



EXECUTIVE SUMMARY • 12

VISION AND GOALS • 29

WHY? • Chapter 1 • Background & Context • 37

WHY? • Chapter 2 • Public Input, Public Action • 43

HOW? • Chapter 3 • Engineering • 60

HOW? • Chapter 4 • Beyond Infrastructure • 153

HOW? • Chapter 5 • Funding & Implementation • 166

» WE ARE HERE

APPENDIX TABLE OF CONTENTS

Project Bank*	178
Illustrated Glossary of Safe Streets Treatments	187
Citywide Crash and Injury Data Details.....	201

PUBLIC INPUT

Public Survey Results	207
Summary of Public Comments on Public Draft of Plan	231

** The Project Bank charts in this plan list projects that could be built with capital funding available to the City of Burlington. Projects known to be funded through other sources (such as sidewalk projects, or projects undertaken with federal funding like the Champlain Parkway) are therefore not included in the charts. As such, charts may not list all project recommendations shown in maps. The implementation timelines in the charts represent one potential scenario - flexibility is essential and the City must capitalize on opportunities to advance recommendations shown in plan maps wherever they arise!*

PROJECT LIST FOR "START NOW" 12 MONTH PROJECTS

- The total estimated cost for the projects recommended in the 12-month time frame is \$295,000. These projects are primarily lower cost actions that can be implemented quickly, and do not require changes to curbs or utilities. Projects included in this estimate are listed in the table below. See the Funding + Implementation Chapter for more details.

Sub-Area	Project Name	Proposed Action
2	Archibald Street Slow Zone/Bikeway	Add supersharrows, and use rapid implementation materials to create curb extensions (epoxy/pea gravel mix, flexposts, etc.)
3	Austin Drive Bikeway	Re-stripe with 2-way protected bike lanes with flex posts on north side of street
2	Bike Parking	Add bike parking in high-need locations such as Church Street, Pearl Street, and Main Street.
3	Birchcliff Parkway Greenway	Traffic calming with shared lanes or advisory bike lanes
2	College Street Bikeway Markings	Add intersection striping treatments to carry College St. bikeway across the Prospect intersection, to UVM path.
2	Depot Street Pilot Projects	Revisit concept plans in 2009 Waterfront North Access Scoping Study, and use pilot projects to test alternatives.
2	East/Colchester Intersection	Extend eastbound bicycle lane markings through intersection. Pilot test median treatments. Change signal phasing.
1	Gosse Court Greenway and Connections	Add traffic calming treatments and shared lane markings to Gosse Court, and shared use markings/signs to Woodbury Road/Hunt Middle School driveway
2	Lakeview Terrace Neighborhood Greenway	Add bikeway markings and traffic calming treatments on Lakeview Terrace.
3	Lakeside Avenue/Pine Street Intersection	Reinforce southbound bicycle lane crossing through intersection
1	Leddy Park Bikeway Connector	Stripe Advisory Lane to be shared by walkers/bikers (with Department of Parks, Recreation, and Waterfront)
3	Ledge Road Bikeway	Shared lane markings and traffic calming
2	Main Street / South Champlain Street Curb Extensions	Use rapid-implementation materials to add curb extensions
2	N. Union Bikeway	Install armadillos to protect bike lane as pilot
2	N. Winooski Bikeway (Pearl to Union)	Install flex posts to protect bike lane as pilot
2	Pearl Street Bikes Lanes and Curb Extensions (Battery to Winooski)	Mark and sign bicycle lanes. Add interim curb extensions at Pearl and North Champlain Street.
3	Pine Street Curb Extensions (Kilburn, Marble, Howard, Locust, Flynn)	Rapid implementation of curb extensions at key crossings with epoxy/pea gravel mix, flexposts or other creative materials
3	Pine Street Bikeway Signage	Place "bikes may use full lane" signs
3	Pine Street Bikeway	Mark and sign bicycle lanes south of Lakeside Avenue to the end of Pine Street
3	Queen City/Industrial Bikeway	Work with South Burlington to mark and sign bicycle lanes
2	Riverside Shared Use Path	Enhance pavement markings at bikeway gaps and across busy driveways
2	South Winooski/Bank Intersection	Rapid implementation of curb extensions with epoxy/pea gravel mix, flexposts or other creative materials
2	Winooski Avenue Corridor Study Pilot Projects	Use pilot projects to test recommendations from the Winooski Corridor Study

Sub-Area 1: The New North End | Sub-Area 2: Downtown, Old North End, Waterfront | Sub-Area 3: South End | See p. 86 for Sub-Area Map

PROJECT LIST FOR YEAR 2-5 PROJECTS

- The total estimated cost for the projects recommended in the 2-5 year time frame is \$1,900,000, or \$475,000 per year over four years. Projects included in this estimate are listed in the sub-area tables below (and on the following 2 pages). See the Funding + Implementation Chapter for more details.

Sub-Area 1: The New North End (See page 86 for Sub-Area Overview Map)

Project Name	Proposed Action
Crescent/Shore Greenway	Shared lane markings and traffic calming
Ethan Allen Parkway Bikeway (North Ave to 127 Path)	Bicycle lane northbound/shared lane southbound
Farrington Parkway Greenway	Shared lane markings and traffic calming
Flynn School Pathway (Plattsburg Ave to School)	Shared use path. (Note: if existing sidewalk needs to be reconstructed vs. simply widened, cost will fall beyond the estimate assumed for this project bank.)
Gosse Court Greenway	Shared lane markings and traffic calming
Marshall Drive Greenway (Gosse to Heineberg)	Shared lane markings, green infrastructure and traffic calming
North Ave Complete Streets Upgrades (1)	Stripe bike lanes on North Avenue, north of Plattsburg Avenue
North Ave Intersection Safety	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials (at Shore, Cottage Grove, Poirier, Saratoga, and Institute)
Plattsburg Ave. Bikeway	In the short term, mark and sign conventional bike lanes (with more robust treatment coming in the long-term)
Starr Farm Road Sidewalk	Add new sidewalk
Venus Ave Connector	Begin planning for neighborhood connector between Venus Avenue and Sandra Circle
Western Ave Sidewalk	Add new sidewalk
Woodbury Road	Stripe advisory bike lane

Sub-Area 2: Downtown, Old North End, Waterfront (See page 86 for Sub-Area Overview Map)

Project Name	Proposed Action
Bank Street Bikeway	Mark and sign shared use lanes
Burlington Bike Path Relocation, King to College	Relocation of waterfront bike path to west of railroad between King and College (project undertaken within the Department of Parks, Recreation, and Waterfront)
Cherry and South Winooski Intersection Improvements	Create rapid implementation curb extensions while 2016 Corridor Study is developed
Colchester Ave Bikeway	Stripe bike lanes on Colchester Ave. east of East Ave., with a more robust treatment to come in the long-term.
Colchester Ave Bridge to Winooski	Implement a lane reassignment with 3 travel lanes and a 2-way shared use path across the bridge, or build a new bridge for people walking/biking
Colchester Ave Hospital Crossing	Install high visibility pedestrian crossing
College/S. Willard Intersection	Consider mini-roundabout or high visibility pedestrian crossings
College Street Shared Lane Markings	Mark sharrows on College from N. Union westward, through Lake
Main St/University Heights Crossing	Install high visibility pedestrian crossing
Main Street Complete Streets Upgrades (College to Winooski)	Design TBD with Great Streets Project; goal is protected bicycle lanes on this segment.
Main Street Complete Streets Upgrades (Winooski to Summit)	Protected bicycle lanes and improvements for pedestrians, per scoping study
Main Street Complete Streets Upgrades (Summit to University Place)	Add a shared use path on UVM property to connect to Main St path
Main Street Path on UVM Campus	Continue UVM Shared Use Path to fill gap from University Heights to the Jughandle
Main Street/S. Winooski Ave Intersection	Consider roundabout or mini-roundabout and lane reassignment
Maple Street Bikeway	Mark and sign shared lane treatments
N. Champlain Street/ Bikeway	Protected 2-way bicycle lanes on west side of street, lane reassignment
N. Winooski Bikeway (Union to Riverside)	Mark and sign protected bicycle lanes
N. Winooski/ N. Union/ Decatur Intersection	Create detailed recommendations for intersection improvements in N. Winooski Corridor study

Sub-Area 2 Continued... Downtown, Old North End, Waterfront (See page 86 for Sub-Area Overview Map)

Project Name	Proposed Action
North St Bikeway	Traffic calming with epoxy/pea gravel, flexposts or other creative materials; shared lanes or advisory bike lanes
North Street near Murray	Study/pilot projects needed to determine best approach for traffic calming
North/North Ave Intersection	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials
ONE Greenway - Loomis Street segment	Shared lane markings, green infrastructure and traffic calming. Intersection improvements at Loomis/Prospect.
ONE Greenway - Sherman, Peru & Grant	Shared lane markings, green infrastructure and traffic calming
Pearl St/South Williams Crossing	Re-establish high visibility crosswalk
Pearl/Prospect/Colchester Intersection	High visibility crosswalks, realignment integrating curb extensions with epoxy/pea gravel, flexposts or other creative materials
Pearl/Winooski Intersection	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials
Pine Street Bike Connections	Stripe bike lane and sharrows on Pine Street from Main to Bank, to connect with planned bike facility upgrades in southern sections of Pine. Once street connections are completed, continue shared lane markings on Pine between Bank and Pearl.
Riverside Ave/Colchester Ave Intersection	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials
Riverside Ave/N. Prospect Intersection	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials
S/N Union Bikeway (Main to N. Winooski)	Complete protected bicycle lanes with preferred rapid implementation treatment (flexposts or armadillos, etc.)
S. Union Bikeway (Shelburne to Main)	Establish protected bicycle lanes with flexposts or armadillos; consider lane reassignment with one-way street for vehicles
S. Union/Main Intersection	Consider mini-roundabout; high visibility crosswalks, curb extensions with creative materials
S. Willard St Bikeway (Cliff to Hyde)	Stripe southbound bike lane on Willard between Hyde and Cliff, to complement the northbound lane on Union St. Move parking to northbound side, and add shared lane markings.
S. Willard/Main Intersection	High visibility crosswalks, curb extensions with creative materials
S. Willard/Pearl Intersection	High visibility crosswalks, curb extensions with creative materials
S. Winooski Ave/College St Intersection	Consider mini-roundabout; high visibility crosswalks, curb extensions with creative materials
S. Winooski Bikeway-Main to Pearl	Mark and sign bicycle lanes in both directions; reassignment of vehicle lanes

Sub-Area 3: South End (See page 86 for Sub-Area Overview Map)

Project Name	Proposed Action
Callahan Park Greenway	Shared lane markings and traffic calming (collaboration with Department of Parks, Recreation, and Waterfront)
Flynn Ave Bikeway	Mark and sign bicycle lanes
Home Ave/Pine St Intersection	Consider mini-roundabout and shared lane markings
Howard Street Greenway	Shared lane markings and traffic calming
Linden Terrace Greenway	Traffic calming, shared lanes or advisory bike lanes
Pine Street Bikeway (Queen City Park to Flynn)	Mark and sign conventional bicycle lanes in both directions
S. Winooski/Howard/St. Paul Intersection	Consider mini-roundabout or signal phasing changes; high visibility crosswalks, curb extensions with creative materials
Shelburne and Home Street Intersection Improvements	Pilot recommendations from planned corridor study (not programmed yet) - aim to reduce speeds, reduce crossing distances.
Shelburne Road Crossings	Install high visibility pedestrian crossings
Shelburne Rotary Upgrade	Implement pilot project to clarify traffic patterns and improve safety by narrowing vehicular lanes and adding curb extensions.

Long-term Plan Project Bank

LIST OF ADDITIONAL RECOMMENDED PROJECTS TO BE IMPLEMENTED IN THE NEXT 5-15 YEARS

Sub-Area	Project Name	Proposed Action
2	Battery Street Complete Streets Upgrades (Maple to Park/Sherman)	Lane reassignment and bike lanes (phase 1), Pearl/Battery intersection improvements and protected bike lanes (phase 2) (assumes changes can be implemented with paint and low cost materials)
3	Briggs St Sidewalk (Morse to Flynn)	New sidewalk
2	BTC Connector (Pine and St Paul between Bank and Cherry)	Establish bikeways as part of Burlington Town Center redevelopment
2	Cathedral Square Crossing (Cherry St at 3 Cathedral Sq)	High visibility crossing
2	Cedar-Poplar Greenway (Elmwood Avenue to Park Street)	Shared lane markings, green infrastructure and traffic calming
3	Champlain School Connection	Connecting path network to Pine Street
2	Chase Street Bikeway	Bike lane up/Shared lane down; shift parking to south side
3	Cliff Street Bikeway	Shared lane markings S. Prospect to S. Union
2	Colchester Ave Complete Streets Upgrades (Prospect to Riverside)	Protected bicycle lanes
2	Colchester Ave Bikeway Winooski River Crossing	Lane reassignment on bridge to provide 2-way protected bike lanes
2	College Street Bikeway (Lake to Union)	Shared lanes with traffic calming
1	CP Smith Connector (Gosse Court to James Ave)	Shared use path (collaboration with Department of Parks, Recreation, and Waterfront)
3	Deforest Heights Sidewalk (DeForest Rd to Chittenden Dr)	New sidewalk
3	Deforest Heights/Edgewood Connector (S. Willard to Ledge via path)	Shared use path or trail
2	Depot St-Lake St Bikeway (North Ave to Main St on waterfront)	Add shared lane markings to Lake, and create Neighborhood Greenway on Depot with shared lane markings, green infrastructure and traffic calming
2	East Avenue Bikeway (Jughandle to Colchester)	Bicycle lane (phase 1)/Two-way protected lanes (phase 2)
1	Ethan Allen Connector	Shared use path through park
3	Fairmount St Greenway (Proctor to Prospect Pkwy)	Shared lane markings, green infrastructure and traffic calming
3	Foster Street Sidewalk (Lyman to Home)	New sidewalk
1	Franklin Square Pathway (North Ave to Sunset Dr via path)	Shared use path or trail
1	Gazo Ave Greenway (Ethan Allen Pkwy to Sandra Circle)	Shared lane markings, green infrastructure and traffic calming
1	Grey Meadow-West Connector (West Rd & Grey Meadow)	Shared use path or trail

Sub-Area 1: The New North End | Sub-Area 2: Downtown, Old North End, Waterfront | Sub-Area 3: South End | See p. 86 for Sub-Area Map

LIST OF RECOMMENDED PROJECTS TO BE IMPLEMENTED IN THE NEXT 5-15 YEARS (Cont.)

Sub-Area	Project Name	Proposed Action
2	Grove Street Bikeway (Chase to South Burl City Line)	Mark and sign bicycle lanes
3	Harrison Ave Greenway (to Island Line Trail)	Shared lane markings, green infrastructure and traffic calming
1	Heineberg Road Greenway (North Ave to Farrington)	Shared lane markings, green infrastructure and traffic calming
3	Hillcrest-Crescent Greenway (Ledge to S. Prospect)	Shared lane markings, green infrastructure and traffic calming
3	Home Ave Bikeway (Oakledge Park to Shelburne)	Mark and sign bicycle lanes
3	Howard Street Greenway (Pine to Union)	Shared lane markings, green infrastructure and traffic calming
2	Intervale Road Bikeway (North of Riverside through Intervale Center)	Mark and sign shared lanes
3	Kilburn Street Sidewalk (Pine to St Paul-north side)	New sidewalk
1	Killarney Drive connector to Island Line Trail	Shared use path or trail to connect southern edge of Killarney Drive to Island Line Trail
1	Killarney Drive Neighborhood Greenway	Shared lane markings, green infrastructure and traffic calming
1	Leddy Park Road - Path connector	Formalize informal path connecting Leddy Park Road and Island Line Path (collaboration with Department of Parks, Recreation, and Waterfront)
3	Lakeside Ave Sidewalk (Champlain Pkwy to Pine, south side)	New sidewalk
3	Lakeside Ave Sidewalk (Island Line Trail to Champlain Pkwy, north side)	New sidewalk
3	Lakeside Neighborhood Greenway (Island Line to Blodgett Oven)	Shared lane markings, green infrastructure and traffic calming
3	Locust Street Bikeway (Caroline to Shelburne)	Protected bicycle lanes
3	Locust Street Bikeway (Pine to Caroline)	Shared use path and marked with shared lanes
2	Main Street Complete Streets Upgrades (University Heights to Jughandle - South Side)	Extend UVM Shared Use Path to South Burlington line
2	Manhattan Bikeway (Elmwood Ave to Park St)	Combination of bike lanes, protected bike lanes, and greenway
2	Manhattan-Washington Greenway (North Ave to Park St)	Shared lane markings, green infrastructure and traffic calming
2	Mansfield Ave Bikeway (Colchester to North)	Shared use path on east side; shared lane markings
1	Moore Drive Greenway (Park to Ethan Allen Parkway)	Shared lane markings, green infrastructure and traffic calming
3	Morse Place Sidewalk (Briggs to Pine)	New sidewalk
1	North Ave. Complete Streets Upgrades (2)	Add permanent protected bikeway treatments along North Avenue. Pending results of the 2016 Pilot Project, add protected/conventional/buffered bike lanes on North Avenue where feasible.

Sub-Area 1: The New North End | Sub-Area 2: Downtown, Old North End, Waterfront | Sub-Area 3: South End | See p. 86 for Sub-Area Map

LIST OF RECOMMENDED PROJECTS TO BE IMPLEMENTED IN THE NEXT 5-15 YEARS (Cont.)

Sub-Area	Project Name	Proposed Action
2	N. Prospect Street Bikeway (Pearl to Riverside)	Bicycle lane northbound/shared lane southbound
2	North Street Sidewalk (Prospect to Mansfield Ave, north side)	New sidewalk
2	North Street Slow Zone (North Ave to Union)	Traffic calming, curb extensions, raised intersections, shared lane markings
1	Northview Drive Greenway (Rivers Edge to North Ave)	Shared lane markings, green infrastructure and traffic calming
2	Oak Street Greenway (Intervale to Manhattan)	Shared lane markings, green infrastructure and traffic calming
1	Old North End Multiuse Connector Trail	Shared use path between North Ave and Island Line Trail (project undertaken within the Department of Parks, Recreation, and Waterfront)
2	Pearl Street Bikeway (Battery to Prospect)	Bicycle lanes (phase 1)/Protected lanes (phase 2)
3	Pine Place Greenway (Pine to St. Paul)	Shared lane markings, green infrastructure and traffic calming
3	Pine Street Complete Streets Upgrades (Howard to Flynn)	Protected bicycle lane (northbound)/shared lane (southbound)
3	Pine Street Sidewalk (Lyman to Home)	New sidewalk
3	Prospect Pkwy Greenway (Shelburne to S. Prospect)	Shared lane markings, green infrastructure and traffic calming
3	Richardson Street Sidewalk (Home to Morse)	New sidewalk
2	Riverside Path Extension (N. Winooski to Intervale Ave)	Shared use path on north side of street
2	Roosevelt Park Greenway (St Louis St through Roosevelt Park)	Shared lane markings, green infrastructure and traffic calming
2	Route 127 Path-Manhattan Connector (Route 127 Path to Manhattan Drive)	Shared use path in Route 127 right-of-way
2	Saint Paul and Kilburn Intersection Upgrade	High visibility crosswalks, curb extensions with epoxy/pea gravel, flexposts or other creative materials
3	S. Prospect Street Bikeway (Ledge to Maple)	Shared Use Path on east side
2	S. Prospect Street Bikeway (Maple to Pearl)	Shared lanes/Shared Use Path on UVM Green
3	S. Prospect Street Greenway (Prospect Pkwy to Ledge)	Shared lane markings, green infrastructure and traffic calming
2	S. Willard Sidewalk (Cliff St to Champlain College)	New sidewalk
3	S. Willard St Bikeway (Shelburne to Cliff)	Mark and sign bicycle lanes
3	S. Winooski Bikeway (Shelburne Rd to Main St)	Southbound protected bicycle lane
3	Sears Lane Bikeway (Pine to Harrison)	Mark and sign for shared use lane
3	Sears Lane Sidewalk (Waterfront Path to Pine St)	New sidewalk
3	Shelburne Road Bikeway (City Line to St. Paul)	Lane reassignment and bicycle lanes (phase 1)/Protected bicycle lanes (phase 2)

Sub-Area 1: The New North End | Sub-Area 2: Downtown, Old North End, Waterfront | Sub-Area 3: South End | See p. 86 for Sub-Area Map

LIST OF RECOMMENDED PROJECTS TO BE IMPLEMENTED IN THE NEXT 5-15 YEARS (Cont.)

Sub-Area	Project Name	Proposed Action
3	South Meadow Greenway (Champlain Pkwy/Howard Ctr to Raymond Pl)	Shared lane markings, green infrastructure and traffic calming
2	Spruce Street Greenway (St. Paul to S. Willard)	Shared lane markings, green infrastructure and traffic calming
2	University Place Shared Street (Main to Colchester)	Shared space zone, prohibit through traffic, consider dedicating street to UVM
1	Starr Farm Rd Greenway (North Ave to Island Line)	Shared lane markings, green infrastructure and traffic calming
3	Summit Street Neighborhood Greenway	Shared lane markings, green infrastructure and traffic calming
1	Sunset Drive Greenway (Franklin Sq to Northview via Rivers Edge Dr.)	Shared lane markings, green infrastructure and traffic calming
1	Village Green Greenway (to Van Patten)	Shared lane markings, green infrastructure and traffic calming
2	Walnut-Elmwood Greenway (Archibald to Oak)	Shared lane markings, green infrastructure and traffic calming
2	Walnut-Elmwood Greenway (Pearl to Archibald)	Shared lane markings, green infrastructure and traffic calming
3	Wells Street Greenway (Flynn to Home)	Shared lane markings, green infrastructure and traffic calming
3	Wells Street Sidewalk (Flynn to Home, east side)	New sidewalk
1	Westward Drive-Northshore Drive Greenway	Shared lane markings, green infrastructure and traffic calming
2	Willard-Bradley Intersection Upgrade	Improve pedestrian safety with curb extensions and/or crosswalk enhancements.

Sub-Area 1: The New North End | Sub-Area 2: Downtown, Old North End, Waterfront | Sub-Area 3: South End | See p. 86 for Sub-Area Map

Illustrated Glossary of Safe Streets Treatments

This section of the document is an “illustrated glossary” defining many of the treatments recommended throughout the plan. The Sub-Area sections of the plan and the Project Bank in this Appendix provide details about how some of these treatments could be applied to achieve the recommendations outlined in the plan.

Best practices in walk/bike planning are changing rapidly. Cities around the country are trying new types of infrastructure every year. Technologies to support active transportation are also rapidly evolving - wayfinding using smart phones is increasingly common, and electric assist bicycles are growing in popularity in cities with hilly terrain. Thus, it is important to note that this illustrated glossary is not an exhaustive or prescriptive list of tools - it is simply intended to provide definitions to help readers understand the recommendations in the plan.

Burlington can and should continue to integrate new design treatments as the dynamics of pedestrian and bicycle planning evolve. As new designs and technologies emerge, Burlington should aim to implement the most robust and appealing facility type possible, to meet the needs of people of all ages and abilities. Where the City’s current Street Design Guidelines do not provide enough guidance on use of new tools, the City should consult the most progressive design standards available, like the NACTO and ITE Walkable Thoroughfares manuals.

In this rapidly-changing design landscape, the overarching goals of the plan should continue to guide implementation:

- Creating safer streets for everyone; and
- Making walking and biking a viable and enjoyable way to get around town.

The illustrated glossary on the pages ahead is intended to provide definitions for many of the treatments recommended in the plan.

It is not an exhaustive or prescriptive list of tools for the City of Burlington to use, nor is it intended to provide detailed guidance about street design.

Best practices in walk/bike planning are changing rapidly. Burlington can and should continue to integrate new design treatments as the dynamics of pedestrian and bicycle planning evolve, consulting the most progressive design standards available, like the NACTO and ITE Walkable Thoroughfares manuals.





Photo: Dan Burden

ADVANCE CROSSING SIGNAL

Definition: The programming of a traffic signal to remain all-red for several seconds for vehicles traveling in all directions while a pedestrian crossing signal gives people walking a head start. Also known as a leading pedestrian interval, this no-cost treatment increases compliance of people driving yielding to people walking.



Photo: unknown

ADVISORY LANE

Definition: A lane that creates preferential space for people biking or walking. Advisory lanes are typically marked with a dashed (not solid) line, and they are often used in conjunction with centerline removal along low-speed, low-volume streets. The dashed lines indicate that people driving can drive over advisory lane when needing to yield to oncoming motor vehicle traffic. Bollards can be placed on the dashed line at intervals to enforce motorist use of the center lane.



BICYCLE BOX

Definition: A section of pavement aimed at preventing bicycle/car collisions at intersections, particularly between drivers turning right and cyclists traveling through an intersection or turning left. To improve its visibility, a Bicycle Box is often colored and includes a standard white bicycle pavement marking.

Overlapping benefits: Increases distance between people walking across the street and idling motorists, and provides people bicycling with a head start across the intersection when the light turns green.



BICYCLE CORRAL

Definition: An on-street bicycle parking facility that can accommodate up to 12 bicycles in the same area as a single car.

Overlapping benefits: When placed near street corners, a Corral increases visibility and creates an additional buffer for pedestrians.

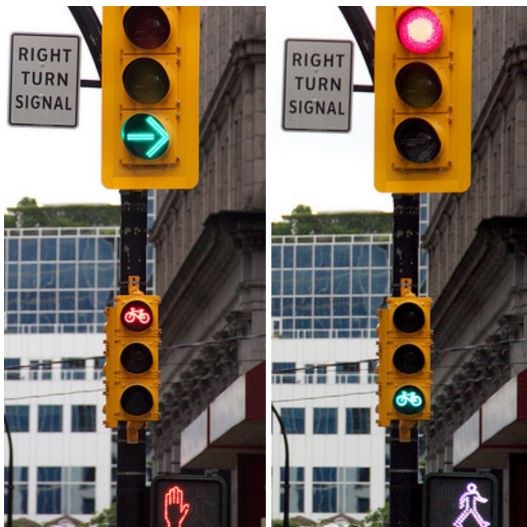


Photo: StreetsblogUSA

BICYCLE SIGNAL

Definition: A traffic control device used in combination with an existing conventional traffic signal or hybrid beacon.

Overlapping Benefits: Bicycle signals reduce conflicts between turning motorists and cyclists traveling through the intersection.



BICYCLE WAYFINDING SIGNS

Definition: Signs of any kind that mark a bikeway route. Wayfinding signs should help people bicycling find the streets most amenable to bicycle travel, and find their way to major bikeway network or community destinations (landmarks, commercial districts, neighborhoods, schools, parks, etc.).



Photo: UrbanABQ

BUFFERED BICYCLE LANE

Definition: Buffered bicycle lanes are conventional lanes paired with a painted buffer between people on bikes and moving and/or parked cars. They are not a substitute for protected bike lanes, but have the added benefit of increased distance between motor vehicles and allowing width for faster cyclists to overtake slower ones.

Overlapping benefits: Can have a traffic calming effect, making a street safer for all users.



Photo: neighborhodonotes.com

CHANNELIZERS

Definition: A constructed barrier that narrows the roadway to slow vehicle speeds.



CHICANE

Definition: A constructed barrier that forces people driving to alter their travel path, effectively reducing the speed of travel.



COLORLED PAVEMENT

Definition: The use of colored pavement (typically green) to make bicycle facilities more visible at known and potential conflict areas. For more detailed guidance, refer to the latest VTrans standard, which specifies that solid green paint should be used for all intersections with 40+ VPH crossings. In Burlington, this plan recommends that green paint be prioritized at intersections/conflict points, and for creating green-backed super sharrows along neighborhood greenways. Solid green paint should only be used when traction is not a safety concern.

Burlington Public Works recently applied green paint at a few intersections. The Department of Parks, Recreation & Waterfront has also consistently applied green paint to visually designate the Burlington Bike Path along the waterfront.



Photo: Streetsblog Los Angeles

COMBINED BIKE LANE/TURN LANE (“MIXING ZONE”)

Definition: Pavement marking that suggest people bicycling through an intersection and motorists turning must share the space. Treatment is often accompanied by signs advising vehicles to yield to cyclists and/or directing cyclists/vehicles into appropriate positions within the lane.



Charlottesville, VA

CONTRA-FLOW BICYCLE LANE

Definition: Bicycle lanes - typically short in length - that are designed to allow cyclists to ride in the opposite direction of vehicle traffic.

Overlapping benefits: By providing a legitimate two-way pathway for people on bikes, contra-flow bicycle lanes can reduce the frequency of sidewalk riding and reduce the length of travel where one-way streets or topography make reaching key destinations by bike inconvenient.



Photo: Flickr user jcutrufo

CONVENTIONAL BICYCLE LANE

Definition: A lane reserved for bicycle travel within a thoroughfare, marked by painted white lines. Conventional bicycle lanes are typically located along the curb or adjacent to parallel parked cars, and usually run in the same direction as vehicular traffic.



Photo: NACTO

CURB EXTENSION

Definition: The expansion of the sidewalk / greenbelt to physically narrow the roadway, creating safer and shorter crossings while increasing the available space for placemaking and stormwater management amenities, such as benches, bus shelters, rain gardens, trees, bike parking etc.



Photo: Paul Krueger

DIVERTERS

Definition: A physical barrier designed to control movement of traffic in a particular direction. One example is a diagonal diverters, which can be strategically located to prevent through moves at an intersection and reduce traffic volumes on a residential street. Diverters can also be designed to prevent drivers from entering or exiting certain legs of an intersection.



GARDEN WALKS

Definition: With involvement from adjacent private landowners, neighborhood organizations can create landscaping along the city's sidewalk that provides a more attractive and enjoyable place to walk, and can have ancillary benefits for stormwater management using rain garden design techniques.

Overlapping benefits: Creates a beautiful street that is more enjoyable for all.



HAWK BEACON

Definition: An acronym for High-Intensity Activated crossWalk beacon, a HAWK beacon is a traffic control device used to stop road traffic and allow pedestrians to cross safely.



INTERSECTION CROSSING MARKINGS (“BIKE CROSSWALKS” OR “CROSSBIKES”)

Definition: Pavement markings which indicate the intended path of bicycle traffic through an intersection. These markings guide bikes on the right path and visibly warn drivers of a potential conflict point. Such markings may consist of white striping alone, or integrate green paint. In Burlington, this plan recommends that green paint be prioritized at intersections/conflict points of particular concern, such as where side paths or protected bike lanes cross intersections or driveways. For more detailed design guidance, refer to the latest VTrans standard, which specifies that green paint should be added to crossing markings at all intersections with 40+ VPH crossings.

Overlapping benefits: Markings reinforce proper directional travel and discourage people from riding their bicycles in the crosswalk itself.



Photo: NACTO

MEDIAN REFUGE ISLAND

Definition: A curb or barrier protected area between travel lanes that provides people crossing the street on foot or on a bike a safe place to rest midway.

Overlapping benefits: Median refuge islands provide a protected space for pedestrians to wait and can have a traffic calming effect. They also provide an opportunity for landscaping/beautification.



Photo: NYCDOT

NEIGHBORHOOD + CORRIDOR SLOW ZONES

Definition: Neighborhood and Corridor Slow Zones are areas where the street is designed and engineered for slow travel. That means designing for 85th percentile speeds to achieve 25 mph or less on major corridors, and 15-20mph or less on neighborhood streets and greenways.

Neighborhood Greenways: A Field Guide

Neighborhood Greenways are streets with low vehicle volumes and speeds (typically below 3,000 AADT), designed to prioritize bicycling and enhance conditions for walking. Neighborhood Greenways are streets where people of all ages and abilities feel safe walking, biking, and playing. To create this condition, Neighborhood Greenways use a variety of the traffic calming and placemaking treatments, including:

- Narrow travel lanes, which can be created with curb extensions, channelizers, or chicanes.
- Treatments such as speed humps and traffic diverters, which discourage vehicles from using the street as a cut-through.
- Greening elements such as planters or rain gardens.
- Clear wayfinding for people walking and biking.
- Pavement markings to reinforce the shared use of the street, typically via a shared roadway marking or sharrow.
- Protected crossings at major intersections.



▲ Neighborhood Greenways are streets with low vehicle volumes and speeds, designed so that people of all ages and abilities feel safe walking, biking, and playing. (Photo by Seattle DOT.)



▲ Neighborhood Greenways feature traffic calming measures, like the diverter above, to keep speeds low. (Photo by Walk Eagle Rock.)



▲ In Seattle, a neighborhood traffic circle keeps speeds low along a Neighborhood Greenway (Photo by Seattle DOT.)



▲ Large shared lane markings help communicate bike/ped priority. (Photo by Payton Chung.)



▲ Neighborhood Greenway signage (Photo by Seattle DOT.)



PARKLET

Definition: The replacement of 1- 3 on-street parking spaces with usable public space.

Overlapping benefits: Can integrate bicycle parking. While parklets are usable by any member of the public, they have been shown to increase business for small cafes or restaurants with a shortage of indoor seating.



PATHWAYS AND SHORTCUTS

Definition: Many neighborhoods have informal paths through public or private spaces that allow more convenient or pleasant access to key destinations, such as schools or parks. Examples include paths through Callahan Park, Integrated Arts Academy at H.O. Wheeler, or Leddy Park.

Overlapping benefits: If shared-use is appropriate, such paths can provide low-stress bikeways.



PEDESTRIAN PLAZA

Definition: Pedestrian Plazas transform underutilized roadway space into a public amenity.

Overlapping benefits: Can benefit locate businesses, integrate bicycle parking, and have a traffic calming effect.



Montreal, Canada

PROTECTED BICYCLE LANES

Definition: A one or two-way bicycle lane that is separated from vehicular traffic with physical barriers (such as bollards, medians, raised curbs, etc.).

Overlapping benefits: By providing a low-stress option for riding a bicycle in the roadway itself, protected bicycle lanes typically reduce the frequency of sidewalk riding. They can also have a traffic calming effect, add beauty, introduce stormwater making, and improve access to commercial districts.



Photo: Alta Planning + Design

PROTECTED INTERSECTION

Definition: The use of design treatments (corner refuge islands, forward stop bar for bicyclists, a setback for bike and pedestrian crossing, and bicycle/pedestrian friendly signal phasing) to simplify left turns, protect right turns from traffic, and provide through movement that minimize or eliminate conflicts from turning cars.



RAISED CROSSWALKS

Definition: Much like a raised intersection, this treatment benefits people walking by raising crosswalks to the level of the sidewalk so that pedestrians are more visible to drivers and have a seamless experience crossing the street.

Overlapping Benefit: When designed properly, raised crosswalks allow people with disabilities a more comfortable way to navigate intersections.



RAISED INTERSECTION

Definition: Similar to speed humps and other vertical surface traffic-calming treatments, raised intersections reinforce slow speeds and encourage motorists to yield to pedestrians at the crosswalk/intersection.

Overlapping Benefit: When designed properly, raised intersections allow people with disabilities a more comfortable way to navigate intersections.



RECTANGULAR RAPID FLASH BEACONS (RRFBS)

Definition: A flashing light activated by people walking who desire to cross the street and seen by people driving who are meant to yield the right-of-way to pedestrians.



RIGHT-TURN-ON-RED BAN

Definition: The use of posted signs that indicate to people driving that they are not permitted to make a right turn on red during the pedestrian crossing phase.

Photo: Flickr

Roundabouts: A Field Guide

Roundabouts offer many benefits, including increasing safety, road capacity, and design, and they are a tool that should be considered for Burlington's intersections. Single lane roundabouts have an excellent safety record for all modes of transportation, and can accommodate car traffic in fewer lanes, potentially leaving more room on the streets for biking and walking. (Note that multi-lane roundabouts lose many of the safety benefits of single-lane roundabouts.) Roundabouts come in many sizes and styles, and each type has a place on Burlington's streets. See the following page for details about potential opportunity sites for each of the roundabout types described below.



Main and High Street roundabout in Plymouth, NH between downtown and Plymouth State campus.

MODERN URBAN ROUNDABOUT

Definition: Typically greater than 90 feet in diameter (measuring the outside edge of the traffic portion), these roundabouts especially good for slowing down traffic, thus increasing safety for everyone.

Cost Range: Typically \$3 to \$5 million, due to high design and engineering complexity, and need for acquiring property, relocating utilities, etc.



Mini-roundabout from Fort Collins, CO.

MINI-ROUNDABOUT

Definition: Have many of the same features of a full sized roundabout, but in a pint-sized version. Mini-Roundabouts are completely “mountable” by larger trucks.

Cost Range: Much lower than Modern Urban Roundabouts. Depending on design, can range from \$100,000 to \$300,000. Vermont's first Mini-Roundabout is located in Manchester, VT.



Flickr Dylan Passmore

NEIGHBORHOOD TRAFFIC CIRCLE

Definition: Roundabout used for traffic calming and beautification on low volume neighborhood streets. Large vehicles have to make their left turns “left of center” of the island.

Cost Range: Less than \$50,000, depending on materials and landscaping.

Roundabout Opportunities in Burlington

Single lane roundabouts, designed with contemporary guidelines (i.e. not a Massachusetts rotary or a New Jersey traffic circle!) have consistently proved to be the safest type of intersection, bar none. They are designed to handle high volumes of traffic in a safe and slow manner. The behavior of drivers navigating a roundabout is very different than traffic signals, where drivers tend to speed up just as the light turns yellow. Roundabouts are a very effective way to reinforce slow zones due to their ability to handle high volumes but maintain low speeds. Any roundabout in an urban setting should have very prominently designed pedestrian crossings. Roundabouts are typically designed to give bicyclists two choices: ride through as a vehicle (less intimidating than you might think due to the low speeds) or circulate outside the roundabout on a shared use path. The list below shows some of the opportunities for roundabouts in the City. For any intersection where a signal or widening is being considered, a roundabout should be considered first!

LOCATION*	URBAN ROUNDABOUT	MINI-ROUNDABOUT	TRAFFIC CIRCLE
Archibald & Intervale		X	X
Colchester & East Ave	X	X	
Colchester & Prospect & Pearl		X	
Colchester & Riverside & Barret	X		
Howard & St Paul & Winooski		X	
Intervale & Oak & Riverside		X	
Lakeside & Pine	X		
Loomis & North Prospect			X
Main & South Prospect	X		
Manhattan & Spring		X	
Maple & Battery	X	X	
Maple & Summit			X
North Ave & Institute	X		
North Ave & Plattsburg		X	
North Ave & Route 127 Ramps	X		
North St & North Prospect		X	
North St & North Willard		X	
North Willard & Loomis		X	

LOCATION (CONTINUED...)	URBAN ROUNDABOUT	MINI-ROUNDABOUT	TRAFFIC CIRCLE
Pearl & Willard		X	
Pine & Flynn		X	
Pine & Home		X	
Randy & Hope			X
Shelburne & Flynn	X		
Shelburne & Home	X		
Shelburne Road Rotary	X		
Shore & Dale			X
South Winooski & Bank	X	X	
South Winooski & Cherry		X	
South Winooski & College		X	
South Winooski & Main	X	X	
South Winooski & Pearl	X	X	

**Not that the locations in the charts above are intended to be an initial list of suggestions, not a comprehensive analysis. More detailed, further review may identify additional opportunity sites.*



SCRAMBLE CROSSING

Definition: The use of a signal that goes red for people driving on all sides of an intersection, while allowing people walking or biking to cross in all directions, including diagonally, in an exclusive signal phase.



Photo: NACTO

SHARED SPACE

Definition: A public right-of-way, typically curbless, where people using all modes of transportation share the space without traditional safety infrastructure to guide them. May also be called a “woonerf.”

Overlapping benefits: Can provide a low-stress bikeway and place-making benefits.



SHARED USE LANE MARKING (OR “SHARROW”)

Definition: Pavement marking that indicates a shared lane for bicycles and motor vehicles. Sharrows reinforce the legitimacy of bicycles on the street, recommend proper positioning, and may be used to offer directional guidance. Sharrows are not a substitute for bike lanes. Sharrows typically do not improve bicyclist safety or comfort unless applied on low-speed streets in conjunction with other traffic calming features, and more robust treatments should be applied wherever conditions indicate that sharrows are not an appropriate treatment. Sharrows are recommended in a limited fashion in this plan. Typical applications include low speed/traffic streets where sharrows can be used as a wayfinding connector, on narrow downhill streets paired with a climbing bike lane, or where street widths pinch more robust facilities for short segments of roadway.



Photo: Boston, MA, via Boston.com

“SUPER SHARROWS” (OR BICYCLE PRIORITY LANES)

Definition: Sharrows (defined above) can be enhanced to create a “super sharrow” by adding colored pavement and/or dotted line markings emphasizing a “bicycle priority lane”. In Burlington, this plan recommends applying green-backed super sharrows to neighborhood greenways only. Super sharrows with dotted line markings and no green (pictured left) can be applied along longer stretches of a corridor where context and traffic volumes justify additional visual emphasis (ex: the shared lane recommended along North Street).

Overlapping benefits for both sharrow types: Enhances predictability of road use, providing a strong visual signal that travel lanes will be used by people on bikes.



SHARED USE PATH

Definition: A two-way path that is physically separated from vehicular traffic. Shared-use paths should be designed to accommodate the needs of both people on bikes and people on foot.

Overlapping benefits: Provides safe and protected recreational option for people walking, jogging, skating, wheeling etc.



Photo: Portland, OR by FHWA

THROUGH BICYCLE LANE

Definition: Pavement marking that provides bicyclists with an opportunity to position themselves to avoid conflict with right turning vehicles.



Photo: Bicycle Tucson

TRUCK CORNER APRONS

Definition: An intersection design technique that provides a visually tighter radius for passenger cars, but allows a more generous radius for trucks with a mountable, durable surface. This treatment reduces speeds for turning passenger cars, but does not impede truck turns.

Overlapping benefits: By creating a tighter turning radius for passenger cars, corner aprons can have a traffic calming effect for all users.

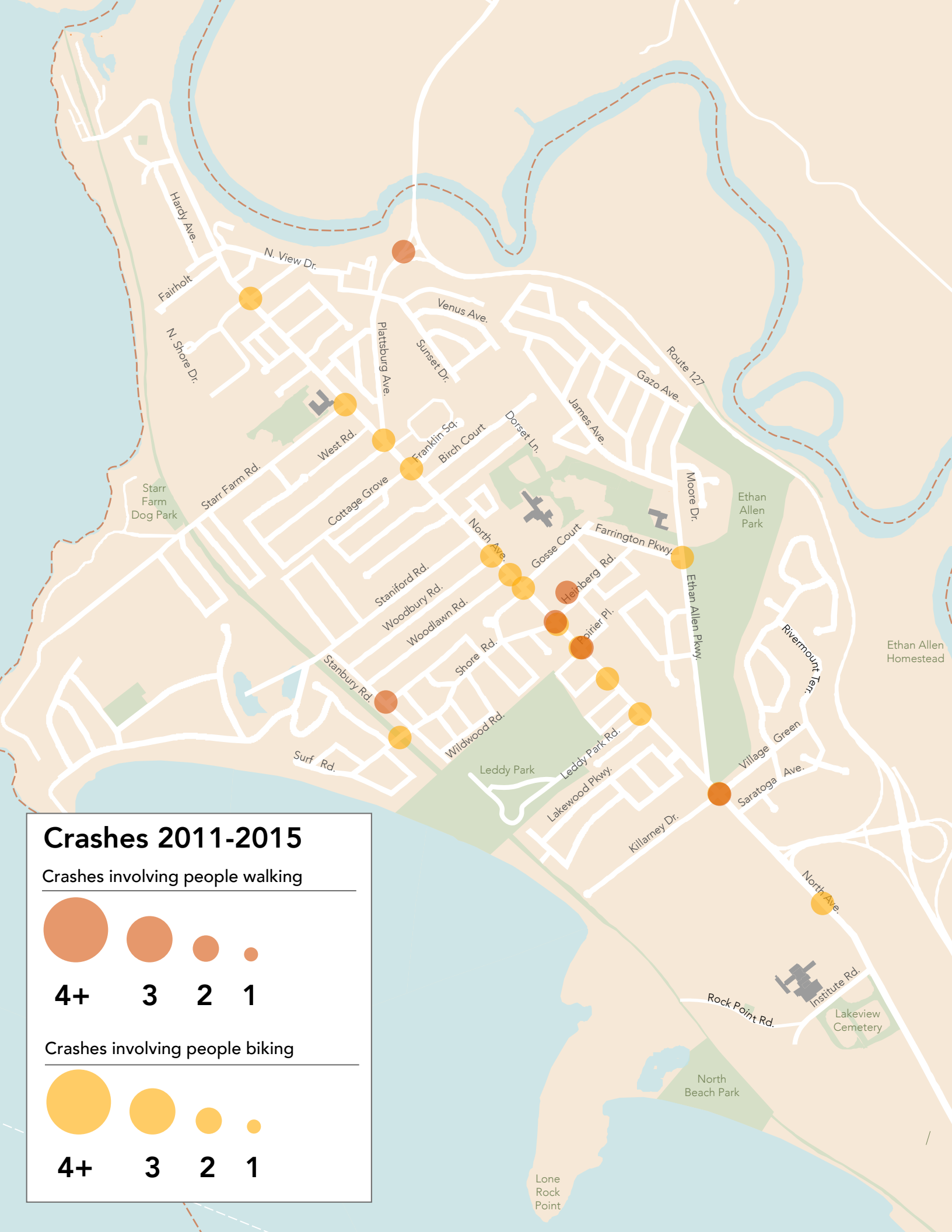


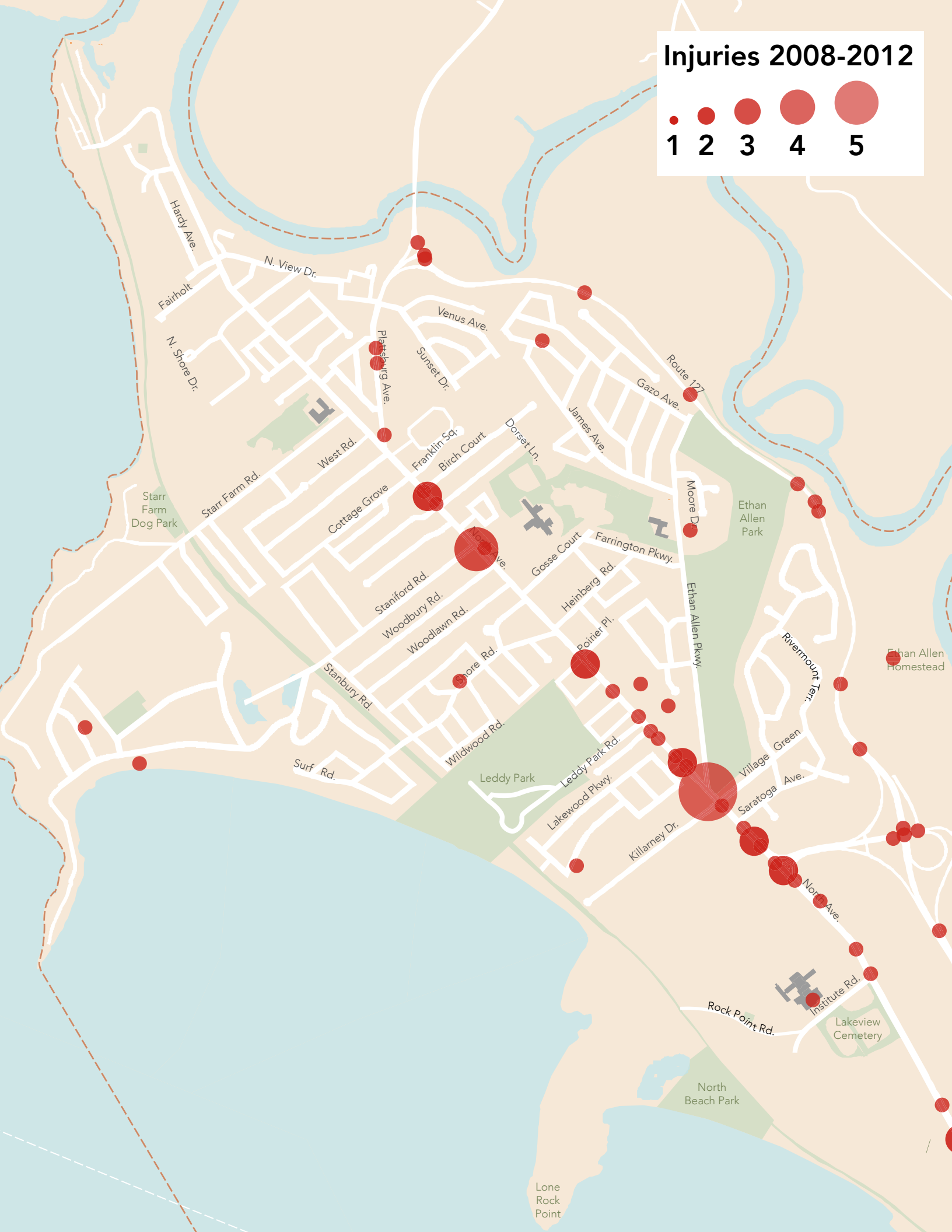
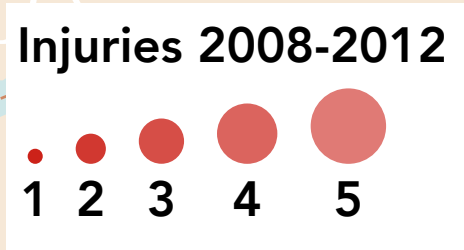
Photo: Matt Johnson

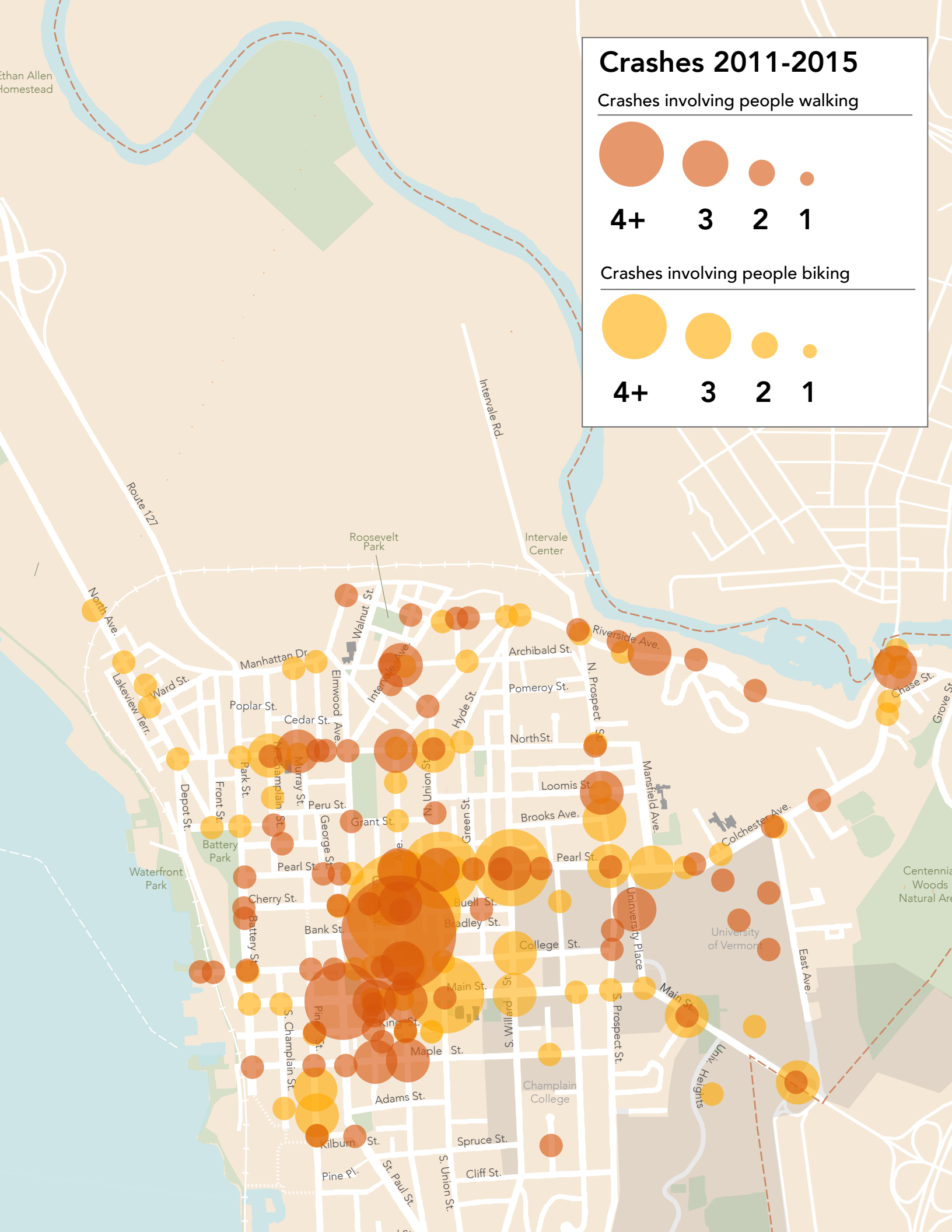
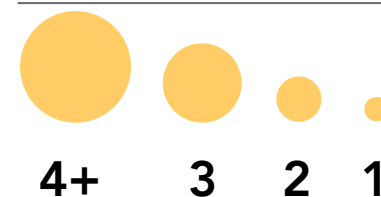
TWO-STAGE TURN QUEUE BOXES

Definition: Pavement marking that allows cyclists a safe way to make left turns from the right side of the road. While two-stage turns may increase comfort in many locations, this design can increase delay for people on bikes, as they must wait for a green signal or gaps in traffic to travel along the intersecting street.

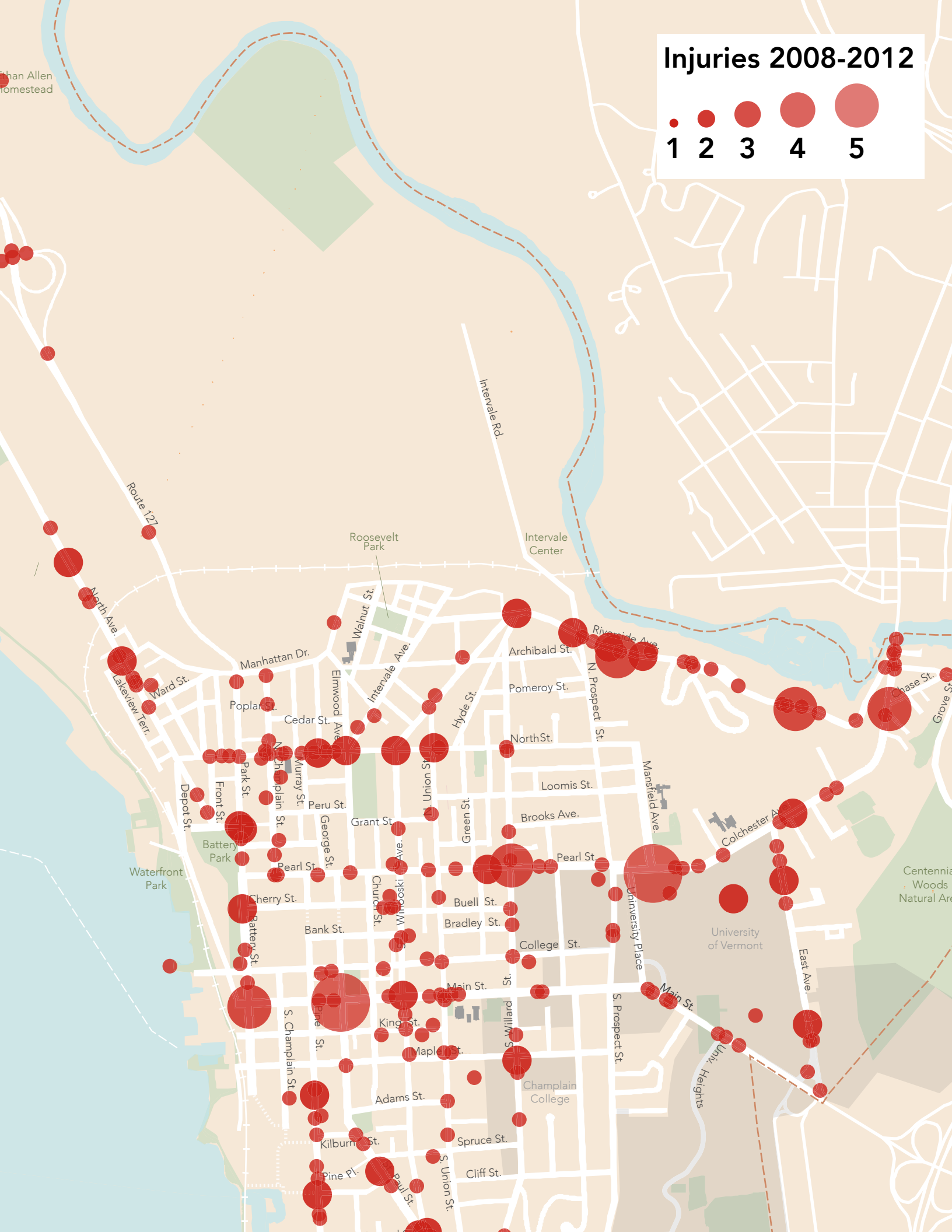
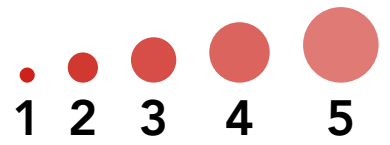
Overlapping benefits: Provides a high-visibility, designated space for people on bikes to wait, outside of the crosswalk area.

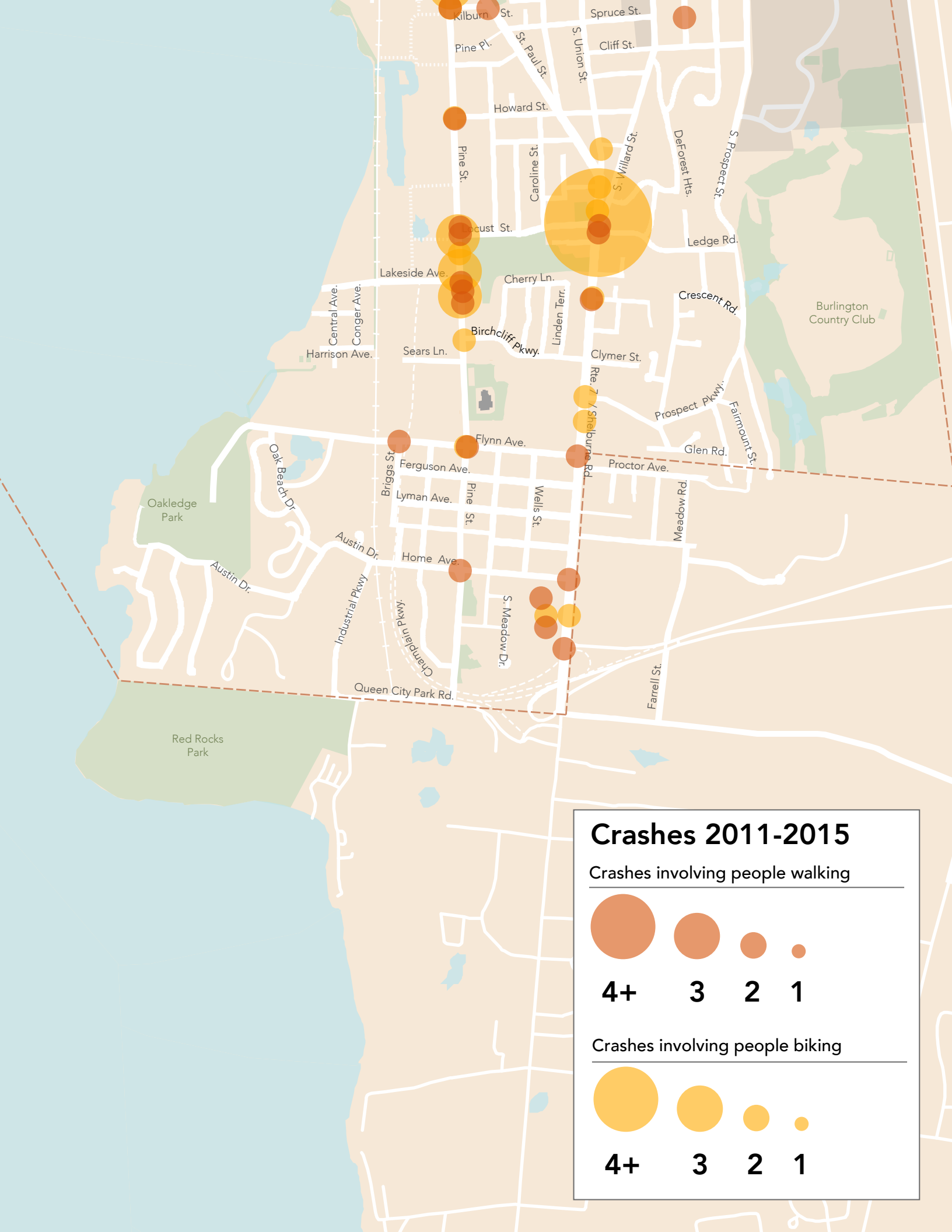


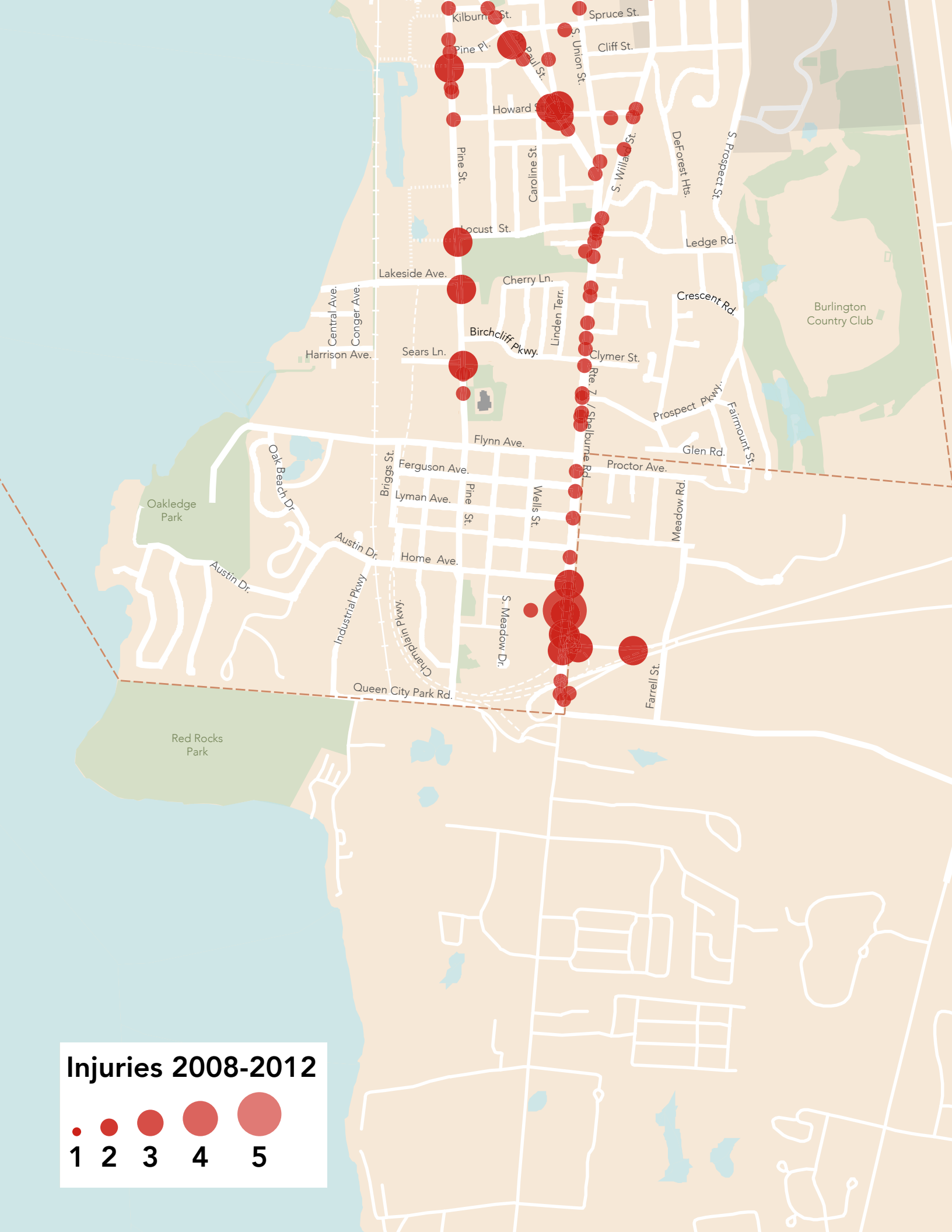
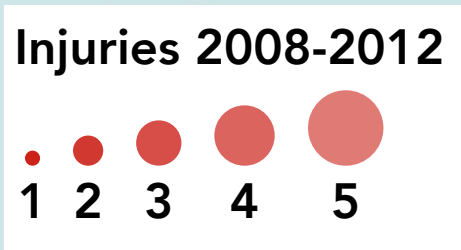




Injuries 2008-2012

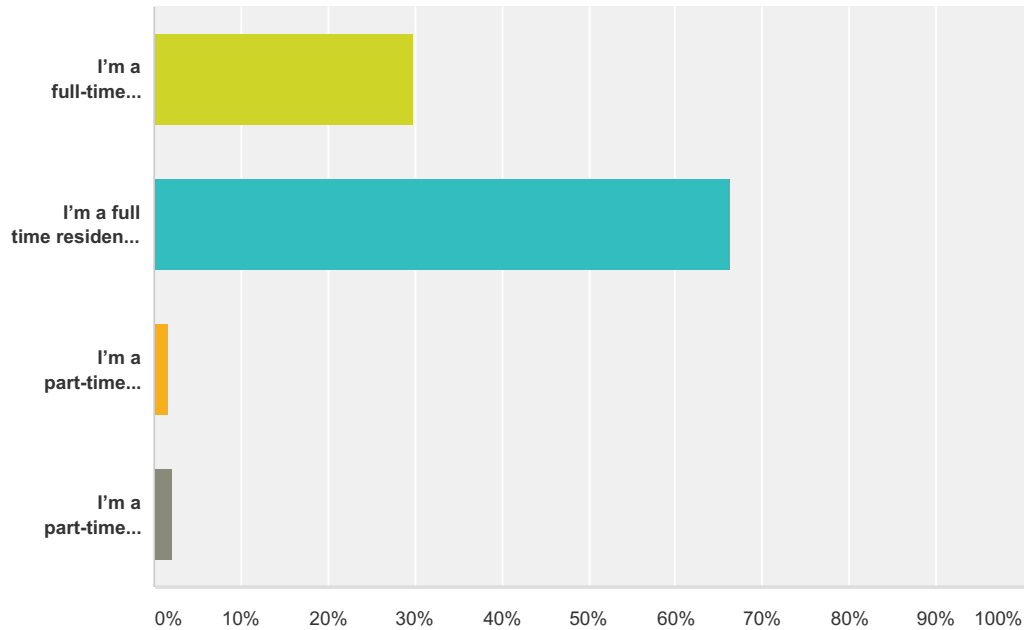






Q1 Do you live in Burlington? If no, proceed to the next question. If yes, please select the option which best describes you:

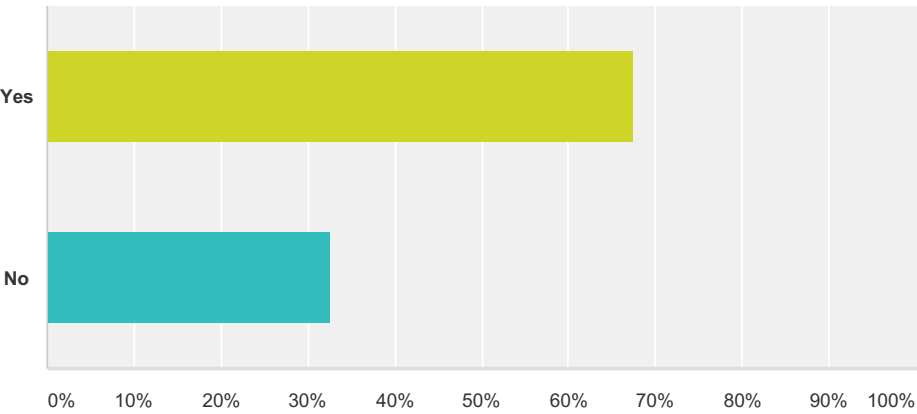
Answered: 369 Skipped: 178



Answer Choices	Responses	
I'm a full-time resident, and I rent my home or apartment.	29.81%	110
I'm a full time resident, and I own my home or apartment.	66.40%	245
I'm a part-time resident, and I rent my home or apartment.	1.63%	6
I'm a part-time resident, and I own my home or apartment.	2.17%	8
Total		369

Q2 Do you work in Burlington?

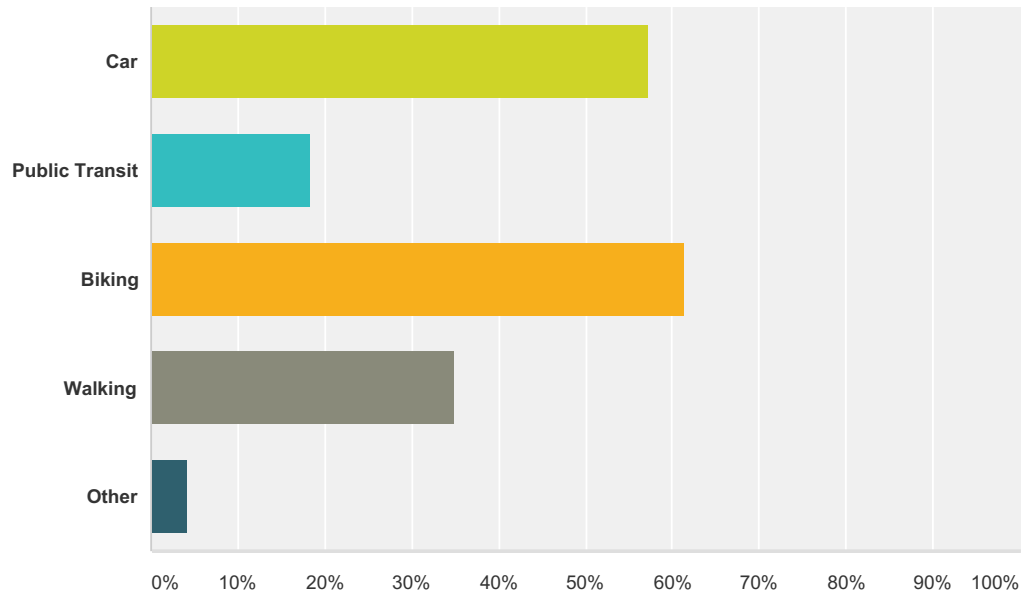
Answered: 516 Skipped: 31



Answer Choices	Responses	
Yes	67.44%	348
No	32.56%	168
Total		516

Q3 What is your primary mode of transportation for your commute? If you use a mixture of modes, select all that you use at least once per week.

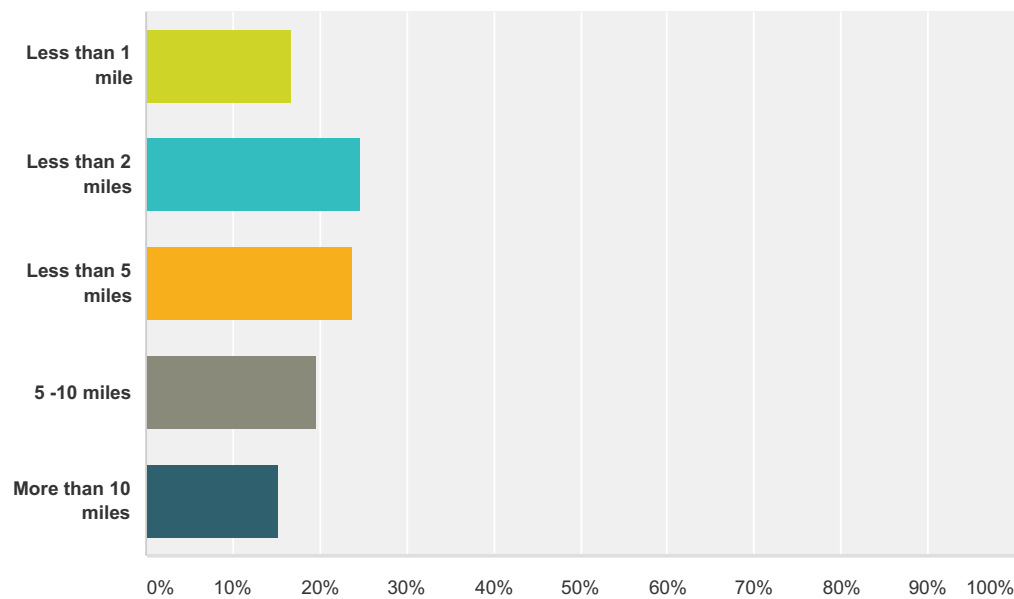
Answered: 451 Skipped: 96



Answer Choices	Responses	
Car	57.21%	258
Public Transit	18.40%	83
Biking	61.42%	277
Walking	34.81%	157
Other	4.21%	19
Total Respondents: 451		

Q4 How long is your commute?

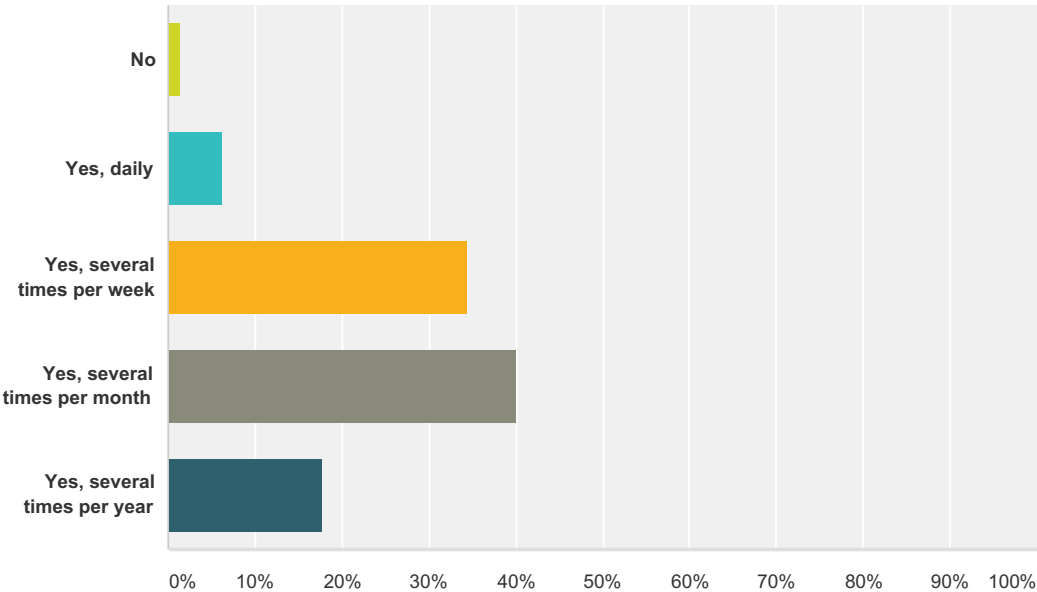
Answered: 444 Skipped: 103



Answer Choices	Responses	
Less than 1 mile	16.67%	74
Less than 2 miles	24.55%	109
Less than 5 miles	23.87%	106
5 -10 miles	19.59%	87
More than 10 miles	15.32%	68
Total		444

Q5 If you are not a resident, do you visit Burlington for reasons other than work? (If you are a resident, skip this question.)

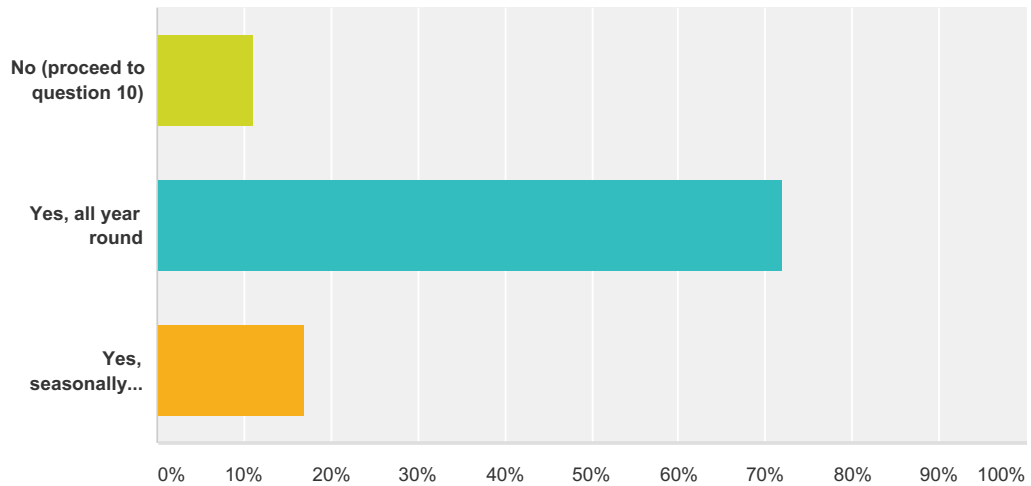
Answered: 192 Skipped: 355



Answer Choices	Responses	
No	1.56%	3
Yes, daily	6.25%	12
Yes, several times per week	34.38%	66
Yes, several times per month	40.10%	77
Yes, several times per year	17.71%	34
Total		192

Q6 Do you walk for transportation in Burlington?

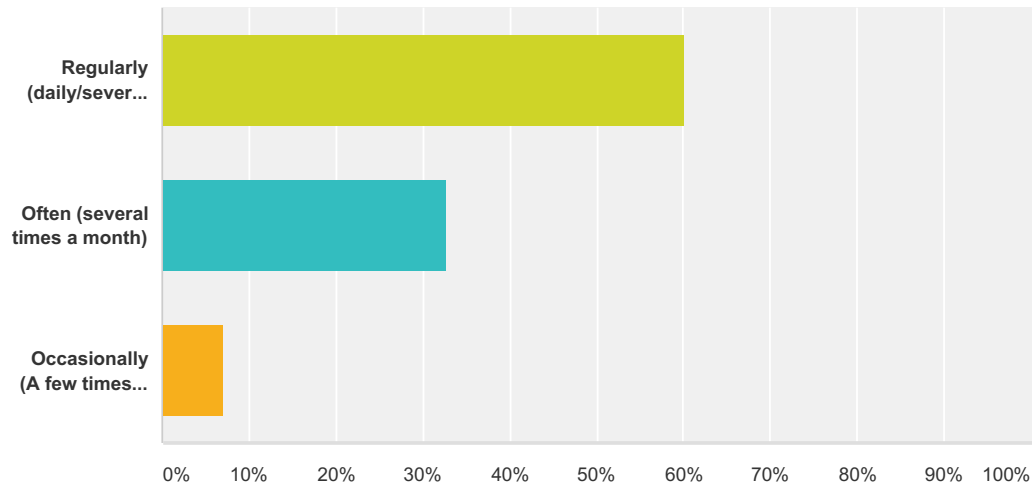
Answered: 538 Skipped: 9



Answer Choices	Responses	
No (proceed to question 10)	10.97%	59
Yes, all year round	72.12%	388
Yes, seasonally (whenever it warms up!)	16.91%	91
Total		538

Q7 During the times of year you indicated above, how often do you walk?

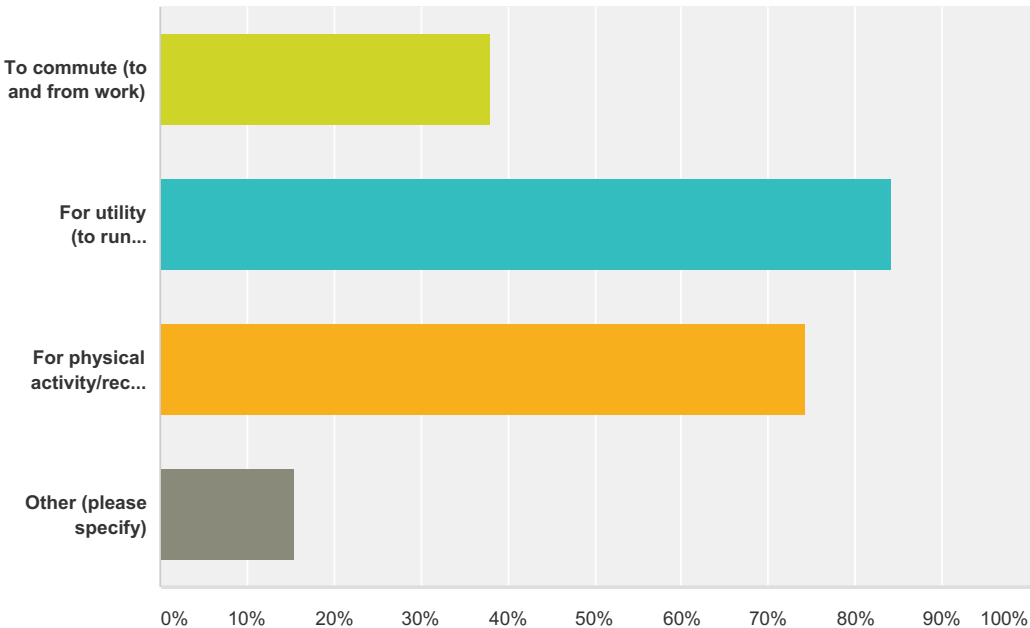
Answered: 488 Skipped: 59



Answer Choices	Responses	
Regularly (daily/several times a week)	60.04%	293
Often (several times a month)	32.79%	160
Occasionally (A few times a year)	7.17%	35
Total		488

Q8 Why do you walk in Burlington? (Select all that apply.)

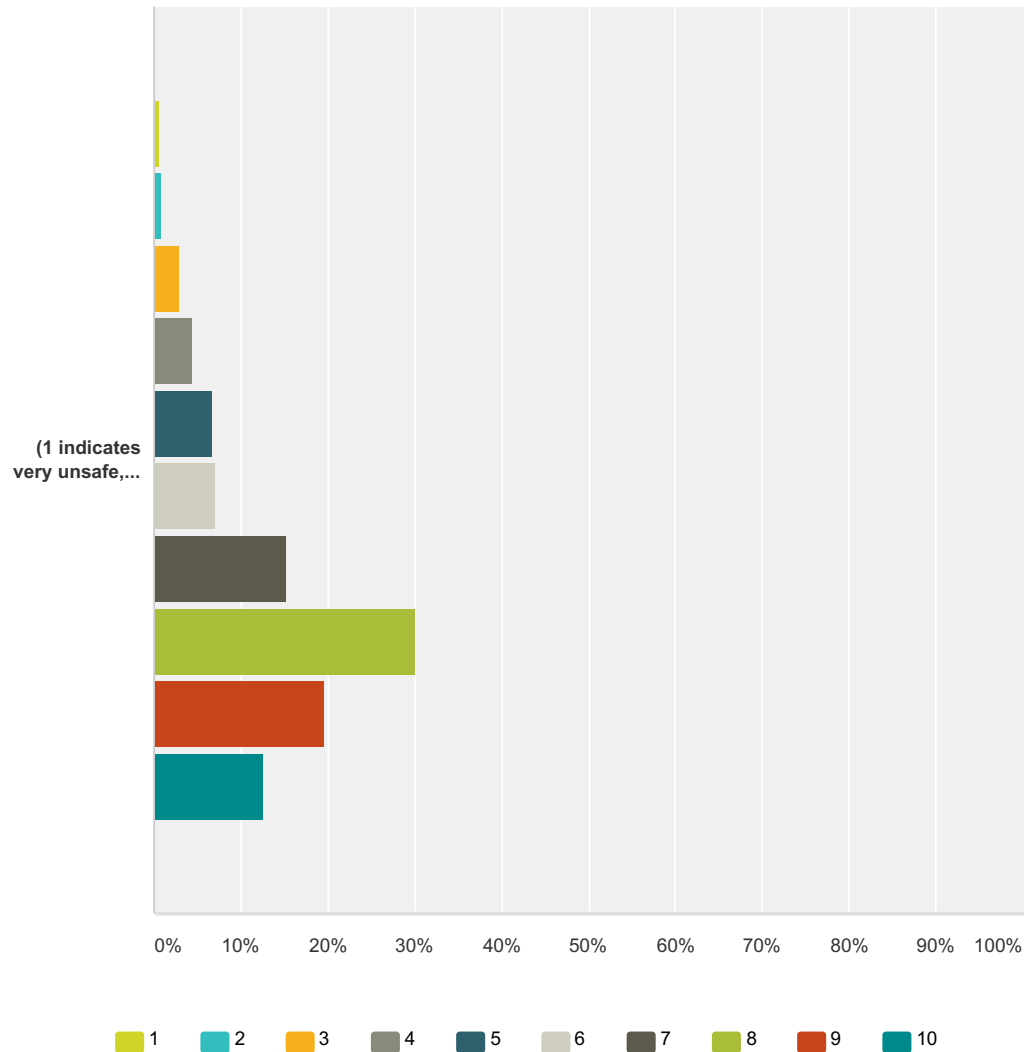
Answered: 495 Skipped: 52



Answer Choices	Responses	
To commute (to and from work)	37.98%	188
For utility (to run errands, see friends, etc.)	84.04%	416
For physical activity/recreation	74.34%	368
Other (please specify)	15.35%	76
Total Respondents: 495		

Q9 On a scale of 1 to 10 how safe do you feel safe when you walk in Burlington?

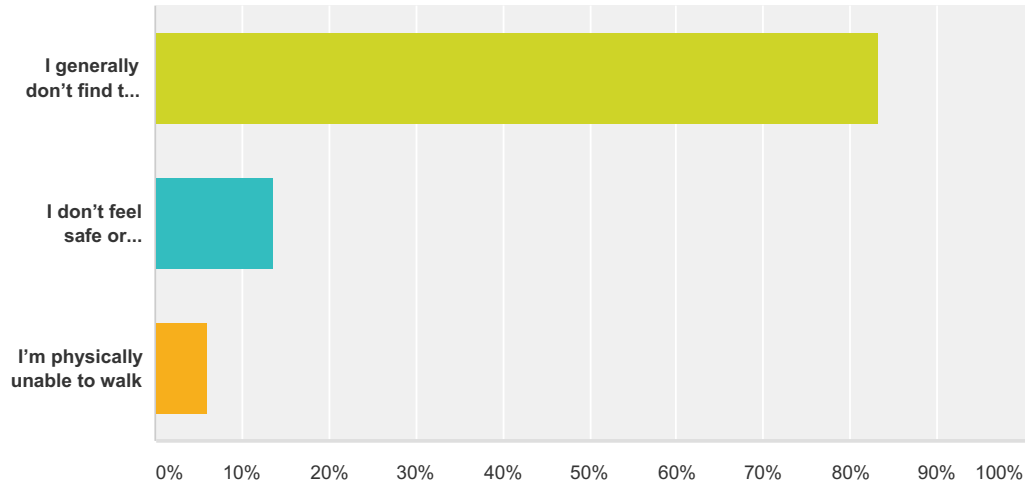
Answered: 499 Skipped: 48



	1	2	3	4	5	6	7	8	9	10	Total
(1 indicates very unsafe, 10 indicates very safe)	0.60% 3	0.80% 4	3.01% 15	4.41% 22	6.61% 33	7.01% 35	15.23% 76	30.06% 150	19.64% 98	12.63% 63	499

Q10 If you don't walk often in Burlington, tell us why. Check all that apply. (If you do walk frequently in Burlington, please skip this question.)

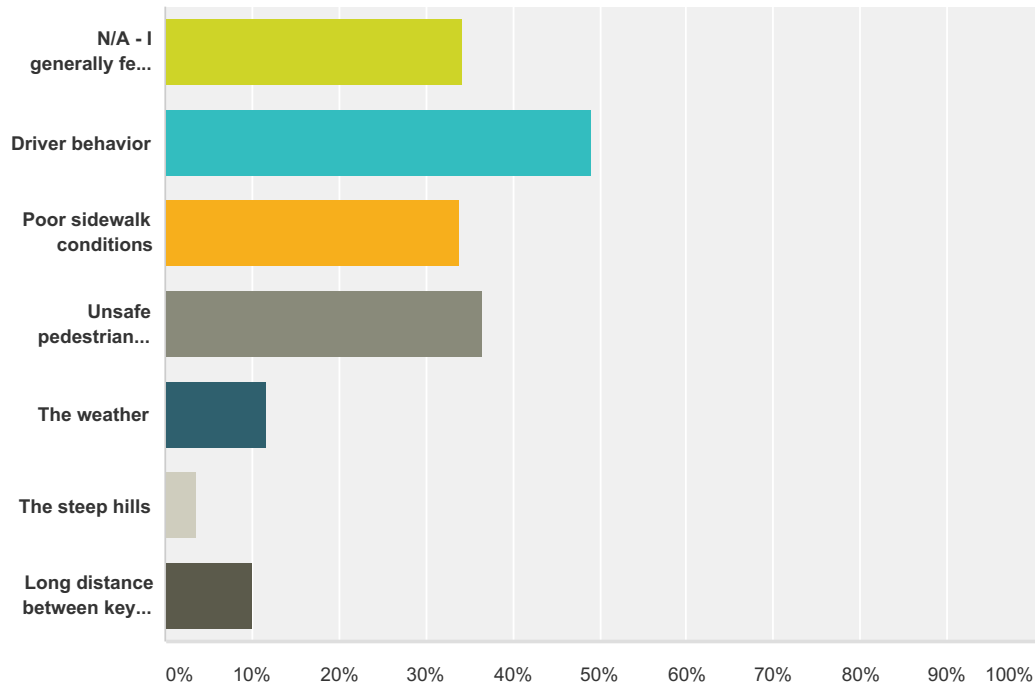
Answered: 66 Skipped: 481



Answer Choices	Responses	
I generally don't find the need or opportunity to walk between my destinations.	83.33%	55
I don't feel safe or comfortable walking	13.64%	9
I'm physically unable to walk	6.06%	4
Total Respondents: 66		

Q11 Please indicate which of the elements below make you feel unsafe or uncomfortable walking around Burlington.

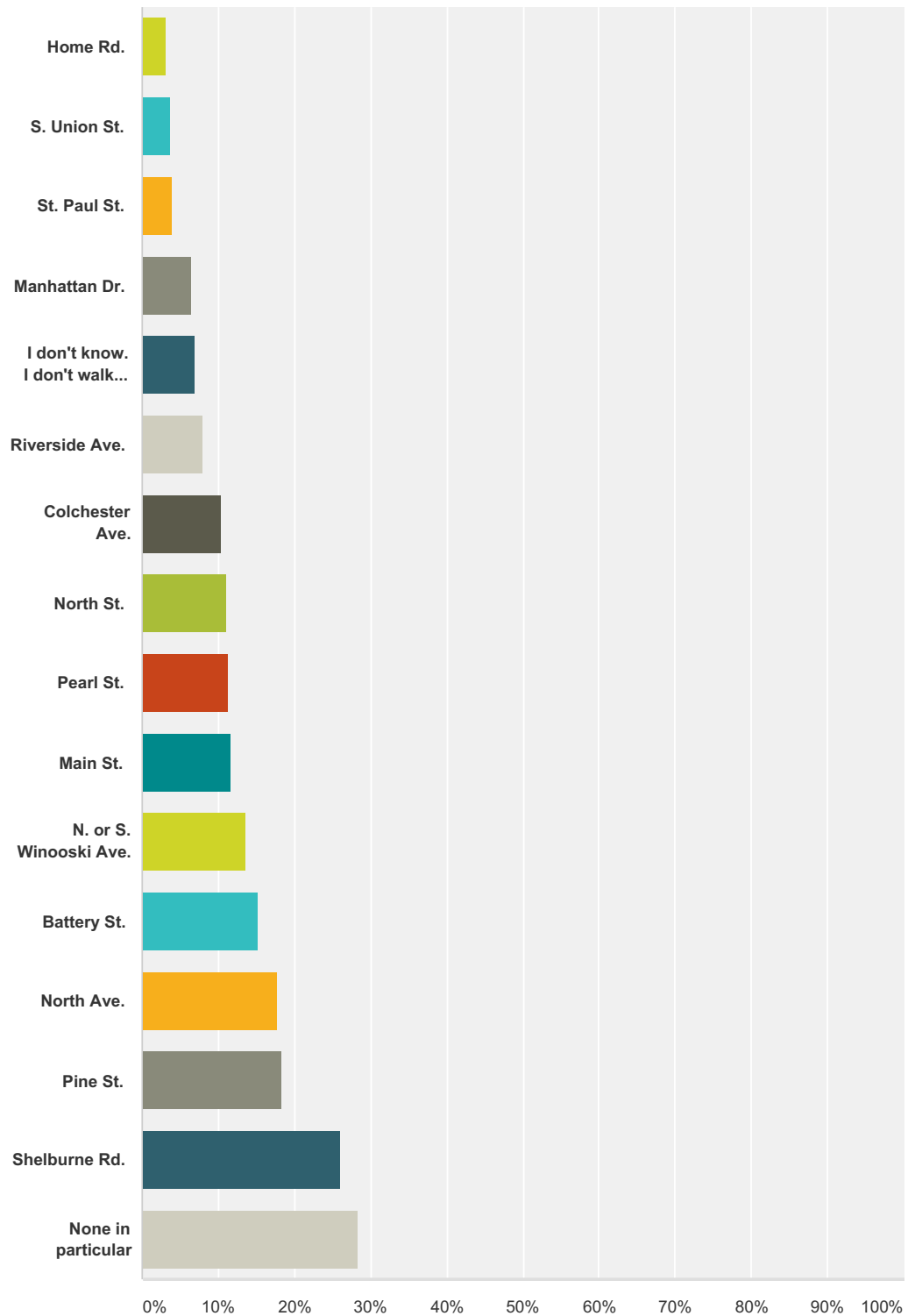
Answered: 486 Skipped: 61



Answer Choices	Responses	
N/A - I generally feel very comfortable and safe walking in Burlington	34.16%	166
Driver behavior	48.97%	238
Poor sidewalk conditions	33.74%	164
Unsafe pedestrian crossings	36.63%	178
The weather	11.73%	57
The steep hills	3.50%	17
Long distance between key destinations	10.08%	49
Total Respondents: 486		

Q12 Are there any particular streets or intersections that feel unsafe for walking? (Check all that apply)

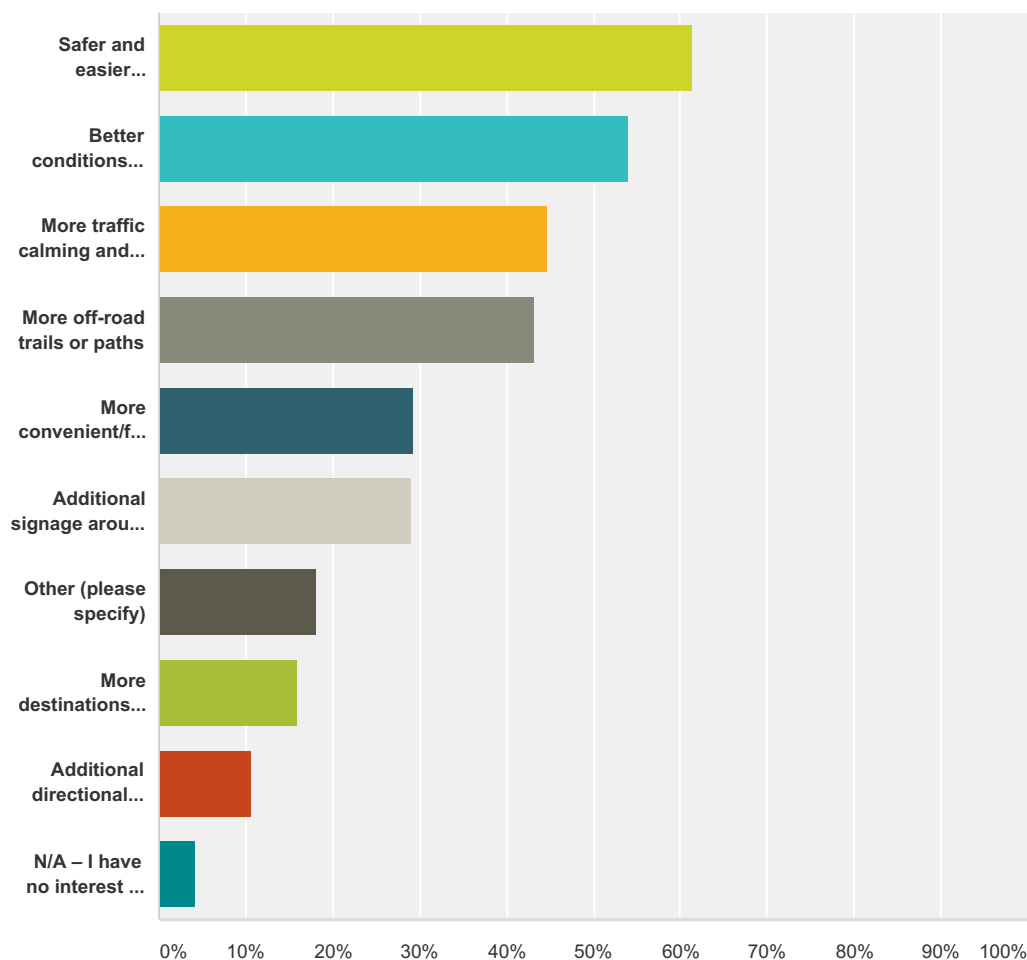
Answered: 353 Skipped: 194



Home Rd.	3.12%	11
S. Union St.	3.68%	13
St. Paul St.	3.97%	14
Manhattan Dr.	6.52%	23
I don't know. I don't walk around frequently enough to have an opinion.	6.80%	24
Riverside Ave.	7.93%	28
Colchester Ave.	10.48%	37
North St.	11.05%	39
Pearl St.	11.33%	40
Main St.	11.61%	41
N. or S. Winooski Ave.	13.60%	48
Battery St.	15.30%	54
North Ave.	17.85%	63
Pine St.	18.41%	65
Shelburne Rd.	26.06%	92
None in particular	28.33%	100
Total Respondents: 353		

Q13 What physical infrastructure upgrades would encourage you to walk more? (Check all that apply)

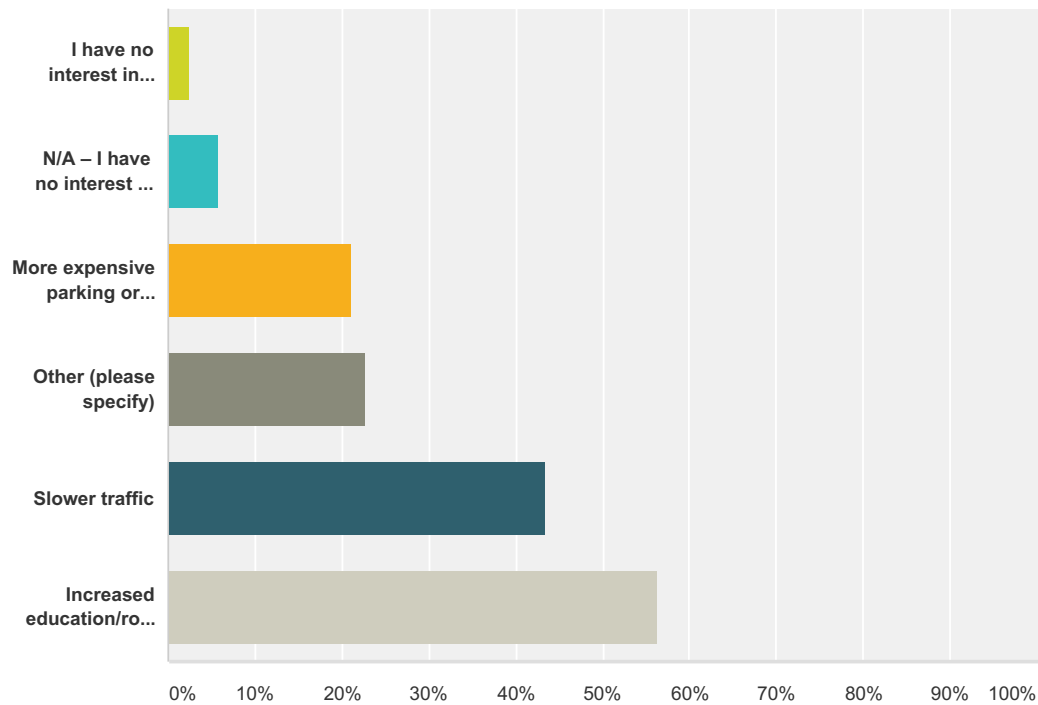
Answered: 501 Skipped: 46



Answer Choices	Responses
Safer and easier intersections for crossings (pedestrian signals, median refuges, shorter crossings/more time to cross, better visibility)	61.48% 308
Better conditions (shade trees, wider sidewalks, fewer curb cuts, landscaping, plowing/timely snow and ice removal, seating, separation from traffic)	54.09% 271
More traffic calming and lower traffic speeds	44.71% 224
More off-road trails or paths	43.11% 216
More convenient/frequent public transportation	29.14% 146
Additional signage around safety/enforcement (ex: "pedestrian crossing" etc.)	28.94% 145
Other (please specify)	18.16% 91
More destinations to walk to within proximity of my house or place of employment (shops, parks, etc.)	15.77% 79
Additional directional signage for pedestrians	10.58% 53
N/A - I have no interest in walking for transportation	4.19% 21
Total Respondents: 501	

Q14 What programs/policies would encourage you to walk around Burlington more? (Check all that apply)

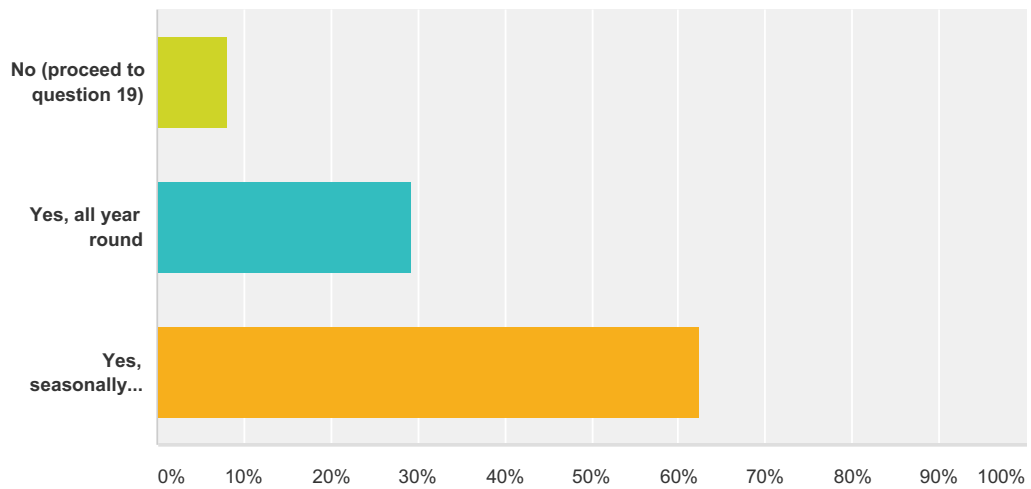
Answered: 426 Skipped: 121



Answer Choices	Responses	
I have no interest in walking for transportation	2.58%	11
N/A – I have no interest in walking for transportation	5.87%	25
More expensive parking or gasoline costs	21.13%	90
Other (please specify)	22.77%	97
Slower traffic	43.43%	185
Increased education/road user awareness/enforcement of laws protecting pedestrians	56.34%	240
Total Respondents: 426		

Q15 Do you bicycle in Burlington?

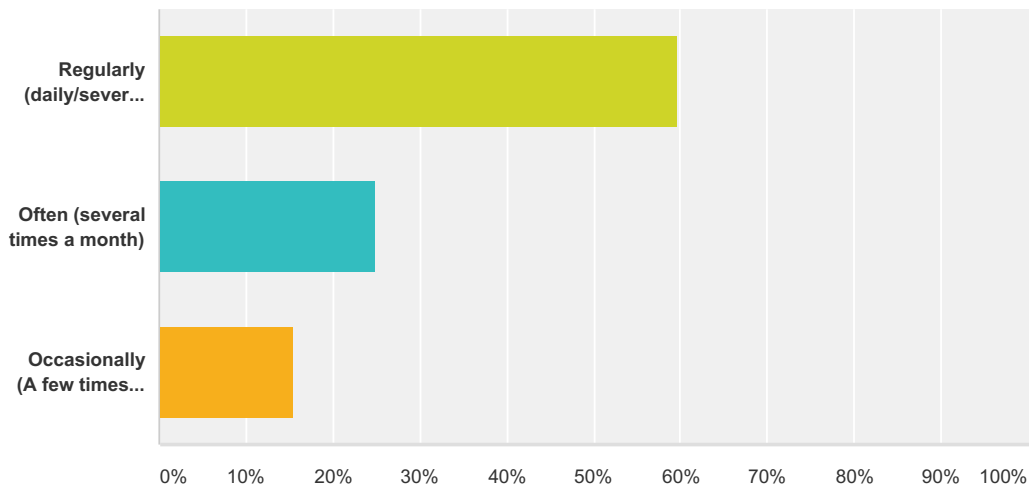
Answered: 539 Skipped: 8



Answer Choices	Responses
No (proceed to question 19)	8.16% 44
Yes, all year round	29.31% 158
Yes, seasonally (whenever it warms up!)	62.52% 337
Total	539

Q16 During the times of year you indicated above, how often do you bicycle?

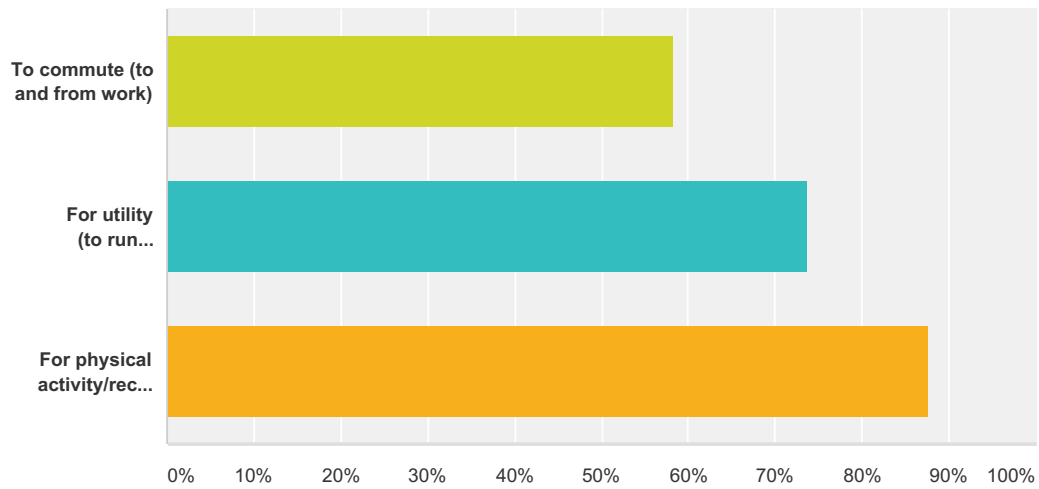
Answered: 496 Skipped: 51



Answer Choices	Responses
Regularly (daily/several times a week)	59.68% 296
Often (several times a month)	24.80% 123
Occasionally (A few times a year)	15.52% 77
Total	496

Q17 Why do you bicycle in Burlington? (Check all that apply.)

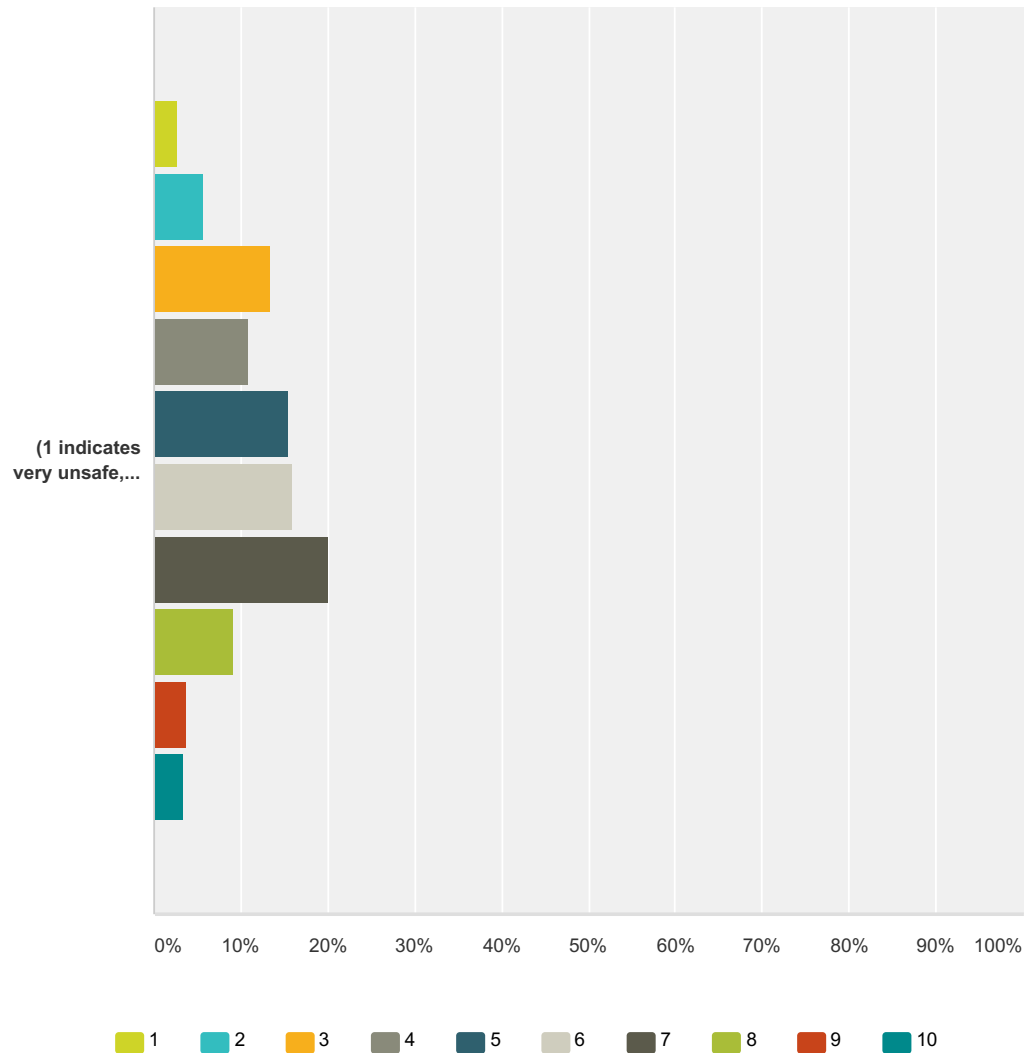
Answered: 493 Skipped: 54



Answer Choices	Responses	
To commute (to and from work)	58.22%	287
For utility (to run errands, see friends, etc.)	73.63%	363
For physical activity/recreation	87.63%	432
Total Respondents: 493		

Q18 On a scale of 1 to 10 how safe do you feel safe when you bike in Burlington?

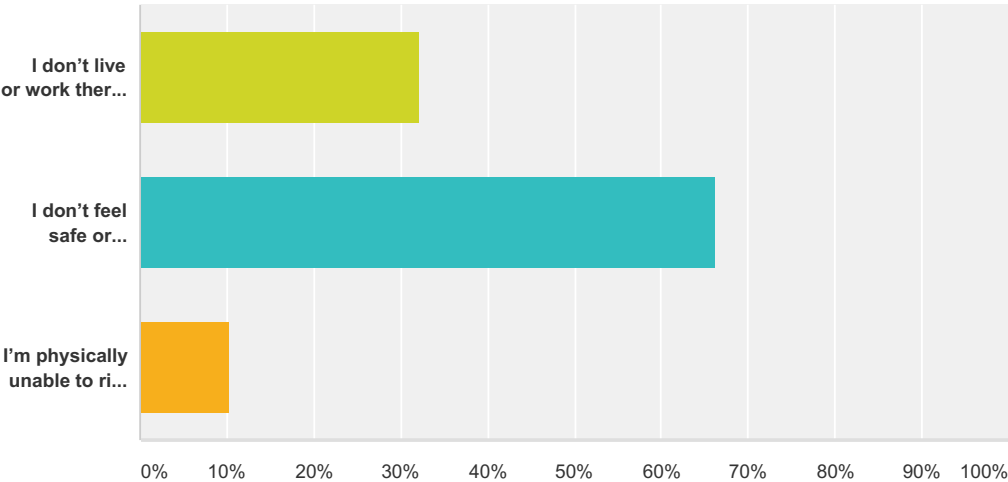
Answered: 501 Skipped: 46



	1	2	3	4	5	6	7	8	9	10	Total
(1 indicates very unsafe, 10 indicates very safe)	2.79% 14	5.59% 28	13.37% 67	10.78% 54	15.37% 77	15.77% 79	19.96% 100	9.18% 46	3.79% 19	3.39% 17	501

Q19 If you don't bicycle in Burlington, tell us why. (Check all that apply.) If you do bike in Burlington, please skip this question.

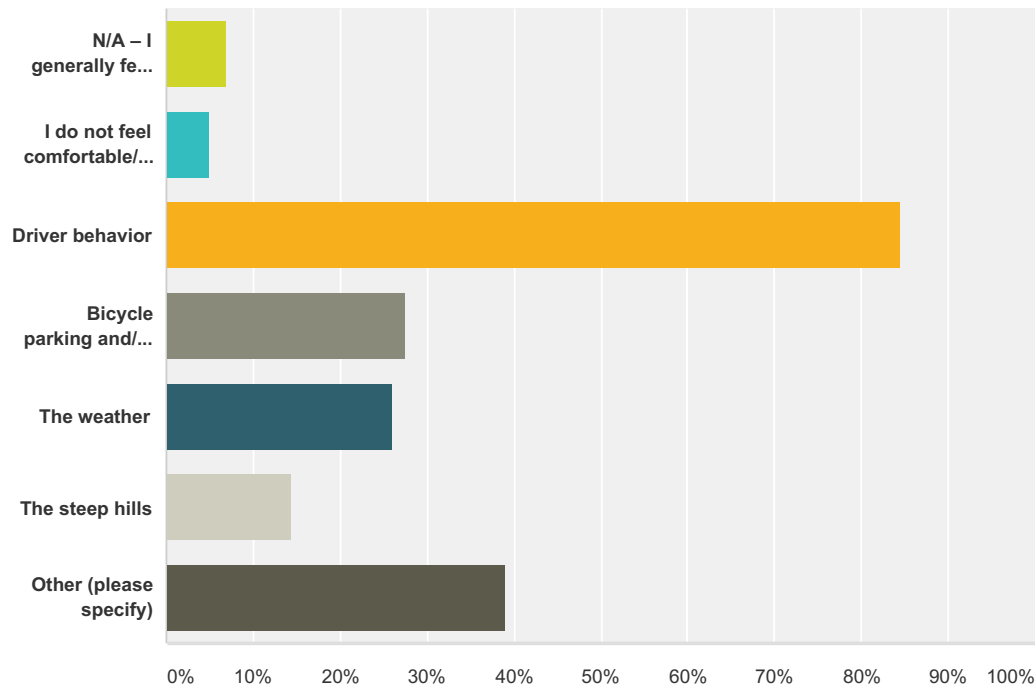
Answered: 59 Skipped: 488



Answer Choices	Responses	
I don't live or work there, and generally don't find the need or opportunity to bicycle.	32.20%	19
I don't feel safe or comfortable biking	66.10%	39
I'm physically unable to ride a bike	10.17%	6
Total Respondents: 59		

Q20 Regardless of how frequently you ride, please indicate which of the elements below make you feel unsafe or uncomfortable biking in Burlington.

Answered: 528 Skipped: 19

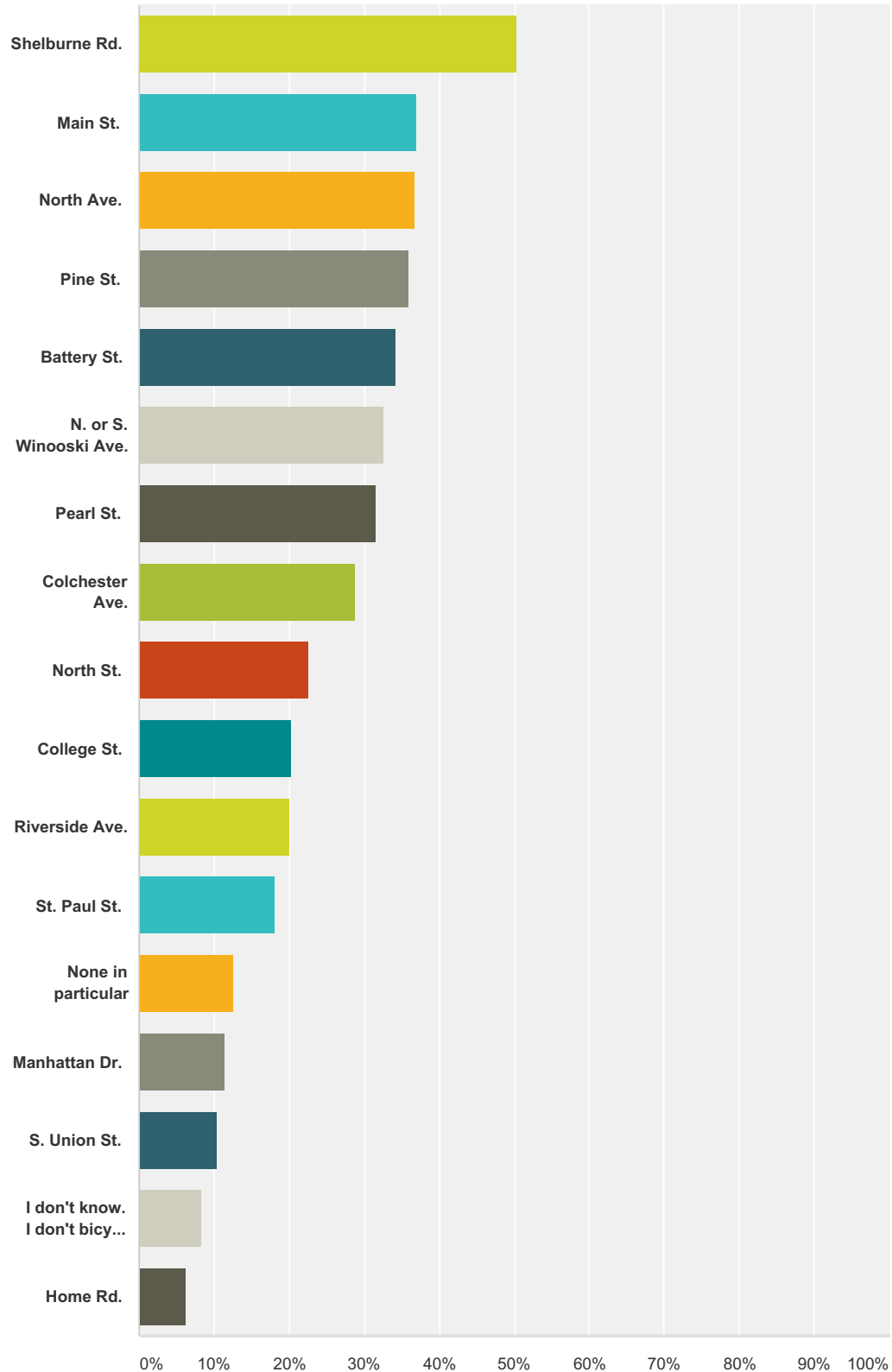


Answer Choices	Responses	
N/A – I generally feel very comfortable and safe biking in Burlington	6.82%	36
I do not feel comfortable/knowledgeable as a cyclist	5.11%	27
Driver behavior	84.47%	446
Bicycle parking and/or other amenities are lacking and make it inconvenient or undesirable	27.46%	145
The weather	26.14%	138
The steep hills	14.39%	76
Other (please specify)	39.02%	206
Total Respondents: 528		

Q21 Are there particular streets or intersections that feel unsafe for biking? (Check all that apply)

Answered: 400 Skipped: 147

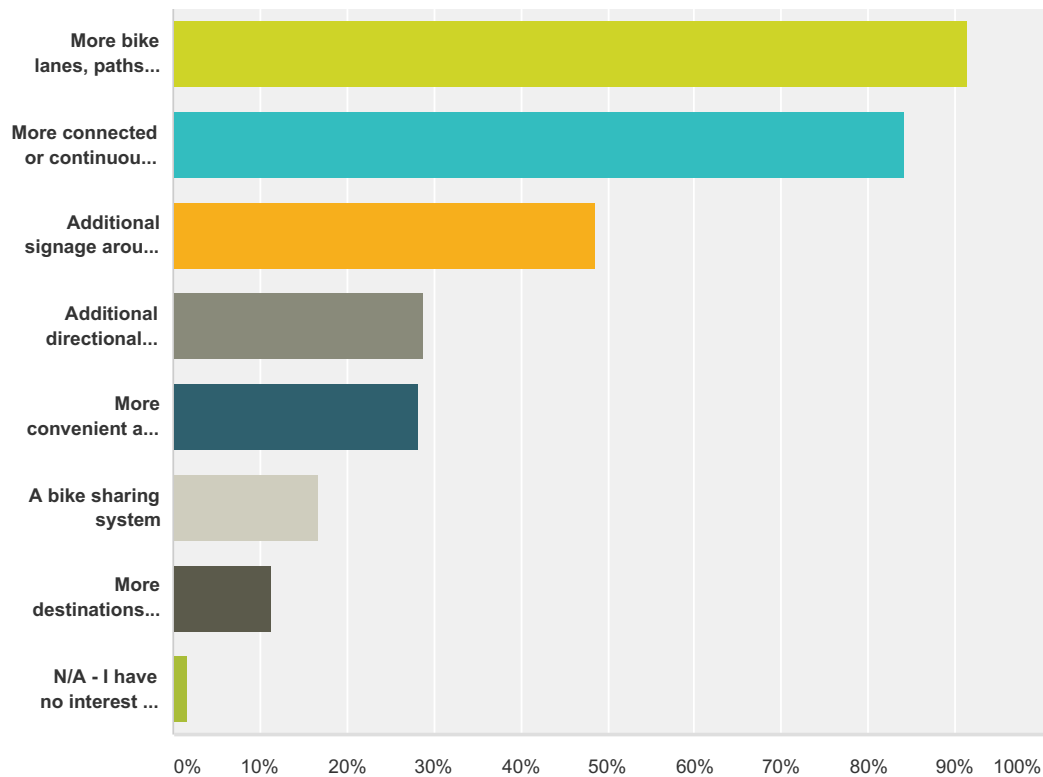
Plan BTV Walk Bike Survey



Answer Choices	Responses	
Shelburne Rd.	50.25%	201
Main St.	37.00%	148
North Ave.	36.75%	147
Pine St.	36.00%	144
Battery St.	34.25%	137
N. or S. Winooski Ave.	32.50%	130
Pearl St.	31.50%	126
Colchester Ave.	28.75%	115
North St.	22.50%	90
College St.	20.25%	81
Riverside Ave.	20.00%	80
St. Paul St.	18.25%	73
None in particular	12.50%	50
Manhattan Dr.	11.50%	46
S. Union St.	10.50%	42
I don't know. I don't bicycle frequently enough to have an opinion.	8.25%	33
Home Rd.	6.25%	25
Total Respondents: 400		

Q22 What physical infrastructure upgrades would encourage you to bicycle more? (Check all that apply)

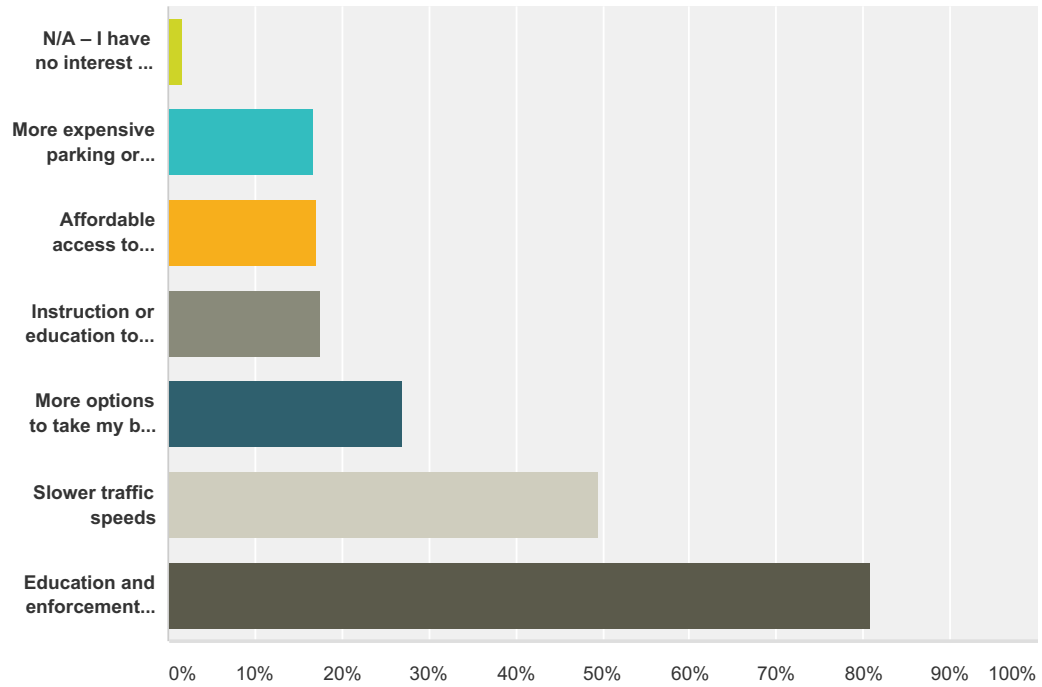
Answered: 527 Skipped: 20



Answer Choices	Responses
More bike lanes, paths, trails that are protected or separated from car traffic	91.46% 482
More connected or continuous bicycle network throughout Burlington	84.06% 443
Additional signage around safety/enforcement (ex: 3 foot rule, "share the road" etc.)	48.58% 256
Additional directional signage for cyclists	28.84% 152
More convenient and weather-appropriate bicycle parking	28.27% 149
A bike sharing system	16.70% 88
More destinations to ride to within proximity of my house or place of employment	11.20% 59
N/A - I have no interest or am unable to bike	1.71% 9
Total Respondents: 527	

Q23 What programs/policies would encourage you to bicycle more? (Check all that apply)

Answered: 463 Skipped: 84



Answer Choices	Responses	
N/A – I have no interest or am unable to bike	1.73%	8
More expensive parking or gasoline costs	16.63%	77
Affordable access to bicycles, helmets, lights, and reflective gear	17.06%	79
Instruction or education to help me become a more confident, safer cyclist	17.49%	81
More options to take my bike on the bus	27.00%	125
Slower traffic speeds	49.46%	229
Education and enforcement campaigns to improve driver behavior	80.78%	374
Total Respondents: 463		

PLAN BTV WALK/BIKE MASTER PLAN

SUMMARY OF COMMENTS ON PUBLIC PLAN DRAFT

This plan is the result of a robust and multi-faceted public input process, described in detail in Chapter 2 of this plan. As a final step to the process, a full draft of the Master Plan was made available for public comment from July to November of 2016. This memo summarizes major, content-related edits suggested during the formal public comment period. Note that small edits (typos, name correction, small map edits related to existing conditions) are not referenced in this memo.

Commenter: Jennifer Green, Sustainability Coordinator, City of Burlington

Comment: Add more explanation/emphasis about e-bikes to plan

Commenter: Many individuals, and advocacy organization Local Motion

Comment: Add more bike lane striping projects in year 1. Local Motion submitted a detailed proposal outlining an alternative, accelerated phasing of recommended projects.

Commenter: Daniel Scheidt

Comment: Create a less steep bikeway connection option between Prospect Street and other parallel routes.

Commenter: Damon Lane

Comment: Clarification is needed regarding treatments/transitions along intersection in the Peru-Sherman-Grant Greenway

Commenter: Several individuals

Comment: Expressed concern that plan inappropriately recommended zoning changes related to Neighborhood Activity Center.

Commenter: Many individuals

Comment: Requested more clarification regarding selection of slow zone streets, and specifically requested expansion of slow zone along S. Prospect

Commenter: David White

Comment: Provide more specific recommendations re: Bike Parking Ratios

Commenter: Erik Brotz

Comment: Provided comprehensive review of existing conditions corrections needed, as well as suggested changes to recommendations for several projects including:

- Leddy Park Road sidewalk
- Phasing of North Avenue protected bike lanes
- N. Winooski/N. Union/Decatur intersection upgrades
- Phasing of wayfinding and trail upgrades to existing dirt path from Ethan Allen Homestead to Intervale Road
- Advocating for passage of new state law allowing 20 mph speed limits
- Adjusting illustrated glossary to provide more local examples

SOURCES: BIKE BENEFITS STATISTICS (PAGE 39)

Households in automobile-dependent communities devote 50% more—an extra \$3,000 on average—to transportation than households in communities with better bike and pedestrian facilities.

Source: McCann, 2000 - in Economic Value of Walkability, T. Litman, 2009

In a survey of recent transplants to Portland, OR, 62% said that the city's bike-friendliness was a factor in their decision to move there.

Source: City of Portland Bureau of Transportation, 2009 - Portland Bicycle Maps and Information Survey, Transportation Options Division, reported via BikePortland.org

After the installation of a protected bike lane in New York City, injuries to all street users decreased by 58% and retail sales increased by as much as 49% (compared to a 3% increase in sales citywide).

Source: Measuring the Street: New Metrics for 21st Century Streets, 2012

The more often an employee cycles and the longer the distance traveled, the lower the rate of absenteeism.

TNO, 2009 - "Reduced sickness absence in regular commuter cyclists can save employers 27 million euros"

An adult cyclist typically has a level of fitness equivalent to someone 10 years younger and a life expectancy two years above the average.

Source: Paffenbarger, R., et al., 1986., and Department for Transport, 2007 - in "Safety in numbers in England," CTC

Adolescents who bike or walk to school watch less TV and are less likely to smoke than their peers who are driven to school. They also get more overall physical activity.

Source: Landsberg, B., et al., 2008 - Associations between active commuting to school, fat mass, and lifestyle factors in adolescents: the Kiel Obesity Prevention Study (KOPS), European Journal of Clinical Nutrition, 62, 739-47

Girls who walk or bike to school perform better on tests. Longer commutes were associated with higher test scores, regardless of how much exercise students got outside of school.

Source: Martinez-Gomez, D., et al., 2010 - Active commuting to school and positive cognitive performance in adolescents: The AVENA study, Archives of Pediatrics and Adolescent Medicine

Walking instead of driving to work or school every day can reduce carbon dioxide (CO₂) emissions by approximately 300 kg (660 lb) per year for a round trip that is 5 km (3.1 miles) long.

Source: "Reducing Personal CO₂ Emissions" - McAuliffe-Shepard Discovery Center: <http://www.starhop.com/library/pdf/studyguide/high/brsp-17ReduceCO2.pdf>



For more information, visit: www.planbtvwalkbike.org