

Seattle's Neighborhood Greenways

SEATTLE TOOLKIT 2012

*Safe streets
for all.*





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This document is downloadable in pdf format from: www.greenfutures.washington.edu/research.php

Foreword

Movement through our neighborhoods is an integral aspect of our daily lives. The Neighborhood Greenway concept recognizes the ripe opportunities for making travel through and between Seattle's neighborhoods safe, enjoyable, healthy and sociable, contributing to multiple aspects of human and environmental well-being.

This booklet is meant to serve as a guide for citizens who want to imagine and promote Neighborhood Greenways in Seattle, to inspire as well as provide them with practical tools. Developed by UW College of Built Environment students Betsy Jacobson and Jennifer Richter while working as interns in the UW Green Futures Lab in Seattle and at Gehl Architects in Copenhagen, it is based upon research on exemplary cycling and walking streets in other cities, study of cycling issues and opportunities in Seattle, and involvement with local Neighborhood Greenway activist groups.

Profound thanks go to Betsy and Jenn for their careful and inspired study and to the many people who have given guidance along the way, especially Darby Watson and Sara Zora at the City of Seattle, and Louise Grassov at Gehl Architects. We are ever grateful to the ScanDesign Foundation for supporting this work. It is my sincere hope that this guide to Seattle's Neighborhood Greenways will be well used and that as a result we will see people walking and cycling, talking to their neighbors, and enjoying greener, more ecological neighborhoods.

Nancy Rottle

**Director, Green Futures
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We are glad you have chosen to learn about creating Seattle's Neighborhood Greenways. Our Greenways will provide connections to places you want to go: to school, to your library, your park and business district and much more. We welcome you to be part of creating this great city-wide network.

Imagine: in just a few years Seattle can create a network of safer, more inviting streets and walkways that connect our neighborhoods to one another. By using the tools described in this guide, your neighborhood can develop your own welcoming spaces that capture and showcase your individual spirit.

Greenways have proven to be golden in other cities across our nation and internationally. Like many other cities have proven, you, your family, and your neighbors will have new and healthy choices to get around. You can choose to walk or ride your bike on safe and protected non-arterial streets. Our goal is to make these Greenways so safe that you will let your 8-year-old ride to school with confidence.

The timing of this booklet coincides with the update of the 2007 Seattle Bicycle Master Plan. The update will build on the grass roots greenway movement as a part of a coherent and safe system. This effort closely follows a series of Seattle Safety Summits, where hundreds of citizens provided valuable thoughts on how to make Seattle's streets safer for all. In response, the Transportation Department's 2012 Transportation Action Agenda highlights Neighborhood Greenway and other safety initiatives.

If you want to learn more about grant opportunities available to you and your neighbors to create your initial designs, check out this City of Seattle website: <http://www.seattle.gov/grants/physicalimprovements.htm>

Thanks to the University of Washington Green Futures Lab, to ScanDesign Foundation, Gehl Architects, and the UW students who have brought the Seattle Neighborhood Greenways Toolkit to life. We are grateful for your vision.

Sally Bagshaw

**Seattle City Councilmember,
Chair, Parks and Neighborhood
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From an underutilized street for cars...



...to a safe and inviting place for people.

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Getting more from our Streets

Neighborhood Greenways are a step towards creating safer and more inviting streets for people to walk and bike. Neighborhood Greenways provide new options for mobility and public spaces that will enhance Seattle's overall transportation network. Prior street planning efforts have focused too heavily on the movement and storage of motor vehicles, and in turn, many residential streets are currently over-designed and over-prioritized for cars. Many drivers have developed the sense that vehicles have ownership over the roadways and as consequence, far too many neighborhood trips are made by car. There is an opportunity to transform residential roads into comfortable and safe places to walk, cycle and enjoy.

We want to meet our friends and be part of a lively community.

I want a safe place where I can teach my kids to ride a bike.



A Framework Not a Fixed Plan

Throughout Seattle, grassroots efforts and political will are gaining momentum in advocacy for Neighborhood Greenways. However, the city currently lacks a unified model for implementation. Residents and city officials will need to develop a framework for all parties to work together. Physical changes to the street and the overall enhancement of the quality of space will need to consider both city-wide priorities and the specific needs of individual neighborhoods and individual streets. Therefore, the model for the future creation of Neighborhood

Greenways in Seattle cannot be established as a fixed plan, but must be a framework which will be able

to support design solutions suited to each neighborhood's context and resources.

Listening to the People

The intent of Neighborhood Greenways is to prioritize and invite all users who wish to walk, bike and play on calmed residential streets. Neighborhood Greenways will make streets safer for non-motorized users, link residential areas with neighborhood destinations and incorporate new and inviting public spaces and amenities along the route. Individual residents, however, will have a wide range of current needs and desires along potential routes. It is paramount that as many individuals and perspectives as possible are taken into account throughout the planning process. Residents can also learn by listening to the visions of each other, such as the potential for ecological improvements along newly implemented Neighborhood Greenways.

I want an even better neighborhood for walking.



I want to keep happy and healthy and stay active everyday.



I want to get from my house to a larger network of bike lanes and trails.



Inclusive Approach

Neighborhood Greenways are wide scale projects involving the entire city of Seattle. Residents, business leaders, politicians and city staff should all be invited to participate in the planning and design. Ultimately, by involving as many people as possible in the process, in addition to seeing benefits in increased transportation options, residents might also develop a heightened sense of ownership for one's neighborhood, stronger community ties between neighbors and more comfort in better knowing one's neighborhood.



I want to make my deliveries more efficiently.



I want to see less cut-through traffic when I'm in my garden.



We want to continue our conversation while riding to get coffee.



Win-Win Benefits

In addition to creating safer and more inviting streets, Neighborhood Greenways have a number of broader benefits. By incorporating more support for outdoor and physical activities, studies show that the overall public health and personal sense of happiness of residents is likely to improve. By making streets more attractive and by linking residential homes to local businesses, housing real estate values are predicted to increase as is the likelihood that more people will shop locally. By adding ecological infrastructure to capture and filter stormwater, the street will become not only more aesthetically pleasing, but will also increase the amount of natural habitat and add biodiversity.

I want to grow up in a world with clean air and water I can swim in.

Think Strategically

The City of Seattle supports the concept of Neighborhood Greenways but public funds and resources are limited. Both the city staff and neighborhood groups should be as opportunistic as possible and to be on the lookout for innovative collaborations. Currently, there are streets which have the potential to become a Neighborhood Greenway with only a few minor infrastructure changes, yielding significant improvements in safety and connections with little investment of cost and time. There are also a number of potential partners that might be able to help fund both immediate and/or future-oriented street enhancements. Involved residents and the city should continuously aim to consider how to achieve multiple goals rather than acting abruptly with short-term, piecemeal improvements. Such strategic thinking can greatly impact the future success and development of Seattle Neighborhood Greenways.

I want to enjoy my daily walk to the bus when I go to work.



I want to drive to the grocery store and park my car outside my door.



Learning from the World and Bringing it Home

EQUALITY

Bogotá, Colombia



A ROCKET START

New York City, U.S.A.



In Bogotá, Columbia, the government recognized mobility improvements as an instrument to enhance social equality. Rather than investing in car-oriented projects, Bogotá prioritized affordable public transportation and pedestrian/cycle networks. Subsequent public improvements continued to focus on linkages for pedestrians and bicyclists to the city's major transportation routes, parks and community centers. Simultaneously, a walking/cycle culture is growing through popular events like "Car-free Sundays."

Take away

Cycling increased 268% between 2000-2007. Currently, more than 23% of trips made by the city's lowest income residents are by foot or bicycle. By prioritizing bicycling and pedestrian mobility, the government has created a more balanced network of transportation across the city.

New York City recognized a need to enhance pedestrian safety, decrease congestion and increase the amount of public space. Acting quickly, using paint, low-cost car buffers and lawn chairs as street furniture, the city made immediate street improvements. In four years the city added 340 miles of bike lanes and 3.5 acres of pedestrian walkways and public space. These rapid investments led to a dramatic drop in traffic injuries, better connected neighborhoods and faster travel times. A year-long study showed cycling doubled, injuries decreased more than 50% and vehicle traffic efficiency improved by 7.5%.

Take away

By working with quick implementation, the city also saw quick results. They tracked these results and now have the statistics to support more costly, but also more permanent and higher quality street and public space enhancements.



SUSTAINABILITY

Malmö, Sweden



With a declining economy and population, the government of Malmö, Sweden recognized the need to improve the quality, appeal and brand of the city. Spurred by the city's transformation from an industrial-based economy to a knowledge-based economy, the city decided to strategically invest in world-leading sustainability improvements. One of the first projects was Augustenborg, a rehabilitated neighborhood focused on recycling, green roofs and stormwater management.

Take away

Malmö has become a model of sustainability unlike anywhere else in the world. Visitors, scholars and politicians travel from around the world to Augustenborg to witness the use of various environmental techniques. Malmö is continuing to develop its approach to sustainability, as not only good for the environment, but also in strengthening the image and brand of the city.



PLACEMAKING

Leeds, UK



'Home Zones' are streets with unique layouts that cause the street to act and feel as equally shared space. Within a Home Zone, the speed limit of vehicles is set to 10 miles per hour. Pedestrians, cyclists and residents use the space for recreational and social engagement and cars are treated as invited guests. Typically the street is non-linear, which not only calms traffic but also creates various spaces to be used as public space for things such as: bike parking, seating, or a place to drink a cup of tea.

Take away

Many public space amenities have also been added to the streetscape of a Home Zone. Public seating, flower beds, play areas, street lights and trees offer several community benefits beyond traffic calming. Home Zones also enhance the aesthetics of the street and have been shown to have increased the value of adjacent homes.

A woman in a dark blue hoodie and jeans is walking a black dog on a leash. She is walking on a paved path that curves to the right. Several children are walking along the path with her. The background features green trees, a dark fence, and a building. The overall scene is a peaceful neighborhood setting.

What do Neighborhood Greenways mean?

The City of Seattle is working to enhance transportation options in the city and Neighborhood Greenways will become an integral part of the process. Reducing vehicle speeds and traffic volume is necessary for safe Neighborhood Greenways, but by creating inviting space for non-motorized users, Neighborhood Greenways can also bring about larger scale neighborhood and environmental improvements.



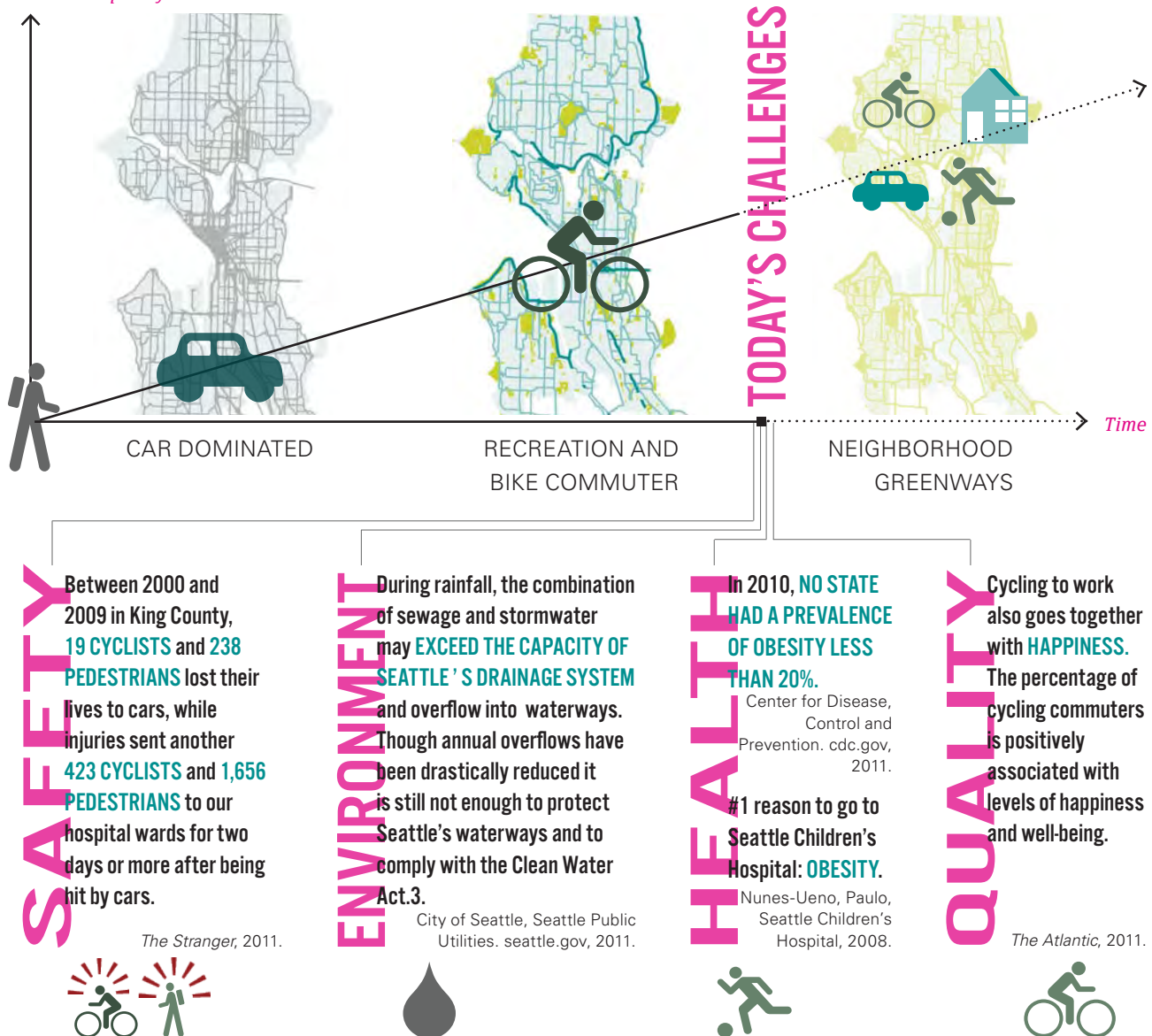
Neighborhood Greenways ensure a comfortable and enjoyable experience that safely connects community services and amenities. There are a number of benefits to the city, neighborhoods, streets and people, such as: more efficient traffic flow and fewer collisions, increase in local economic activity and real estate values, more fitness opportunities leading towards better public health, reductions in CO₂ emissions, increased native habitat and biodiversity and more pleasant and beautiful streets.

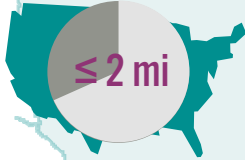
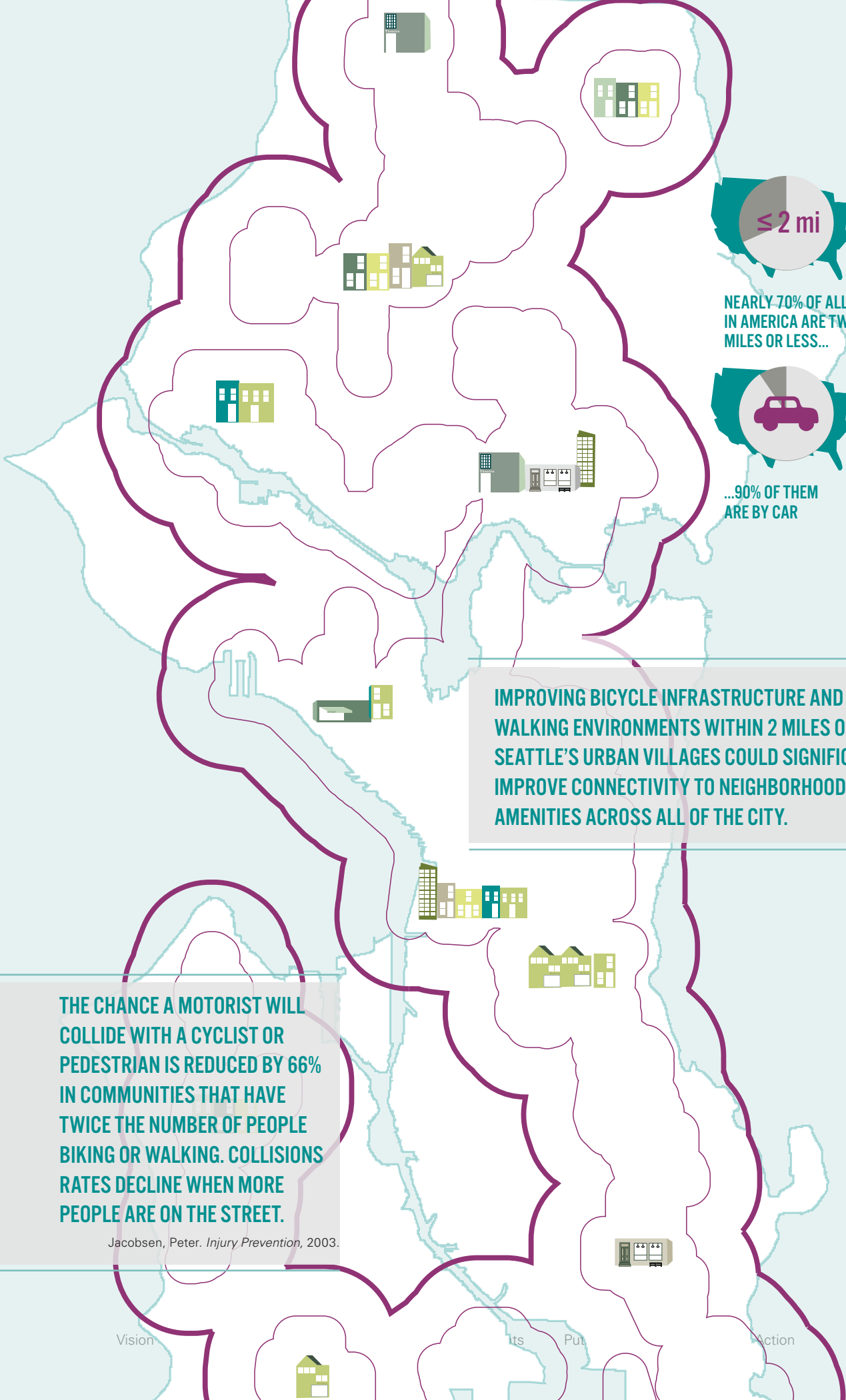
What Neighborhood Greenways mean for Seattle

Eighty percent of Seattle’s publicly owned land is used for streets. Historically, streets have been dominated by the movement of vehicles but as more people choose to walk and bike, the Seattle Department of Transportation (SDOT) wants to address a wider range of needs. The introduction of Neighborhood Greenways in the updated Bicycle Master Plan provides another alternative in transportation and represents an important step to creating a complete network.

CITY OF SEATTLE PLANNING EFFORTS

safety, environment,
health and quality





NEARLY 70% OF ALL TRIPS
IN AMERICA ARE TWO
MILES OR LESS...



...90% OF THEM
ARE BY CAR



IMPROVING BICYCLE INFRASTRUCTURE AND WALKING ENVIRONMENTS WITHIN 2 MILES OF SEATTLE'S URBAN VILLAGES COULD SIGNIFICANTLY IMPROVE CONNECTIVITY TO NEIGHBORHOOD AMENITIES ACROSS ALL OF THE CITY.

THE CHANCE A MOTORIST WILL COLLIDE WITH A CYCLIST OR PEDESTRIAN IS REDUCED BY 66% IN COMMUNITIES THAT HAVE TWICE THE NUMBER OF PEOPLE BIKING OR WALKING. COLLISIONS RATES DECLINE WHEN MORE PEOPLE ARE ON THE STREET.

Jacobsen, Peter. *Injury Prevention*, 2003.

What Neighborhood Greenways mean for a Neighborhood

Great neighborhoods bring residents together to foster relationships and support a greater sense of community. In many Seattle neighborhoods it is already possible to get to local destinations in a relatively short walk or bike ride, yet many people still choose to drive. Neighborhood Greenways can significantly improve the safety and social experience of getting around one's own neighborhood, inviting more residents to choose to walk or bike to local destinations.



Although biking provides physical activity, health is jeopardized when cyclists inhale car exhaust.



Small details affect how a pedestrian experiences a street.

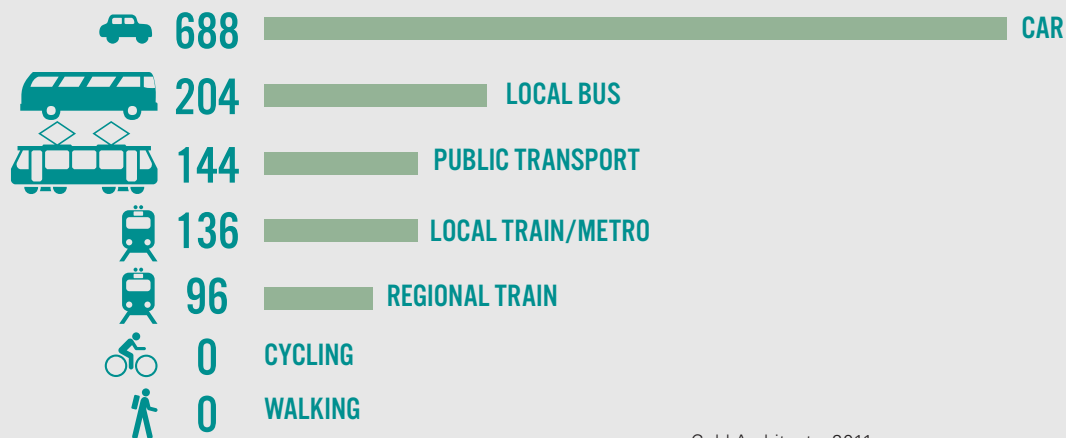


Rainwater picks up pollutants from pavement and enters water bodies.



Routes along steep topography and hills discourage cyclists from biking daily.

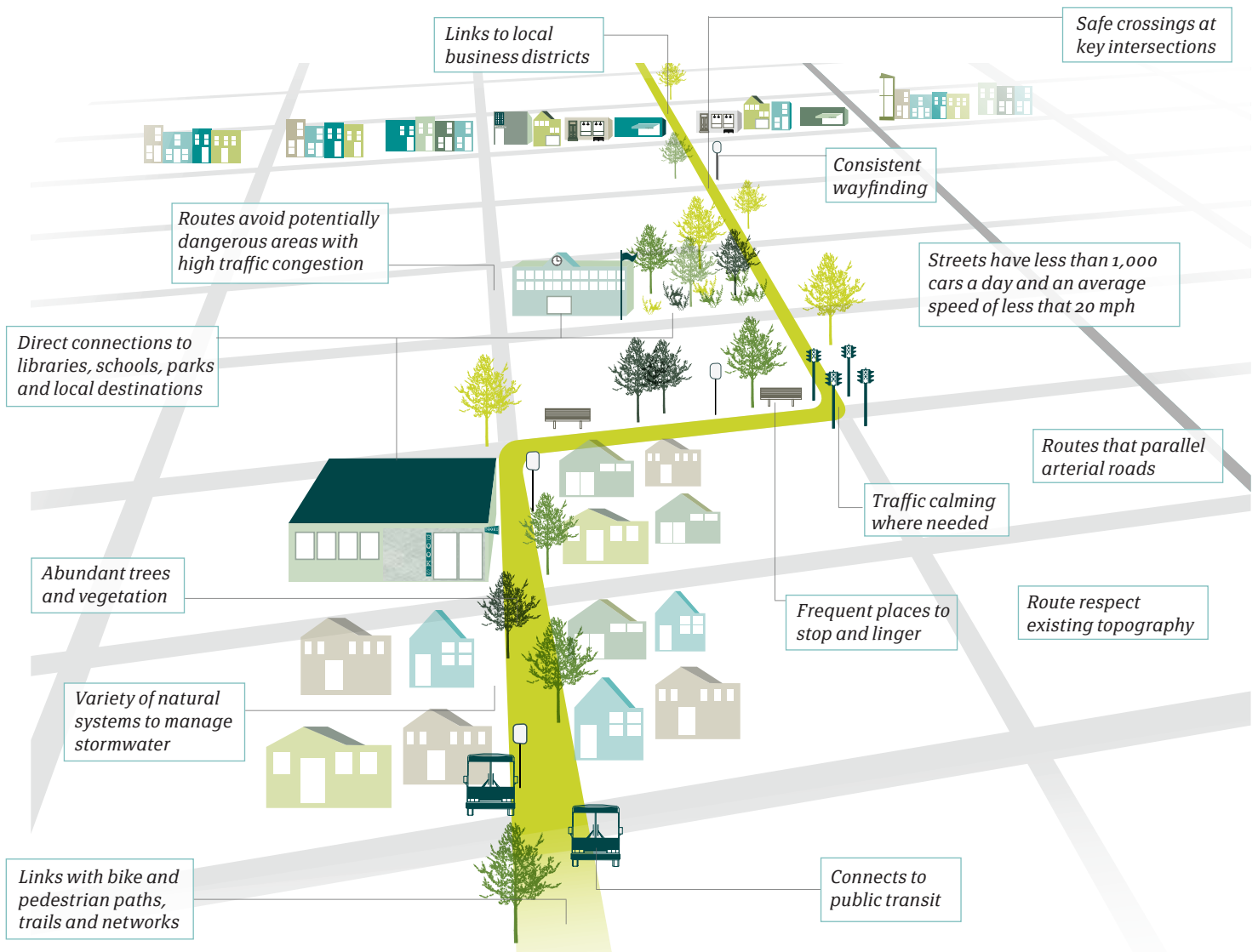
CO2 EMISSIONS (KG/CO2/YEAR BASED ON A 6 MILE COMMUTE)



RESIDENTS LIVING IN WALKABLE URBAN COMMUNITIES USE HALF AS MUCH ENERGY IN BTU'S PER CAPITA AS THEIR SUBURBAN COUNTERPARTS.

Gehl Architects, 2011.

Farr, Douglas *Sustainable Urbanism*, 2008.



If I walk an average of .6 miles a day while growing up, I am 10% less likely to be obese.

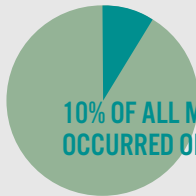


\$\$\$

PORTLAND GREENWAYS COST ROUGHLY \$250,000 PER MILE...

...MOST OF THIS IS USED FOR INTERSECTION IMPROVEMENTS.

\$\$\$



10% OF ALL MILES BIKED IN PORTLAND OCCURRED ON GREENWAYS.



ONLY 1% OF PORTLAND'S BICYCLE INFRASTRUCTURE IS GREENWAYS.

Raisman, Greg. Portland Bureau of Transportation, 2011.

Dill, Jennifer. *Journal of Public Health and Safety*, 2009.

Frank/Andresen/Schmid, *American Journal of Preventive Medicine*, 2004.

What Neighborhood Greenways mean for a Street

Neighborhood Greenways enhance safety for those who wish to walk or bike, without preventing cars from getting where they need to go. Each street and intersection presents a unique set of circumstances for which a variety of physical elements can be employed to reduce traffic volumes and retain low speeds. By carefully considering how physical elements are arranged new functions can occur within the roadway.



Cyclists often share sidewalk with pedestrians, causing potential conflict and confusion.



Streets do not always drain during major storm events.



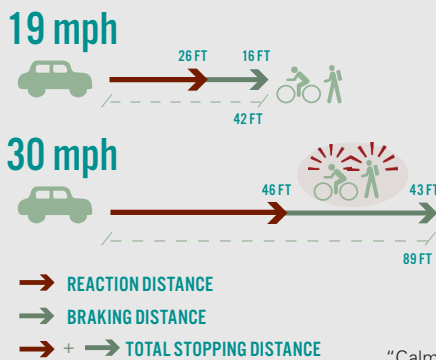
Intersections with arterials are unmarked and confusing.



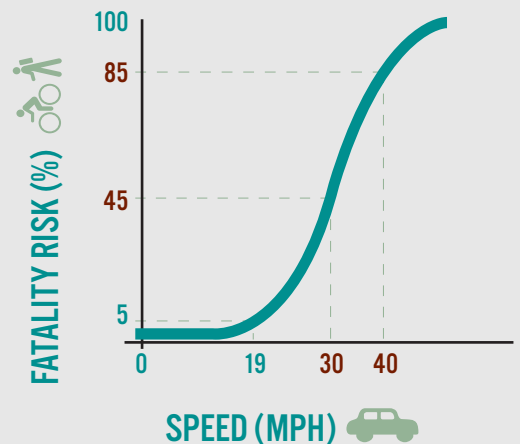
Streets are dominated by cars, leaving no room for bicyclists to safely share the road.

19 MPH = 5% OR LESS RISK OF FATAL INJURY

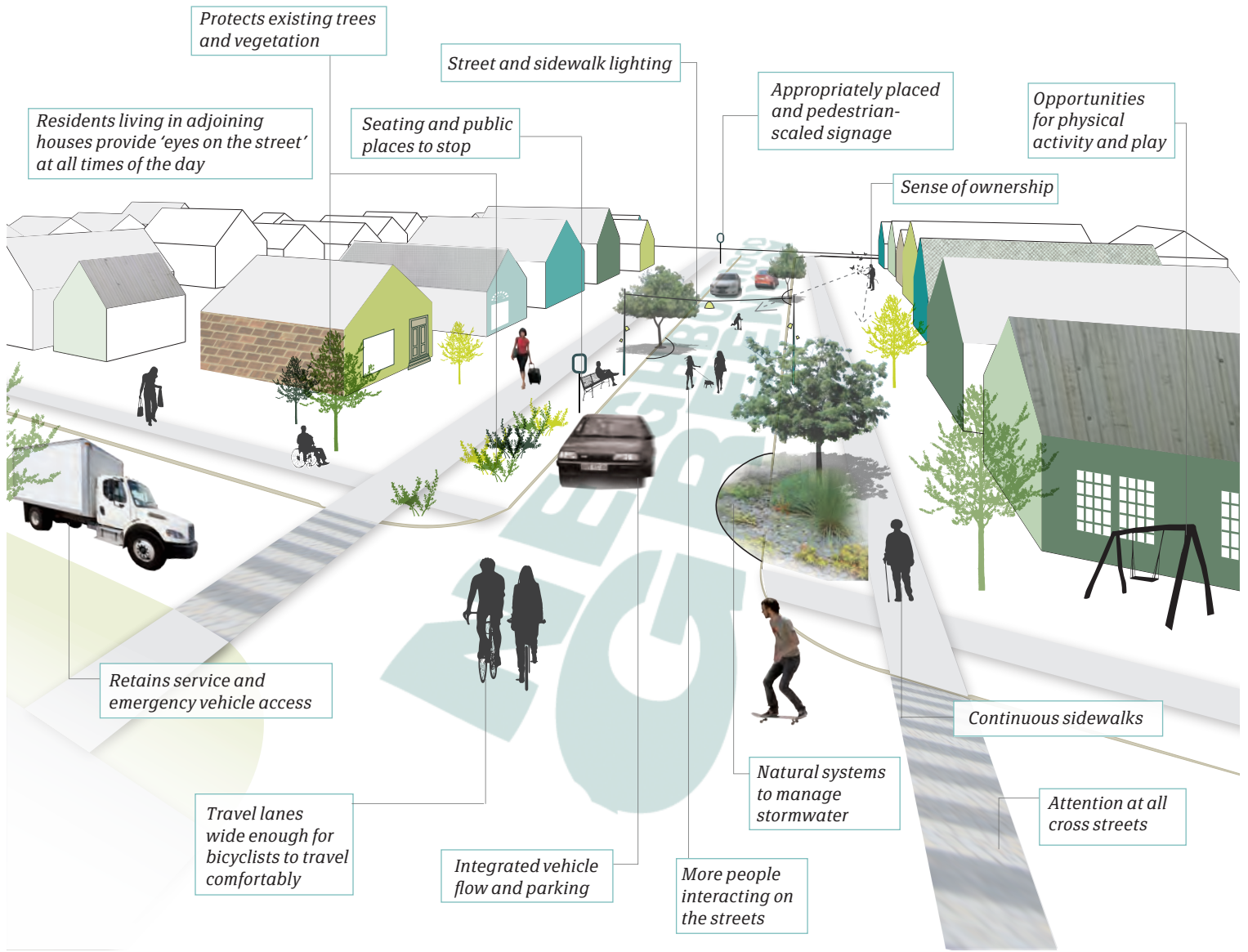
WHETHER A TRAFFIC COLLISION OCCURS AND HOW SEVERE THE INJURIES ARE, IS DIRECTLY CONNECTED TO SPEED. WITH LOWER SPEEDS SOME COLLISIONS CAN BE AVOIDED AND INJURIES ARE LIKELY TO BE LESS SEVERE.



"Calm Down," *The Economist*, 2011.



"Calm Down," *The Economist*, 2011.



THE DAILY ACTIVITY MOST INJURIOUS TO HAPPINESS IS COMMUTING (BY CAR).



Brooks, David. *The New York Times*. March 29, 2010.

TREES IN THE PUBLIC RIGHT OF WAY ARE ASSOCIATED WITH LOWER CRIME RATES. THE EFFECT OF TREES ON A HOUSE'S LOT IS MORE MIXED. LOT TREES SMALL ENOUGH TO BLOCK THE VIEW FROM A FIRST-FLOOR WINDOW INCREASE CRIME OCCURRENCE, WHILE LARGER LOT TREES DECREASED CRIME OCCURRENCE.

Donovan, Geoffrey and Jeffrey Prestemon. *Environmental and Behavior*, 2010.

What Neighborhood Greenways mean for People

Pedestrians, cyclists, and vehicle drivers each experience a street differently. A car may travel on a residential street at 25 mph, whereas an average adult walking along the sidewalk will move at a speed of 3 mph and an average bicyclist will go down the street at 7 mph. Each of these users' eye levels and peripheral vision will be at different heights and ranges. These details significantly affect perceived distances, the ability to recognize signage and overall enjoyment of a route.

Neighborhood Greenways should provide connections, safety, enjoyable spaces and comfortable movement. A list of 'Quality Criteria' has been developed to ensure the best possible conditions for pedestrians and cyclists. This can be used to evaluate designs pre- and post-implementation and throughout all stages of the public engagement process.

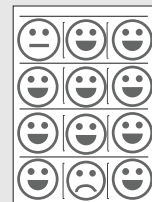
2 EXAMPLES USING 'QUALITY CRITERIA' TO EVALUATE A STREET



HIGH POINT DRIVE SOUTHWEST, WEST SEATTLE NEIGHBORHOOD

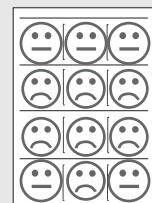
This street is not designated as a special route but produces many good (smile) ratings based on comparison with the 'Quality Criteria' checklist.

With the simple addition of legible signage and pavement markings, this street can easily be transformed into a high quality Neighborhood Greenway.



WEST EWING STREET, INTERBAY / MAGNOLIA NEIGHBORHOOD

This 'multi-use trail' is an integral link to regional bike and walking trails but receives a very poor rating (frown) in most areas when compared to the 'Quality Criteria' checklist.



Connections

Links Neighborhood

- Connects to regional trails and other bicycle facilities
- Route travels close to local business activities
- Connect schools, public spaces and neighborhood amenities



Integration with Street Hierarchy

- Accessible from nearby residences
- Maintains adequate street parking
- Street layout that allows emergency vehicle and delivery access
- Heavier traffic routed to arterials



A City-wide Network

- Connections from one neighborhood to another (may need to use other bicycles facilities)
- Removes barriers and detours for efficient bicycle and pedestrian flow
- Connects to transit stops and other modes of transportation



Safety and Protection

Deterrent of Crime and Violence

- Active residential buildings provide passive surveillance and eyes on the street
- Overlapping functions and use throughout the day
- Appropriate lighting in evening hours



Protection Against Collisions

- Defined and protected arterial crossings
- Reduced motor vehicle speed
- Dry surface that drains water
- Clear sight lines
- No impeding obstacles
- Visibility and small scaled lighting on paths and obstacles



Protection from Unpleasant Sensory Experiences

- Reduction of vehicles cutting through neighborhood and accompanied pollution, noise, and dust
- Protection from ambient noise
- Clean environment without trash or litter



Enjoyable Spaces

Opportunities to Stop

- Fun and playful experiences dispersed throughout a route
- Overlapping activities
- Protection against weather
- Bicycle parking close to destinations
- Appropriate furniture for activities
- Variety of places to sit with street furniture that encourages conversations



Neighborhood Identity

- Spaces for spontaneous activities to encourage 'getting to know your neighbor'
- Opportunities for art and local activity
- Street designs that reflect natural and historic character
- Sense of ownership and responsibility



Visually Appealing Landscape

- Interesting views and vistas
- Abundant trees and vegetation
- Spaces designed for a full range of ages
- Trees to protect from wind and adverse climate
- Delineation between private and public spaces



Comfortable Movement

Opportunities to Interact and Exercise

- Travel lanes wide enough for bicyclists to travel comfortably
- Visual and interesting experiences placed at regular intervals



Ease in Finding and Understanding a Route

- Recognizable street designs at the pedestrian scale
- Clear signage at gaps between links
- Legible wayfinding to nearby destinations



Comfort to Walk, and Bike

- Route responds to existing topography
- Continuous routes and minimization of obstacles
- Smooth and comfortable pavement
- Guaranteed pedestrian paths that especially consider the needs of children, elderly, and the disabled





Physical Elements

Physical changes in street layout and design are usually needed to enhance user experience. All citizens can provide valuable ideas for how physical elements can be used and where they should be placed. Therefore, it will be beneficial for residents, community leaders, designers and city officials to be familiar with the language involved in basic street design.



To understand their purpose and intention, this section breaks down the physical elements of Neighborhood Greenways into six categories. Images from Seattle and around the world are used to depict a range of proven and innovative strategies.

Additional examples and links to resources are available on the Seattle Neighborhood Greenways Toolkit and Resource pages:
neighborhoodgreenwayssea.wordpress.com

Invitations

Incorporating dynamic elements into Neighborhood Greenways both enhances the experience of moving along the street and provides amenities that invite users to stop and linger.



Key Considerations

Provide a variety of open spaces that might invite individuals from different cultures, ages, gender and incomes to interact.

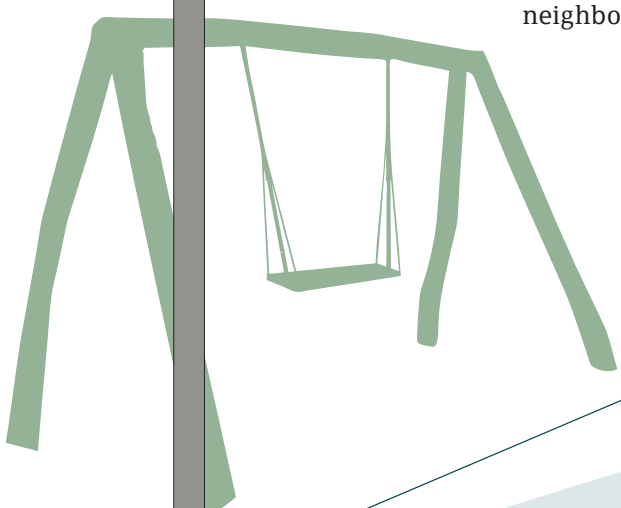
Provide safe bicycle parking facilities at all major destinations and public transport nodes.

Maintain adequate maintenance of new amenities.

The use of high quality, sustainable materials bestows a sense of pride to a place, communicating the importance of the space.

Cultivate and look for opportunities for public education. Signs, interactive displays and community boards can tell about the history and the environment of a place or of the people living there.

New elements should be well integrated in the street with a human scaled design that supports the identity, character and use of the neighborhood.



Furniture and Amenities



Community Information Board was built as part of a city repair project. Portland, OR



Seating can be creatively integrated into the streetscape. Seattle, WA



Bicycle repair stations provide tools and air. Austin, TX



Staircase runnels help the cyclist maneuver. DK

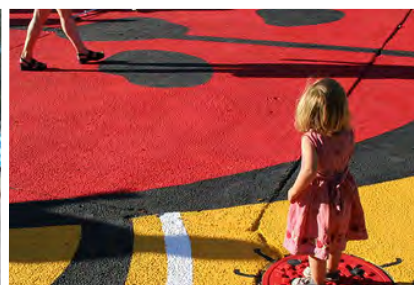
Street furniture and other amenities can be added. Street furniture provides people with a reason to linger and also ensures that movement along routes is pleasurable and interesting.

- Seating
- Planters
- Water fountain
- Lighting
- Overhead protection
- Exercise stations
- Public art
- Bike racks and bays
- Community kiosks/boards
- Bike repair station

New Public Spaces



Tents and chairs are used during pop-up events in the street. Seattle, WA



As part of a community-generated art project, this painted intersection creates a sense of arrival and identity. Seattle, WA



Located in the street right-of-way, this community cob oven is shared and constructed by local residents. Portland, OR



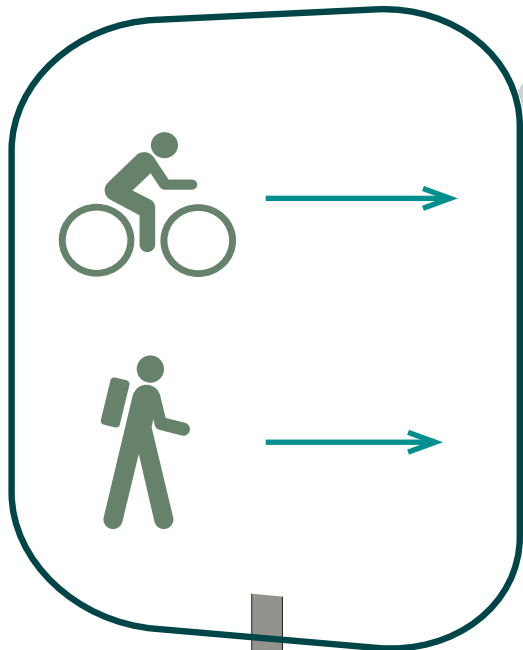
Designed by a local artist, this gate screens a garage and creates a visually interesting stop along the sidewalk. Seattle, WA

Small and inviting spaces are created by enhancing public land situated between a street and other elements such as a building, wall, or public art. The spaces are protected from unpleasant experiences and can be used to highlight community stories and identity.

- Urban gardens
- Public art
- Pocket Parks
- Water features
- Screens
- History walk

Wayfinding

Wayfinding visually directs people along Neighborhood Greenways and informs them about what is nearby. It also gives motorists visual clues to expect more people biking, walking, and enjoying the street.



Key Considerations

Excess street signs can clutter the visual landscape and become a distraction for drivers. The use of street signs should be limited and integrated with existing vertical elements.

Signage should always be placed to the right of the direction of travel.

Wayfinding should be sized appropriately for the user. For example, pedestrian signage should be located at eye level.

Additional pavement markings initiated by residents can provide a sense of ownership while also alerting other road users to expect an increase of cyclists and pedestrians on the street.

Community art projects can establish clear landmarks that assist cyclists and pedestrians in navigating through their neighborhoods.

Place indicator signage wherever a Neighborhood Greenway intersects another residential street.



Signage



Purple was one of the few noticeable colors not already used for city-wide traffic signage. Berkeley, CA



Signage alerts motorists that bicycles have priority and should yield when turning. Seattle, WA



The small scale and placement of this sign is designed specifically for the needs of bicyclists. Copenhagen, DK

Signage is typically used at intersections or near destinations to notify bicyclists and pedestrians of the proper direction to travel. These signs can also include the distance to regional trails and neighborhood destinations.

- Motorist-scaled signs
- Directional signage
- Public art or object

Pavement Markings



Bicycle sharrow stencil flower indicates the intersection of two Neighborhood Greenways. Portland, OR



Pavement paintings and material changes are incorporated into the entire streets design. New Zealand



Painted dots playfully indicate who is allowed and invited onto the street. Chongqing, China



Striped bike lanes are highly visible to vehicle drivers and directs cyclists through major intersections. Barcelona, Spain

Pavement markings remind all users they are using or intersecting a Neighborhood Greenway. Variations in color, patterns, and surface materials alert users that they have entered a different type of street and will make them aware of potential danger and conflict zones.

- Strip of colored road paint
- Bicycle sharrow stencil
- Painted intersection
- Stamped concrete

Traffic Calming

Traffic calming encourages both bicyclists and motorists to slow down and share the road. By using the right combination of visual cues and physical changes along a street, the behavior of cars, bicyclists and pedestrians will change.



Key Considerations

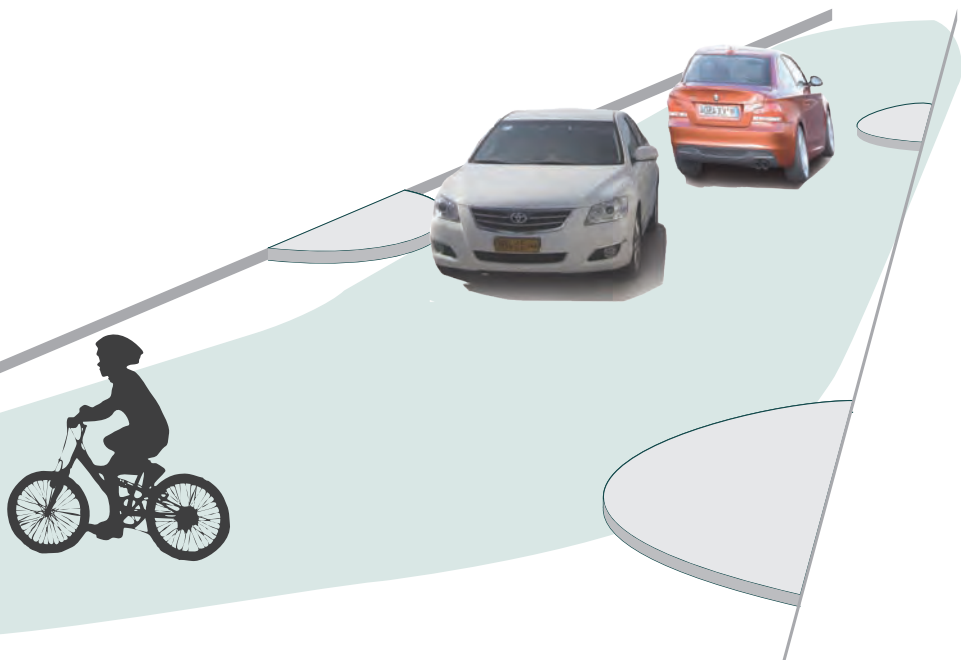
Traffic calming must be used at appropriate intervals throughout the entire length of a Neighborhood Greenway and will vary depending on original street conditions .

Combine green stormwater infrastructure and other public amenities with traffic calming to efficiently achieve multiple objectives.

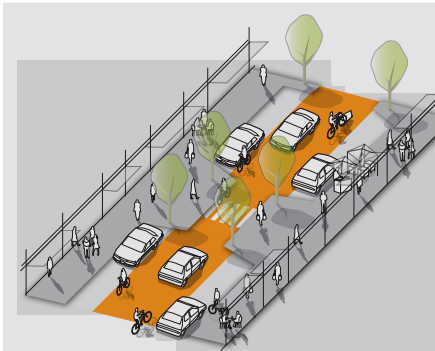
At intersections with a Neighborhood Greenway, physical elements placed between vehicle traffic lanes (such as a pedestrian refuge island) can temporarily reduce the street width and slow traffic to a safer speed.

Ensure that the travel lane maintains a minimum width of 11 feet. On two-way streets, the overall width of vehicular travel space can be reduced to 20 feet without additional traffic analysis by extending the curb or introducing vehicle parking.

A cyclist's path might be affected by inconsistent curb lines. Ensure that curb extensions are gradual and do not force a bicyclist abruptly into a vehicle travel lane.



Change Street Layout



Neckdowns extend the curb to reduce street width and crosswalks can be integrated to minimize the crossing distance.



This chicane interrupts traffic flow by momentarily allowing bicyclists to travel on the side of the road. Portland, OR



Median crossings provide a haven for pedestrians at arterial crossings and narrow the street. Copenhagen, DK



A series of barriers on alternative sides of the street create a meandering lane for cars. Seattle, WA

Changes in street layout force drivers to become more aware of their surroundings. By narrowing the road at an intersection, motorists' turning speeds are reduced as is the distance for a crossing pedestrian. Slight shifts in the travel lane along a route slow speeds and improve the visibility of approaching pedestrians and bicyclists.

- Chicane
- Mini traffic circle
- Pinch point
- Neckdown (curb extension or bulb out)
- Median crossing
- Reducing turning radius
- Roadway narrowing
- Medians

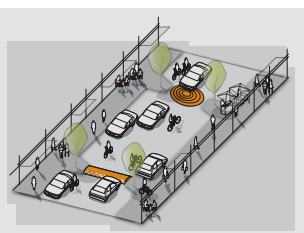
Raised Interruptions



By regrading the street, speed tables are designed to maintain slower speed levels. In this example the middle of the table has been raised to the height of the sidewalk. Copenhagen, DK



Speed humps are inexpensive tool to temporarily slow vehicle speed but can also be uncomfortable for bicyclists, especially with trailers. Portland, OR



The physical design and implementation of each raised interruption can vary along a route.

Raised interruptions placed mid-block or at intersections will slow the speed of motor vehicles.

- Speed humps
- Speed table
- Raised crosswalks
- Raised intersections
- Material changes

Traffic Control

Traffic control manages vehicles by limiting the number of motorists on the street and the speed at which they travel. The intent is not to prevent vehicles from getting to where they need to go but to encourage the use of arterials, improving efficiency and safety of the entire transportation network.



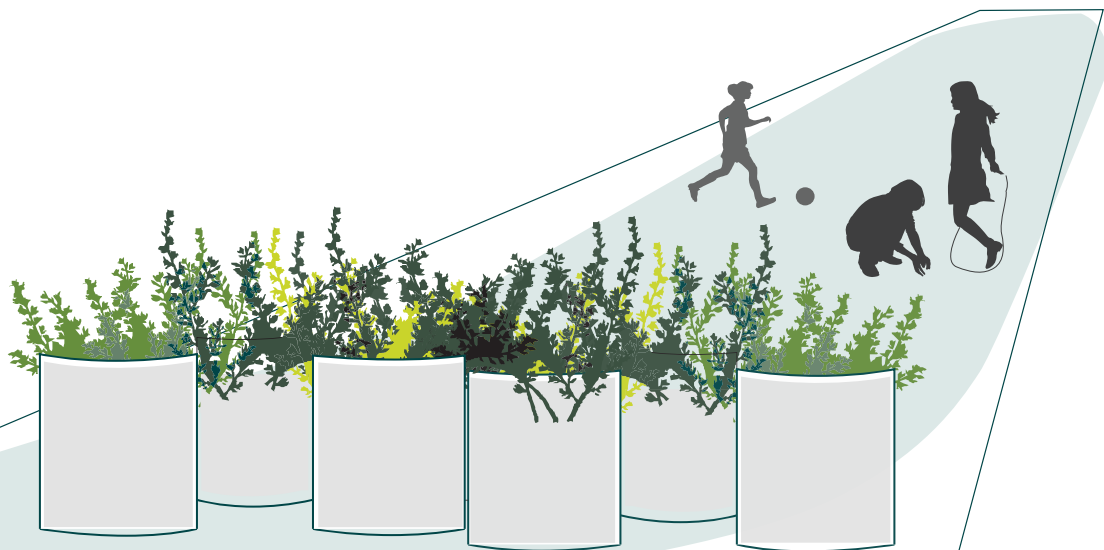
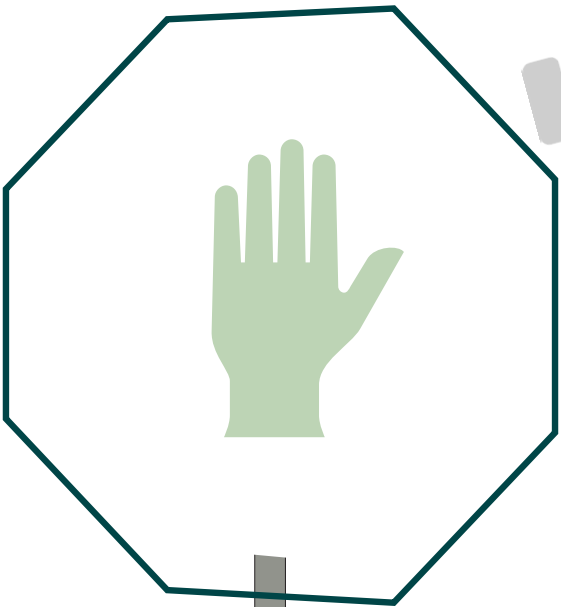
Key Considerations

Use traffic control measures only when other traffic calming measures will not achieve needed speed reductions.

Unnecessary traffic signals can encourage red light running and/or jaywalking. By rerouting high speed vehicles to arterials, some existing traffic signals may not be necessary.

Clearly indicate how bicycles and pedestrians are expected to travel through all traffic barriers.

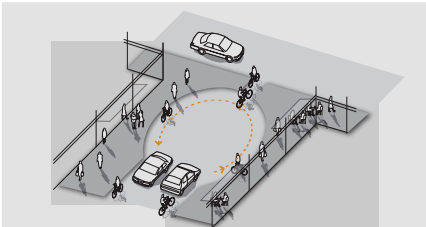
Maintain sight lines at every crossing.



Physical Barriers



Diagonal diverters prevent cars from continuing down a street by forcing them to turn. Portland, OR



Full street closures use raised features or barriers to prevent any vehicle from entering a street.



Contraflow bike lanes allow bicycles to travel in both directions on a one-way street. Portland, OR



Choker entrances allow bicycles to turn onto side streets, while blocking vehicles from entering. Altadena, FL

Physical barriers and deviations limit or restrict vehicle traffic from entering a Neighborhood Greenway from a busier street. This keeps cars from cutting through on neighborhood streets and can provide neighborhood park space while maintaining full pedestrian and bicycle access.

- Full street closure
- Partial street closure
- Diagonal diverter
- Directional closure
- One-way streets

Traffic Rules



Consistently using hand signals and following traffic rules informs all users about what to expect. Roseville, MN



A stop sign forces travellers to stop and look for cross traffic before entering a Neighborhood Greenway.



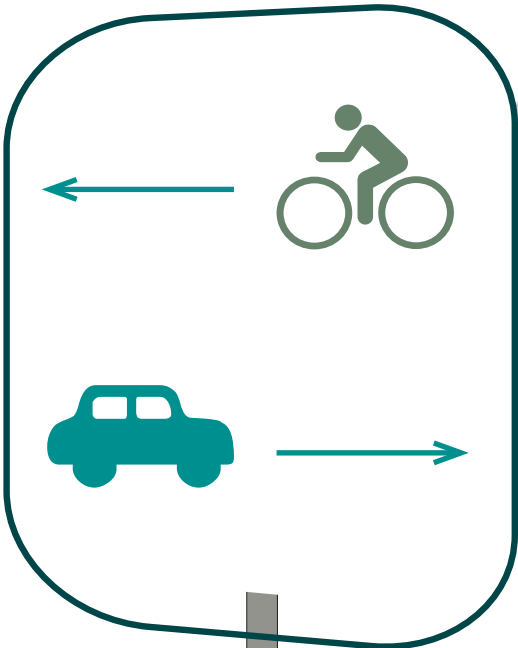
As a reminder to motorists, 20 mph speed limit is painted in tall letters at regular intervals along the route. New York City, NY

Traffic rules affect how people behave as they move through a street but they are successful only if people are educated and streets are designed to reinforce the rules.

- Reduced speed limit
- Hand signals, helmets, bike light
- Speed cameras
- Traffic garden
- Blinking speedometer

Modal Separation

Neighborhood Greenways create shared spaces where bicycles and cars travel at a similar speed and pedestrians can safely cross the street. There will be times, however, where it is necessary to separate modes to reduce potential conflict between users.



Key Considerations

Always keep the slowest traffic on the right-hand side: pedestrians, then bikes, then cars .

Ideally, a change in curb height from a travel lane to a dedicated bicycle path to sidewalk should be 3 inches between each path.

It is always safer for bicyclists to travel in the same direction as motorized traffic. Where feasible, avoid placing a two-way bicycle lane on one side of a two-way street.

Never direct cyclists onto the narrow space of a residential sidewalk unless there are no other safe alternatives.

A 6-foot wide bicycle lane is needed for riders to continue a conversation while riding comfortably.



Bicycles and Pedestrians



Traffic islands on busier streets guide bicyclists to cross in the middle of the intersection and pedestrians at sidewalks. Portland, OR



Bikes and pedestrians take advantage of shortcuts when each are given their own space to travel through. Copenhagen, DK



A smooth ground material differentiates where bicycles travel on a wide sidewalk. Malmö, Sweden

Clear delineation between bicycles and pedestrians allow both users to move at comfortable speeds without interruptions or conflict.

- Sidewalk
- Bollards
- Ground material changes
- Vegetated strip
- Variation in curb height

Bicycles and Cars



Offering a separated bike path through a park encourages bicyclists as they take advantage of neighborhood shortcuts. Seattle, WA



Bicycle stop bars allow a bike to go to the front of the vehicle stop sign, making them more visible to drivers. Portland, OR



Parked cars are used to protect bikers on the cycle track from vehicle flow. Copenhagen, DK



Painted double lines allow bicycles to travel in both directions on a one-way street. Seattle, WA

Separating bicycles from motorists provides protection when bicyclists must travel near busier traffic. It can also make bicyclists more visible to motorists.

- Pedestrian bridge
- Bicycle sidepath (cycle track)
- Contraflow bike lane
- Bicycle forward stop bar
- Bicycle sharrow
- Buffered bicycle lane

Green Stormwater Infrastructure

Green Stormwater Infrastructure (GSI) is the practice of managing stormwater using natural systems. This technique can be used to clean runoff before it flows into streams, lakes, and bays and to reduce demand on our existing sewer system. This can also increase aesthetics and improve biodiversity within the streetscape.



Key Considerations

Taller trees typically allow better sight lines. Scale trees and vegetation appropriately to retain good visual overview for bicyclists and pedestrians.

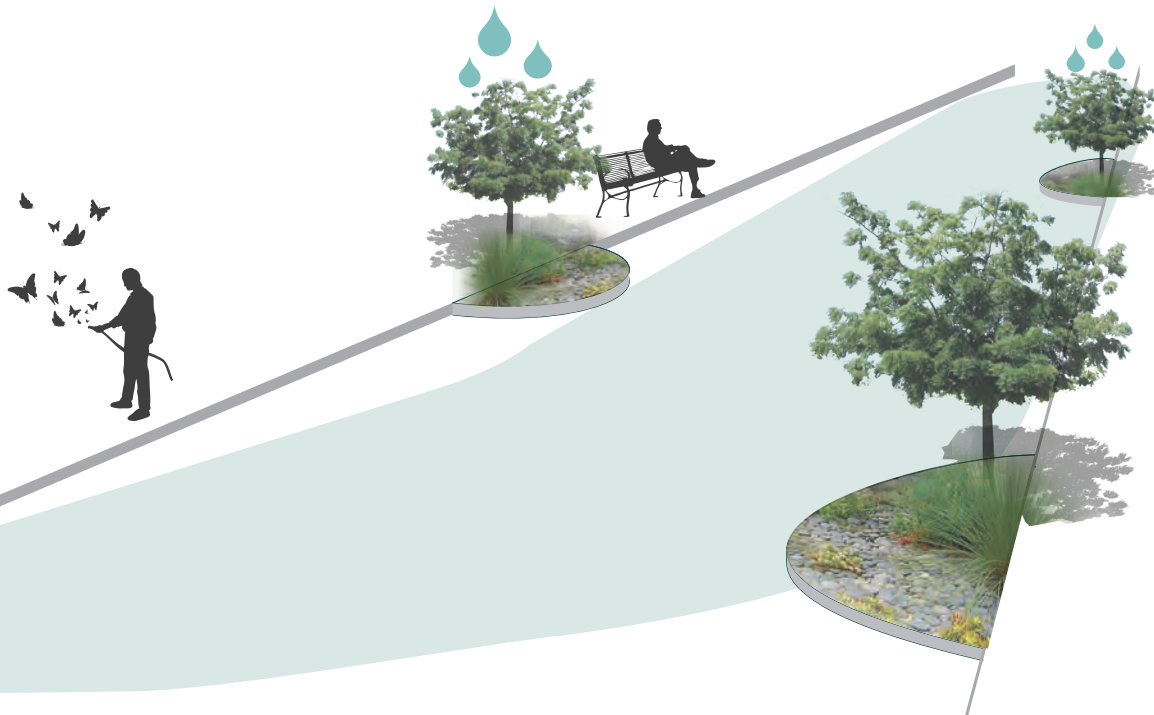
Integrate as many green stormwater infrastructure components as possible into each block of a Neighborhood Greenway.

Consider how Green Stormwater Infrastructure can be combined with other interventions, such as curb extensions or seating.

Protect existing trees and roots.

Educate neighbors about Green Stormwater infrastructure by incorporating educational signage and interpretation.

Reclaim the 30-foot near intersections where vehicles are restricted from parking, to combine curb extensions with rain gardens.



Trees and Vegetation



Sidewalk curves to protect mature trees and their roots. Berkeley, CA



Green screens introduce three-dimensional element. Copenhagen, DK



A green roof has been integrated into a bus shelter to absorb the rainfall that lands on it. London, UK

Trees and vegetation can significantly reduce the amount of stormwater runoff. Evapotranspiration captures rainwater in the leaves and the roots soak up water and increase the ability of soil to store precipitation. Vegetation can be incorporated with other GSI techniques to increase effectiveness and appearance.

- Native and drought tolerant plants, Street trees, Greenroofs, Green screens

Infiltration



Bioswales run parallel to traffic lanes and can be used to narrow the road and provide small habitat corridors. Seattle, WA



Interlocking permeable pavers allow water to infiltrate between and into the pavement. Denver, CO



Infiltration strip filters water before discharging into the sewer system. Portland, OR



This raingarden takes advantage of the reclaimed space used for traffic calming. Portland, OR

Infiltration techniques are designed to hold standing water for a period of time before eventually infiltrating or flowing into the sewer system. This cleans polluted water and slows the time it takes for water to reach the sewer, which prevents system overload during large storm events.

- Raingardens, Bioswales, Stream daylighting, Infiltration trench, Detention basin, Permeable pavement, Planted pavers

Water Reuse



This cistern becomes a sculptural art piece and public education tool. Seattle, WA



Open and closed trenches/runnels integrated into the sidewalk carry water to where it can be used. Malmö, Sweden

Water Reuse captures and stores rainwater that would normally run directly into the sewer. This treats water as a resource rather than a waste by using the water for productive uses like flushing toilets or irrigation.

- Downspout disconnection, Rain barrels or cistern, Water runnels, Underground facility



Putting it Together

To envision what Neighborhood Greenways could be, these street design collages combine a number of physical elements in locations throughout the city. They are shown at actual sites and are meant to illustrate one of several alternatives to address a site-specific problem. The sites were selected after discussions with existing neighborhood group leaders and analysis of potential connections. However, each neighborhood and route will encounter similar situations and these visual collages can provide inspiration and generate discussions.



The strategies and changes applied to the street were inspired by real-world examples. The designs were developed with the 'Quality Criteria' in mind to ensure that each key issue was addressed. After putting together the principles of Neighborhood Greenways, the physical elements and the 'Quality Criteria' checklist, we hope Seattle residents are one step closer to safer and more inviting streets.

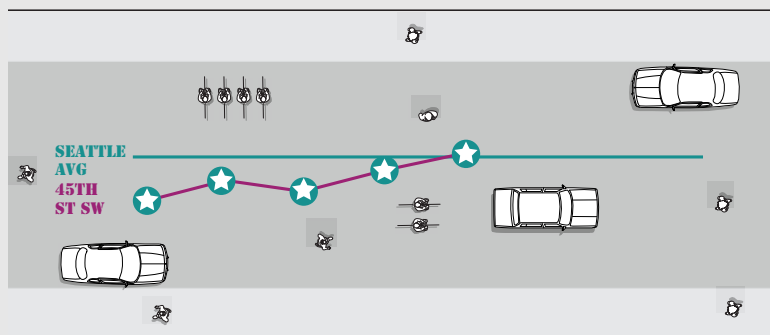
Do it Yourself

Not every street will be officially designated as a Neighborhood Greenway, but neighbors can work together to achieve many of the same results. With careful route planning and a few low-cost additions, homeowners can contribute to the creation of a safe and well-connected network. These investments will make this typical residential street more inviting while also demonstrating the neighborhood's commitment to additional transportation options.

** May require City permit*



45th Avenue SW, West Seattle



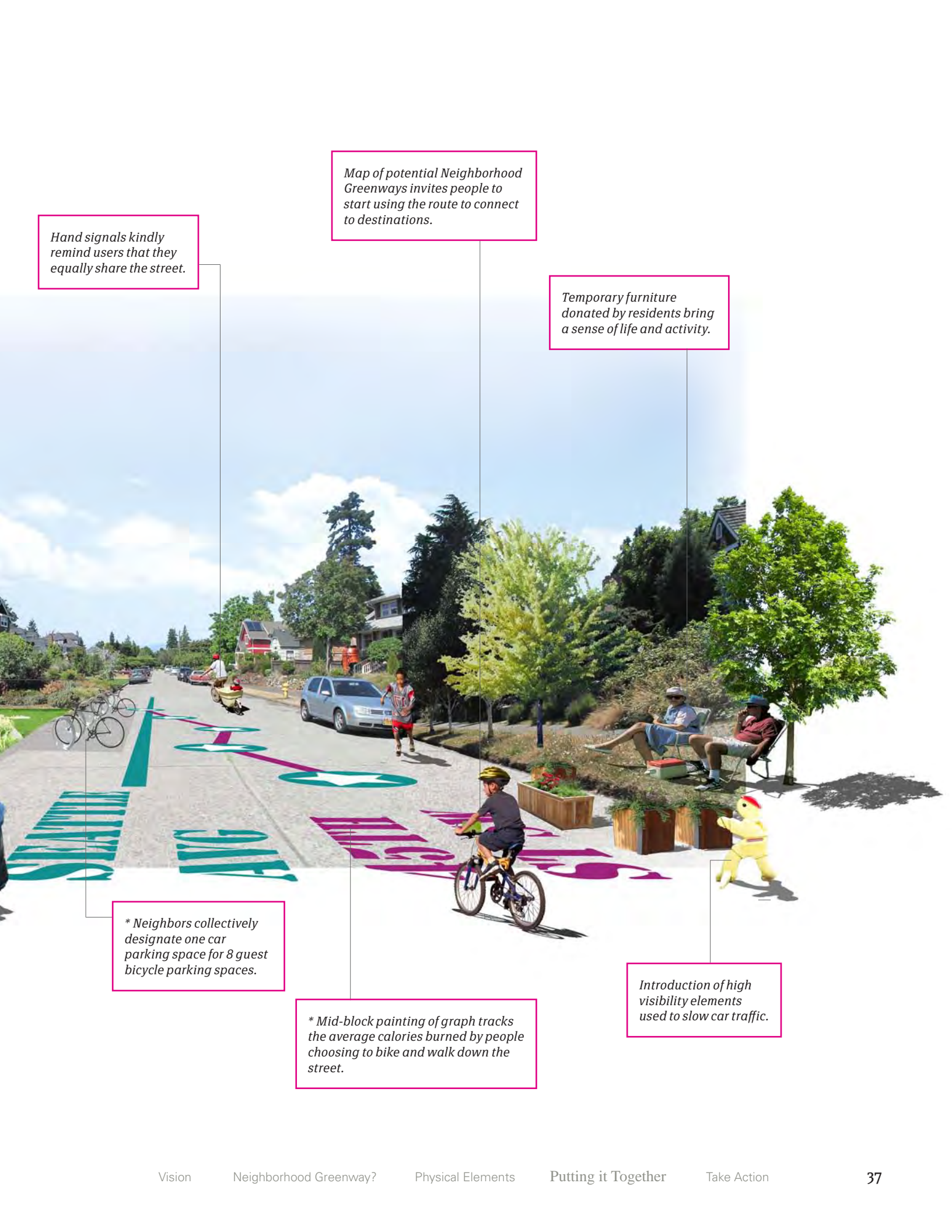
Rain barrel captures roof runoff that is stored for later use in the garden.

Homes and windows out onto the street provide natural surveillance and a perceived sense of safety.



Neighbors gain a sense of ownership and look after their street.

** Raingarden built by homeowner and funded by the Seattle Residential RainWise program.*



Map of potential Neighborhood Greenways invites people to start using the route to connect to destinations.

Hand signals kindly remind users that they equally share the street.

Temporary furniture donated by residents bring a sense of life and activity.

** Neighbors collectively designate one car parking space for 8 guest bicycle parking spaces.*

** Mid-block painting of graph tracks the average calories burned by people choosing to bike and walk down the street.*

Introduction of high visibility elements used to slow car traffic.

Linking Destinations

A school and a park are separated by a potential Neighborhood Greenway but the lack of buildings along the street edge makes the block feel unwelcoming. An enhanced mid-block crossing can be integrated with a curb extension to narrow the travel lane. This shortens the crossing distance for pedestrians, slows vehicular traffic and identifies entrances to the two destinations.



45th Avenue NE, Laurelhurst



Terraced P-Patch brings activity to an otherwise uninteresting hillside.



Flashing LED lighting within the pavement inform riders of upcoming obstacle.

Neckdown forces cars to slow down by temporarily narrowing the travel lane to 17 feet.

Parking spots on both side of the street are removed to improve visibility.



Sidewalk height is extended by raising the crosswalk 3" above the street, creating a speed table to slow cars.

Pavement marking directs bicycles to the right of the street where they are momentarily separated from the vehicle travel lane.

Appropriately scaled signage informs bikers of nearby attractions.

Crossing a Busy Street

A park is separated from neighborhood residences by an arterial street. By narrowing the road to two lanes, a median refuge island can be placed between the travel lanes to momentarily divert drivers. This provides pedestrians and cyclists a haven while crossing the arterial and partially restricts vehicles from turning onto the Neighborhood Greenway.



S Spokane Street + Lafayette Avenue S, Beacon Hill



Developed as a pilot project, permeable pavers denote vehicle parking and visually narrow the road when no cars are parked.



Walking and running path separated from two-way bicycle path by a buffer.



Pedestrian scaled lighting illuminates the intersection of cycle path and sidewalk.

Existing tree protected and incorporated into the path layout.

Combined raingarden and curb extension replaces the pavement 30 feet in front of the stop sign.

High visibility signage and pavement markings inform vehicles they are approaching a crossing.

Interpretive signage tells about the history of the park and its relationship to the neighborhood.

Median island restricts vehicles from turning onto the Neighborhood Greenway.

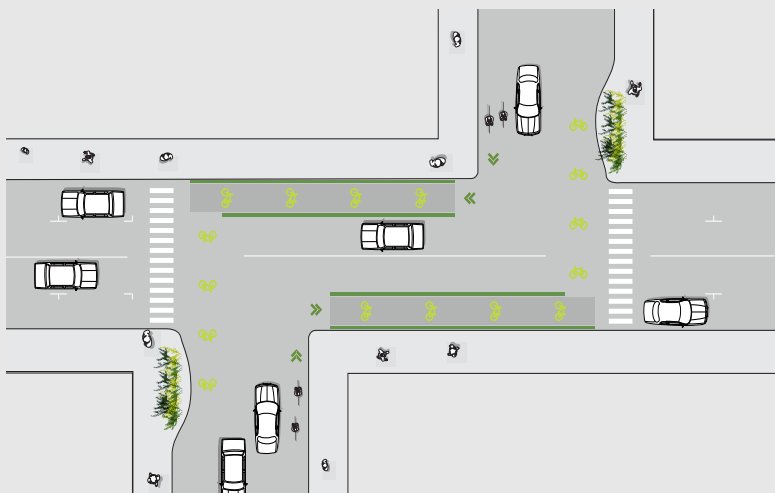
Median refuge island designed wide enough for two passing bicycles or for a cargo bike to safely wait.

Thinking about the Gaps

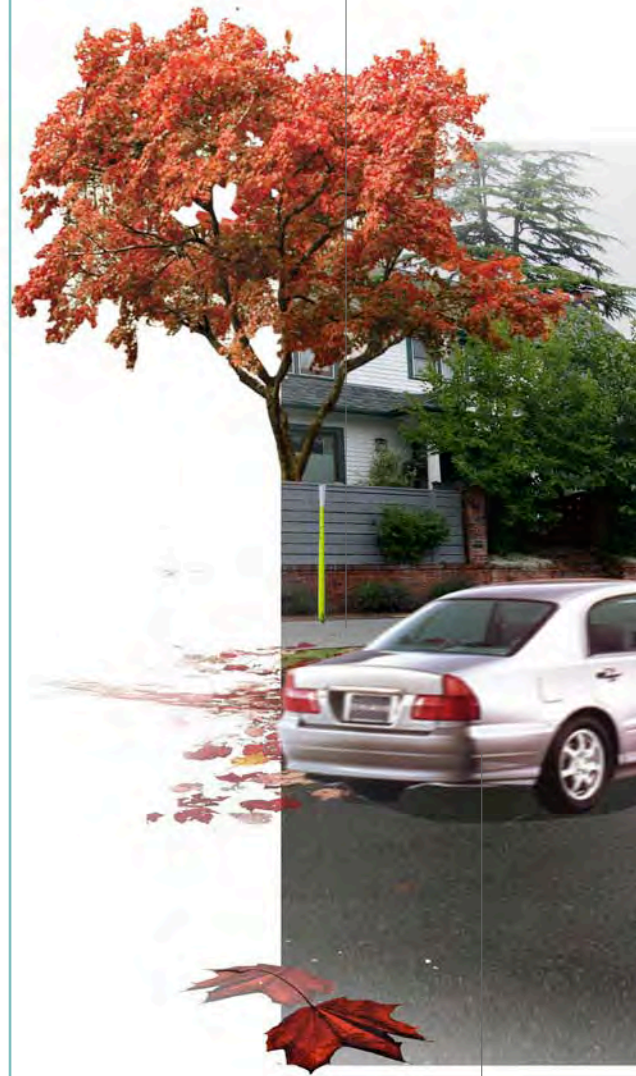
Due to shifting street grids, some Neighborhood Greenways cannot cross an arterial in a straight line and bicyclists and pedestrians must temporarily travel along a busier road. This can be dangerous unless riders are separated from car traffic. A one-way cycle track creates a safe route for bicyclists who will then use a highly visible crossing to enter back onto a Neighborhood Greenway. Stormwater features can be integrated to further help separate bicyclists and pedestrians from heavy traffic.



NW 65th Street + 22nd Avenue NW, Ballard



One way cycletrack on both sides of the street direct cyclists to safe crossing across arterial.



Strictly enforced speed limits increases the safety of non-vehicle traffic.



Gradual curb extension eases cyclist into the cycle sidepath while also slowing the speed of turning vehicles.

Sidewalks resurfaced with permeable pavement to soak up rainwater.

User scaled lighting increases safety and usage during evening hours .

A striped bike lane and a highly visible crosswalk increase crossing safety.

Filtration strip creates a buffer to protect bicyclists from vehicle traffic.

Legible and consistent city-wide wayfinding indicates travel path.

Residents maintain existing green strip that separates pedestrian and bicycle movement.

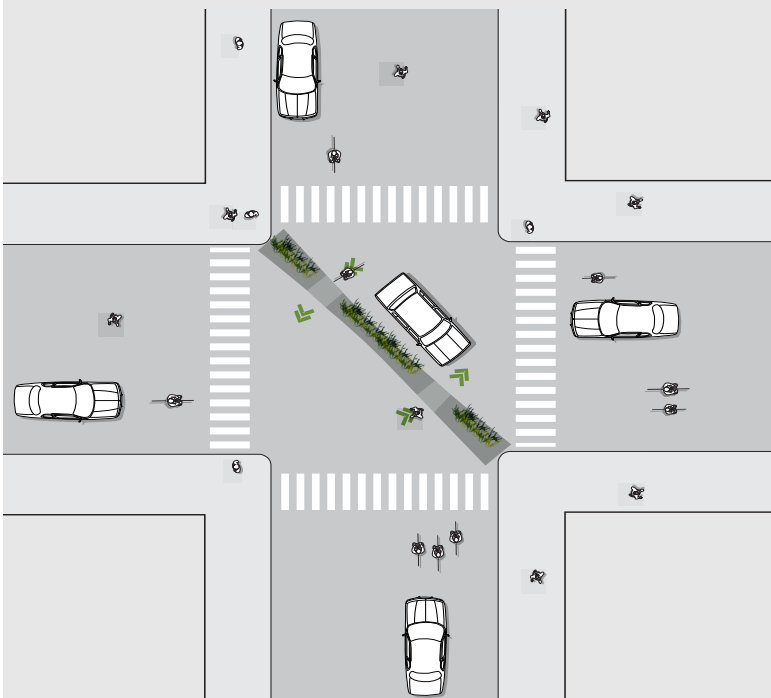
Curb cut realigned and ADA crossing marks.

Limiting Cut-through Traffic

In high-traffic areas where major roads intersect, neighborhoods might experience cut-through traffic. A diagonal diverter placed one or two blocks away from an arterial street can restrict the vehicle traffic from making shortcuts on Neighborhood Greenways. In this example, the diverter is constructed by placing rain gardens into the intersection with small openings for pedestrians and bicyclists to easily travel through the barrier.



47th Street NE + NW 9th Avenue, University District



Barrier diverts traffic while retaining vehicle access to local destinations.



Sidewalk improvements increase mobility for children, elderly and disabled.



Reappropriated public space for temporary uses.

Public art incorporated within bioswale.

Mix of housing types provide additional eyes on the street.

Curb cuts capture rainwater runoff from the pavement.

Opening wide enough for bicycles to comfortably move through the barrier.

Potholes and pavement improvements during construction and subsequent maintenance prioritized.



Take Action

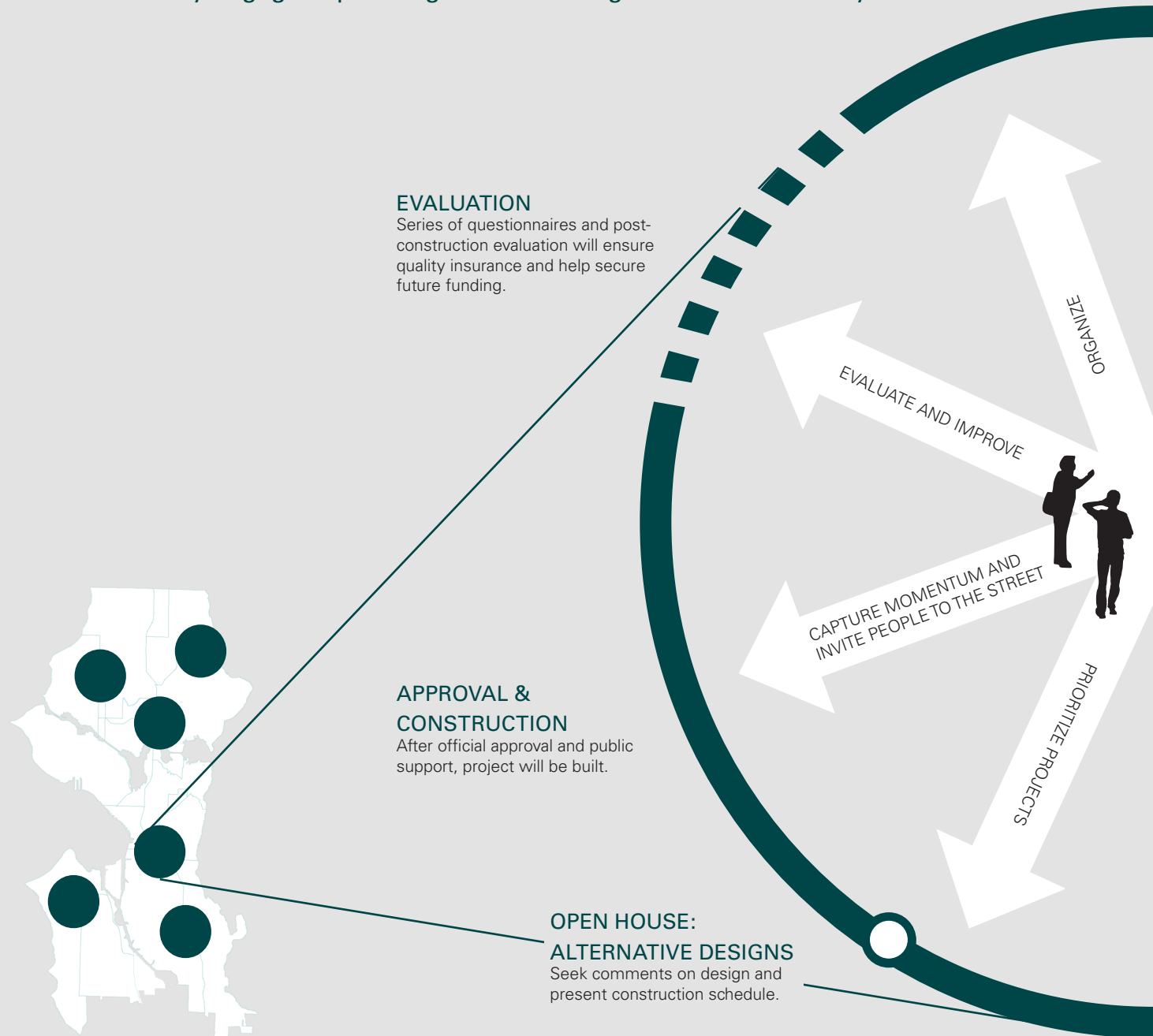
The City is developing a comprehensive model for planning and constructing Neighborhood Greenways. This means that the physical elements, the layout, and the quality of the infrastructure in one neighborhood will be similar to that in another. A city wide strategy for design, development, implementation, and evaluation will ultimately facilitate a complete network of Neighborhood Greenways.



In order to have the greatest amount of success, this project must have broad involvement and support from both citizens and interest groups, and from both the private and public sectors. Many grassroots efforts have already begun and by working effectively within a public engagement process, those involved can contribute first-hand knowledge and advocate for their own needs and desires.

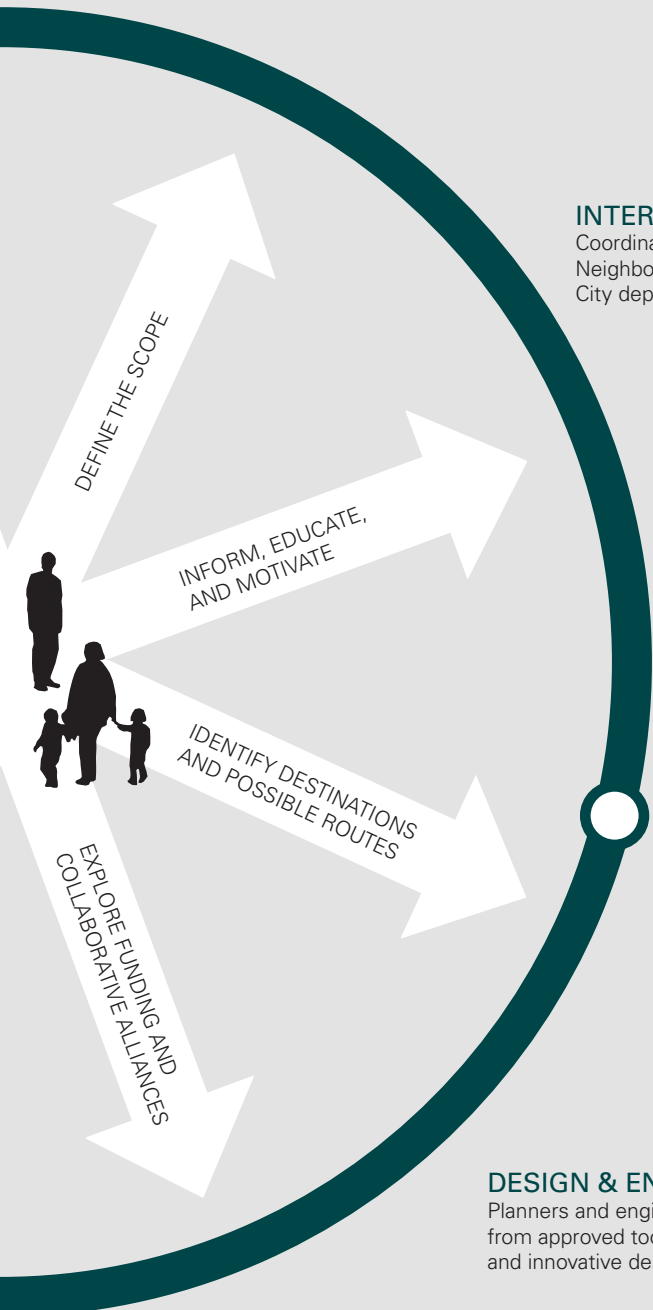
Understanding the Planning Process

The Seattle Department of Transportation (SDOT) will incorporate Neighborhood Greenways in the Seattle Bicycle Master Plan update. SDOT will oversee coordination with other city departments and initiate a public engagement process. The diagram on the following pages is modeled after Portland’s public engagement process and illustrates how communities could effectively engage in planning their own Neighborhood Greenways.



IDENTIFY NEIGHBORHOOD AND ANALYSIS

Notify residents that their neighborhood is being considered and prioritize potential routes.



INTERNAL STRATEGY

Coordinate with SPU, Parks, Neighborhoods, OSE and other City departments.

“The concept is simple and we learned that implementing the concept is cost effective, too.”

Bagshaw, Sally. *Sally Blogshaw*.
March 09, 2011.

OPEN HOUSE: ROUTE SELECTION

Present overall concept and possible routes. Without public support, another route will be selected.

DESIGN & ENGINEERING

Planners and engineers choose from approved toolbox of traditional and innovative design elements.



A Resident's Guide for Working with the City

There are many opportunities for community members to show support and help create Seattle's Neighborhood Greenways. Below is a list of possible ways to be involved.



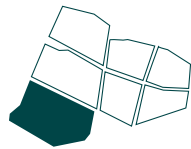
ORGANIZE

Build a network of involved citizens who want to be involved in the process of Neighborhood Greenways.

Encourage group leaders to arise who will be able to either communicate with officials, fundraise, educate the community or facilitate route selection activities.

Seek out other neighborhood groups, local community groups, schools, business associations, local health leaders, and anyone else who might like to be involved in the process.

Visit the Seattle Neighborhood Greenways website, neighborhoodgreenwayssea.wordpress.com, to connect with other neighborhoods' Facebook, Twitter and Google Groups accounts.



DEFINE THE SCOPE

Clearly define the borders of the neighborhood. Typically administrative or geographical borders will apply but steep slopes or watersheds may create a natural boundary.

Survey potential users to better understand their needs. For example, school children can fill out questionnaires where they describe the route they use for coming to school.

Consider how Neighborhood Greenways could help accomplish other neighborhood projects or aspirations.



INFORM, EDUCATE, AND MOTIVATE

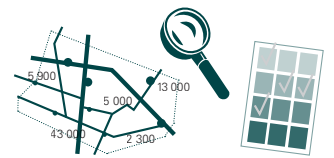
Develop a clear message for the neighborhood group. Talking points and other tools are available on the Seattle Neighborhood Greenways website.

Know your audience and target the message to entice different groups.

Continue to identify and use a variety of outreach tools to engage with other potential users.

Websites, blogs and online media can be helpful but don't overlook the power of talking with people face-to-face. Set up a booth at the farmer's market or simply talk to you neighbor.

Identify opportunity for additional branding and campaigns that inform, educate and motivate residents to get out and start envisioning the fantastic possibilities of potential routes.



IDENTIFY DESTINATIONS AND POSSIBLE ROUTES

Think practically. Begin evaluating streets that have a low motorized traffic speed and, ideally, less than 1,000 cars a day.

Identify streets that are already preferred for walking and biking by observing or counting the pedestrians, bicycles, and cars in the area.

Invite all types of users to help map all destinations in the area - parks and spaces, schools, shops, transit hubs, markets, sport facilities, libraries, child care, etc. Expand the scope to include destinations and bicycle routes in adjacent neighborhoods.

Identify potential barriers along each route and specific intersections that will need special considerations.

Analyze the existing conditions of the possible routes using the 'Quality Criteria.'



EXPLORE FUNDING AND COLLABORATIVE ALLIANCES

New opportunities emerge once routes are decided. Consider who might directly benefit and reach out to them.

Think creatively. A variety of private funding sources could be used to supplement available funding for construction or even used to hire a design consultant to explore innovative traffic calming solutions.

Apply for Seattle Neighborhood Matching Funds and other city programs that can be used to fund workshops and planning initiatives.

Invite potential partners on a bike ride or walk to show them problem areas and opportunities.



PRIORITIZE PROJECTS

Determine the route, or routes, that can link the greatest amount of people.

Minimize the cost of implementation. Prioritize improvements that are low cost but have the highest impact.

Consider both long and short-term solutions.

Ensure that every resident is informed about a potential along their street.

Think how each project might strengthen local characteristics and identity.

Consider how to integrate wayfinding, traffic control and calming, modal separation, green stormwater infrastructure, and invitations.



CAPTURE MOMENTUM AND INVITE PEOPLE TO THE STREET

Seattle residential streets can be closed up to once every month. Start programming and planning new events on the streets.

Publish virtual and portable maps of the new routes to be constructed in the neighborhood.

Familiarize people with the routes by re-routing Sunday rides, Safe Routes to Schools, and other safe events onto the Neighborhood Greenway.

Organize other programs, such as a neighborhood speed watch, to further enhance the experience and achieve the 'Quality Criteria.'

Consider offering incentives to users seen on a Neighborhood Greenway and thank them for using hand signals while biking or to drivers politely sharing the road with non-motorized users.



EVALUATE AND IMPROVE

Measure the results regularly by gathering data. Continue to count pedestrian and bicycle usage, as well as staying activities along the Neighborhood Greenways.

Regularly inform others about results using campaigns, media, or innovative methods, such as a public cycling counter, to encourage even more users.

Interview users to identify additional needs and problems in the network.

Share photographs of your street to get others excited.

Recognize that improvements might need to be made. Document potential improvements using the 'Quality Criteria' and compare to data gathered in Step 4.

SEATTLE NEIGHBORHOOD GREENWAYS

more information available at:

neighborhoodgreenwayssea.wordpress.com



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