



PEQUABUCK RIVER TRAIL STUDY FINAL REPORT



**JULY
2023**



Pequabuck River Trail Study

Prepared by: Naugatuck Valley Council of Governments

Prepared for: City of Bristol, CT

Date: July 5, 2023

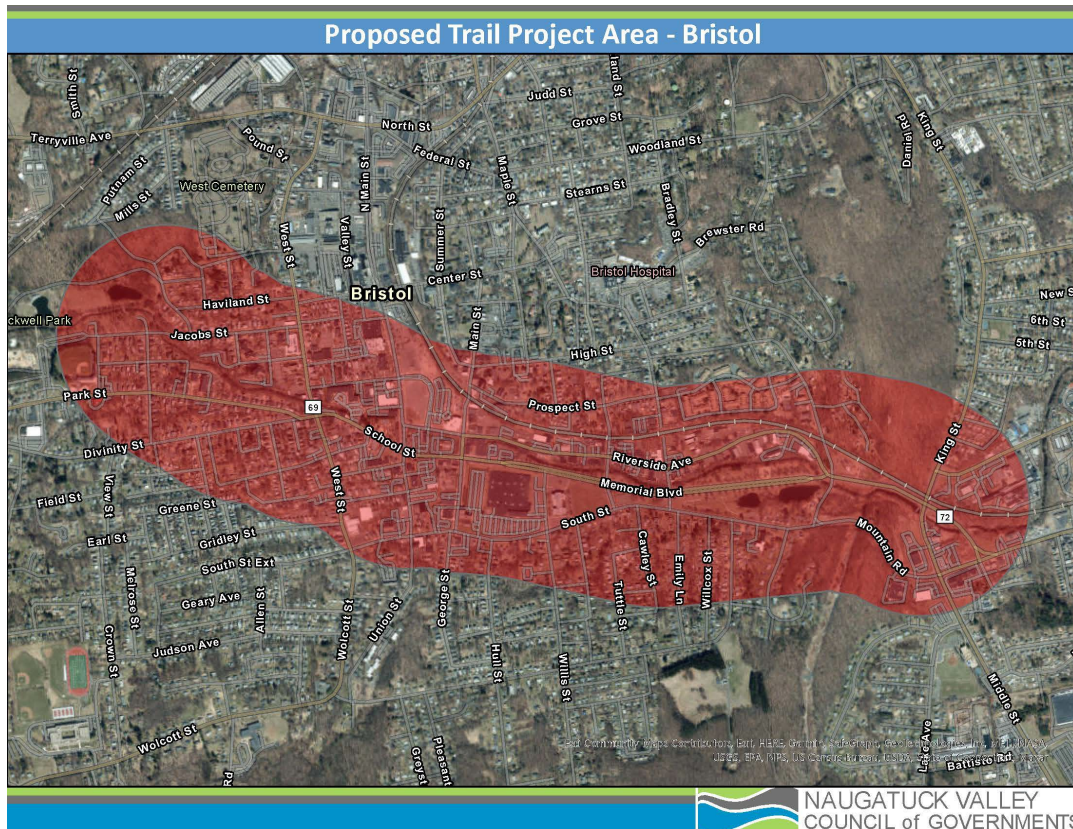
Abstract

At the request of the City of Bristol, the NVCOG has developed conceptual routing options for a multi-use trail designed to connect the West End to Downtown, Route 229 and the proposed north-south multi-use path proposed there, and ultimately east to a meeting point with the Farmington Canal Heritage Greenway Trail in Plainville. Through a comprehensive public engagement strategy and in close collaboration with City stakeholders, the NVCOG has identified a preferred alternative for these phases of the study, including access to the Pequabuck River, active transportation connections to the many projects ongoing downtown, and east to a pocket park between Riverside Avenue and the River.

Introduction

In support of the City of Bristol's goals to enhance pedestrian and bicycle access to Downtown, and in conjunction with the completed Route 229 study, the Naugatuck Valley Council of Governments and the City of Bristol initiated the Pequabuck River Trail Study in late 2022. The Study aimed to provide routing options for a safe and continuous east-west active transportation corridor between Downtown Bristol and the West End neighborhood, tentatively named the Pequabuck River Trail. The Study began in January 2023 with a final report completed at the end of June 2023.

Study Area



The above map delineates the study area of the Pequabuck River Trail project. The first segment of the project area is between Rockwell Park and continues eastward to Brackett Park. The second segment of the project area connects Brackett Park to Route 229 via Memorial Boulevard. A future study to route Phase III of the trail will provide routing options for a connection between Route 229 and the planned section of the Farmington Canal Heritage Trail in Plainville, connecting the Pequabuck River Trail to the region's larger multiuse trail network.

The proposed trail will travel along or nearby the existing roadway network, including Jacobs Street, a local road; CT Route 72, a state-owned principal arterial (state highway); and Memorial Boulevard, a minor arterial. In addition, the trail will intersect with CT Route 69, a state-owned principal arterial; North Main Street, a major collector; and Main Street, a local road.

Background

Bristol's West End is a disadvantaged community, located within USDOT-identified Justice40 census tracts. As an environmental justice community, the West End has suffered from decades of disinvestment and a lack of access to economic opportunity for residents. The West End contains two parks, Rockwell Park and Brackett Park, which are seen as neighborhood recreational assets. Although the parks are less than a mile apart, there is currently no active transportation corridor connecting the two, nor is there a continuous active transportation corridor that connects the West End to the various economic, cultural, and recreational activities in downtown Bristol. This is increasingly important, given the City's various downtown revitalization projects, such as the City Hall renovation, municipal parking garage construction, and several planned mixed-use developments.

Much of the existing non-motorized infrastructure is in a state of poor repair. In some areas there are cracked sidewalks, eroded curbing, faded crosswalks, and broken pedestrian signals. Additionally, both Rockwell Park and Brackett Park also interface directly with the Pequabuck River, one of Bristol's most prominent natural features, but public access for recreation is nearly non-existent.

Improving bicyclist and pedestrian circulation and mobility was identified as high-level goal by the City of Bristol in its 2015 [Plan of Conservation and Development](#). With the Memorial Boulevard reconstruction project, the City reallocated space toward non-motorized needs, constructing painted bike lanes on each side of the boulevard with an interest in extending these bike lanes further West in the future. In 2022, in collaboration with the CTDOT, Federal Highway Administration, the City of Bristol, and the Town of Southington, the NVCOG engaged a multidisciplinary team to conduct a [corridor study](#) along CT Route 229 between Interstate 84 and US Route 6. The study provided a plan and recommendations for a multi-use side path, intending to improve pedestrian, bicycle, and transit-user accessibility while addressing safety and traffic flow concerns. The north/south active transportation corridor recommended by the Route 229 study will provide non-motorized access to destinations such as Bristol Eastern High School, Page Park, ESPN, and various shopping centers. The study also recommended a pocket park near the intersection of Route 72 and Route 229.

With plans for a growing active transportation network in Bristol, the City partnered with the NVCOG to study options for an east-west active transportation corridor that would connect the West End neighborhood to Downtown. This connection was identified as a long-term action by the City in the [2008 Plan for the West End Neighborhood](#) and [CTDOT's 2017 Road Safety Audit](#) of Route 72. Additionally, this corridor would be integrated with the larger active transportation network, connecting to the route identified in the Route 229 Corridor Study as well as Memorial Boulevard's new bike lanes. A preliminary outline proposed that the trail would travel along the river, connecting Rockwell Park to Brackett Park, and continue eastward to Memorial Boulevard and Route 229.

It is important to consider the Pequabuck River Trail project's context within the larger vision of planned and current active transportation improvements in Bristol. For example, Route 229 is not currently an essential destination for non-motorized users in the short-term, but it will become an important future connection with the planned north/south trail network proposed in the Route 229 study. This connection will provide trail users with access to an even larger selection of recreational, cultural, and economic opportunities. The connection to Route 229 will also be important for Phase III of the trail, which will continue east to the Farmington Canal Heritage Trail. In addition, the pocket park proposed in

the Route 229 study will add a recreational destination and serve as an opportunity for the City to engage in placemaking through signage and wayfinding.

There are several CTDOT projects, either in construction or planned, in this corridor, both of which will be beneficial for routing the proposed trail project. The first project involves infrastructure improvements at the intersection of Route 69 (West Street) and Route 72 (School Street), which is currently under construction. The 69/72 project will improve the geometry of the 69/72 intersection, turning it into a conventional four-way intersection, as well as enhance sidewalks and crosswalks to improve pedestrian connectivity. This project will allow a smoother transition through the intersection for both motorized and non-motorized users.

The second project is the realignment of Route 72 (Riverside Avenue) near North Main Street, which is still in the early stages of planning. While an official alignment has not yet been selected for this project, the preliminary alternatives provided by CTDOT will convert School Street into a local road or eliminate sections of it altogether. As a local road, the City will not have to acquire encroachment permits for any work that is to take place on School Street. Another possible implication is the significant reduction (or elimination) of traffic south of Brackett Park, which will serve to alleviate non-motorized safety concerns. Other improvements on Riverside Avenue include streetscaping and pedestrian improvements through the Community Investment Fund, and the rehabilitation of the Sessions Building, a brownfield site that will be converted into housing.

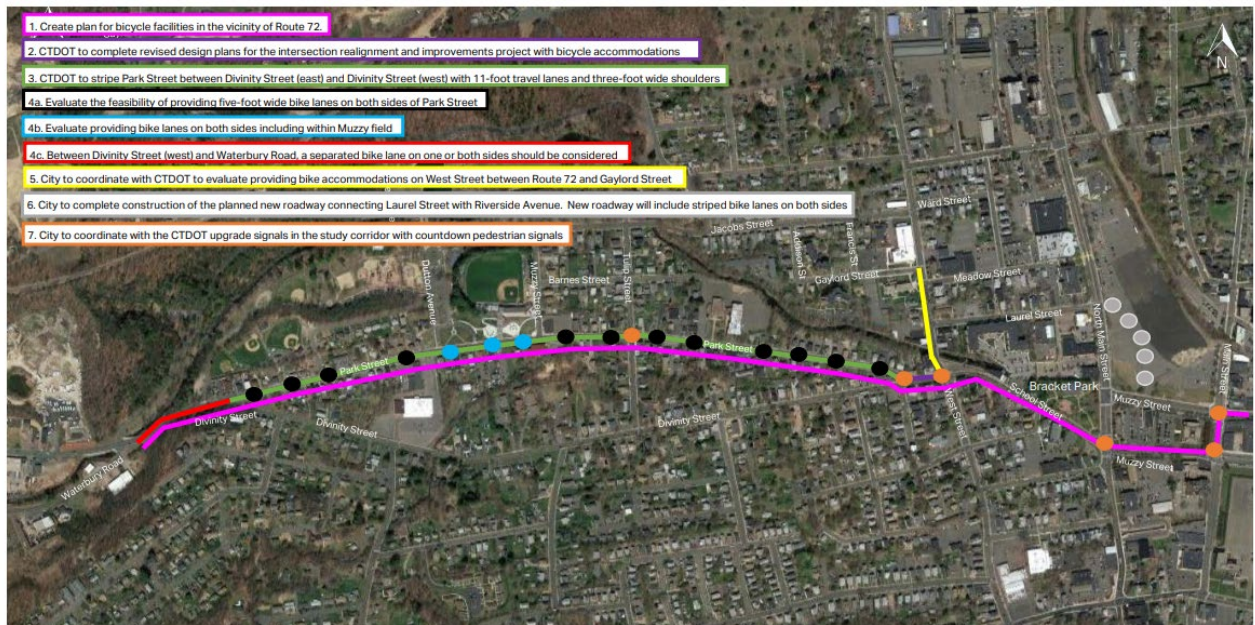


Figure 25. Medium Term Recommendations

Figure 1 Recommendations from Bristol's Road Safety Audit, 2017



Figure 2 CTDOT Route 72 Realignment Alternative A - Limited Park Impacts



Figure 3 CTDOT Route 72 Realignment Alternative B - Straight Alignment



Figure 4 CTDOT Route 72 Realignment Alternative C - Minimized Impacts to Park and Private Property

Data

In order to select the most appropriate route, NVCOG staff analyzed current traffic conditions of any roadways that would potentially be impacted by the trail project. Using data from StreetLight, an on-demand mobility analytics platform that uses cell phone data, staff analyzed Average Annual Daily Traffic (AADT) from 2019 to 2021 on Jacobs Street, Park Street, Divinity Street, School Street, and Memorial Boulevard:

StreetLight Data is an on-demand mobility analytics platform that uses cell phone data to collect transportation data, including traffic volumes, speeds, origin/destination locations, and more.

Location	Average Annual Daily Traffic (AADT)
Jacobs Street	5,535
Park Street	10,691
Divinity Street	15,475
School Street	12,513
Memorial Boulevard	5,535
West Street	9,285
North Main Street/Church Street	6,656
Main Street	4,140

Based on StreetLight data, the section of roadway with the highest amount of traffic is the section of Route 72 south of Brackett Park (Divinity Street and School Street). Although the relatively high traffic counts, in addition to the rather narrow width of this section of roadway, present concerns for a trail facility, the CTDOT’s Route 72 realignment project will reroute traffic north of Brackett Park to Riverside Avenue, alleviating these concerns.

NVCOG staff also used Streetlight to collect average weekday speeds for the same roadways between 2019 and 2021:

Location	Average Weekday Speed
Jacobs Street	19 MPH
Park Street	24.5 MPH
Divinity Street	23 MPH
School Street	23.5 MPH
Memorial Boulevard	24 MPH
West Street	18 MPH
North Main Street/Church Street	18.5 MPH
Main Street	19 MPH

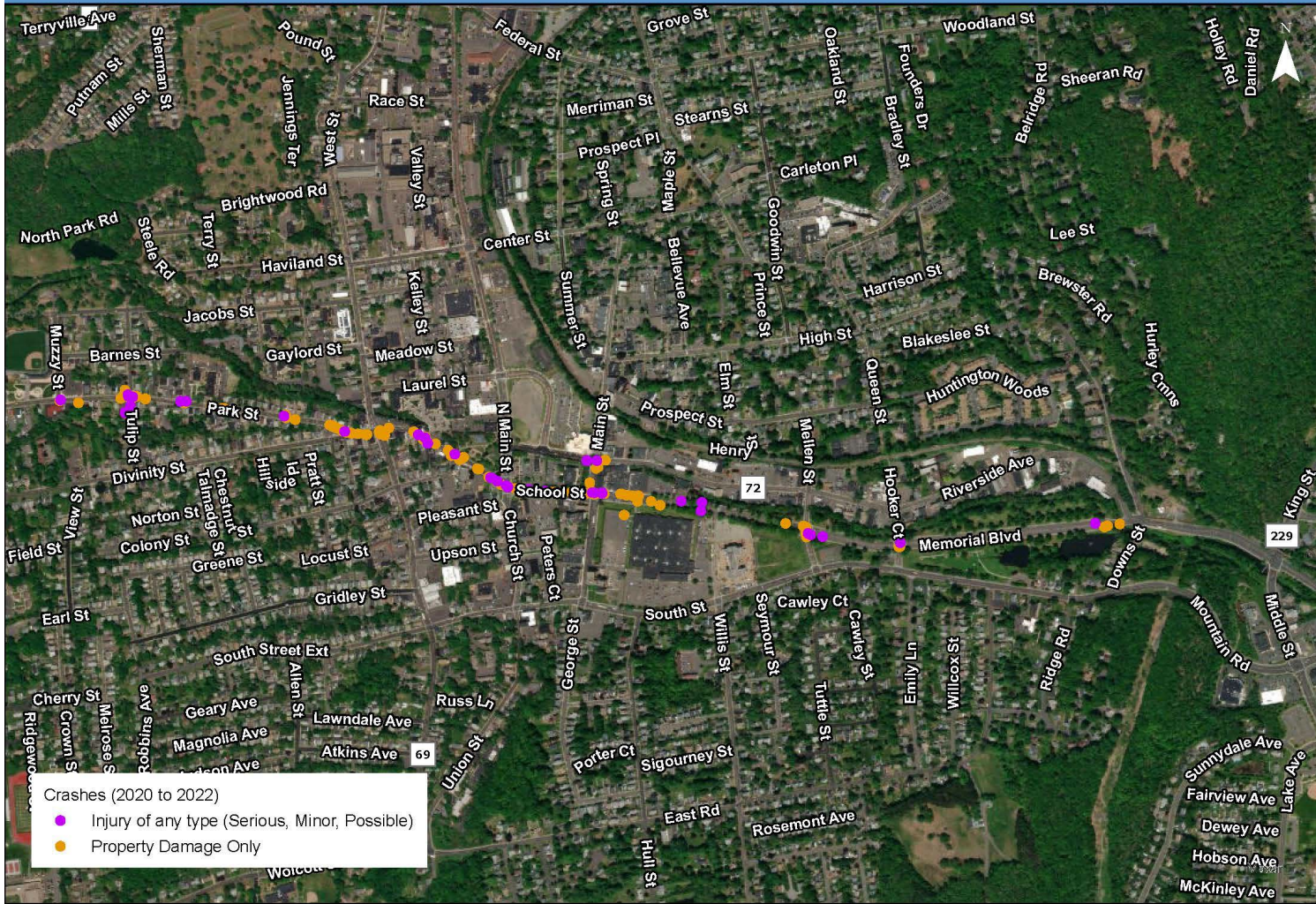
Speed is an important factor in traffic safety and determining suitability for active transportation facilities. Generally, neighborhood streets should have speed limits less than or equal to 25 miles per hour. The average weekday speeds on roadways within the proposed trail area all fall below this threshold. It is important to note, however, that other speed management and street design techniques will be necessary to create a safe and comfortable environment for non-motorized users.

In addition to traffic and speed data, NVCOG staff used the UConn Crash Data Repository to collect crash data for CT-72 (Park Street, Divinity Street, and School Street) and Memorial Boulevard for the years 2020, 2021, and 2022, specifically focusing on pedestrian and cyclist related crashes.

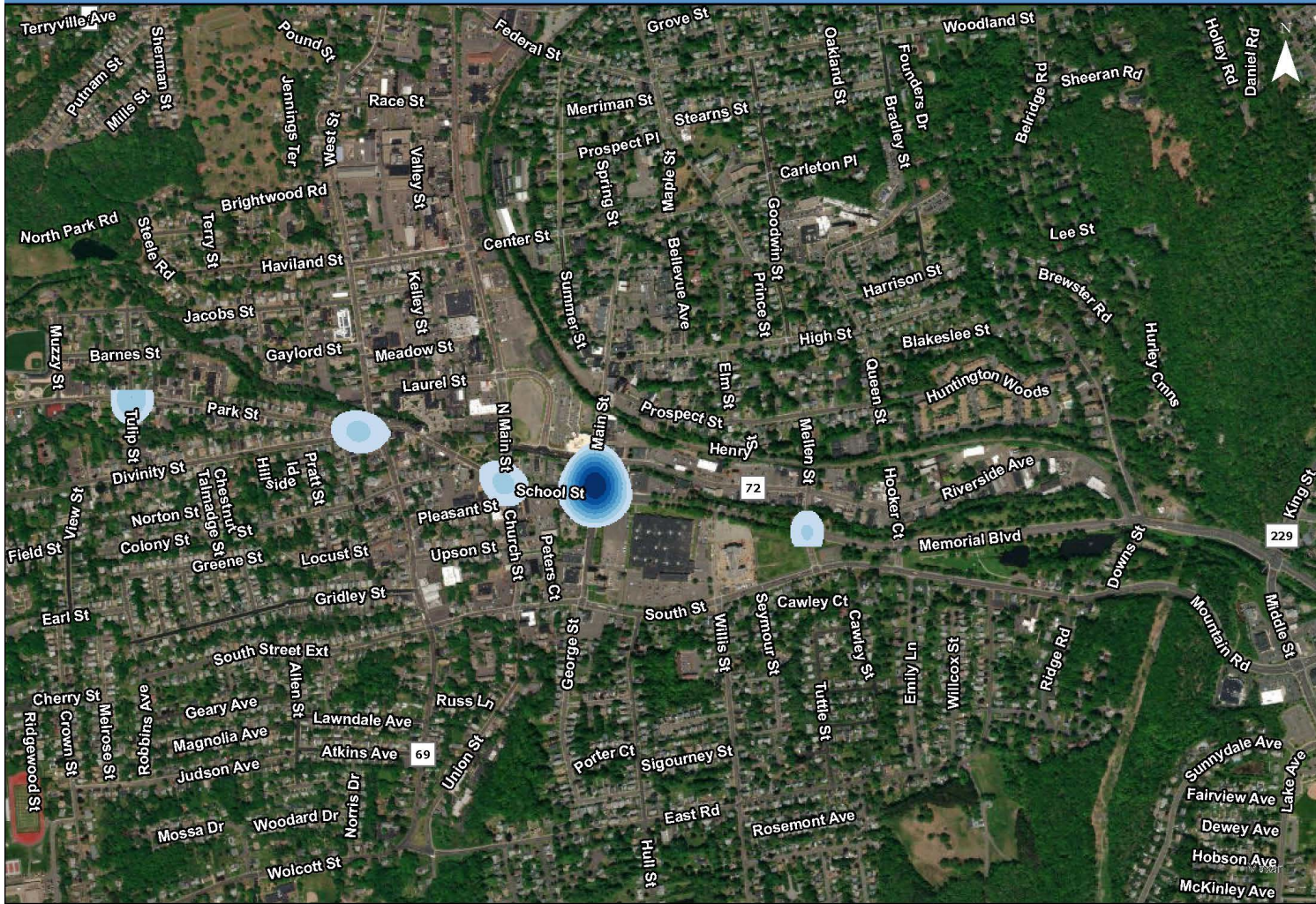
In the years 2020-2022, there were **111** total crashes on CT-72 between Rockwell Park and Memorial Boulevard (Park Street and School Street). 18 of these crashes resulted in possible injury, 9 in suspected minor injury and 1 in suspected serious injury. There was **1 pedestrian related crash**, which resulted in possible injury. 43 crashes (including the pedestrian crash) occurred on the portion of CT-72 west of West Street. The other 68 crashes were on School Street. The relatively low crash frequency on this segment of CT-72 can likely be attributed to low speeds and narrow geometry. Additionally, the CTDOT’s realignment plan for Route 72 aims to address safety issues.

In the years 2020-2022, there were **38** crashes on Memorial Boulevard. In total, 4 crashes resulted in possible injury, and 6 resulted in suspected minor injury. There were **no bike/pedestrian related crashes**. While crash data along Memorial Boulevard does not show a safety concern for vulnerable users, this data is all prior to the current configuration, which is expected to further improve safety and comfort for pedestrians and cyclists.

Crashes from 2020 to 2022



Crashes from 2020 to 2022



Public Engagement

Stakeholder engagement and public involvement were central to this study. At the study's initiation in January 2023, the NVCOG planned a proactive public outreach and engagement process in order to consider and integrate the needs of the public. Two public information meetings were planned, as well as a community walk audit, in which attendees would be able to offer opinions and suggestions, with the study team considering and responding to all comments. NVCOG staff also attended meetings of the West End Association on two occasions to discuss the trail project and collect community feedback. In addition, the NVCOG created and maintained a project webpage, which provided project updates, meeting materials, and any other information related to the study. A final 30-day public comment period was held following a draft of the final report, during which the study team addressed all comments received. All comments are attached as an Appendix to the final report, as well as direct responses.

In February 2023, the NVCOG held a Project Advisory Committee (PAC) meeting to initiate the study and guide project outcomes. The PAC consisted of representatives from Bristol Public Works, Parks, and Community Development, as well as the NVCOG. The PAC's guidance suggested that the Pequabuck River Trail project should be a transformational recreational destination for the City, exceeding minimum trail design standards wherever feasible. The PAC envisioned the Farmington Canal Heritage Trail, a nearby active transportation corridor, as a good model for this trail project.

On March 8, 2023, the NVCOG held an initial public meeting at the Bristol Public Library to discuss the concept of the trail study and collect initial community feedback. The meeting was attended by several members of the public, as well as Bristol's Mayor Caggiano and other City staff. The project's concept was well received, and community members expressed enthusiasm for increased recreational opportunities in Bristol.

On May 24, 2023, the NVCOG held a second public meeting at the Bristol Public Library to share the study's preliminary findings and respond to public comments.

Walk Audit

On April 20, 2023, the NVCOG held a community walk audit of the section of School Street (Route 72) between West Street and Main Street, near Brackett Park. The walk audit's purpose was to assess the current condition of the street environment, demonstrate the community's need for improved active transportation infrastructure, and discuss potential improvements with the public and local stakeholders.

During the walk audit, participants were invited to share their thoughts on a worksheet as well as through informal discussions. Participants praised the walkability and overall potential of the corridor but criticized the uneven and damaged condition of the sidewalks. Participants also had concerns about busy traffic in the corridor and the narrow street widths, which could be dangerous for both cyclists and other users. Participants also shared the desire for a well-maintained trail that is clean and safe to use.

Participants were asked to share which potential features would improve the safe walkability and appeal of the route. Out of the five participants that responded to this question, four identified protected bike lanes as a potential improvement. Two out of five participants signaled decorative path features, wider sidewalks, and sidewalk repairs/maintenance as potential improvements. Other selected improvements included safety barriers between the path and street, a multi-use side path, and a painted bike lane.

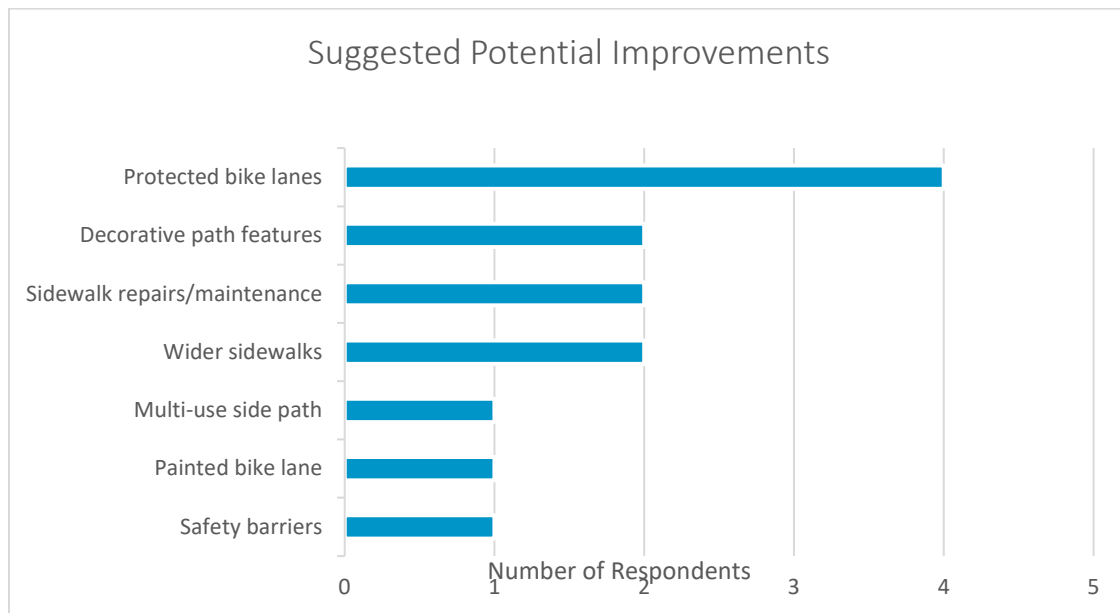


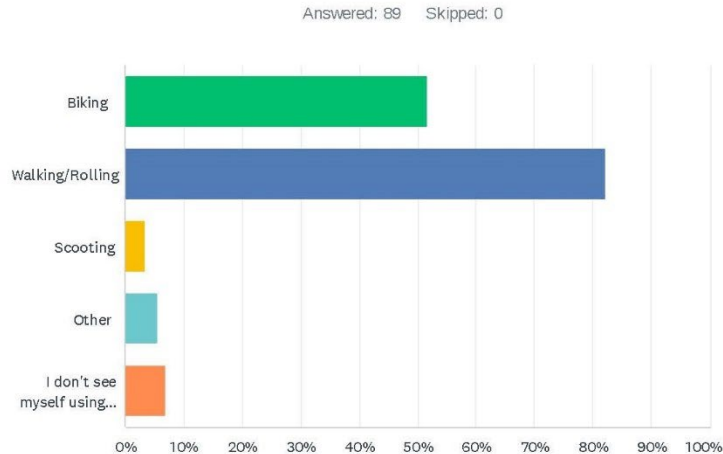
Figure 5 Walk audit survey responses

Survey

In addition to public meeting opportunities, NVCOG staff created and shared an online survey that was open during the duration of the study, collecting 89 responses.

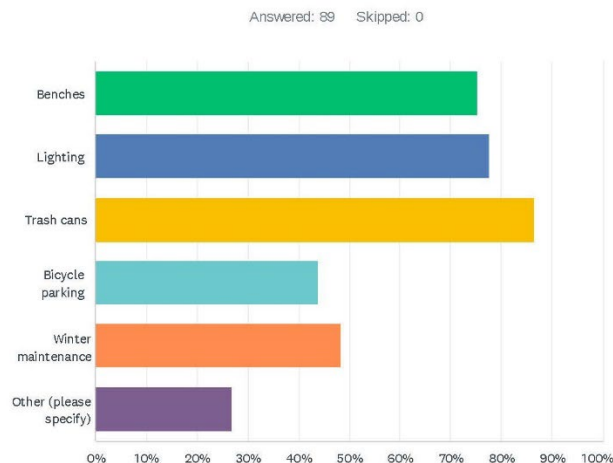
The largest majority of respondents indicated that they would use the trail for walking or rolling, but over half responded that they would bike on the trail, indicating that the trail should be able to accommodate a variety of users.

Q2 How do you see yourself using a trail? (Select all that apply)



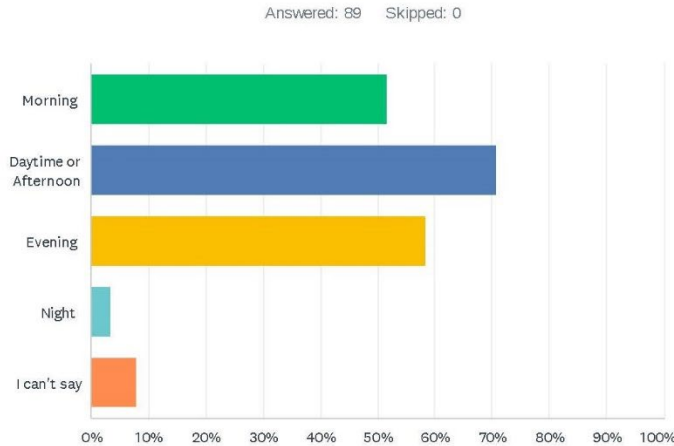
Respondents were also asked about trail amenities they would like to see on the trail. The survey indicated that trash receptacles, lighting, and benches are community priorities, with each being selected by over 75 percent of respondents. Winter maintenance and bicycle parking were lower priorities, although they could still be considered in the future. Other elements suggested by the community included pet waste disposal, trail markers, emergency/security call boxes, and historic and environmental signage.

Q3 Which of the following would you like to see on the trail? (Select all that apply)



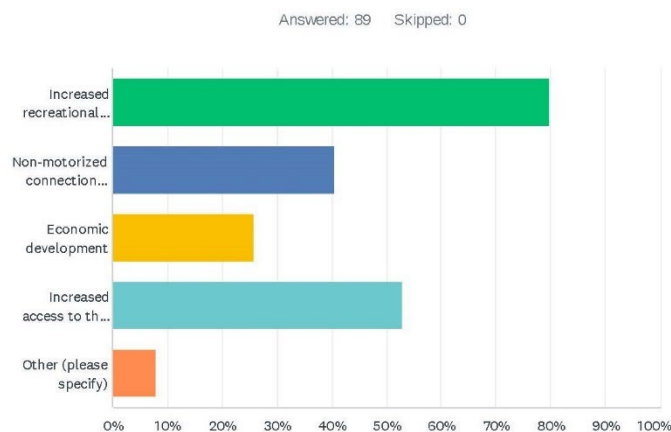
Respondents indicated that they would be most likely to use the trail during the daytime, which is consistent with typical trail “dawn to dusk” hours.

Q4 What time(s) would you be most likely to use the trail? (Select all that apply.)



Trails have numerous community impacts, from economic development to increased mobility. Survey respondents indicated that the most important potential trail impact would be the increased recreational opportunities. Similarly, respondents also placed importance on increased access to the Pequabuck River, an underutilized natural amenity in Bristol’s downtown. These responses are consistent with comments made during the Project Advisory Committee meeting and the March 8 public meeting. Although the majority of respondents prioritized the recreational impacts of the trail, over 40 percent also placed importance on the non-motorized connection between the West End and Downtown Bristol.

Q5 What potential trail impacts are most important to you?



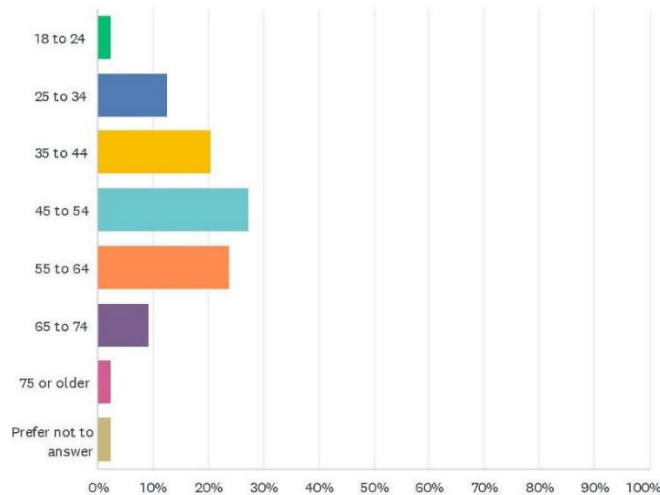
The survey also asked an optional question in which residents could provide any open-ended comments or suggestions. The vast majority of responses to this question were very supportive of the study. Responses emphasized the need for adequate safety, security, and maintenance, as well as the potential for the trail to connect to other existing and planned trails in the region. Additionally, several responses

emphasized the importance of ensuring that the trail is accessible for all users, regardless of age or ability. Few community members have safety concerns about a multi-use path, but [a study by the Massachusetts Department of Transportation](#) of several multi-use trails in the state indicated that users perceived crime to be unaffected or even decrease. All responses to this question are available in the Appendix.

The NVCOG wants to ensure equity in all transportation projects and ensure that all communities have a chance to share their opinion. At the end of the survey, the NVCOG asked several optional demographic questions about age, gender, race, and household income. It is significant that the results of the survey skewed older, white, and affluent. Over 60 percent of respondents were over the age of 45, 87 percent of respondents were white, and over 70 percent of respondents have an annual household income of over \$75,000. Future public outreach for this project should make a concerted effort to reach underrepresented populations, including communities of color, lower-income individuals, and youth.

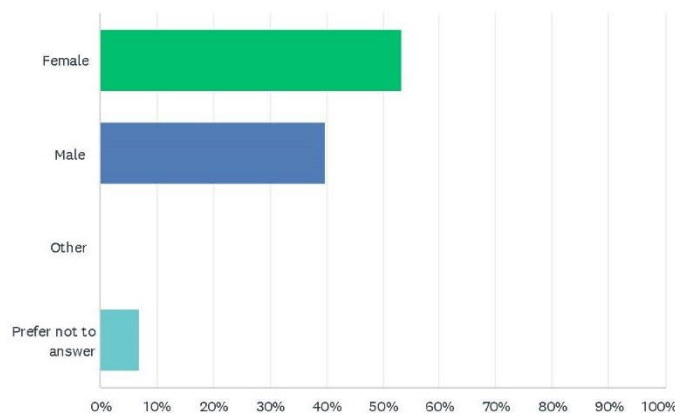
Q7 Which category below includes your age?

Answered: 88 Skipped: 1



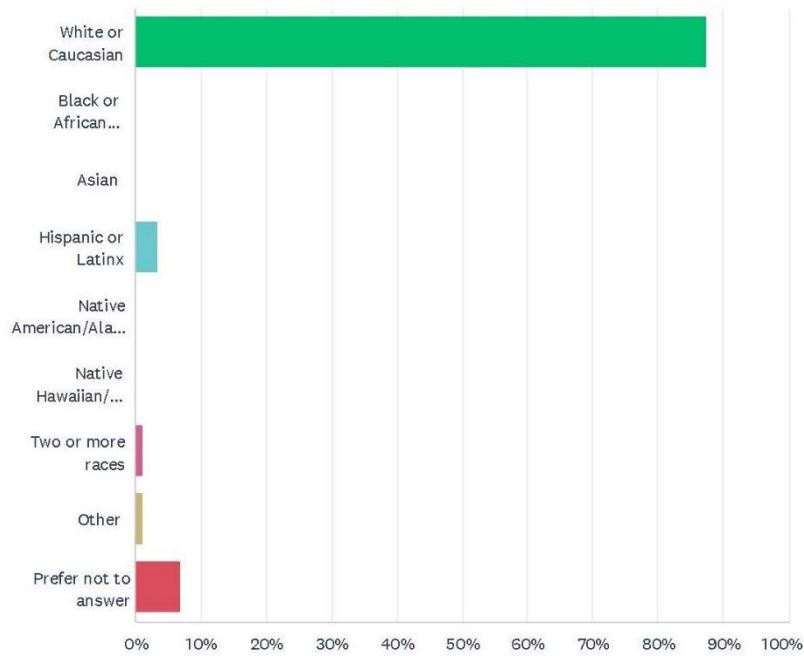
Q8 What gender do you identify as?

Answered: 88 Skipped: 1



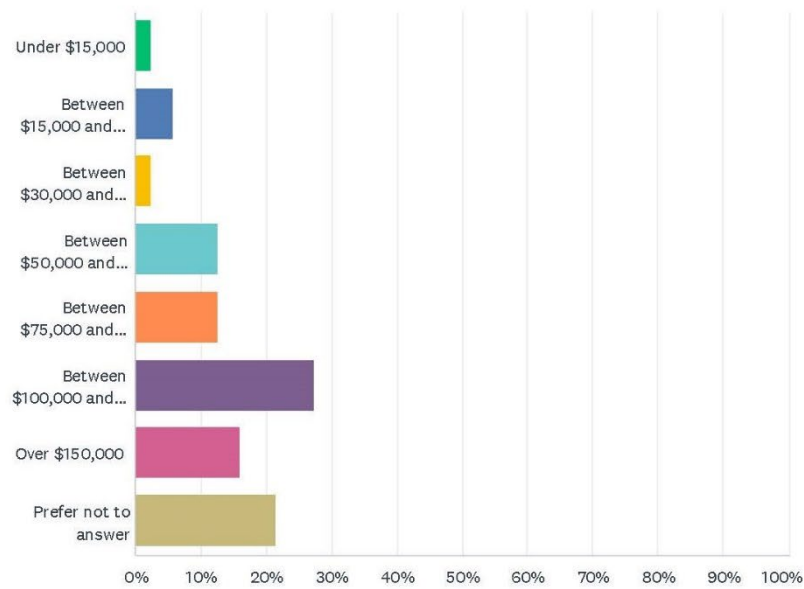
Q9 Please specify your ethnicity

Answered: 88 Skipped: 1



Q10 What is your annual household income?

Answered: 88 Skipped: 1



Routing Alternatives

Based on the public meetings and data collection, NVCOG staff have prepared three routing alternatives for the Pequabuck River Trail. The alternatives have considered the various current and upcoming CTDOT projects in the study area (CT 69/CT 72 intersection improvements; CT 72/Riverside Ave. realignment).

The trail will require at least one bridge over the Pequabuck River, and potentially three. Whether there is one bridge or three bridges will be largely dependent on the topography, grades, and rights-of-way near the river, as well as the City's budget for this project. Based on feedback from stakeholders and community, all the alternatives have been routed to include three bridges due to their recreational potential and vistas. Three bridges will also require fewer property impacts/takings. The alternatives can easily be modified to include only one bridge by omitting the first two bridges near the Clara T O'Connell School building, keeping the only crossing just west of West Street.

Alternative A – Low Cost

Alternative A is a lower-cost solution that minimizes the amount of construction to the current street environment. This alternative would consist of a two-directional multi-use trail from Rockwell Park until CT-72, following the course of the Pequabuck River. The trail will start north of the river near Jacobs Street, cross to the south side near the Clara T O'Connell School building, cross back to the north side shortly thereafter, and finally cross back to the south side near CT-72. The trail will cross CT-72, becoming a two-way cycle track on the south side of the street. Instead of continuing along the planned CT-72 realignment, the trail will continue as a multi-use path south of Brackett Park (on what is now School Street). Upon reaching North Main Street, the trail will transition into one-way painted bike lanes on each side of the street, like what is currently on Memorial Boulevard. Alternative A keeps Memorial Boulevard as is. At Downs Street, the trail will transition into an off-street multi-use path until Route 229, following an existing utility easement in between Riverside Avenue and the Pequabuck River.

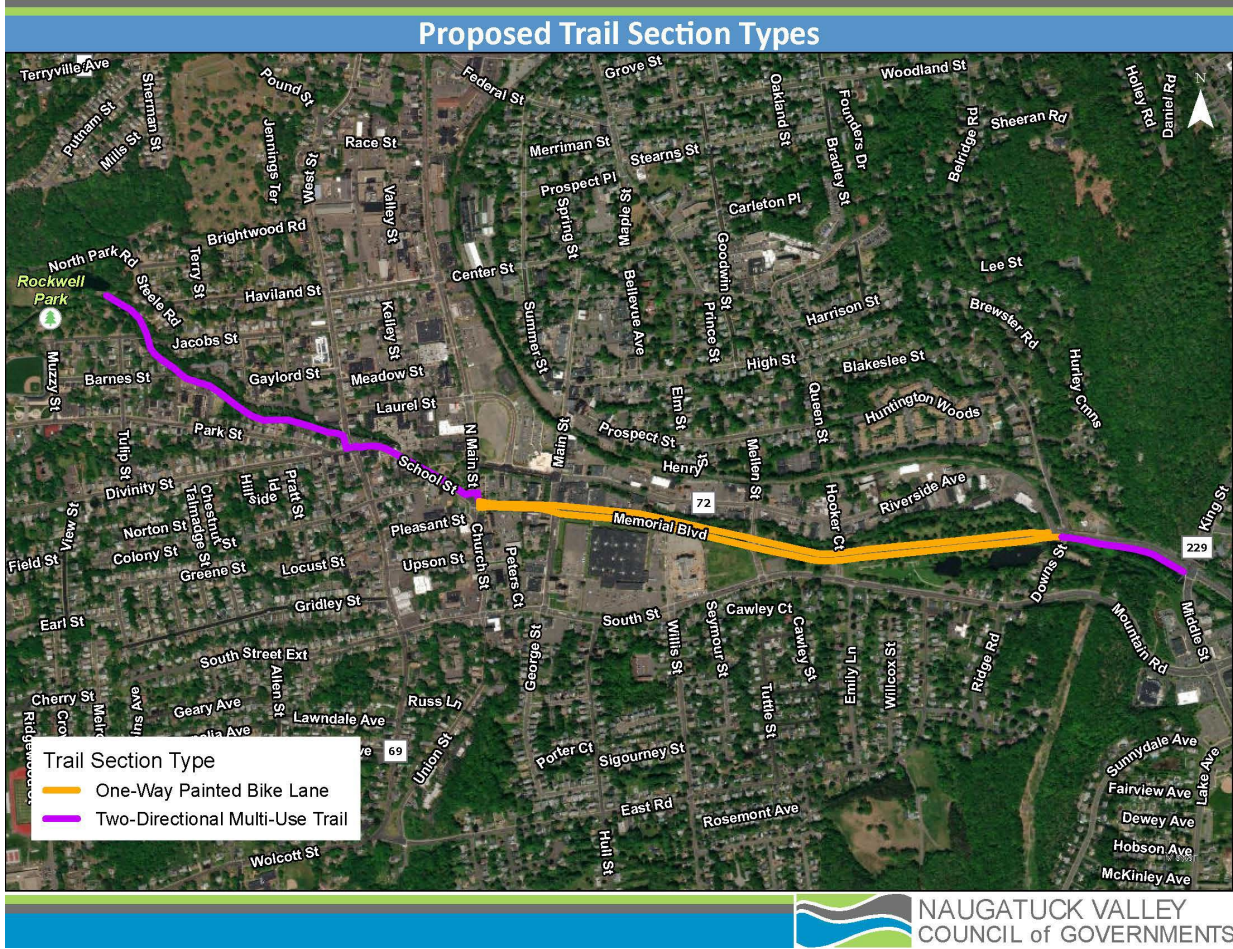


Figure 6 Routing Alternative A

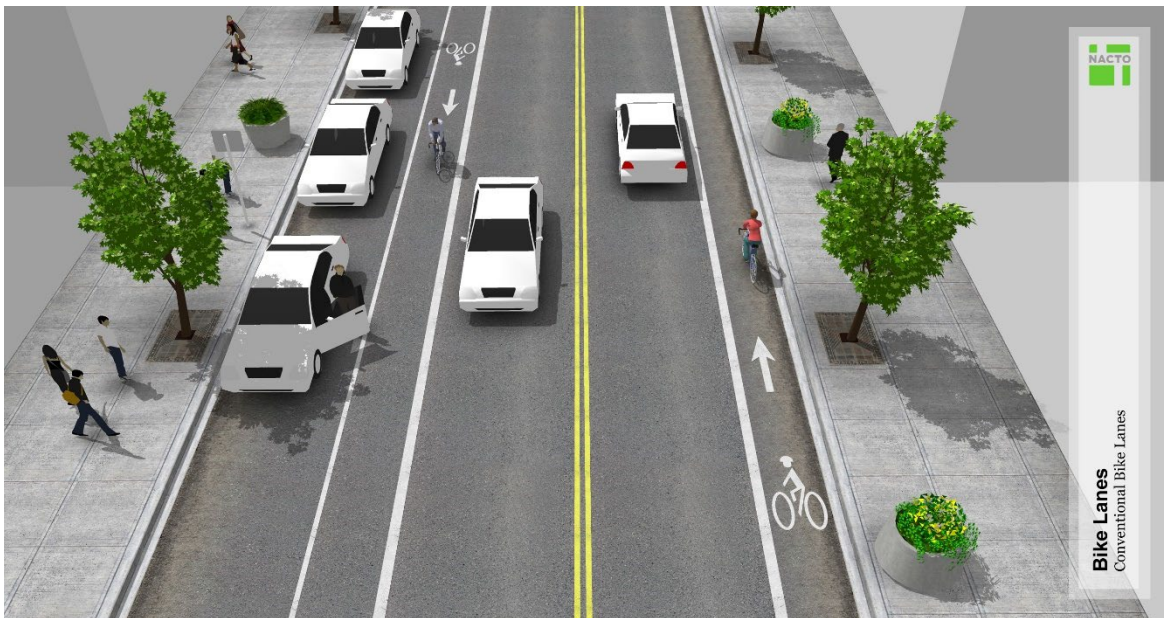


Figure 7 Conventional painted bike lane. Photo from NACTO

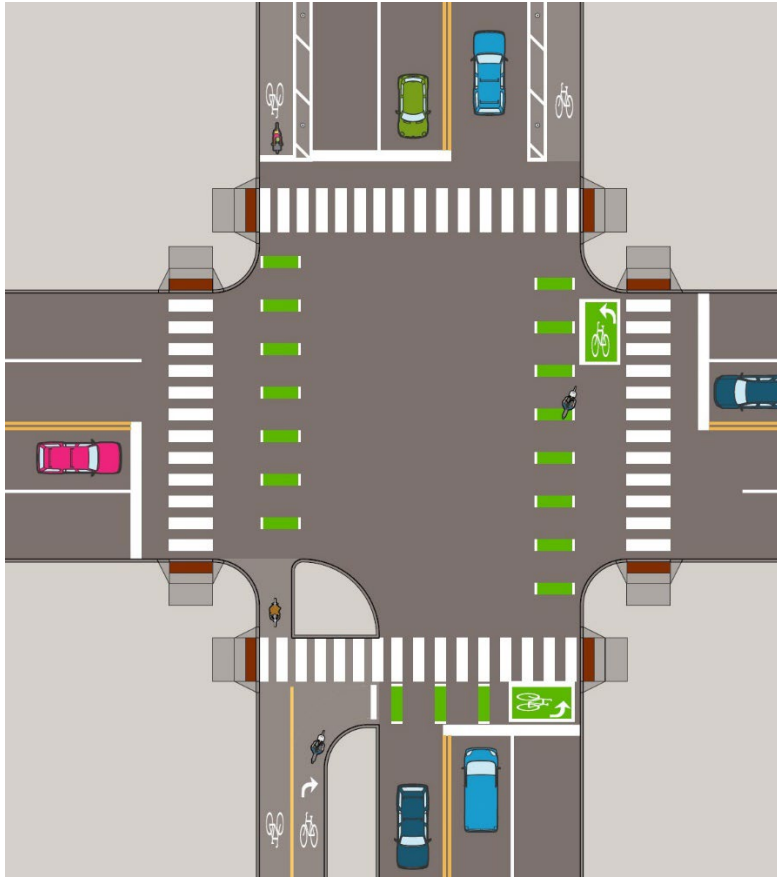


Figure 8 A two-way bikeway transition, similar to this, could be required at the intersection of School Street and North Main Street. Photo courtesy of the City of Minneapolis.

Although painted bike lanes are much easier and less expensive to implement than other facilities, they are unprotected. Paint serves only as a visual divider and will not physically stop motor vehicle traffic from potentially colliding with trail users, especially given the corridor’s traffic volumes. However, painted mobility lanes could be an interim solution before implementing flex posts, planters, or other protection in the future.

Alternative B – NVCOG Suggested Routing

Alternative B is similar to Alternative A but provides for additional user safety and comfort.

This alternative would consist of a two-directional multi-use trail from Rockwell Park until CT-72, following the course of the Pequabuck River. The trail will cross CT-72, becoming a two-way protected cycle track on the south side of the street. Instead of continuing along the planned CT-72 realignment, the trail will continue as a multi-use path south of Brackett Park (on what is now School Street). Upon reaching North Main Street, the trail will transition into one-way protected cycle tracks on each side of the street. Alternative B keeps Memorial Boulevard as is. At Downs Street, the trail will transition into an off-street multi-use path until Route 229, utilizing an existing utility easement in between Riverside Avenue and the Pequabuck River.

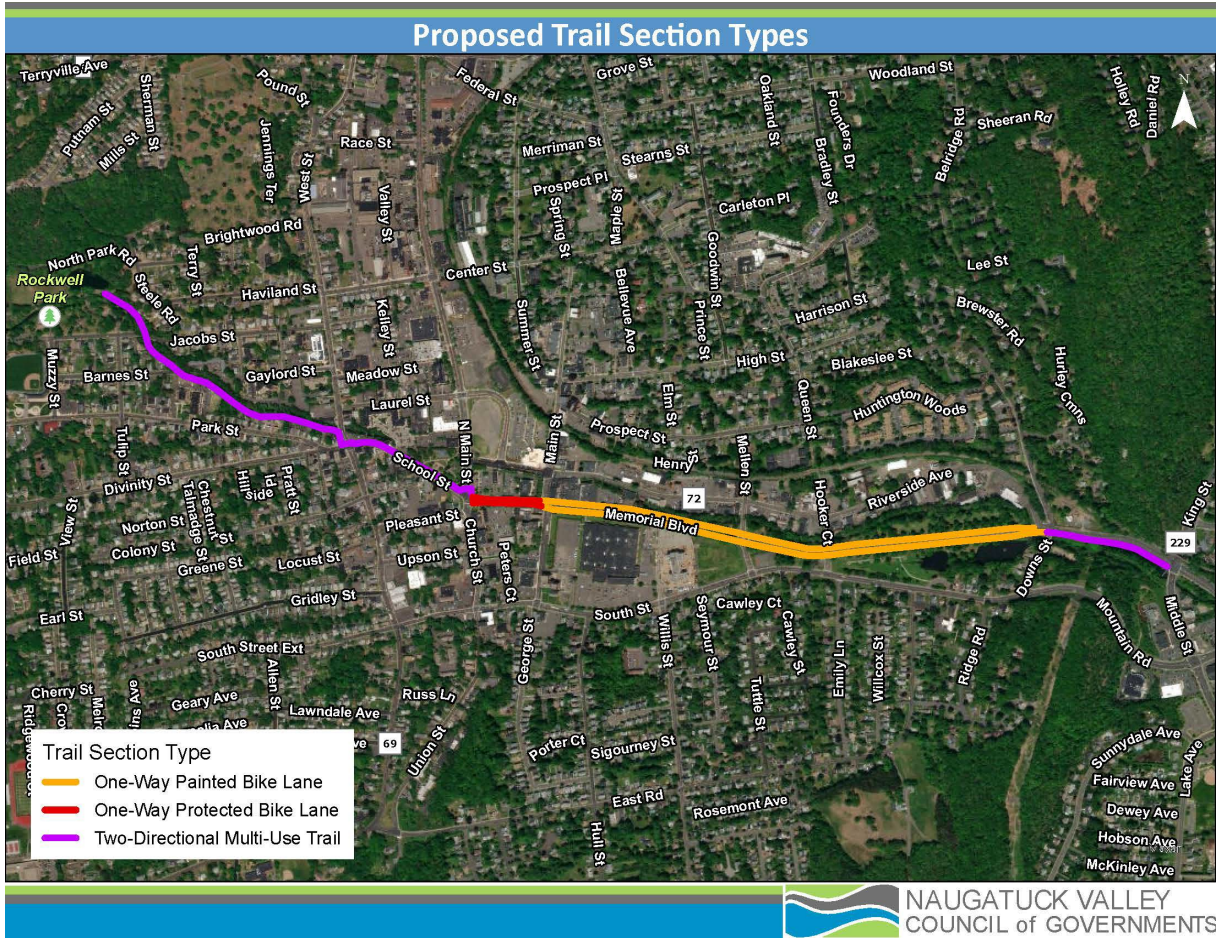


Figure 9 Routing Alternative B



Figure 10 Example of a protected cycle track, using flex posts as buffers.

NVCOG suggests this routing as it prioritizes user safety and comfort. The Federal Highway Administration (FHWA) publishes bikeway selection guidance based on traffic speeds and volumes. Based on the data collected and FHWA guidance, we recommend a protected (separated) bike lane for the section of trail on School Street between North Main Street and Main Street. Protection may be especially important, as the intersection of Main Street and School Street has the highest crash incidence in the study area. Memorial Boulevard has a lower number of crashes, making protection less critical, although the City should still consider implementing beautification measures such as planters and streetscaping. Based on community feedback, the NVCOG also recommends a spur trail that connects north to Riverside Avenue via Downs Street, particularly given the various economic development projects planned on the Riverside Avenue corridor.

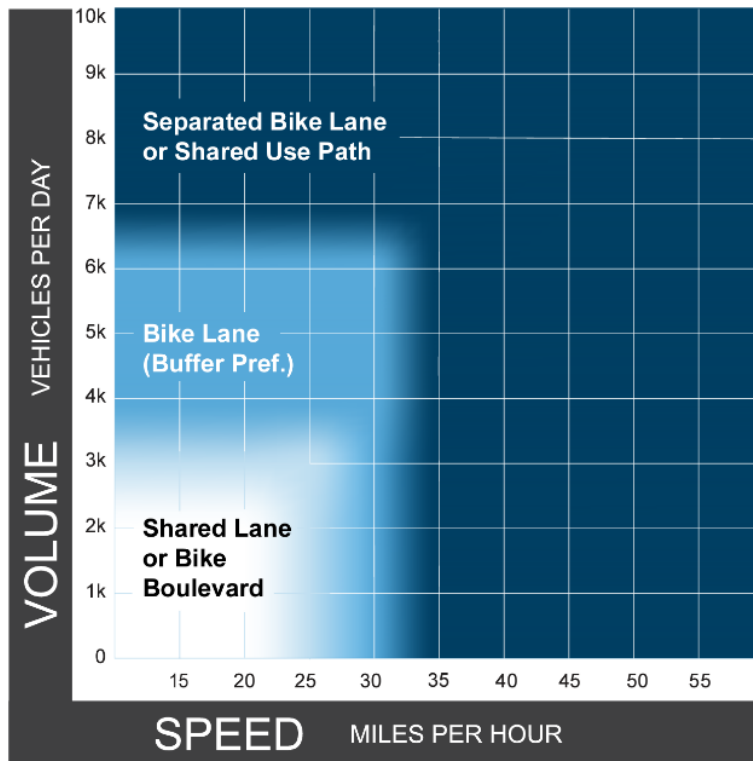


Figure 11 FHWA bikeway selection guidance

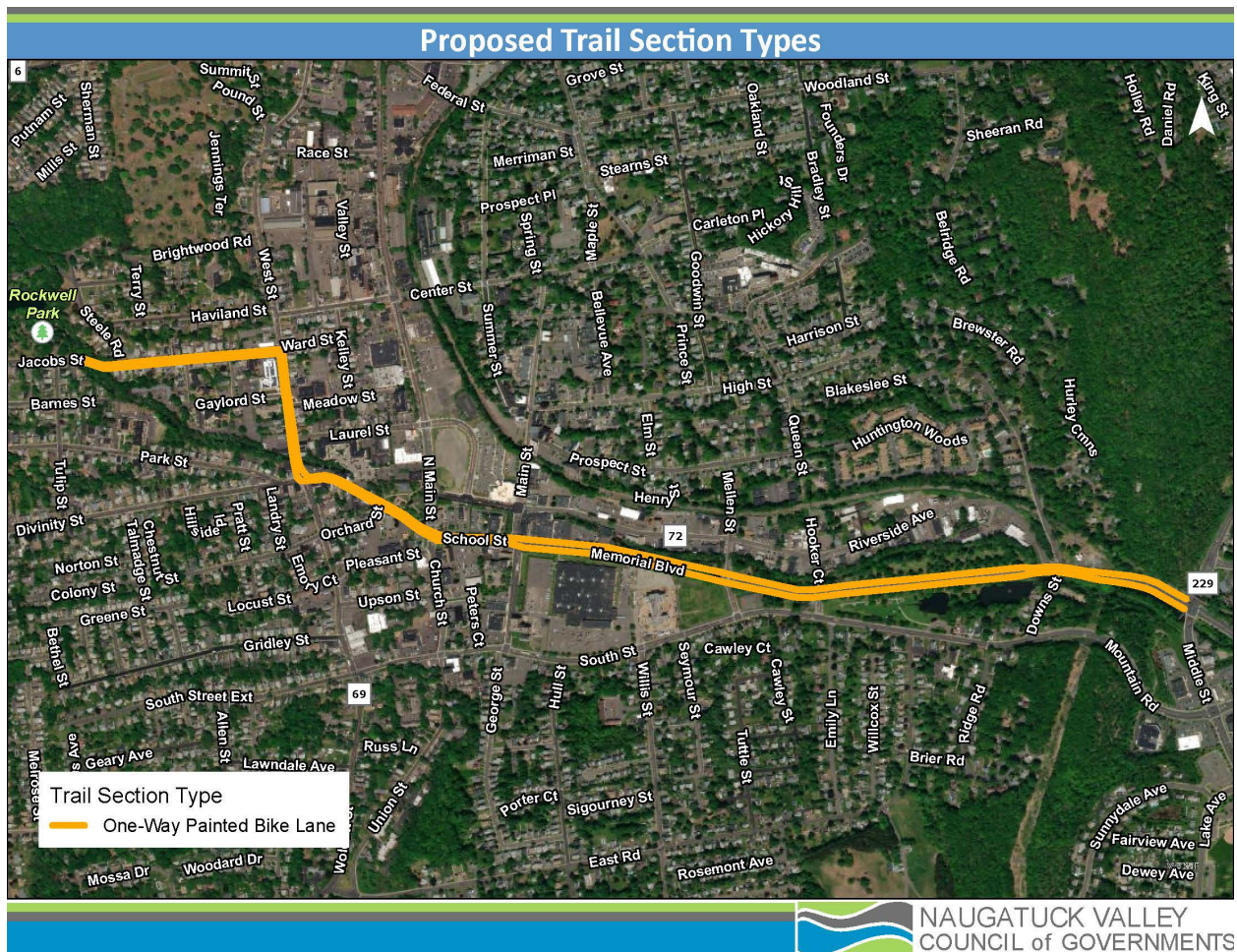
Although few respondents indicated that they would use the trail at night, providing lighting could extend trail hours as well as improve user safety and security. Should the City provide lighting, pedestrian-scale lighting (shorter light poles, lower illumination levels) is recommended for shared use paths, with an average level of 0.5 to 2 foot-candles. Lighting should be Dark Sky compliant (minimized glare, downcast). Crossings may benefit from higher illumination. For more information on bikeway technical design standards, please refer to Appendix B.

As the trail is intended to be a destination, the City should also consider potential parking facilities; currently, there is existing parking at Rockwell Park, and there are several downtown facilities that are either planned or under construction.

Alternative C – On-Street

The study team also explored a third, completely on-street alternative. This alternative would begin as a conventional bike lane south of Rockwell Park on Jacobs Street, before continuing south on West Street. At the intersection of West Street, the trail would continue eastward as an on-street bike lane on School Street. Memorial Boulevard would remain as is, and the trail would continue on Riverside Avenue as an on-street bike lane until Route 229.

We do not recommend this route for several reasons. Primarily, it does not fit the City’s goals of creating a transformative recreational project for the West End and reconnecting the community to the Pequabuck River. Additionally, it is not an appropriate route based on current traffic volumes and speeds in the corridor.



Implementation Strategies

This trail project is intended to be transformative for the City of Bristol, with economic development benefits not only improving the status and quality of life in the West End neighborhood, but the City more generally. The trail will provide a recreational destination in Bristol by creating additional green space and better connecting residents to the Pequabuck River, while providing an active transportation corridor that will benefit residents, workers, and businesses in the West End and Downtown Bristol alike. The trail will draw new visitors to the West End and Downtown Bristol and provide trail users the opportunity to support shops, restaurants, and cultural establishments in both neighborhoods.

In May 2023, The Connecticut Department of Energy and Environmental Preservation (DEEP) awarded the City of Bristol a \$320,000 grant to move the City's preferred routing concept into the design phase. Design is expected to be completed in early 2026. As the project moves through design, the City and NVCOG will consider various options for funding construction.

Possible funding options include:

- Local Transportation Capital Improvement Program (LOTICIP): The LOTICIP program was created by the CTDOT to provide state funds to municipalities through the Councils of Governments for road, bridge, multi-use trail, and pedestrian improvements.
- Transportation Alternatives (TA): TA is a set-Aside from the Surface Transportation Block Grant (STBG) Program that provides funding for a variety of generally smaller-scale transportation projects such as pedestrian and bicycle facilities.
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE): RAISE is a USDOT program that awards competitive funds for major capital investments in surface transportation projects that will stimulate the nation's economy. Selection criteria includes safety, economic competitiveness, quality of life, environmental protection, state of good repair, innovation, partnership, and additional non-Federal revenue for infrastructure investments.
- Safe Streets and Roads For All (SS4A): SS4A is a USDOT program that was created to support efforts to advance "Vision Zero" plans and implement other capital improvements that reduce the number of fatal and serious injury crashes, especially for bicyclists and pedestrians.

While design progresses on phases I and II, the City of Bristol and the NVCOG will seek funding for a detailed routing study which will continue the trail's current planned terminus at Route 229 to the Farmington Canal Heritage Trail in Plainville, linking Bristol to a larger region-wide network of trails and recreational opportunities. Phase III of this project will likely take several years to fund, with the following as a sample of the available funding programs that will be examined:

- CT DEEP Recreational Trails: The Recreational Trails program provides funding to support trail projects, including planning, design, and construction of new trails, maintenance and restoration of existing trails, access to trails by persons with disabilities, and more.
- Transportation Alternatives (TA): See above.