

## MEMORANDUM

December 10, 2019

To: Bryan Davis, AICP and Marshall Distel, CCRPC  
Elizabeth Gohringer and Nicole Losch, Burlington DPW

Organization: Chittenden County Regional Planning Commission  
City of Burlington

From: Lucy Gibson, PE  
Stephanie Weyer, PLA

Project: Bikeway Connectivity, Pedestrian Safety, and Stormwater Management in  
Burlington's Old North End

### Re: Existing Conditions & Statement of Project Purpose

In partnership with the Chittenden County Regional Planning Council (CCRPC) and City of Burlington (the City), Toole Design has conducted existing conditions research as part of a project to address biking connectivity, pedestrian and cyclist safety, and stormwater management in the Old North End neighborhood of Burlington, VT. This memorandum summarizes that research, providing an overview of existing infrastructure, connectivity gaps, plus public input from an initial community meeting. A statement of project purpose and need follows the summary along with recommendations for next steps in the project.

## Project Overview

This project was initiated by CCRPC and the City in their commitment to making walking and biking safer and more comfortable in Burlington. The project is funded through CCRPC and will result in concept plans and cost estimates for streets in the Old North End. The project team is focusing the concepts to provide low stress bicycle connections plus streetscape and intersection improvements. The team will also identify opportunities to address drainage issues and integrate green stormwater infrastructure into streetscape concepts.



### Project Area

The Old North End is located just north of downtown Burlington. The bounds of the project area are shown in **Figure [x]**. They include Lakeview Terrace and North Avenue to the northwest, North Street to the north, North Champlain Street to the east, the full area of Battery Park, Pearl Street and Battery Street to the southeast, and Depot Street to the west. The streets are mostly two-way throughout the project area. However, Park Street runs one-way south from North Street to Sherman Street, and North Champlain Street heads one-way north throughout.

## Timeline

The project is operating on the following timeline. Concept development is the next step beyond this memo.

<b>September 2019</b>	Project Kickoff
<b>Fall 2019</b>	Community Meeting & Existing Conditions Analysis
<b>Winter 2019 – 2020</b>	Concept Development by Project Team
<b>Winter – Spring 2020</b>	Concept Refinement with Community Review
<b>Spring 2020</b>	Finalize Concept Plans and Planning Level Cost Estimates

## Stakeholder and Public Engagement

Feedback is being sought throughout the project from the members of an Advisory Committee that includes City staff plus regional and neighborhood representatives:

- Ethan Waldman, NPA Ward 3 Rep
- Mary Manghis, Burlington Walk Bike Council
- Barry Simays/Aaron Collette, Burlington Fire Department
- Max Madalinski, Burlington Parks, Recreation and Waterfront
- James Sherrard, Burlington Department of Public Works (Stormwater)
- Nicole Losch/Elizabeth Gohringer, Burlington Public Works (Transportation)
- Bryan Davis/Marshall Distel, CCRPC

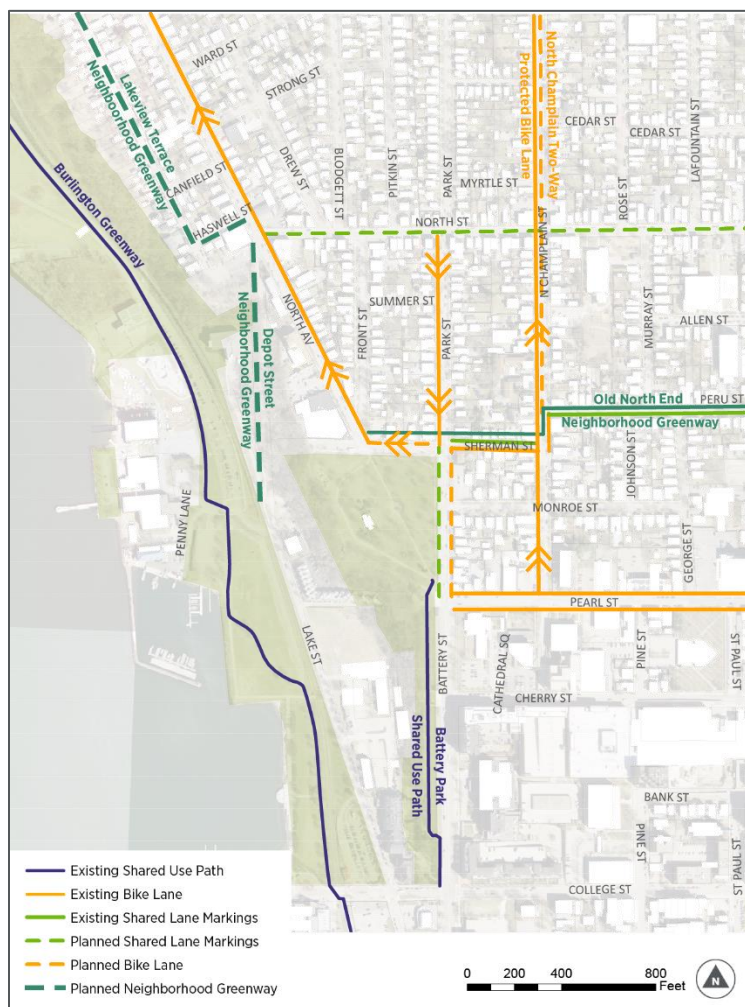
Toole Design also sought public involvement by presenting existing conditions and soliciting feedback at the Ward 2/3 NPA community meeting on November 14, 2019. Community members made comments during the meeting, and seventeen people provided comments and drawings on handouts that included maps. Their thoughts are summarized below.

### General Comments

- East – west connections are lacking in Old North End
- High bike volume areas would benefit from better lighting
- Add bike lanes going opposite on one-ways
- Plow bike lanes / road shoulders
- Get police to enforce cell phone use
- Set motion-detecting traffic lights to detect bicyclists
- More street trees needed
- More roundabouts requested
- Add rain gardens in all locations that collect water runoff, including parking lots. Can function as traffic calming.
- Consider permeable bike lanes

## Location Specific Comments

LOCATION	COMMENTS
Battery Park	<ul style="list-style-type: none"> <li>▪ Connection requested a few times between Battery Park and Waterfront Park/Lake Street</li> <li>▪ Would like to see road removed and for parking to not be allowed in park during functions</li> </ul>
Battery Street	<ul style="list-style-type: none"> <li>▪ Noted multiple times as dangerous and in need of safer crossings. Sidewalk riding feels necessary</li> <li>▪ Consider lane reduction</li> <li>▪ Crosswalk needed across Battery at Monroe Street. Flashing beacons requested here</li> <li>▪ Intersections with Sherman Street, Pearl Street, and College Street noted multiple times for improvements</li> </ul>
North Street	<ul style="list-style-type: none"> <li>▪ Bike lanes requested</li> <li>▪ Suggestions for parking on side streets / no cars</li> <li>▪ Request for street to be plowed in winter</li> </ul>
North Avenue	<ul style="list-style-type: none"> <li>▪ Street is narrow at intersection near police station, so cyclist rides on sidewalk</li> <li>▪ Protected bike lanes desired</li> <li>▪ Intersections with North Street, Sherman Street, and North Champlain Street noted multiple times as needing improvements</li> <li>▪ Flashing beacon requested at intersection with Ward Street</li> </ul>
Depot Street	<ul style="list-style-type: none"> <li>▪ Cyclist is surprised to see cars here and points out that cyclists pick up speed going downhill</li> <li>▪ Intersection with North Street needs improvement. Sidewalk riding feels necessary</li> </ul>
Sherman Street	<ul style="list-style-type: none"> <li>▪ Loves the two-way bike lanes</li> </ul>
Pearl Street	<ul style="list-style-type: none"> <li>▪ Noted a few times as needing protected bike lanes. Connect to other lanes</li> <li>▪ Path in Battery Park down from Pearl Street is a tourist destination for photo-taking</li> </ul>
Cherry Street	<ul style="list-style-type: none"> <li>▪ Needs safety improvements</li> </ul>
College Street	<ul style="list-style-type: none"> <li>▪ Needs safety improvements</li> <li>▪ Intersection with Battery Street noted a few times</li> </ul>
Main Street	<ul style="list-style-type: none"> <li>▪ Needs safety improvements</li> </ul>



## Existing & Planned Infrastructure

Toole Design worked with City staff and reviewed previous studies, plans, and 2018/19 construction drawing sets to identify existing and planned bike infrastructure in Burlington. We also conducted an in-field observation of existing conditions on October 25, 2019. The result of this research is summarized in Figure [X], which shows the locations of existing bicycle infrastructure and planning priorities. Some installations have been made according to 2-5-year priorities identified in the 2017 planBTV Walk Bike Master Plan.

### North-South

Existing north-south connections include standard northbound bike lanes on North Avenue starting at Sherman Street and on North Champlain Street from Pearl Street. A small two-way segment connects Sherman and Peru Streets as part of the Old North End Neighborhood Greenway (ONE). On Park Street, a southbound standard lane runs between North and Sherman Streets. The Battery Park Shared Use Path provides a means to travel separated from motor vehicles, though

allowable uses are not clear. These are further described under “Issues and Connectivity Gaps.”

On Park Street between Sherman and Pearl Streets, a pavement marking set has been made for southbound shared lane markings and a northbound bike lane. A pavement marking set also exists for the Lakeview Terrace Neighborhood Greenway to follow the Redstone Condo Development. Plans are under development for a two-way protected bikeway on North Champlain Street and changes at the Battery and Pearl Street intersection.

### East-West

The 2017 plan had prioritized creating east-west connections, with paint-buffered bike lanes now installed on Pearl Street. The lanes on Pearl are mostly buffered from parked cars to prevent dooring. The Old North End Neighborhood Greenway (ONE) identified in the plan and a follow-up study is now partially complete. The ONE, or the Wiggle, includes a counterflow east-running bike lane on Sherman Street from Park to N Champlain Streets. Shared lane markings otherwise mark the westbound movement in this location and two-way movement to the east of N Champlain Street, with additional traffic calming measures planned. A westbound bike lane is planned west of Park Street.

Shared lane or advisory markings were identified by the 2017 plan as a 2-5-year priority for North Street along with traffic calming.

Depot Street is used like a shared use path by cyclists and pedestrians while remaining open to motor vehicles during special events on the waterfront [is that correct?]. It is currently the only connection between the street

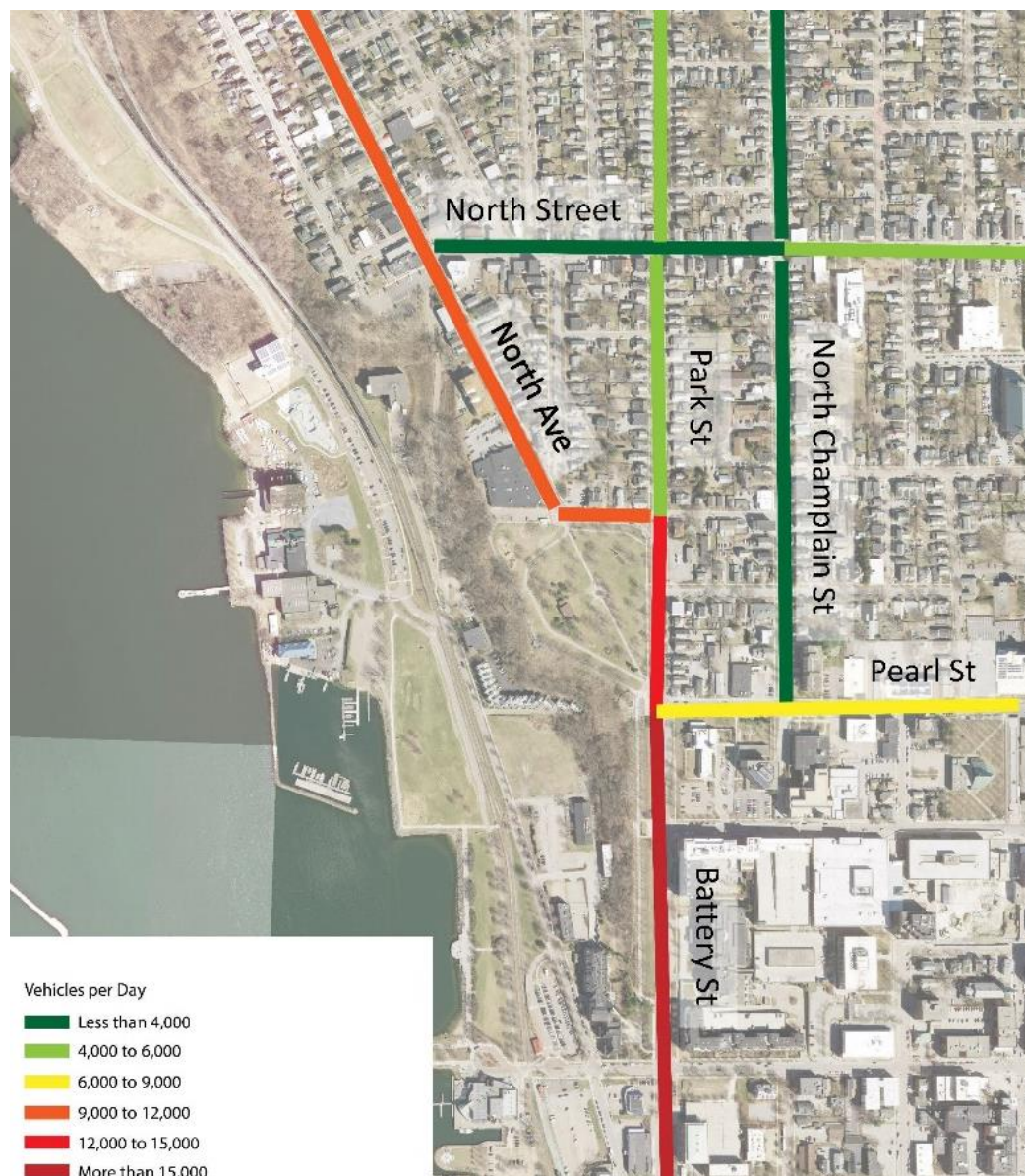


network and the waterfront area and Burlington Greenway between College St and the planned connection at Cambrian Rise.

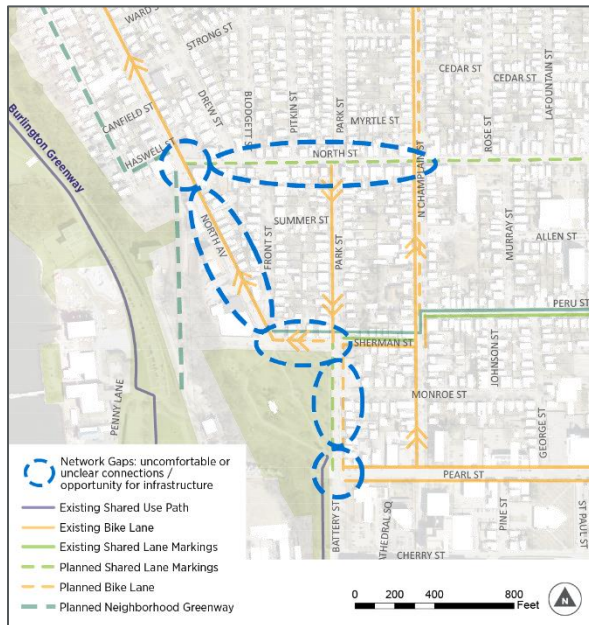
## Connectivity Gaps & Infrastructure Issues

Toole Design conducted desktop analysis of available traffic data, described below. The team also observed existing infrastructure and issues during the October 25<sup>th</sup> site visit. Many positive things were observed: multiple bicycle lanes, signage to make drivers aware of people on bikes and pedestrians at crossings, new sidewalks with good pavement conditions and detectable edges, plus a traffic signal that can be triggered by people at bikes at North Avenue and North Street. However, Toole Design staff also observed gaps in infrastructure devoted to people on bikes, intersections where pedestrian crossings were not adequately protected or up to ADA standards, and other locations where improvements could be made to clarify space for and to protect pedestrians and people on bikes. This section discusses those issues.

## Traffic Volumes



## Bicycle Connectivity Gaps



Bicycle connectivity (or network) gaps are the locations where low-stress infrastructure is lacking for people on bikes. In the Old North End, Toole Design staff observed people riding bikes on sidewalks where they feel unsafe in the roadway. Cyclists were also seen using pedestrian crosswalks to navigate intersections. This corresponds to the feedback received at the public meeting. Bike connectivity gaps exist in the following locations:

- North Avenue lacks a southbound bike lane between Haswell Street and Sherman Street, thus missing a key connective link from northern Burlington to downtown. Cyclists use sidewalks and crosswalks to navigate the intersections with North Street and Sherman Street.
- Along North Street, shared lane markings are planned but no bike infrastructure currently exists. Parking on the north side restricts space for bike infrastructure.
- A westbound bike lane is planned for Sherman Street

from North Avenue to Park Street, but no infrastructure exists there currently. Connections for people on bikes into Battery Park are unclear, and the intersection of Sherman and Park Street is particularly confusing to navigate.

- Park Street from Sherman Street southward lacks bicycle infrastructure, though it is planned in this location. The width of the roadway here is wide, and traffic volumes are high, so the planned shared lane markings on the west side may not sufficiently make cyclists feel safe on this road.
- Battery Street at Pearl Street intersection where people cross from bike lanes on Pearl to the Battery Park Path. Due to the lack of markings and signage, it is unclear how people on bikes are supposed to safely cross. Battery Park also contains a plaza that, with steps and bollards, appears to be for pedestrians only. Bikes must go around to the accessible ramp area to access the Battery Park Path.
- Between Lakeview Terrace and ONE Greenway and between ONE Greenway and Battery Park Path. This is a bigger picture issue where the connectivity between named bike routes is lacking due to the gaps mentioned above.

## Pedestrian Crossings

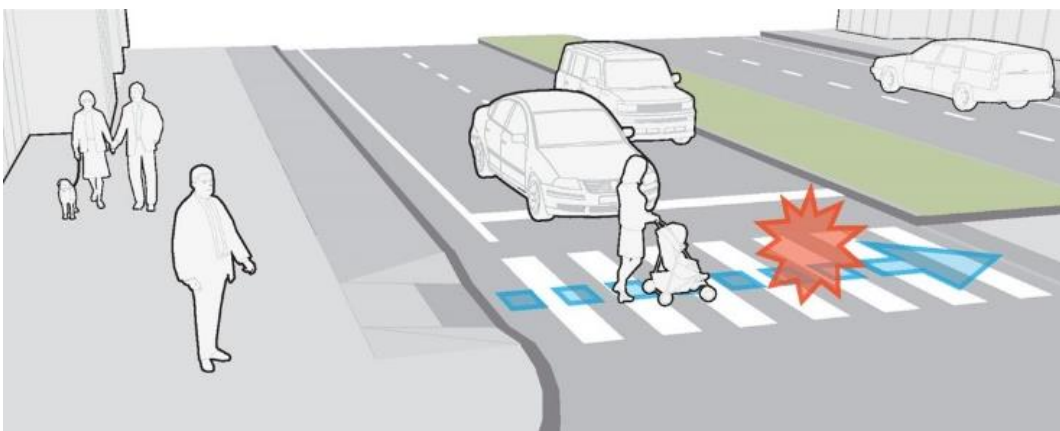
Some intersections within the project area host high volumes of motor vehicle traffic while lacking enough protection to make crossings comfortable for pedestrians. The sidewalks in these intersections may also lack infrastructure that follows best practices\* for sidewalk-to-roadway transitions. Toole Design staff observed issues at the following locations:

- North Avenue at North Street: The large turning radii on the northeast corner of this intersection makes the sidewalk narrow and crosswalk wide, with motor vehicles able to turn at higher speeds. Catch basins interrupt two crosswalks. With people on bikes also using the crosswalks, conflict may exist here between cyclists and pedestrians.
- North Avenue at Sherman Street: This is a wide intersection on a turn, where the turning radius is large enough to allow cars to move quickly through. This has the effect of making crosswalks wide, and easternmost crosswalk is also positioned directly within the turn, an unsafe condition. While not



technically required to meet ADA ramp standards if under 5% slope, it is best practice to ensure that transitions have detectable edges and smooth pavement conditions adjacent to bottom of sidewalk, which the transitions in this intersection lack. A catch basin interrupts the eastern crosswalk.

- Sherman Street at Park Street: Due to a slip lane and lack of crosswalks, pedestrian access to Battery Park is indirect if entering from the southeast side of the intersection. The sidewalk through the porkchop island is also very narrow and in disrepair. Detectable edges are lacking throughout much of this intersection. See the text under “Battery Park” below for more information.
- Park St at Monroe: This intersection is uncontrolled, and pedestrians cross Park Street at a small crosswalk leaving Battery Park. This location is troublesome as motor vehicles can move swiftly, and the southbound direction of the roadway has two lanes. A two-lane approach may prevent drivers in the lane farther from the sidewalk from seeing around an adjacent car that people are in the crosswalk. Rough pavement conditions exist at the bottom of each sidewalk-to-roadway transition, and the eastern transition lacks a detectable edge.

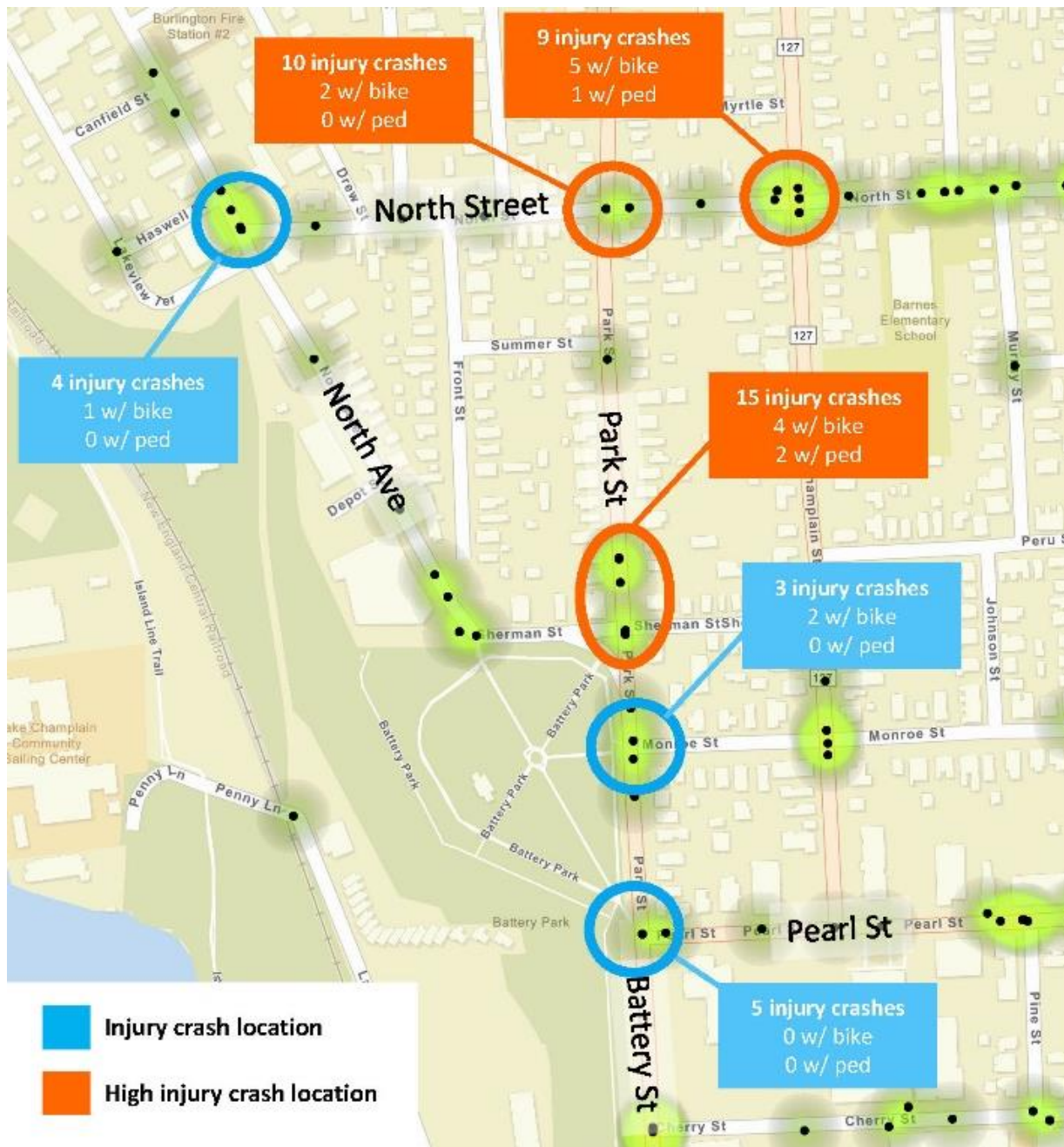


\*In this context, best practices refers to the 2011 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) for curb ramps. PROWAG is the proposed update to the original Americans with Disabilities Act (ADA) standards, and The Toole Design considers PROWAG to be the best practice to follow for accessible design.

## Crashes

The concentration of crashes at specific intersections informs us where infrastructure may be inadequate for multimodal users.

- Sixty (60) total crashes involving injuries have occurred within the study area for people walking, people on bikes, and people driving motor vehicles.
- Sixteen (16) involve people on bikes
- Four (4) of the above bicycles riding on the sidewalk, and three (3) of these were along North St
- Five (5) involve pedestrians.





High concentrations of injury crashes were noted particularly at Park Street at Sherman Street , and the North Street intersections with Park Street and N Champlain Street.

### **Battery Park**

A significant historic landscape in Burlington, Battery Park contains wide grassy areas and collection of large trees. It provides a lovely space for strolling and for events. However, walking and biking access to and through the park is lacking.

As described previously, safety issues exist for people crossing at each adjacent intersection, and the entries within the park itself have fair to poor pavement conditions. Some lack detectable edges, light pole bases need repointing, and few bike racks are available. With “Do Not Enter” signs at the North Avenue/Sherman Street and Battery Street/Pear Street intersections, the access roadway is closed to all cars but presumably maintenance vehicles. These signs do not clarify use and do not welcome pedestrians or cyclists.

In the park interior, several pedestrian paths do not meet ADA required minimum widths. They are too narrow to support socializing while moving in groups. Picnic tables cannot be accessed by people with disabilities.

### **Stormwater**

Drainage appears to be an issue at several crosswalk locations due to the amount of grit noticed at sidewalk-to-roadway transition points. Modifications to existing drainage structures and green stormwater infrastructure additions can be designed to enhance streetscape space.

Catch basins (CBs) intersect crosswalk markings at several intersections within the study area. Fortunately, most CBs do not interrupt pedestrian access routes across each roadway, but CBs do directly interrupt the northern crossing at North Avenue at North Street and the eastern crossing at Battery and Pearl Streets. A sewer manhole also interrupts the detectable edge on the northeastern corner of North Street at N Champlain Street, which is not desirable.

Among the goals of this project is to incorporate green stormwater infrastructure into streetscape plans, in order to address the City’s stormwater management goals, which include reducing the peak volumes, and improving stormwater quality.

### **Statement of Project Purpose & Need**

This memorandum illustrates several safety, connectivity, and stormwater issues within the study area. Bike level of stress analysis and crash data show how infrastructure devoted to motor vehicles results in real safety issues and discomfort for people using active modes of travel. Paths and crossings that are non-compliant with ADA/PROWAG standards hinder access for people with disabilities. A lack of bicycle infrastructure in roadway segments and intersections makes people on bikes feel unsafe while increasing conflicts between users of different modes. As Burlington is prioritizing walking and biking, improvements should be made to increase accessibility and to help people feel safer and more comfortable for active modes of transportation.

This project will identify proposed actions and improvements to address these issues, and their associated costs and impacts.