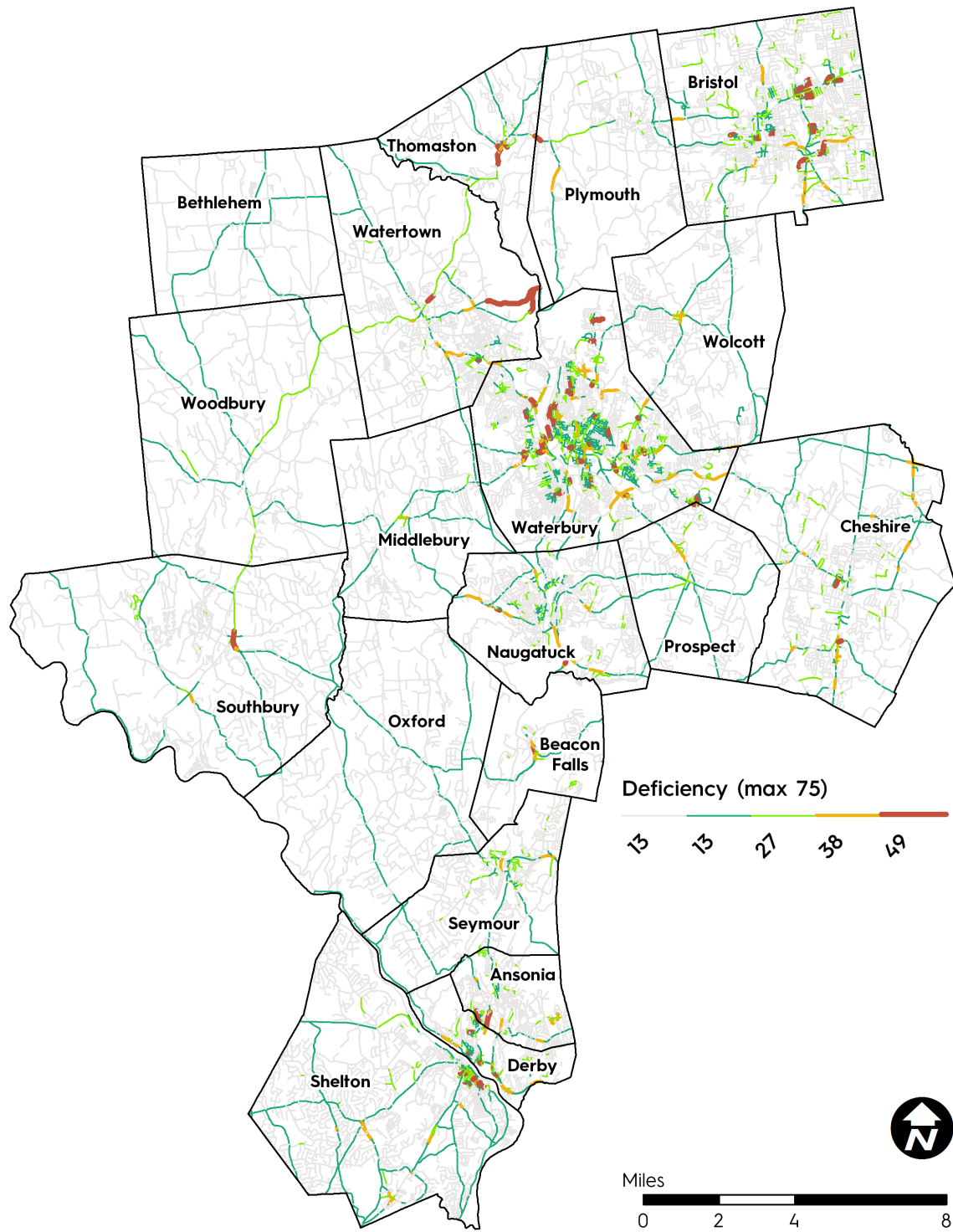
Unlike the *Pedestrian Demand Index*, the *Pedestrian Deficiencies Index* is more difficult to measure because of the difficulty in measuring the quality of the pedestrian environment. For example, a 5-foot sidewalk with a grass buffer may be safe in a suburban context but may be too small for safe pedestrian use on a downtown street. Other factors, such as signal timing, visibility, snow plowing practices, or the availability of marked crossings also contribute to pedestrian crashes but are difficult to measure. Despite some limitations, there are multiple locations with deficiencies scores that indicate a roadway of great danger to pedestrians.

Pedestrian Safety Improvements

Typical road design, with an emphasis on moving traffic, have made the street environment an intimidating place for pedestrians. They feel insecure walking along a high speed, multi-lane road and are reluctant to cross arterials even when crosswalks are provided. Well-designed pedestrian facilities can change the street setting and create a more walkable environment, where pedestrians feel safe and secure and adjacent traffic is not perceived as intimidating.

Pedestrian facilities are separated areas specifically for pedestrian use and are intended to provide a safe area for people to travel between destinations. The most common pedestrian facility is a sidewalk; and the characteristics that most ensure its usage are continuity and interconnectedness. A well designed sidewalk network is one that provides continuous paths with no gaps within the system where walkers want to go.

While sidewalks are the main thoroughfare for walkers, there are many other pedestrian features that enhance the safety and attractiveness of the area and encourage people to walk. These include:



Map 2 Pedestrian Deficiency within NVCOG region

- Pedestrian activated signals to provide protection while crossing. Count-down indicators provide reinforcement that the signal is working and lets walkers know how much time remains to their protection. Pedestrian signals need to be equipped with audible tones to aid persons with vision impairments
- Well-marked and visible crosswalks.
- Buffers between the street and the sidewalk.
- ADA compliant curb ramps.
- Signing.
- Curb extensions at intersections to reduce the walk distance across a street.
- Refuge islands.

Often the best approach to improving pedestrian access and safety is to expand the pedestrian network by building new sidewalks. In some areas, gaps in the sidewalk network exists force pedestrians to intrude onto the road to complete their trip. Addressing sidewalk gaps is typically done *ad hoc*, but a methodical approach of identifying their locations and sourcing funding for construction would allow for quicker improvements.

To function properly, sidewalks must be of an adequate width, have a smooth and stable surface, and provide adequate space for pedestrians to move freely and easily without impediments. Of critical importance is for the sidewalks to be well maintained. Cracks in the pavement or heaves in the surface creates trip hazards and can lead to falls and injuries. Ideally, sidewalks must meet ADA requirements and conform to PROWAG guidelines.

The design of a sidewalk depends on its location and function. In less urban and commercial areas, a four-foot wide sidewalk may be sufficient. However, where high pedestrian traffic is expected, a minimum width of five feet should be provided. Wider sidewalks should be installed in areas near schools, transit stops or other areas with high a concentration of pedestrians and mixed-use activities. A 4-to-6-foot buffer should be provided between the street and the sidewalk.

In downtown areas, the sidewalk area needs to consider adjacent buildings and other amenities that may be placed in the area. In addition to a five-foot pedestrian zone, an additional three feet space should be provided as a frontage zone along the building-side-walk edge. This zone provides space for the opening of doors without intruding into the pedestrian zone. On the street side, a two-to-four-foot zone should be reserved for tree plantings, street furniture, signposts, and other items. This zone provides separation between where people are walking and fixed objects.

Pedestrian signals are a critical safety device. These signals are connected to traffic control signals and alert pedestrians to when it is appropriate to cross a street. In conjunction with the

traffic control signal, the pedestrian signal provides either an exclusive crossing phase when all traffic is stopped or a concurrent phase. The latter situation allows pedestrians to cross while the opposing vehicle traffic has a green light and intersecting traffic is stopped by a red light. The pedestrian phase is timed to allow sufficient time for pedestrians to cross the street. Often the red phase is extended when the pedestrian signal is activated to ensure adequate crossing and clearance intervals. In areas where there is a heavy concentration of the elderly or children, more walk time should be provided. The installation of pedestrian signals must comply with the requirements and guidelines in the *Manual on Uniform Traffic Control Devices (MUTCD)*.

Marked crosswalks are an effective method for improving safety and reducing accidents. Crosswalks indicate the preferred locations for pedestrians to cross a street and provide warning to motorists to expect pedestrians. Typically, crosswalks are installed at intersections controlled by a traffic signal or stop sign. Mid-block locations are acceptable when warranted by high pedestrian activity. Advance stop lines, consisting of a series of white, triangular-shaped pavement markings should be installed in combination with a mid-block crosswalk. Material needs to be visible, non-slippery and not cause a tripping hazard. As part of a complete streets concept, a tactile material should be used, such as concrete pavers or stamped concrete. In either case, the markings must be well maintained to function properly. To better alert drivers of the presence of a pedestrian in a crosswalk or waiting to cross, the installation of Rectangular Rapid Flashing Beacons (RRFB) is warranted. These devices consist of high-intensity beacons located on top of pedestrian crossing warning signs. The flashing beacons are activated by pedestrians waiting to cross. Embedding warning lighting in mid-block crosswalks can also be used to enhance visibility and alert motorists of the presence of pedestrians, but RRFBs are a less complicated action to implement.

To address longer term needs, the entire streetscape environment may require enhancement. The concept consists of assessing the road environment to accommodate all users regardless of mode, age, and mobility ability. This concept is referred to as “Complete Streets” and is intended to transform a street environment from one designed only for motor vehicles to one that will accommodate a wide range of travelers. Typically, the conversion of a road into a “complete” street includes a number of actions. Often, where a road is excessively-wide, the width is reduced to provide fewer travel lanes, accommodate sidewalks, and add bicycle elements. Clearer lane markings, bus stops, traffic calming, or green infrastructure are also common elements. This road narrowing or “Road Diet” may be included as part of a resurfacing or rehabilitation project within existing curb lines. Other possible actions include neckdowns, which are smaller-scale projects where a roadway is modestly reduced in width as the roadway approaches an intersection, in order to provide shorter pedestrian crossings. These types of treatments include bump-outs, curb extensions and median barriers. Implementing pedestrian-related traffic calming projects help to reduce traffic speed and make an area more visible as a

pedestrian space. These actions include raised cross walks, raised intersections, and textured pavement.

Both road diets and neckdowns can be accomplished through interim striping, paint, planters, and flexible delineators in situations where the cost of moving curbs, drains, and other street infrastructure is prohibitive. These low-cost projects may be designed and executed in-house by municipalities in anticipation for more permanent improvements.

In the Naugatuck Valley planning region, a critical area of concern is pedestrian access to transit stops. Improving the bus stop environment and ensuring good access to bus stops serves to improve safety and accessibility for all bus riders. Examples of transit accessibility improvements include ADA-accessible shelters and bus stops; clear accessible pathways from popular destinations to transit locations; curb extensions, bus bays, and bus bulbs to improve boarding times and passenger visibility; and clearly marked crosswalks to transit stops.

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6.2 REGIONAL BICYCLE PLAN

In Connecticut, bicycles are considered a type of vehicle and can be ridden on all roads where they are legally permitted. Someone riding a bicycle must adhere to traffic laws as if they were a driving a motor vehicle. At the same time, motorists are required to share the road with bicyclists and provide at least three feet of space when passing a cyclist. The most common bicycle facility is a shared road and because of these responsibilities, all roads that are open to bicyclists should incorporate features that enhance safety and ride quality for bicyclists.

It is not necessary to specifically designate roads as bicycle routes or provide bicycle lanes. But roadways should be maintained and upgraded to ensure riding a bicycle on them is safe and convenient. This lets bicyclists decide which road they want to ride.

What accommodations should be made for bicyclists depends on the type of road and traffic characteristics. Bicyclists can easily use low-volume residential streets because there are few motor vehicles and may not require any separation. This type of road is a shared space used by vehicles, bicyclists, and pedestrians. But for roads that are busy with a lot of fast-moving traffic, special features are necessary and greater separation is required to accommodate bicyclists on higher-volume, higher-speed arterials.

Bicyclists fall into one of three categories ranging from young children to the **advanced bicyclist**. In between are **basic bicyclists** who represent the average adult rider. Because of their abilities, **advanced bicyclists** are more easily accommodated on existing roads. Advanced cyclists generally can ride within the road's right-of-way and under most traffic conditions. They are confident riding in traffic and do not feel in danger or perceive a safety hazard. This group of riders prefers the freedom to decide how to complete their bicycle trip, as well as the convenience and speed of using higher class roads. Picking a route is more a



Figure 2 Bike facilities need to accommodate a variety of users, from children to basic adult bicyclists to advanced riders. Source: www.Pedbikeimages.org/ Dan Burden

function of where the cyclist is going and less dependent on road characteristics. Their trips also tend to be much longer than the **basic bicyclist**.

Because only about 5% of the bicycling public is considered advanced, special attention must be given to the needs of **basic bicyclists** and children. The design treatments that enhance both groups' experience is similar. Bicyclists in these groups are generally less confident of their ability to ride in traffic and feel unsafe riding on higher volume and higher speed roads. They prefer low volume, low speed roads or designated bicycle facilities that are separated from motor vehicles. A trip for a basic bicyclist tends to be between two and five miles. Children typically only ride in their neighborhood and tend not to venture beyond familiar areas. These riders are best served by neighborhood streets and designated bicycle facilities.

The design approach needs to reflect what type of rider the facility is designed for, the type of facility and what are needed to make the roads more friendly to bicyclists. The minimum operating space of a bicyclist is assumed to be about 40 inches and the minimum width for a bicycle facility is four feet. The vertical clearance from any overhead obstructions should be at least 100 inches, which is a little more than eight feet.

The need to implement specific design treatments depends on the characteristics of the adjacent roadway. A high volume of traffic and fast operating speeds mean cyclists face greater potential risk from passing motorists and create an uncomfortable feeling. Generally, the higher the traffic volume and speed, the greater need there is to implement more extensive design treatments to accommodate **basic bicyclists**. Children and young bicyclists should avoid these roads.

There are three types of bicycle facilities: shared roadway; bicycle lanes and shared-use paths. Shared roadway facilities and bicycle lanes are located on-the-road and share space with motorized vehicles or are provided an exclusive space along the edge of the road. Shared use paths are specialized, off-road facilities on a separate right-of-way that accommodate multiple users.

- **Shared Roadway Facilities**: These provide the minimum level of route designation and separation from motorized vehicles. Bicyclists share the road with motorists and go in the same direction of traffic. No special treatments are made at intersections or where there is on-street parking. These facilities are either unmarked or signed with a standard bicycle route sign along both sides of the road. Recently, it has become common to mark shared roadways where there is insufficient shoulder width with a shared lane marking known as a Sharrow. This marking helps bicyclists know where they should ride on the road and alerts motorists of that cyclists may be using the road.
- **Bicycle Lanes**: A bike lane is a portion of the road specifically designated for cyclists that is marked with specially designed stripes painted on the roadway and signs. They are

always one-way facilities and carry bicycles in the same direction as adjacent traffic lanes. On two-way roads, there are often bike lanes on both sides of the street. Bike lanes are more acceptable to basic cyclists because they provide a more predictable movement for bicycles and motorized vehicles and a greater degree of separation between the two. The minimum width of a bicycle lane is four feet, but if guard rails or curbing are present, the width needs to be at least five feet. Additional width is desirable in urban areas. Where on-street parking is designated, the bike lane should be located between the travel lane and the parking spaces. Parking is prohibited in a designated bicycle lane, so a clear designation for each use must be installed. At intersections, the striping and signage need to encourage positioning bicyclists in the proper lane whether to go straight, turn left or turn right.

- **Shared-use Path:** These facilities provide the most service for bicyclists and require special design considerations. They are called shared-use paths because other users include walkers, in-line skaters, people in wheelchairs, and people with small children in strollers. A shared use path is physically separated from the road and follows an independent right-of-way. Two-way flow of people using paths is provided and one-way sections are typically not allowed. Short one-way sections may be acceptable if they are clearly designated, strictly enforced, and limited to areas where it is necessary. These paths provide a safe place where novice riders and children are separated from motorized vehicles. But the mix and volume of users often creates a challenging environment with the potential for conflict. Because of this, the design of a shared-use path needs special attention. User rules also need to be established and enforced. Additionally, speed limits for cyclists may be needed to ensure that they are a good mix with walkers.

Sidewalks are not considered acceptable for use by most bicyclists and designating a sidewalk as a bicycle facility is not a satisfactory policy. Sidewalks are designed for pedestrians and cannot safely accommodate the higher speeds of bicycles. Mingling pedestrians and bicyclists can result in conflicts. For example, a sudden change in direction by a pedestrian could leave a cyclist with little time to react and pedestrians are sometimes uncertain where on-coming bicyclists are going. Additionally, bicyclists on sidewalks are not readily visible to motorists and when they enter the road-way right-of-way they will be approaching traffic from an unexpected direction. Fixed objects located within or nearby sidewalks like utility poles, signposts, and newspaper vending machine are hazardous for bicyclists. Designating bicycle use is acceptable only for short sections and in exceptional situations where no alternatives are feasible.

Despite these inherent conflicts, state law does not specifically prohibit bicyclists from riding on sidewalks. Instead, laws require that bicyclists yield to pedestrians on a sidewalk and emit an audible signal when overtaking them. But municipalities have the right to enact ordinances to

prohibit the operation of bicycles on sidewalks. Many communities have done so, but the restriction is rarely enforced.

The regional bicycle plan for the Naugatuck Valley planning will be developed as part of and incorporated into a comprehensive plan for active transportation. The plan will identify actions that would make cycling safer in the region. The suggestions fall into four categories:

- **Planning**: These actions consist of endorsing and adopting regulations, ordinances, and policies by member communities to enhance the opportunities for implementing bicycle and pedestrian projects. Specific actions include:
 - Update planning and zoning regulations to encourage the accommodation of bicyclists in new developments.
 - Create and adopt a vision and goals statement that supports bicycling and include in municipal Plans of Conservation and Development.
 - Adopt bicycle facility design guidelines.
- **Infrastructure**: Improve and enhance the physical infrastructure that cyclists use. This includes designated bicycle routes, bicycle lanes and installing signs and pavement markings that warn motorists to the presence of cyclists. Specific actions include:
 - Include bicycle elements, such as bicycle pavement markings, signs, widened shoulder width, and use of a smooth, compacted asphalt material for road surfaces in all road projects.
 - Designate roads that are less than 30-feet wide as “Shared Road” bicycle routes and mark them with sharrows and share-the-road signs.
 - Designate a network of bicycle routes to provide intra-town and inter-town connections. Those routes should use roads with shoulders that are at least four feet wide.
 - Install bicycle racks at strategic locations in the region, including commuter rail stations.
 - Implement a program for on-going maintenance and repair of bicycle facilities.
- **Education**: Take these actions to help inform everyone about the rules of the road for bicycling and the laws that motorists and bicyclists need to follow. Specific actions include:
 - Develop an information and education campaign to communicate the rules of the road and the importance of following all traffic laws.
 - Develop promotional campaigns and events that encourage cycling and teach other users how they can safely share roads with cyclists.

- Enforcement: Increased enforcement of traffic laws can encourage motorists to be aware of the street environment and pay attention to people traveling by bicycle. Enforcing traffic laws is a critical element of enhancing bicycle safety. Specific actions include:
 - Monitor speeds in areas that have been identified as the most severe and where critical problems occur. Effectively target driver behaviors that lead to collisions with cyclists.
 - Ensure proper design and construction of bicycle facilities.
 - Develop an information and education campaign to communicate the rules of the road and the importance of following all traffic laws.

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6.3 MULTIUSE TRAIL SYSTEM

The Naugatuck Valley's network of multi-use trails has become an important part of the area's transportation network. Multiuse trails, also known as shared-use paths, are paved, or compacted off-road facilities that are separated from motor vehicle traffic and designed to accommodate pedestrians, bicyclists, joggers, skaters, and others. They should be accessible to users of all abilities where practicable. Multiuse trails are often viewed as recreational facilities, but with the right design and location, they act as non-motorized expressways for people who



Map 3 Multiuse Trail map for NVCOG region

do not have or would rather not use a motor vehicle. Multiuse trails, in conjunction with a well-connected network of sidewalks and on-road bicycle routes, can provide safe corridors that link residential areas, commercial areas, mass transit and other destinations.

In the Naugatuck Valley planning region, a comprehensive plan for multi-use trails would create a continuous, connected route that lets non-motorized users travel between city and town centers and other destinations. In the center of the region, the Naugatuck River Greenway will serve as the north-south spine, with east-west connections to the Larkin State Bridle Trail, the Middlebury Greenway, the Steele Brook Greenway, the Shelton Riverwalk, and the Sue Grossman Trail. On the east side of the region, the Farmington Canal Heritage Trail traverses Cheshire north-to-south, and is close to connecting Northampton, Massachusetts, to New Haven, Connecticut. The goal is to connect trails, sidewalk networks, and on-road bicycle facilities so that pedestrians and bicyclists have full access to the region using safe, off-road paths.

Naugatuck River Greenway Trail

The Naugatuck River Greenway (NRG) Trail will follow the Naugatuck River for approximately 44 miles and link 11 municipalities. The trail will start in Torrington and follow the river south through Litchfield, Harwinton, Thomaston, Watertown, Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia, and Derby. The NRG will help reclaim the Naugatuck River for recreation, provide an alternate mode of transportation through the region, support tourism and economic development, and improve Valley residents' quality of life. As of 2022, there are eight sections of NRG Trail open in Torrington, Watertown, Waterbury, Naugatuck, Beacon Falls, Seymour, Ansonia, and Derby. This is approximately 13% of the total planned length of the trail. More sections in various phases of design with plans for construction in the coming years.

The NRG Trail will help communities reclaim the river as a driver of the local economy by drawing tourists to the Valley. Sightseers, cyclists, people using micro-mobility devices, and other recreationalists will provide opportunities for local businesses. At the same time, the NRG Trail will offer area residents active transportation options close to home. Convenient access to the trail will encourage residents to be physically active and keep them connected with nature. Since many of the communities along the planned route are close to each other, the trail will provide a safe and convenient non-motorized alternative to a personal motor vehicle or public transit. These benefits are already evident on the open sections of the NRG, which has become a popular destination and meeting place as well as a popular means of transportation. These benefits will increase as more trail sections are built.

The CT Trail Census (<https://cttrailcensus.uconn.edu/>), a collaborative statewide volunteer data collection program that NVCOG is supporting, conducts counts of how many people use the NRG Trail. In 2021, the Census counted more than 200,000 trips in Derby near the Division Street trailhead, making it the busiest NRG section and the second busiest multiuse trail in the state.

Naugatuck River Greenway, Naugatuck



Design and construction of the NRG Trail happens at the local level, but with oversight and guidance from the NRG Steering Committee (NRGSC). The NRGSC is a volunteer group with members from the eleven NRG host communities, along with regional, state, and federal representatives and stakeholders. The NVCOG hosts and administers the NRGSC.

Since much of the planning and construction is at the local level, the materials, feel and look of the trail may vary from town-to-town based on local needs and desires. Regardless of these differences, it is important to emphasize that the NRG is a single entity that will traverse 11 communities, and NVCOG is working with communities to implement trail standards during design and construction.

The completed trail will have a familiar and consistent system of signage and wayfinding, so visitors will know that they are on a section of the NRG no matter which town they are in. The NRGSC recognized that a well designed and implemented brand and signage program was critical to the NRG. With support and assistance from the NRGSC, NVCOG developed the *“Naugatuck River Greenway Uniform Signage and Wayfinding Design Manual”*, which includes templates for trail head, route designation, directional, and informational signs consistent with MUTCD standards and guidelines.

Active Construction Projects:

- Derby-Shelton Bridge Improvements (DERB-4): The project includes bicycle and pedestrian improvements and connects the NRG to the Shelton Riverwalk. Construction is underway and expected to continue through the 2023 construction season.
- Thomaston (THOM-4): This section of trail will connect Old Waterbury Road around the WPCA facility to a new pedestrian bridge over Branch Brook. Once design is complete, the project will be funded by the Local Transportation Capital Improvement Program (LOTICIP), a state funding program available to towns and cities.
- Torrington (Portion of TORR-3): The City will connect two open sections of trail along Scoville Street using local funds.
- Waterbury (WTBY-3): Phase II of the Waterbury Active Transportation and Economic Resurgence (WATER) Project includes a 2.3-mile extension of the NRG from the intersection of Eagle Street and South Main Street to West Main Street. This project is funded by a USDOT Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant.

In 2021, the NRGSC endorsed priorities for future construction. Regional NRG priorities are trail sections that have demonstrable local support, and

- connect two complete or soon to be complete sections of trail, or
- connect a complete or soon to be complete section of trail with an important destination or population center, or
- require little investment or effort to complete.

Regional Priorities:

- Torrington: TORR-2 (East Main Street/ Franklin to East Albert Street)
- Harwinton: LITC/HARW-3 (Campville Hill Road to Wildcat Hill Road)
- Watertown: WTTN-1 (Branch Brook Road to Frost Bridge Road)
- Naugatuck: NAUG-1 (Naugatuck River Access Park to Pulaski Bridge)
- Beacon Falls: BEAC-3 (Route 42 to Toby's Pond)
- Seymour/ Beacon Falls: SEYM-1/BEAC-5 (Toby's Pond to Bank Street)

Larkin State Bridle Trail

The Larkin State Bridle Trail (LSBT) is a Connecticut State Park Trail that follows the historic route of the New York and New England Railroad for 10 miles from Naugatuck through Middlebury and Oxford to Southbury. It is a compact stone dust trail originally designated as a bridle path. While it remains popular with equestrians, many bicyclists, walkers, and joggers use it too. The CT Trail Census estimated 33,359 trips on the Larkin Trail in Oxford in 2021. As part of a LOTICIP-funded reconstruction of Hawley Road, which crosses the Larkin Trail in Oxford, improved parking and trail access is under construction. This will provide easier access to the trail for residents and visitors. At its terminus at Route 63 in Naugatuck, the LSBT is within a half-mile of Waterbury's Phase 1 NRG Trail at Platts Mill Road. Connecting these two points is a regional priority.

Action:

1. Conduct a preliminary engineering study to identify the preferred alignment for a multi-use trail to connect the LSBT to the NRG Trail.



Figure 3 - Larkin State Bridle Trail

Middlebury Greenway Trail

The Middlebury Greenway follows the historic trolley bed that once connected Waterbury to Woodbury. Generally paralleling Route 64, the trail currently runs 4.5 miles from the intersection of Route 63 and Woodside Avenue near the Waterbury city line, west to the Woodbury town line near Lake Quassapaug. The trail is paved and 10 feet wide. It is popular with bicyclists, joggers, and walkers. The CT Trail Census recorded 72,066 trips on the Middlebury Greenway in 2021.

There are long-term plans to extend the Middlebury Greenway in both directions. To the west, the town of Woodbury recently purchased a decommissioned reservoir and land surrounding it that will be preserved as open space. The property is called the Woodbury Trolley Bed Preserve and has a substantial section of the old trolley bed that is passable as a trail. Woodbury and the NVCOG have discussed connecting downtown Woodbury through the Trolley Bed Preserve to the Middlebury Greenway. A preliminary routing feasibility study and high-level cost estimation have been completed. Completing a section of the corridor between the Preserve and the terminus of the Middlebury Greenway would be challenging because Route 64 has subsumed the trolley bed. Despite the challenges, both towns have expressed interest in making the connection.

At the east end of the Middlebury Greenway, there are conceptual plans to extend the trail along Route 63, providing access to Post University and the Hop Brook Lake Recreation Area. The extension would be within the state right-of-way of Route 63 and proposes a road diet on Route 63.

Action:

1. Conduct a preliminary engineering study to determine the feasibility of connecting the Woodbury Trolley Bed Preserve to the Middlebury Greenway and identify the preferred alignment.
2. Construct an extension of the Middlebury Greenway from its terminus at Woodside Avenue to the Hop Brook Lake Recreation Area, with a spur connection to Post University.

Oxford Route 67

Oxford does not have a traditionally walkable downtown. Route 67, the town's Main Street, does not have accommodations for pedestrians, and it has a high volume of fast-moving traffic. Because of this, the road is unsafe for bicyclists and pedestrians. To improve non-motorized access in the corridor, the Town of Oxford and NVCOG initiated the Route 67 Alternative Transportation Study, with the goal of connecting the Oxford municipal center to Seymour in the south, including the NRG Trail and Seymour train station, and to the Larkin Trail to the north through a series of sidewalks, multiuse trails, and other non-motorized and traffic calming accommodations. The Oxford Board of Selectmen approved the final study report in 2022. This will help the Town plan, prioritize, and fund future improvements. The final study report, including recommended routing and facility types, can be found on the NVCOG website at <https://nvcogct.gov/project/current-projects/transportation-planning-studies/oxfordroute67/>.

Bristol Trail Study

In 2022, the NVCOG, along with the Capital Region Council of Governments (CRCOG), City of Bristol, and Town of Southington, completed a study of the Connecticut Route 229 corridor, which travels north-south between Route 6 in Bristol and Interstate 84 in Southington. The study recommended traffic calming and safety enhancements, as well as the construction of a complete and continuous cycle track along the route. These recommendations will provide non-motorized access options to the schools, parks, shopping, and services along the corridor, and to ESPN, one of the region's largest employers.

Aiming to build off the Route 229 Corridor Study, the City of Bristol and NVCOG have begun a study of routing options for a multi-use trail in Bristol. The goal is to propose a route that provides a safe, continuous connection between Rockwell Park in the west to downtown Bristol, continuing east to Route 229. In the future, NVCOG will seek additional funding to design a route from Route 229 to the Farmington Canal Heritage Trail in Plainville.

Action:

1. Identify funding for final design and construction of the Route 229 project, focused on pedestrian improvements and a multi-use side path.
2. Finalize routing and preliminary concepts for a downtown multi-use trail to connect Rockwell Park, the downtown, and the Route 229 path.

3. Initiate study for a route from Route 229 east to the Farmington Canal Heritage Trail in Plainville.

Steele Brook Greenway Trail

The Steele Brook Greenway (SBG) Trail is a 4.5-mile trail in Watertown, mostly following an old rail bed that once carried freight and passengers to Watertown from Waterbury. In 2021, Watertown received federal funding under the Transportation Alternatives Set Aside Program to connect two existing sections of trail and construct a new pedestrian bridge over Steele Brook near French Street. The project has not started yet. Long term plans call for the trail to continue into downtown Oakville to the south and follow the rail bed into Waterbury where it could connect to the NRG Trail. The town is also working to connect the SBG trail to the recently completed NRG Trail section at the new CT Transit bus maintenance facility via sidewalks and on-road accommodations on Echo Lake Road.

Action:

1. Complete sections of the Steele Brook Greenway Trail and connect the SBG to the NRG Trail.

Shelton River Walk

The Shelton River Walk is a paved trail along the Housatonic River with two open sections, one adjacent to Veterans Memorial Park and another behind the residential buildings on Canal Street. There are plans to connect the two sections and expand the trail to the north as new development occurs on the river side of Canal Street. The renovation of the Derby-Shelton Bridge will create a direct connection to the Shelton River Walk and connect downtown Shelton to downtown Derby. Additional efforts by the City to establish a park at the historic canal lock site will provide a terminus to the trail approximately 1 mile north of the Derby-Shelton Bridge. This facility, along with proposed growth within Downtown Shelton, will enhance the need for a direct and safe connection between the Shelton River Walk and the Derby/Shelton Train Station.

Action:

1. Complete connection between Shelton River Walk and Derby Greenway, providing access to the Derby/Shelton Train Station.
2. Complete improvements to Canal Street and park around the remaining lock at the end of the canal system.

Farmington Canal Heritage Trail

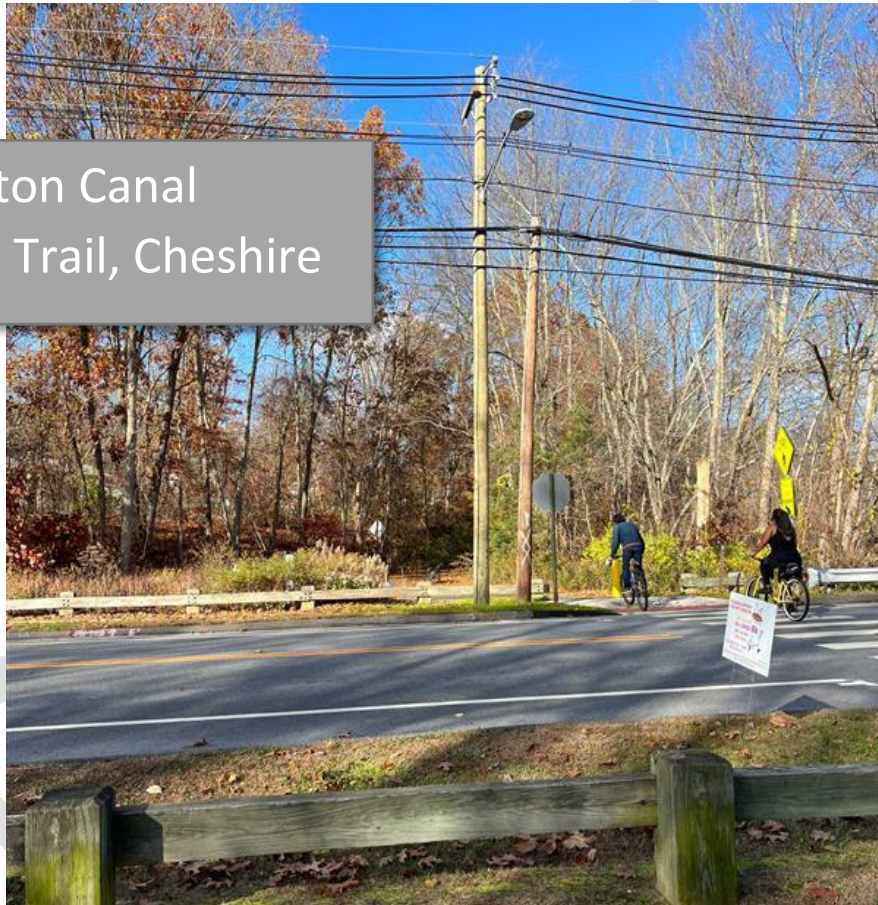
The Farmington Canal Heritage Trail (FCHT) is an 84-mile multiuse trail from New Haven, Connecticut, to Northampton, Massachusetts, that follows the route of the historic Farmington Canal and the Canal Railroad. The FCHT is part of the East Coast Greenway (ECG), a bicycle and pedestrian route that stretches from Maine to Florida. As of 2019, the 7.1-mile section of trail in Cheshire was complete. Cheshire is working to improve pedestrian and bicycle access to the trail

from residential and commercial areas, especially around the Jarvis Street trailhead. There are plans to connect the FCHT in Cheshire to the Quinnipiac River Gorge Trail in Meriden and potentially to the Airline Trail via Middletown. Coordination and discussions with the Lower Connecticut River Council of Governments (RiverCOG) about these opportunities are underway.

Action:

1. Implement pedestrian and bicyclist access and safety enhancements along the FCHT.
2. Identify preferred routes to connect the FCHT to the NRG.

Farmington Canal Heritage Trail, Cheshire



The Sue Grossman Still River Greenway Trail

The Sue Grossman Trail is not in the Naugatuck Valley planning region but plans for it would enhance the trail network in the area. There are plans to connect the Sue Grossman Trail to the NRG trail in Torrington, and it will eventually connect to the village of Winsted in Winchester, which would extend the NRG's reach. About three miles of the paved trail are complete between Harris Drive and Lanson Drive in Torrington. The City has funding to design the connections into Torrington and construct the already designed section into Winsted. This extension will provide additional natural resource and recreation connections to residents of the Naugatuck Valley like Highland Lake in Winchester, which is a popular destination in the summer.