

# Making Multimodal Friendly Networks

MetroPlan Flagstaff Workshop  
Wednesday, May 4, 2022  
Amy Rosepiler and Doug Cobb



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## Who are we?



**Amy Rosepiler, PE**

- Multimodal Engineer
- 20+ years of experience
- Urban Design and “Complete Streets”
- Bicycle and Pedestrian Facilities

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**Douglas Cobb, PhD, PE, PTOE, RSP<sub>21</sub>**

- Traffic Safety Engineer
- 10+ years of experience
- Human Factors and Safety
- Bicycle and Pedestrian User Comprehension

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## Workshop Rules

- ▶ We encourage people to answer each question, but it is fine to abstain from discussing specific topics if you are not comfortable.
- ▶ All responses are valid—there are no right or wrong answers.
- ▶ Respect the opinions of others even if you do not agree.
- ▶ Try to stay on topic; we may need to interrupt so that we can cover all the material.
- ▶ Speak as openly as you feel comfortable.
- ▶ Help protect others' privacy by not discussing details outside the group.



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## POLLEVERYWHERE Instructions

- ▶ We will with POLLEVERYWHERE to get your input
- ▶ Two forms to respond:
  - ▶ [Pollev.com/burgessnipl738](https://pollev.com/burgessnipl738) OR
  - ▶ Text **BURGESSNIPL738** to **22333** once to join, then select, type, or respond accordingly
- ▶ The questions will be a combination of the following:
  - ▶ Multiple Choice
  - ▶ Word Cloud
  - ▶ Open Responses



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## Outline

- ▶ Changing the Car-Centric Culture
- ▶ Ped and Bike Connectivity, Safety, and Comfort
- ▶ Best Practices
- ▶ What have we learned?



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**What words come to mind when you think of a "Multi-modal Friendly City"?**

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**Why do you think people choice NOT to walk or bike for various trips (e.g., work; shopping; leisure)?**

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# Changing the Car-Centric Culture

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## Changing the Car-Centric Culture



- ▶ Safe Streets for Bicyclists and Pedestrians



- ▶ Changing Land-Use Development



- ▶ Incentivize vs. Penalizing Transportation Modes



- ▶ Tipping Point



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## Changing the Car-Centric Culture Safe Streets for Bicyclists

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## Changing the Car-Centric Culture

### Safe Streets for Bicyclists

- ▶ Less than 3% of all trips in USA are by bike
- ▶ For every 3 men that cycle, only 1 woman cycles
- ▶ Cycling Mode Splits
  - ▶ Copenhagen (Denmark) - 49%
  - ▶ Amsterdam (Netherlands) - 35%
  - ▶ Portland, OR (USA) - 5% (Considered America's Premier Biking City)
- ▶ Need to know who we are planning for to grow the demand!
  - ▶ Cyclists Typology

Boomed in Late 70s, due to energy crisis, fueled car free Sundays and community support for bicycle friendly communities!

In 2018, nearly 5 times (650,000 vs 150,000) as many bicycles than cars in Copenhagen.



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## What type of Cyclist are you?

- Strong and Fearless (i.e., regular riders and willing to ride on-street with vehicles and traffic)
- Enthusied and Confident (i.e., occasional riders and willing to ride with on-street bicycle facilities)
- Interested but Concerned (i.e., currently ride sparingly or never, but would ride more if good and safe infrastructure was provided, specially separated facilities)
- No Way, No How (i.e., will never get on a bike to ride, regardless of the infrastructure)

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# Changing the Car-Centric Culture

## Safe Streets for Bicyclists

- ▶ Cyclists Typology (Roger Geller 2005, validated by Jennifer Dill 2012)
  - ▶ Strong and Fearless (<1%)
  - ▶ Confident and Enthused (7%)
  - ▶ Interested but Concerned (60%)
  - ▶ No Way, No Way (33%)
- ▶ Interested but Concerned?
  - ▶ Want to cycle, but need to facilities to feel comfortable and safe.
  - ▶ Infrastructure: Separated facilities (e.g., buffered bicycle lanes, cycle tracks, shared-use path)



"Having to share the road or space with vehicle is main reason for not bicycling!"

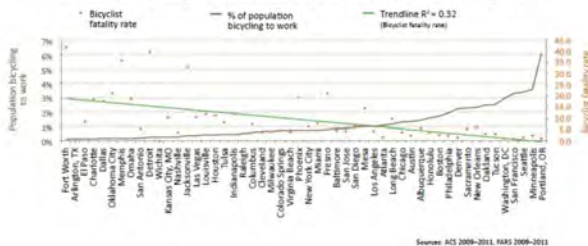


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# Changing the Car-Centric Culture

## Safe Streets for Bicyclists

Comparing Bicycling to Work and Bicyclist Fatality Rates in Large Cities



Alliance for Biking & Walking, fatality rate is per 10,000 commuters

<https://www.washingtonpost.com/news/wnp/wp/2014/04/17/actually-cyclists-make-city-streets-safer/>

- ▶ Bicyclists make streets safer!
  - ▶ Slower speeds typically on bicycle friendly roadways
  - ▶ Safety in Numbers (exposure increases awareness increases safety)
- ▶ Ways to make Streets safer for Cyclists:
  - ▶ **Connectivity**
  - ▶ **Comfort**
  - ▶ **Accessibility for Origin/Destination**



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# Changing the Car-Centric Culture

## Safer Streets for Pedestrians

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### What type of pedestrian are you?

- All the Time, Anywhere (i.e., walk for most trips, including to work, school, shopping, for fun and exercise)
- Sometimes, for Some Reasons (i.e., walks sometimes, such as to the store or for fun, or exercise)
- Recreational (i.e., walks long distance primarily for recreation and exercise)
- Infrequently, Short Distances (walks short distance, such as around the block or from a parked car and back)

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# Changing the Car-Centric Culture Safer Streets for Pedestrians

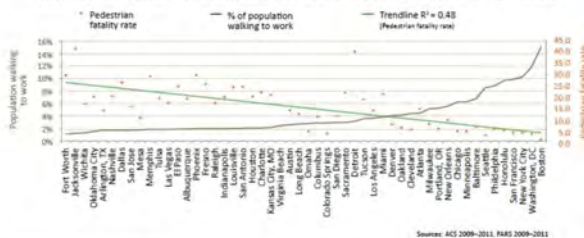
- ▶ Pedestrian Challenges
  - ▶ People with mobility, sensory, cognitive limitations
  - ▶ Children
  - ▶ Older Adults
- ▶ Why do people chose not to walk?
  - ▶ No dedicated facilities for walking
  - ▶ Too far to reach destination
  - ▶ No / poor lighting
  - ▶ Barriers / unsafe crossings /
  - ▶ Poor connectivity
  - ▶ Weather
  - ▶ Maintenance



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# Changing the Car-Centric Culture Safer Streets for Pedestrians

Comparing Walking to Work and Pedestrian Fatality Rates in Large Cities



Alliance for Biking & Walking

<https://www.washingtonpost.com/news/wnk/wp/2014/04/17/actually-cyclists-make-city-streets-safer/>

- ▶ Ways to make Streets safer for Pedestrians:

- ▶ Appropriate sidewalk widths
- ▶ Curb extensions
- ▶ High visibility crossings & enhancements
- ▶ Shorter crossings (minimize exposure)
- ▶ Pedestrian level lighting



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# Changing the Car-Centric Culture

## Changing Land-Use Development

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### What type of development do you live in?

- Single Family Residence without Commercial Development Integrated
- Single Family Residence with Commercial Development Integrated
- Multi-Family Residential (Apartment/Condo) without Commercial Development Integrated
- Multi-Family Residential (Apartment/Condo) with Commercial Development Integrated

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## Changing the Car-Centric Culture

### Changing Land-Use Development

- ▶ Moving away from single family developments and moving towards multi-use developments
  - ▶ 75% of residential land is Single Family Zoning
  - ▶ Problems with Single Family Zoning
    - ▶ Racial Impact - displacement of communities
    - ▶ Surges Car-Use - Little Development opportunities
  - ▶ Need to create 20-minute cities!
    - ▶ Being able to get to everything (e.g., school, jobs, work, shopping) within 20-minute walking
    - ▶ Up zoning near transit
    - ▶ Bike-Share (easy access)/Micromobility - 1<sup>st</sup> mile/Last Mile
    - ▶ Equitable - Representative, Accessibility, and Displacement Prevention



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## Changing the Car-Centric Culture

### Changing Land-Use Development

- ▶ Studies show that land use improves non-motorized travel
  - ▶ *Green Space Improvements*
    - ▶ Parks/Lawn has been positively correlated with bicycle usage (Frank et al., 2005)
  - ▶ *Restaurants/Businesses*
    - ▶ Restaurants close to a bike station increase usage (Faghih-Imani et al., 2014)
    - ▶ Recreation/Businesses significantly contribute to bicycle usage (Faghih-Imani et al., 2017)
  - ▶ *Land Use Mixes*
    - ▶ Neighborhoods with higher mix of land uses bicycle more (Handy et al., 2005; Zhao et al., 2020)
    - ▶ High land use levels and diversity lead to easier access to services and facilities (Duncan et al., 2010)



<https://www.wharfdc.com/wharf/>



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# Changing the Car-Centric Culture

## Incentivizing vs. Penalizing Transportation Modes

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**If you were given incentives (e.g., money; company benefits, etc.) for walking/biking to work, would you?**

Yes

No

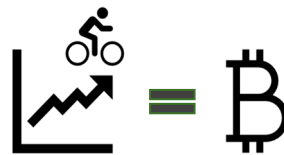
Depends

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## Changing the Car-Centric Culture Incentivize vs. Penalize Transportation Modes

- ▶ Driving is often convenient and cheap (especially outside of urban developed areas)
- ▶ Congestion Pricing
  - ▶ Drivers to pay fee for driving in high-traffic areas (e.g., London, NYC (maybe))
  - ▶ Hurts low income communities
  - ▶ Note: Need walking, bicycling, and transit facilities adequate to accommodate this
- ▶ Incentivize individuals for walking and biking
  - ▶ Benefits through Jobs (Sonos; Seattle Childrens; Sunpower)
    - ▶ Money Back; Gifting Bikes; Bike Hubs
  - ▶ Programs through Education
    - ▶ Bike to Work; Bike to School;
  - ▶ Health Benefits



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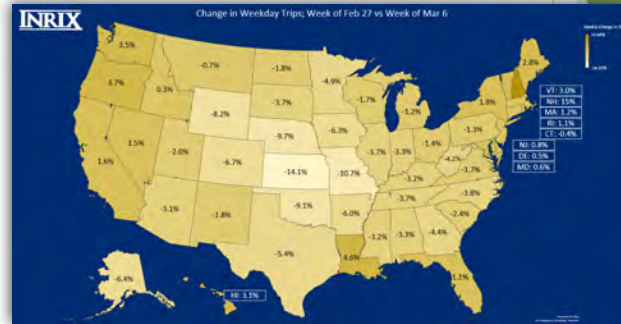
## Changing the Car-Centric Culture Tipping Point

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## Changing the Car-Centric Culture Tipping Point

- ▶ **Pandemic?**
  - ▶ Anxiety over Public Transit (certain cities and states)
  - ▶ Surge in Exercise and need to get outside
  - ▶ Push to change the landscape of streets
- ▶ **Gas Prices?**
  - ▶ Gas prices exceeding \$4 dollars a gallon
  - ▶ States with longest trip length saw decreases in trips



Credit: Inrix



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## Ped & Bike Connectivity, Safety and Comfort

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# Ped & Bike Connectivity, Safety, and Comfort

## Ped & Bike Connectivity

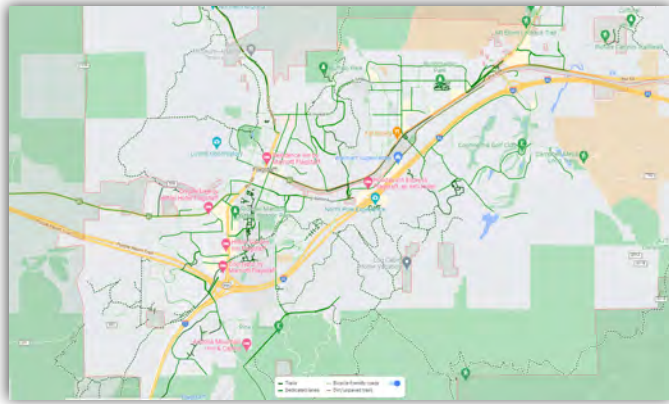
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**What comes to mind when you think of pedestrian and bicycle network connectivity?**

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# Ped & Bike Connectivity



Source: Google Maps

## Characteristics of Good Connectivity

- ▶ Network Completeness
- ▶ Network Density
- ▶ Route Directness
- ▶ Access to Destinations
- ▶ Network Quality

[https://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/publications/multimodal\\_connectivity/#toc502339719](https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_connectivity/#toc502339719)



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# Ped & Bike Connectivity Network Completeness

## ▶ Network Completeness

- ▶ Things to consider:
  - ▶ How complete is the existing bicycle and ped network?
  - ▶ How complete is the planned bicycle and ped network?
  - ▶ How much of the network (i.e., streets and intersections) contains active transportation (e.g., pedestrian and bicyclist) infrastructure or facilities?
- ▶ Measurement of this?
  - ▶ Percent of planned facility miles
  - ▶ Percent of street miles with non-motorized facilities
  - ▶ Percent of street miles that meet LOS and low stress networks



Total Roadway Network



Bike Specific Network



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## Ped & Bike Connectivity Network Density

### ► Network Density

- Things to consider:
  - Do designated bicycle and pedestrian facilities allow people to travel between destinations
- Measurements of this?
  - Roadway Density of Active Transportation Facilities
  - Intersection Density of Active Transportation Facilities



Total Roadway Network



Bike Specific Network

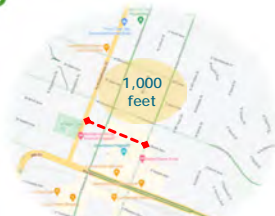


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## Ped & Bike Connectivity Network Directness

### ► Network Density

- Things to consider:
  - Do non motorized users travel throughout a community on direct routes (e.g., on designated or safe facilities)
- Measurements of this?
  - Safest path vs. shortest path
  - Ability to create easiest path from origin and destinations



Direct Route



Route with Designated Bike Facilities

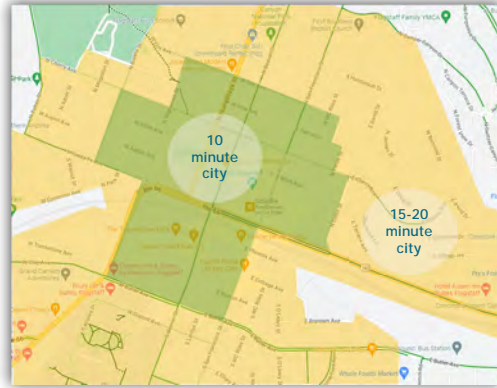


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## Ped & Bike Connectivity Network Access

### ► Network Density

- Things to consider:
  - Do active transportation facilities connect to popular destinations?
- Measurements of this?
  - Walkshed (area reachable by foot)
  - Bikeshed (area reachable by bike)
  - Number of jobs accessed by active transportation



Walkshed for 10-minute and 15-20 minute City



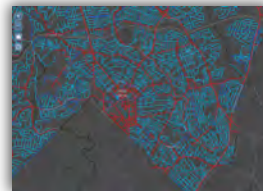
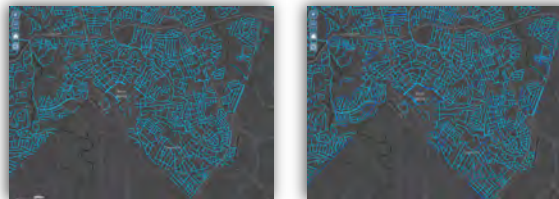
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## Ped & Bike Connectivity Network Quality

### ► Network Quality

- Things to consider:
  - Quality of the connectivity?
  - Do roadways have designated facilities? If so, what condition?
  - Are routes to and from places accessible via dedicated infrastructure?
- Measurements of this?
  - LOS (Bicycle; Ped)
  - Bicycle Route Quality
  - Level of Traffic Stress

Montgomery County – Bicycle Stress Maps



<https://mcatlas.org/bikestress/>



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# Ped & Bike Connectivity, Safety & Comfort Bike Safety & Comfort

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**When you think of Bicycle Safety and Comfort, what comes to mind?**

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# Which Bicycle Infrastructure do you prefer?

A

B



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## Which bicycle infrastructure do you prefer?

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# Bike Safety and Comfort

- ▶ Creating networks that provide facilities that are safe and comfortable is key to increasing the mode share!
- ▶ Questions to Ask:
  - ▶ Is this roadway or intersection safe for bicyclists?
  - ▶ Is there designated infrastructure for cyclists?
  - ▶ Are cyclists visible and given priority?
- ▶ Type of Infrastructure:
  - ▶ Bike Lanes (increase in ridership by Dill and Car, 2003; Parkin et al., 2008; Pucher and Buehler, 2005)
  - ▶ Cycle Tracks (increase in 20% ridership in Copenhagen by Jensen, 2008; decrease in crashes and 58% increase in riders by Transport for London, 2004)
  - ▶ Intersections Treatments (studies show increase in bicyclist comfort with bike box present by Newman, 2022; Rodgers, 2005; Wall et al., 2003)
  - ▶ Bicycle Signals (reduction in crashes with separate bicycle phase by Korve and Niemeier, 2002)
  - ▶ Bikeway Signing and Marking
  - ▶ Bicycle Boulevards (studies find that people go out of their way to find bicycle boulevard, specifically women and less experience cyclists by Dill and Giebe, 2008)



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# Bike Safety and Comfort

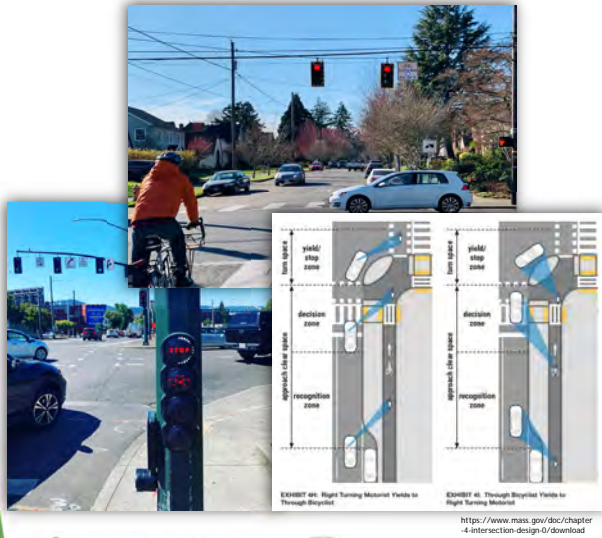
## Things to Consider

- ▶ **Bike Lanes**
  - ▶ **Standard**
    - ▶ Used for Medium to low volume with speeds 25mph and less
    - ▶ 5-6 feet wide
    - ▶ Consideration for parking integration
  - ▶ **Buffered**
    - ▶ Used when separated bike lanes are not feasible
    - ▶ 3-foot wide buffer
    - ▶ Consideration of Dooring
  - ▶ **Left Side**
    - ▶ Used to medium to low volume with speeds 25mph and less
    - ▶ Avoids conflicts with parked cars
    - ▶ Right-Turns at intersections is of concern
  - ▶ **Contraflow**
    - ▶ May require physical separation
    - ▶ May require enhanced signing and pavement marking
- ▶ **Separated Bike Lanes**
  - ▶ **One-Way**
    - ▶ Used for higher volume, higher speed, complex roadways
  - ▶ Lane may be elevated to sidewalks
  - ▶ 5-7 feet wide + 1-3 foot buffer
  - ▶ Requires snow/street cleaning
- ▶ **Two-Way**
  - ▶ 8-14 wide plus 1-3 foot buffer
  - ▶ Requires additional signing and marking, especially at intersections
- ▶ **Intersections**
  - ▶ Bike Signals and how they get integrated into the intersection
  - ▶ Proper signage, marking and designated space at intersection (e.g., Bike Box; Two-Stage Bike Left-Turn Staging area; Lane line extension thru intersection)
- ▶ **Shared Use Paths**
  - ▶ Usually along active corridors such as abandoned rails, utility easements, etc.
  - ▶ Should always try to be greater than 10 feet but aim 14-16 feet wide
  - ▶ Requires specialized intersection treatments
  - ▶ Volumes may warrant separation between bicyclists and pedestrians (i.e., 300 users per hour, with 30% peds)
  - ▶ Permeable asphalt for green infrastructure and better for inclement weather
  - ▶ Inclusive, Equitable, and well lit!



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## Bike Safety and Comfort



<https://www.mass.gov/doc/chapter-4-intersection-design-0/download>



### Potential Challenges

- ▶ Interactions with vehicles
  - ▶ Separated Facilities and driver awareness when turning or changing lanes
  - ▶ Mixing Zone awareness, pavement markings, and signage
  - ▶ Passing distance and what is appropriate
- ▶ Way Finding and Signage
  - ▶ Discontinuity of bicycle infrastructure and not knowing where to go
  - ▶ Signage or lack of for bicyclists and motorists
- ▶ Facility Design
  - ▶ Designing for the right users (i.e., women; interested but concerned; 8-80 year olds)
  - ▶ Infrastructure to stop bad cyclist behavior (e.g., detection; bicycle signals; dedicated space)

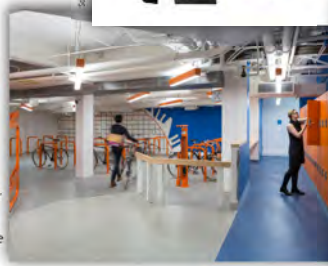
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## Bike Safety and Comfort

- ▶ Additional Considerations that Change the Bike Experience
  - ▶ What to use when biking?
    - ▶ Human Wear
      - ▶ Make yourself visible (i.e., wear retroreflective materials and/or vest so that you are visible during daylight/nighttime conditions)
      - ▶ Helmet - to ensure that a user is always protected
    - ▶ Bicycle Wear
      - ▶ Headlight for viewing in front
      - ▶ Tail Light so vehicles behind can see you
      - ▶ Florescent paint on bike to make visible
      - ▶ Side and Rear-View Mirrors for movement changes
      - ▶ Bell to warn other users on routes
      - ▶ U-Lock for security when parking
  - ▶ Providing bike parking and facilities at origin and destination points
    - ▶ Showers and locker rooms at Work
    - ▶ Security to ensure that people feel safe leaving their bike
    - ▶ Storage for bicycle wear and content so doesn't have to be taken into the office



source: Bicycle Alliance of Minnesota



<https://bikemakelifebetter.com/bike-parking-for-employers-developers-a-guide-to-end-of-trip-facilities/>



<https://ehabitat.com/glass-enclosed-bike-transit-center-opens-in-downtown-washington-dc/>



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# Bike Safety and Comfort

▶ Additional Consideration that Change the Experience

▶ Inclement and Winter Weather

▶ Proper Maintenance of bicycle infrastructure

- ▶ Ensuring things are plowed
- ▶ Ensuring that refurbishment is considered due to inclement weather

▶ Proper Etiquette for Winter

- ▶ Be visible as driver's don't expect bicyclist
- ▶ Choose route carefully (i.e., some routes melt quicker vs. some remain snowy and icy)
- ▶ Proactive Bike Safety
  - ▶ Keep brakes, tires, and conditions of the bike in proper order, as they are much more sensitive in inclement weather conditions
  - ▶ Work on low gears to get through snow

▶ Be aware of weather and light conditional changes!



City of Madison, Wisconsin

- 55 miles of shared use paths
- 133 miles of bike lanes
- 116 miles of signage
- Plowing
  - Bike paths are plowed immediately after storms to ensure usability; Sometimes snow windrows are present from plowing
  - Bike lanes are often at the edge of pavement so they get snow accumulations
- Limitations
  - Deicing is dependent on salt movement and mixing from vehicles, so bike lanes often take longer or are not as clear
  - Parking issues: if vehicles are parked adjacent to bike lanes, hard to plow to edge of pavement.

<https://www.cityofmadison.com/bike/madison/getBiking/winter.cfm>



<https://www.active.com/cycling/articles/why-i-bike-in-cold-weather-and-how-you-can-too>

## Ped & Bike Connectivity, Safety & Comfort Ped Safety & Comfort

## When you think of Pedestrian Safety and Comfort, what comes to mind?

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## Ped Safety and Comfort

- ▶ Creating networks that provide facilities that are safe and comfortable is key to increasing the mode share!
- ▶ Questions to Ask:
  - ▶ Is this roadway or intersection safe for pedestrians?
  - ▶ Is there designated infrastructure for pedestrians?
  - ▶ Are pedestrians visible and given priority?
  - ▶ Are there places (e.g., intersections; midblock) to cross?
- ▶ Type of Infrastructure:
  - ▶ Sidewalks
  - ▶ Shared-Use Paths
  - ▶ Pedestrian Crossings (e.g., HAWK, RRFB, MPS)
  - ▶ Mid-Block Crossings
  - ▶ Pedestrian Signals (e.g., Countdown Signals; LPI; Audible)



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## Ped Safety and Comfort

### Things to Consider

- ▶ Sidewalks/Share-Use Paths
  - ▶ Are the facility wide enough?
  - ▶ Continuous and provide access between destinations?
  - ▶ Buffer from traffic?
  - ▶ Wayfinding?
- ▶ Intersections
  - ▶ Curb Extensions
  - ▶ Minimize Crossing Distance
  - ▶ High Emphasis Crosswalks: Separated Ramps and Detectable Warning Pads; Separated Push Button Signals
  - ▶ Crosswalks on all sides
- ▶ Pedestrian Signals
  - ▶ Pedestrian Priority (e.g., LPI)
  - ▶ Limited conflicts (i.e., limited conflicting movements such as permitted left-turns during concurrent Ped Phase)
  - ▶ Ped Countdown Signals with Adequate crossing and clearance time (i.e., determining if different walking speeds are needed based on local conditions) and determine need for audibility
- ▶ Pedestrian Crossings
  - ▶ Marked and signed
  - ▶ Proper conditions to warrant various types of Crossings (e.g., HAWK; RRFB; MPS)

### Potential Challenges

- ▶ People with Mobility Limitations
  - ▶ Uneven pavement and sidewalks
  - ▶ Landing pads and proper connection for ADA users
  - ▶ Long distances
  - ▶ Things that require reaction times
- ▶ People with Sensory Limitations
  - ▶ Lack of non-visual information
  - ▶ Complex intersections
  - ▶ Lack of information for safe and accommodating crossings (e.g., detectable warning; crossing time)
- ▶ Children/Older Adults
  - ▶ Inability to judge gaps (C;AD)
  - ▶ Impulsive (C)
  - ▶ Lack of experience (C)
  - ▶ May not read or understand (C;AD)
  - ▶ Slow reaction times (AD)
  - ▶ Slower walking speeds (C;AD)



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## Ped Safety and Comfort

- ▶ Other Pedestrian Considerations
  - ▶ Speed of adjacent traffic / traffic management
  - ▶ Pedestrian Lighting
  - ▶ Distance between crossings
  - ▶ Directness of route
  - ▶ Walking environment
  - ▶ Intuitiveness
  - ▶ Physical safety
  - ▶ Maintenance / snow removal
  - ▶ Equity in planning








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# Best Practices

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## Best Practices

-  Tactical Urbanism/Quick-Build
-  Superblocks + Open Streets
-  Multimodal Plans and Studies
-  Unique Studies



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# Best Practices

## Tactical Urbanism/Quick-Build

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### Tactical Urbanism/ Quick-Build

- ▶ Approach that groups local governments and citizens to develop short-term, low cost solutions to yield long term improvements for safety, mobility, and equity!
- ▶ Concept aims to:
  - ▶ Integrate Communities
  - ▶ Bring out local artists
  - ▶ Create a safer, accessible, and equitable environment



Before



After

Source: BikeUtah



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# Tactical Urbanism/Quick-Build Example 1 - Fort Lauderdale, Florida

- ▶ 15<sup>th</sup> Avenue NE (Broward County)
  - ▶ Developing concepts with Public
  - ▶ Design Development
  - ▶ Material Acquisition
  - ▶ Event Development and Event
- ▶ Roadway
  - ▶ 5L with TWLTL
  - ▶ 328 Crashes
    - ▶ 72% daylight
    - ▶ 6 Ped/5 Bike crashes
- ▶ Analysis
  - ▶ Sensor data to evaluate exposure of bikes/peds
  - ▶ Data showed lots of Mid-block crossings



Source: Google Street View



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# Tactical Urbanism/Quick-Build Example 1 - Fort Lauderdale,



Source: StreetPlans Collaborative



Source: Broward MPO



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## Tactical Urbanism/Quick-Build Examples

### ▶ Roadblocks and Controversy

- ▶ Public reception of what is being done?
- ▶ Does the local community actually want to be involved and want this change?
- ▶ Are the results proven?
- ▶ It is done cheaply and potentially wrong?



Before



After

Source: Bloomberg Philanthropies



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## Tactical Urbanism/Quick-Build Example 2

### ▶ Tactical Urbanism Safety Study

- ▶ Conducted in April 2022
  - ▶ Bloomberg Philanthropies + Sam Schwartz
- ▶ Study looked at:
- ▶ Evaluating crash rates at 17 sites
  - ▶ Real-time before-and-after video data at 5 sites



Before



After

Source: Bloomberg Philanthropies



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## Superblocks

- ▶ **Concept:** Certain areas only allow pedestrians and bicyclists, and sometimes personal vehicles based on users residence
- ▶ **Goal:** By implementing superblocks, Madrid aimed to reduce vehicular traffic by 21% over the next 2 years.
- ▶ **Status:**
  - ▶ Currently Pablenou Superblock was used as case study and was successful but came with some opposition initially.
  - ▶ Using lesson's learned to fuel additional superblocks in City



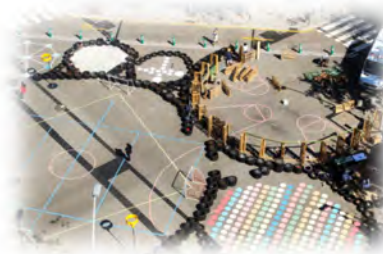
Source: ShareCities Action Pablenou Superblock



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## Superblocks

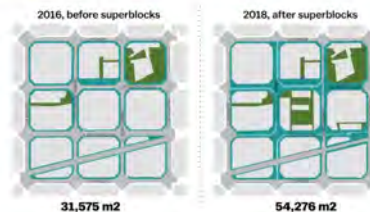
- ▶ **Controversy:**
  - ▶ Many individuals thought it only benefited the superblock area, but hurt everything outside
  - ▶ Had neighborhood organization that were against it, because of their reliance on vehicles
  - ▶ Once implemented, people loved it:
    - ▶ Safe space for kids
    - ▶ Places to relax, eat, and play
    - ▶ Use it as example to fuel additional ones - 500 planned for the city



Source: Vox Pablenou Superblock

### Public spaces for citizen use

Green spaces Pedestrians Pedestrians and vehicles



Source: BCNU/EJ



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## Open Streets

- ▶ **Concept:** Street is closed or repurposed for Pedestrian and Bicycle Users ONLY
- ▶ Developed in urban areas (NYC), but was jump started by Cities during Pandemic!
- ▶ **Open Streets have:**
  - ▶ **Crash Improvements:**
    - ▶ Cyclist injuries dropping by 17%
    - ▶ Pedestrian Injuries dropped 42%
    - ▶ Vehicular injuries dropped 62%
  - ▶ Helped Save 100k jobs from restaurants and businesses
- ▶ **Controversy:**
  - ▶ Access
  - ▶ Political Influence
  - ▶ Not Follow-Through



Source: Byron Smith/Getty Images



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## Best Practices Multimodal Plans + Studies

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# City of Cambridge Bicycle Plan

- ▶ Developed in 2020
- ▶ Develop to create Biking Comfortable and Safe within Cambridge, MA
- ▶ Outline:
  - ▶ Goals and Visions
  - ▶ Why Bicycle Transportation
  - ▶ **Bicycle Facility Toolbox**
  - ▶ **Bicycle Network Vision**
  - ▶ Bicycle Programs (Parking; Public Bike Share; Operation and Maintenance)
  - ▶ Action Items



[https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/Ocoverandfrontmatter\\_20210621.pdf](https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/Ocoverandfrontmatter_20210621.pdf)



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# City of Cambridge Bicycle Plan

- ▶ **Bicycle Toolbox**
  - ▶ Discussion of different types of facilities
  - ▶ Considerations:
    - ▶ Depending on context of the roadway
    - ▶ Design and size of facilities
    - ▶ Environmental Conditions
    - ▶ Operational and Transit Considerations
  - ▶ Applicability:
    - ▶ Discussion about concerns related to the area
    - ▶ Discussion about applicability to certain streets and areas!



[https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/5bicyclenetworkvision\\_20210618.pdf](https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/5bicyclenetworkvision_20210618.pdf)



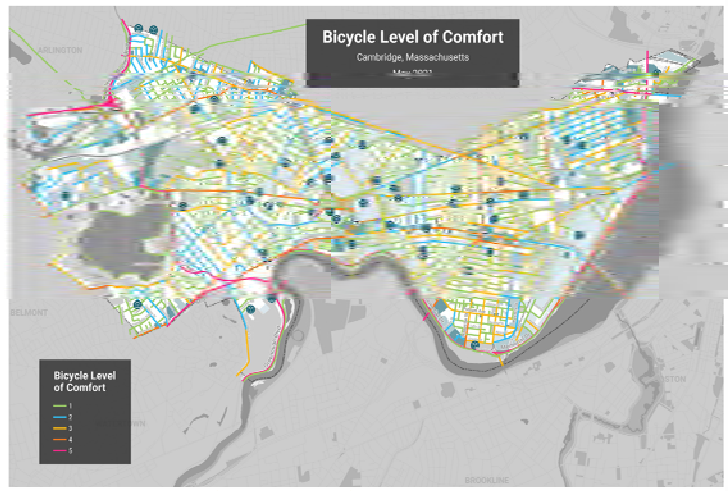
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# City of Cambridge Bicycle Plan

## ► Bicycle Network Vision

- Initiated Public Input on Needs and wants
- Developed Bicycle Level of Comfort (BLC)
  - Based on LTS, but refined and validated with additional inputs to determine levels 1-5 of BLC)

| BICYCLE LEVEL OF COMFORT | TYPICAL CRITERIA                            | EXAMPLES |
|--------------------------|---|----------|
| 1                        | Highly desirable for all ages and abilities |          |
| 2                        | Desirable for all ages and abilities        |          |
| 3                        | Acceptable for all ages and abilities       |          |
| 4                        | Acceptable for most ages and abilities      |          |
| 5                        | Acceptable for some ages and abilities      |          |



[https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/5bicyclonetworkvision\\_20210618.pdf](https://www.cambridgema.gov/-/media/Files/CDD/Transportation/Bike/bikeplan/2020/finalchaptersJune2021/5bicyclonetworkvision_20210618.pdf)



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# City of Seattle Pedestrian Plan

- Developed in 2017 but being implemented now
- Develop a 20-year plan to be most walkable city in the nation with four (4) goals: Safety, Vibrancy, Equity, Health
- Outline:
  - Policy Framework
  - **Measuring Progress**
  - **Prioritizing Ped Improvements**
  - Implementation Strategies
  - Plan Implementation



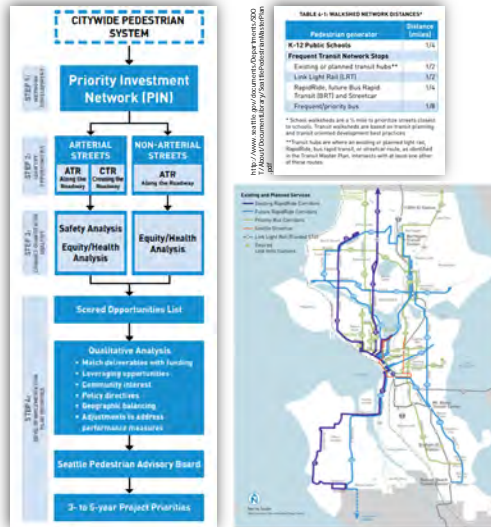
<http://www.seattle.gov/documents/Departments/SDOT/A%20book/Documents/Seaplan/PedestrianMasterPlan.pdf>



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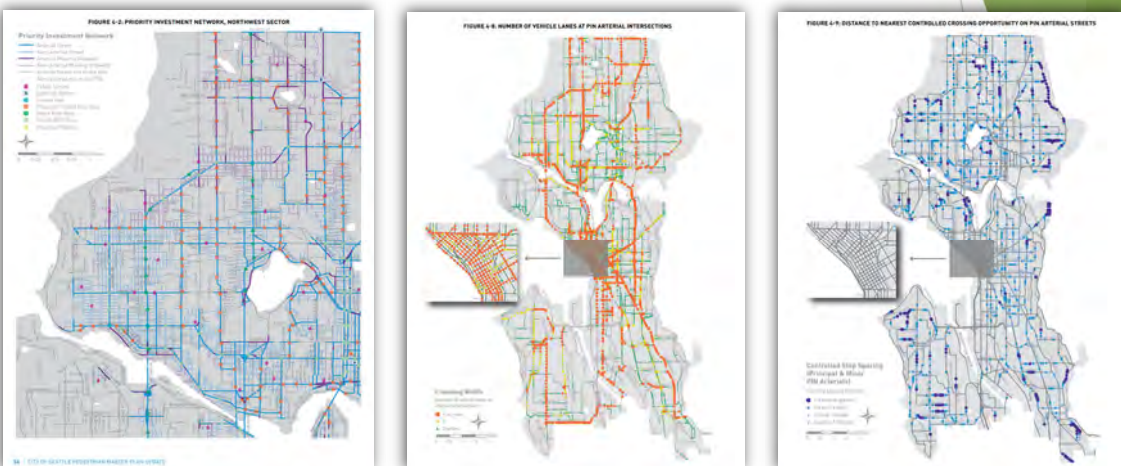
# City of Seattle Pedestrian Plan

- ▶ Assessment of 2009 Plan
- ▶ Prioritizing Pedestrian Improvements
  - ▶ Focus on public schools and transit network
  - ▶ Priority Investment Network (PIN) and Frequent Transit Network (FTN)
    - ▶ Pedestrian Routes to K-12 public schools and transit stops
    - ▶ Received feedback that these two most important destinations
    - ▶ Created walksheds for destinations over the network
    - ▶ Developed Frequent Transit Network, as a way to prioritize high ridership routes (i.e., service every 15 minutes, 18 hours a day, 7 days a week)



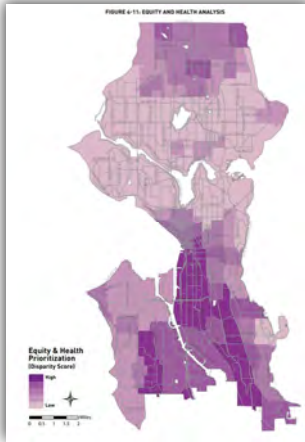
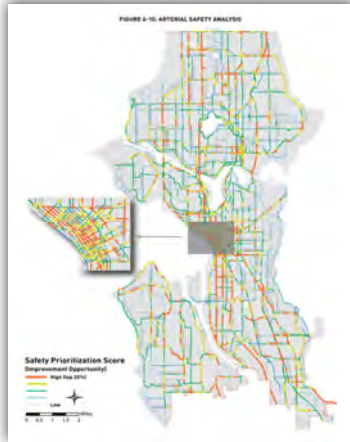
<http://www.seattle.gov/Documents/Departments/SDOT/About/Documents/Library/SeattlePedestrianMasterPlan.pdf>

# City of Seattle Pedestrian Plan



<http://www.seattle.gov/Documents/Departments/SDOT/About/Documents/Library/SeattlePedestrianMasterPlan.pdf>

## City of Seattle Pedestrian Plan



### ▶ Pedestrian Opportunities

#### ▶ Safety Analysis

- ▶ Uses the Bicycle and Pedestrian Safety Analysis (BPSA) model to assess safety
- ▶ Considers factors such as: roadway design, behavioral characteristics, and opportunities for hot spot or corridor improvements

#### ▶ Equity and Health Analysis

- ▶ Used ACS to determine disparity levels of equity and health
- ▶ Factors: Income level, disability, race, physical activity rates, obesity rates, diabetes rates.



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Best Practices  
Unique Studies

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## Monterey Center Cycle Track

- ▶ Study in 2017, Design / Construction in 2020
- ▶ Addressing bicycle / pedestrian safety on N Fremont Street
- ▶ Project:
  - ▶ Create bicycle corridor and still preserve parking and protect cyclists from high speed traffic
  - ▶ Avoid cyclists / driveway conflict through corridor
  - ▶ Repurposed median area into cycle track, avoiding R/W acquisition
  - ▶ Crosswalks controlled by bicycle signals



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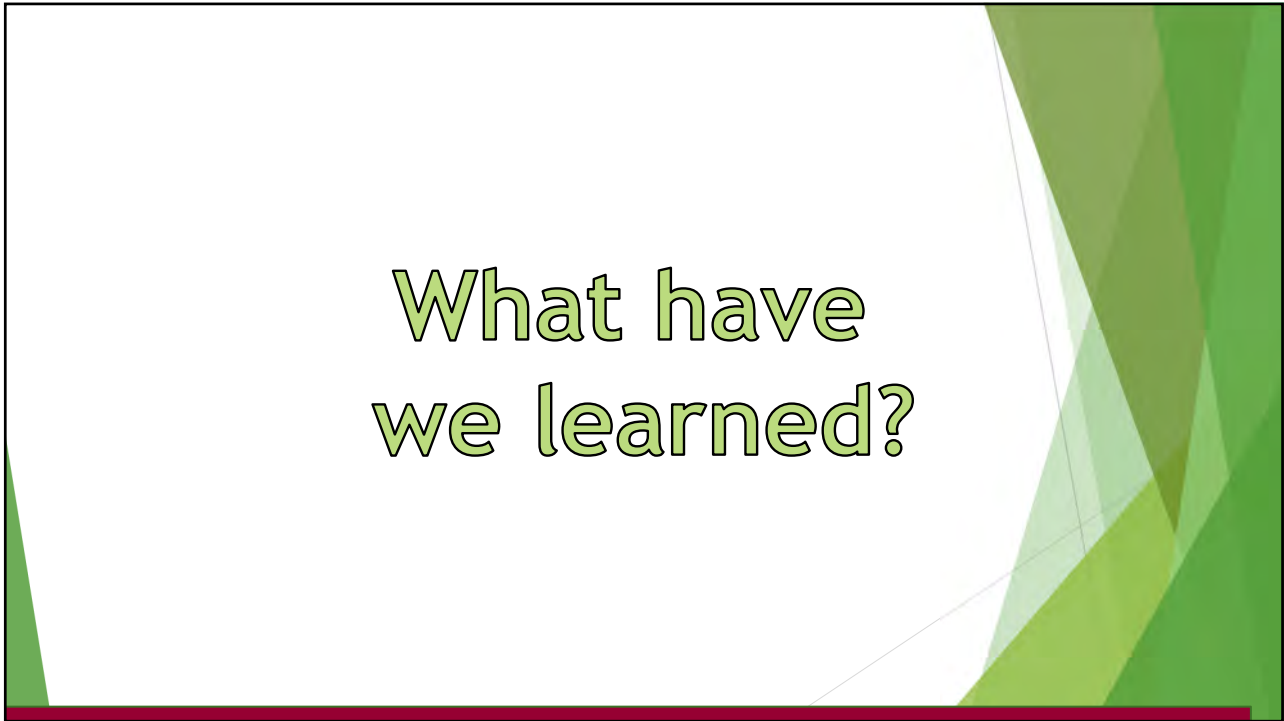
## Ohio Pedestrian Safety Improvement Project (Rapid Implementation)

- ▶ Design - 2020 / Construction 2020 / 2021
- ▶ Addressing pedestrian safety on high injury arterials
- ▶ Project:
  - ▶ Uncontrolled midblock crossing locations
  - ▶ Three levels of plan development to simplify plan design
  - ▶ Prioritize locations with no right-of-way or utility relocation needs to avoid delays
  - ▶ Accelerated environmental process
- ▶ Construction lessons learned



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**How can you change your community to make it more  
Multi-modal Friendly?**

Start the presentation to see live content. For screen share software, share the entire screen. Get help at [pollev.com/app](https://pollev.com/app)