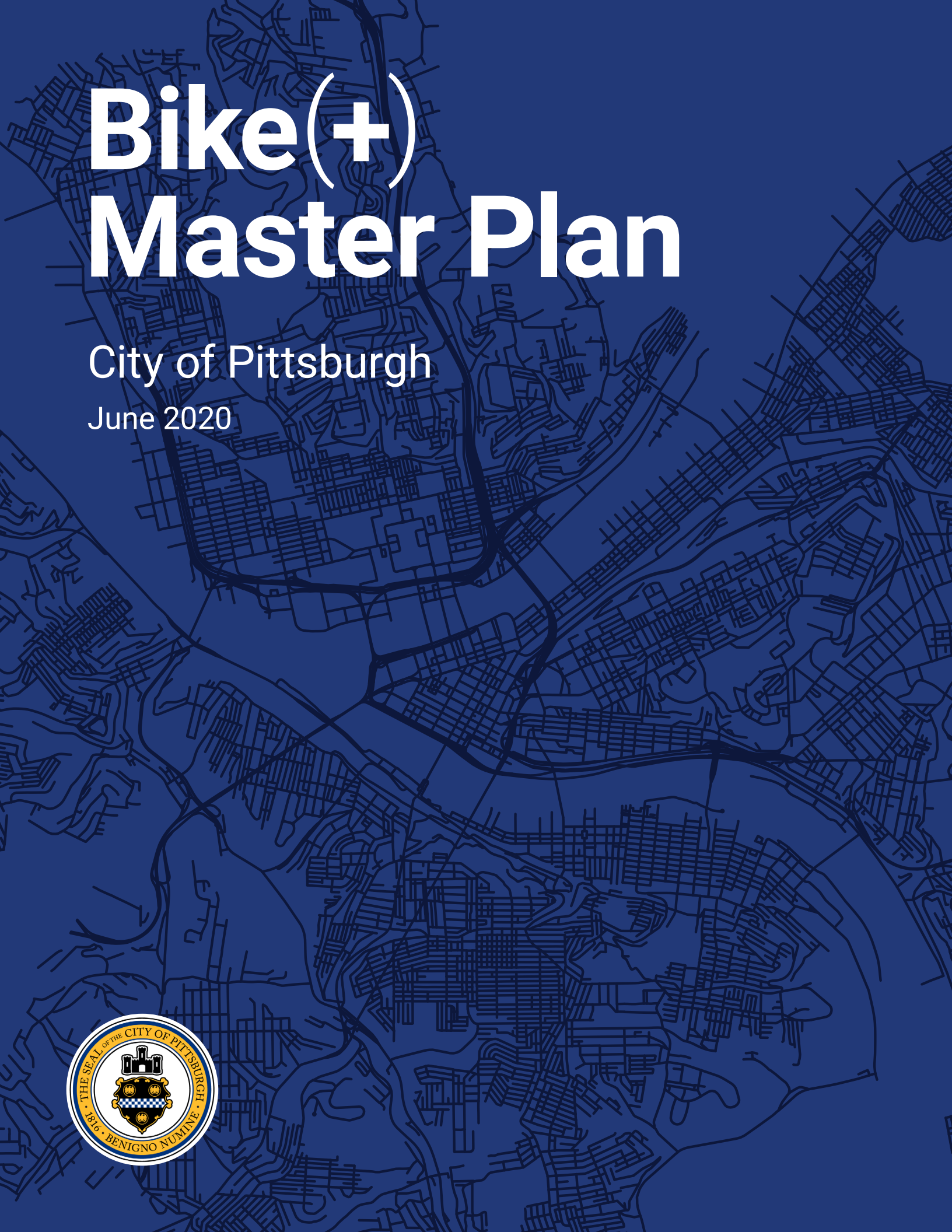
Bike(+) Master Plan

City of Pittsburgh

June 2020



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Message from the Director

Dear Friends,

After five years in development, scores of neighborhood meetings, a dozen public events and inputs and suggestions from innumerable individuals, I am so pleased to release this draft Bike(+) Plan for your review.

It has been more than twenty years since Pittsburgh's last ten-year bike plan and a lot has changed since then. We have added more than 50 miles of bike friendly facilities, seen a many-fold increase in people who commute by bicycle, and dramatic increases in bicycle-based recreation and tourism. Bicycles now come in many different shapes and sizes transporting children and cargo, sitting upright or recumbent, traveling by two wheels or three with two people or more. Traditional pedal cycles have been joined by electric pedal assist bicycles, scooters and skateboards that give people more confidence (and joy!) traveling up our steep hills and across longer commutes.

At the same time, many things have not changed. Bicycles and their kin have been around for more than 200 years and remain one of the cleanest, most efficient and most enjoyable ways to travel. Bikes still give many of us the same thrill and sense of freedom and independence we felt as when we first learned to pedal, and remain an affordable source of mobility independence for many as we have gotten older. Travel by bicycle is still something enjoyed by 8-year olds and 80-year olds – where they are provided a safe place to travel.

And that's what this plan is about. It is about providing safe, affordable, sustainable and joyful travel options for people of all ages and all abilities in our city. It is a plan and roadmap for implementation that we will travel with each neighborhood of our city as we collaborate with residents and stakeholders in designing individual segments that will knit our city together as a whole.

I am excited to hear from you as you review this draft document. I am eager for your feedback on these meaningful actions to improve safety, combat climate change, lower transportation costs and increase access to opportunity. And I look forward to our continued collaboration over the next decade as we build another component of our diverse mobility system.

I want to thank all the people who have given countless hours and ideas in contributing to this plan and look forward to the many more people who will help to make it even better.

Sincerely,
Karina Ricks, Director
Department of Mobility and Infrastructure

Contents

Bike(+) Defined

Bike(+) is used throughout this document to include not only conventional pedalcycles, but also other personal mobility devices such as electric pedal assist bicycles, kick scooters or e-scooters, and other similar lightweight (<150 pounds), low-speed (<20 MPH) vehicles without internal combustion engines.

Photo by BikePGH

Photo by BikePGH

Photo by Toole Design

Examples of Bike(+) devices including an electric pedal assist bicycle, an electric mobility scooter, and an electric kick scooter.

Executive Summary

The Pittsburgh Bike(+) Plan establishes a vision to continue building a safe, comfortable, and convenient bike network for all types of riders and all types of trips.

Beginning with the City's first Bike Plan in 1999, Pittsburgh has a history of striving to improve the safety and accessibility of its 90 neighborhoods by implementing bicycle network improvements. As the City's population prepares for growth, it becomes more important than ever to find ways to move people safely and efficiently. The goal of the Pittsburgh Bike(+) Plan is to identify policy and infrastructure improvements that will support the City's mobility goals – objectives intended to ensure that Pittsburgh residents thrive.

The City of Pittsburgh's Department of Mobility & Infrastructure has commissioned surveys and utilized Census and other data to capture a snapshot of biking in Pittsburgh today. These data have helped guide the recommendations in the Bike(+) Plan. The Pittsburgh Bike(+) Plan incorporates results from a robust public engagement campaign to help identify critical gaps in our existing bike network that should be addressed over the next 10 years.

Pittsburgh Mobility Goals:

- **Goal 1:** No one dies traveling on city streets.
- **Goal 2:** All households can access fresh fruits and vegetables within 20 minutes travel of home, without requiring a private automobile.
- **Goal 3:** Walking and bicycling are the most joyful mode for short distance trips.
- **Goal 4:** No household must spend more than 45% of household income for basic housing and mobility.
- **Goal 5:** Pittsburgh streets and right of ways reflect the values of our community.

Bike Plan Engagement Highlights:

7 Citywide open houses

5 OpenStreetsPGH booths

16 Neighborhood bicycle and pedestrian committee meetings

15 Neighborhood-level meetings

1,536 Online map inputs

750+ People engaged

Bike Infrastructure in Pittsburgh Today:

93 miles of bike infrastructure (about 40% of which are bike lanes)

31% of residents bike, walk, or ride public transit to get to work

23% of Pittsburgh households do not have access to a personal automobile

2.1% of City of Pittsburgh commuters bike to work

Over 500 bikes at 113 Healthy Ride stations, and 66,000 active users

Proposed Bike Network:

Critical network gaps are highlighted in the Bike(+) Plan. In some cases, a preferred route for new or improved bike facilities is identified, and what remains is the selection of the appropriate facility type (neighborway, bike lane, separated bike lane, etc.). In other instances, where multiple route options remain, the Plan identifies steps to determine the most beneficial and viable route option.

Biking in Pittsburgh Tomorrow (after 10-year network is built):

- **123 miles of new on-street bike facilities**
- **27 miles of new trails**
- **243 total miles of facilities (existing + proposed) for bicycles and similar light-weight devices**

Buffered contraflow bike lane along Third Avenue

Policy & Program Highlights:

Infrastructure solutions will go a long way in encouraging more individuals of all ages and abilities to get on two wheels for quick trips around Pittsburgh. However, supportive policies and strategies are critical to achieving the outlined mobility goals. Such policies and strategies include:

- Pursuit of "Vision Zero" design strategies to reduce traffic-related serious injuries and fatalities to zero
- Improved accessibility of bike facilities and curbside destinations for those with mobility impairments
- Increased inclusive bike-related education among students and the general public
- Defined policies that help prepare for the introduction of new two- and three-wheeled low-speed mobility devices
- Promotion of non-car travel through progressive transportation demand management strategies
- Expanded integration of transit and bike(+) mobility
- Enhanced bikeshare system and utilization
- Enhanced bicycle and bike(+) data collection
- Collaboration with the Department of Public Safety to improve reporting of crashes involving people on bicycles
- Increased supply of convenient short-term, and secure long-term, bike(+) parking

Through rain and shine, up hills and along rivers, getting around on two feet or two wheels is in Pittsburgh's DNA. The 2020 Bike(+) Plan is the City of Pittsburgh's playbook to make biking safe, easy, and joyful for everyone regardless of age, ability, and economic or geographic location.

Vision and Principles

CHAPTER 1

Vision and Principles

VISION

Provide the people of Pittsburgh the physical mobility necessary to achieve equitable economic mobility and a sustainable, inclusive, and vibrant city.

Pittsburgh Bike(+) Plan Vision Statement

"The Pittsburgh Bike (+) Plan will outline clear steps toward building a safe, comfortable, and convenient bike network for all types of riders and all types of trips."

Photo by Toole Design

Multiple types of users on Three Rivers Heritage Trail at Allegheny Landing

City Mobility Goal 1

No one dies traveling on city streets.

To accomplish this the Bike(+) Plan must:

- Provide a safe network for people of all ages and abilities to use bike(+) devices.
- Ensure the network is intuitive and easy to navigate for all.
- Increase access to, and use of, helmets, lights, and other equipment.
- Promote better understanding of and adherence to traffic safety rules by all roadway users.

City Mobility Goal 2

All households can safely access fresh fruits and vegetables within 20 minutes travel of home, without requiring a private automobile.

To accomplish this the Bike(+) Plan must:

- Expand the bike(+) network to provide a comfortable, safe facility within ¼ mile of every home.
- Connect residential areas to grocery stores and other commercial districts with a continuous network of comfortable bike(+) facilities.
- Work with shared-mobility providers to ensure forms of bike(+) vehicles accommodate at least one bag of groceries.
- Provide safe, adequate short-term bike(+) parking at commercial destinations.

City Mobility Goal 3

Walking and bicycling are the most joyful mode for short trips.

To accomplish this the Bike(+) Plan must:

- Provide a comfortable, safe network for residents to access neighborhood destinations like parks, libraries, and schools.
- Remove high-stress barriers to bicycling such as critical connections, bridges, or intersections that put people on bicycles at high risk.
- Promote a more inclusive and diverse bicycling community through authentic collaboration, confidence-building, and support.
- Reduce conflicts between pedestrians and people on bicycles and other micromobility devices through proactive policies, facility design, and implementation.
- Make bicycling accessible to more people, particularly given Pittsburgh's hilly terrain, by accommodating electric, pedal-assist bicycles.
- Celebrate bicycling through public events.

City Mobility Goal 4

No household must spend more than 45% of household income for basic housing and mobility.

To accomplish this the Bike(+) Plan must:

- Provide a complete citywide network appropriate for commuting across the city at all hours of the day and night.
- Address gaps in the existing bike(+) network.
- Increase low-cost access to bicycles and other micromobility devices.
- Promote employer bicycle benefits.
- Provide adequate long-term bicycle parking.

City Mobility Goal 5

Pittsburgh streets and right of ways reflect the values of our community.

To accomplish this the Bike(+) Plan must:

- Plan and design facilities in collaboration with local residents and stakeholders.
- Maintain bike(+) facilities and equipment in a good state of repair.

Why a Bike(+) Plan?

Bicycling brings benefits to the health and happiness of those who ride, but also to the whole community of Pittsburgh by improving the safety of our streets and the quality of the streetscape.

People who bicycle in Pittsburgh come in all shapes and sizes. They are people of all colors who span the entire income spectrum. They ride to work, school, visit friends, and run errands. They are new learners and lifelong riders. While 2% regularly commute by bicycle, roughly one-third (32%) ride a bike on occasion,[1] and many more would if they felt safer on our streets. The Plan will make bicycling more viable for them all: whoever they are, wherever they ride, or whatever the purpose of the trip.


Photo by City of Pittsburgh

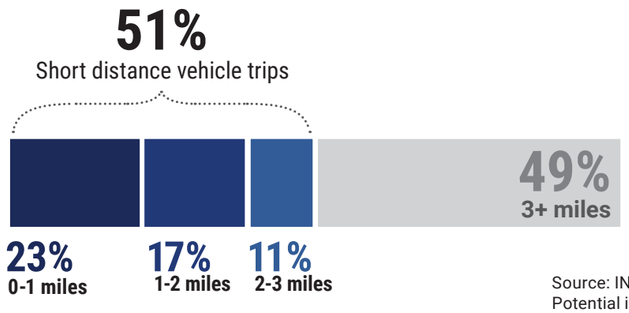

Photo by BikePGH


Photo by City of Pittsburgh

Bike(+) devices can be used for commuting, recreation, errands, exercise, or fun

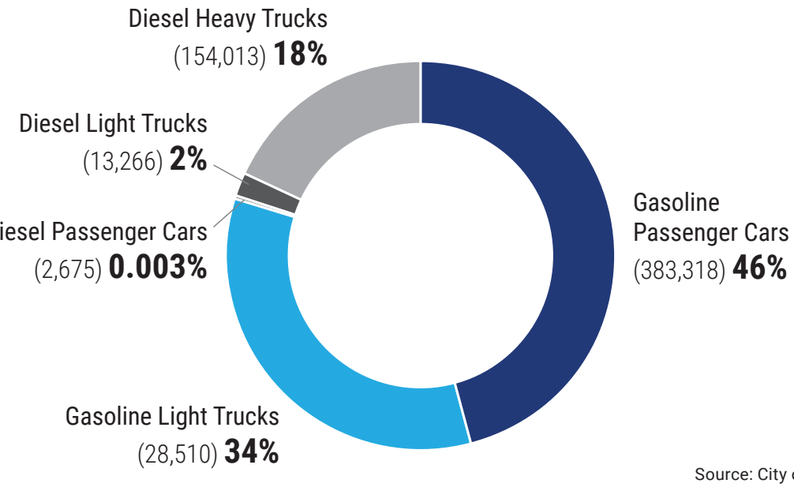
1 People for Bikes *U.S. Bicycling Participation Report* https://peopleforbikes.org/resources/u-s-bicycling-participation-report/

Figure 1: Percent of short distance motor vehicle trips made in the City of Pittsburgh



Source: INRIX, Micromobility Potential in the US, UK and Germany (2019)

Figure 2: 2013 Sector-based profile for transportation-related emissions



Source: City of Pittsburgh Climate Action Plan (2018)

This Bike(+) Plan is also for those who do not bike and perhaps never will. Providing a safe, connected, convenient network for people who bike can reduce the number of vehicles on our roads and improve the flow of traffic by reducing friction and frustration between modes; helping transit vehicles and motorists to have more efficient and reliable trips as well. Allowing shorter distance trips (trips less than three miles) to be made on foot, bicycle, or similar modes can reduce vehicle congestion, parking demand, and associated air emissions.

A safe, comfortable and fully connected network is critical in combating climate change. The City of Pittsburgh Climate Action Plan calls for an 80% reduction in city greenhouse gas emissions and a 50% reduction in transportation emissions below 2003 levels by 2050. This requires a rapid and dramatic move away from fossil-fueled mobility and toward low- and no-emission mobility such as walking, pedalcycles, and electric-powered mobility.

Plan Development

CHAPTER 2

Plan Development

Pittsburgh's Bike(+) Plan has been in development since 2016. During its development, hundreds of individuals spent countless hours engaging residents and workers from across the city and visitors from around the world.

Photo by Kristin Saunders

Temporary protected bike lane OpenStreetsPGH event

Participants generated ideas at citywide open houses, local neighborhood and community meetings, OpenStreetsPGH events, via online engagement, and many other modes of comment and input. Participants reflected Pittsburgh's diversity across age, race, income, and geography. While 93% of those providing input biked at least occasionally, 7% of contributors do not ride bikes at all.

Key partners in development of this Bike(+) Plan include:

- **BikePGH** – a non-profit organization working on behalf of the Pittsburgh community to make the city safe, accessible, and friendly to bicycle transportation. BikePGH is transforming our streets to make biking and walking commonplace for all Pittsburghers in order to improve our quality of life and reduce the harmful effects of car dependence in our communities.
- **Friends of the Riverfront** – a nonprofit trail stewardship organization that focuses on preserving and improving the 25 miles of the Three Rivers Heritage Trail.
- **Riverlife** – a nonprofit organization that collaborates with private landowners, community groups to create new parks, trails, real estate development, and riverfront art.
- **Healthy Ride** - Pittsburgh's public bike share system.

Photo by Toole Design

People biking and walking on the Three Rivers Heritage Trail

Figure 3:

Plan Outreach

7 Citywide open houses

5 OpenStreetsPGH booths

16 Neighborhood bicycle and pedestrian committee meetings

15 Neighborhood-level meetings

200 People commented online

1,536 Online map inputs

750+ People engaged

4 Years old youngest contributor

75 Years young oldest contributor

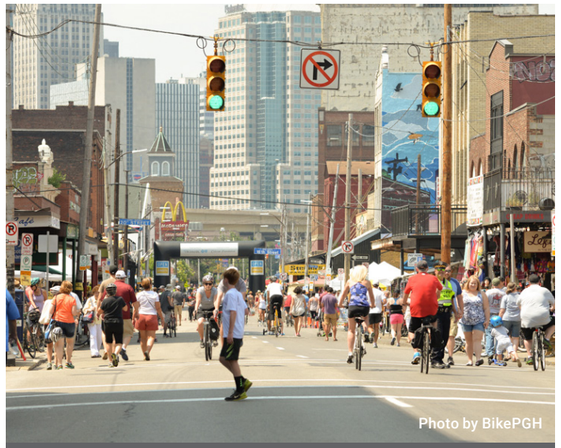


Photo by BikePGH

OpenStreetsPGH event in Pittsburgh

Photo by City of Pittsburgh

Bike(+) Plan public meeting in East Liberty

Biking in Pittsburgh Today

CHAPTER 3

Biking in Pittsburgh Today

Since the completion of Pittsburgh's first and most recent Bike Plan in 1999, Pittsburgh has seen an expansion of its bicycle network, a dramatic increase in bicycle ridership, and the creation of supportive bicycle policies.

Pittsburgh's bicycle network has grown from about 11 miles in 1999 to roughly 93 miles in 2019, 40% of which are bike lanes. The City's extensive network of over 35 miles of paved riverfront trails forms a strong backbone of the bicycle system and culture in Pittsburgh. After launching in 2015 with 50 stations, Pittsburgh Bike Share (a.k.a. "Healthy Ride") now has over 500 bikes at 113 stations and over 66,000 active users.

The number of people who bicycle – and people who WANT to bicycle – has grown substantially as well. The share of bicycle commuters has increased from .05% in 1999 to 2.1% today, according to the American Community Survey (a product of the U.S. Census). According to the *Make My Trip Count* survey conducted by Pittsburgh's Green Building Alliance, 7.1% of respondents living in Allegheny County indicated biking as among their primary three transportation methods. Fifteen percent of respondents living within the City of Pittsburgh indicated that they ride a bike for transportation.

All of this has contributed to making Pittsburgh 12th in the nation for the share of people who bike to work and 20th on People for Bikes ranking[2] of the best places for bicycle riding.[3]

2 BikePGH, Bike Commuters in Pittsburgh Double Amidst a Growth in Driving, 2017 American Community Survey data

3 People for Bikes, City Ratings, https://cityratings.peopleforbikes.org/all-cities-ratings/

The existing bike(+) network is sparse and disconnected. As shown in Figure 7, 56% of households are more than a quarter-mile away from an existing low-stress bike facility. For many, the current network does not provide access to the many needs of daily life including grocery stores, schools, and high-frequency transit.

On-street bicycle parking remains limited with many neighborhoods lacking any city-installed bike racks. While Healthy Ride has expanded significantly, the bike share system still does not serve all neighborhoods of the city.

Many important and highly frequented bicycling routes require a bicyclist to share the road with fast-moving vehicles in heavy traffic for at least a portion of the trip.

The safest routes often require local knowledge, cut-throughs on private property, or illegal maneuvers such as biking the wrong way on a one-way street.

Pittsburgh's narrow streets, heavy traffic volumes, and comparatively high rates of vehicle speed make biking on our streets stressful for many users and often impossible for the most vulnerable people on bicycles: children, older adults, and less confident riders. The many complex intersections throughout the city can be difficult to safely navigate for even the most experienced rider. Steep topography presents still more challenges to the use of a conventional pedalcycle for many people.

Figure 4: Healthy Ride system

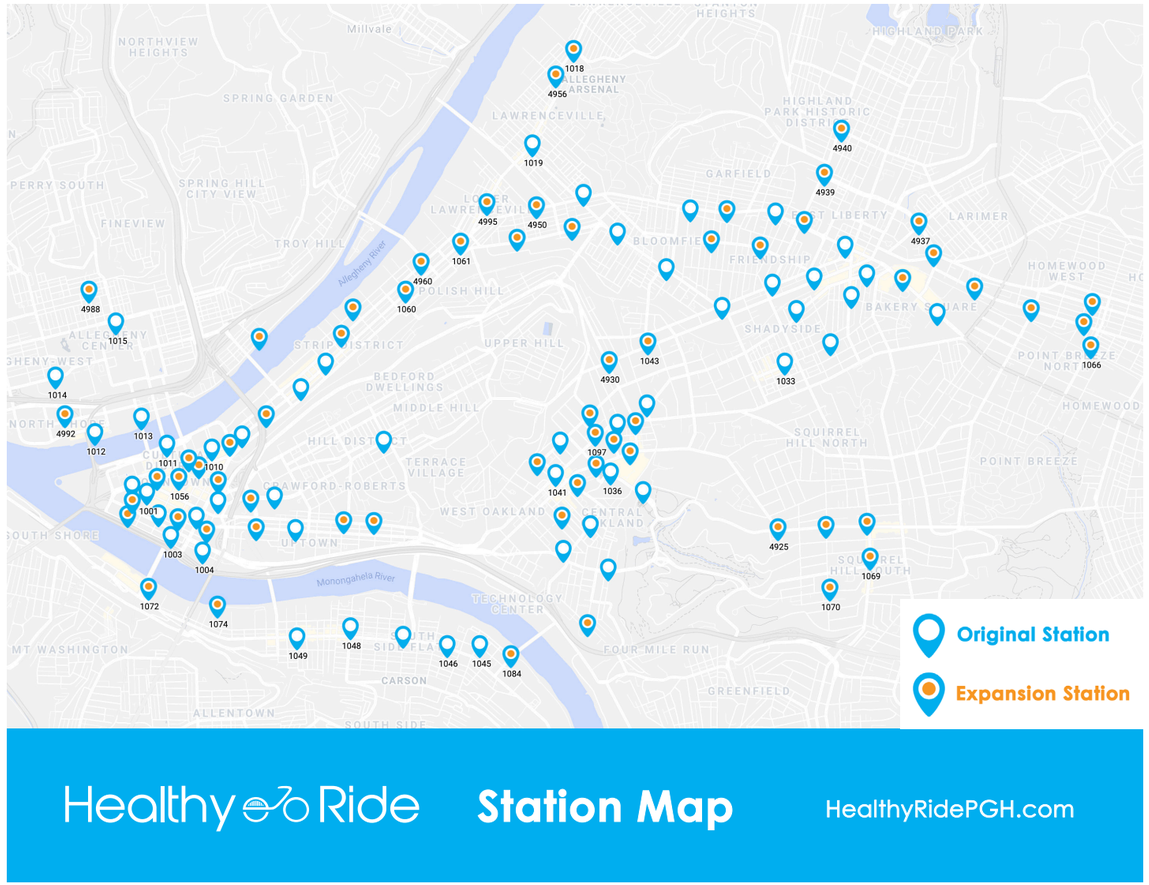


Figure 5:

Pittsburgh by the numbers

31% of residents bike, walk, or ride public transit to get to work [4]

12th highest share of bicycle commuters in the nation[6]

484.9% increase in bicycle commuting from 2000 to 2016[7]

2nd among large cities where bike commuting is growing the fastest

23% of Pittsburgh households do not have access to a personal automobile[5]

33% of Pittsburgh households have 2 or more vehicles[4]

$6,000 to $11,000 per year is the total cost of owning a car in Pittsburgh[8] [9]

19% is the average amount of Pittsburgh household income spent on transportation

Pittsburghers who pedal[10]

30%
of Pittsburghers aged 18 to 54 bicycle at least occasionally

Half
of people who bicycle in Pittsburgh do so only on the weekends

78%
bicycle for exercise, health and fitness, or simply for joy

21%
use a bicycle because it is less expensive than driving

43%
of people who bicycle are comfortable riding on city streets, in the same lane as motor vehicle traffic

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4 U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Means of Transportation to Work

5 U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates, Selected Housing Characteristics

6 BikePGH, Bike Commuters in Pittsburgh Double Amidst a Growth in Driving, 2017 American Community Survey data

7 "Where we ride: Analysis of bicycle commuting in American cities: Report on 2016 American Community Survey Data by the League of American Bicyclists." The League of American Bicyclists, 2017. http://bikeleague.org/sites/default/files/LAB_Where_We_Ride_2016.pdf

8 Cook, Richard. "What it Costs to Own a Car in Pennsylvania." Pittsburgh Magazine, 21 Mar, 2016. https://www.pittsburghmagazine.com/Best-of-the-Burgh-Blogs/The-412/March-2016/What-it-Costs-to-Own-a-Car-in-Pennsylvania/

9 Mercadante, Kevin. "How Much Does it Really Cost to Own Your Car? You'll be Amazed." MoneyUnder30, 16 Apr, 2019. https://www.moneyunder30.com/true-cost-of-owning-a-car

10 Information from the Bicycle Marketing Campaign research \\city.pittsburgh.pa.us\group\DOMI\Planning and Projects\190084 - Bike Marketing Campaign\Presentations

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Figure 6: Existing Bicycle Facilities

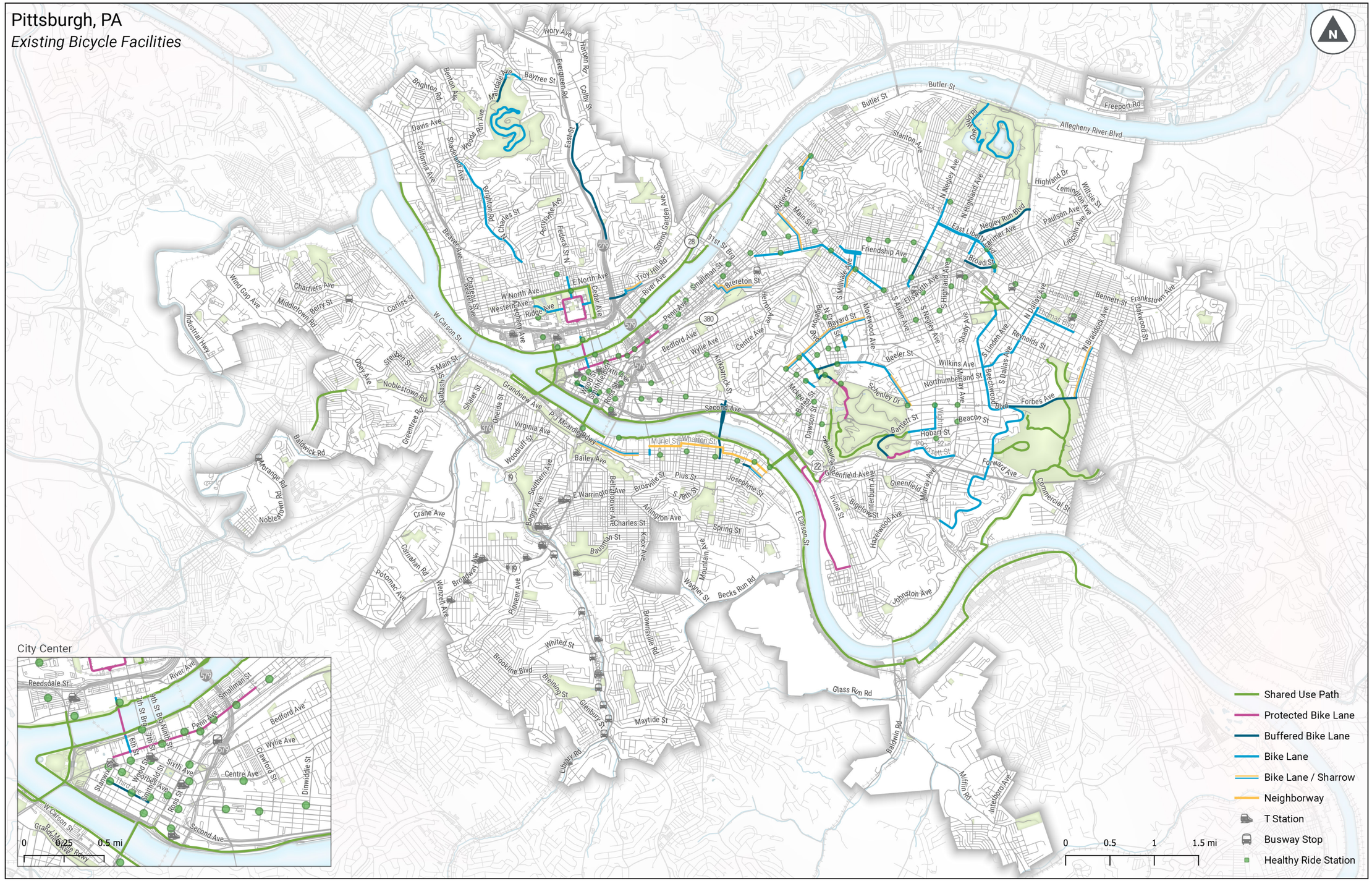

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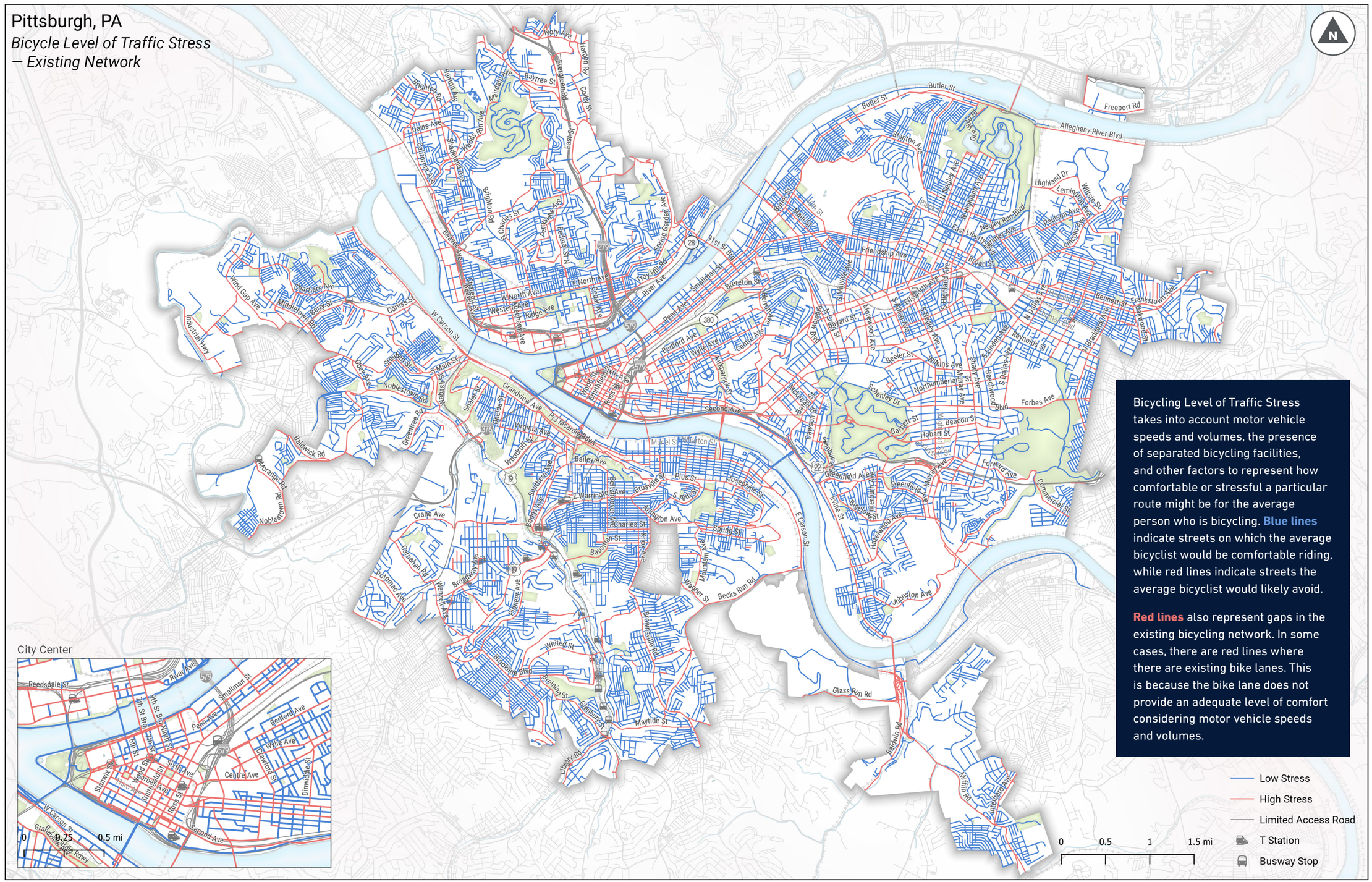
Figure 7: Existing Bicycling Level of Traffic Stress



Safety remains a critical concern. Fewer than 37% of motorists and people who bicycle think bicycling is a safe travel option in Pittsburgh. Over the past ten years the city has averaged 57 reported crashes per year involving people on bicycles – more than one a week. Crashes involving people on bicycles are fairly distributed throughout the City, with slightly higher concentrations in Downtown, the Strip District, throughout the East End, and around East Carson Street in Southside. Five out of the six fatal crashes involving people on bicycles in the past ten years occurred on arterial roadways, which tend to have the highest traffic volumes and speeds compared with other roads in the City.

Pittsburghers who do not bicycle reported that the top two reasons why people do not ride bicycles in Pittsburgh are:

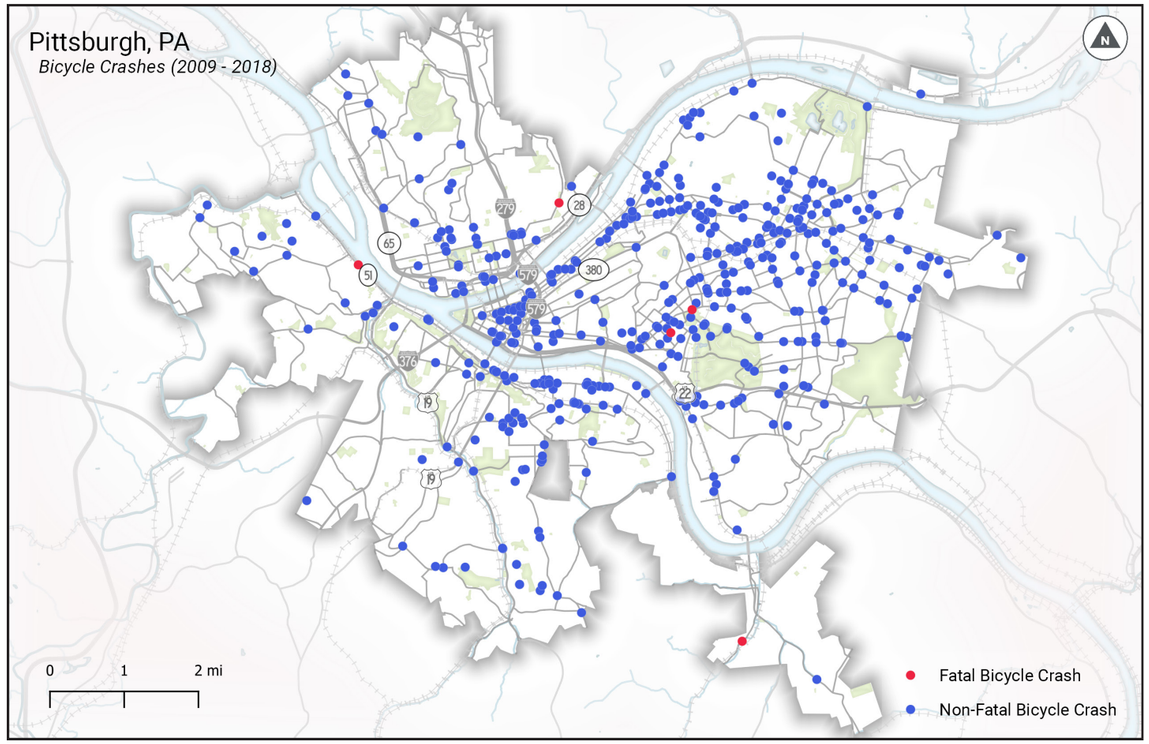
- Concerns about safety
- Hills and inclement weather

73% of motorists said they would be MORE likely to bicycle if there were:

- Protected bike(+) lanes
- More trails
- Fewer aggressive drivers and/or
- Low volume, slower speed streets

There is an urgent need to expand the existing bike(+) network for reasons of safety, climate, and mobility. Furthermore, there is support to do so. 83% of motorists believe people on bicycles should have their own lane or facility to ride in. This sentiment was particularly high among people of color (95%) and women (87%).

Figure 8: Bicycle Crashes, Pittsburgh, 2009-2018 (Pennsylvania Crash Information Tool)



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Proposed Bike(+) Network

CHAPTER 4

Proposed Bike(+) Network

The proposed Bike(+) network is designed for all ages and abilities and a range of trip purposes.

The proposed network is based on technical analysis and the input of neighborhood-level pedestrian and bicycle committees, civic and community organizations, and innumerable individuals. The Plan consolidates and reflects a number of improvements identified in various neighborhood plans.

The network development process began with identification of gaps in the current bicycling network. Options for addressing each gap were then assessed based on several criteria, including input received through the public outreach process, roadway width, motor vehicle volume, data from the cycling mobile app Strava that shows where some bicyclists ride, and the location of destinations, such as transit stations, community centers, schools, and neighborhood districts.

The proposed network provides connectivity at both a citywide and localized scale:

- An extended, citywide system of routes provides direct connections to major job centers and supports longer commuter trips.
- A fine-grained network of local "neighborways" knits together low-speed, low-volume and residential streets to connect children and adults to community necessities and amenities including groceries, school, parks, and recreation centers.

Both are complemented by riverfront trails that provide connections for commuting, recreation and fitness.

In total, the proposed Bike(+) network adds an additional 150 miles of safe and appropriate bicycle facilities to the city expanding the total network from 57 miles of on-street facilities and 36 miles of trail to 180 miles on street and 63 miles of trails for a total of over 243 miles of travel lanes for bicycles and other lightweight, low-speed travel modes.

While the City of Pittsburgh has authority over the roadways it owns within City limits, oftentimes individuals need to travel across the City's borders to access employment, entertainment, and residential opportunities. This Plan includes several facilities located along the City's border that would benefit from connections to adjacent communities. The City will continue to coordinate with its neighbors to complete network connections requested during the Plan's public engagement process, with the goal of ensuring that inter-jurisdictional travel is a safe and seamless experience.

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Figure 9: Proposed Bike(+) Network

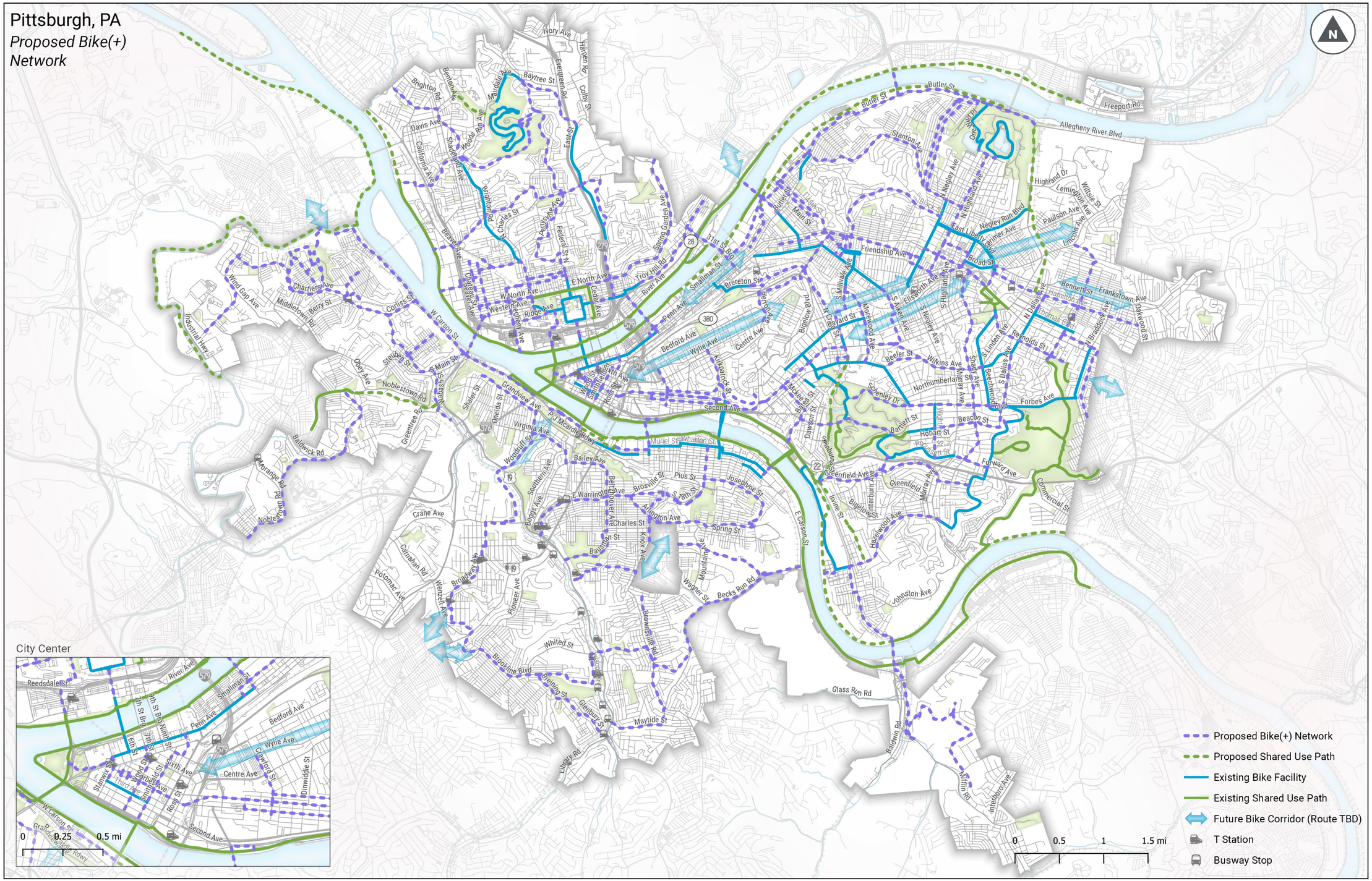

Figure 10: Proposed Bike(+) Network Northern Quadrant

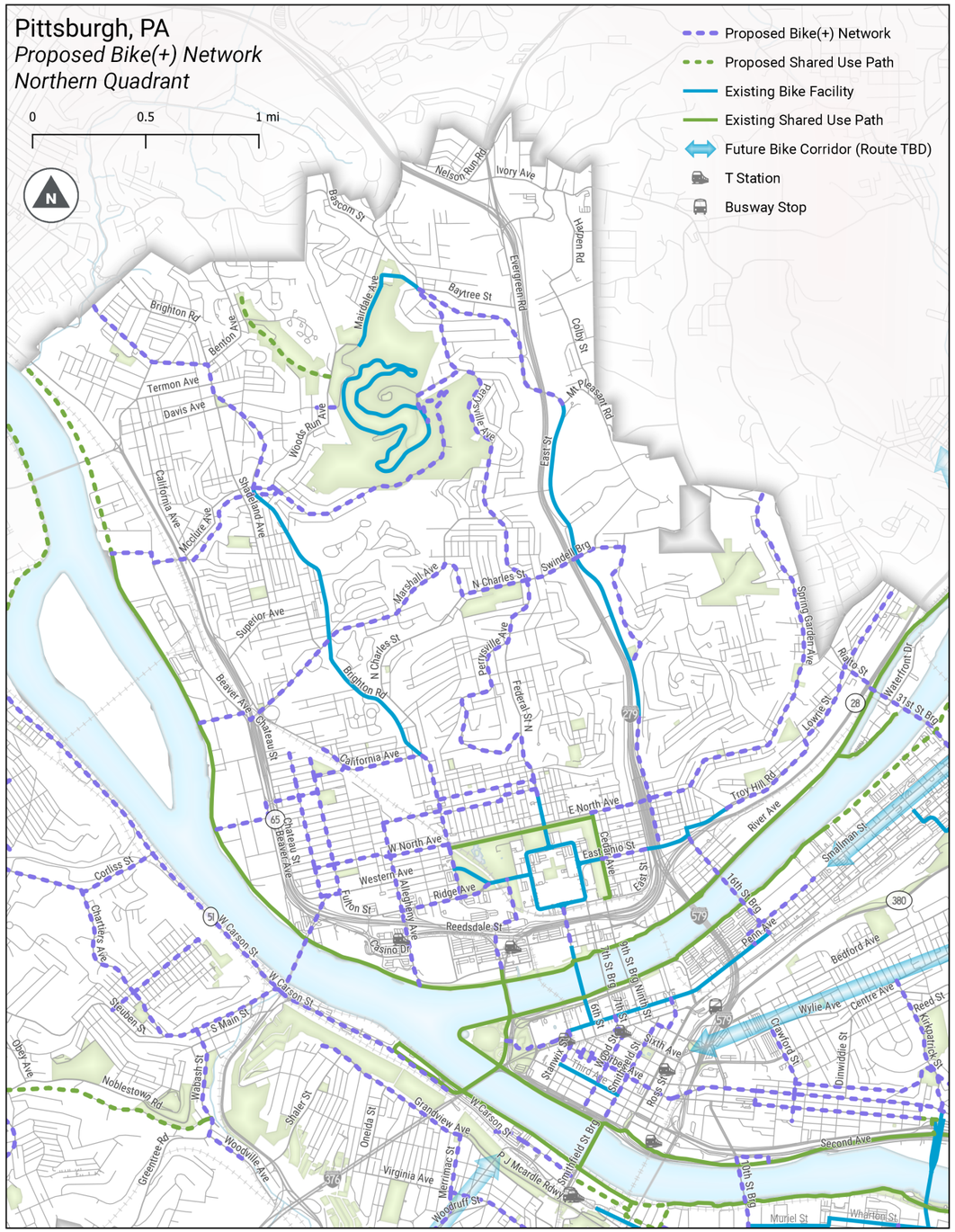

Figure 11: Proposed Bike(+) Network Eastern Quadrant

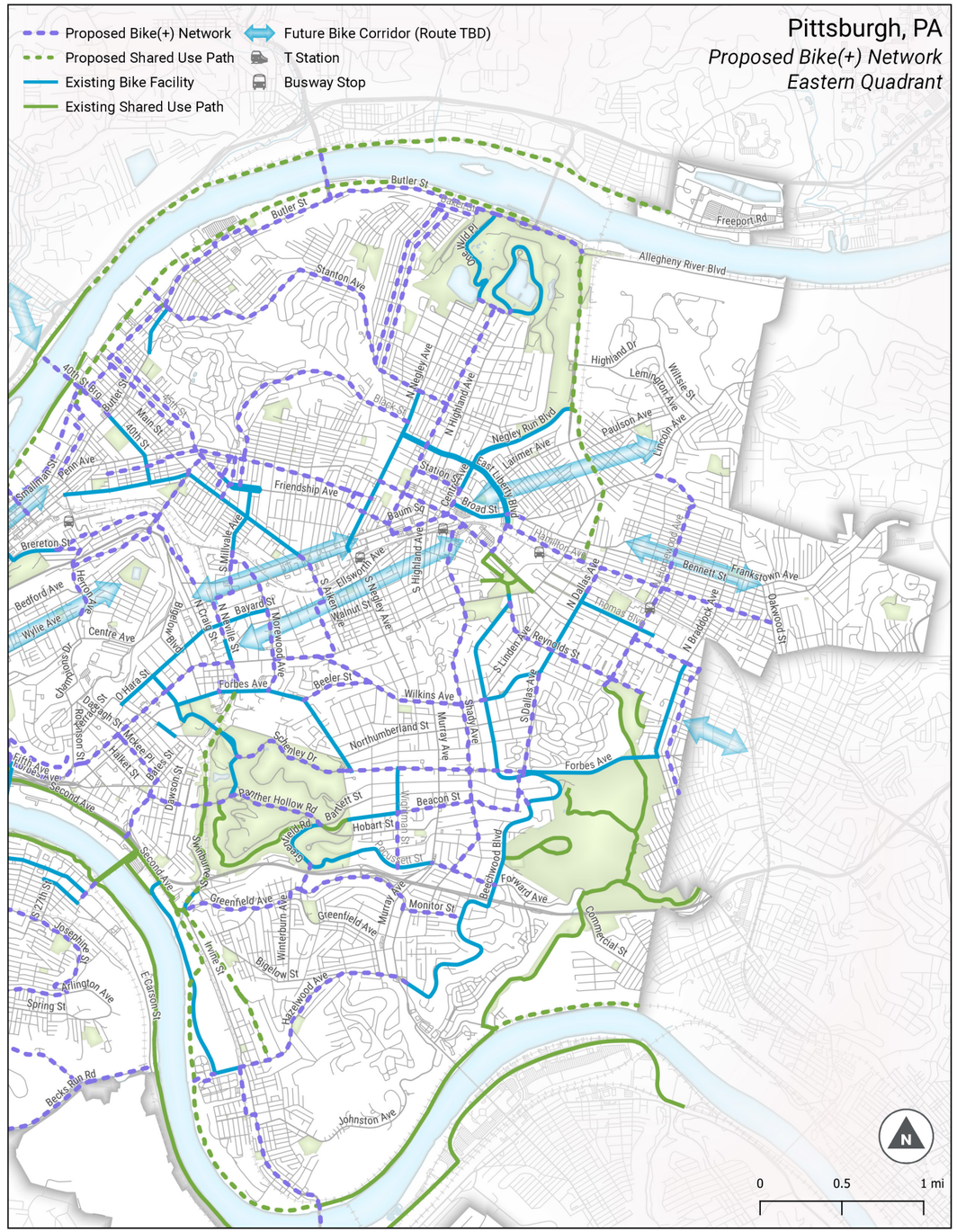

Figure 12: Proposed Bike(+) Network Southeast Quadrant

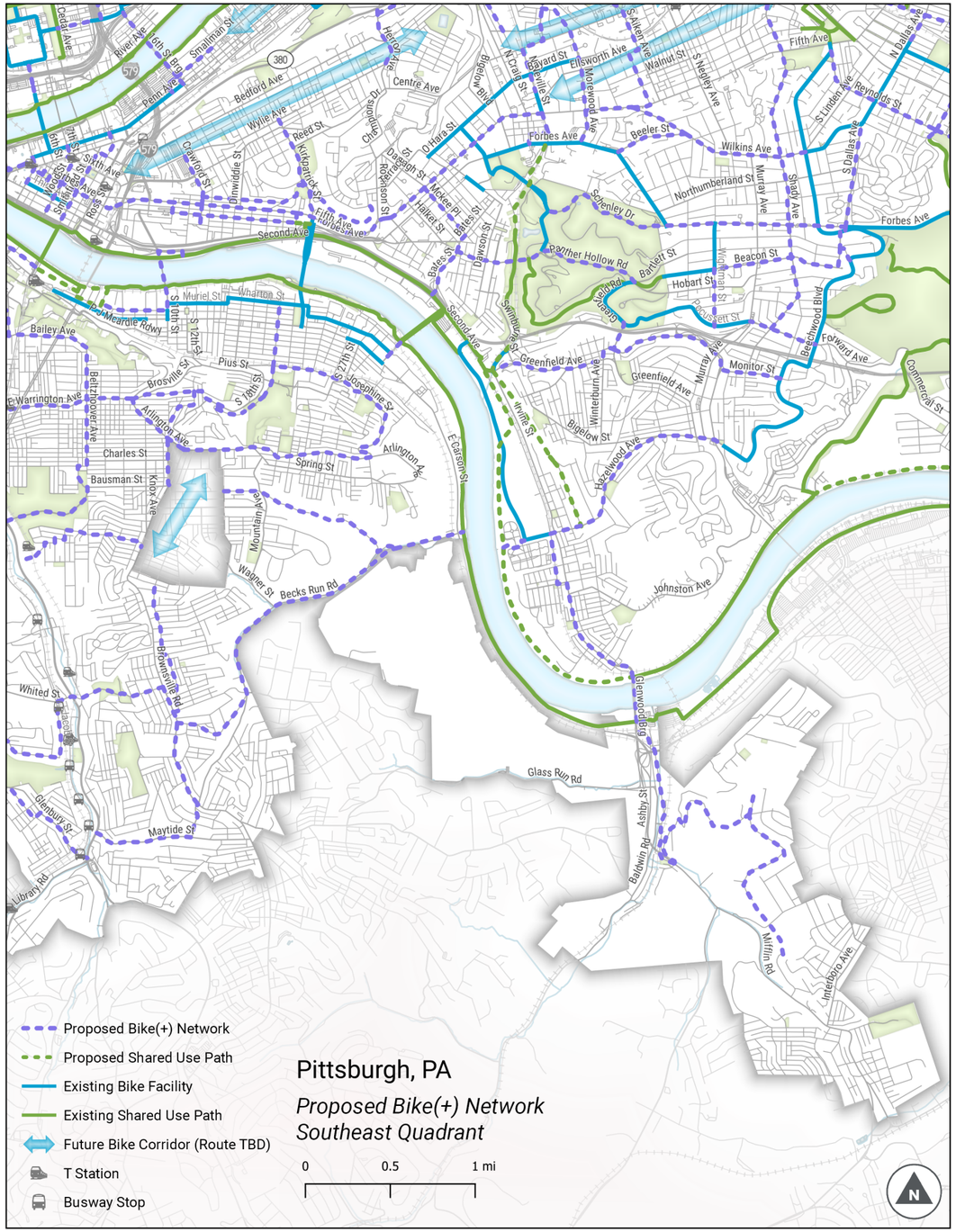

Figure 13: Proposed Bike(+) Network Southwest Quadrant

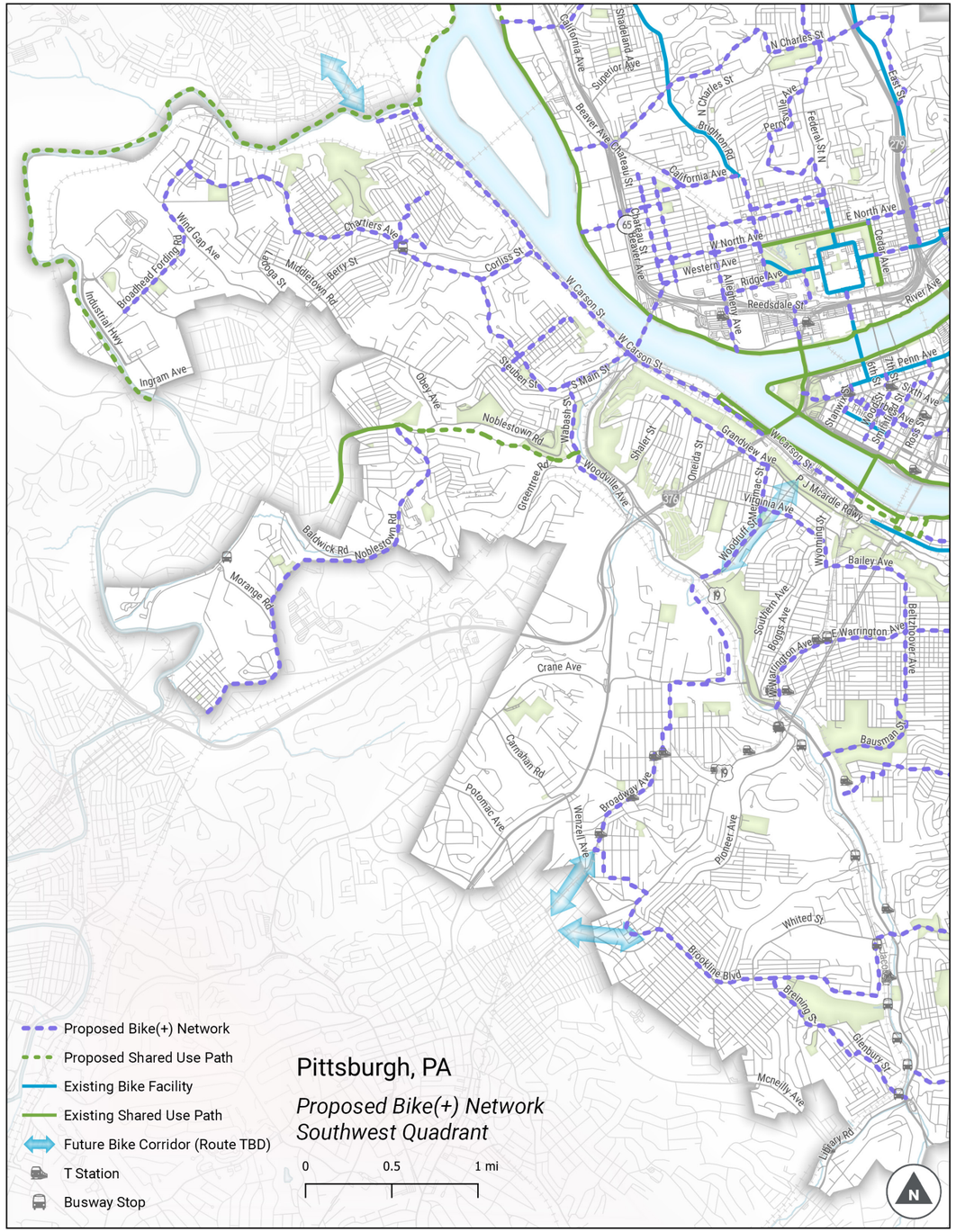

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Figure 14: Proposed Bicycle Level of Traffic Stress

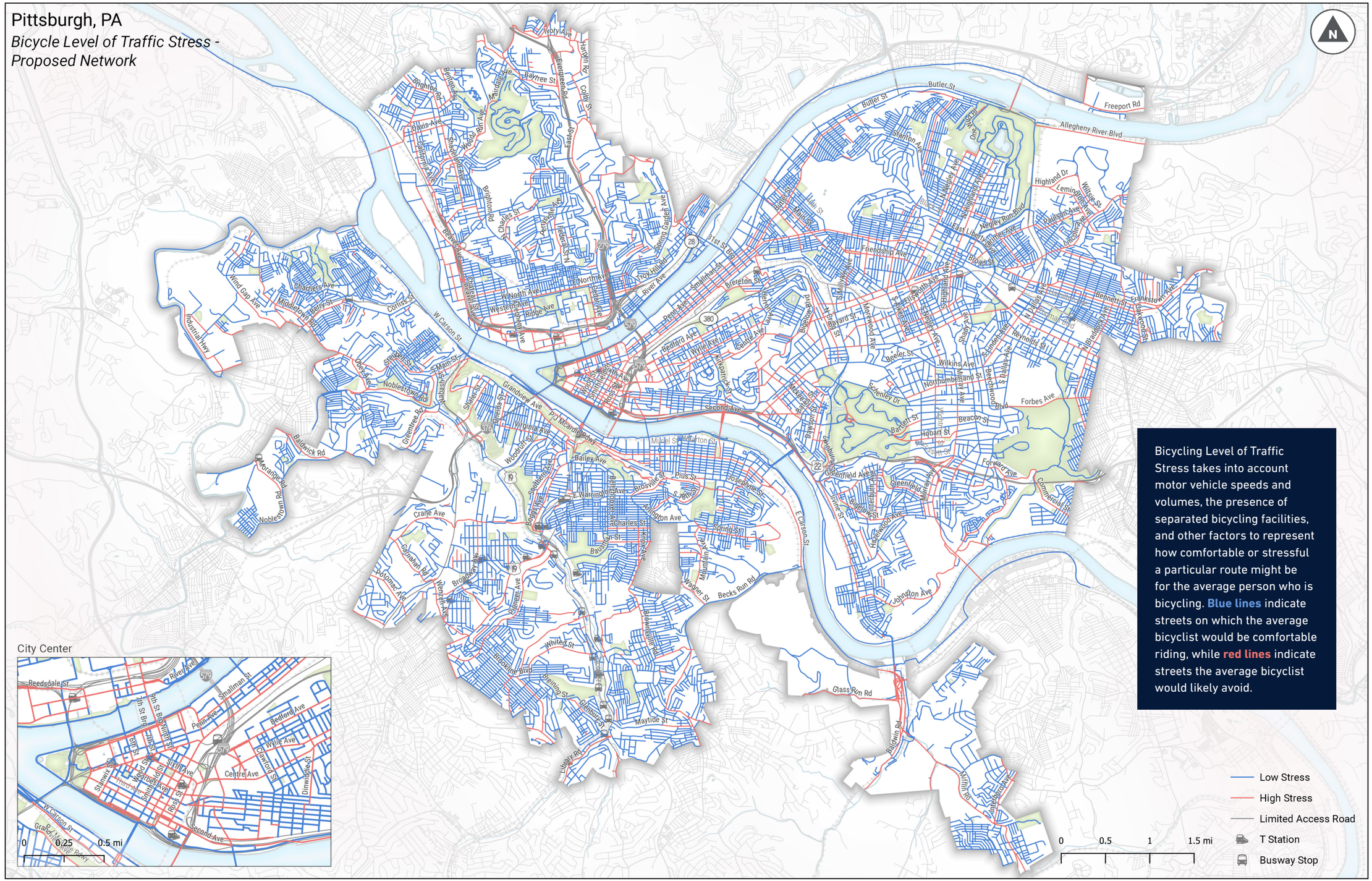

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Figure 15: Locations within 1-mile of a key destination along a low-stress bicycling route

An expanded Bike(+) network...

...will improve low-stress bicycling access to key destinations.

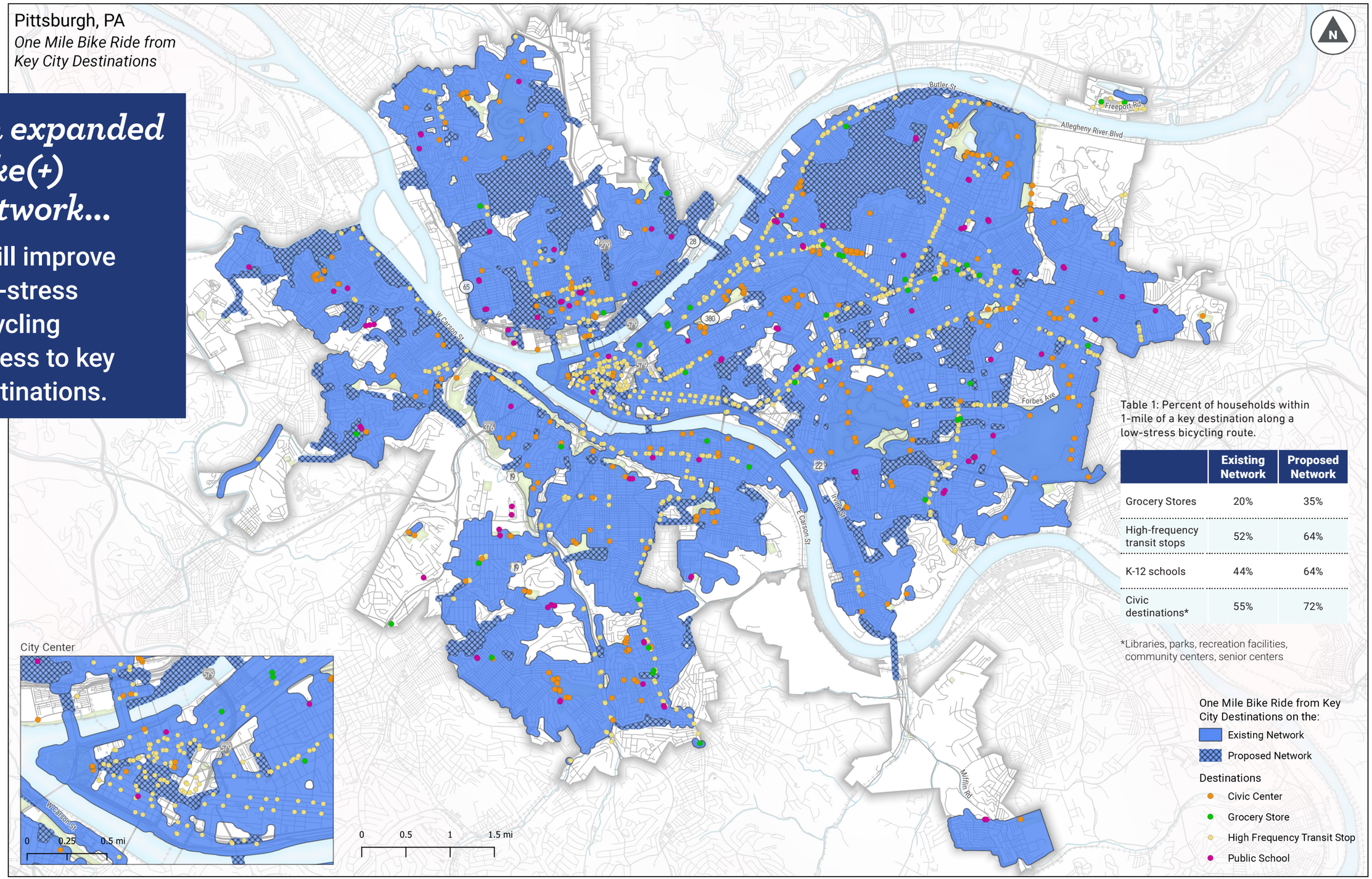


Table 1: Percent of households within 1-mile of a key destination along a low-stress bicycling route.

	Existing Network	Proposed Network
Grocery Stores	20%	35%
High-frequency transit stops	52%	64%
K-12 schools	44%	64%
Civic destinations*	55%	72%

*Libraries, parks, recreation facilities, community centers, senior centers

One Mile Bike Ride from Key City Destinations on the:
- Existing Network
- Proposed Network

Destinations
- Civic Center
- Grocery Store
- High Frequency Transit Stop
- Public School

Bike(+) Facilities and Facility Selection

CHAPTER 5

Bike(+) Facilities and Facility Selection

Based on the input received, the Bike(+) Plan identifies a number of specific routes for bike(+) connections.

In most cases, the Plan does not identify the specific ***type*** of bike(+) facility to be implemented on a specific street or segment. The facility type will be determined in consultation with local stakeholders and with consideration of the unique street context and character. The facility selection matrix in this chapter provides guidance on the appropriate facility type(s) for streets of varying character. For example, based on the chart on p. 41, a street with 5,000 vehicles per day and a speed limit of 30 miles per hour typically requires a buffered or standard bike lane (buffered preferred), whereas a street with 2,000 vehicles per day and a speed limit of 25 miles per hour could be configured as a neighborway.

The chart below will be used in Pittsburgh to guide decisions about the type of bike(+) facility that is appropriate for individual roadways. This chart is based on national research related to the safety and comfort of bicyclists of all ages and abilities.

Table 2: Pittsburgh Bicycle Facility Selection Chart

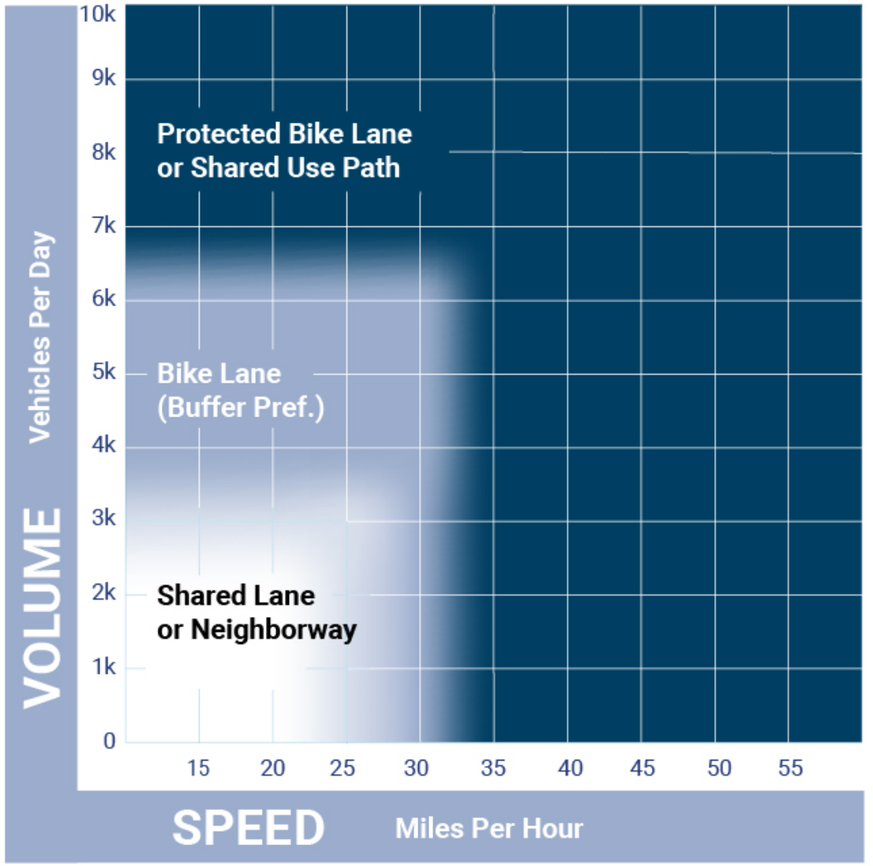


Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.

Bike(+) Facility Types

The proposed bike(+) network will be achieved by implementing a variety of different facility types appropriate to the conditions and context of each individual street and segment. Detailed guidance on facility design is provided in the Pittsburgh Complete Street Design Guidelines.


Photo by Toole Design

Shared Use Paths

- Commonly referred to as trails
- Completely separated from the roadway of a street. May have their own right of way or may run parallel to, but separate from, the street
- Generally shared by people walking and riding; may distinguish "lanes" for diverse users
- Typically paved or covered with crushed limestone
- May or may not have lighting; may or may not be permissible for use after dark
- Highly comfortable for users of all ages and abilities


Photo by BikePGH

Protected Bike Lane

- Also referred to as a cycle track
- On-street bike(+) facility separated from motor vehicle traffic by a physical barrier such as curb, flexible bollards, planters, parked cars, or similar
- May be one-way or two-way
- Highly comfortable for users of all ages and abilities


Photo by Toole Design

Buffered Bike Lane

- Bike lane separated from adjacent vehicle traffic by a painted buffer
- Lane does not have physical protection from motor vehicle encroachment
- Generally used only for one-way travel; may be used for contra-flow travel
- Moderate level of comfort; appropriate for most ages and abilities


Photo by Kristin Saunders

Bike Lane

- Marked and dedicated in-street lane for bicycles located immediately adjacent to vehicle traffic
- Used for one-directional travel
- Modest level of comfort; generally appropriate for more confident and experienced bicyclists


Photo by Eric Boerer

Shared Lane Markings

- Also known as sharrows
- Do not establish a dedicated or reserved space for travel
- Generally advisory as a wayfinding convention or to alert motorists to expect the presence of people on bicycles
- When used on their own, shared lane markings do little to reduce the level of stress or improve safety for people on bicycles


Photo by Eric Boerer

Neighborway

- Also known as a neighborhood slow street
- Proactively managed low-volume (generally less than 1,000 vehicles per day), low-speed (less than 25 MPH) local streets with well-designed crossings safe for all ages and abilities
- Generally two-way travel
- May utilize sharrows for wayfinding or trailblazing
- Comfortable for all ages and abilities, however less appropriate for higher-speed bicycle travel

Intersection Treatments

Photo by Kristin Saunders

Two-stage Turning Boxes

- Provide a place outside of a travel lane for a left-turning bicyclist to wait for the signal to change
- Persons on bicycles cross with cross traffic


Photo by Toole Design

Protected Intersections

- Intersection with extended corner refuge islands and bicycle-friendly signal phasing to separate bicycle movements – both straight and turning – from turning or straight traveling vehicles

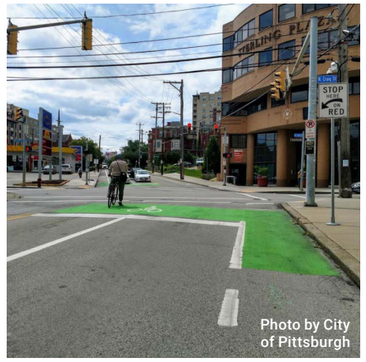


Photo by City of Pittsburgh

Bike Box

- Designated area at the front of a traffic lane at a signalized intersection that provides a safe and visible way for bicyclists to get ahead of queuing traffic during the red phase

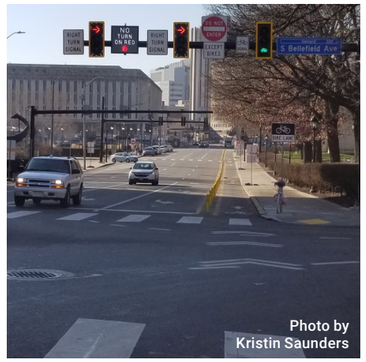


Photo by Kristin Saunders

Through Bike Lanes

- Dashed lines or chevrons extending through a complicated intersection indicating the appropriate and expected route of bicycle travel


Photo by Kristin Saunders

Mixing Zones

- Dashed bike facility lines, often with dashed green paint extending across the lane, indicating an area where vehicles may cross, or cross into the bicycle facility

Implementing Bike(+) Facilities on Existing Streets

Almost without exception, the public right of ways of city streets are fixed widths without any opportunity to widen. This generally means that right of way space must be reallocated to make room for safe, dedicated bike(+) facilities. This is generally accomplished by one of several processes:

Road Diet

- Typically used to reduce four vehicle travel lanes to three vehicle lanes and bi-directional bike(+) travel lanes. Occasionally reduces three lanes to two
- Generally used on streets with fewer than 15,000 vehicles per day

Narrowing Travel Lanes

- Reduce width of vehicle travel and/or parking lanes and apply excess space to bicycle accommodations
- Special considerations are needed for streets with significant bus or truck volumes

Street Redistribution

- May redistribute street such as removing center medians, changing angled parking to parallel, or changing curb alignment

On-Street Parking Reduction

- Reduce or remove on-street parking to provide safe bicycle accommodation
- Generally requires a parking study to document parking utilization and viable alternative parking accommodations
- May consider parking time restriction rather than reduction or removal

Examples of bikeways accomplished using the tools described on this page.


Photo by Toole Design

Example of narrowing travel lanes to create space for bicycle facilities.

Photo by Virginia Department of Transportation

Photo by Virginia Department of Transportation

Example of removing a travel lane to create space for bicycle facilities.

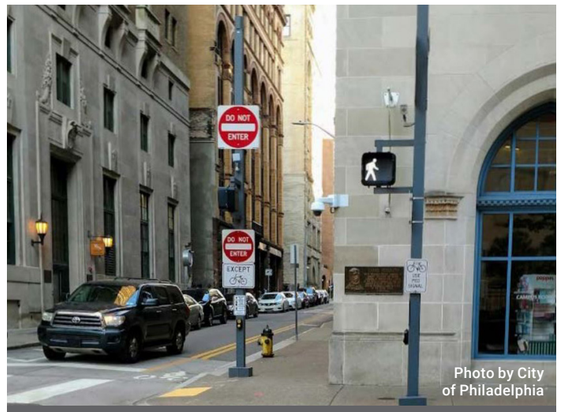


Photo by City of Philadelphia

Example of removing parking to create space for bicycle facilities.

Bike(+) Supportive Policies and Strategies

CHAPTER 6

Bike(+) Supportive Policies and Strategies

Defining a connected network and appropriate facilities for each of its segments is only part of the picture. Fully realizing our goals for a safe, efficient, fun, affordable, and inclusive Bike(+) network that addresses climate change and social equity requires policies that promote safe operations, increased accessibility, and expanded services. Over the next ten years, Pittsburgh will pursue a number of policies to promote bicycle use and safety.

Pursue Vision Zero.

"Vision Zero" is a fundamentally different approach to traffic safety. Adopted by communities across the globe, Vision Zero is based in the fundamental knowledge that we can *eliminate* all traffic fatalities by recognizing that people will sometimes make mistakes while driving or traveling on the road. Therefore, street design and operations must be crafted to ensure those inevitable mistakes do not result in fatalities. Vision Zero not only leads to greater safety, it also increases healthy and equitable mobility for all.

1 Convene a regular working group among at least the four public agencies central to any successful Vision Zero transformation: the Department of Mobility and Infrastructure, the Department of Public Safety, the Department of Public Health, and the Office of the Mayor.

- With community partners, develop a roadmap to Vision Zero and follow through on the multi-year workplan.
- Develop reportable milestones and create a public dashboard to track progress.

2 Conduct an equity assessment to ensure safety benefits are accruing in all neighborhoods, prioritizing those with more vulnerable populations including higher proportions of children, older adults, and those without access to an automobile.

Photo by BikePGH

Recumbent tricycle

Protected bike lane with an accessible loading/unloading curbside zone. Photo by Alex Pochowski, via FHWA Separated Bike Lane Planning and Design Guide (2015).

Ensure access for all, with particular attention to those with mobility impairments.

Pittsburgh seeks to be an equitable and inclusive city. As such, it is imperative that bike(+) facilities are both accessible for all and maintain accessibility to curbside destinations. Similarly, shared public mobility services such as bikeshare and shared micromobility (bike(+)) should offer vehicle types that accommodate a range of different abilities.

1 Review bike(+) facility design standards and guidelines through an accessibility lens and modify as necessary.

2 Support integration of accessible devices into shared micromobility fleets. Work with the industry to prototype and deploy more accessible form factors.

3 Meet regularly with groups representing the interests and perspectives of persons with disabilities to review design guidelines, specific project designs, and/or emerging policies.

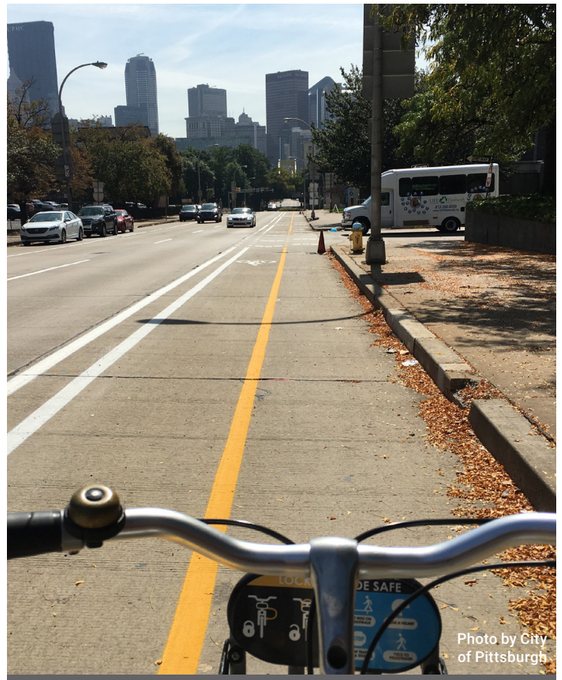
4 Update, as necessary, and make readily publicly available, City policy on bike lanes/protected bike lanes and access for persons with disabilities.

Improve bike(+) safety education.

Safety is paramount in expanding the use and enjoyment of travel by bicycle and other small personal mobility devices. While building upon current educational offerings, more education programs are needed to comprehensively inform the various communities in the city including children, adults, seniors, motorists, commuter bicyclists, recreational bicyclists, university students, immigrants, developers, employers, employees, and public officials.

1 Expand on existing partnerships to further promote bike safety education and awareness.

- Leverage programs and materials provided by Allegheny County Health Department's Traffic Safety Education Project and the Pennsylvania Department of Transportation to ensure users of all modes know the rules of the road and actively participate in crash and injury prevention.
- Enhance long-standing partnership with BikePGH to promote participation in bicycle awareness campaigns, learn to bike programs, and similar.



Example of a two-way buffered bike lane

2 Develop safety education materials to specifically address the use of and interaction with emerging bike(+) devices.

- Publish all operating rules and regulations for users of privately owned or publicly available shared bike(+) devices in the public right of way.
- Develop multi-media outreach and awareness materials using social media, internet, video, print, radio, and other.
- Require any shared mobility service providers to develop safety education materials and require all users to undergo safety training prior to service use.
- Incorporate safety standards and established regulatory standards for emerging mobility technology and its components from the Consumer Product Safety Commission, Underwriters Laboratories (UL), or equivalent into operating agreements with any fleet mobility service providers, and make them available for consumers to reference.

Bicycle lane at Forbes Ave and Schenley Drive

3 Expand youth bicycle safety education initiatives.

- Create and staff a citywide Safe Routes to Schools program providing infrastructure improvements as well as educational opportunities for schools.
- Expand access to low-cost or free city bicycle skill classes for youth at community organizations.
- Partner with Pittsburgh Bureau of Police (PBP) on youth riding education programs.
- Support the development and expansion of a bicycle safety component of high school driver education programs.
- Work with public, charter and private school systems to encourage schools (1st grade through high school) to provide on-bicycle training as part of their physical education curriculum.
- Partner with a bicycle provider, such as Free Ride or Major Force, to make bicycles available at a low cost or free for youth.

Engaging children during OpenStreetsPGH event

4 Expand and promote adult bicycle education initiatives.

- Work with partners to provide low or no cost adult bicycle skill courses, rules of the road bicycle maintenance, and similar programing.
- Support positive reinforcement programs such as BikePGH's Operation Illumination and bike helmet giveaways.
- Support the development and expansion of a bicycle safety component included in driver's education programs and licensure.
- Translate bicycle education programs and materials into at least four of the major languages spoken by a significant share of the Pittsburgh population.

5 Develop bike(+) education initiatives for city employees.

- Offer and promote bicycle education classes to city employees.
- Integrate bike education, bikeshare membership, bike purchasing, and bike repair into the City's employment benefits.
- Regularly train and retrain City staff who operate motor vehicles to understand the laws governing interactions between bicycles and motorized vehicles.

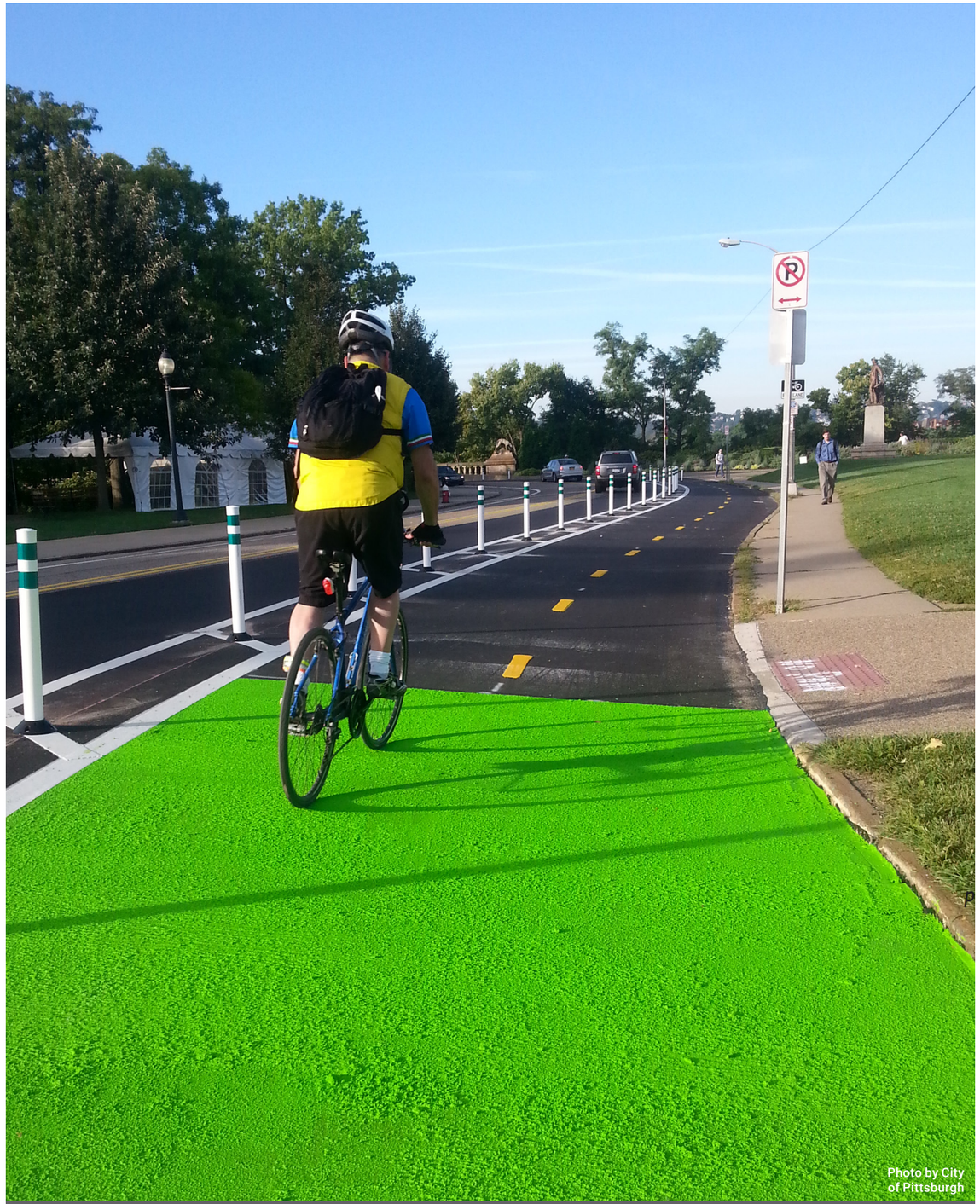


Photo by City of Pittsburgh

Protected Bike Lane in Oakland on Panther Hollow Road

Expand integration of transit and bike(+) mobility

Bicycles and similar personal mobility devices are important extenders of the public transit network. While transit riders commonly walk up to a mile to high-frequency transit corridors, bicycles serve as a "walk accelerator" permitting users to cover roughly three times the distance in the same amount of "last mile" travel time. Increasing the seamless integration of bicycles to, on, and from the transit network can radically increase access to high-frequency transit services and access to more transit routes and more direct travel to destinations.

1 Enhance the experience of biking to transit.

- Establish regular coordination with the Port Authority on all bicycle projects and bicycle planning efforts.
- Complete bike(+) network access to high-frequency and rapid transit stop locations. Prioritize projects in areas with large changes in elevation.

2 Establish bike(+) parking and storage at transit facilities.

- Work with the Port Authority to identify opportunities for covered bike(+) parking and design. Fund and implement such parking at 30% of high-frequency, rapid transit stops by 2025.
- Increase the amount of bike(+) parking at or near bus stops in commercial districts.
- Incorporate covered bike(+) parking into larger bus rapid transit (BRT) stop designs and provide bike(+) parking as a component of BRT implementation.

3 Improve the ease of taking bicycles on transit.

- Encourage the Port Authority to increase the bike carrying capacity on its buses (e.g. racks that might accommodate more than 2 bicycles).
- Widely distribute educational materials that inform residents about their ability to take bicycles on transit.
- Encourage space designated for bikes be added to "T" light rail train cars. Evaluate policies related to where bicycles are permitted on train cars.

Photo by BikePGH

Currently two bicycles can fit on buses in Pittsburgh

Enhance bikeshare system and utilization.

Bikesharing is a service where bicycles are available for public, short-term rental at a fee. Bikes are available for rent and return in public spaces like streets and sidewalks. In 2015, Bike Share Pittsburgh launched the Healthy Ride bike share system. Healthy Ride has been a local success and a national leader in bikeshare innovation including, in 2017, piloting the first-of-its-kind partnership with the Port Authority of Allegheny County to enable all Connect Card pass holders to utilize an unlimited number of free 15-minute trips on bikeshare.

1 Continue to support public bikeshare as the most reliable, equitable means of shared bike(+) mobility.

- Incorporate public bikeshare benefits and facilities in approved transportation demand management (TDM) plans to reduce traffic impacts associated with new development or larger employment centers.
- Meet regularly with leadership of Pittsburgh Bike Share to review existing and developing policies for their effect on the strength and sustainability of public bikeshare in the City of Pittsburgh.

2 Support the full or partial conversion to electric, pedal-assist public bikeshare.

- Support Pittsburgh Bike Share in its pursuit of various state and federal funding streams to aid in capital costs associated with full or partial fleet conversion.
- Work with partners to install electric charging stations in the public right of way and in appropriate off-street locations.

3 Promote and expand efforts to increase equity in ridership, access, siting, and pricing in public bikeshare.

- Jointly develop equity goals using national best practices in shared mobility.
- Leverage city resources to communicate and promote equity programs to private, and other public-serving, local organizations.

4 Support financial sustainability in public bikeshare.

- Investigate additional revenue streams to support public bikeshare such as outdoor advertising, third-party contributions to citywide bikeshare goals, developer offsets for station expansion, and other emerging models.
- Support further integrated experiences between transit and public bikeshare, especially by co-locating bikeshare and other mobility options near transit.

Photo by City of Pittsburgh

A bikeshare station within Pittsburgh's Healthy Ride bikeshare system

Develop and pursue a citywide Transportation Demand Management (TDM) program that promotes a greater share of bicycle use.

Transportation Demand Management (TDM) is a programmatic strategy that seeks to shift mode of travel, time of travel, and/or route of travel to reduce congestion and transportation-related emissions associated with climate change. TDM programs are generally aimed at larger employers, institutions such as universities and hospital systems, dense employment or mixed use districts, and/or larger residential or commercial developments.

1 Establish a citywide Transportation Demand Management (TDM) program and install appropriate staff to lead and coordinate efforts.

2 Develop marketing and informational materials that increase awareness of the viability of year-round bicycle commuting and travel in the city, and provide these materials developing TDM plans and strategies.

3 Develop a toolkit of TDM strategies and investments to reduce peak period vehicle trips and support alternatives such as sponsorship of mobility hubs, mobility as a service memberships, contributions to bike(+) network build-out, enhanced bicycle parking, and similar.

4 Encourage the provision of bicycle benefits such as employee bike share or bicycle purchase assistance.

5 Contribute to methodologies to track and measure the effectiveness of TDM programs and strategies, especially with regard to bicycle and bike(+) utilization and vehicle use and traffic reductions.

Photo by City of Pittsburgh

Bikeshare stations are located throughout the city

Enhance bicycle and bike(+) data collection.

Better data contributes to better decision-making.

1 Look for appropriate opportunities to install real-time bike counters and displays and make information available to the public and app developers via an open data feed and live data displays.

2 Improve data gathering on occasional bicycle usage. Currently the American Community Survey does not capture reporting of multimodal trips or occasional use of bicycles for commuting which generally leads to an undercount of persons interested in bicycling.

3 Partner with local institutions to improve data analytics related to bicycle use, route selection, and general demands for all ages and abilities.

4 Develop an open data dashboard of key performance indicators of bicycle use, demand, and safety.

5 Require all bike(+) and micromobility service providers operating in the City of Pittsburgh to utilize the Mobility Data Standard and provide open standardized data feeds to the city.

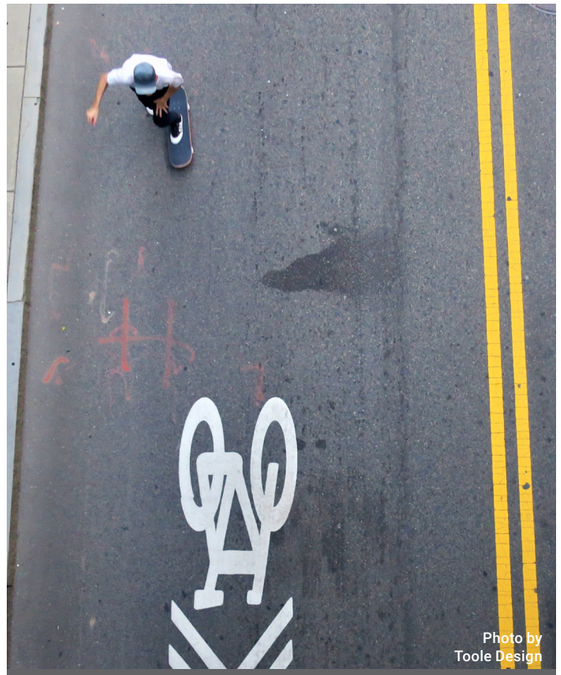


Photo by Toole Design

Shared lanes can be used by other modes, such as skateboarders


Photo by Toole Design

Electric scooter and bikeshare in Denver, CO

Proactively define and manage bike(+).[11]

The increased availability and use of various bike(+) devices such as electric assist pedalcycles, electric kick-scooters, motorized skateboards, and other similar devices increases the opportunity for low-cost, low-emission, and space efficient travel. It also increases the demand for safe travel lanes for the use of these modes in the public right of way. The Bike(+) Plan must anticipate the increased presence of these devices and the expanded constituency for bike(+) lanes their users represent, and appropriately accommodate them in the mobility ecosystem of the city in a way that does not diminish the use and enjoyment of a conventional bicycle in the city.

1 Propagate local regulations to manage new bike(+) modes in the City of Pittsburgh.

- Clearly define where emerging bike(+) devices may, and may not, operate in the public right of ways of Pittsburgh.
- Develop operating requirements for new bike(+) devices including speed, operator age, permit requirements for rental enterprises, etc.
- Promote broad public awareness and understanding of regulations defining the appropriate use of bike(+) devices in the public right of way, including in designated bicycle facilities.
- Collaborate with enforcement agencies and authorities to ensure safe behavior and compliance with all traffic rules.

11 At the time of writing, only bicycles, Segways, motorscooters, motorcycles and conventional motor vehicles are defined in the Pennsylvania Motor Vehicle Code with clear operating rules in the public right of way. Other devices are specifically designated for off-road travel. In general, most undefined forms of bike(+) devices (a.k.a. micromobilty) are then categorized as "toys" and consigned to operating on the sidewalk. Given the significant speed differential between pedestrians and micromobility devices, Pittsburgh has adopted policy that micromobility devices typically operating in excess of 5 MPH shall not operate on the sidewalk.


Photo by BikePGH

Electric Bicycles

Electric assist bicycles (or e-bikes) are gaining popularity in the United States and in Pittsburgh. E-bikes are bicycles with an onboard battery and electric motor that assist a rider as they pedal, making it easier to tackle hills and take longer trips. E-bikes are defined by Pennsylvania state law to have the following characteristics:

- Operable pedals
- A motor that is less than 750 watts
- No more than three wheels
- Weigh less than 100 pounds
- Top speed of 20 MPH or less

2 Establish a diverse multi-agency and stakeholder working group to propagate and maintain current policies and regulations for the management of bike(+) devices in the public right of way and on city trail facilities.

- Set quarterly meetings (at minimum) to discuss and develop bike(+) policy by a working group to include, but not be limited to: Department of Mobility and Infrastructure, Department of Public Safety, Bureau of Police, Department of Parks and Recreation, Department of Public Works, Department of Law, Port Authority of Allegheny County, and bicycle and pedestrian focused organization representatives.
- Establish policies governing allowable speed of operations for emerging/bike(+) devices when operating in bike(+) lanes, trails and general purpose travel lanes.

3 Establish appropriate policies regarding bike(+) parking in the public right of way.

- Bike(+) parking in the right of way must not block or inappropriately constrain pedestrian, bicycle, and/or vehicular travelways of the street.
- Clearly identify appropriate bike(+) parking locations with paint and/or signage.
- Ensure bike(+) parking areas are equitably distributed across the City in both commercial and residential areas to maintain order in the public right of ways

Collaborate with the Department of Public Safety to improve reporting of crashes involving persons on bicycles.

Full crash reporting in the Commonwealth of Pennsylvania is required only when a person involved in the crash requires medical care or when a vehicle involved in the crash is disabled and must be towed. This policy may result in an underreporting of crashes involving people on bicycles, as bicyclists often decline medical attention immediately following a crash, but may need to seek attention after the fact. Although a bicycle may be disabled in a crash, it is not "towed" and therefore does not meet the alternate threshold for reporting.

1 Collaborate with the Department of Public Safety on a city protocol, intake process, and database to increase reporting of local crashes involving people on bicycles.

2 Meet with Department of Public Safety leadership on a monthly basis to review crash events and trends and/or identify problematic locations requiring enforcement or engineering interventions.

3 Explore emerging technology systems with analytics to assess near-miss activity and other risk indicators at signalized intersections. Pilot at least two approaches by 2025.

Collaborate with the Department of Public Works, public utilities, and other partners to improve routine maintenance of bike(+) facilities.

People on bicycles are often more vulnerable to small disruptions in bike travelways than motor vehicles are to objects or disruptions in the vehicle travelway. A minor pothole, missing utility cap, or mass of organic debris in a bike lane can cause a person on a bicycle to swerve out of the lane or into the curb to miss the object, putting them at grave risk of a crash or injury. This becomes particularly dangerous for more vulnerable bike(+) users such as children and older adults.

1. **Collaborate with the Department of Public Works on bike(+) facility design to ensure it can be readily swept and plowed in both summer and winter using reliably available equipment and staff.**

2. **Meet regularly with the Department of Public Works to review key performance indicators in relation to bike(+) lane clearance and routine maintenance.**

3. **Aid the Department of Public Works in acquiring equipment and staff, if needed, to adequately and reliably address maintenance issues that could affect safety on bike(+) facilities.**

4. **The City of Pittsburgh's Department of Mobility & Infrastructure collaborates with the Department of Public Works to maintain roads and sidewalks. For the facilities located on roads owned by Allegheny County and PennDOT, the City must coordinate maintenance with those entities.**

5. **The City of Pittsburgh has a robust trail network, and this Plan indicates the need for many more miles of trails. At this time, routine maintenance of trails is a collaboration between the City and a number of non-profit partners including Friends of the Riverfront and Riverlife. As the trail infrastructure continues to degrade over time and with substantial use, the City should identify a strategy for larger-scale capital maintenance and replacement of the existing trail network.**

6. **Many of the aforementioned trails are located within the City's expansive Parks network. As City parks are closed after dark, these trails are technically not accessible between sunset and sunrise. Given the critical transportation network connections that park trails provide, the Department of Mobility & Infrastructure should explore with the Department of Public Works an option to open the trails at night. This initiative may include infrastructure upgrades such as lighting or other security features, which would necessitate the identification of funding.**

Minimize disruptions incurred by utility work and construction projects in the public right of way through improved oversight and enforcement.

DOMI manages and permits work in the public right of way. Maintenance and new construction projects have the potential to temporarily or semi-permanently make riding bicycles and other bike(+) devices more hazardous. Construction debris, utility cuts resulting in uneven pavement or temporary metal plates, as well as sidewalk and travel lane closures, can create an uncomfortable experience for all roadway users.

1. **Improve permit reviews and inspections, during and after completion of projects in the right of way, to ensure compliance with all permit requirements.**

2. **Improve maintenance of traffic standards and publish resulting guidance that prioritizes safety and accessibility for travelers on bike(+) devices and pedestrians.**

3. **Educate public right of way inspectors to be aware of the special impact of utility cuts, restoration, and other facilities in bicycle travelways and to enforce accordingly.**

4. **Increase awareness among utilities and other right of way users on the impact of their activities on the safety and utility of bike(+) facilities for users of all ages and abilities.**

5. **Revise public right of way obstruction permit policies to require continuity of bicycle facilities through work zones. Explore development of Public Inconvenience Fees to encourage the rapid restoration of public travelways when pedestrian, bicycle, and vehicle travelways must be closed for construction.**

Support programs and events that promote increased bicycle use.

Pittsburgh has a robust community of bicycle users and lovers and a number of annual and episodic events that promote and celebrate bicycle use.

1. **Support BikePGH annual OpenStreetsPGH events and use them to assist in the continued implementation of this Bike(+) Plan.**

2. **Robustly promote national Bike to Work Day and associated events.**

3. **Collaborate with organizers on various other bike-related events that promote safe bicycle use for people of all ages and abilities from throughout the city.**

Protected Bike Lane on Penn Avenue in Downtown Pittsburgh

Support wayfinding to and around bike(+) facilities.

To access bike(+) facilities, one needs to know where they are located and how to navigate between origins and destinations using the network. By ensuring that this information is readily accessible for bicycle routes, from neighborways to trails, will help cyclists make informed decisions about routing choices and also bring awareness to the infrastructure upgrades outlined in this Plan.

1. **Establish an analog wayfinding program that increases access to bicycle routing information by increasing bicycle network information in street and trail signage, including directional arrows and distances to key destinations.**
2. **Collaborate with local partners such as transit agencies, local universities, and other map-producing entities to ensure inclusion of bike(+) network information on their maps.**
3. **Support digital wayfinding by ensuring that accurate and complete bike(+) facility data is available for technology providers to assist in their incorporation into digital wayfinding and trip-planning platforms.**
4. **Explore new opportunities for enhanced ways to help residents and visitors navigate our City on two (or three) wheels.**

Support and expand the bicycle-related economy, especially among small, minority-owned business enterprises and organizations.

Bicycle entrepreneurship is alive and well in Pittsburgh and contributes significantly to our local economy.

1. **Lend technical support and expertise to emerging minority-owned business enterprises participating in the bicycle-related economy through bike repair, (re)sale, or bike-related events.**
2. **Encourage youth involvement in bicycle-related initiatives and employment opportunities.**

Bike(+) Support Facilities

Increase supply of convenient short-term bike(+) parking.

Short-term ("unprotected") bicycle parking is infrastructure designed to hold bikes for a few hours while the rider is visiting a destination. Short-term parking is generally located in the public right of way either in the sidewalk zone or parking zone of the street. It is commonly provided via bike racks, bike corrals, and/or covered bicycle parking. Sufficient bicycle parking supports access to local shopping districts and other activity centers, reduces the number of bicycles locked to trees, benches, or railings, and helps to keep the sidewalk clear for walking.

1. **Increase city-led installation of on-street bike racks.**
   - With BikePGH, promote programs to increase support for bike racks and other complementary bicycle amenities in local business districts.
   - Work with local neighborhood and business associations to appropriately locate and install bike racks in all business districts by 2025.
   - Develop and launch a streamlined process for the public to request bicycle racks.
   - Develop and launch a streamlined process for public or private partners to sponsor standard city bike racks and their installation.
2. **Modify the public right of way permit process to make it easier for the public to both request and install on-street bicycle parking.**
   - Develop a "furnishing permit" in lieu of the current "encroachment permit" to reduce the burden on private sector partners installing publicly available bicycle parking.
   - Publish bicycle parking design guidelines in the Complete Streets Design Guidelines to facilitate provision of bicycle parking.
3. **Review right of way plans associated with new development to encourage and ensure appropriate and visible short-term bike(+) parking accommodation.**

Expand and promote long-term bike(+) parking and storage.

Long-term ("protected") bicycle parking supports people commuting by bicycle to work and/or transit and provides organized storage at residential buildings for residents owning bicycles or other small mobility devices. Long-term, protected bicycle parking is a storage facility that protects the entire bike from theft and inclement weather such as bicycle rooms, bicycle lockers, and bicycle cages.

1. **Promote the use of bicycle storage facilities at existing high-frequency, rapid transit stops, such as the East Liberty Station.**
2. **Identify additional opportunities for "park and bike" facilities near regional trails to promote last mile(s) bicycle commuting into congested employment centers.**
   - Pilot at least one covered and/or secure bicycle parking and storage facility adjacent to a regional trail used for commuting by 2025.
   - Review vehicle parking management policies against the objective to increase last mile(s) bicycle commuting into employment centers. Adjust as appropriate.

Example of long-term, protected bike parking

Where appropriate, implement projects on a temporary basis before implementing them permanently.

1. **Utilize demonstrations, pilot projects, and "quick-builds" for real-world testing of potential bike facility solutions, particularly in hard-to-solve segments.**

BikePGH staff and volunteers installed a temporary two-way protected on Euclid Street/Penn Circleahead of the real installation to talk to OpenStreetsPGH visitors about the project and have them test it out.

BikePGH installed a one-day parking protected bike lane installation that allowed community members and elected officials to better understand and try out the design. Parking protected bike lanes are currently not allowed in the state of Pennsylvania due to the state Vehicle Code which requires vehicles to park within 12 inches of a curb.

DOMI staff installed a temporary bus lane and one-way projected bike lane on the street where BRT will be installed in 2021.

Install bike runnels on public steps to increase access.

Pittsburgh has over 800 sets of public steps. These vertical travel ways are important connections within and between neighborhoods – especially given the steep topography of our city. Bike runnels are channels alongside steps that facilitate walking a bicycle up or down the stairway. These simple enhancements dramatically improve the ease of bicycle access in the city.

1. **Adopt a policy to make bike runnels standard on all public step restoration projects.**
2. **Install bike runnels on all steps leading to high-frequency and/or rapid transit stops where consistent with Port Authority policies.**
3. **Install bike runnels to access bike parking areas in the City-County building and other public city facilities.**

Example of a bike runnel on a public staircase in Pittsburgh.

Stairs are a critical part of Pittsburgh's transportation system

Phasing, Implementation and Plan Updates

CHAPTER 7

Phasing, Implementation and Plan Updates

Transforming Pittsburgh's existing network of bike infrastructure into the vision expressed in the network map will be a multi-year process. Implementation of the proposed 120 mile network will be phased in over the course of the next decade.

Project Prioritization

This Plan lays out a phased approach to installing bicycle infrastructure. Projects will be prioritized for implementation according to the following factors:

- **High crash segment** – Areas of the network where bike(+) facilities are lacking and where there are a relative frequency of crashes involving people on bicycles.
- **Low access segments** – Areas where there is a relative concentration of residents or jobs but no access to a designated bike(+) facility within ¼ mile.
- **Network gap** – Missing segments between two established bike(+) facilities that complete a necessary link in the city network.
- **Final link** – Segments that connect to critical destination nodes such as high-frequency, rapid transit stops, concentrated employment centers, significant commercial areas, regional assets such as parks or cultural destinations, or similar.
- **Opportunities** – Segments that present a unique and time-limited opportunity such as scheduled street resurfacing or street restoration, adjacent development projects, currently low traffic volumes, or similar. May also represent upgrades to enhance existing facilities to a higher level of user comfort and protection.
- **Planning need** – Necessary links that require a community planning process in which to determine the appropriate alignment to complete the connection.

Network Implementation

While it is expected that the City of Pittsburgh will build the majority of the network, other actors are anticipated to contribute to project implementation over time. These include:

- **Pennsylvania Department of Transportation (PennDOT)** – Of the approximately 1,200 linear miles of street in the City of Pittsburgh, roughly 160 belong to PennDOT. A small fraction of these overlap with the proposed bike(+) network. Implementation on these right of ways will be completed by, or in coordination with, PennDOT either as a discrete project or as a component of routine street resurfacing. PennDOT is also an important funder of bike(+) facilities with state funds or as the steward of federal investments.
- **Allegheny County** – A number of critical links, including several bridge or tunnel connections, are county-owned assets that will require participation by the County for implementation. The County has also been instrumental in providing technical support and/or funding for critical links such as riverfront or rail corridor trails.
- **Port Authority of Allegheny County (PAAC)** – While no link in the proposed network is on PAAC right of way final access to and parking near Port Authority stations will require close cooperation with the Authority. Opportunities may emerge over time to utilize PAAC assets such as the Wabash Tunnel.
- **Southwestern Pennsylvanian Commission (SPC)** – While SPC does not own any right of way assets in the City, the Commission oversees a number of funding programs that will be critical sources of funding for implementation of the network.
- **Private Developers and Investment** – Today it is common for private development projects to build a new traffic signal, restripe streets for turn lanes, or make other investments to mitigate vehicle impacts. Building out the bike(+) network may be one of the most effective means to reduce vehicle impacts and require less mitigation. The Department of Mobility and Infrastructure will work with the Department of City Planning Office of Zoning and private developers to increase private investment in bike(+) network implementation.

Funding

The City of Pittsburgh employs a variety of funding sources for implementing mobility infrastructure and programs. Each type of funding has distinct requirements pertaining to allocation, utilization, and reporting. The three most common sources of funding for mobility projects are:

- **City of Pittsburgh's Local Capital Budget** - Priority projects that have strong community support and can be completed within one year are typically funded via Capital Budget requests. Capital projects are often designed and installed by in-house crews and can be completed in a short amount of time.
- **County, State, and Federal Grants** - Larger-scale and therefore more expensive projects, especially those critical to the regional network, are good candidates for County, State, and Federal Grants. Because the application and program requirements for this type of funding are among the most time-consuming and rigorous, these funds are typically used only on multi-year, high cost projects.
- **Philanthropic or Private Funding** - There are several local and national organizations that fund active transportation projects and programs. Pittsburgh has a rich history of working with such organizations to fund a variety of mobility programs and services, and will continue to pursue these opportunities as they become available.

Figure 16:

From Planning to Implementation

This Plan sets the stage for implementation, as shown in the graphic below.

EVALUATION

VISION AND GOALS
1 Building a complete network
2 Increasing ridership
3 Improving safety
4 Encouraging a bike community that reflects the city

PROJECT SUPPORT
The city receives support from bicycle and pedestrian committees, Community groups, Pittsburgh City Council, the Mayor's Office, and other stakeholders.

PROJECT READINESS
The city evaluates whether a project can physically and logistically be completed in a year's time.

PRIORITY PROJECTS

IDENTIFY FUNDING

CITY OF PITTSBURGH'S CAPITAL BUDGET
Priority projects that have the support of the community and can be completed within a year are good Capital Budget requests. Capital projects are often designed and installed with in-house crews and can be completed in a short amount of time.

6mo-1 year from design to installation

GRANT APPLICATION

PHILANTHROPIC OR PRIVATE FUNDING
Priority projects that require special attention to build public support or address site issues might be good candidates for private or philanthropic funding, which can be spent faster than federal funds.

6mo-1 years from design to installation

STATE AND FEDERAL GRANTS
Projects that are important to the city but are not immediate needs are good candidates for a federal transportation grant.

When federal grants are received, Capital Budget money must be reserved for a local match

2-4 years from design to installation

GRANT APPLICATION

PUBLISH YEARLY BIKE PROJECTS

DESIGN & PUBLIC OUTREACH

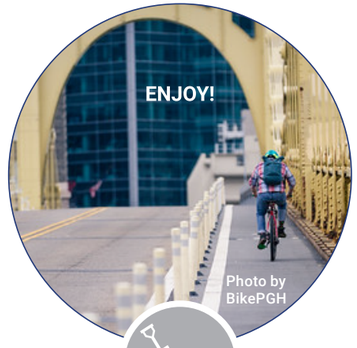
A typical outreach process includes:

- Presentations to neighborhood community groups
- Public meetings during schematic design and design development
- Stakeholder outreach to adjacent property owners and relevant agencies

6mo-1 year from design to installation

INSTALL

May - October



Tracking Progress

The Department of Mobility and Infrastructure will measure and report progress in both implementation of the plan and measures of effectiveness at least annually by way of a report to the Office of the Mayor shared with City Council and public stakeholders. Progress tracking will include, but is not limited to:

Metric	Baseline (2020)
Miles of network built and/or improved	**93 mi**
New critical connections made (e.g. difficult intersections, bridge crossings, etc.)	**N/A**
User data from count locations by month	**13,210 rides/month** (Penn Ave - Average for 3 count locations, May-Nov 2019)
Percent of households within ¼ mile of a bike(+) facility	**44% households**
Percent of households within 1 mile of groceries by way of a low-stress bicycle route	**20%**
Crashes involving people on bicycles	**57 per year** (rolling 5 year average, 2014-2018, PCIT data)
Crash rate (crashes/population) for people on bicycles	**0.019%** (rolling 5 year average, 2014-2019 PCIT data)
Number of new bike racks or corrals installed	**N/A**
Average monthly bikeshare customers	**~1,750** customers per month in 2019
Rides taken on shared bike(+) devices by month	**7,191 per month** avg. Healthy Ride trips, 2019
Number of public steps infrastructure with runnels	**3**

Looking Forward

The 2020 Bike(+) Plan is a living document. This is a framework that will need to be regularly revisited, debated, and updated to keep current with the changing nature of our city, the demands of our public, and evolutions in mobility. While this is a ten-year plan, the Plan and associated strategies should be formally reviewed by City agencies, advocates, and representatives of the diverse public roughly every two years with a significant update anticipated after five years.

The Bike(+) Plan will help Pittsburgh achieve its goals related to health, mobility, access, safety, and quality of life.

Appendices

Appendix A

Projects

Table 3: Bike(+) Network Projects and Connections

Name	From	To	Neighborhood	Council District
Merchant Street Connector	Ridge Avenue	Reedsdale Street	Allegheny Center, Allegheny West, North Shore	1
East North Avenue Bridge Connection	Vinial Street	Cedar Avenue	Allegheny Center,Central Northside, East Allegheny, Spring Garden	1
South Federal Street Bike Facilities	South Commons	Roberto Clemente Bridge	Allegheny Center, North Shore	1
Brighton Heights Bike Facilities	California Avenue	Woods Run Avenue	Brighton Heights	1
Eckert Westhall Connection to Trail	California Ave	Three River Heritage Trail	Brighton Heights, Marshall-Shadeland	1
East Ohio Commercial District Connection	East Street	Cedar Avenue	East Allegheny	1
Lower Spring Garden Bike Facilities	Wicklines Lane	Vinial Street	East Allegheny, Spring Garden, Troy Hill	1
East Street South Extension	Lareda Street	East Ohio Street	East Allegheny, Spring Hill-City View	1
Troy Hill Bike Facilities	Rialto Street	Phineas Street	East Allegheny, Troy Hill	1
Lecky Avenue Neighborway	Central Avenue	Eckert Street	Marshall-Shadeland	1
Kilbuck Road Park Connection	Woods Run Avenue	Riverview Park	Marshall-Shadeland, Perry North	1
Tony Dorsett Drive Bike Facilities	Reedsdale Street	North Shore Drive	North Shore	1
East Street North Extension Phase 1	East Street	Evergreen Road	Northview Heights, Perry North, Summer Hill	1
Spring Hill City View Bike Facilities	Swindell Bridge	East Street	Northview Heights, Spring Hill-City View	1
East Street North Extension Phase 2	Evergreen Road	Perrysville Avenue	Perry North	1
Old Kilbuck Road Trail Improvements	Kilbuck Road	Riverview Avenue	Perry North	1
Riverview Avenue Entrance Bike Facilities	Riverview Avenue	Perrysville Avenue	Perry North	1
Upper Perrysville Avenue Bike Facilities	Mairdale Avenue	Riverview Avenue	Perry North	1
Upper Spring Garden Avenue Bike Facilities	City Limits	Wicklines Lane	Spring Garden	1
Ley Street Bike Facilities	City Limits	Rialto Street	Troy Hill	1
Rialto Street Steps Runnel Upgrade	Ley Street	31st Street Bridge	Troy Hill	1
Upper Chartiers Avenue Bike Facilities	Windgap Avenue	Hillsboro Street	Chartiers City, Sheraden, Windgap	2
Lower Chartiers Avenue Bike Facilities	Corliss Street	Wabash Street	Crafton Heights, Elliott, Sheraden, West End	2
Central Chartiers Avenue Bike Facilities	Hillsboro Street	Corliss Street	Crafton Heights, Sheraden	2

Name	From	To	Neighborhood	Council District
Trolley Trail	Nobles Town Road	Wabash Street	Crafton Heights, West End, Westwood	2
Noblestown Road Trail Connector	Crafton Boulevard Trail	Trolley Trail	Crafton Heights, Westwood	2
Grandview Avenue Bike Facilities	Merrimac Street	Republic Street	Duquesne Heights, Mount Washington	2
Seldom Seen Rail Trail	Saw Mill Run Boulevard	Woodville Avenue	Duquesne Heights, West End	2
Noblestown Road Bike Facilities	City Limits	Route 60	East Carnegie, Oakwood, Westwood	2
Loenz Avenue Bike Facilities	Steuben Street	West End Overlook	Elliott	2
West Carson Street Bike Facilities	Esplen	Fort Pitt Bridge	Elliott, Esplen, South Shore, West End	2
West End Bike Facilities	Wabash Street	West Carson Street	Elliott, West End	2
Broadhead Fording Road	Mazette Rd	Dead End	Fairywood	2
Fairywood Windgap Bike Facilities	Chartiers Avenue	Broadhead Fording Road	Fairywood, Windgap	2
Mount Washington Bike Facilities	Boggs Avenue	Grandview Avenue	Mount Washington	2
Woodruff Street Connector	Merrimac Street	Saw Mill Run Boulevard	Mount Washington	2
Sheraden Neighborhood Bike Facilities	Stafford Street	Hillsboro Street	Sheraden	2
Wabash Street Bike Facilities	Greentree Road	Steuben Street	West End	2
West End Seldom Seen Connector	Seldom Seen Rail Trail	Wabash Street	West End	2
Crafton Boulevard Trail	City Limits	Noblestown Road	Westwood	2
Arlington Avenue Bike Facilities	Arlington Avenue	Warrington Avenue	Allentown, Knoxville	3
Mount Oliver Street Connector	Arlington Avenue	Saint Martin Street	Allentown, South Side Slopes	3
South Side Slopes Bike Facilities	Saint Martin Street	South 18th Street	Allentown, South Side Slopes	3
Josephine Street Bike Facilities	Arlington Avenue	South 21st Street	Arlington Heights, South Side Slopes	3
Arlington Bike Facilities	Brownsville Road	Josephine Street	Arlington, Arlington Heights, South Side Slopes	3
Parkwood Road Bike Facilities	Mount Oliver Borough	Becks Run Road	Arlington, Mt. Oliver, St. Clair	3
Becks Run Bike Facilities Phase 1	Bajo Street	East Carson Street	Arlington, South Side Flats	3
Charles Anderson Bridge Bike Extension	Charles Anderson Bridge	Bates Street	Central Oakland, South Oakland	3
Glasshouse Bike Trail	South 2nd Street	Station Square Drive	South Shore	3
South Side Neighborway Extension	South 10th Street	South 2nd Street	South Shore, South Side Flats	3
Becks Run Rail Crossing	Becks Run Road	Three Rivers Heritage Trail	South Side Flats	3
Hot Metal Street Bike Facilities	East Carson Street	Hot Metal Bridge	South Side Flats	3
South 21st Street Bike Facilities	Mission Street	Wharton Street	South Side Flats, South Side Slopes	3
South Side Park Bike Route	Quarry Street	South 21st Street	South Side Slopes	3
Crane Avenue Trail	Dagmar Avenue	Brashear Trail	Beechview	4

Name	From	To	Neighborhood	Council District
Seldom Seen Beechview Connector	Broadway Avenue	Crane Avenue Trail	Beechview	4
Brookline Beechview Connector	Brookline Boulevard	Broadway Avenue	Beechview, Brookline	4
Brookline Bike Facilities	Brookline Memorial Park	Pioneer Avenue	Brookline	4
Carrick Brookline Connector	Brownsville Road	Brookline Boulevard	Brookline, Carrick	4
Overbrook Brookline Bike Facilities	Saw Mill Run Boulevard	Brookline Boulevard	Brookline, Overbrook	4
Brownsville Road Bike Facilities	Biscayne Drive	Newett Street	Carrick	4
Carrick Mount Oliver Bike Facilities	Brownsville Road	Mount Oliver Borough	Carrick	4
Maytide Street Bike Facilities	Brownsville Road	Saw Mill Run Boulevard	Carrick, Overbrook	4
Glenwood Bridge Bike Facilities	Great Allegheny Passage Trail	Alluvian Street	Glen Hazel, Hays, Hazelwood	5
Second Avenue Bike Facilities	Alluvian Street	East Elizabeth Street	Glen Hazel, Hazelwood	5
Beechwood Boulevard Bike Facilities	Monitor Street	Greenfield Bridge	Greenfield	5
Greenfield Avenue Commercial District Bike Facility	Winterburn Avenue	Haldane Street	Greenfield	5
Winterburn Avenue Bike Connector	Greenfield Bridge	Greenfield Avenue	Greenfield	5
Greenfield Avenue Bike Facilities	Haldane Street	Irvine Street	Greenfield, Hazelwood	5
Mon Oakland Phase 2 Sylvan Avenue Trail	Irvine Street	Greenfield Avenue	Greenfield, Hazelwood	5
Hazelwood Avenue Bike Facility	Saline Street	Sylvan Avenue	Greenfield, Hazelwood, Squirrel Hill South	5
Monitor Street Bike Facilities	Beechwood Boulevard	Beechwood Boulevard	Greenfield, Squirrel Hill South	5
Mifflin Road Bike Facilities	Doerville Avenue	Great Allegheny Passage Trail	Hays, New Homestead	5
Gloster Street	Second Avenue	Hazelwood Avenue	Hazelwood	5
Marina Drive Bike Facilities and Trail	Homeridge Drive	Theodore Road	Lincoln Place, New Homestead	5
Circle Avenue Bike Facilities and Trail	Marina Drive	Doerrville Avenue	New Homestead	5
Doerville Avenue Bike Facilities	West Circle Avenue	Mifflin Road	New Homestead	5
Beacon Street Bike Extension	Shady Avenue	Wightman Street	Squirrel Hill South	5
Beacon Street Bike Extension	Beechwood Boulevard	Shady Avenue	Squirrel Hill South	5
Darlington Road Bike Connector	Beechwood Boulevard	Beacon Street	Squirrel Hill South	5
Lower Shady Avenue Bike Facilities	Forbes Avenue	Forward Avenue	Squirrel Hill South	5
Panther Hollow Road Bike Facilities	Charles Anderson Bridge	Hobart Road	Squirrel Hill South	5
Wightman Street Bike Facilities	Beacon Street	Pocusset Street	Squirrel Hill South	5
10th Street Bridge to GAP Trail Connector	10th Street Bridge	GAP Trail	Bluff	6
Brady Street Trail	Forbes Avenue	Great Allegheny Passage Trail	Bluff	6

Name	From	To	Neighborhood	Council District
BRT Diamond Street Bike Facilities	Fifth Avenue	Forbes Avenue	Bluff, Central Business District	6
Crawford Pride Bike Facilities	Locust Street	Wylie Avenue	Bluff, Central Business District, Crawford-Roberts	6
BRT Forbes Avenue Uptown	Moultrie Street	Magee Street	Bluff, Central Business District, West Oakland	6
Kirkpatrick Street Bike Facilities	Fifth Avenue	Wylie Avenue	Bluff, Middle Hill, Terrace Village, West Oakland	6
BRT Birmingham Forbes Bike Connector	Birmingham Bridge	Moultrie Street	Bluff, South Oakland	6
California Avenue Bike Facilities	Marshall Avenue	Columbus Avenue	California-Kirkbride, Manchester	6
Columbus California Bike Facilities	Fulton Street	Brighton Road	California-Kirkbride, Manchester	6
Downtown Bike Facilities (GAP to the Point)	Third Avenue	Point State Park	Central Business District	6
Forbes Avenue Downtown Bike Facilities	Diamond Street	Wood Street	Central Business District	6
Market Square Bike Facilities	Wood Street	Stanwix Street	Central Business District	6
Smithfield Penn Bike Connector	Smithfield Street	Penn Avenue	Central Business District	6
Smithfield Street Bike Facilities	Seventh Avenue	Fort Pitt Boulevard	Central Business District	6
Wood Penn Bike Connector	Wood Street	Penn Avenue	Central Business District	6
Wood Street Bike Facilities	Sixth Avenue	Fort Pitt Boulevard	Central Business District	6
Hill District Network Gap	Upper Hill	Downtown	Central Business District, Crawford-Roberts, Middle Hill, North Oakland, Upper Hill	6
Jacksonia Street Bike Facilities	Federal Street	Brighton Road	Central Northside	6
North Federal Street Bike Facility Extension	Hemlock Street	Perrysville Avenue	Central Northside, Fineview, Perry South	6
Lower Perrysville Avenue Bike Facilities	North Charles Street	End of Perrysville Avenue	Central Northside, Perry South	6
North Franklin Street Bike Facilities	Beaver Avenue	Three River Heritage Trail	Chateau	6
Manchester Bike Facilities	Manhattan Street	Fulton Street	Chateau, Manchester	6
Upper Allegheny Avenue Bike Facilities	Pennsylvania Avenue	Ridge Avenue	Chateau, Manchester	6
Colwell Connector	Burrows Street	Pride Street	Crawford-Roberts, Terrace Village, West Oakland	6
Juniata Street Neighborway	Fulton Street	Chateau Street	Manchester	6
Marshall Avenue Bike Facilities Phase 1	Brighton Road	Linwood Avenue	Perry South	6
North Charles Street Bike Facilities	Marshall Avenue	Perrysville Avenue	Perry South	6
Friendship Avenue Extension	Pearl Street	Comrie Way	Bloomfield	7
Howley Street Bike Facilities	Friendship Avenue	Main Street	Bloomfield	7
South Millvale Bike Facilities	South Millvale Bridge	Centre Avenue	Bloomfield	7
Bloomfield Lawrenceville Connector	Comrie Way	Hatfield Street	Bloomfield, Central Lawrenceville	7

Name	From	To	Neighborhood	Council District
Bloomfield Lower Lawrenceville Neighborw	Friendship Avenue	37th Street	Bloomfield, Lower Lawrenceville	7
Central Lawrenceville Neighborway	40th Street	51st Street	Central Lawrenceville	7
40th Street Bridge Bike Facilities	City Limits	Butler Street	Central Lawrenceville, Lower Lawrenceville	7
Allegheny Green Boulevard Phase 1	39th Street	43rd Street	Central Lawrenceville, Lower Lawrenceville	7
Upper Allegheny Green Boulevard	43rd Street	Highland Park Bridge	Central Lawrenceville,Morningside,Upper Lawrenceville	7
51st Street Bike Connector	Stanton Avenue	Allegheny Green Boulevard	Central Lawrenceville, Upper Lawrenceville	7
Bunkerhill Bike Connector	One Wild Place	Resevoir Drive	Highland Park	7
Stanton Avenue Bike Facilities Extension	Chislett Street	North Euclid Avenue	Highland Park, Morningside	7
Butler Street Bike Facilities	Washington Boulevard	57th Street	Highland Park, Morningside, Stanton Heights, Upper Lawrenceville	7
Lower Lawrenceville Neighborway	40st Street	34th Street	Lower Lawrenceville	7
Lower Allegheny Green Boulevard	31st Street	39th Street	Lower Lawrenceville, Strip District	7
Strip District Trail Extension	36th Street	24th Street	Lower Lawrenceville, Strip District	7
62nd Street Bridge			Morningside, Upper Lawrenceville	7
Dobson Street Bike Facilities	Herron Avenue	Brereton Street	Polish Hill	7
Lower Herron Avenue Bike Facilities	Bigelow Boulevard	Brereton Street	Polish Hill	7
Upper Lawrenceville Neighborway	57th Street	51st Street	Stanton Heights, Upper Lawrenceville	7
15th Street Cycle Track Connection	Smallman Street	Penn Avenue	Strip District	7
Produce Terminal Bike Lanes	21st Street	15th Street	Strip District	7
Strip District Network Gap	Lower Lawrenceville	Downtown	Strip District	7
North Neville Street Bike Facilities	Centre Avenue	Existing North Neville Street Bike Lanes	North Oakland	8
Filmore Street Connector	South Neville Street	Forbes Avenue	North Oakland, Squirrel Hill North	8
South Neville Street Bike Facilities	Fifth Avenue	Filmore Street	North Oakland, Squirrel Hill North	8
Wilkins Avenue Bike Facilities	Fifth Avenue	Beechwood Boulevard	Point Breeze, Shadyside, Squirrel Hill North	8
Saint James Street Bike Facilities	Ellsworth Avenue	Fifth Avenue	Shadyside, Squirrel Hill North	8
Shadyside Fifth Avenue Bike Connector	Saint James Street	Morewood Avenue	Shadyside, Squirrel Hill North	8
Upper Shady Avenue Bike Facilities	Penn Avenue	Fifth Avenue	Shadyside, Squirrel Hill North	8
Beeler Street Bike Facilities	Wilkins Avenue	Forbes Avenue	Squirrel Hill North	8
Hamilton Avenue Bike Facilities	Oakwood Street	East Liberty Boulevard	East Hills, Homewood South, Homewood West, Larimer	9

Name	From	To	Neighborhood	Council District
East Liberty Centre Avenue Bike Facilities	Station Street	South Euclid Avenue	East Liberty	9
Black Street Bike Facilities	Mossfield Street	North Negley Avenue	East Liberty, Garfield	9
Broad Street Bike Extension	East Liberty Boulevard	Lincoln Avenue	East Liberty, Larimer	9
East Liberty Boulevard Bike Extension	Hamilton Avenue	Penn Avenue	East Liberty, Larimer	9
North Homewood Avenue Bike Facilities	Upland Street	Penn Avenue	Homewood North, Homewood South, Point Breeze North	9
Apple Avenue Bike Facilities	North Homewood Avenue	Lincoln Avenue	Homewood North, Lincoln-Lemington-Belmar	9
North Dallas Bike Extension	McPhearson Boulevard	Hamilton Avenue	Homewood South, Homewood West, Point Breeze North	9
Brilliant Branch Rails to Trails	Negley Run Boulevard	Hamilton Avenue	Homewood West, Lincoln-Lemington-Belmar	9
Meade Street Bike Facilities	City Limits	South Homewood Avenue	Point Breeze North	9
South Homewood Avenue Bike Facilities	Penn Avenue	Reynolds Street	Point Breeze, Point Breeze North	9
Brighton Road Bike Facilities	California Avenue	Ridge Avenue	Allegheny West, California-Kirkbride, Central Northside, Perry South	1, 6
West North Avenue Bike Facilities	Manhattan Street	Brighton Road	Allegheny West, Central Northside, Manchester	1, 6
Ridge Avenue Bike Facilities	Ridge Avenue	West Ohio Street	Allegheny West, Chateau	1, 6
Pennsylvania Avenue Bike Facilities	Brighton Road	Allegheny Avenue	California-Kirkbride, Central Northside	1, 6
Marshall Avenue Bike Facilities Phase 2	Brighton Road	California Avenue	California-Kirkbride, Marshall-Shadeland	1, 6
North Taylor Sampsonia Bike Facilities	Federal Street	Brighton Road	Central Northside	1, 6
Marshall Ave to Trail Connector	California Avenue	Three Rivers Heritage Trail	Chateau, Manchester, Marshall-Shadeland	1, 6
Lower Allegheny Avenue Bike Facilities	Ridge Avenue	Three Rivers Heritage Trail	Chateau, North Shore	1, 6
Central Perrysville Avenue Bike Facilities	Riverview Avenue	North Charles Street	Perry North, Perry South	1, 6
16th Street Bridge Bike Facilities	East Ohio Street	Penn Avenue	East Allegheny, North Shore, Strip District, Troy Hill	1, 7
31st Street Bike Facilities			Strip District, Troy Hill	1, 7
Baily and Beltzhoover Bike Facilities	Boggs Avenue	Michigan Street	Allentown, Knoxville, Mount Washington	2, 3
Station Square Bike Facilities			South Shore	2, 3
Warrington Avenue Bike Facilities	Saw Mill Run Boulevard	Arlington Avenue	Allentown, Beltzhoover, Mount Washington	2, 3, 4
Broadway Avenue Bike Lanes	City Limits	Fallowfield Avenue	Beechview	2, 4
Brashear Trail Upgrade	Crane Avenue	Seldom Seen Rail Trail	Beechview, Mount Washington	2,4
West End Bridge Bike Facilities	West Carson Street	Western Avenue	Chateau, Elliott, South Shore	2,6
Bausman Street Connector	Michigan Street	Saw Mill Run Boulevard	Beltzhoover, Bon Air, Knoxville	3,4
Bon Air Bike Facilities	Brownsville Road	Saw Mill Run Boulevard	Bon Air, Knoxville	3, 4
Becks Run Bike Facilities Phase 2	Brownsville Road	Bajo Street	Carrick, St. Clair	3, 4

Name	From	To	Neighborhood	Council District
Charles Anderson Bridge Bike Facilities	Panther Hollow Road	Parkview Avenue	Central Oakland, South Oakland, Squirrel Hill South	3, 5
Mon Oakland Connector	Boundary Street	Saline Street	Central Oakland, Greenfield, North Oakland, South Oakland, Squirrel Hill North, Squirrel Hill South	3, 5, 8
10th Street Bridge Bike Facilities	Muriel Street	Second Avenue	Bluff, South Side Flats	3, 6
South Oakland Bike Facilities	Boulevard of the Allies	Forbes Avenue	Central Oakland	3, 6
Central Shady Avenue Bike Facilities	Fifth Avenue	Forbes Avenue	Point Breeze, Shadyside, Squirrel Hill North	5, 8
Forbes Avenue Squirrel Hill Bike Facilities	Schenley Drive	South Dallas Avenue	Squirrel Hill North, Squirrel Hill South	5, 8
Schenley Drive Bike Facilities	Forbes Avenue	Panther Hollow Road	Squirrel Hill North, Squirrel Hill South	5, 8
South Dallas Avenue Bike Facilities	Wilkins Avenue	Forbes Avenue	Point Breeze,Squirrel Hill North, Squirrel Hill South	5, 8, 9
East End Avenue Bike Facilities	Meade Street	City Limits	Point Breeze, Point Breeze North, Regent Square	5, 9
Upper Herron Avenue Bike Facilities	Wylie Avenue	Bigelow Boulevard	Bedford Dwellings, Middle Hill, Polish Hill, Upper Hill	6, 7
Bloomfield Bridge Bike Facilities	Liberty Avenue	Bigelow Boulevard	Bloomfield, North Oakland, Polish Hill, Upper Hill	6, 7
Melwood Gold Neighborway	Baum Boulevard	Herron Avenue	North Oakland, Polish Hill	6, 7
Ridgeway Street Bike Facilities	Bloomfield Bridge	Herron Avenue	Polish Hill, Upper Hill	6, 7
BRT Fifth Avenue Bike Lanes	Craig Street	Diamond Street	Central Business District, Crawford-Roberts, North Oakland, Shadyside, South Oakland, West Oakland	6, 8
North Oakland Centre Avenue Bike Facilities	South Millvale	North Neville Street	Bloomfield, North Oakland, Shadyside	7, 8
South Aiken Bike Facilities	Baum Boulevard	Saint James Street	Bloomfield, Shadyside	7, 8
Morewood Avenue Bike Facilities	South Millvale	Forbes Avenue	Bloomfield, Shadyside, Squirrel Hill North	7, 8
South Mathilda Street Bike Facilities	Mossfield Street	Friendship Avenue	Bloomfield, Garfield	7, 9
Stanton Avenue Climbing Lanes	Chislett Street	Butler Street	Central Lawrenceville, East Liberty, Morningside, Stanton Heights, Upper Lawrenceville	7, 9
Mossfield Street Bike Facilities	North Aiken Avenue	South Mathilda Street	Central Lawrenceville, Garfield, Stanton Heights	7, 9
Penn Circle Two Way Conversion	Station Street	South Euclid Avenue	East Liberty	7, 9
Bloomfield Friendship Neighborway Extension	Coral Street	South Euclid Avenue	East Liberty, Friendship	7, 9
North Euclid Neighborway	Bunkerhill Street	Station Street	East Liberty,Highland Park	7, 9
Morningside Bike Facilities	Butler Street	Stanton Avenue	East Liberty, Highland Park, Morningside, Stanton Heights	7, 9
Washington Boulevard Trail	Butler Street	Negley Run Boulevard	Highland Park, Lincoln-Lemington-Belmar	7, 9
East Liberty Penn Avenue Bike Facilities	East Liberty Boulevard	South Negley Avenue	East Liberty, Shadyside	8, 9
Reynolds Street Neighborway	South Dumfermline Street	Beechwood Boulevard	Point Breeze	8, 9

Appendix B

Bicycling Level of Traffic Stress

Pages 28-29 and 42-43 show an assessment of existing and future bicycling conditions in the City of Pittsburgh based on Bicycling Level of Traffic Stress. The Bicycling Level of Traffic Stress methodology was developed in 2012 and first published in a report by the Mineta Transportation Institute.1 Bicycling Level of Traffic Stress uses readily available roadway data to help planners understand how comfortable a roadway may be for certain types of people when bicycling. Bicycling Level of Traffic Stress scores range from LTS 1 to LTS 4, and each score corresponds to a user type, as shown Table 3.

Table 4: Relationship of Bicycling Level of Traffic Stress Scores to Target Bicycle User Type

LTS	Target Bicycle User Type
1	All Ages and Abilities
2	Interested but Concerned (Mainstream Adults)
3	Enthused and Confident (Adult Commuters)
4	Strong and Fearless (Long-Distance Recreational Bicyclists)

The Mineta Bicycle Level of Traffic Stress methodology is a “worst case scenario” analysis whereby the characteristic of the street segment (e.g., number of lanes, speed, bike lane presence/width, parking presence, etc.) that scores highest on a four point scale trumps characteristics with lower scores. For instance, a low-volume two-lane street with a speed limit of 40 mph would be rated LTS 4 because of the high-speed limit.

The analysis conducted for the Pittsburgh Bike (+) Master Plan is an extension of the Mineta methodology that incorporates updates published by the Mineta paper’s author and other modifications drawn from experience applying the methodology nationwide. It used street data from the City of Pittsburgh and OpenStreetMap, including: City of Pittsburgh street centerlines with speed limit and number of travel lanes; City of Pittsburgh traffic volumes; City of Pittsburgh bicycle facility data (update during Plan development); and OpenStreetMap functional classifications, which were used in cases where segments in the City’s data lacked characteristics needed for analysis.

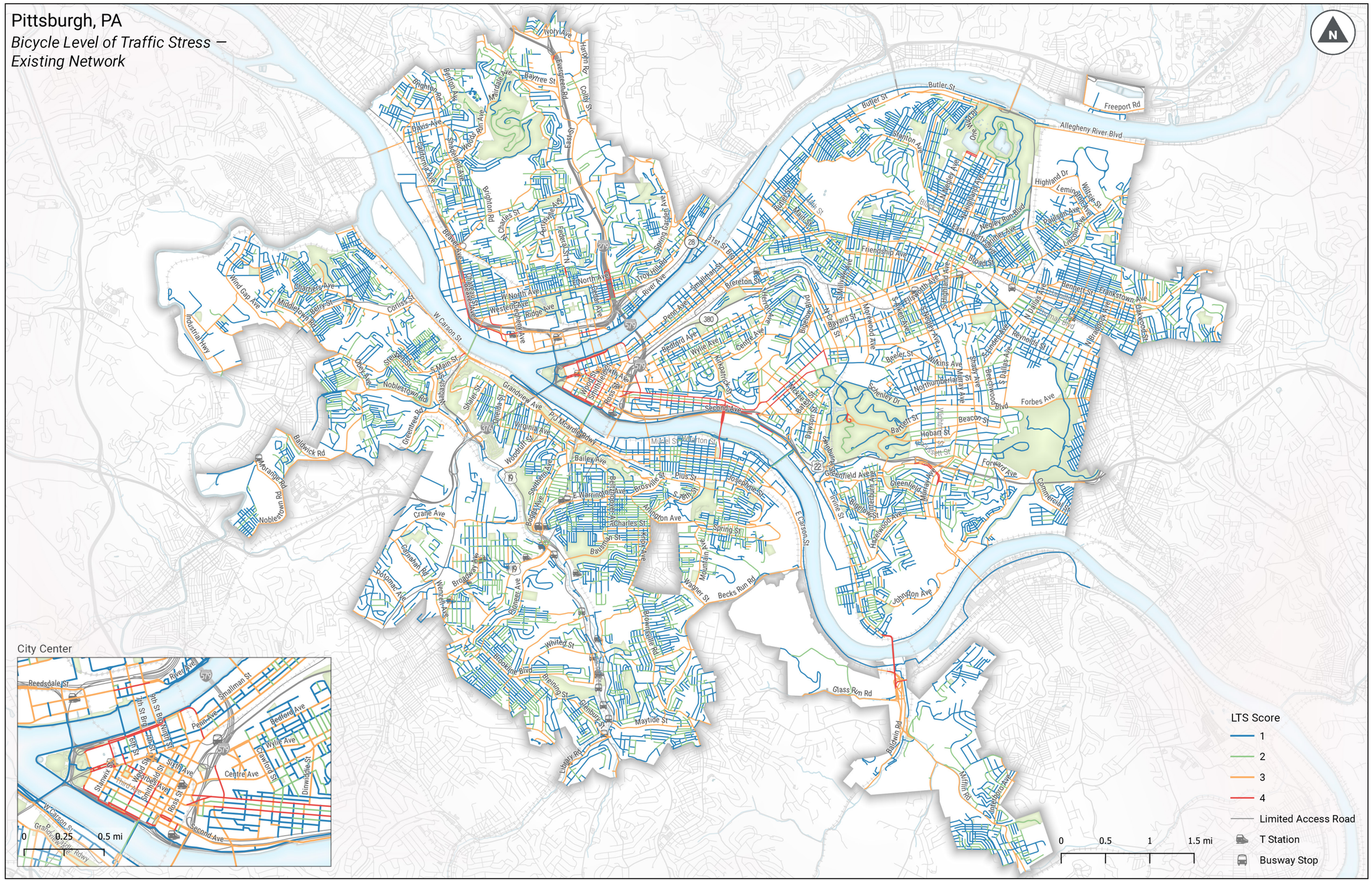
The Bicycling Level of Traffic Stress analysis in this Plan differed from conventional Bicycling Level of Traffic Stress in that it incorporated street slope as a factor contributing to stress. Any street with a slope of 25% or higher was coded as high stress. In addition, streets with slopes between 12% and 25% were classified as high stress if they had a primary, secondary, trunk, or tertiary street classification.

Finally, unlike a typical Bicycling Level of Traffic Stress analysis that assigns scores based on a four-point system, the Bicycling Level of Traffic Stress analysis shown on pages 28-29 and 42-43 uses a two-level system. Segments that scored LTS 1 or LTS 2 on the four-point system were classified as low stress. Segments that scored LTS 3 or LTS 4 were classified as high stress. Combining LTS 1 and LTS 2 into a single category corresponds with the comfort level of a typical adult who is interested in riding a bicycle but concerned about motor vehicle volumes and speeds. Simplifying the LTS scores into these two categories emphasizes the importance of the low-stress network while highlighting existing high-stress gaps.

A map showing Bicycling Level of Traffic Stress (LTS) showing all four stress levels is provided in Figure 17 on the following page.

CITY OF PITTSBURGH BIKE(+) MASTER PLAN JUNE 2020 | APPENDIX B

Figure 17: Bicycling Level of Traffic Stress (LTS) Four Stress Levels

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