Session 1: Where the Sidewalk Ends - Exploring Safe Street Design

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Data

Safety Voyager & Numetric Bike/Ped Crashes

2016-2020

31,000+ crashes

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ELSEVIER

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Pedestrian- and bicyclist-involved crashes: Associations with spatial factors, pedestrian infrastructure, and equity impacts

Hannah Younes ✉, Robert B. Noland ✉, Leigh Ann Von Hagen ✉, Sean Meehan ✉

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DEPARTMENT OF TRANSPORTATION THE STATE OF NEW JERSEY

NEW JERSEY Safe Routes

Municipality	Geocoded	All Crashes	% Geocoded
HOBOKEN CITY	349	341	97.71
PERTH AMBOY CITY	312	303	97.12
UNION CITY	475	460	96.84
MONTCLAIR TWP	249	241	96.79
BAYONNE CITY	410	394	96.10
JERSEY CITY	2067	1970	95.31
EDISON TWP	230	219	95.22
IRVINGTON TWP	630	597	94.76
CLIFTON CITY	338	320	94.67
LAKEWOOD TWP	512	484	94.53
ATLANTIC CITY	406	383	94.33
PASSAIC CITY	554	519	93.68
EAST ORANGE CITY	439	408	92.94
FORT LEE BORO	309	285	92.23
WOODBRIDGE TWP	275	253	92.00
TEANECK TWP	240	218	90.83
TRENTON CITY	495	447	90.30
NORTH BERGEN TWP	408	362	88.73
NEWARK CITY	2991	2586	86.46
WEST NEW YORK TOWN	330	282	85.45
HACKENSACK CITY	390	329	84.36
NEW BRUNSWICK CITY	389	327	84.06
CAMDEN CITY	571	473	82.84
PATERSON CITY	1382	1129	81.69
ELIZABETH CITY	914	689	75.38

Crashes, Income, & Race

- 31,000 bike/ped crashes between 2016-2020
- 90% of crashes are geocoded.
- Crashes are **less likely to be geocoded** in lower income areas and areas with more minorities.
- Crashes **disproportionately** occur in overburdened communities.
  - Overburdened communities make up 21% of the NJ population
  - 40% of crashes occur in overburdened communities

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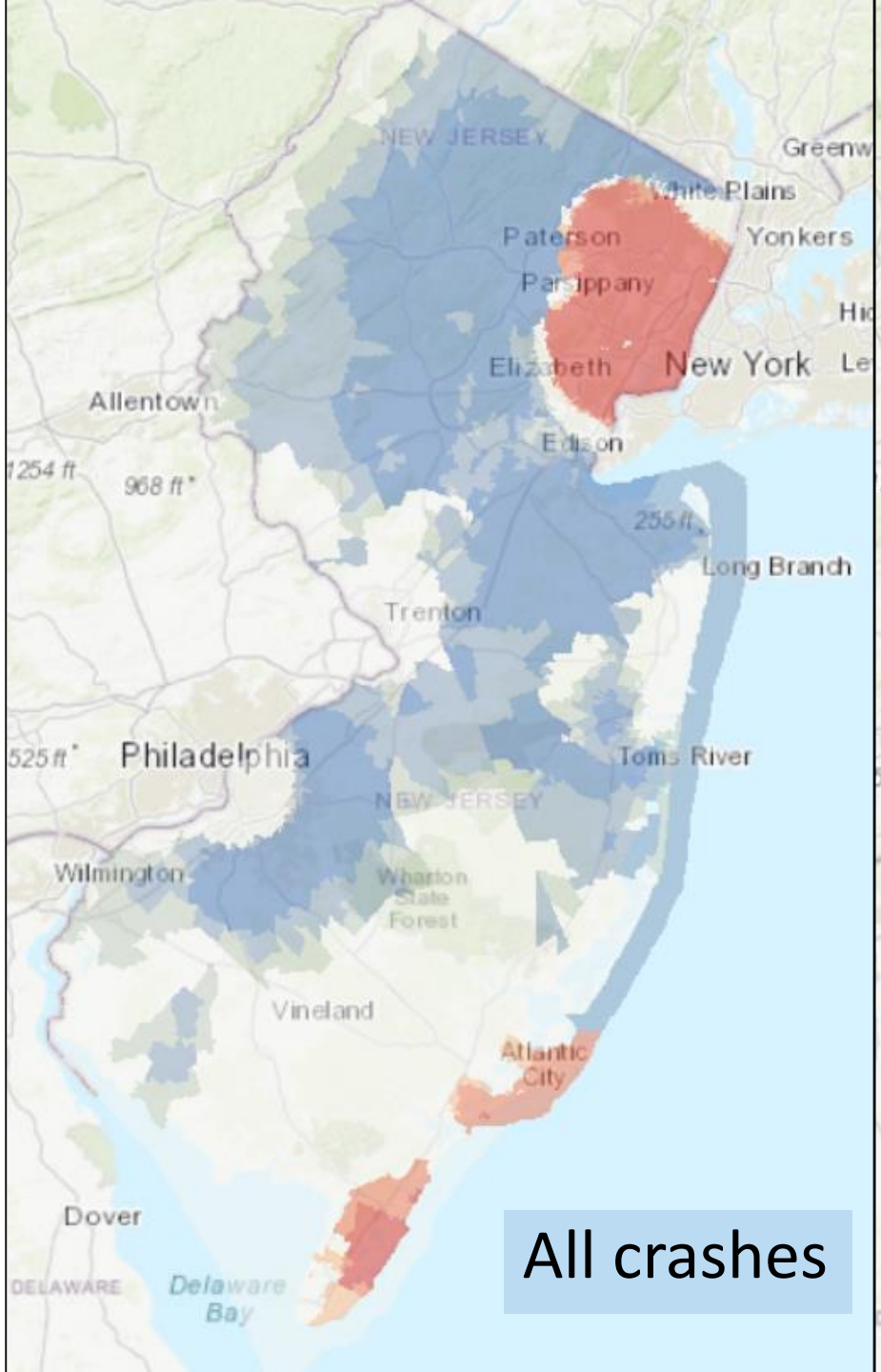
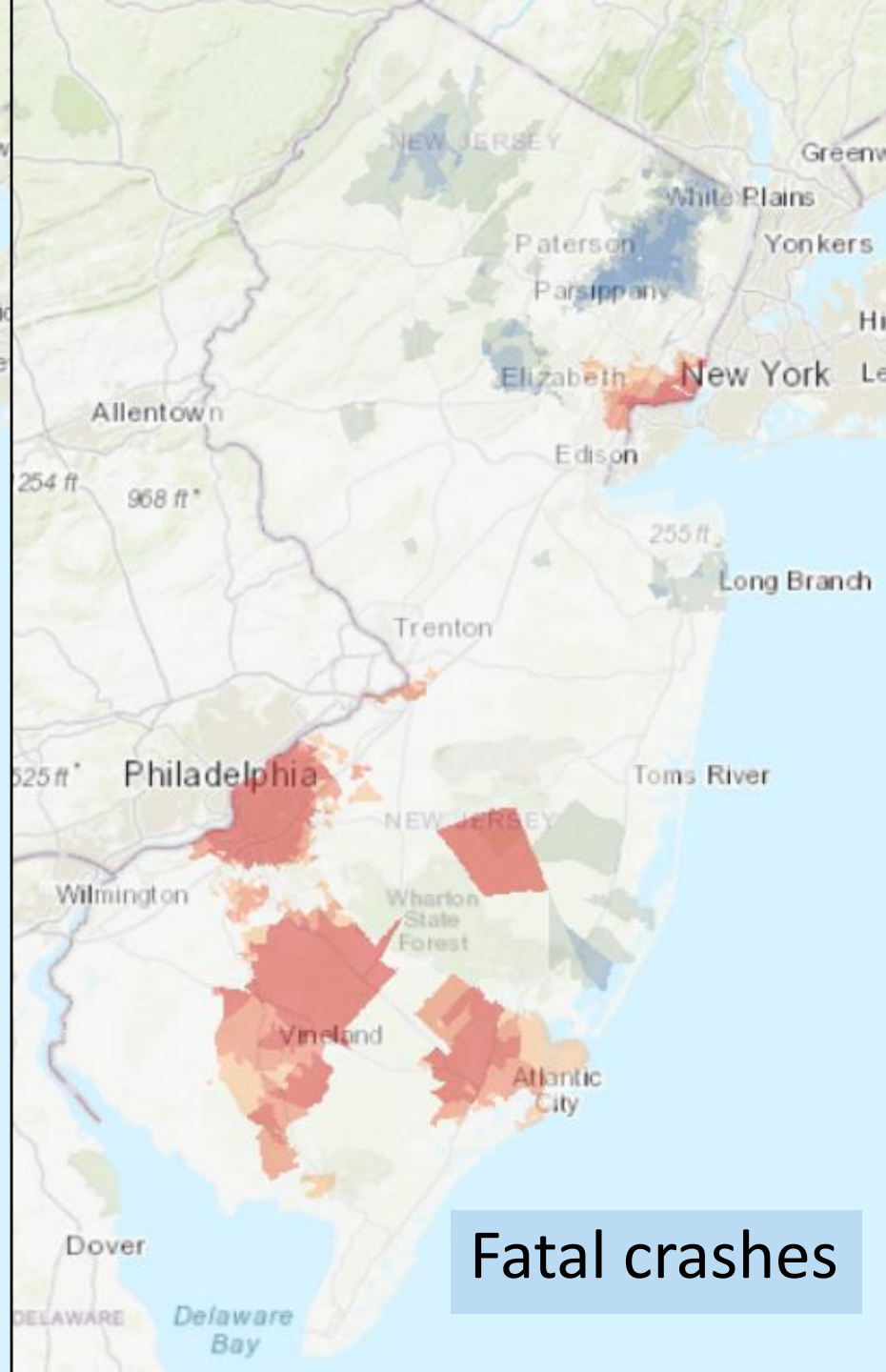
Hotspots for Bicycle & Pedestrian Crashes per Capita





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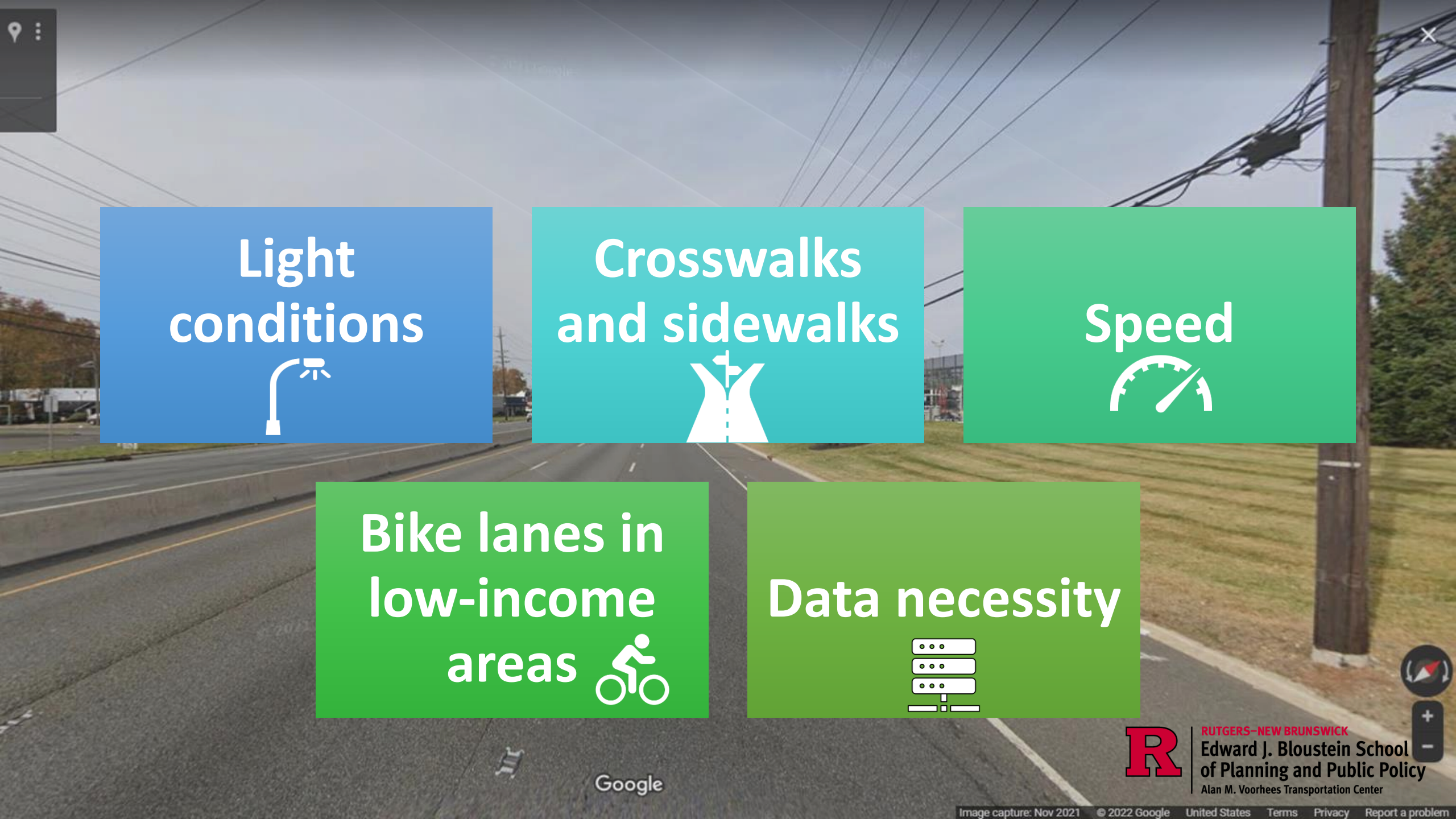
Light conditions
Crosswalks and sidewalks
Speed
Bike lanes in low-income areas
Data necessity
Google
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Results: Under what conditions are fatal crashes more likely to occur?

- Non-motorists aged **65+** were **2.6-3.4** times more likely to suffer a fatal injury.
- Road system: **State/US highways** are more likely to be fatal for pedestrians (**3.4-3.6** times more likely).
- **Light conditions**: Compared to daylight, crashes that occurred in dark conditions (no street lights) were **6-7.5** times more likely to be fatal.
- Speed: a posted speed of **> 40 mph** was **2.9-3.0 times** more likely to be deadly
- A **truck or bus** collision are particularly deadlier for cyclists: **10.8-13.7** times more than cars.
- No **sidewalk** nearby (20 meters): **1.6** times more likely to be fatal for pedestrians
- No **crosswalk** nearby (10 meters): **1.6** times more likely to be fatal for pedestrians
- Cyclist crashes in **low-income areas** are **1.6** times more likely to be fatal.

Data: Geocoded Safety Voyager Bicycle and/or Pedestrian Involved Crashes from 2016-2020

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Addressing Speeds in School Zones

- Higher posted speeds → higher chance of fatality
- Lower speeds → more students walking
- Need for traffic calming

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Example 1: 2009

Poll

Do you think drivers go 25 mph on this road during school hours?

1. Yes
2. No
3. I don't Know

Example 1: 2023

Poll

Do you think drivers go 25 mph on this road during school hours?

1. Yes
2. No
3. I don't Know

Example 2: 2007

Poll

Do you think drivers go 25 mph on this road?

1. Yes
2. No
3. I don’t Know

Example 2: 2018

Poll

Do you think drivers go 25 mph on this road?

1. Yes
2. No
3. I don't Know

NJ School Zone Safety Projects

- 4 out of 48 projects implemented traffic calming measures
- Measures implemented:
  - Raised intersection
  - Curb extension
  - Speed humps
  - Speed hump & bulb out

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Using Speed Studies

- Burden on municipalities, counties, state
- Data collected by police, engineers (standardized procedure)
- Data often collected in overburdened communities
- Collect during grant application phase & closeout
- Measures safety!

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Speed Studies

- Infrastructure grants 5+ years to complete

- “After” speed survey measures outcomes, no matter the:
  - New housing construction
  - Closed or redistricted schools
  - Increased charter schools

I implemented proven safety counter-measures, how do I evaluate my project?

Radar feedback signs

(turned off)

Pneumatic

Road Tubes

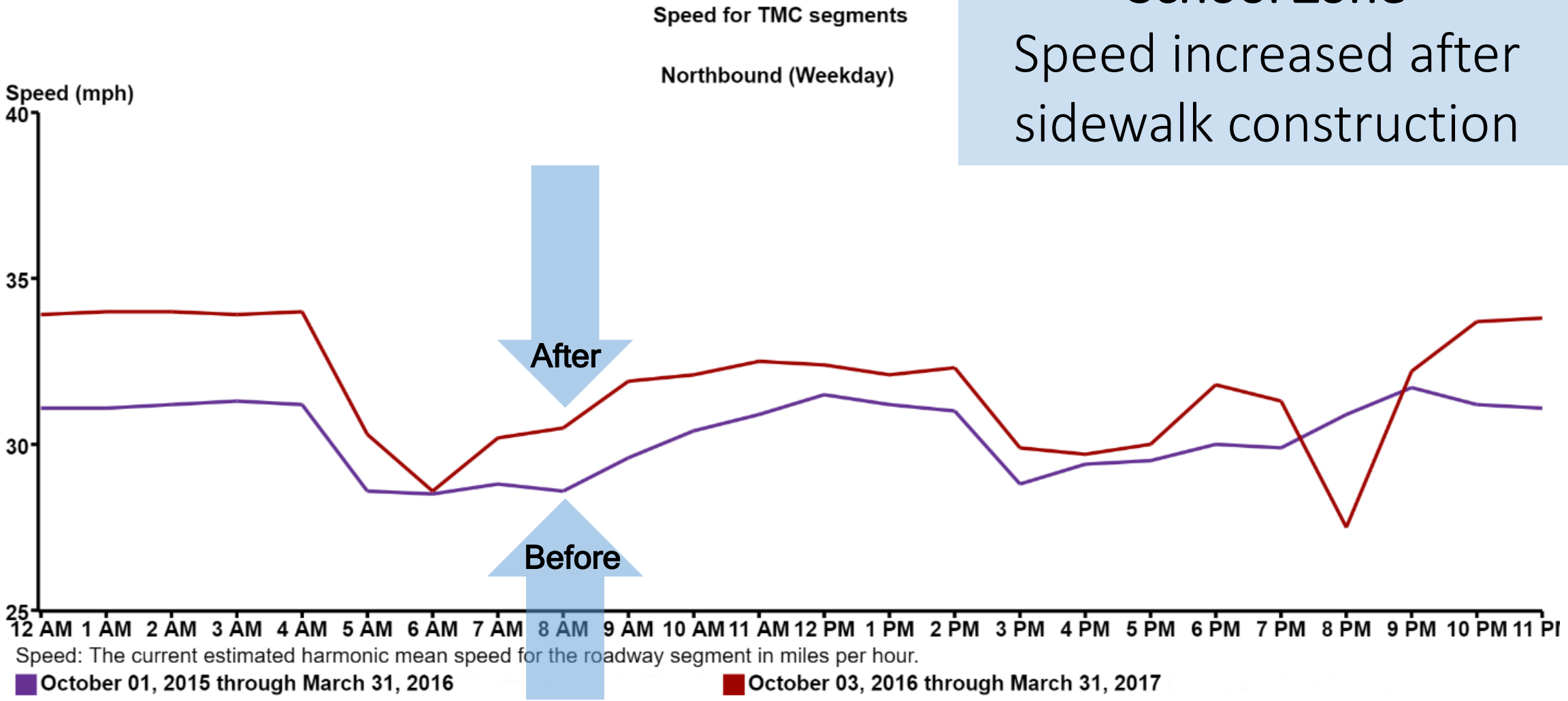
Traffic Footage

Sensor-based retroactive data


Canfield Ave
25

School Zone

Speed increased after sidewalk construction



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THANKS!

NJ Safe Routes Resource Center Help Desk

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Websites

NJ Safe Routes Resource Center

saferoutesnj.org

Voorhees Transportation Center

vtc.rutgers.edu

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Where the Sidewalk Ends: Exploring Safe Street Design

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Agenda

- Proven Safety Countermeasures
- Comfort
- Temporary Improvements
- Design Resources

Proven Safety Countermeasures

Bicycle Lanes

Walkways

Leading Pedestrian Interval

Ped Refuge

Rapid Flashing Beacon

Pedestrian Hyrbid Becons

Road Diet

Lighting

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Walkways

- Defined space for use by a person on foot or in a wheelchair
- Can be sidewalks, shared use paths, or shoulders
- Accessible, continuous, direct, firm, slip resistant
- Buffer zone from adjacent vehicle traffic is preferred

Benefits:

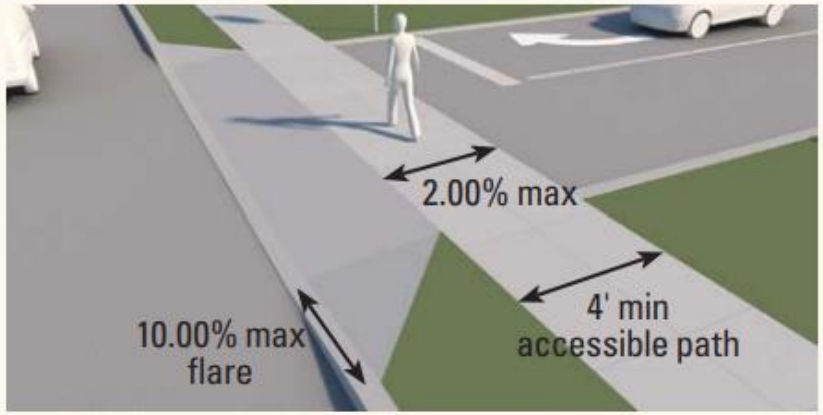
- ✓ Sidewalks: **65-89%** reduction in crashes involving people walking on roadways
- ✓ Paved shoulders: up to **71%** reduction in crashes involving people walking on roadways

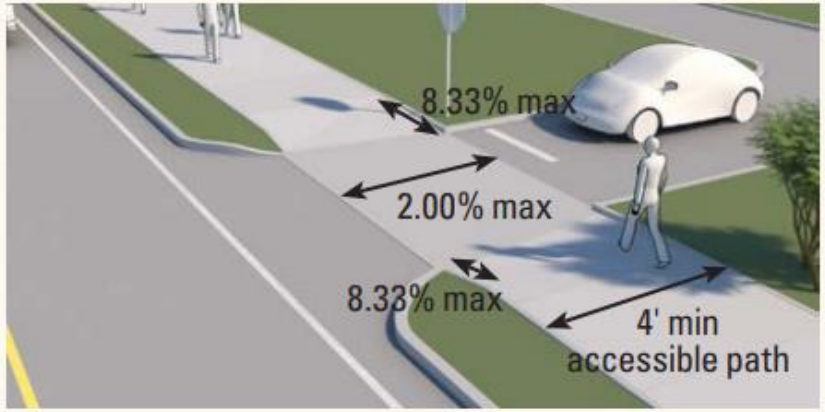
Walkways

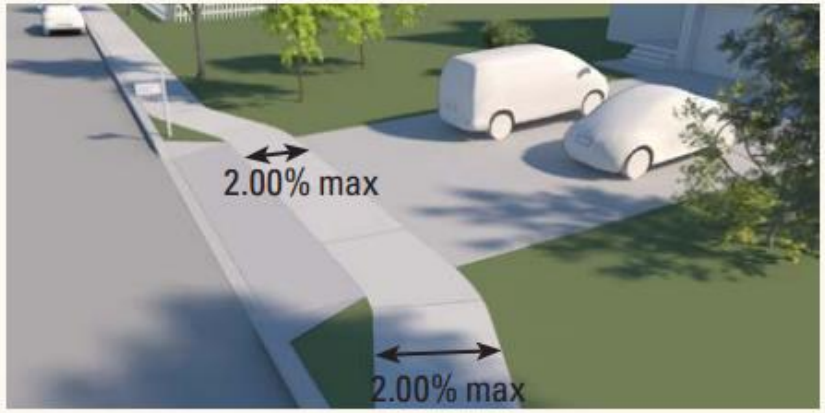
- Public Right-of-Way Accessibility Guidelines
  - ~~Width: Federal minimum is 36”~~
    - NEW – 48” min, exclusive of curb
  - Wider is always better!
- Be careful with:
  - Vertical obstructions
  - Protruding objects
  - Slope

Walkways

- Steep grades and cross slopes at driveways are dangerous
- Provide as level a surface as possible
- Sidewalks should NOT stop at driveways





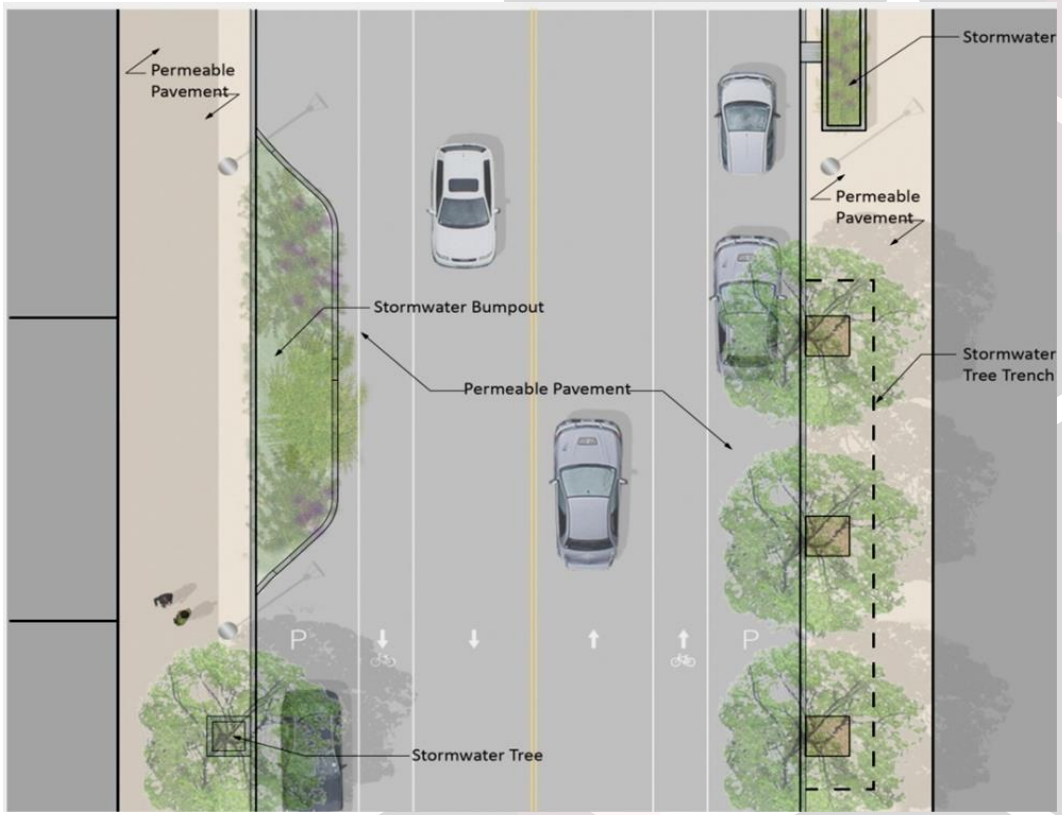


Walkways

Walkways

- Shade and shelter
- Seating
- Lighting and signage
- Shops and stands
- Trash cans
- Bicycle Parking
- Water Fountains
- Fitness Stations

Walkways


Permeable Pavement
Stormwater
Permeable Pavement
Stormwater Bumpout
Permeable Pavement
Stormwater Tree Trench
Stormwater Tree

Crosswalk Visibility Enhancements

- High-visibility markings
- Improved lighting
- Parking restrictions on crosswalk approaches
- Curb extensions
- Advanced "Stop" markings and signs
- In-Street "Stop" signs

Benefits:

- ✓ High visibility crosswalks: up to **40%** reduction in pedestrian injury crashes
- ✓ Intersection Lighting: up to **42%** reduction in pedestrian crashes
- ✓ Advance yield or stop markings: Up to **25%** reduction in pedestrian crashes

Crosswalk Visibility Enhancements

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Medians/Refuge Islands

- Enable pedestrians to focus on one direction of traffic at a time
- Especially beneficial on roadways with:
  - Heavy mix of ped/vehicle traffic
  - Multiple lanes in each direction
  - Posted speeds of 35 MPH or greater

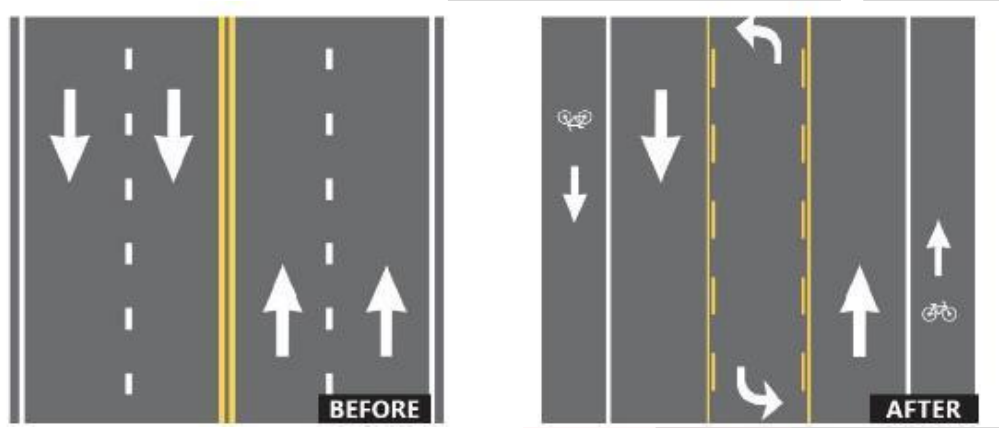
Benefits:

✓ Up to **56%** reduction in pedestrian crashes

Roadway Reconfiguration (Road Diet)

Reduction in lanes, typically a 4- to 3-lane conversion

- Fewer lanes for pedestrians to cross
- Traffic calming and more consistent speeds
- Reduction of rear-end and left-turn crashes
- Offers opportunity to install refuge islands, bike lanes, on-street parking, and transit stops



Benefits:

✓ 4-lane to 3-lane roadway reconfigurations: **19-47%** reduction in total crashes

Rectangular Rapid Flashing Beacon (RRFB)

- Enhances pedestrian warning signs with LED indicators
- Pushbutton or passive detection
- Placed on both sides of crosswalk
- Particularly effective at multi-lane crossings

Benefits:

- ✓ Up to **47%** reduction in pedestrian crashes
- ✓ Can increase motorist yielding rates up to **98%**

Pedestrian Hybrid Beacon

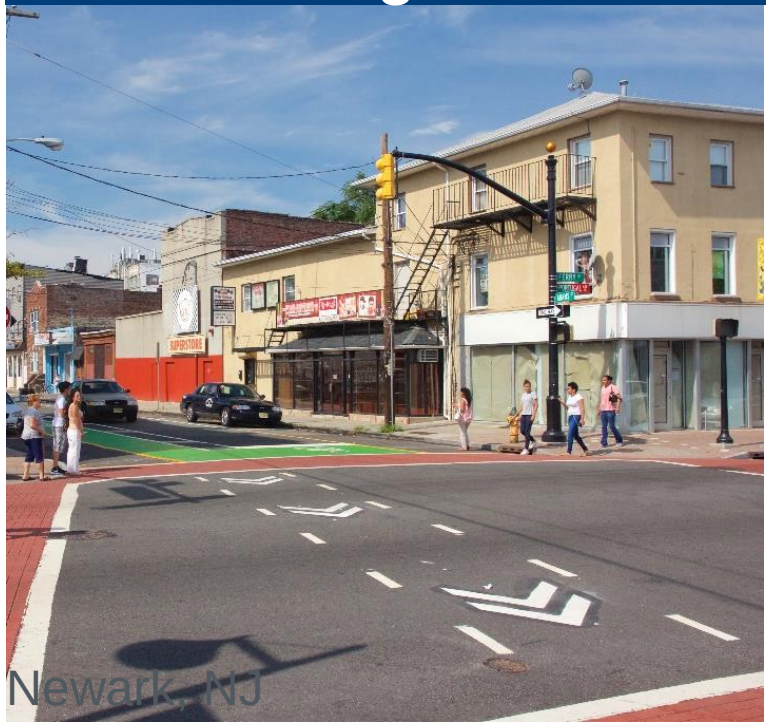
- Intermediate option between a flashing beacon and full signal
- Typically placed at midblock crossings or uncontrolled intersections on multi-lane, higher speed, higher volume roadways
- Lenses remain "dark" until activated by a pedestrian

Benefits:

- ✓ Up to **55%** reduction in pedestrian crashes
- ✓ Up to **29%** reduction in total crashes
- ✓ Up to **15%** reduction in serious injury and fatal crashes

Bicycle Lanes

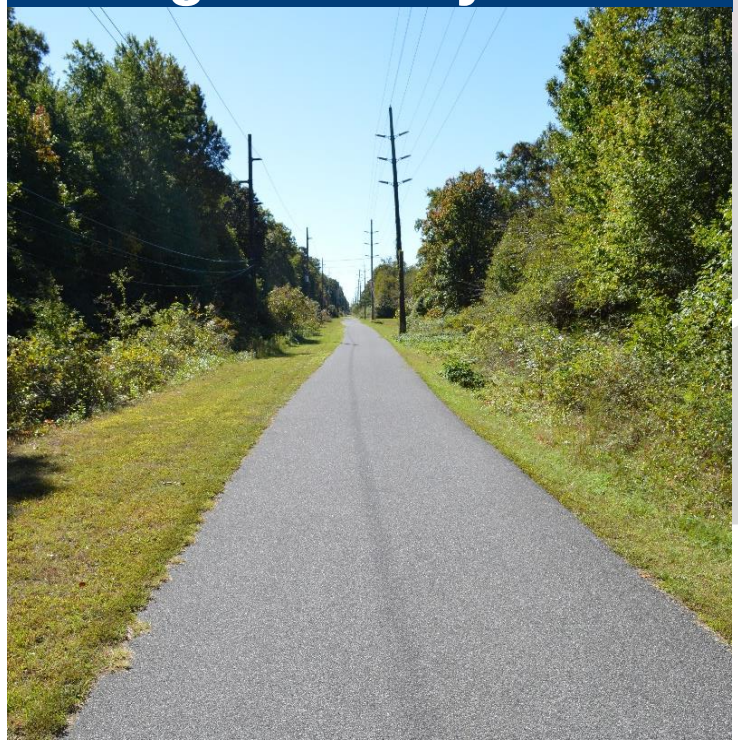
1. Reducing conflict



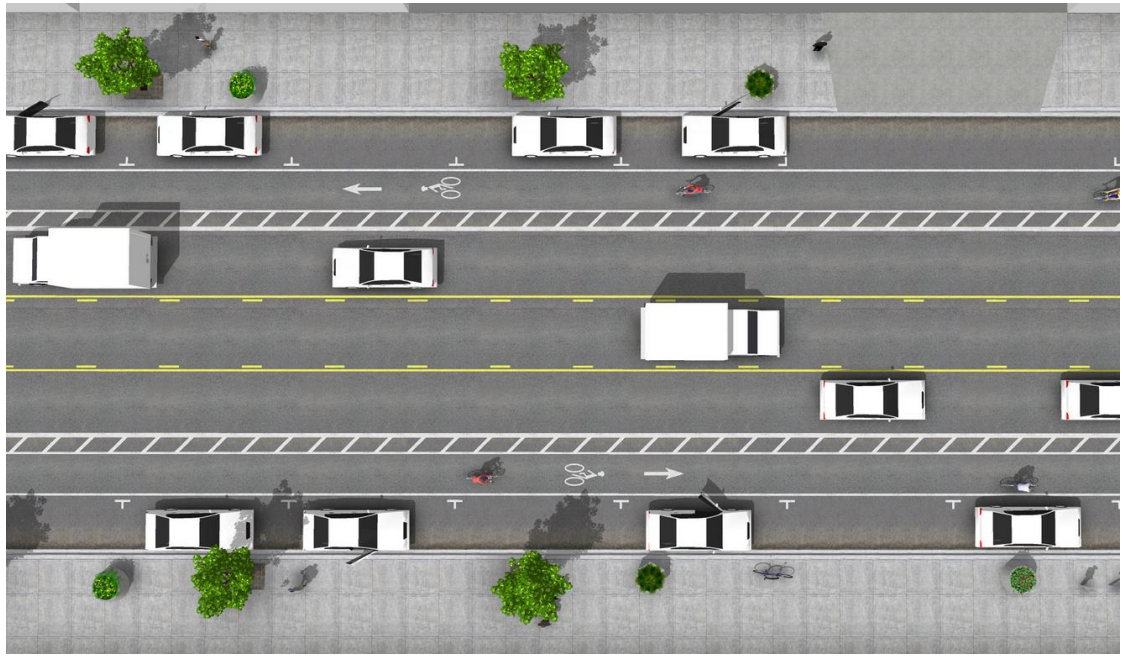
Newark, NJ

2. Visibility

3. Right-of-way



Bicycle Lanes



One-way Protected Bicycle Lane

- 5 feet bike lane + 3 feet buffer minimum
- Not optimal if there are many driveways or close intersections
- Need to think about loading areas, bus stops, and turning vehicles

Bicycle Path

- Two-way
- Minimum 8-feet, preferred 10-feet, best 12-feet+
- Best with minimal intersections and driveways

Traffic Calming and Bicycle Boulevards

- For quiet residential streets
- Use signage and traffic calming

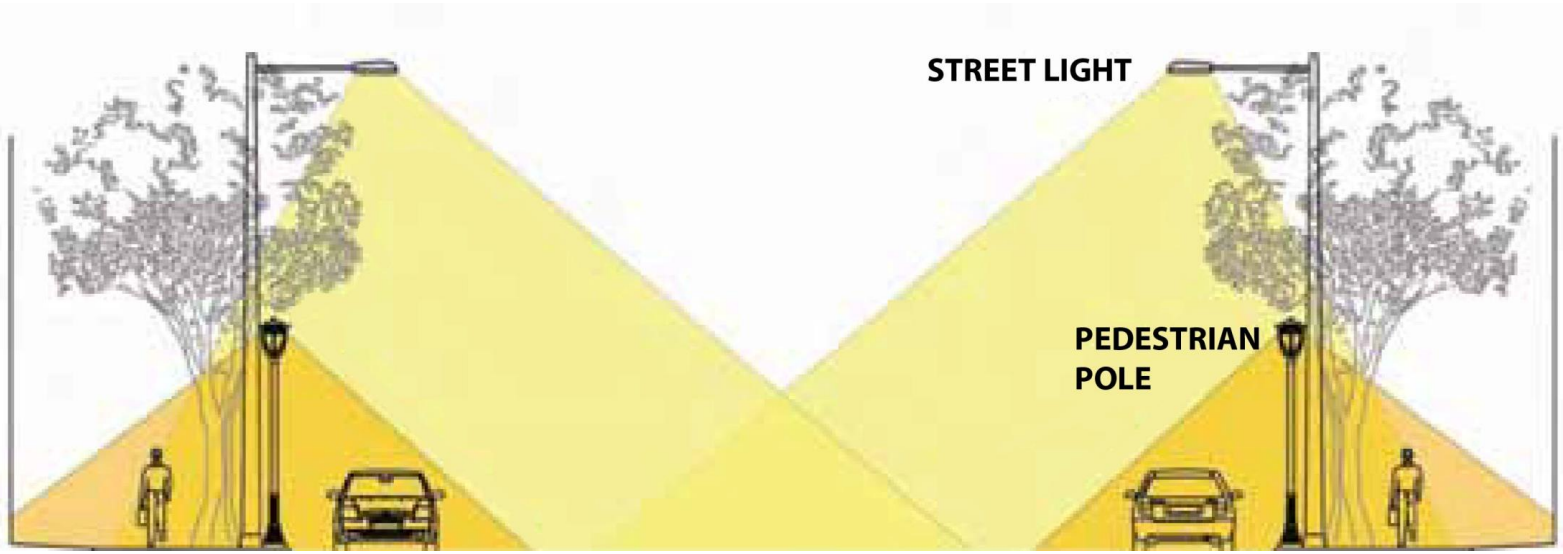
Traffic Diversions

Neckdowns / Chicanes

Speed Bumps and Raised Crosswalks

Lighting

- If it's not Complete at night, it is not Complete
- Lighting provides visibility for safety and security
- Pedestrian scale lighting, below the tree line
- Intersections, roundabouts, and crossings require special lighting

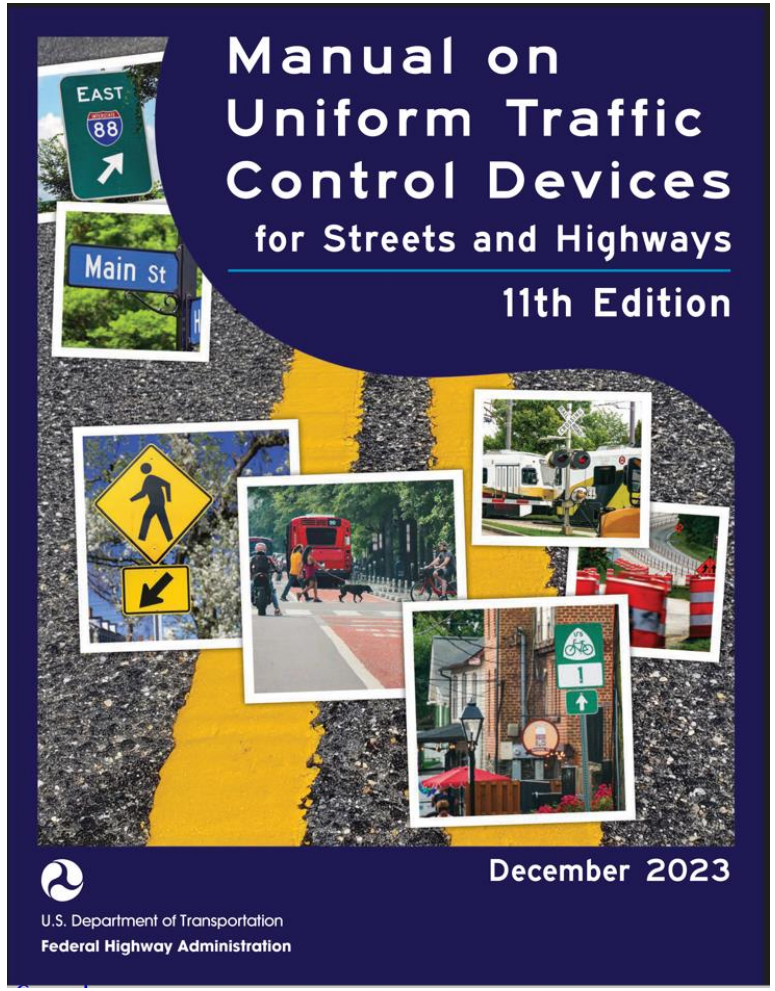


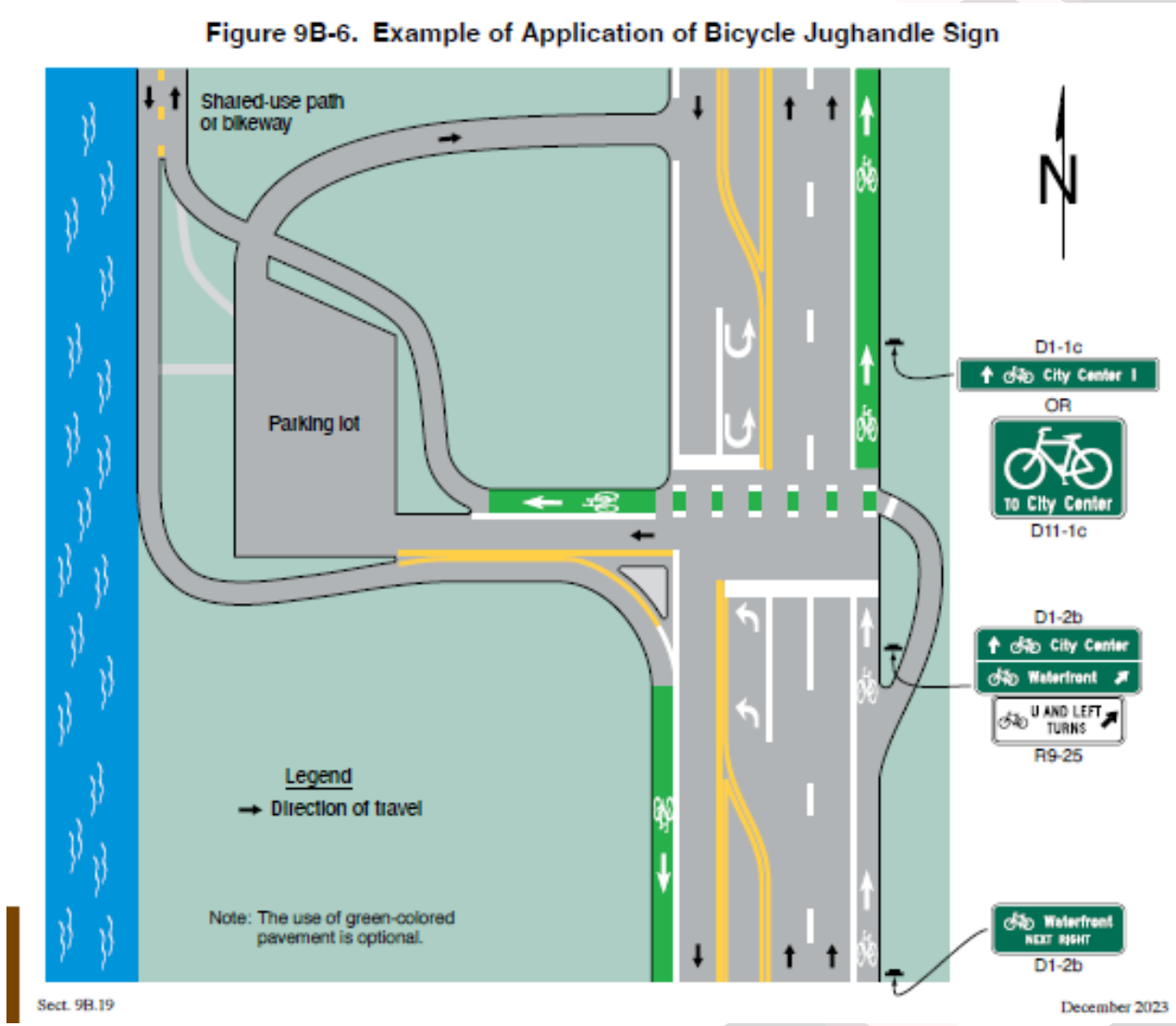
Lighting

Lighting

- Aesthetics
- Light pollution

Design Guides





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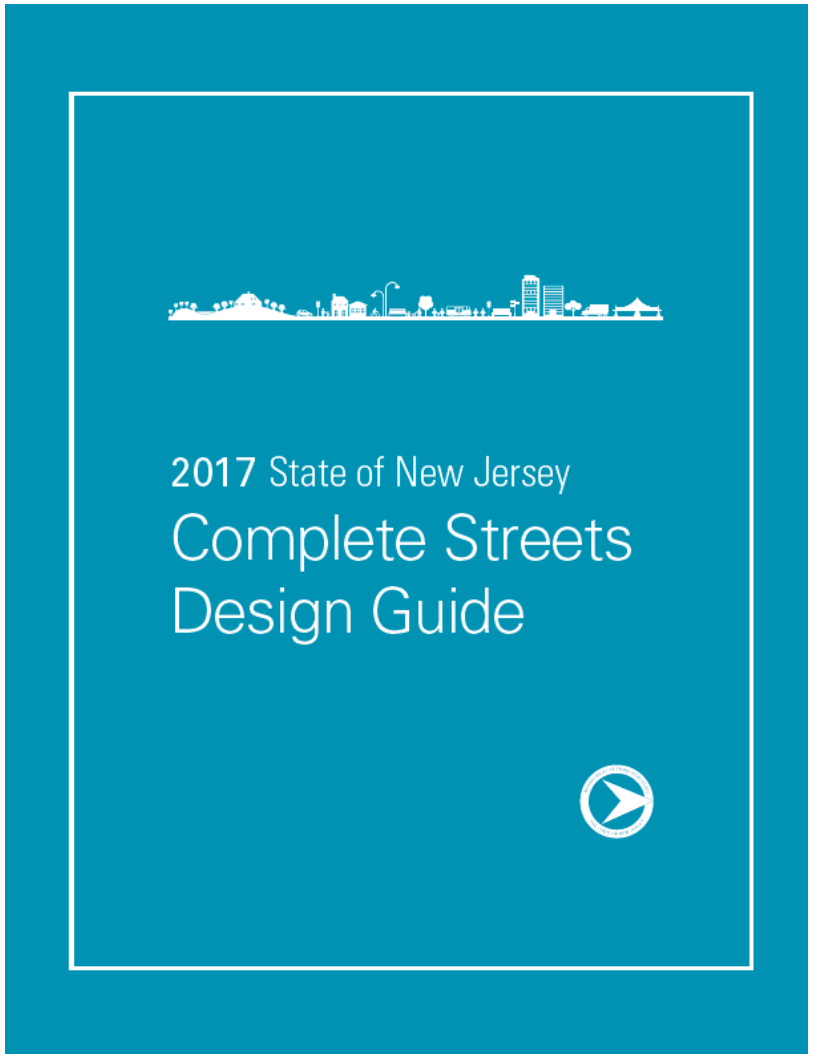
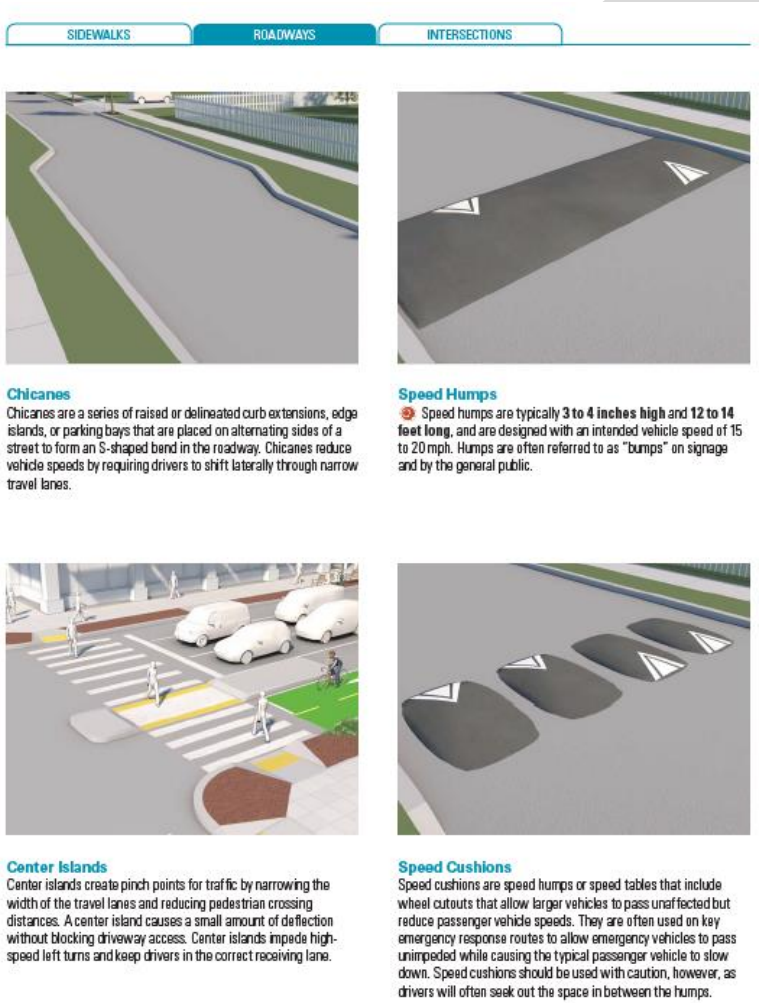
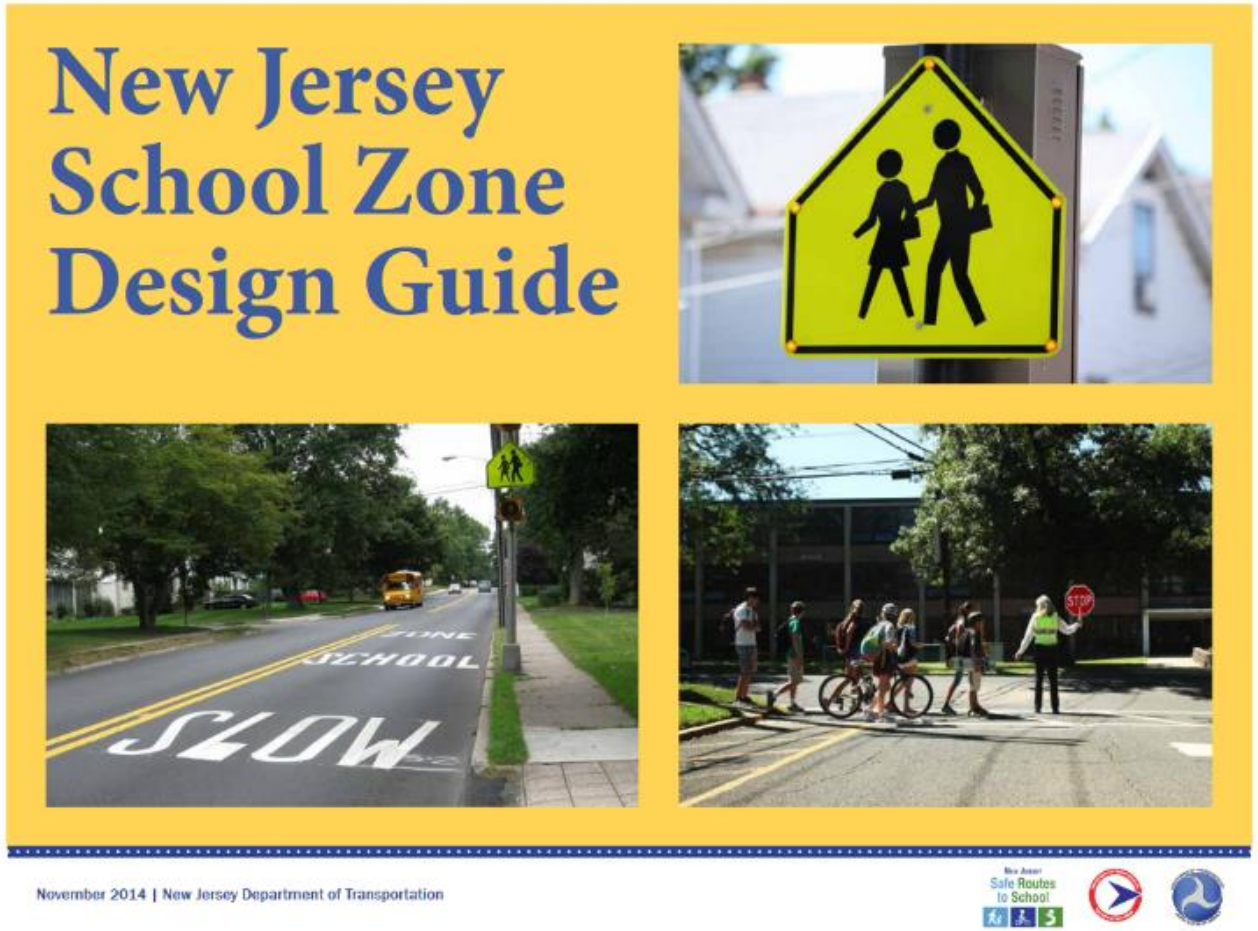




Design Guides



- Highlights physical improvements for School Zones
- Examples gathered from throughout New Jersey

Available at:
saferoutesnj.org

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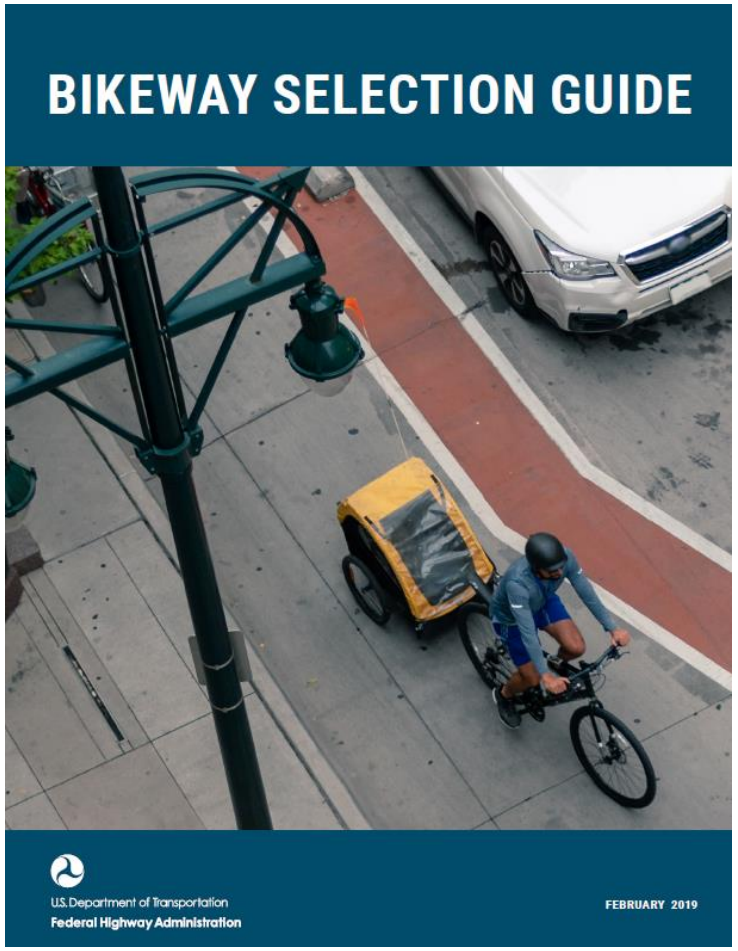
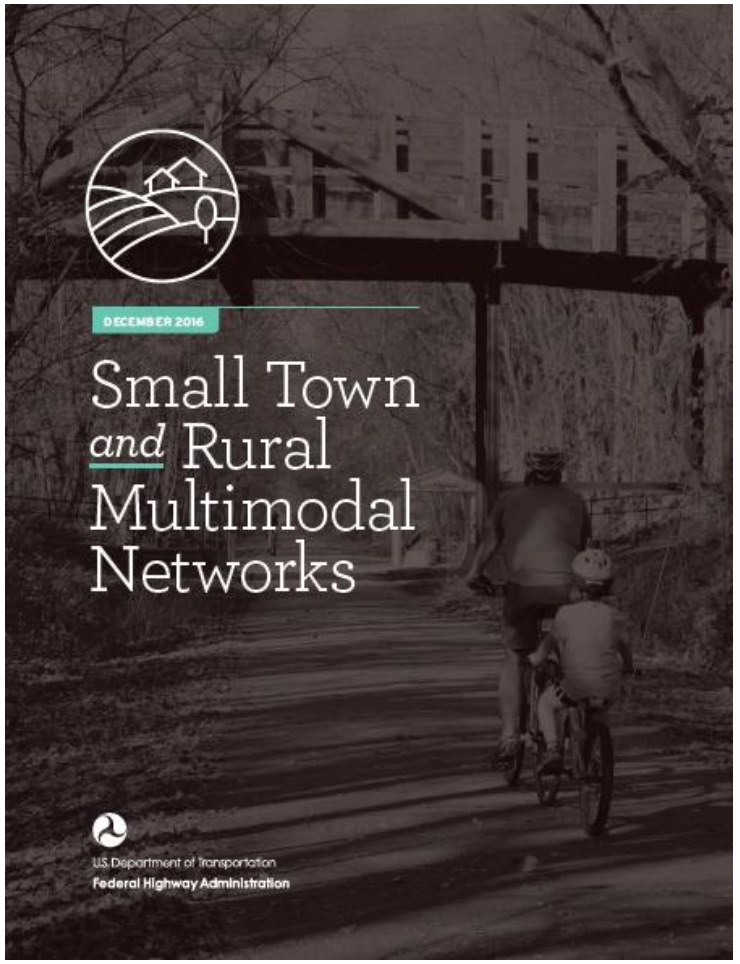
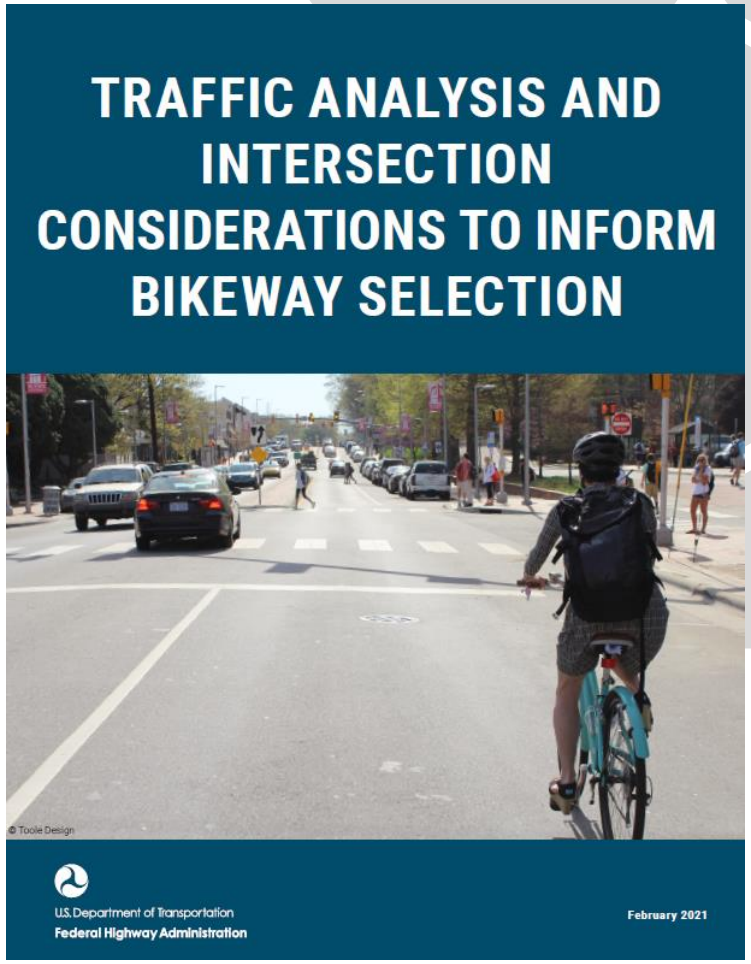
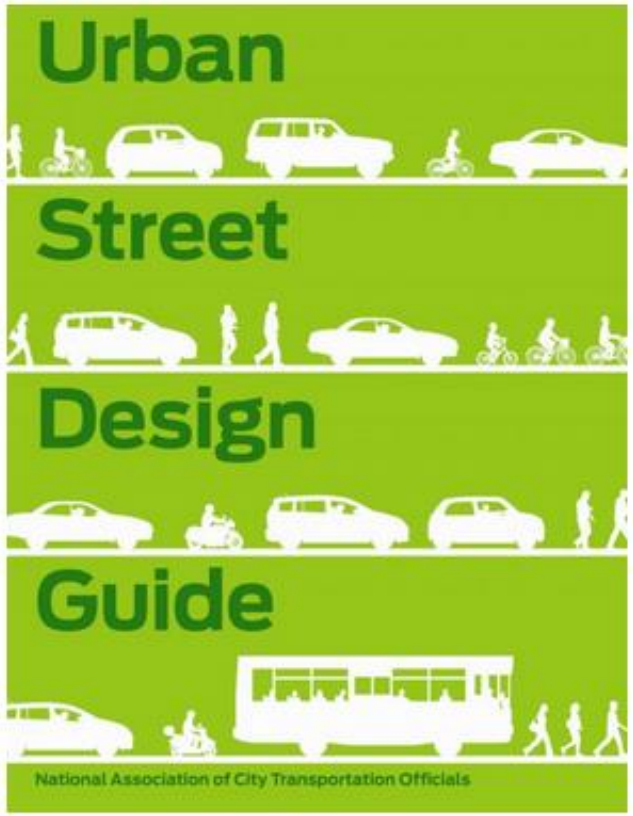
Other Guides - FHWA







Other Guides - NACTO



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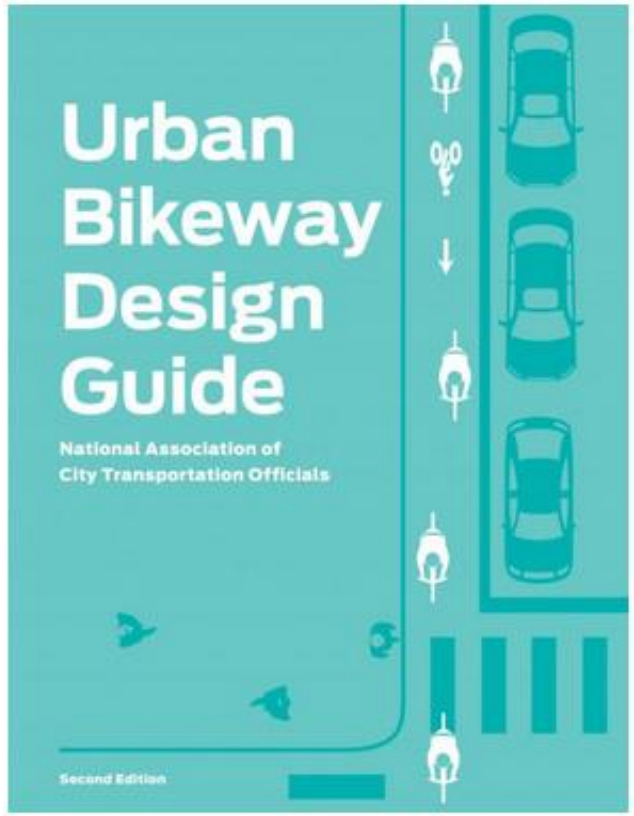

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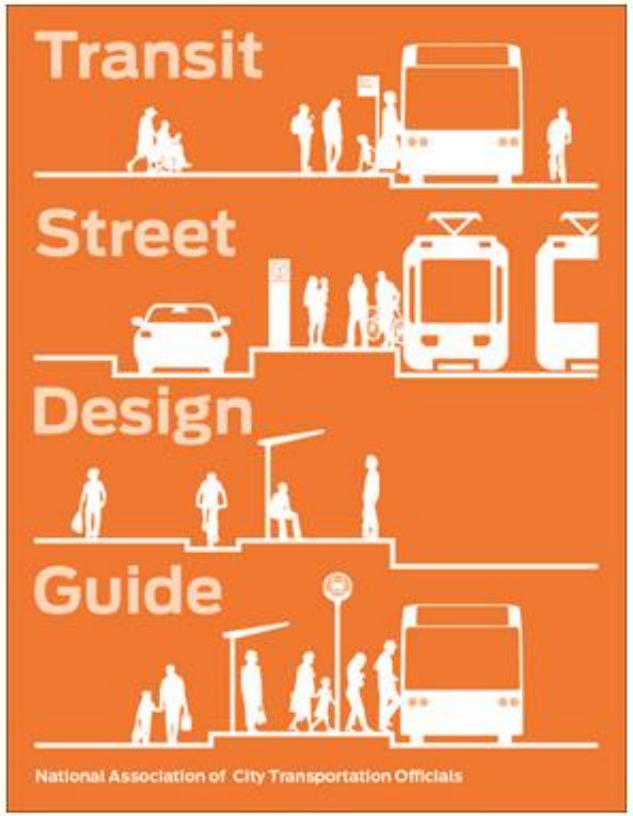

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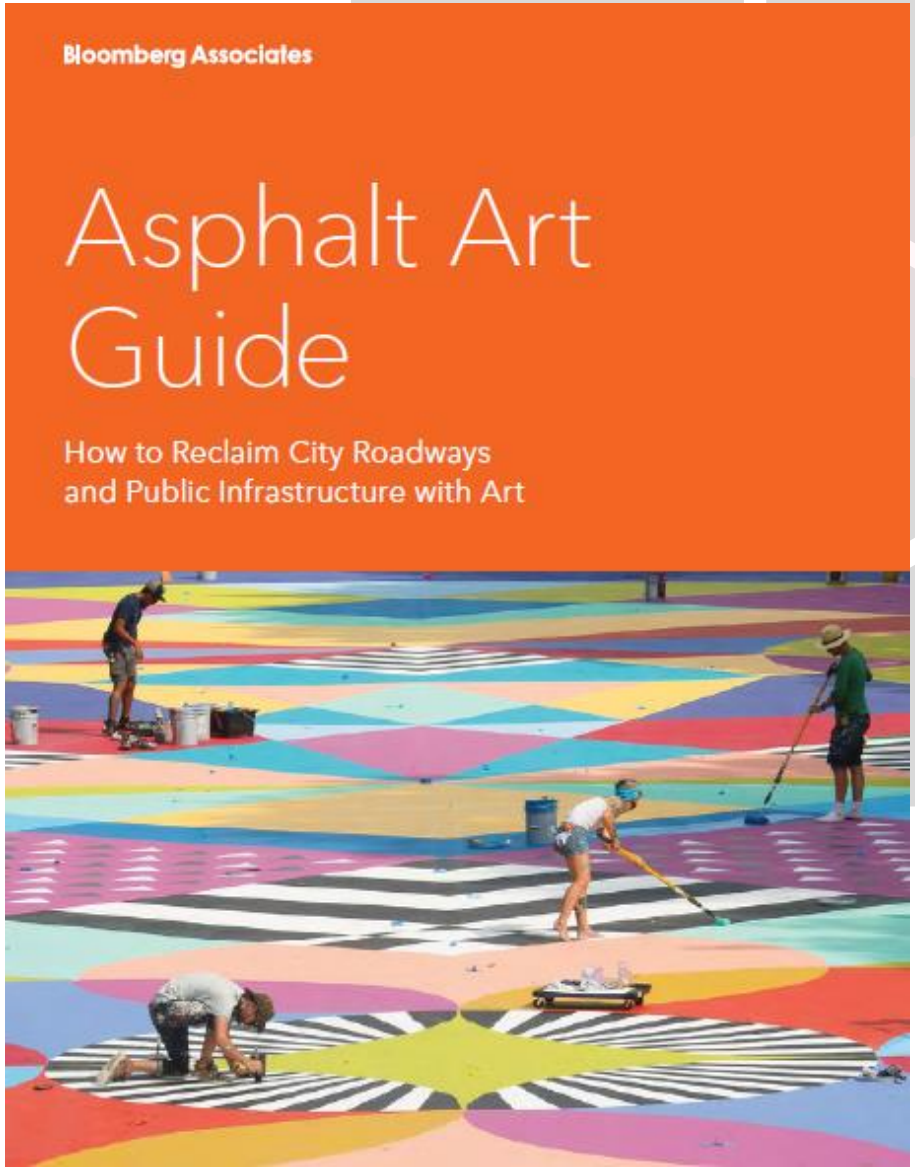
Other Guides – Street Plans



Webinar: How to Adopt or Update a Complete and Green Streets Policy

Learn how to create and adopt your own custom municipal Complete & Green Streets Policy. If you already have a policy, learn how to upgrade with the NJ Model Policy. This free one-hour webinar for municipal officials, staff, or consultant representatives is sponsored by the NJDOT Bureau of Safety, Bicycle and Pedestrian Programs and the North Jersey Transportation Planning Authority and organized by Sustainable Jersey.

- Tuesday, September 17, 2024, noon to 1:00pm
- Follow-up Open House Q&A for attendees to be held virtually on Wednesday, October 30, 2024 from 3:00-5:00pm

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Thank you!

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