

Planning For a Safe Bicycle Network

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Planning For a Safe Bicycle Network

- What Can It Look Like?
- Why Plan a Bicycle Network?
 - Characteristics Of People on Bikes
 - Planning the Bicycle Network
 - Resources to Assist in Planning



What Can It Look Like?

[HTTPS://VIMEO.COM/183441272](https://vimeo.com/183441272)



Why Plan a Bicycle Network?

SAFETY-ACCESS-COMMUNITY HEALTH-EQUITY



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Bicycle Networks:

- Make bicycling a viable transportation method
 - Provide reliable conditions (pavement surface, lighting)
 - Offer direct routes where people on bikes feel comfortable
 - Reduces conflicts with motor vehicles where possible
 - **Improves safety by reducing crashes**



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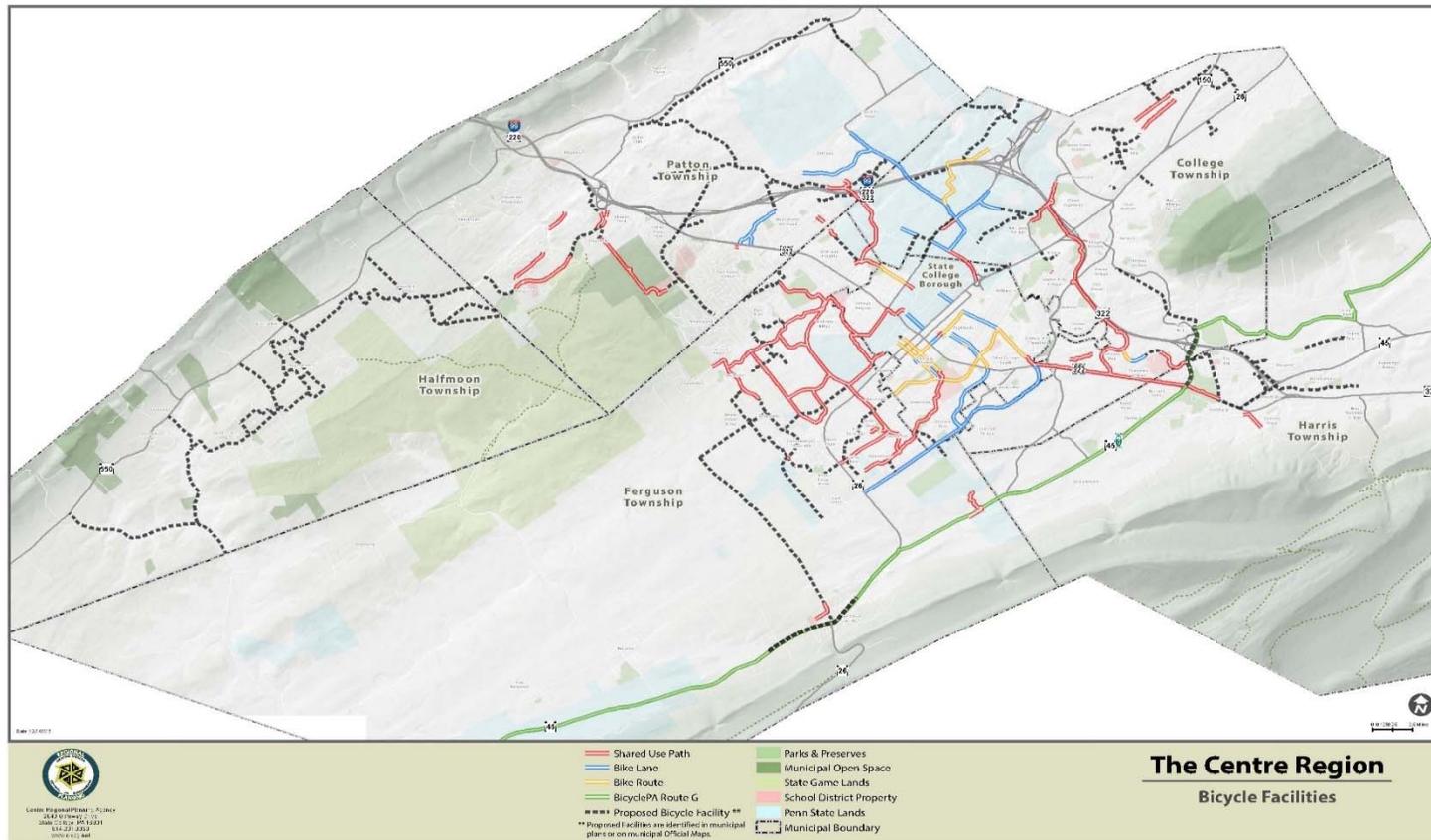
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Bicycle Networks:

- Enhance access to schools, jobs, health care
 - Connects origins and destinations within a community
 - Supports economic growth for a low project cost
 - Reduces demand on motorized network



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Bicycle Networks:

- Promote physical activity and health
 - Builds physical activity into each day – 22 minutes
 - Reduces incidents of chronic disease (high blood pressure, obesity, and diabetes)
 - Reduces health care costs for the community



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Bicycle Networks:

- Creates human-scale places
 - Allows for human social interaction
 - Reduces stress for residents (improved long-term health)
 - Helps people feel comfortable in the built environment
 - Supports a sense of ownership and community



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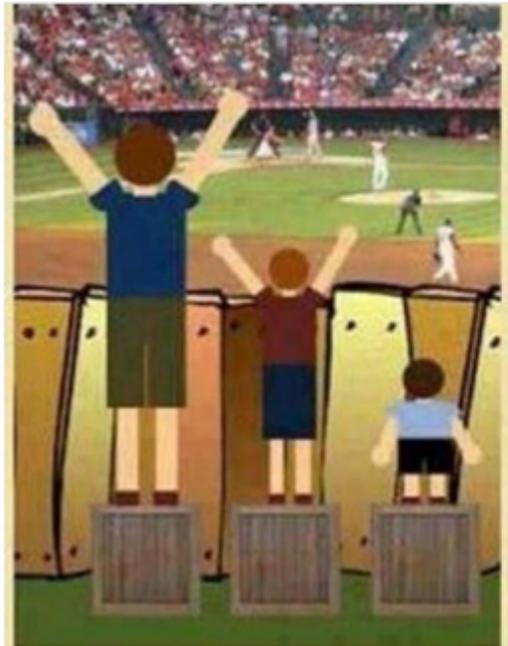
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Bicycle Networks:

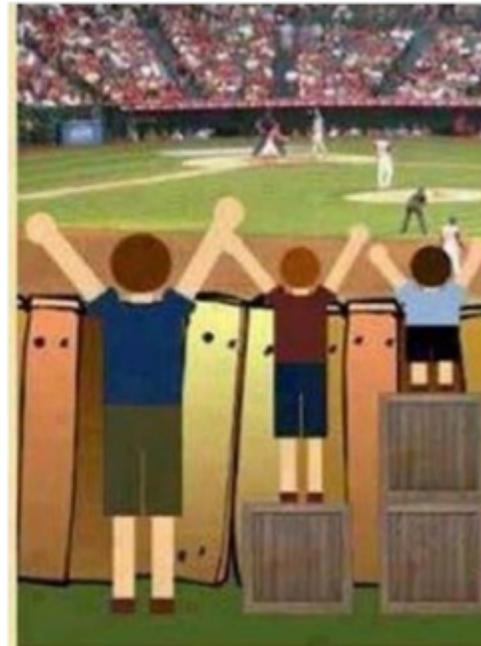
- Promote equity
 - improve the ability of **traditionally underserved communities** to travel safely and conveniently via bicycle
 - Numerous studies have shown that enhancing access for traditionally underserved populations to travel via nonmotorized modes can potentially lead to improved outcomes:
 - public health
 - Safety
 - economic development
 - strengthen inclusive neighborhood relations
 - bolster public transit services

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Equality



Equity



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Twenty four percent of Americans living in poverty do not own a vehicle

Low-income, minority, or immigrant individuals are more likely to have jobs that cause them to commute outside of traditional '9 to 5' hours, **often in the dark** and when public transit services are not operating

Immigrants and those with language barriers are more likely to travel by bicycle but are often **less likely to practice safe bicycling techniques** (such as riding with traffic, using lights, and wearing helmets and reflective clothing)

Immigrants and individuals with language barriers travel more frequently by walking or wheeling than non-immigrants and native English speakers but **are often forced by circumstance to do so along roads lacking safe, accessible pedestrian and bicycle facilities**

People with diverse cultural or religious backgrounds may choose not to own motorized vehicles and **may live where public transportation options are limited**

Characteristics of People on Bikes

WHO ARE WE PLANNING FOR?



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Not this fellow!!



Characteristics of People on Bikes

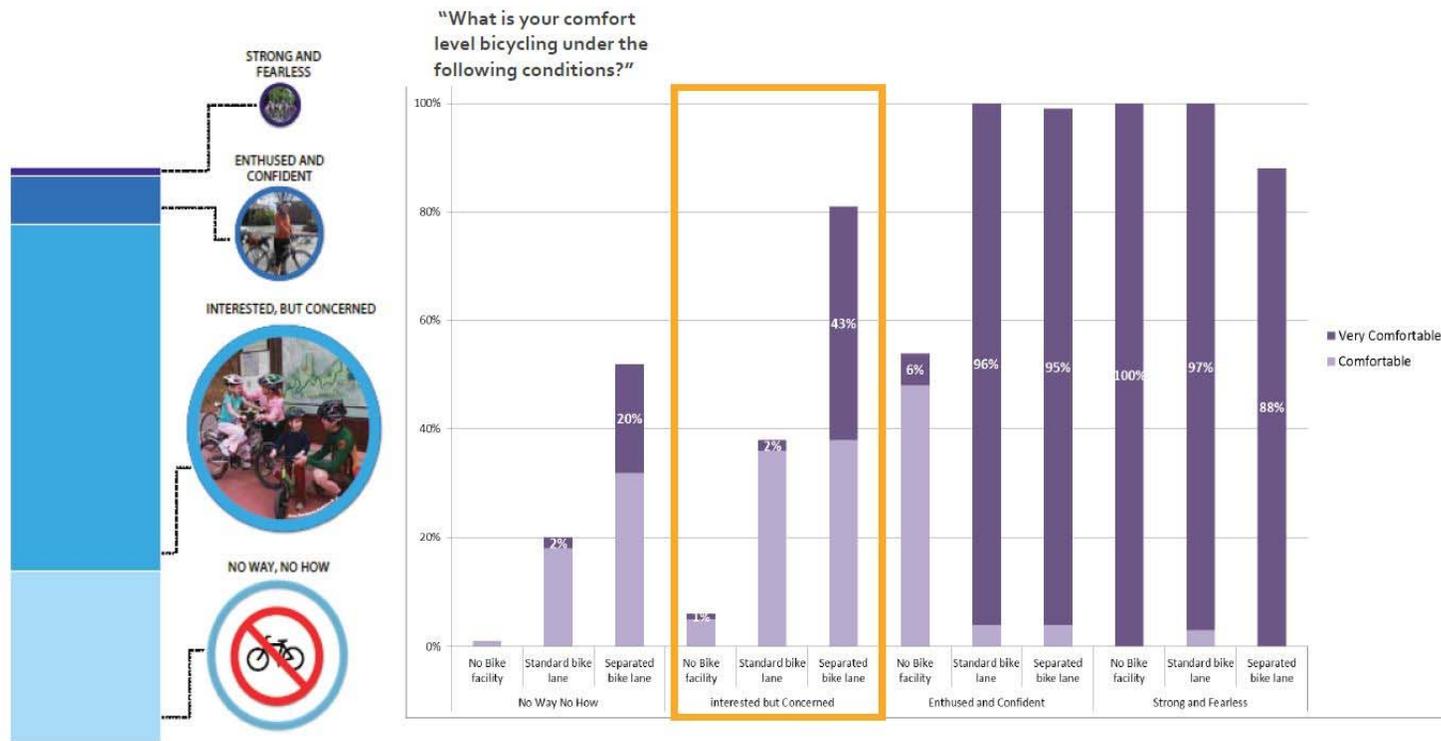
Characteristics of People who ride bikes

- Strong and Fearless – 4%
- Enthused and Confident – 9%
- Interested but Concerned – 56%
- No Way, No How – 31%



Characteristics of People on Bikes

Characteristics of People who ride bikes



Characteristics of People on Bikes

Characteristics of People who ride bikes

Least Separation



SHARROW
(2A)



STANDARD BIKE
LANE (2B)



BUFFERED BIKE
LANE (2C)



TWO-WAY
CYCLE TRACK (2D)



SHARED USE
PATH (2E)

Most Separation

7



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Characteristics of People on Bikes

Characteristics of People who ride bikes



www.bicyclebelleboston.com



Characteristics of People on Bikes

Characteristics of People who ride bikes

- 2:1 more men than women bike in the US
 - On Bike Share the ratio is 3:1
 - In Europe the ration is closer to 1:1
- Their trip length mostly 2 miles or less (74%)
- May be low-income, minority, or immigrant individuals with language barriers



Characteristics of People on Bikes

Characteristics of People who ride bikes



Characteristics of People on Bikes

Characteristics of Bikes

Gearing – three or more gears – 98%

- Low grades can be accommodated

Speed of Travel – varies

- Less than 10mph for children
- 10mph for loaded touring cyclists
- 10-15mph for casual riders on urban streets
- 20mph for experienced commuters

Stopping Distance

- At 20mph the Effective Stopping Distance for the 85% user is 41' on dry pavement and 64' on wet pavement
- Sight Stopping Distance is 127' at 20mph



Characteristics of People on Bikes

Characteristics of Bikes

- Operator Requires 30" minimum physical space
- Bicycle operating space is 4 feet **minimum**
- Bike lanes need a 4' minimum width with FHWA recommending 5' or more
- Bike Length – up to eight feet for a tandem bike



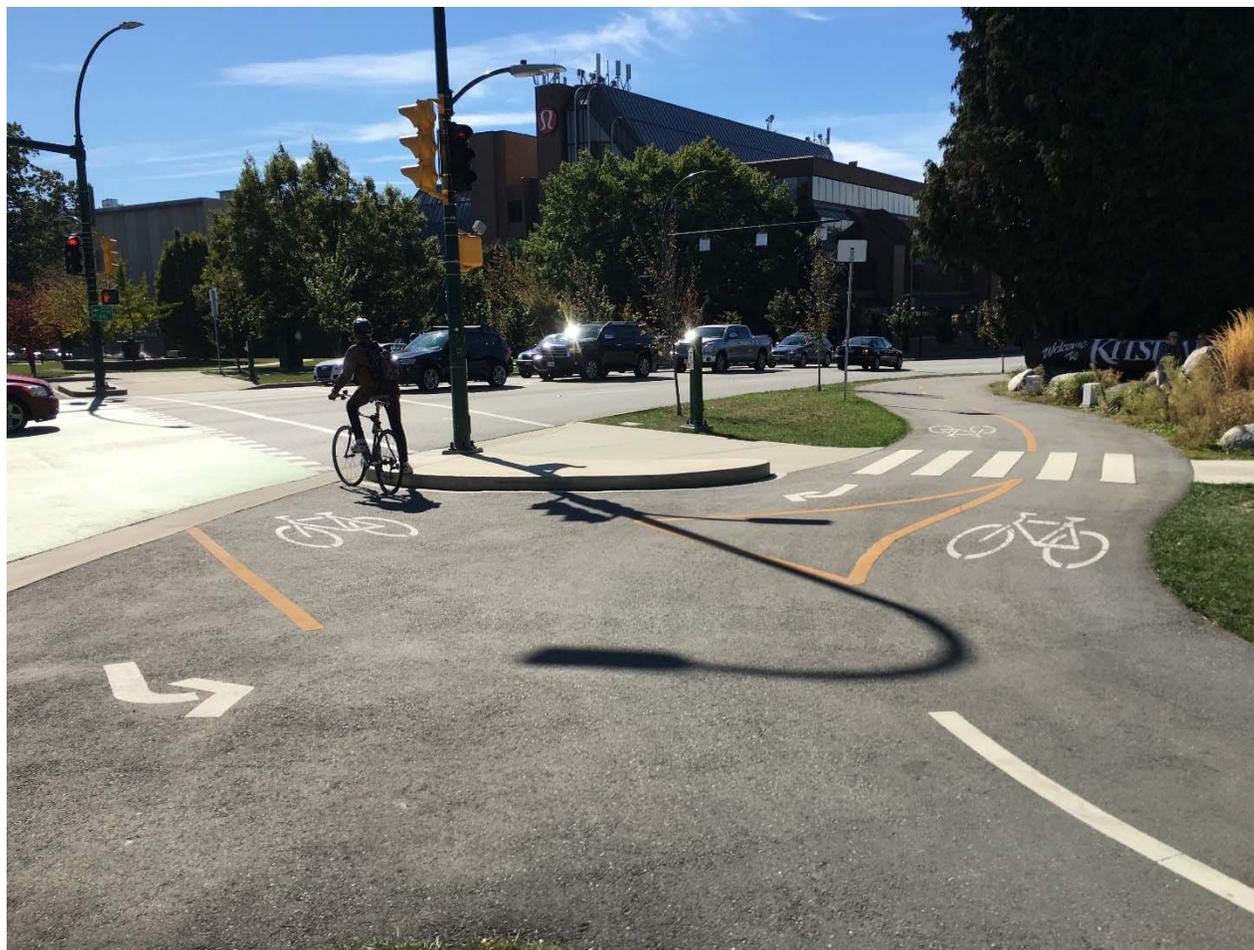
Characteristics of People on Bikes

Additional Issues for Network Planning

- Riders are exposed to weather
- Direct routes preferred but will travel out-of-the-way to avoid hills or threatening traffic conditions
- Need safe places to park their bikes upon arrival
- Wayfinding and signalization needs are different



Characteristics of People on Bikes



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HOW TO GET STARTED



Planning the Bicycle Network

FHWA: Case Studies in Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks

An exemplary pedestrian and bicycle network will satisfy each of these principles. The following sections illustrate each of these principles and provide some examples of how they can be achieved through network development.

These principles include:

- **Cohesion** – How connected is the network in terms of its concentration of destinations and routes?
- **Directness** – Does the network provide direct and convenient access to destinations?
- **Accessibility** – How well does the network accommodate travel for all users, regardless of age or ability?
- **Alternatives** – Are there a number of different route choices available within the network?
- **Safety and Security** – Does the network provide routes that minimize risk of injury, danger, and crime?
- **Comfort** – Does the network appeal to a broad range of age and ability levels and is consideration given to user amenities?



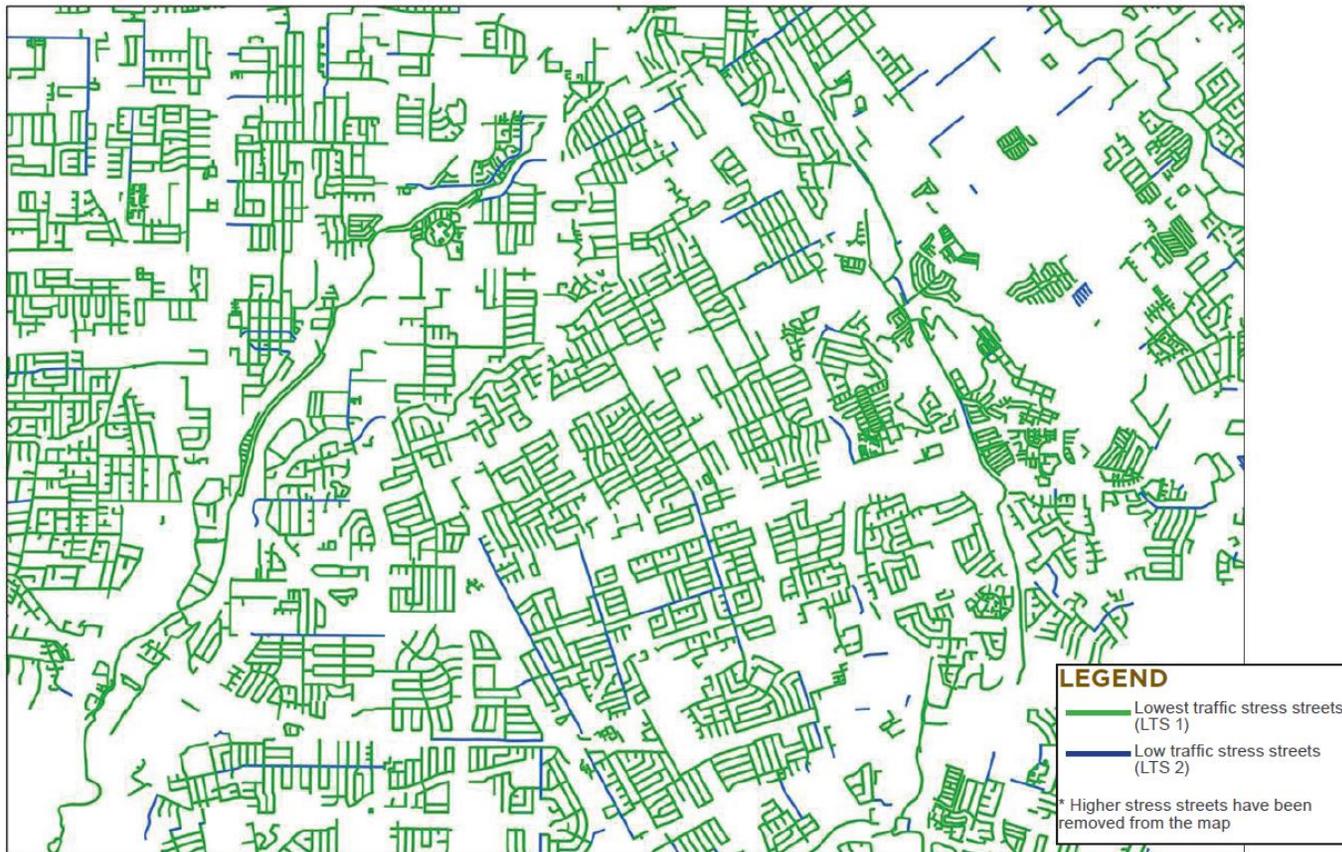
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Bicycle Network Planning is LOCAL

- Remember the usual trip is 2 miles
- Public input identifies needs / priorities / existing routes
- Work on a low-volume and low-stress network
- Crossing arterials is challenging and these can be identified as priorities for projects

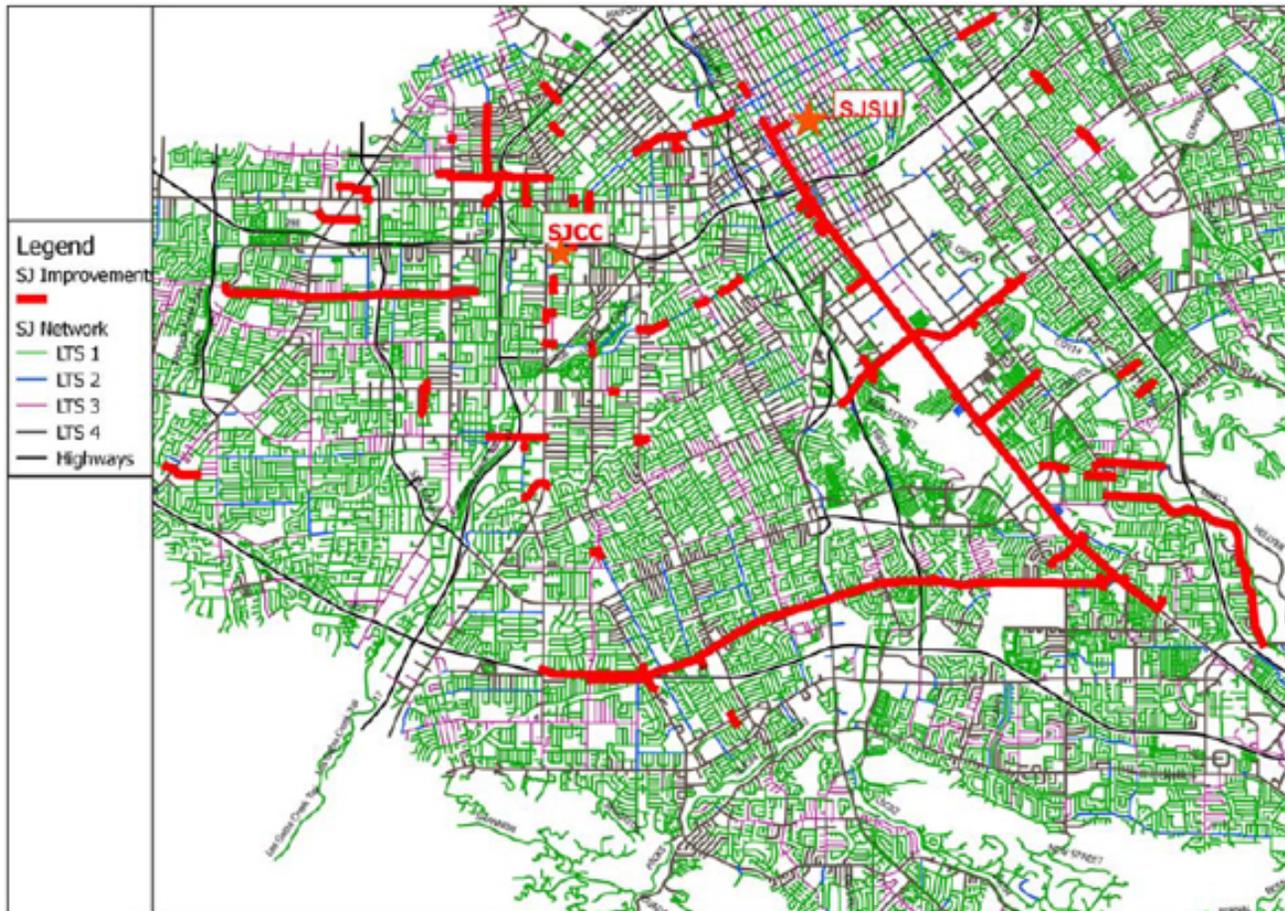


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MAP BASICS

Common approaches for bicycle infrastructure planning maps are highlighted below. The maps that follow demonstrate these general approaches to varying degrees.

(1) COMMON INFORMATION LAYERS

BIKE NETWORK LAYERS

Specific Facility Types

- Bike path, bike lane, buffered bike lane, bike boulevard, separated bike lane, greenway, etc.

OR

Flexible Facility Types

- On-street vs. off-street bikeway systems

LOCAL CONTEXT LAYERS

- Transit lines & stations
- Bikeshare stations
- Community amenities: Schools, universities, libraries, community centers, hospitals etc.
- Building footprints
- Specific land use functions, such as commercial uses
- Study areas or corridors

BASE LAYERS

- Parks & open space
- Streets
- Waterbodies
- City boundaries
- Labels

(2) REPRESENTING DIFFERENT TYPES OF INFORMATION

PROPOSED VS. EXISTING NETWORK

- Identify ways to clearly denote what is existing and what is being proposed.

 Outline	 Dashed
 existing	 existing
 proposed	 proposed

COLOR SCHEME

- Consider how color will play a role in highlighting the bicycle network. Bright, saturated colors stand out against softer and more subdued tones.

LEVEL OF INFORMATION

- Carefully consider the amount of information used to tell the story. More information can help, but it can also be overwhelming if not organized in a seamless way.
- Small icons and symbols can help to identify points of interest in a less obtrusive way

[6] Bike Network Mapping Idea Book

FHWA Guide Book for Bicycle Network Mapping



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(3) LEVEL OF DETAIL ON EXISTING/PROPOSED FACILITY TYPES

Providing more information about facility types requires more complex color schemes and line types.

MULTIPLE LAYERS AND INFORMATION

Example: Boston, pg. 34

This scheme helps to convey multiple facility types and specific street conditions in a clear and easily digestible manner. It can also fully integrate a series of community base layers and contextual information, including supplemental data like bicycle counts or safety information to aid decision making.

Consider a similar palette if creating a map that:

- Identifies specific facility types
- Needs a clear and concise color palette

EXISTING	PROPOSED	BASE LAYERS
Shared-Use Path	Shared-Use Path	Rail Lines & Stations
Cycle Track	Cycle Track	Schools
Buffered Bicycle Lane	Buffered Bicycle Lane	College or University
Bicycle Lane	Bicycle Lane	Bike Share Stations
Shared Road	Contraflow Bicycle Lane	Waterbodies
Bus-Bicycle Lane	Neighborhood	Parks & Open Space
Shared-Lane Marking	Shared Road	Freeways & Arterials
	Bus-Bicycle Lane	Neighborhood Streets
	Advisory Lane	
	Priority Shared Lane	
	Shared-Lane Marking	
	Suggested Local Routes	

FLEXIBLE NETWORK MAPS

Example: Cedar Rapids, pg. 42

This scheme helps to convey a bicycle network that does not identify specific facility types.

Consider a similar palette if the map:

- Is not intended to identify specific facility types
- Is focused on existing & proposed routes

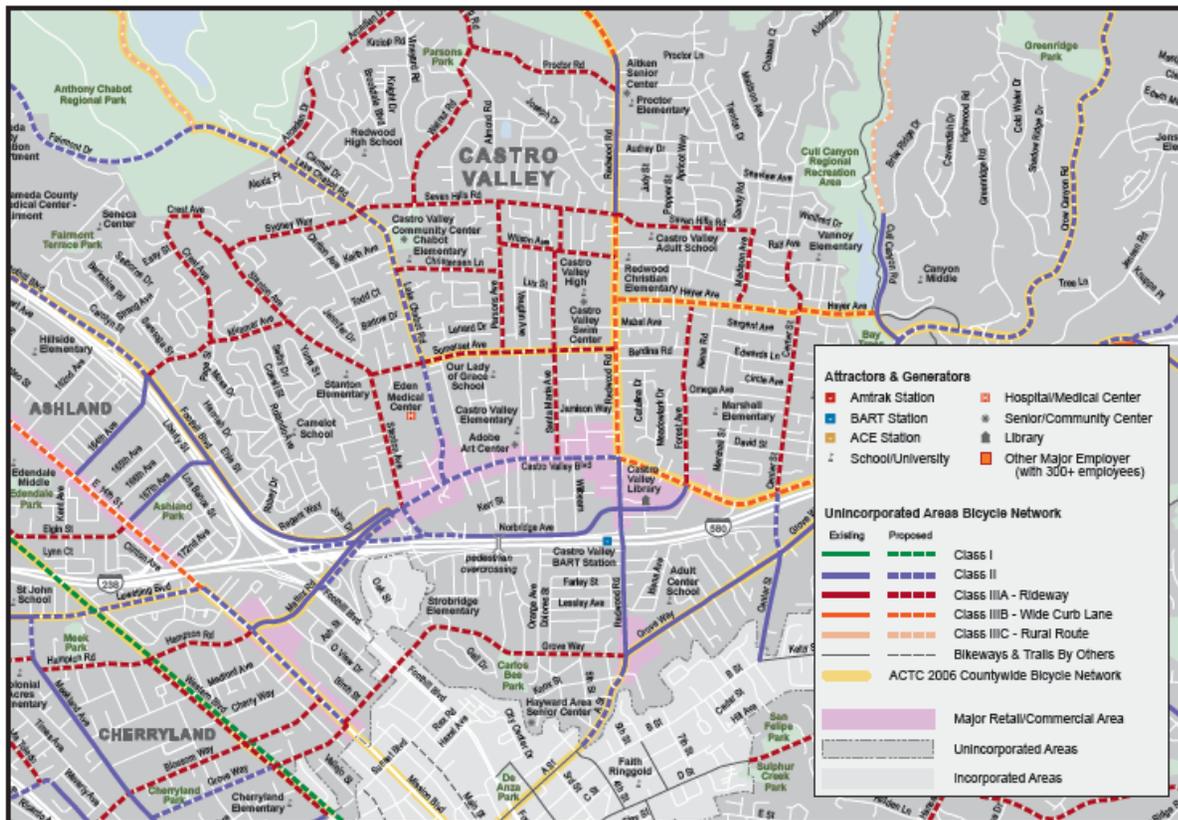
EXISTING	PROPOSED	BASE LAYERS
Existing On-Street	Proposed On-Street	Rail Lines & Stations
Existing Off-Street	Proposed Off-Street	Schools
		College or University
		Bike Share Stations
		Waterbodies
		Parks & Open Space
		Freeways & Arterials
		Neighborhood Streets

FHWA Guide Book for Bicycle Network Mapping



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COUNTY



Bike Network Mapping Idea Book [19]

Alameda County, CA – 2016 FHWA Guidebook for Bicycle Network Mapping



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Who Can Develop a Bicycle Network Plan?

- MPO's can do this work as part of the Long Range Transportation Plan by incorporating local plans
- Municipal Governments update local comp plans
- These support pre-scoping of projects



Resources to Assist in Planning



Resources to Assist in Planning

PlanWorks Website

PlanWorks is a Web resource that supports collaborative decision making in transportation planning and project development.

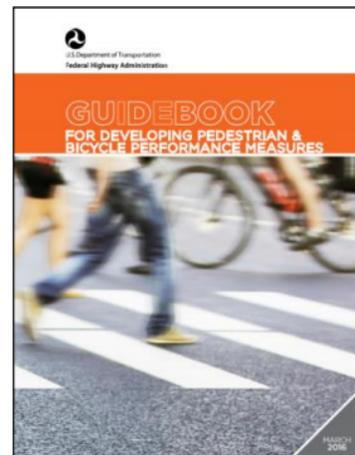
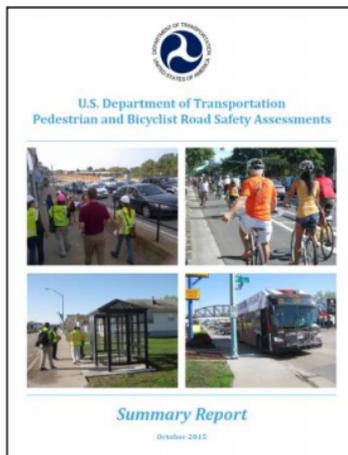
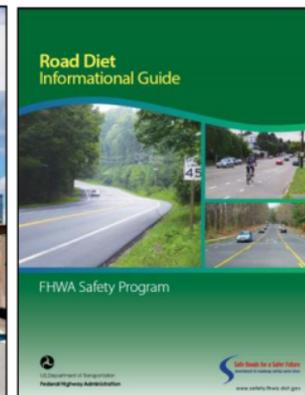
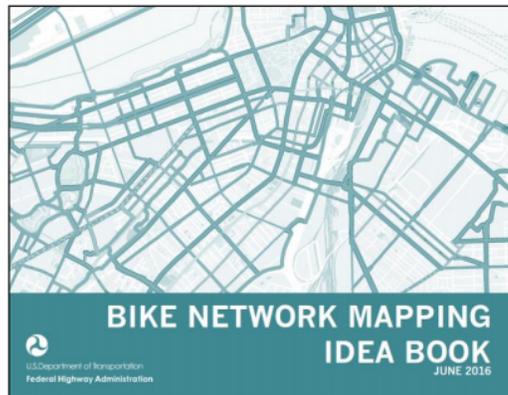
PlanWorks is built around key decision points in long-range planning, programming, corridor planning, and environmental review.

PlanWorks suggests when and how to engage cross-disciplinary partners and stakeholder groups. This system can help build consensus throughout these processes.

<https://fhwaapps.fhwa.dot.gov/planworks/>

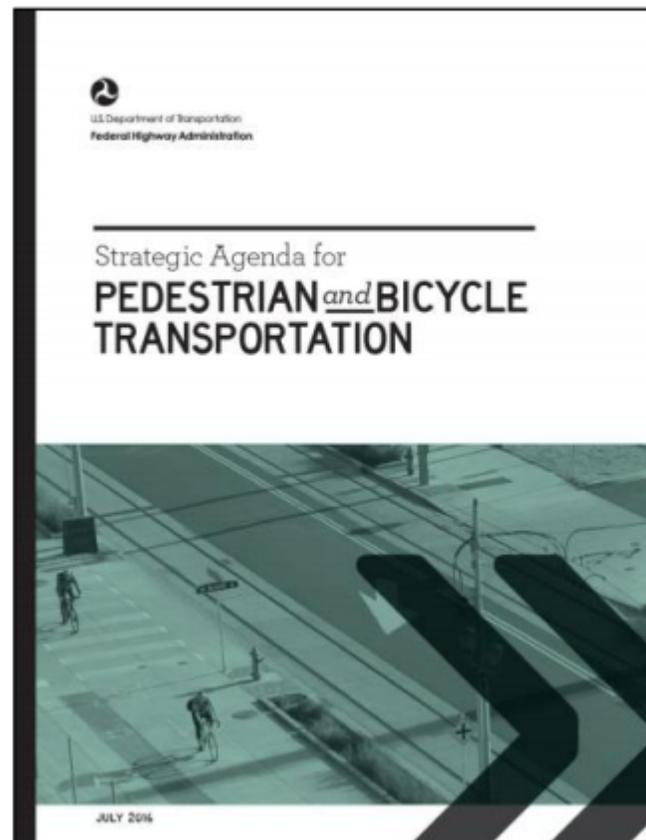
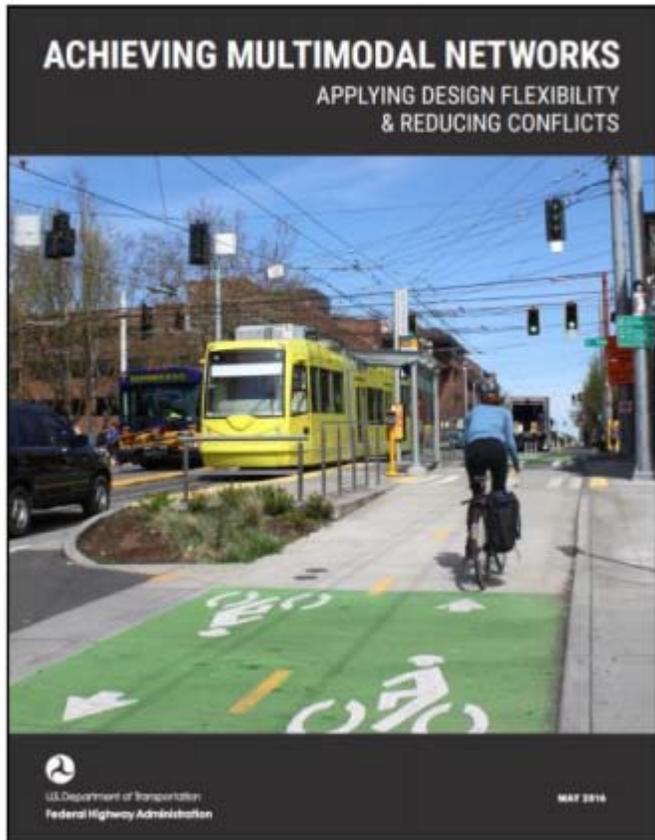


Resources to Assist in Planning



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Resources to Assist in Planning

Fall of 2016

Multimodal Networks in Small Towns and Rural Communities

FHWA's Website

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/



Resources to Assist in Planning

PennDOT's Draft Policy Statement

PennDOT shall make accommodations for bicycling and walking a routine and integral element of planning, project development, design, construction, operations, and maintenance.



Resources to Assist in Planning

Contact Information

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