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# QUEEN CITY PARK – AUSTIN DRIVE BICYCLE PEDESTRIAN CONNECTIONS SCOPING STUDY

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Prepared for the CCRPC, City of Burlington and City of South Burlington

24 June 2022 | FINAL

## CONTENTS

<b>Introduction</b>	<b>1</b>	Pedestrian Alternatives	14
Regional Connections	1	Bicycle Alternatives	14
Purpose and Need statement	1	Segment A	15
Project Context	2	Segment B	17
Relevant Projects and Studies	3	Segment C	19
Study Process	4	Segment D	21
Engagement and Outreach	4	Segment E	25
Existing Conditions	7	Alternative Cost Estimates	<b>Error! Bookmark not defined.</b>
Transportation	7	<b>Preferred Alternative</b>	<b>27</b>
Project Area Environment	10	Implementation Strategy	27
Alternatives	14	<b>Short Term Recommendations</b>	<b>29</b>
		<b>Attachments</b>	<b>30</b>

## INTRODUCTION

The Chittenden County Regional Planning Commission (CCRPC), in association with the Cities of Burlington and South Burlington, initiated a Scoping Study for a bicycle and pedestrian connection between the Lindenwood Drive intersection on US Route 7 in South Burlington, along Queen City Park Road and Austin Drive, to the Burlington Waterfront Greenway (commonly called the Burlington bike path). Toole Design was retained to conduct the study, which includes the required elements of a VTrans scoping study. This will allow the City of Burlington or City of South Burlington to pursue funding through the VTrans Bicycle and Pedestrian Program or other similar funding sources.

This study evaluates connections between the South Burlington Recreation Path network at Lindenwood Drive, the Hannaford Plaza, Red Rocks Park, Oakledge Park, Green Mountain Transit (GMT) transit stops, the existing shared use path along the Champlain Parkway corridor, and many other destinations.

The UVM Consulting Archaeology Program was also retained to conduct an evaluation of the cultural resources in the study area, which is required for a VTrans scoping study.

## REGIONAL CONNECTIONS

One intent of this project is to address several gaps in the regional bicycle network that can be seen in Figure 1. The project has regional implications for bike tourism and transportation, enhancing access to Lake Champlain and the

Champlain Islands as well as strengthening the local network of on and off-street bike facilities.



Figure 1: Regional Bike Network

## PURPOSE AND NEED STATEMENT

This study explores options, costs and feasibility for two primary purposes:

- Provide a regional bike connection between several existing shared use paths (the Burlington Waterfront Greenway, the Champlain Parkway Shared Use Path, and the South Burlington path network), and key destinations in the study area: Oakledge Park and Red Rocks Park.
- Provide a safe and comfortable movement for people to travel by all modes of transportation throughout the study area.

The need for these connections is due to gaps in the network for both walking and biking, and transit stops that are not served by sidewalks. These are described in detail in the following sections.

## PROJECT CONTEXT

The study area, shown in Figure 2, has diverse land uses in and adjacent that include industrial facilities, major waterfront parks, residential neighborhoods, smaller commercial properties, the Champlain Water District, electrical utility installations, and other uses, as shown in Figure 2.



Figure 2: Land Uses in the Study Area



## RELEVANT PROJECTS AND STUDIES

This project is one of several transportation-related initiatives in the area:

### 2020 Queen City Park Road Pedestrian Facility Assessment

This study was conducted by the City of Burlington and Clough Harbor Associates, and provides an assessment of alternatives for either a new sidewalk or shared use path on Queen City Park Road in Burlington, between Central Ave and Home Ave. The intent was to investigate both drainage considerations and sidewalk feasibility in advance of a resurfacing and drainage project. The resurfacing project was completed in 2021, altering the drainage patterns on the road that will facilitate the construction of a sidewalk or shared use path on the east side of the road.

### 2008 Queen City Park Road Bridge Initial Project Definition Report

This study evaluated the condition and operations of the one-lane bridge over the Vermont Railroad. Key findings include the following:

- The bridge is generally structurally sound, but is deteriorating due to age, and there is a failing retaining wall adjacent to the bridge abutment.
- There is not sufficient vertical clearance for double stack rail cars. Accommodating them would require increasing the vertical clearance by about 2 feet.
- The one-lane width causes delay for people driving or biking across the bridge.
- The open grating sidewalk is not desirable to walk on, especially for those walking with dogs, and people often walk across in the vehicle lane.
- Public comments also noted that eastbound vehicles tend to pull onto the right side to make room for oncoming traffic across the bridge, blocking the pedestrian access to the sidewalk.

The report recommended replacing the bridge with a bridge wide enough to carry two lanes of traffic (one in each direction).

At this time the project is not funded for design and construction.

### Champlain Parkway Project

This project has been decades in the planning, and is expected to break ground in 2022. Figure 3 shows elements of this project that impact the study area.



**Figure 3: Champlain Parkway Project Features**

The closure of Pine Street will significantly affect circulation in the study area, and will create a barrier for walking and biking between Burlington's south end and Queen City Park Road.

## STUDY PROCESS

The study was guided by a project management committee including the following people.

Member	Representing
Christine Forde	CCRPC
Nicole Losch	City of Burlington Department of Public Works
Marla Keene	City of South Burlington Planning and Zoning
Lucy Gibson	Toole Design Group
Julie Shapiro	Toole Design Group

This study also coordinated with a Project Advisory Committee, with members appointed by the City of Burlington and the City of South Burlington. This committee met four times during the study.

Member	Representing
Peter Keating	Burlington Walk Bike Council
Gillian Bell	Burlington Neighborhood Planning Assembly
Chip Mason	Burlington City Council
Doug Goodman	South Burlington Neighborhood Representative
Bob Britt	South Burlington Bicycle & Pedestrian Committee
Amanda Holland	South Burlington Bicycle & Pedestrian Committee
Tim Barrett	South Burlington City Council
Chris Damiani	Green Mountain Transit

The committee met the following dates:

- September 23, 2021
- November 18, 2021
- February 22, 2022

Meeting notes are attached to this report as Appendix 1.

## ENGAGEMENT AND OUTREACH

This project had three opportunities for the public to weigh in on the project, early as the issues and concerns were identified, mid-way through the project when alternatives were developed, and at the project conclusion to review the final report and recommendations.

### Survey

An online survey was open for responses between September 17 and October 18, 2021 to obtain information from the public on issues, concerns, and needs in the study area. It was advertised on the Front Porch Forum, City and CCRPC websites, and via lawn signs that were placed at numerous locations in the study area and in surrounding neighborhoods. The survey yielded over 250 individual responses and 896 comments on issues and concerns. The survey respondents were generally representative of Burlington and South Burlington demographics in terms of age, gender, and ethnicity. In terms of barriers to walking, the following chart summarizes the survey responses.

The charts presented here summarize some data on why people travel to the study area, and what they find to be barriers to walking and biking. Additional questions and data are provided in Appendix 2.

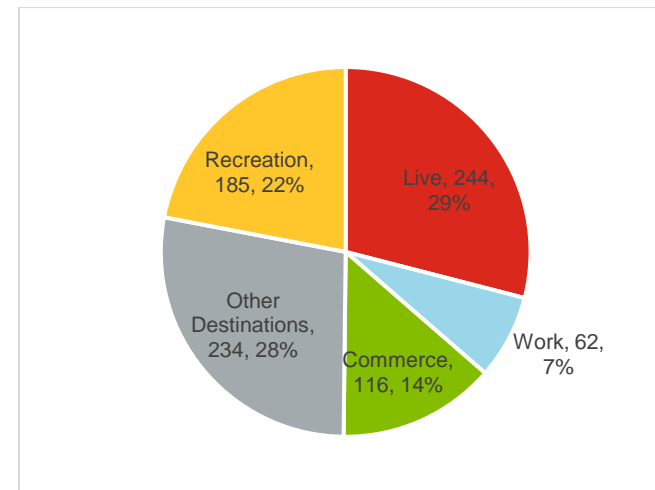


Figure 4: Purpose of trips in study area

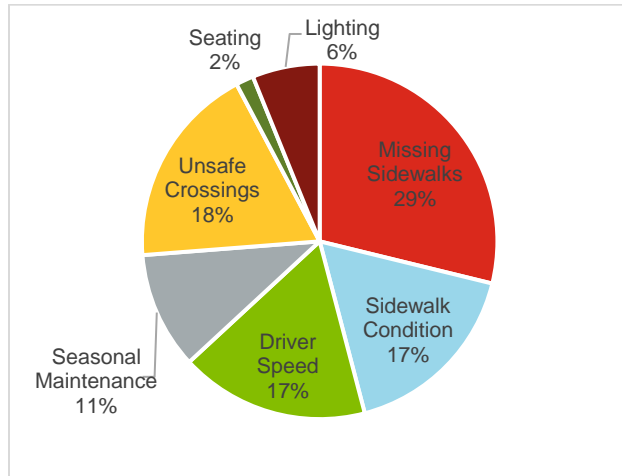


Figure 5: Barriers to Walking

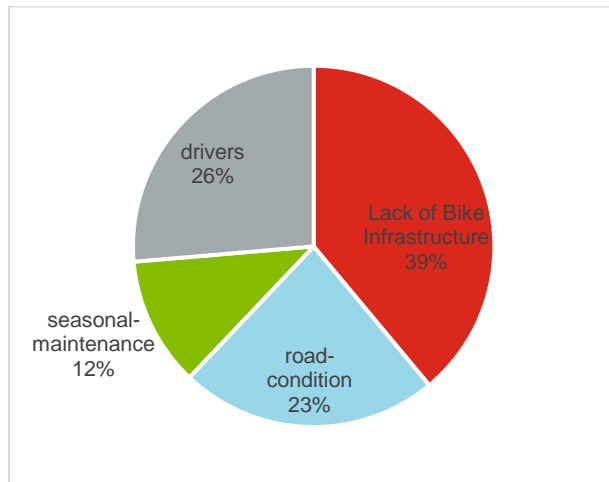


Figure 6: Barriers to Biking

The most useful information came in the form of location-specific comments for issues related to travel by all modes throughout the study area. These comments are summarized in Figure 7.

### Alternatives Presentation

A public meeting was held on Wednesday, March 9, 2022, hosted by the South Burlington Bicycle and Pedestrian Committee Meeting, to share project alternatives and gather feedback. This virtual event was well attended, allowing participants to hear a presentation on the project progress and alternatives, and provide feedback. Concerns expressed by attendees included parking in the vicinity of Red Rocks Park, the one lane bridge safety, and speeding traffic. There was general support for the alternatives that were reviewed. Meeting notes are attached to this report in Appendix 3.



## QUEEN CITY PARK-AUSTIN DRIVE BICYCLE PEDESTRIAN CONNECTIONS SCOPING STUDY | FINAL REPORT

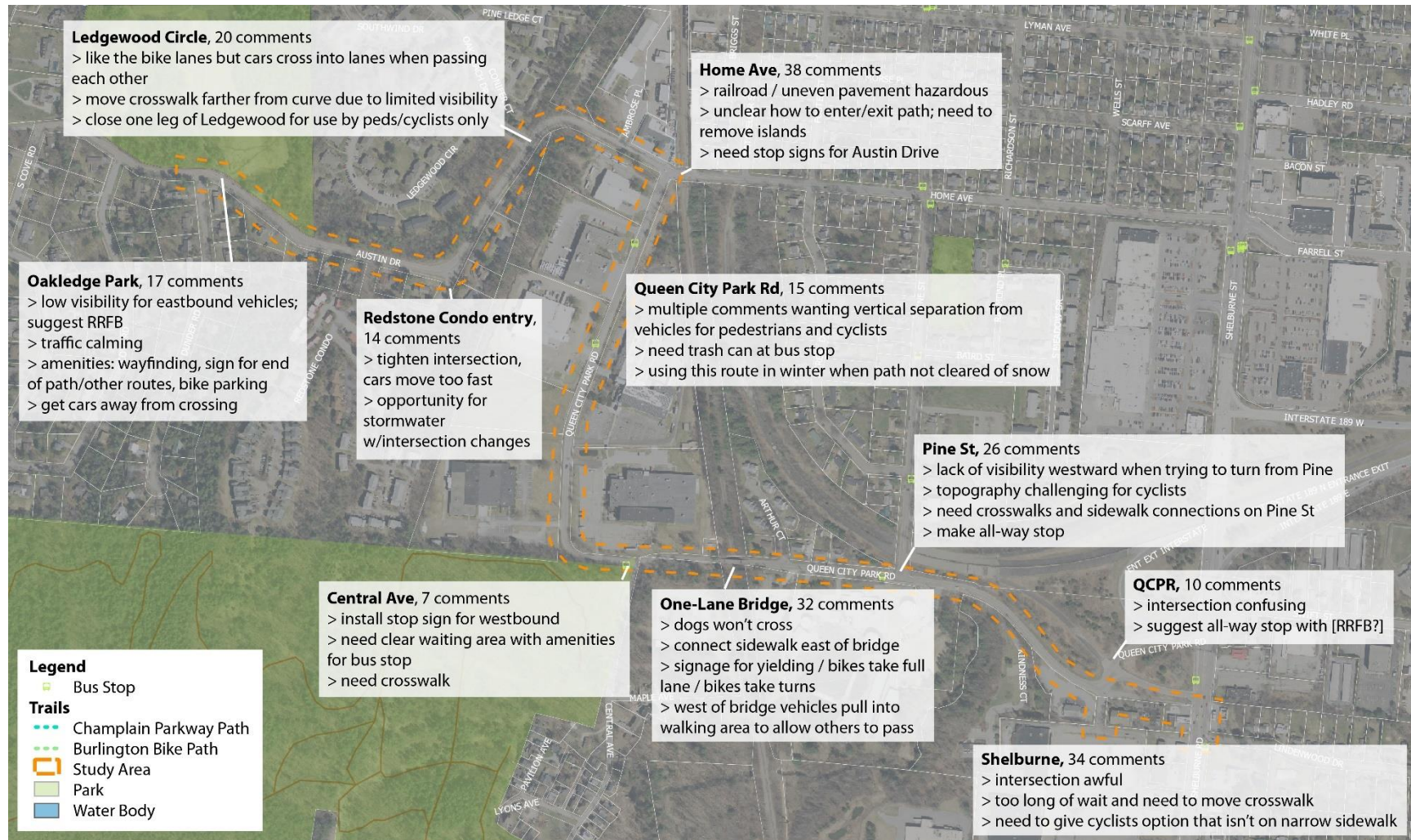


Figure 7: Public Comments for Transportation-related Issues and Concerns



## EXISTING CONDITIONS

The study area spans from the Burlington Waterfront Greenway terminus on Austin Drive, and the intersection of Shelburne Road/US Route 7 and Lindenwood Drive. The following sections review all relevant aspects of the study area, including all applicable modes of transportation, safety, and environmental resources.

## TRANSPORTATION

The following sections provide an overview of conditions for each mode of transportation. More detailed descriptions are provided in later sections of the report.

### Walking

There are sidewalks and shared use paths serving some portions of the study area streets, as shown in Figure 10. The notable lack of sidewalks is along Queen City Park Road, generally between Arthur Court and Home Avenue/Austin Drive. In addition, while the bridge over the railroad has a sidewalk, its metal grate material is undesirable, and many walkers avoid using the sidewalk.

### Bicycling

As shown in Figure 10, there are a variety of bicycle facility types in the study area, including shared use paths, bicycle lanes, shared lanes and advisory lanes. The bicycle level of traffic stress is a method to measure how comfortable a bicycle facility is for people, with a low stress environment (1 or 2 on a scale of 4) being completely separated from traffic, or shared with traffic on a low volume, low speed street. Stress levels are associated with user types, illustrated in Figure 8, with stress level 1 being most suitable for less experienced riders or mixed ability groups, and stress level 4 representative of riding on a busy road with no separation from traffic. As the goal of this project is to provide a bicycle connection through the study area for all ages and abilities of riders, a level of stress target of 1 is appropriate. As shown in Figure 9, the existing bicycle level of stress ranges from 1 on the shared use paths in the study area to 4 along Shelburne Road, due to the high volumes of traffic and lack of bicycle facilities. Queen City Park Road and Austin Drive have level of stress 2 where bike lanes exist, and 3 elsewhere.

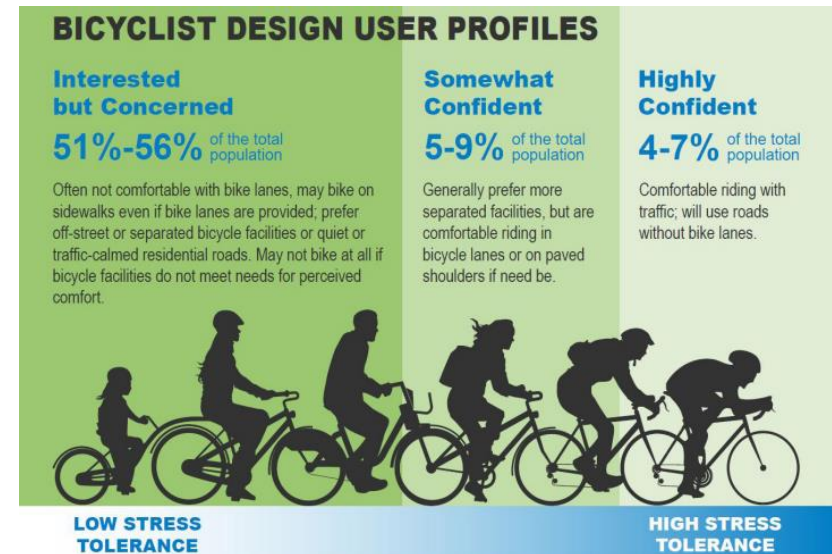


Figure 8: Bicycle User Profiles and Traffic Stress Tolerance



Figure 9: Existing Bicycle Level of Traffic Stress

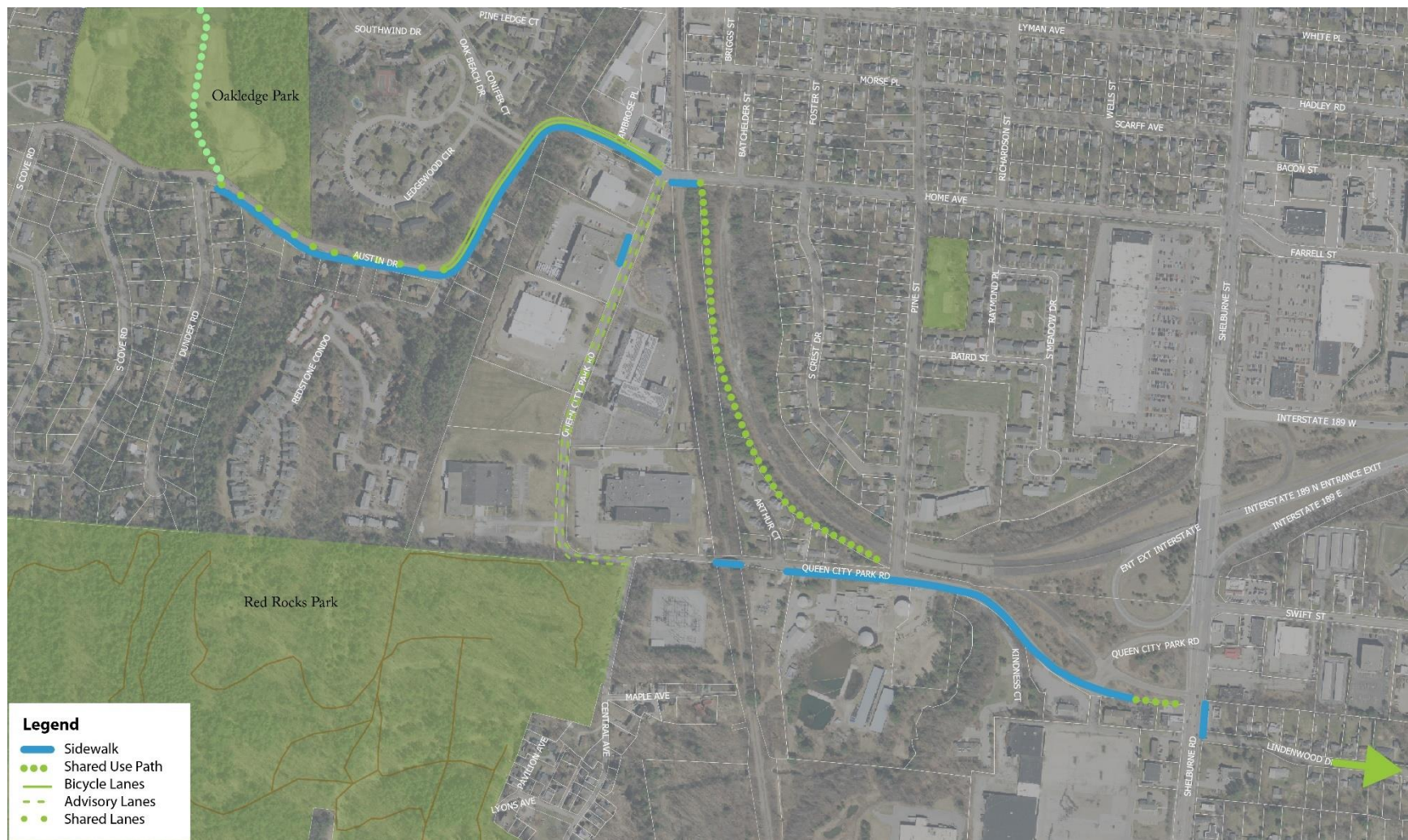


Figure 10: Bicycle and Pedestrian Facilities in the Project study Area



## Transit

Several routes are operated by Green Mountain Transit within or adjacent to the study area:

**Route #5** runs on Pine Street, terminating in a loop at the end of Pine Street via Queen City Park. This route runs on 60 minute headways, and serves the Howard Center on Pine Street.

**Route #6** runs on Shelburne Road on 20 to 30 minute headways, with a southbound stop at the Queen City Park Road intersection, and northbound at Lindenwood Drive.

Bus stop locations are shown in Figure 11. In addition to these fixed routes, the Green Mountain Transit service center is within the study area on Queen City Park Road, where all GMTA buses are serviced. This facility generates nearly 200 bus trips per day on Queen City Park Road.

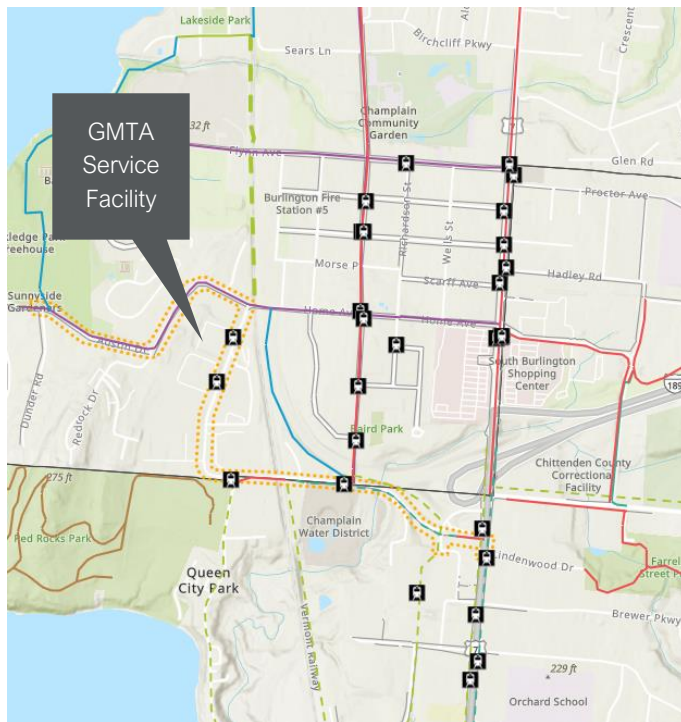


Figure 11: Bus Stop locations for GMTA Routes 5 and 6

## Driving

Study area traffic volumes are shown on Figure 12. The highest traffic is on Shelburne Road, followed by Queen City Park Road between Pine Street and Shelburne Road. The lowest volumes are on Queen City Park Road north of Central Avenue. It is expected that, after construction of the Champlain Parkway, traffic on Queen City Park Road east of Pine Street will be considerably lower than today.

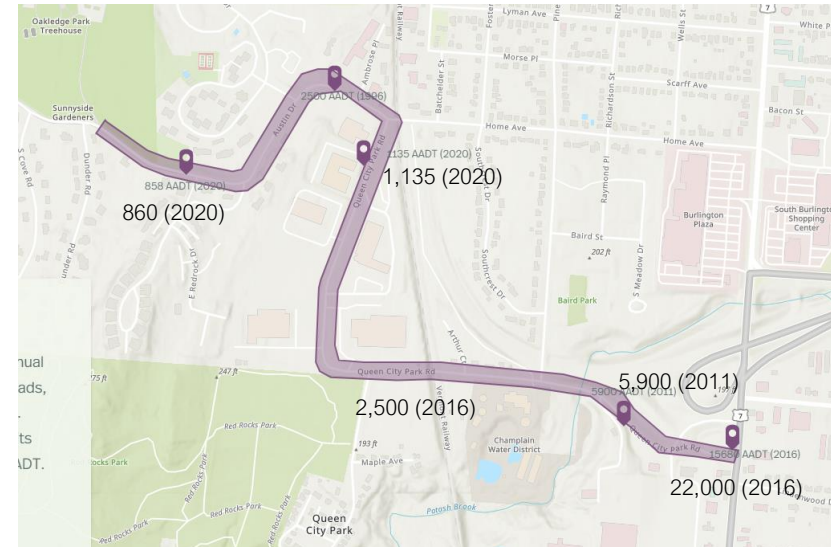


Figure 12: Average Annual Daily Traffic (VTrans)

## Crash Summary

Between January 2016 and April 2021, fifteen (15) crashes occurred in the study area (Figure 13):

- Eight (8) at the intersection of Queen City Park Road and Pine Street.
- Two (2) at the intersection of Austin Drive and Ledgewood Circle.
- One (1) at the intersection of Queen City Park Road and Central Avenue
- One (1) at the intersection of Shelburne Road and Lindenwood Drive.
- One (1) occurred along Queen City Park Road near the one-lane bridge over the railroad.

Three (3) of the fifteen were injury crashes. None were fatal. All crashes were vehicular, and no pedestrians or people on bikes were involved. Sight distance



from Pine Street appears to be a factor for the number of crashes at this intersection.

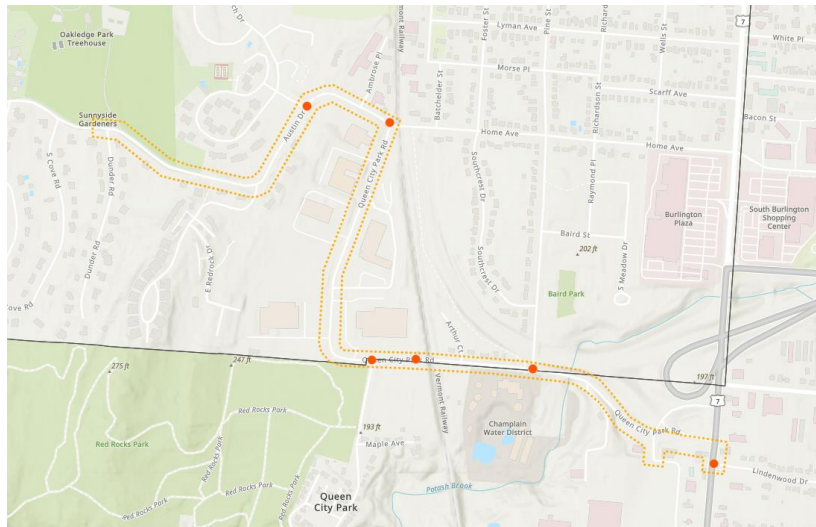


Figure 13: Crash Locations (Source: VTrans, 2016-2021)

## PROJECT AREA ENVIRONMENT

The study area was evaluated for environmental resources that may affect the design, location, or feasibility of alternatives.

### Natural Resources

Several natural resources in the study area will be considered in the planning and design of transportation projects:

- The project area drains either into Potash Brook or Lake Champlain, both of which are considered water quality impaired. This status emphasizes the need to reduce the amount of additional pavement resulting from the project. Incorporation of green stormwater infrastructure may be helpful to reduce any impacts to these waters.
- Wetlands are in the vicinity of the study area. Figure 14 shows that there are both Class 2 and possible Class 3 wetlands associated with Potash Brook, and additional areas in Red Rocks Park. None of these

are within 50 feet of the project corridor streets. There are additional wet areas in the project vicinity, including in drainage swales along Queen City Park Road. Some of these have recently been determined in the Burton Snowboards permitting process to not be wetlands under state jurisdiction.

- There are some rare species in the vicinity of the study area, primarily in Red Rocks and Oakledge Parks (Figure 15). There are also several sites on the south side of Queen City Park Road with rare plants, which may require documentation for any work outside of the roadway.

### Hazardous Material Sites

The Vermont Agency of Natural Resources hazardous material site inventory indicates that there are eight sites in the vicinity of the project area where hazardous materials have been discharged or spilled (Figure 16). All of these currently have a status of “SMAC - Site Management Activities Completed” or “NFAP - No Further Action Planned” with the exception of the Hoechner/Gulf site at 793 Shelburne Road, which has a status of “MED - Site with sensitive receptors that are threatened by contamination.” Contamination from this site was found during site investigations after a property sale, and was found to have spread to the Limoge apartment complex, adjacent to the site. Monitoring and the development of a corrective action plan (CAP) is currently underway. As any project work occurs in this area, it will need to be done in coordination with the Vermont Agency of Natural Resources. A summary table of all hazardous material sites is included in the report Appendix 4.

### Historic and Archaeologic

The UVM Consulting Archaeology Program conducted an assessment of cultural resources in the project area, including both architectural history and archaeological resources. While there is a rich agricultural and archaeological history in the project area, their report concludes that there are no intact resources in the project area that might be affected by the project. This is due to the proposed path being located on land that has already been disturbed, and any historic buildings in the area have been so significantly altered that they are no longer contributing to the area’s historic landscape.



Figure 14: Vermont Wetlands Mapping for Project Area





Figure 15: Rare, threatened and endangered species in the vicinity of the study area



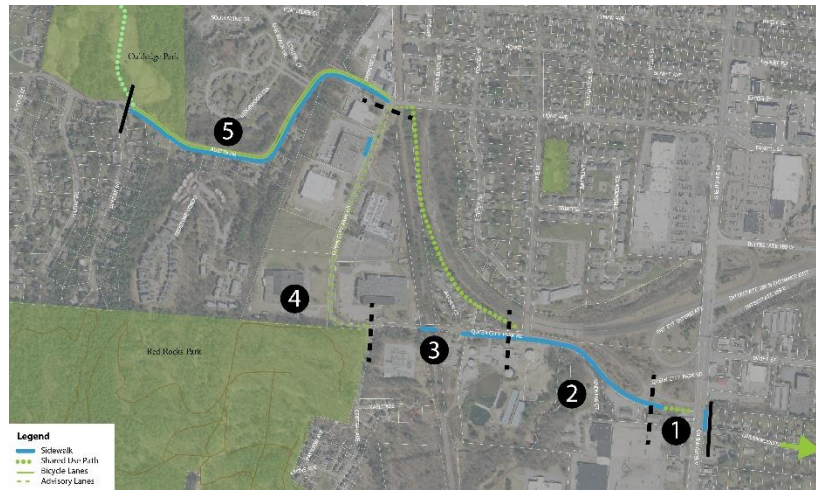


Figure 16: Hazardous Waste Sites in or adjacent to project area (Source: Vermont Agency of Natural Resources)



## ALTERNATIVES

The project area has broken up into segments (Figure 17) in order to evaluate the existing conditions and alternatives for each segment.



**Figure 17: Project Area Segments**

Alternatives for the project are specific to each segment, as conditions vary considerably. In general, pedestrian accommodations include sidewalks or shared use paths, and bicycle accommodations include shared use paths or separated bicycle lanes in order to achieve the low stress/all ages and abilities bicycle network.

## PEDESTRIAN ALTERNATIVES

To provide for safe and comfortable pedestrian travel on the study area streets, dedicated pedestrian infrastructure – either a sidewalk or shared use path – is considered for all streets in the project area, and marked/signed crosswalks where needed. While the advisory walk-bike lanes provide an indication to drivers to keep to the center of the road, and reserve the edges for walking and biking, input from people who currently walk in this area supports providing separated facilities. In the bend of Queen City Park Road just west of Central Avenue, the tracking of larger trucks and buses while turning puts people walking or biking at risk, especially in winter when snowbanks are present.

## BICYCLE ALTERNATIVES

Several different types of bicycle infrastructure were considered for each segment, as described and illustrated below.

### Shared Used Paths

Similar to the Champlain Parkway Path, these are 10 feet wide and typically surfaced with asphalt pavement. Pedestrians and bicycles share the space, so they are not well suited to corridors with high volumes of either people walking or biking. They can provide an enjoyable recreational experience as they allow for side-by-side riding.



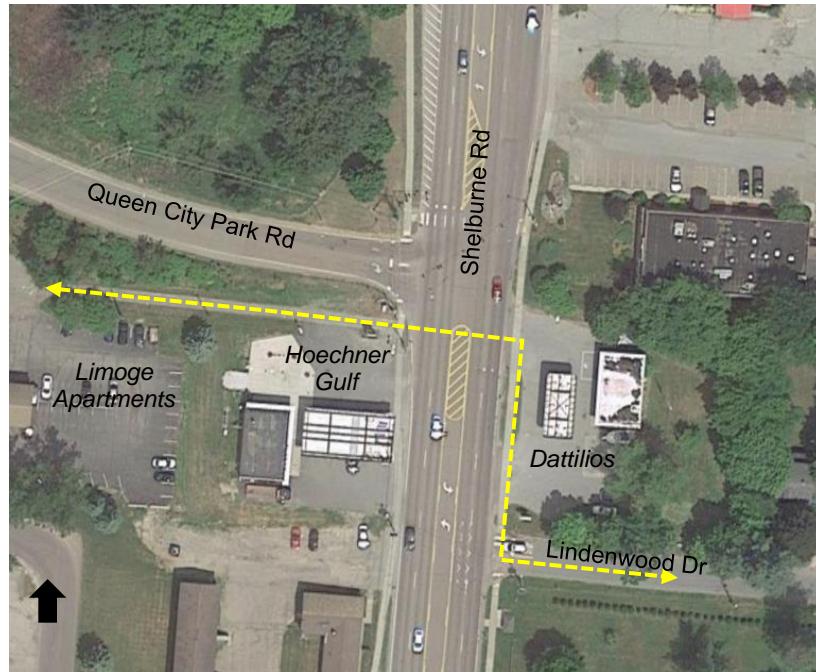
### Separated Bicycle Lanes

These allow bicycles to be separated from moving traffic by curbing, flex-posts, planters, or other materials. They can be constructed as one-way facilities on each side of a street, or two-way facilities on one side. These provide a comfortable riding experience for a range of abilities. Two-way facilities offer some advantages including greater ease of passing, side-by-side riding, and the ability of a small plow to perform snow removal. The disadvantage is that bicycles are sometimes traveling in a direction not expected by motorists, which can result in greater risk of conflicts at intersections and driveways.



## SEGMENT 1

This segment connects Lindenwood Drive with Queen City Park Road (Figure 18). An ongoing VTrans signal project will provide a crosswalk over the south side of the intersection of US 7/Shelburne Road and Queen City Park Road, which will significantly improve access from Shelburne Road to the existing segment of path, addressing many concerns about this location that were expressed early in this study process.



**Figure 18: Segment A – Shelburne Road to Existing Shared Use Path**

Conditions along the corridor include a sidewalk that many bicyclists will use to travel this segment of Shelburne Road, and the existing shared use path segment that is narrow at about 8 feet wide, with pavement and drainage that is in poor condition, and with a grade of approximately 7.5%.

With the high traffic volumes along Shelburne Road, and the current strong desire line to cross at the Queen City Park intersection to access the project area, the recommended improvements include widening the sidewalk on the

east side to a 10 or 12 feet wide shared use path, and widening the curb ramp on the west side to provide convenient access to the existing shared use path entrance. In addition, a bollard-style push button unit should be provided in a location that is convenient for people riding a bike to activate. See Figure 19 for an illustration of these recommendations.

## Site Photos



Shared Use Path connecting Shelburne Road with Queen City Park Road



Bicycle rider waiting to cross at Shelburne Road



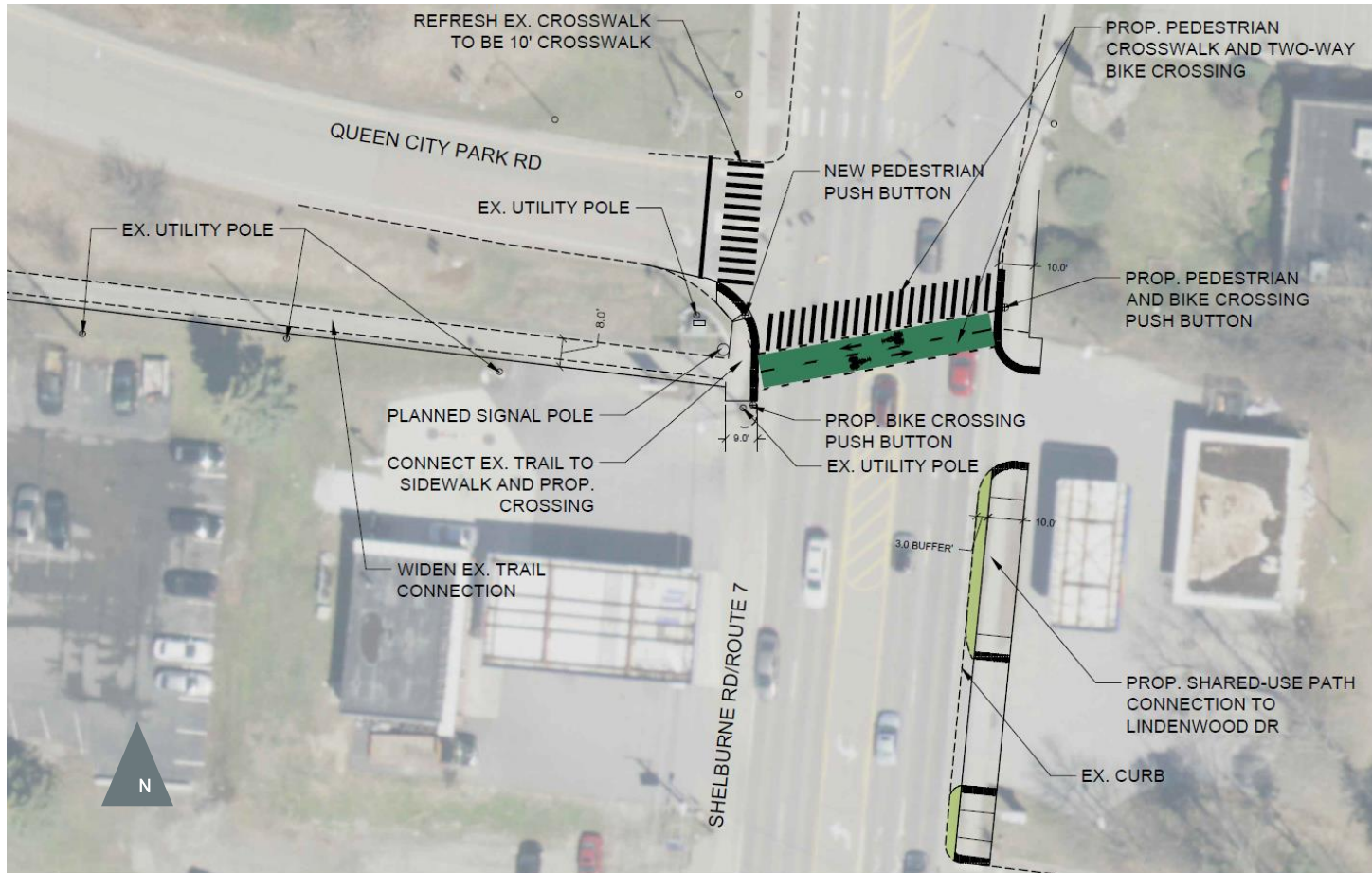


Figure 19: Proposed Recommendations for Segment A

## SEGMENT B

This segment extends from the Hannaford Plaza entrance at Queen City Park Road to the intersection of the Champlain Parkway Shared Use Path, just west of the intersection with Pine Street. This segment has a continuous sidewalk on the south side of Queen City Park Road and no dedicated bicycle facilities. There is no crosswalk, nor accessible curb ramp connecting the sidewalk to the Champlain Parkway Path.

### DESIGN CONSIDERATIONS

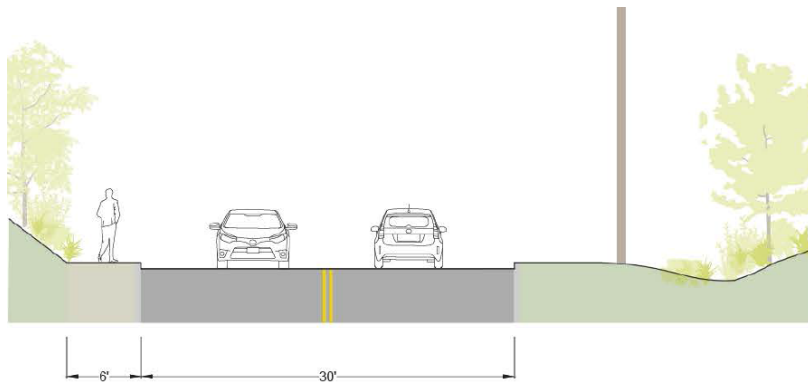
<b>SEGMENT LENGTH</b>	1,120 feet
<b>TRAFFIC VOLUME</b>	5,900 ADT
<b>POSTED SPEED</b>	25 mph
<b>RIGHT-OF-WAY WIDTH</b>	49.5 ft +/-
<b>PEDESTRIAN FACILITIES</b>	Sidewalk on south side
<b>BICYCLE FACILITIES</b>	Shoulders of approximately 4 feet

Public input for this segment expressed significant concerns at the intersection of Pine Street and Queen City Park Road due to sight distance and grades.

The City of South Burlington noted that the drainage infrastructure along the sides of this segment are in poor condition, and may need to be replaced if any proposed work involves relocation of catch basins.

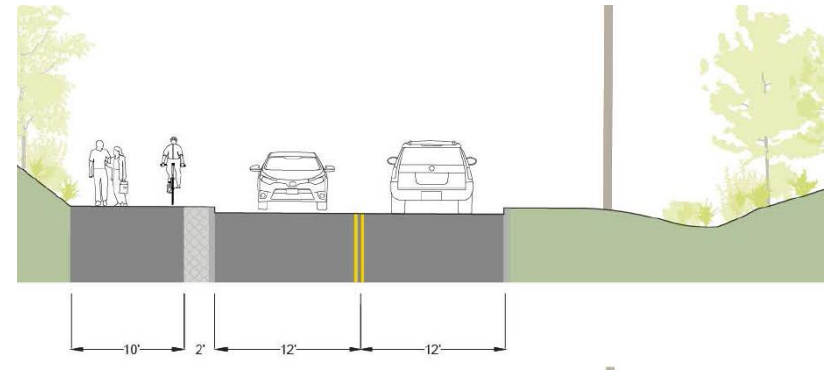
### Existing Width and Configuration

While the width varies somewhat along the length of this segment, the typical width of Queen City Park Road is 30 feet from curb to curb, and a 5 foot sidewalk with a 6 inch granite curb. This is shown below.



### Alternative: Shared Use Path

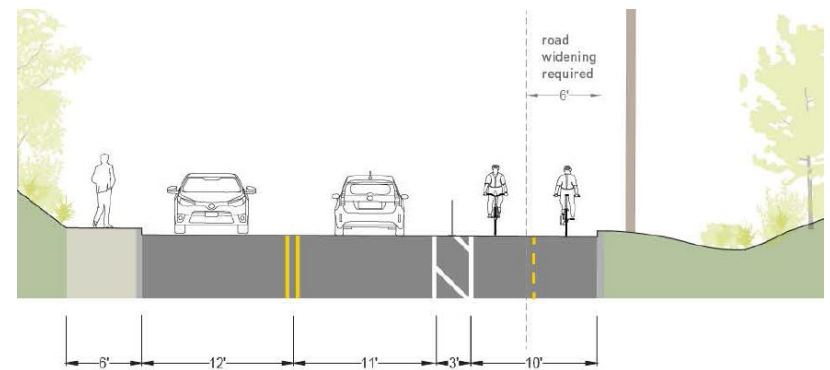
A shared use path can be constructed along the south side of Queen City Park Road such that the roadway width is narrowed by about 6 feet, and the sidewalk is essentially widened to the width of a shared use path, which has a minimum width of 10 feet.



This alternative would not result in any additional paved area, but would require relocating catch basins, and possibly associated reconstruction of the stormwater collection system on the south side of this street.

### Alternative: Separated Bicycle Lanes

In this alternative, Queen City Park Road would be widened to a total width of 36 feet to provide room for 2-way separated bicycle lanes on the north side of the street. This will also potentially require reconstruction of stormwater infrastructure, and examination of possible wetland impacts along the north side of the street.





Site Photos



Looking east from south side of street at Kindness Court



Possible wet area alongside of Queen City Park Road



Looking east from south side of street



Pine Street intersection



## SEGMENT C

This segment leads from the Champlain Parkway Path crossing to the intersection of Central Avenue. A sidewalk extends along Queen City Park Road for the frontage of the Champlain Water District, and there is a sidewalk on the bridge over the railroad. West of the bridge over the railroad, there is a gravel path or shoulder on the south side that leads to Red Rocks Park.

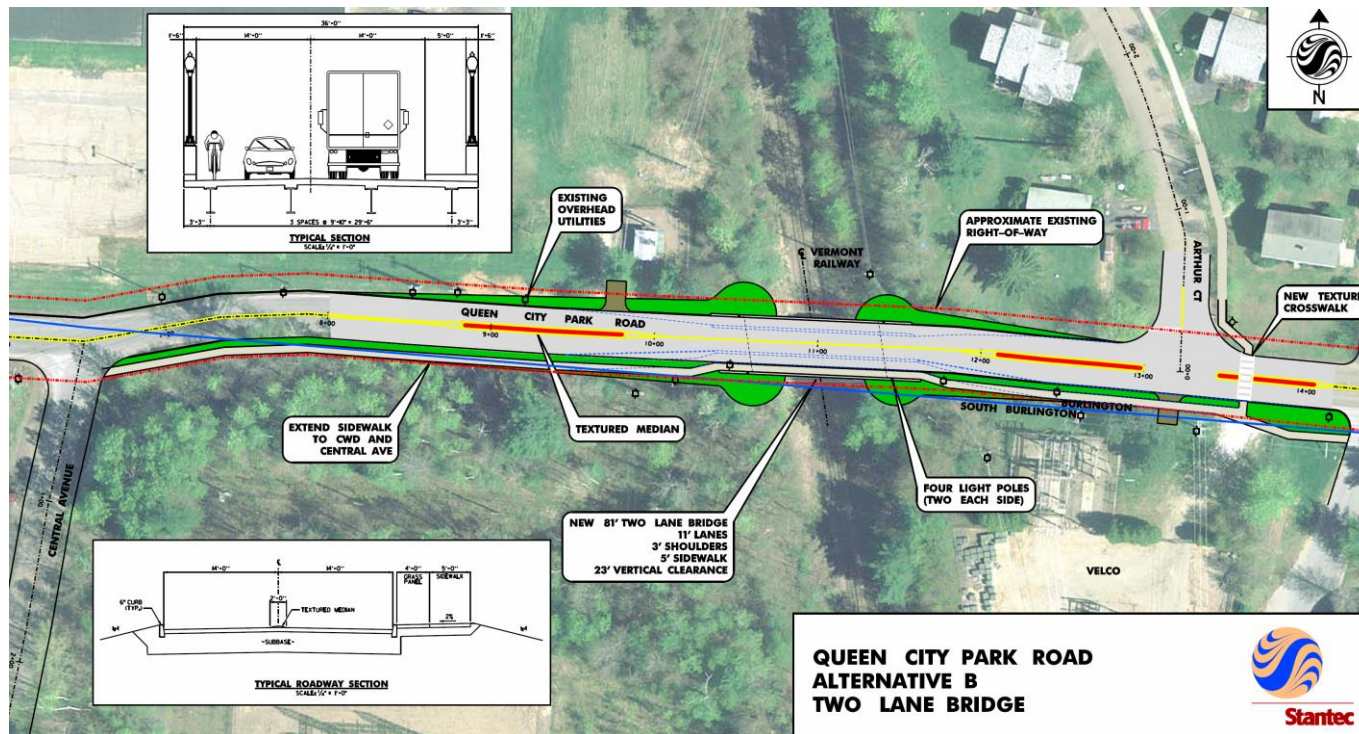
### DESIGN CONSIDERATIONS

SEGMENT LENGTH	1,300 feet
TRAFFIC VOLUME	2,500 ADT
POSTED SPEED	25 mph
RIGHT-OF-WAY WIDTH	49.5 feet +/-
PEDESTRIAN FACILITIES	Intermittent sidewalk on south side
BICYCLE FACILITIES	Shared lane (unmarked) or shoulder

Public concerns noted in this section included a lack of a continuous sidewalk, and inadequate parking at Red Rocks Park. Among the intent of the project is

to provide better access to Red Rocks Park for people biking and walking, which could potentially help to alleviate the parking situation.

The one-lane bridge over the Vermont Railway corridor has also been the subject of study and concern. Its current condition requires motorists to yield to oncoming traffic due to the narrow width. There is a sidewalk on the bridge, but its metal grate surface makes it unusable for anyone walking a pet. While there is a sidewalk on the bridge, the lack of curbed sidewalks approaching the bridge allows waiting vehicles to pull along side of the road, waiting for oncoming traffic to pass, which hinders safe pedestrian access. A study was conducted in 2008 that evaluated alternatives for rehabilitation or replacement, and identified a preferred alternative for the bridge replacement to have two lanes for traffic, plus a sidewalk. At this time, no funding for the bridge replacement has been identified. When the bridge eventually is funded for design and construction it can be designed to accommodate the facilities identified as the preferred alternative for this corridor segment.





## Site Photos



Wide buffer and utility poles between sidewalk and street



Bus stop near Pine Street



Approach to bridge from west

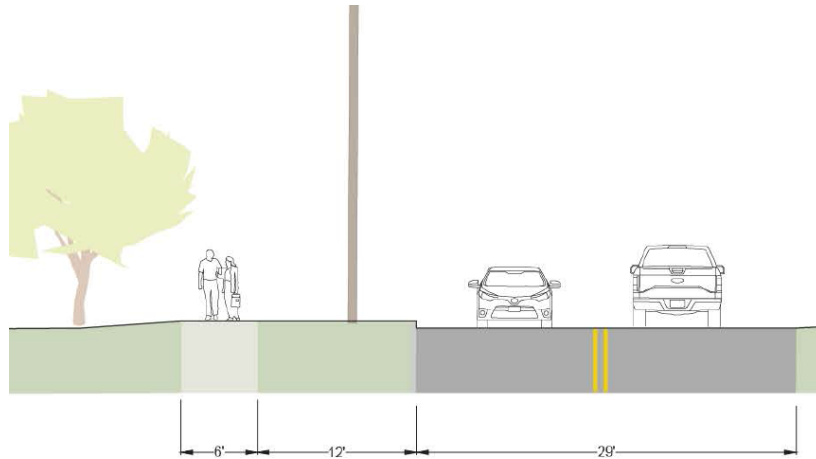


Path leading to Red Rocks Park



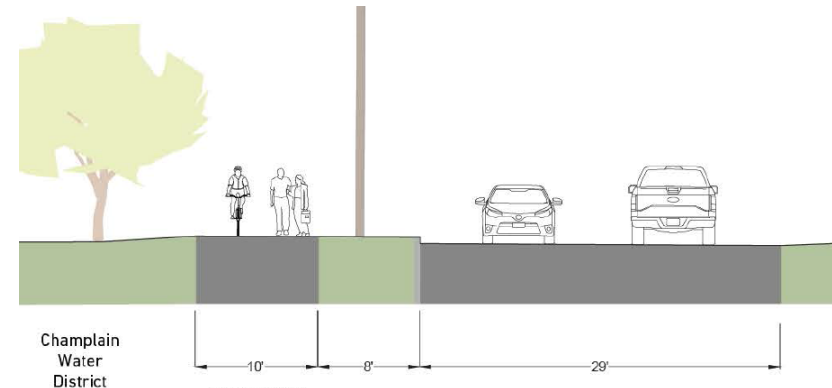
## Project Alternatives

Two options were explored for this alternative: a shared use path on the south side, or widening the road by approximately 8 feet to provide for separated bicycle lanes. As the timeline for the bridge replacement is uncertain at this time, it is expected that the bridge project could be designed and constructed to accommodate the preferred alternative as identified in this report.



### Shared Use Path Alternative

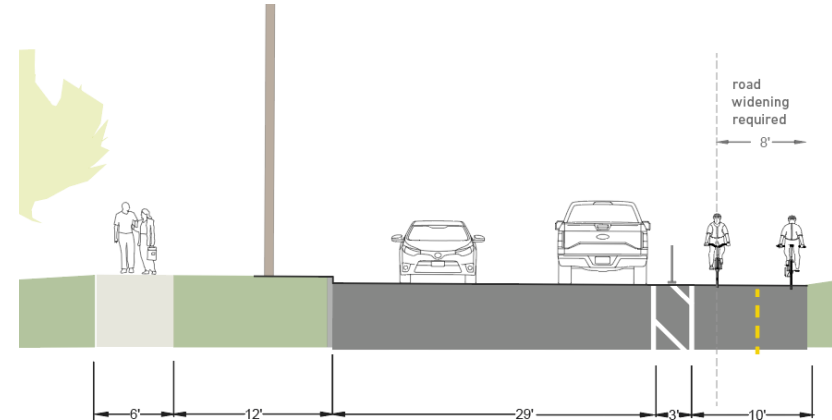
The shared use path would be established by widening the sidewalk to a width of 10 feet where it exists, and constructing a new path where there is no sidewalk. This is illustrated on an aerial photograph above, right. In general, the shared use path could avoid conflicting with utilities that are present along the south side of the street.



Shared Use Path on south side

### Separated Bicycle Lanes

This option involves widening the road to the north side by about 8 feet, and providing two-way separated bicycle lanes. This would allow riders to access the Champlain Parkway Path without crossing the road. There would be relatively few utility impacts, and all widening would be within the city right-of-way.



Separated Bicycle Lanes on north side

## SEGMENT D

This segment runs between the intersection of Central Avenue and Home Avenue/Austin Drive, through an industrial zone with commercial, manufacturing, and transportation uses. This section currently has advisory lanes for walking and biking, which were installed after a recent resurfacing project.

### DESIGN CONSIDERATIONS

<b>SEGMENT LENGTH</b>	2,000 feet
<b>TRAFFIC VOLUME</b>	1,200 ADT
<b>POSTED SPEED</b>	25 mph
<b>RIGHT-OF-WAY WIDTH</b>	49.5 feet +/-
<b>PEDESTRIAN FACILITIES</b>	Advisory lanes
<b>BICYCLE FACILITIES</b>	Advisory lanes

While overall traffic volumes for this segment are relatively low, the land uses in this area generate significant heavy vehicle traffic. Rhino Foods and Edlund have deliveries in and out with tractor trailers, and Green Mountain Transit buses move in and out of their site for maintenance throughout the day.

The level topography and the high water table in this area create a challenge for stormwater drainage. There are currently large swales on each side of Queen City Park Road to manage stormwater from both private land and the street right-of-way. Burton Snowboards is in the process of design and permitting of a site renovation that will include new stormwater infrastructure so that all of their stormwater is handled on-site. The drainage pattern for Queen City Park Road was altered during the recent resurfacing such that for its frontage with the Burton Snowboards site, it now drains to the east. This was done in part to facilitate the construction of a sidewalk or shared use path on the east side of Queen City Park Road. This alteration in drainage patterns, in conjunction with the proposed alterations at Burton Snowboards, obviates the need for the swale on the eastern side of Queen City Park Road in this segment.

The proposed layout of the Burton Snowboards site is shown on Figure 20, with the potential alignment of a sidewalk or shared use path shown in red.



Figure 20: Burton Snowboards Site Plan



## Site Photos



Approach to Central Avenue from the east



Drainage swale and utilities in front of Burton Snowboards site



Advisory Lanes signage



Drainage swale and utilities near Rhino Foods



## QUEEN CITY PARK-AUSTIN DRIVE BICYCLE PEDESTRIAN CONNECTIONS SCOPING STUDY | FINAL REPORT

Other planned changes to this area include changes at the Queen City Park/Home Avenue/Austin Drive intersection, associated with the Champlain Parkway (Figure 21). These include a new shared use path connection from the intersection to the existing Champlain Parkway Path, as well as its northern extension up to Pine Street. The intersection of the Champlain Parkway will be signalized, which will affect traffic circulation in this area. In addition, traffic circulation may be affected by planned AMTRAK service along the Vermont Railway corridor.

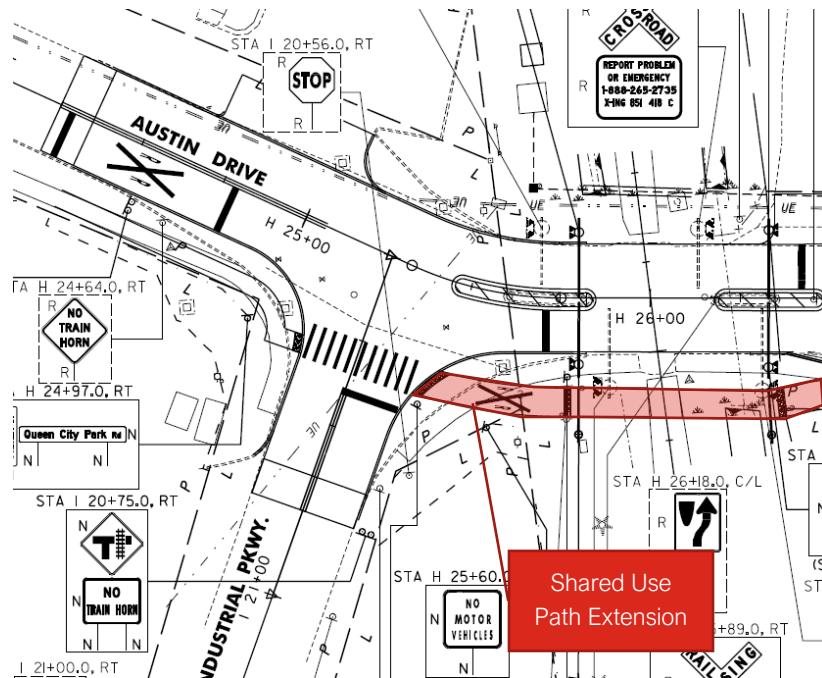
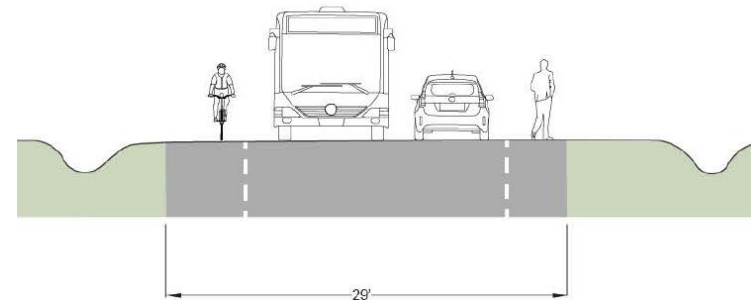


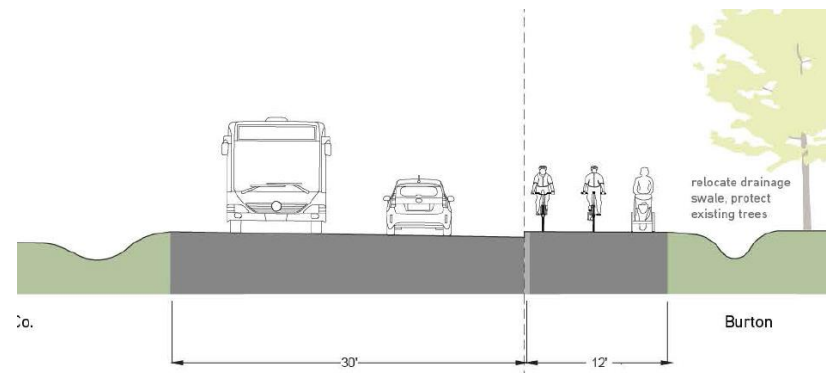
Figure 21: Plan Excerpt for Champlain Parkway project

### Proposed Alternatives

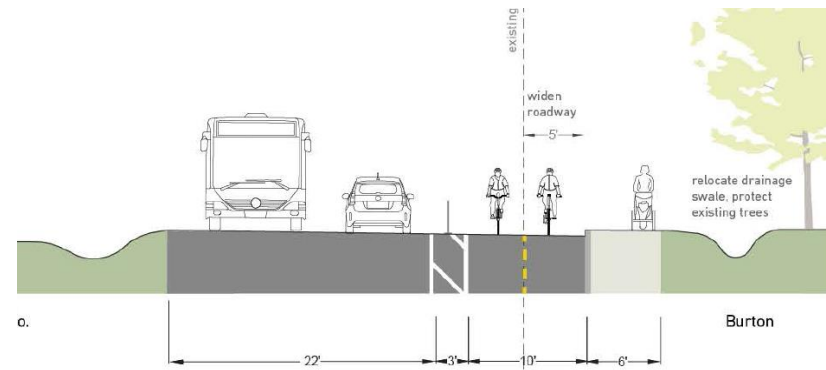
Queen City Park Road has a width of 28 to 30 feet, and is marked with Advisory lanes for walking or biking. Two alternatives are considered: one with a new shared use path constructed on the east side of Queen City Park Road, and one with a new sidewalk constructed, plus separated bicycle lanes. The option of constructing a new sidewalk and maintaining the advisory lanes for bicycles was considered, but as the costs were higher and impacts were similar to construction of a shared use path, so this alternative was less favorable.



Existing Cross Section



Shared Use Path on east side of Queen City Park Road



Sidewalk and separated bicycle lanes



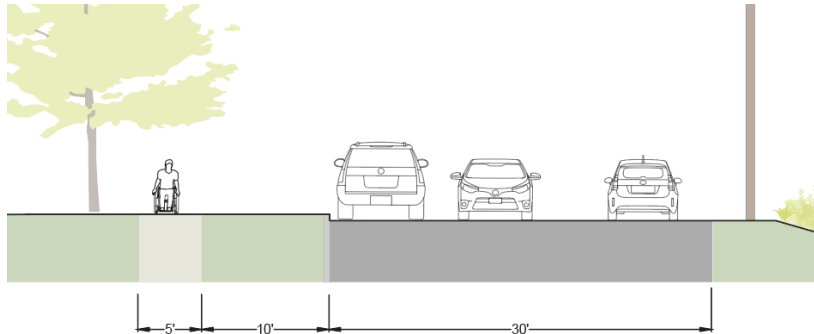
## SEGMENT E

Austin Drive between the Home Avenue/Queen City Park intersection and the crossing to the Burlington Waterfront Greenway makes up this segment, which includes bike lanes on the eastern portion and shared lanes with parallel parking on the western section. Land uses are all residential, and the parking usage is primarily for people accessing Oakledge Park, which charges a fee for parking in its dedicated lot on Flynn Avenue.

### DESIGN CONSIDERATIONS

SEGMENT LENGTH	2,600 feet
TRAFFIC VOLUME	1,100 ADT
POSTED SPEED	25 mph
RIGHT-OF-WAY WIDTH	60 feet
PEDESTRIAN FACILITIES	Sidewalk on south side
BICYCLE FACILITIES	Bicycle lanes, shared lanes (marked)

The right-of-way of 60 feet is wider than other streets in the study area, and the existing sidewalk has a generous tree lawn, with tree plantings and utilities present.

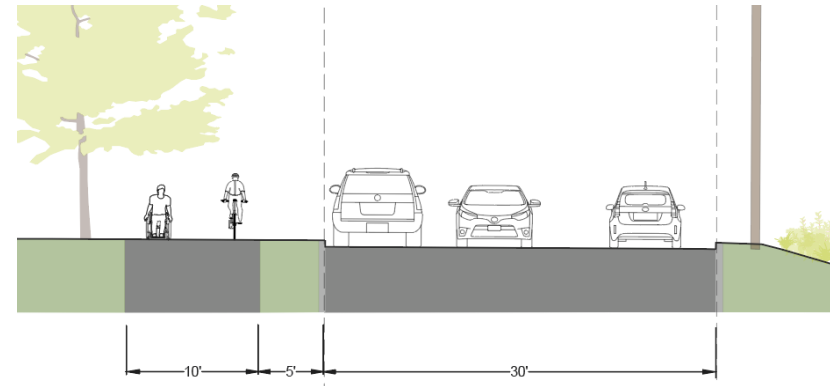


### Alternatives

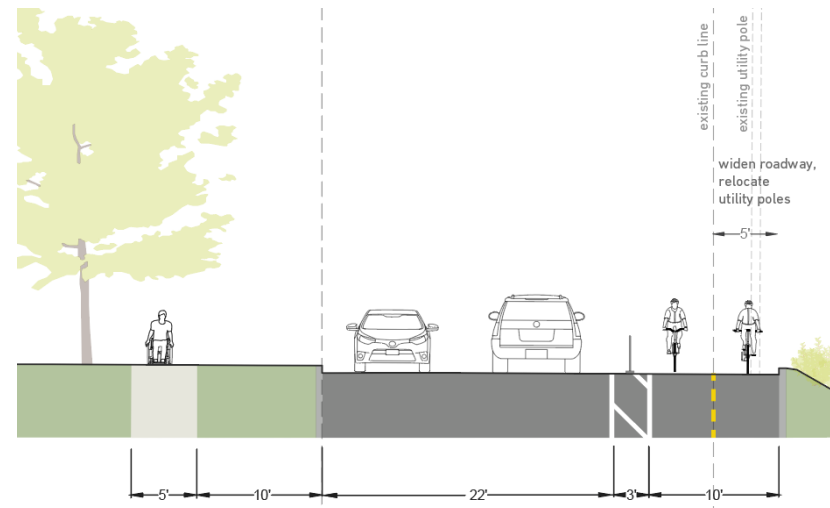
Two alternatives were developed for this section to address the project goal to provide low stress bicycling along Austin Drive:

**Widen sidewalk to a 10 feet shared use path.** This will be possible to do within the public right-of-way, and can avoid utility impacts by aligning the path around trees and existing electric and telecom utilities. This will not affect stormwater drainage patterns on Austin Drive, but it will increase the paved area surface by approximately 10,000 square feet, which is less than a quarter

acre. This option will preserve the on-street parking along Austin Drive that provides free access to Oakledge Park.



**Widen Austin Drive to provide separated bicycle lanes.** In this alternative, the existing street width would be widened by approximately 5 feet to provide space for separated bicycle facilities. This will require some utility relocation, including electric, telecom, and stormwater infrastructure. It will require either prohibition of on-street parking, or additional street widening of about 8 feet to accommodate a parking lane. This option will also result in about 10,000 square feet of additional paved area.





## Site Photos



Looking east toward Home/Queen City Park intersection



Shared lanes and sidewalk on Austin Drive



Intersection of Red Rocks Condominium Entrance



Crosswalk to Burlington Waterfront Greenway



## PREFERRED ALTERNATIVE

After consideration of the advantages and constraints of each alternative, project costs, and public input, the Shared Use Path alternative is recommended for implementation. The following factors were important in this recommendation:

- The project costs are lower for the shared use path in segments 3 and 4, and only slightly more costly for segments 2 and 5. (Bicycle lanes were not considered an alternative for segment 1).
- The project impacts to utilities and environmental resources are nearly identical for each alternative, and therefore not a significant factor in the recommendation.
- Providing a continuous shared use path connecting the entire study area will provide continuity in the rider experience, and will be easier to navigate for less experienced riders. It would be possible to select different alternatives for each segment, but the consistent type of facility is desirable to make this connection.

Table 1: Project Cost Estimates by Segment

SEGMENT	1	2	3	4	5
<b>TOTAL CONSTRUCTION COST ITEMS</b>	\$ 145,000	\$ 326,000	\$ 245,000	\$ 563,000	\$ 565,000
<b>25% CONTINGENCY</b>	\$ 36,000	\$ 82,000	\$ 61,000	\$ 141,000	\$ 141,000
<b>PROJECT MANAGEMENT (10%)</b>	\$ 18,000	\$ 41,000	\$ 31,000	\$ 70,000	\$ 71,000
<b>DESIGN ENGINEERING (22%)</b>	\$ 40,000	\$ 90,000	\$ 67,000	\$ 155,000	\$ 155,000
<b>CONSTRUCTION ENGINEERING (15%)</b>	\$ 27,000	\$ 61,000	\$ 46,000	\$ 106,000	\$ 106,000
<b>TOTAL PROJECT COST</b>	\$ 266,000	\$ 600,000	\$ 450,000	\$ 1,035,000	\$ 1,038,000
<b>LENGTH (FEET)</b>	540	1400	1200	2100	2700
<b>COST PER FOOT</b>	\$ 492.59	\$ 428.57	\$ 375.00	\$ 492.86	\$ 384.44

## COST ESTIMATE

A planning level cost estimate has been prepared for each alternative, incorporating the following assumptions:

- The most recent available VTrans unit costs were used for major items such as excavation, pavement, curbing, catch basins, pavement markings and plantings.
- A contingency of 25% has been included to cover costs of items that have not specifically been quantified due to the planning level of this analysis.
- Allowances were also included for items including mobilization, erosion control, traffic control, design engineering, and construction engineering.

The following table summarizes the cost for each project segment for the alternatives of a shared use path or separated bicycle lanes.

Segment cost estimates are provided in Appendix 5.

## IMPLEMENTATION STRATEGY

The project will require the coordination of the cities of Burlington and South Burlington to implement this regional project. While it is likely to be completed in phases due to funding constraints, the following are considerations for implementation.

### Funding Sources

There are many possible funding sources for this project. Several of the most commonly-used funding sources include the following:

- VTTrans Bicycle-Pedestrian Program. This program uses up to 80% federal funds and 10% state funds for projects to improve bicycle and pedestrian transportation. There is a 10% local match, and no project funding limit, though it is rare for a project exceeding a total cost of \$1 million to be funded in a single year/grant cycle.
- VTTrans Transportation Alternatives Program. This program provides 80% federal funds and requires at least a 10% local match. The projects are capped at \$500,000 total cost (\$375,000 grant award), and are sometimes used to provide additional funding for large bicycle/pedestrian projects.
- RAISE grants. This is a new federal funding source that may be a source for funding the entire project, as typical grants exceed \$2 million.

There may be options to augment funding with urban forestry or stormwater project funding for project elements such as tree planting or green stormwater infrastructure.

### Bridge Project

While the timing of a potential replacement project for the bridge carrying Queen City Park Road over the Vermont Railway is uncertain, the bridge design should be done to match the preferred alternative, which is for two lanes of traffic at approximately 11 feet each, and a shared use path of 10 feet in width, to provide consistency in the corridor.

### Prioritization and Phasing

Each segment has a different role in this network, and the prioritization among segments should consider the relative needs. Some considerations for prioritization include the following:

- Segments 1 and 2 should be considered for implementation at the same time and with the same priority, as they are both essential to make the connection from South Burlington's Recreation Path network to the Champlain Parkway path, which will eventually continue towards downtown Burlington when the Champlain Parkway is completed. Segment 1 will require coordination with the State of Vermont both because part of this is within the right-of-way of US Route 7, and because of potential hazardous materials issues adjacent to the Hoechner Gulf/Limoge Apartments hazardous materials site.
- Segment 3 addresses connectivity for all modes to Red Rocks Park. With the current issues related to inadequate parking, providing safe and comfortable walking and biking access to the park will be beneficial.
- Segment 4 addresses needs for access to significant employment opportunities, and currently has pedestrian and bicycle accommodations that do not provide any separation from traffic that includes heavy trucks and buses.
- Segment 5 may be relatively lower priority due to the presence of bicycle lanes for part of this route, and the lower volumes on Austin Drive. There may be greater opportunity to reduce traffic speeds through installation of traffic calming measures, making the street more suitable to shared use by people biking and driving. As any sidewalk repairs or utility work are done in this segment, consideration should be made for the eventual widening of the sidewalk to a 10 feet wide shared use path.



## SHORT TERM RECOMMENDATIONS

The following are proposed as near-term projects for consideration, to address issues raised in the public engagement, and result in some benefits to safety and accessibility.

**Queen City Park/Hannaford Intersection.** This location had numerous complaints for confusing circulation. One factor is that the street network is confusing, and overly wide paved area doesn't define travel ways. In observed field conditions, the pavement markings indicating that this is an all-way stop intersection are barely visible, likely due to the heavy traffic in this area. Figure 22 shows potential rapid implementation changes using paint, flex-posts, and other low cost materials to clarify circulation and reduce vehicle speeds.

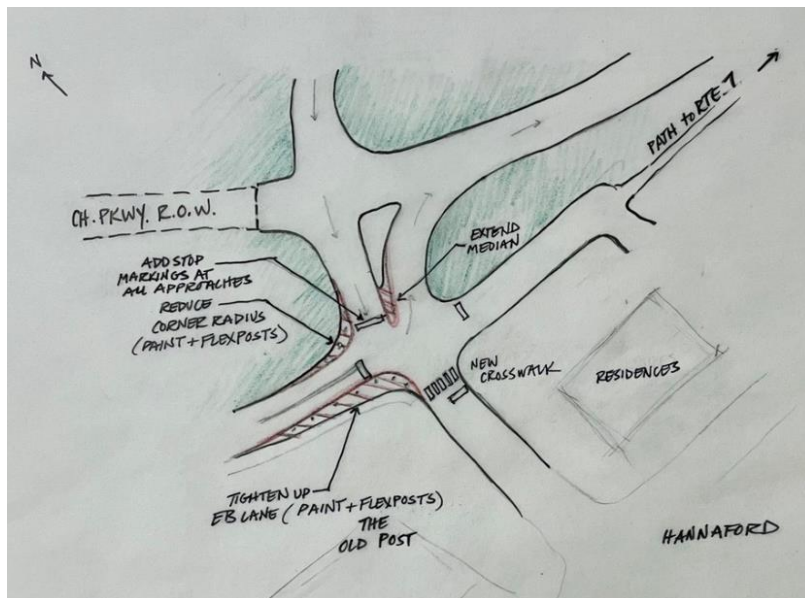


Figure 22: Short Term Recommendations for Queen City Park Road at the Hannaford entrance

**Queen City Park Road between Hannaford and Pine Street.** Narrow travel lanes to 10 feet, and provide 5 ft bicycle lanes. This provides some additional space and may have the effect of reducing traffic speeds.

**Pine Street/Queen City Park.** Initial analysis using available data suggests that all-way stop would be appropriate for the traffic volumes at this intersection. Pine Street carries a similar amount of traffic as Queen City Park Road, making an all way stop advantageous. This change could be beneficial for speed reduction and improved safety.

**Queen City Park Road Bridge over the Railroad.** Re-deck sidewalk with a material that can be more easily cleared of snow, and that will be comfortable for pets to walk on in all seasons. At bridge approaches, provide some protection for pedestrians approaching sidewalk on the western side of bridge with quick build materials, as vehicles pull into the shoulder waiting for oncoming vehicles, not leaving any space for people crossing bridge on foot.

**Queen City Park Road/Central.** Consider all-way stop to reduce confusion, as only two approaches stop currently. Traffic count would be useful to confirm traffic operations.

**Queen City Park Road/Home/Austin.** Consider all way stop as an interim measure before the Champlain Parkway is constructed. Traffic count would be useful to confirm traffic operations

**Austin Drive/Redstone Condo Drive** - Reinforce the painted curb extensions with quick build materials, such as planters, flex posts, or reflective elements, and solid colored paint.

**Austin Drive Traffic Calming** – Consider traffic calming measures such as speed lumps, chicanes or choke points to reduce speeds along this street and make it more suitable for shared use for bicycling.

## ATTACHMENTS

1. Advisory Committee Meeting Notes
2. Survey Results
3. Public Meeting Notes and Presentation
4. Hazardous Materials Table
5. Cost Estimates by Segment