

Kirkland Neighborhood Greenways

DRAFT

GUIDE FOR IMPLEMENTATION

Public Works Department
CITY OF KIRKLAND 123 5th ave

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Credits

NEIGHBORHOOD GREENWAY TASK FORCE

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Overview

One of the goals the Kirkland City Council established with its 2015 approval of the Transportation Master Plan was to enhance Kirkland's transportation environment for all types of travel. That includes walking and bicycling.

The pursuit of this goal has led to several policies, programs and initiatives, which prioritize the movement of people. The first of these is Vision Zero, the main objective of which is to eliminate by 2035 all transportation-related deaths or serious injuries. Manifesting this vision relies directly on safe, multi-modal road design, such as Neighborhood Greenways, which accommodate all kinds of travel for all ages and abilities.

Residents asked the City Council for these kinds of facilities. And the City Council is responding by allocating f for each of the City's first two Greenway projects.

The purpose of this document is to establish a set of guidelines that Kirkland's staff can use to initiate each Greenway project. The guidelines recommend a year-long outreach and design process during which city staff can carefully evaluate present-day conditions to better design future connections. In the outreach process, the project team solicits stakeholders' feedback, perspective and experience on existing issues and design considerations. The design of each greenway responds directly to this feedback.

After the ensuing construction period, City staff evaluates each Neighborhood Greenway's outcomes to identify opportunities for improvement.

Neighborhood Greenways

Neighborhood Greenways are well-connected neighborhood roadways on which people of all ages and abilities feel safe to walk and ride bicycles. Fewer than 3,500 automobiles travel through them--most at speeds slower than 25 miles per hour. Greenways often have signs, pavement markings and traffic control measures that enhance walking and bicycling safety. As such, driving an automobile on them is, by design, less convenient than driving on the other streets.

Many neighborhood streets already have the low speeds and low volumes that are so essential to a safe multi-modal environment. But not all of them connect to important destinations, such as schools, parks and retail outlets. To create a safe and effective walking and bicycling route, a city must identify these connective residential roadways and enhance the qualities that discourage automobile speeds and volumes to create a place to go to, not just through.

On top of the neighborhood connections they enhance, Neighborhood Greenways also enhance a series of community values, according to the Transportation Master Plan. Those community values are:

- Quality of life
- Public health
- Neighborhood and street aesthetics
- Improve environmental health
- Affordable and convenient options for travel
- Safety
- Economic activity
- Improved real estate values
- Clean air
- Traffic flow



Seattle, WA

As described in Figure 1 below, the network proposed by Kirkland Greenways advocacy group and adopted in the Transportation Master Plan, accounts for existing and planned facilities in its vision of a fully connected transportation system of multiple levels of roadway. In support of these guidelines, an additional map was created (figure 2) to provide a clearer picture of the concept-level greenway routes the city will pursue.

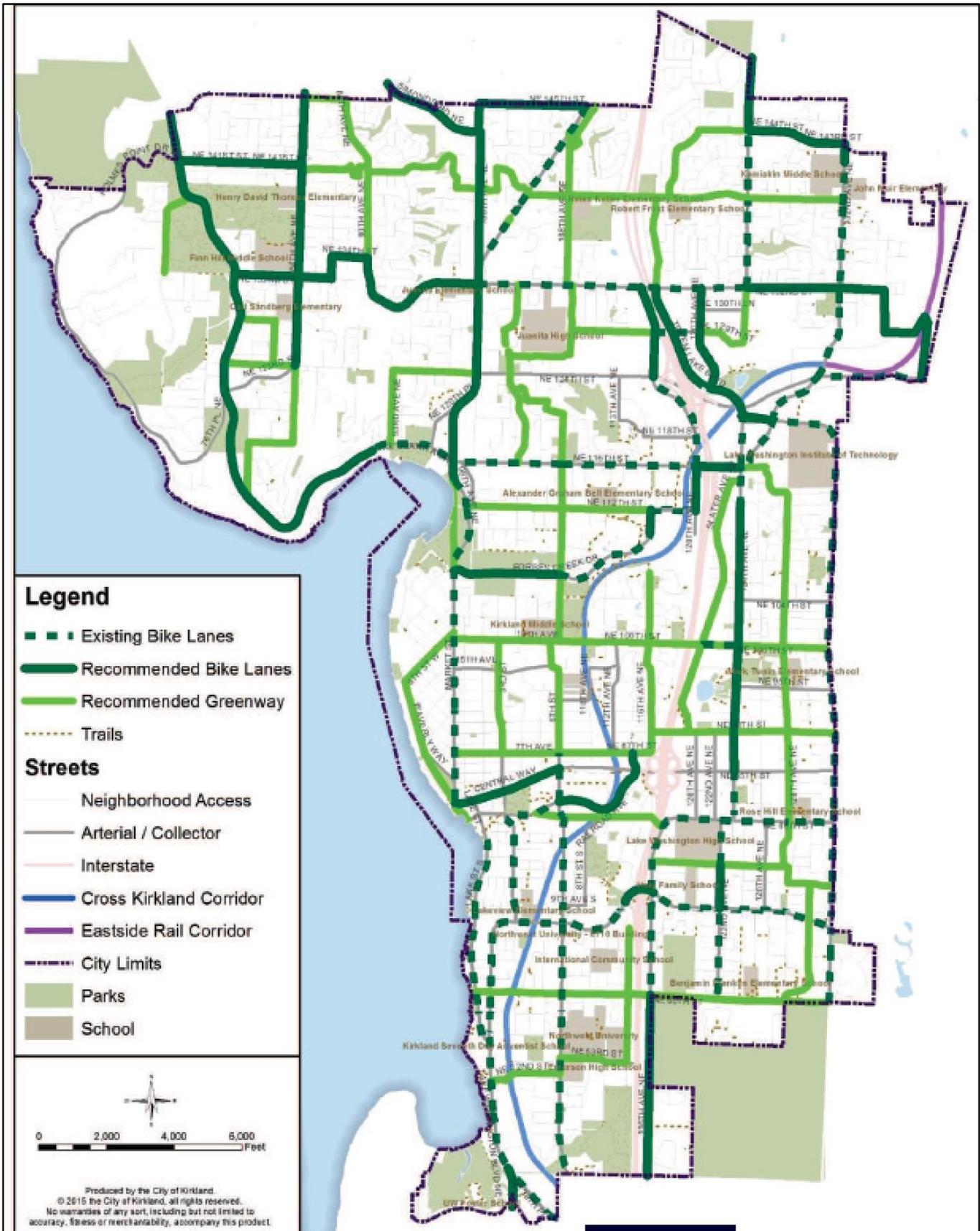


Figure 1: Existing and Planned Bicycle Facilities identified in the 2015 Transportation Master Plan

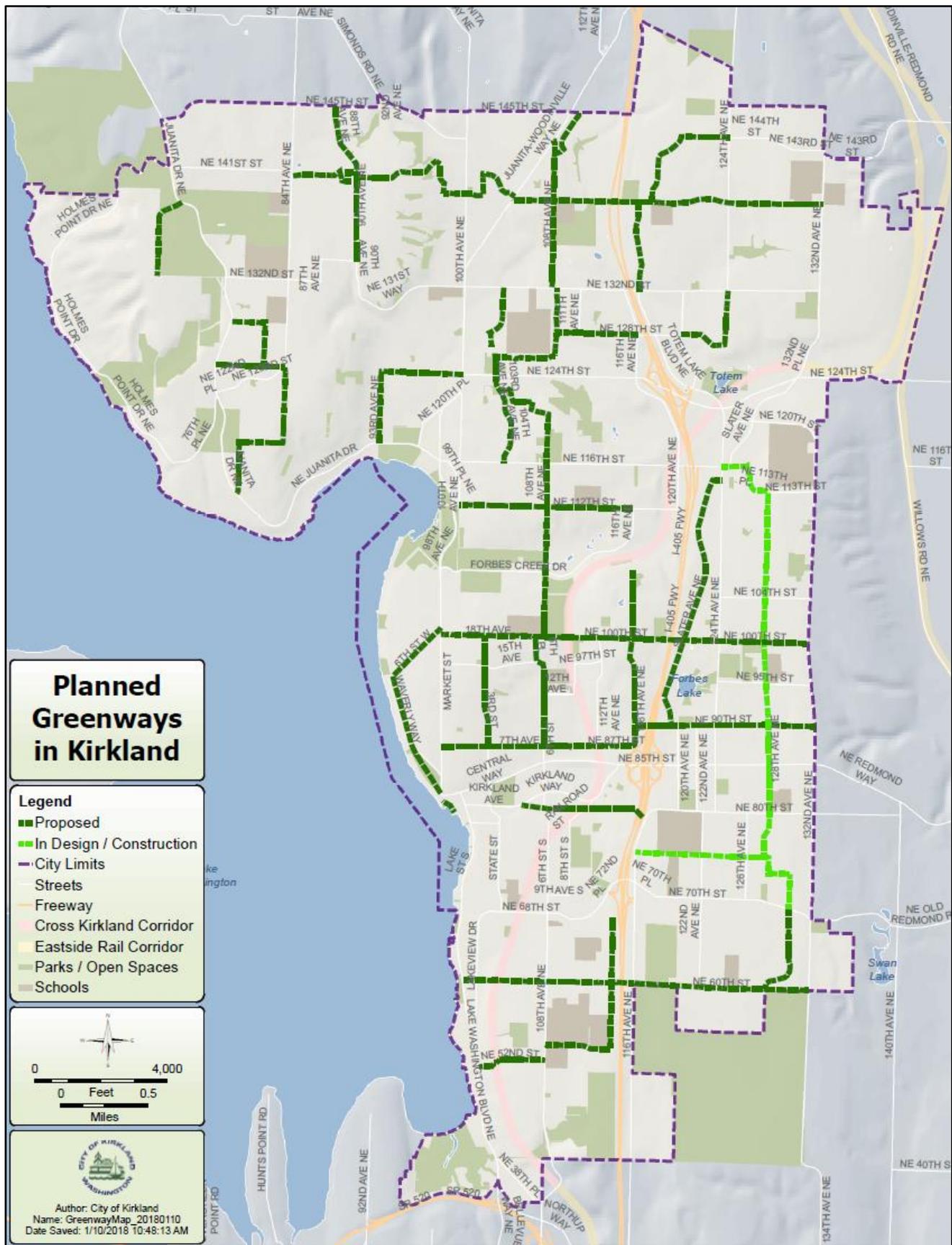


Figure 2: Network of Greenway Projects (Map updated 2017)

Guidelines Task Force

A citizen advisory group, consisting of City staff and external stakeholders, helped form these guidelines. The primary purpose of this group was to discuss major greenway concepts and guide a recommended template for all greenway projects. In the four meetings the task force assembled, the group discussions focused on three broad topics:

- 1.) Routing: Where does a greenway begin, connect and end
- 2.) Design: What tools should a greenway use to enhance walkability and bikeability
- 3.) Prioritization: How to decide which greenway candidate receives the funding for design and construction.

Routing

The advisory group highlighted the importance of destinations to better connect community assets, such as parks, churches and transit centers, and encourage more use of the greenway routes. The group said greenways should connect community services and amenities to residents with comfortable facilities designed for safe travel.

Guidance for Routing and Facilities

- Prioritize the route's directness; then balance hilliness and existing facilities.
- Minimizing a greenway route's hilliness is important, especially considering it must be accessible to all ages and all abilities. Minimizing hilliness, however, is not as important as ensuring the greenway offers a direct route to intended destinations. When hilliness is unavoidable, staff should assess the route for infrastructure that would accommodate all ages and abilities.

If there is a balance between directness and hilliness, staff should consider those existing facilities that provide an ideal level of safety for the neighborhood greenway. Figure x below describes the different type of facilities and the comfort level of pedestrians and bicyclists.



Figure x: Level of comfort in relation to the type of facility

Routing Considerations

The chart below describes the Task Force's recommended priorities for considering greenway projects.



Schools & school routes

Greenways offer an appropriate facility for students still learning how to navigate the world. Greenways that connect to schools should capitalize on school walk routes and school zones to enhance the greenways.



Neighborhood Shopping

Greenways that connect to residents to shopping areas make utilitarian errand- and shopping-trips more feasible.



St John Church Kirkland, Washington

Neighborhood Centers

Places of worship are often used as community centers when a community center is not in place.



Kirkland Transit Center

Access to Transit

Greenways offer a convenient option to access the expanding transit services, which incentivize transit-use and reduce dependence on automobiles.



Google Campus Kirkland, WA

Employment

Safe connections between jobs and the rest of the community will support the city's overall goal of achieving a multimodal network of transportation options.



Marina Park Kirkland, WA

Parks

Parks are identified as an important feature the city is committed to preserving. Greenways should provide access to these highly valued community assets.

Neighborhood Greenway Design

The purpose of neighborhood greenways is to create a comfortable space for people when they are most vulnerable on the roadway, which is when they are walking or riding a bicycle. In Greenway development, City staff should limit conflict points between automobiles and people who are walking or riding bicycles. Additionally, partnerships in the community and within City Hall should be considered in the design process to maximize support for each greenway project.

All Ages & Abilities

The City should be focused on designing greenways to accommodate people of all ages and abilities. The city must improve crossings so the level of comfort on the greenway flows through the entire corridor. Design should also balance the amount of devices, signs and pavement markings necessary to preserve the neighborhood roadway appeal, but effectively promote the safe travel on the greenway.

Level of comfort and vehicle movement

To preserve the greenway's level of comfort and, at the same time, improve the conflict points, city staff may need to consider redirecting automobiles onto parallel streets. The City should also be more proactive in design with the expected increase in pedestrian and bicyclist volumes and prioritize the movement of people at greenway intersections. If the proposed greenway overlaps an arterial, modal separation should be considered to maintain the level of comfort ideal for any greenway corridor.

Intuitive Design

The elements that make a greenway highly comfortable include intuitive and predictable design. There needs to be good visibility so all users can be aware of each other and better predict movement. The design should self-enforce safe speeds for automobiles and bicycles. The design should also coordinate traffic calming devices, signs or markings to preserve intuitive design but also minimize clutter.

Each of the following elements are required for all neighborhood greenway projects:

Way-finding and Pavement Markings



Safe Speeds



Prioritized Movement



Investment in Arterial Crossings



Partnerships

Neighborhood support through the outreach process is also imperative to achieve a successful neighborhood greenway.

As our regional partners on bicyclist and pedestrian topics, Cascade Bicycle Club and Feet First should be consulted in the initial stages for each project. Each organization has staffers with technical expertise and members located in Kirkland that would support every greenway project.



Locally, city staff should consult with the Kirkland Alliance of Neighborhoods and the respective neighborhood each greenway project is proposed to be located. Each of these groups is effective in supporting outreach efforts and providing important feedback for project design. Through these groups, city staff can highlight related issues identified by the neighborhoods and address them through the greenway project.



Kirkland is fortunate to have a local group focused on neighborhood greenway implementation. This group was paramount in the discussions with City Council to include greenways as part of the city's transportation network. The group includes on the ground knowledge of the proposed greenway network and includes residents with a passion for healthy transportation modes. This is a strong group to include in the outreach and design process for each greenway project the city pursues.



Within the City, Public Works will be the primary department implementing greenway projects city wide. Through the design process Police and Fire should be consulted to ensure the project supports access for emergency services and supports enforcement of traffic laws. These groups will be vital in the location and design for any new devices that impact vehicle movement.

Within the Public Works Department, the project manager for the greenway project should consult internal divisions, specifically, maintenance, operations and stormwater staff. In a region where the weather brings frequent rain and often high winds, the city must ensure the greenway corridors remain clear and in good condition to use.

Through an integrated effort to combine stormwater system improvements with the capital projects for a greenway, the city will be better able to support a healthy environment and safe use of roadways.

Through an interdepartmental partnership, city staff will educate residents about stormwater issues and potential solutions, encourage a more active role for residents in stormwater management, and improve poor quality infrastructure contributing to frequent ponding, further accumulating pollutants.

City staff will look at partnerships to integrate:

- Educational opportunities
- Rain Gardens
- Bioswales
- Habitat restoration
- Inlet covers
- Permeable pavement

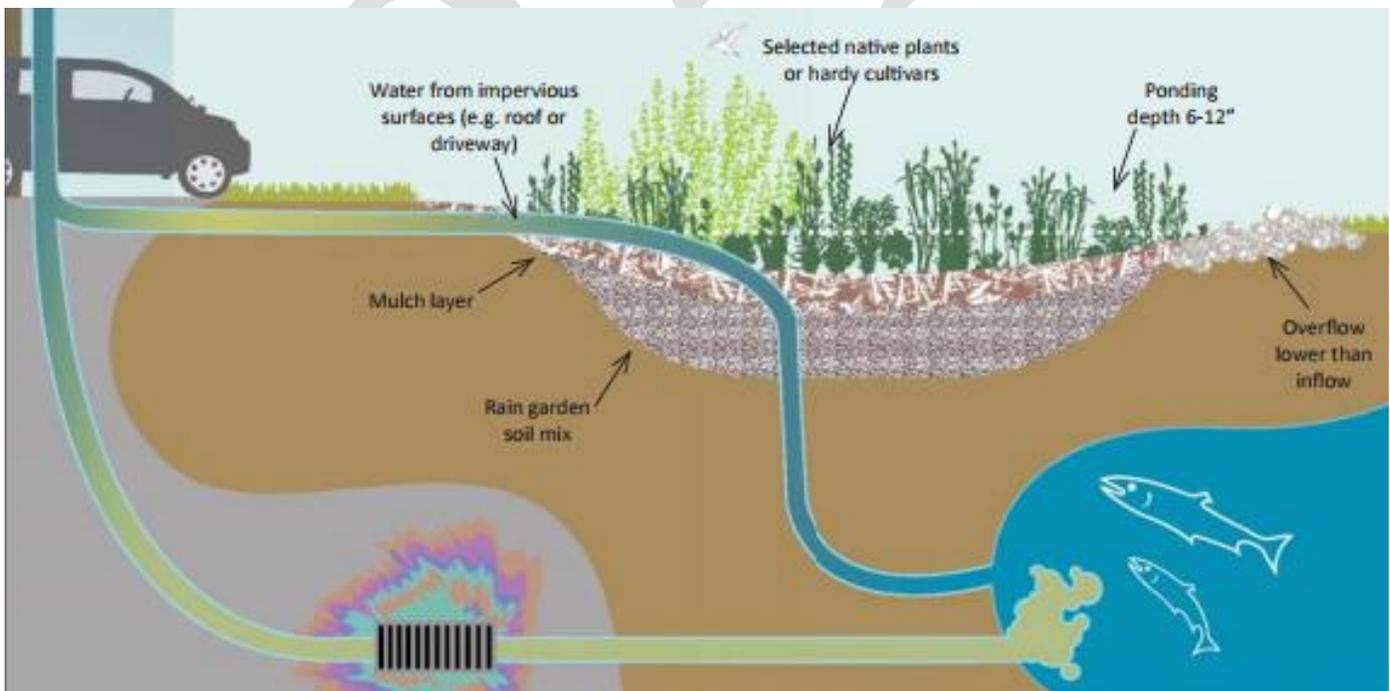


Figure X: Stormwater filtration comparison

Greenway Network Prioritization

The Kirkland City Council currently designates funding for each Greenway project identified in the Capital Improvement Program. This means the city-wide network of greenways will be executed as the funding becomes available. The following criteria should be applied for implementing the neighborhood greenway network.

Network completion focuses on the transportation network as a whole and prioritizes greenway projects which fill gaps in the existing system. Link to land use considers the projects ability to better connect the greenway users to important destination for example, schools, parks and areas of focused development. Risk evaluation considers historical information for safety

Greenways Priortization



Network Completion	<ul style="list-style-type: none"> • Links to regional connectors • Connects to improved facilities • City-wide Greenway network completion
Link to Land Use	<ul style="list-style-type: none"> • Connect to schools • Connect to transit facilities • Connect to urban centers • Connect populations with highest need
Risk Evaluation	<ul style="list-style-type: none"> • Crash History

Greenway draft project schedule (2017 projection)

Rank	Location	Network	Land Use	Risk	Score
1	128 th Ave & 75 th Steet Greenways				
2	100 th St & Waverly Beach Greenway				
3	NE 128 th St & the Juanita Beach Greenway				
4	124 th St & NE 60 th St Greenway				
5	NE 140 th St & 116 th Ave Greenway				
6	NE 90 th St & NE 128 th St Greenway				
7	NE 140 th St #1 & NE 141 st St #2 Greenway				
8	NE 60 th St & 3 rd St Greenway				
9	116 th Ave NE & 6 th St Greenway				
10	108 th Ave NE & 103 rd Ave NE Greenway				
11	NE 140 th St & 90 th Ave NE Greenway				
12	NE 141 st St #1 & 75 th St Greenway				
13	128 th Ave Greenway				

*The full point criteria and ranking can be found in Appendix C.

Implementation and Outreach

In general, designing each greenway will follow a two-year process, but the timing for implementation will be determined by the project manager and will be dependent on staff availability for executing the project's phases. Naturally, residents are going to be interested in any changes made within their neighborhood and how the neighborhood will be impacted. Throughout the design process, staff will consult with the neighborhood and local advocates for feedback on neighborhood needs and potential solutions. City staff will also consider right-of-way needs and the budget for each project to make the final decision on the schedule, the list of improvements, and project timeline.

Timeline	Basic Implementation Process	Parallel Outreach Process
	Initial Conditions	Stage 1
Spring - Year 1	<ul style="list-style-type: none"> Evaluation of potential routes Data collection Route Audit/Field Check (Decided by project manager) 	<ul style="list-style-type: none"> Initial meeting with Neighborhood Association Meeting with Transportation Commission Optional Neighborhood Survey
	30% design	Stage 2
Summer - Year 1	<ul style="list-style-type: none"> Consultant hired to advance design 2nd Route Audit/Field Check (Decided by project manager) 	<ul style="list-style-type: none"> Consultation with Advocate Group(s) 2nd Meeting with Neighborhood Association
	60% design	Stage 3
Fall - Year 1	<ul style="list-style-type: none"> Meeting with PWPKHS Committee 	<ul style="list-style-type: none"> Follow-up with Advocate Group(s) 2nd Meeting with TC
	100% design & bid for construction	Stage 4
Winter - Year 1	<ul style="list-style-type: none"> Proposal Review by City Council Design finalized by staff Construction contract advertisement 	<ul style="list-style-type: none"> 3rd Meeting with TC
	Construction notification	Stage 5
Spring - Year 2	<ul style="list-style-type: none"> Coordinate outreach with construction timeline Construction contract award 	<ul style="list-style-type: none"> Outreach for upcoming construction Potential Community Event
	Construction begins	Stage 6
Summer - Year 2	<ul style="list-style-type: none"> Monitor construction and neighborhood impacts 	<ul style="list-style-type: none"> Potential Community Event for full greenway opening
	Process Evaluation	
Fall/Winter - Year 2	<ul style="list-style-type: none"> City Staff evaluate greenways implementation process Process prioritization for next Greenway project 	

Note* In the following spring, the process for the next greenway project restarts.

Performance Measures

The following performance measures are an essential piece of creating a low-stress environment for greenway users. These guidelines recommend four main measurements which will gauge the potential success of the greenway.

The numerical targets for the performance measurements are based on Kirkland’s experience, guidance analysis, research and the feedback we received from the guidelines task force. Kirkland’s Transportation Master Plan, the NACTO Urban Bikeway Design Guide and other traffic studies all highlight the need for low automobile volumes and speeds on greenways and safe crossings.

The priority for Kirkland’s greenway network is the comfort and safety of greenway users. Drivers pose the highest risk to greenway users which is why the majority of performance measures are focused on driver behavior. Safe speeds is best achieved when vehicles are travelling 20 mph or slower. Additionally, vehicle volume on the greenway will contribute to the comfort level of greenway users.

Crossing conflicts are the other part of the greenway which present risk to users so all crossings must be evaluated for improvements. The level of improvements is determined by the need to maintain the comfort and safety desired for the greenway corridor.

Use of the greenway is dependent on three major factors: public knowledge of the greenway, the completion of an accessible and comfortable transportation network, and access to community resources. It is expected that the initial greenway projects will not have significant increases in non-motorized use immediately following construction. It will take time for more people to learn about what greenways offer before regular use increases.

Greenway Performance Measures	
Vehicle Speeds	
<ul style="list-style-type: none"> 20 mph (85th percentile speed) 	
Automobile Volumes	
<ul style="list-style-type: none"> 1,000 Average Daily Traffic (ADT) as goal 1,500 ADT as acceptable 2,000 ADT maximum 	
Crossing Opportunities	
<ul style="list-style-type: none"> 100% safe crossings 	
Greenway use	
<ul style="list-style-type: none"> 1% increase per year post construction 	

Figure x: Vehicle performance goals for greenways

Data for Collection		
Vehicles		
	Speeds	Before and After 85 th percentile
	Volume	Before and After ADT
	Collisions	Before and After
Pedestrians & Bicyclists		
	Volume	Before and After
	Satisfaction survey	(optional)
Figure x: Data collection methods		

As the transportation network improves and becomes more accessible, regular use of the greenway will naturally increase. It is expected that more people will recognize the convenient connections to community assets.

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Appendix A – Design Tools

SIGNAGE

All the following signs should be in accordance with the Manual on Uniform Traffic Devices (MUTCD) for regulatory and warning road signs, however, the colors for way finding signs can be unique to the jurisdiction.

Identification signs

These signs market the greenways network with unique symbols, colors and characteristics which become universally recognized.

These signs do not define what a neighborhood greenway is, but enhance the roadway as part of a group of improvements but not as a lone addition.

Install at intersection with arterials and at the greenway ends.

Cost estimate: \$100-150 per sign including installation



Cascade Bicycle Club Example

Wayfinding Signs

These type of signs provide direction, distance and/or estimated travel times or distances to destinations. These should complement the identification signage so that signage does not cause confusion. Staff should be cognizant of sign and preserve the balance of the signage and the greenway comfort levels.

Install as frequent as necessary to minimize confusion for users.

Cost estimate: \$100-150 per sign including installation



Seattle DOT Greenway Example

Warning Signs

Warning signs alert roadway users of changes in the road condition, including traffic calming, traffic control devices and greenway route ends. Warning signs shall comply with MUTCD regarding type, color, size and placement requirements.

Cost estimate: \$100-150 per sign including installation



City of Redmond example

Pavement Markings

In addition to the signage, pavement markings serve as reminders for all greenway users that greenway travel has the priority on the corridor.

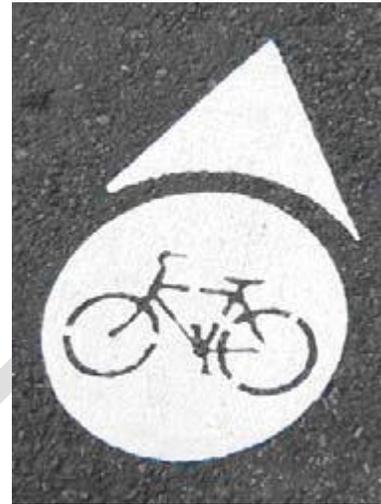
Consider proper positioning for all users if the roadway is shared with motor vehicles. The frequency of marking placement can lead greenway users through confusing areas and add more value to the greenway.

Install in intervals approximately 200 feet apart

Install near driveways or other conflict points to emphasize a shared roadway to all users.

Methyl Methacrylate (MMA) Pavement Marking is the staff recommended material at the time these guidelines were created. This material has enough 'grip' to increase skid resistance and reflectivity which maximizes the visibility of the symbol.

Cost estimate: \$200-300 per marking including installation



Portland Oregon marking



Seattle Greenway dual marking



Sharrow use for greenway wayfinding Portland, OR



Basic Sharrow design Seattle, WA

TRAFFIC CONTROL

All traffic control devices including signs and markings shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) and the National Association for City Transportation Officials (NACTO) for design and placement.

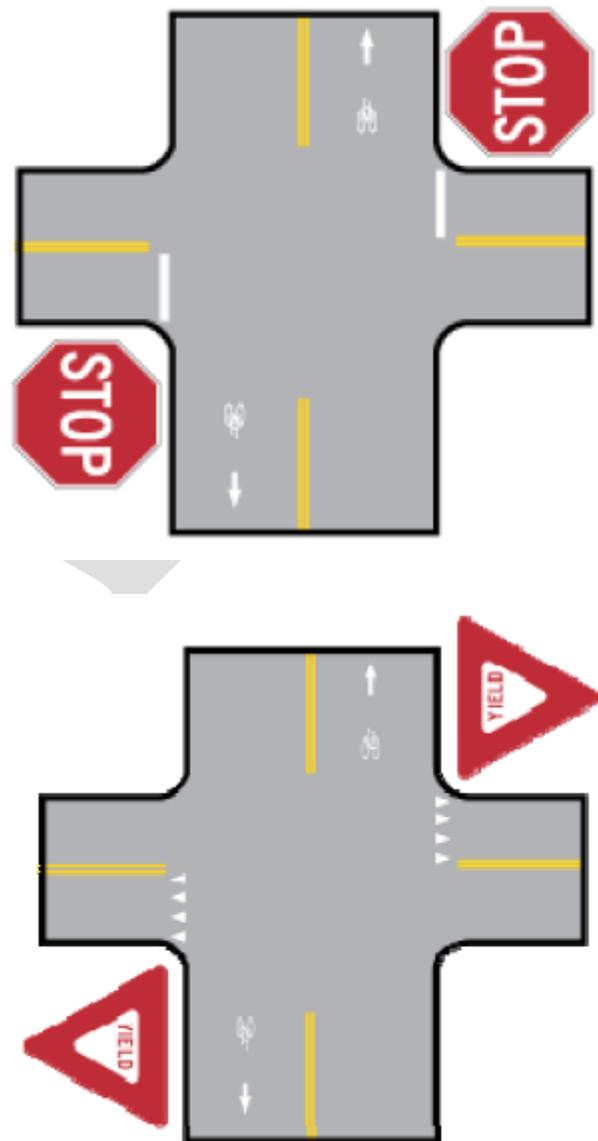
Stop/Yield Signs

Stop signs and yield signs will often be used to prioritize travel on the neighborhood greenway. This will maximize continuous travel with minimum number of stops.

Project considerations:

- If intersection control must be used, a yield sign is preferred in accordance with sight distance requirements.
- There may be the need to increase sight distance by removing parking near the intersection.
- Traffic control/calming mitigation may be necessary to prevent an increase in motor vehicle volume or speeds along the greenway. For example a diverter may be used to discourage motorized vehicles on the greenway.
- If a traffic circle already exists, stop signs and yield signs may be considered to complement an existing traffic circle.

Cost estimate: \$200 including installation for each sign



20 MPH signs

To achieve safe speeds, all neighborhood greenways will establish a 20 mph speed limit. As a lone solution, this may not be effective, but in combination with the other listed measures, this can contribute to meeting the goal of a comfortable and convenient corridor.

Project Consideration:

- This is often the more controversial element of greenways, so early and clear communication on this is vital to the success of the greenway.
- Sign Spacing should be in accordance with MUTCD for residential signage.

Cost Estimate: \$200 including installation for each sign



Greenwood Greenway Connector Seattle, WA

Diverter

A measure for prioritizing travel on the greenway may be redirection of motor traffic using diverters, but still allowing people walking or riding a bicycle through.

- Design for this device should consider safe through traffic for people on foot or riding a bicycle.
- Emergency Services needs to be consulted in the design process for these devices.
- These devices will need early outreach to impacted residents. Staff should consider additional measures to contact residents including door hangers, and mailers to maximize feedback for the project.

Cost Estimate: \$10,000 - \$60,000



2013 NACTO Guidelines - Diverter

INTERSECTION TREATMENTS

Bike Boxes

These devices reduce right-turn conflicts at intersections by increasing visibility of people on bicycles.

Device Consideration:

- A public education campaign is highly suggested with each installation.
- The lead-in bike lane may also be filled in with the same green color
- The green color is necessary to differentiate and highlight the bike box area.
- Do not allow the bike box to extend into the crosswalk.
- Right turn on red may need to be prohibited through signage, an exception for people on bicycles is allowed.

Cost estimate: \$5,000 per installation



2013 NACTO Guidelines – Bike Box Use

Bicycle activated signals

Assists people on bicycles travel through intersections by providing a means of activating the signal.

Detection options:

- Push Button
- In pavement loops
- Video detection (primary option in Kirkland)

Device Considerations:

- A separate signal head is used in areas with a high volume of people on bicycles.
- The City of Kirkland utilizes video detection equipment for recognizing people on bicycles at intersections. Loops and push buttons can be added as an additional option to support the greenway.

Cost estimate: \$2,000 – 50,000 (depending on device)



2013 NACTO Guidelines – San Luis Obispo



2013 NACTO Guidelines

Crossing Islands

Primary use of islands is at crossings on major arterials with high volume traffic or multiple lanes of traffic. Islands provide a comfortable and safe crossing environment with a two-stage crossing process which allows people to focus on one direction of travel at a time. These can also be used to limit conflicts with turn movements. Islands also allow additional street trees and landscaping in the corridor which enhance the greenway environment.

Device Considerations:

- 8 to 10 foot wide crossing spaces, which accommodate travel in both direction regardless of modes.
- Refuge island may be angled 45 degrees to redirect traffic.
- Raised medians will help enclose the safe area.
- If landscaped, native or low-maintenance plants are recommended to reduce maintenance costs.
- If using street trees, consider sight distance as well as shadows to avoid safety issues.
-

Cost Estimate: \$10,000 – 50,000



Crossing Island Seattle, WA



2013 NACTO Guidelines,

Crossing Beacons

Flashing lights crossing major arterials either at mid-block crossings or where conventional signals aren't warranted, can improve comfort and safety. These beacons are activated by people with the intent of crossing the roadway, which increases visibility at conflict points.

Rapid Flashing Beacons

- Side post installation
- Push-button activation

Hawk Signal

- Overhead installation
- Push-button activation

Design Considerations:

- Push buttons may be located closer to the street to accommodate bicyclist's movements.
- The signal phases should consider timing all ages and abilities.
- Kirkland prefers no flashing signs installed in center of median.

Cost Estimate: \$20,000 – 100,000



Hawk Signal Installation Edmonds, WA



Rapid Flashing Beacon Seattle, WA

TRAFFIC CALMING

Traffic Calming Devices in combination with other greenway improvements will encourage safe speed and traffic volume on the greenway route. Design traffic calming devices so as not to impede access for emergency services or inhibit travel for all people using the roadway.

Speed Humps

The City of Kirkland no longer utilizes speed humps as a traffic calming solution.



2013 NACTO Guidelines

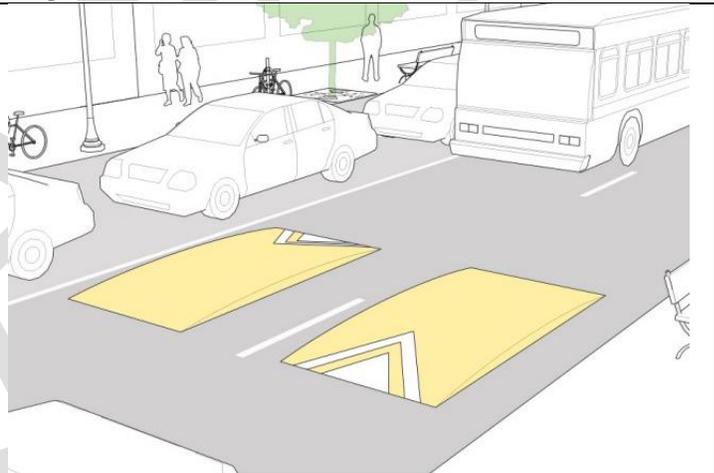
Speed Cushions

Speed Cushions are similar to speed humps in intent but the design is broken up for access of emergency service vehicles. A typical design includes multiple smaller humps lined up in a row across the roadway. Due to the broken up design, these devices are sometimes less effective in reducing traffic speeds at the same levels as speed humps

Design consideration:

- Avoid close proximity to driveways,
- Avoid placement on steep hills,
- Advance signage and pavement markings are required with this device,
- Device spacing 300-500 feet apart and from other traffic calming devices,
- Consider placement and impact on emergency services and people on bicycles.

Cost Estimate: \$10,000 – 40,000 each



2013 NACTO Guidelines

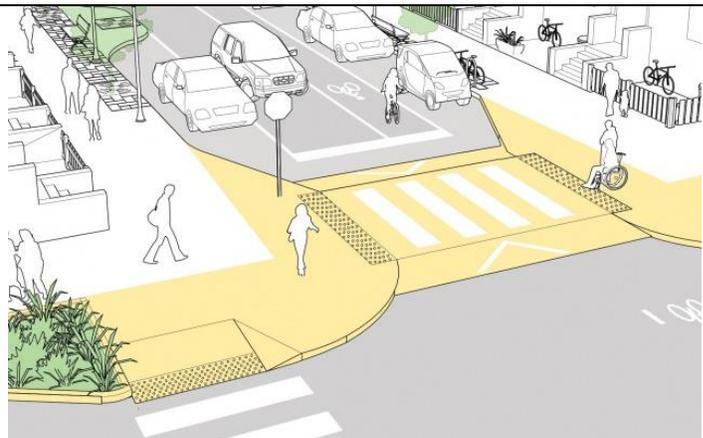
Raised Crosswalks/ Speed Tables

A wider version of the speed hump, this device has a broad flat top with the intention of keeping vehicle traffic at safe speed. These devices are typically paired with crosswalks at intersections or at mid-block crossings to enhance the environment for people crossing the street.

Design consideration:

- Need to consider stormwater drainage at location
- Avoid close proximity to driveways
- Advance signage and pavement markings are required with this device.
- Device spacing 300-500 feet apart and from other traffic calming devices depending on location.
- Balance slope with proposed devices and accessibility of the neighborhood.
- Consider longer and broader devices to make the use more manageable for emergency services and people on bicycles.

Cost Estimate: \$5,000 – 25,000 each



2013 NACTO Guidelines

Raised Intersection

The same traffic calming benefits of a speed table but the added benefit of enhancing all crossing locations for an intersection.

Design consideration:

- Proximity to
- Should consider stormwater drainage at location
- Avoid close proximity to driveways
- Advance signage and pavement markings are required with this device.

Cost Estimate: \$25,000 – 70,000 each



2013 NACTO Guidelines – Raised Intersection

HORIZONTAL DEFLECTION TRAFFIC CALMING

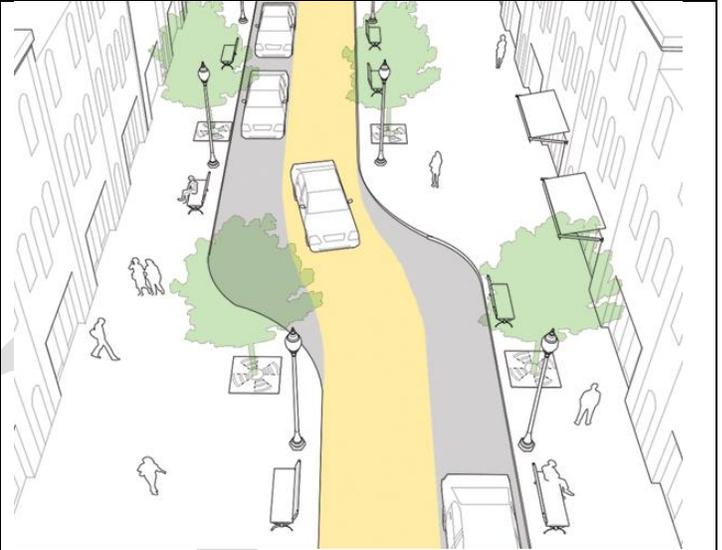
These types of devices come with a potential partnership for Stormwater filtration improvements as part of the project.

Chicanes

These are raised curbs that create a shift in the travel lanes along a roadway. This device forces drivers to shift laterally and therefore reduces vehicle speeds by minimizing long straight corridors.

Design Considerations:

- Stormwater needs to be carefully designed.
- Raised medians for diverting traffic movement
- Placement of parking.
- Right-of-way limitations.



2013 NACTO Guidelines

Curb-extension (bulbout)

These devices extend out the sidewalk or curb face at an intersection often in combination with other improvements to enhance the environment with the primary purpose of reducing the crossing distance.

Design consideration:

- Should accommodate bicycle facilities where they exist so not to impede bicycle movement.
- Install at intersections or mid-block crossings.
- Should consider the turning movement of large vehicles at intersections.
- If the extension includes additional landscaping, it is recommended to use low height shrubs for preserving sight distance.
- Catch basin must be replaced if impacted.



2013 NACTO Guidelines – Curb Extension

Cost Estimate: \$5,000 – 25,000

Traffic Circle

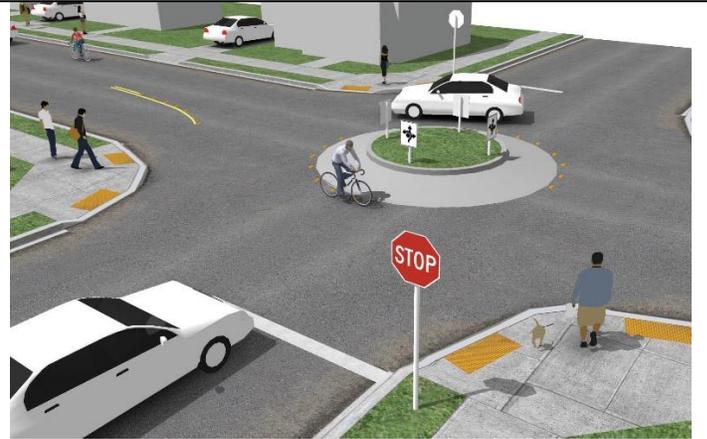
These devices are circular raised island in the center of intersections which force a right-turn circular movement encourages safe speeds.

Provides an opportunity to add landscaping and improve travel for all roadway users. These devices may replace use of stop or yield signs.

Design Considerations:

- Use CAD software to understand impacts to larger vehicles
- Larger vehicles may need to turn left to negotiate the turn around the circle island.
- If landscaping is chosen with the traffic circle, use low maintenance plantings.

Cost Estimate: \$15,000 – 50,000



2013 NACTO Guidelines – Traffic Circle

COST EFFECTIVE SOLUTIONS

Painted and Patterned Surfaces

As a cheaper alternative for greenway solutions, surface pavement can be painted to visually alert drivers to be more cautious.

This method can be used for narrowing the user vision of the roadway, provide tactile surface treatments and add an aesthetic appeal to the greenway.

Project Considerations:

- Use textured materials to prevent an uncomfortable surface.
- Painted surfaces should be slip resistant.

Cost estimate: \$50 -200 per square foot



Seattle, WA

Street Murals

Murals can be mid-block or within intersections and act as art or a community building tool to promote connectivity in the neighborhood. This is not an official traffic calming device but is more of an outreach tool to maximize support for the project.

Design Considerations:

- Will require a ROW permit.
- Needs to be a neighborhood driven project
- Murals cannot replicate or be similar to any other traffic control designs.

Cost Estimate: \$200-500



Seattle, WA

Appendix B – Art Booklet

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Appendix C – Greenways Rankings

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