

Safe and Sustainable Street Design: Street Transformations

A workshop for the City of Ljubljana, Slovenia

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Global Designing Cities Initiative

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Street Transformations and Intersections

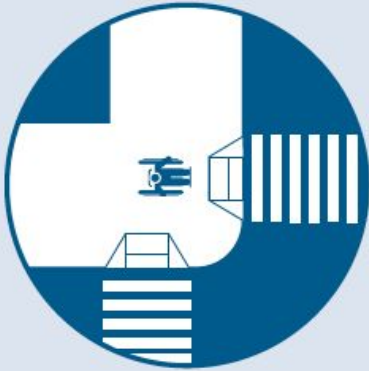


A vibrant street scene in Istanbul. On the left, a yellow tram with a Turkish flag emblem is moving along the tracks. A person on a black motorcycle is riding in the same direction. The sidewalk is crowded with pedestrians, some walking and others standing near shops. A man in a bright blue shirt is in the foreground on the right. The background shows multi-story buildings with a mix of modern and historic architectural styles, including arched windows and stone facades. A sign for 'YAVUZ ORU' is visible on the right. The overall atmosphere is busy and urban.

Street

Transformations

Street Design Strategies



Ensure Universal Accessibility



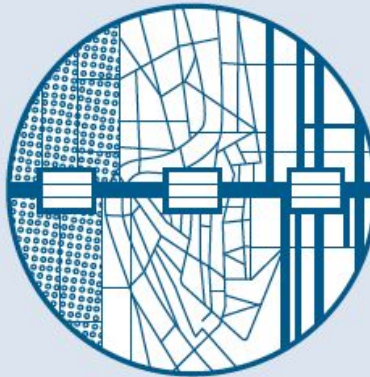
Design for Safe Speeds



Reconfigure the Space



Accommodate Diverse Uses



**Develop
Context-Driven Solutions**



**Act Now—
Start Somewhere!**

Street Typologies



**Pedestrian
Priority
Streets**



**Shared
Streets**



**Neighborhood
Streets**



**Large
Streets**



**Special
Conditions**

Neighborhood Main Street



Neighborhood Main Street

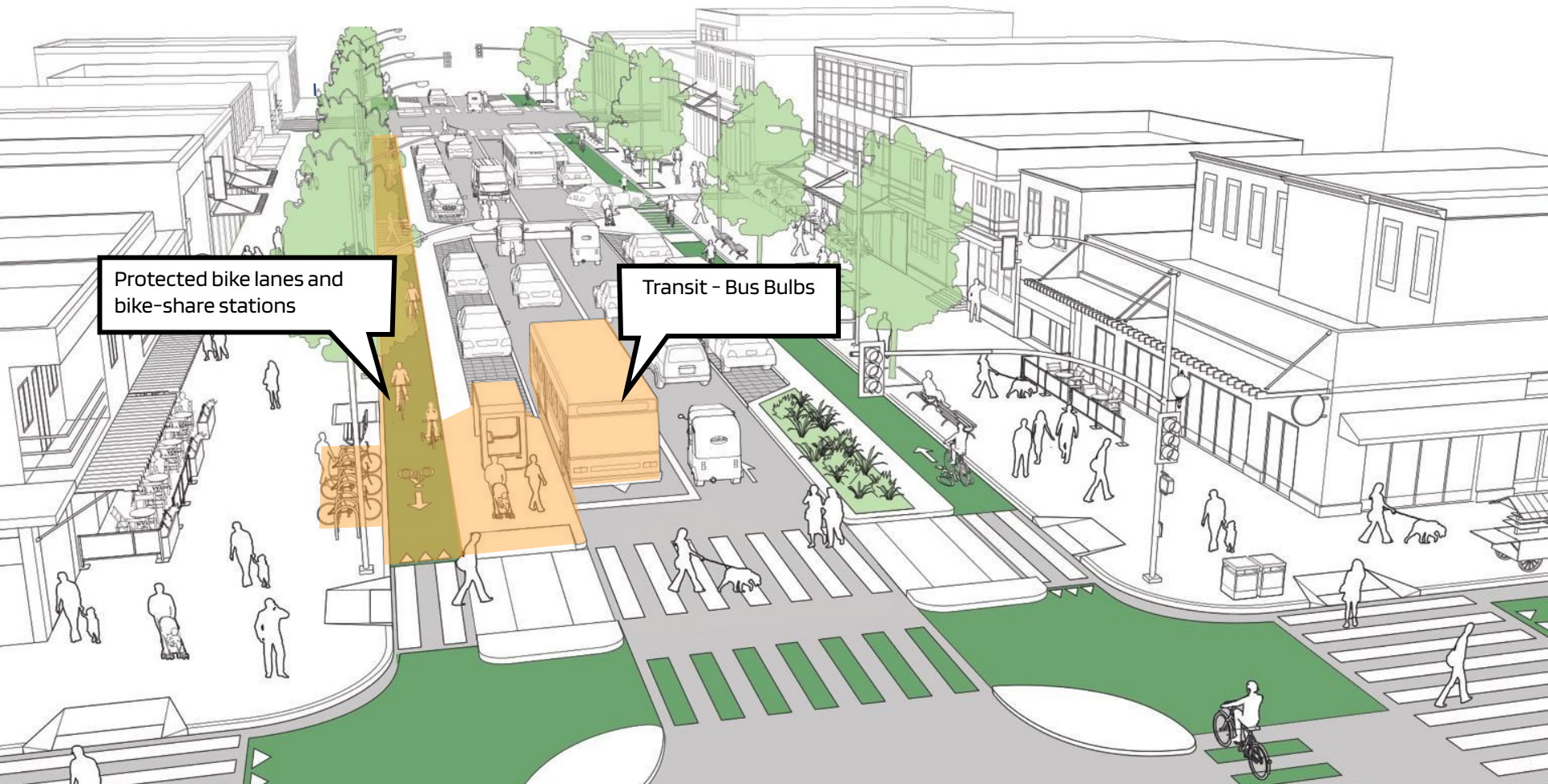


Neighborhood Main Street

Widen Sidewalks to accommodate more uses



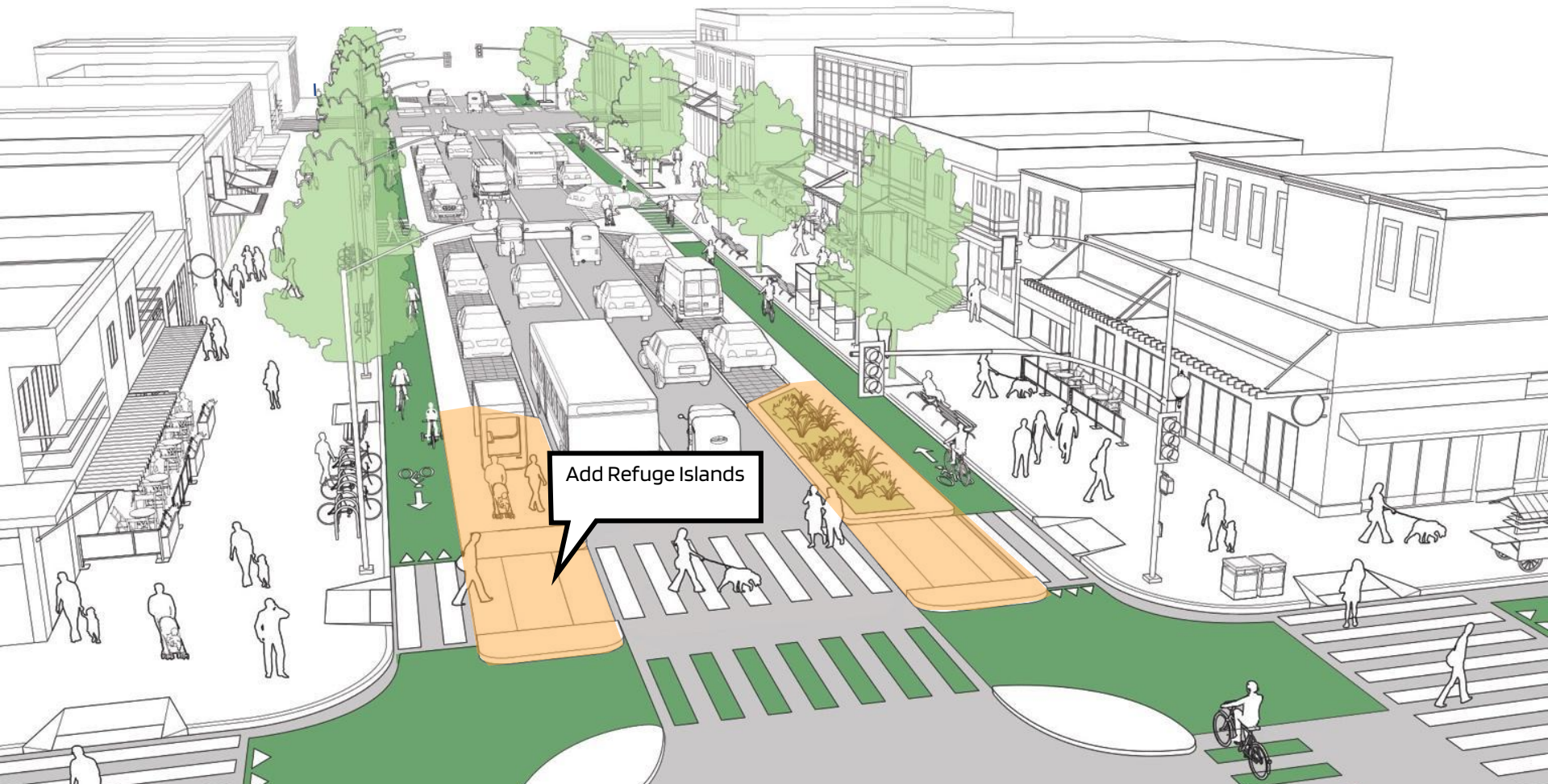
Neighborhood Main Street



Protected bike lanes and
bike-share stations

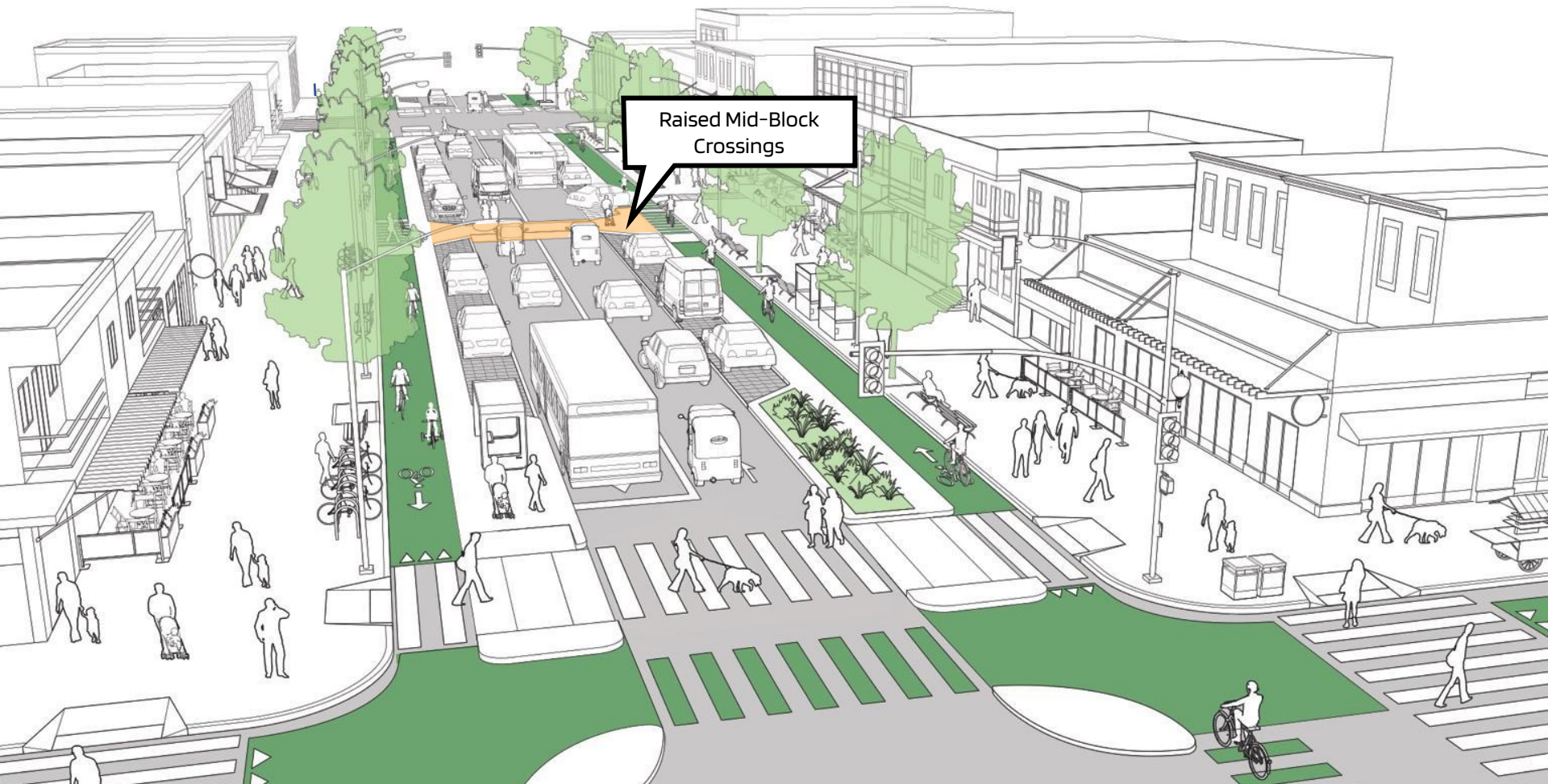
Transit - Bus Bulbs

Neighborhood Main Street

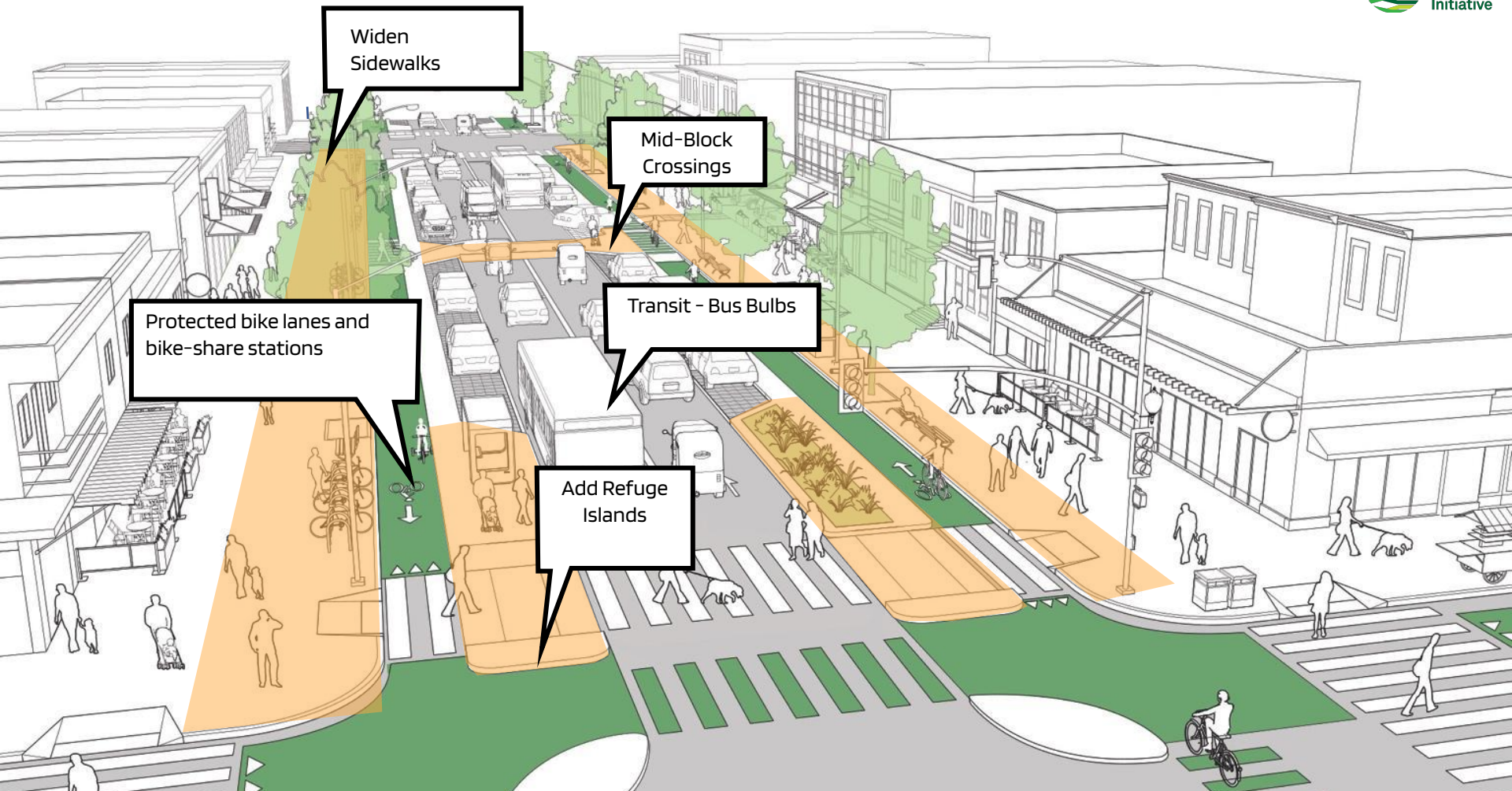


Add Refuge Islands

Neighborhood Main Street



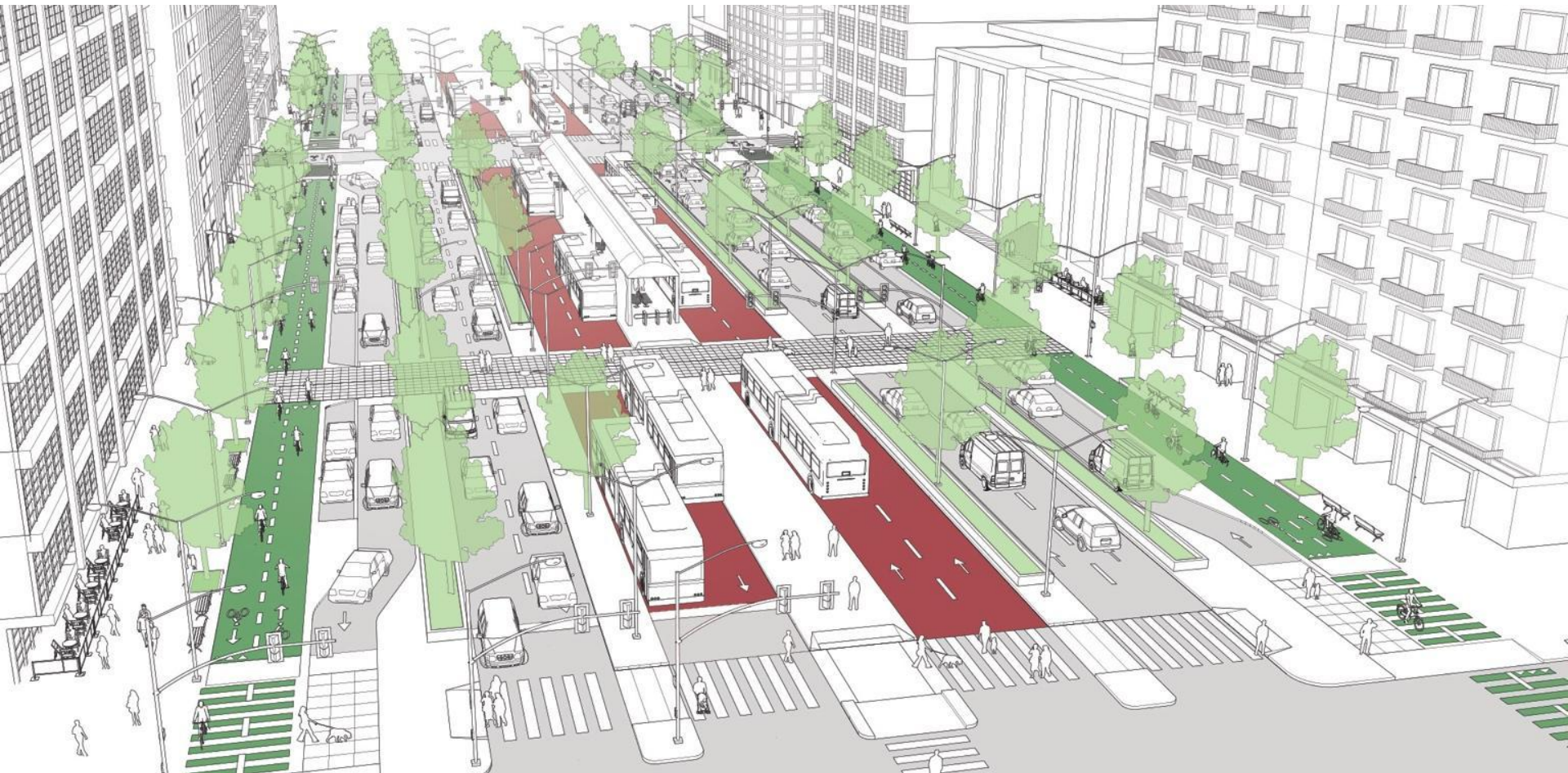
Neighborhood Main Street

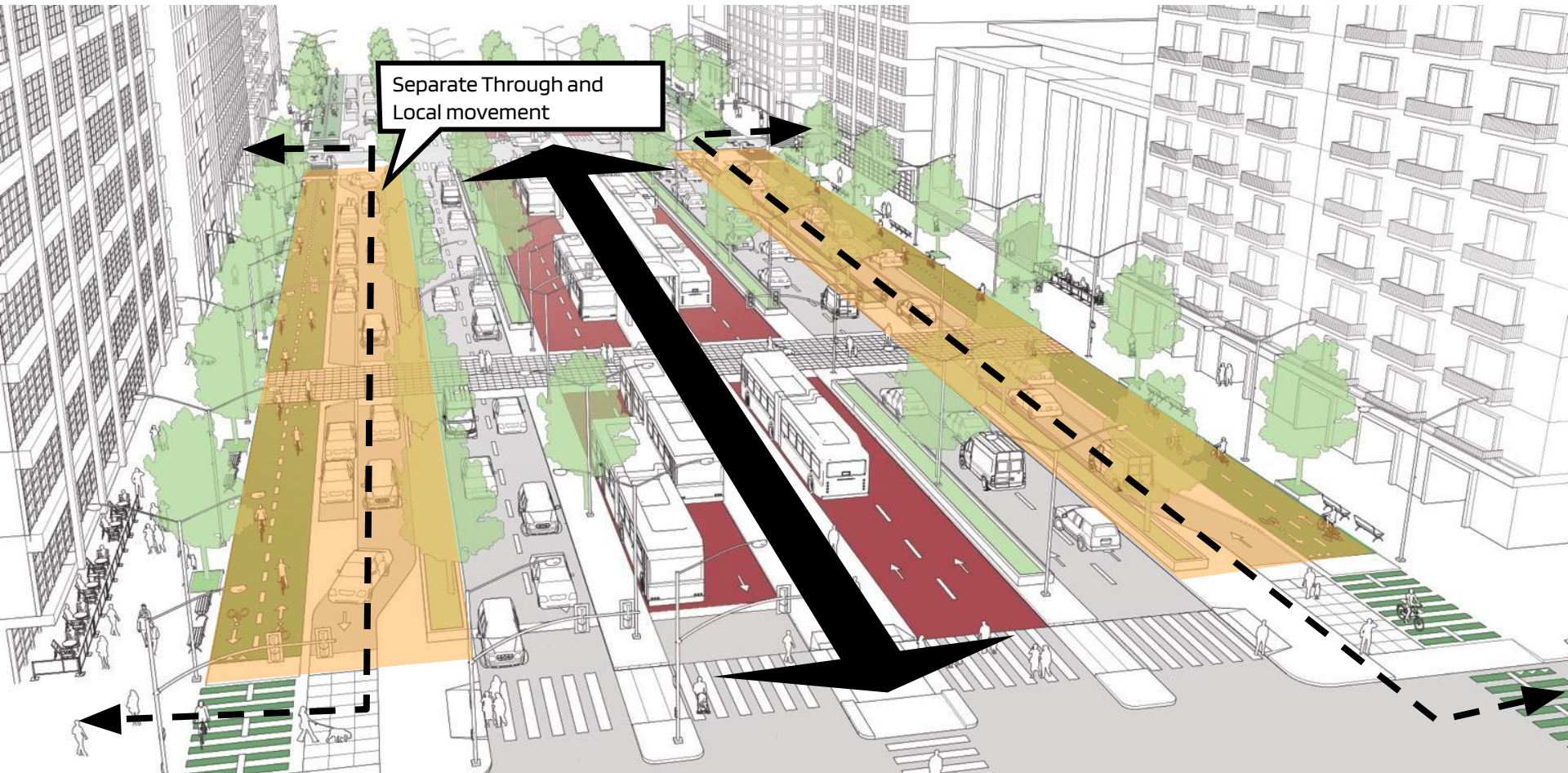


Neighborhood Main Street

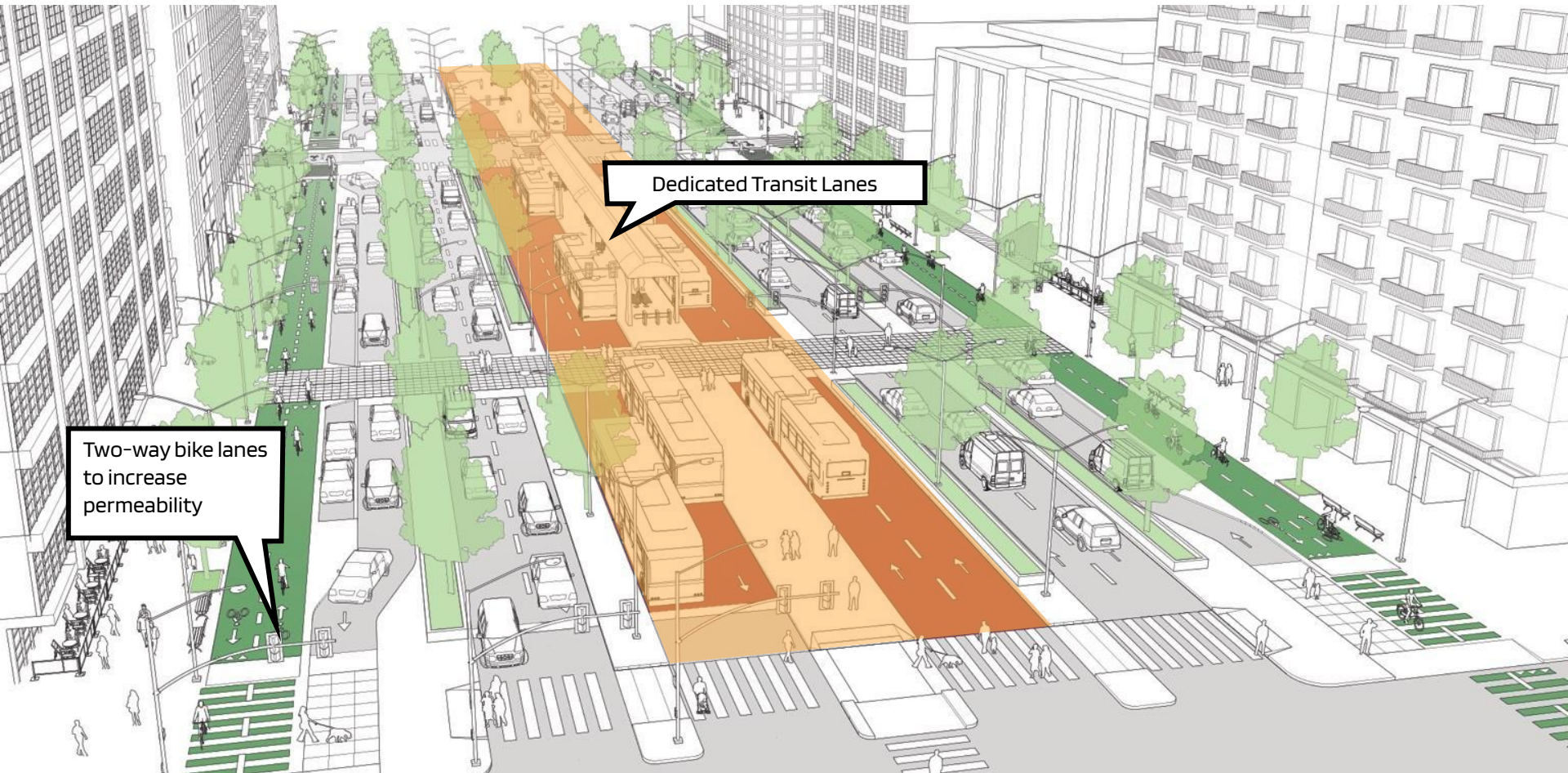


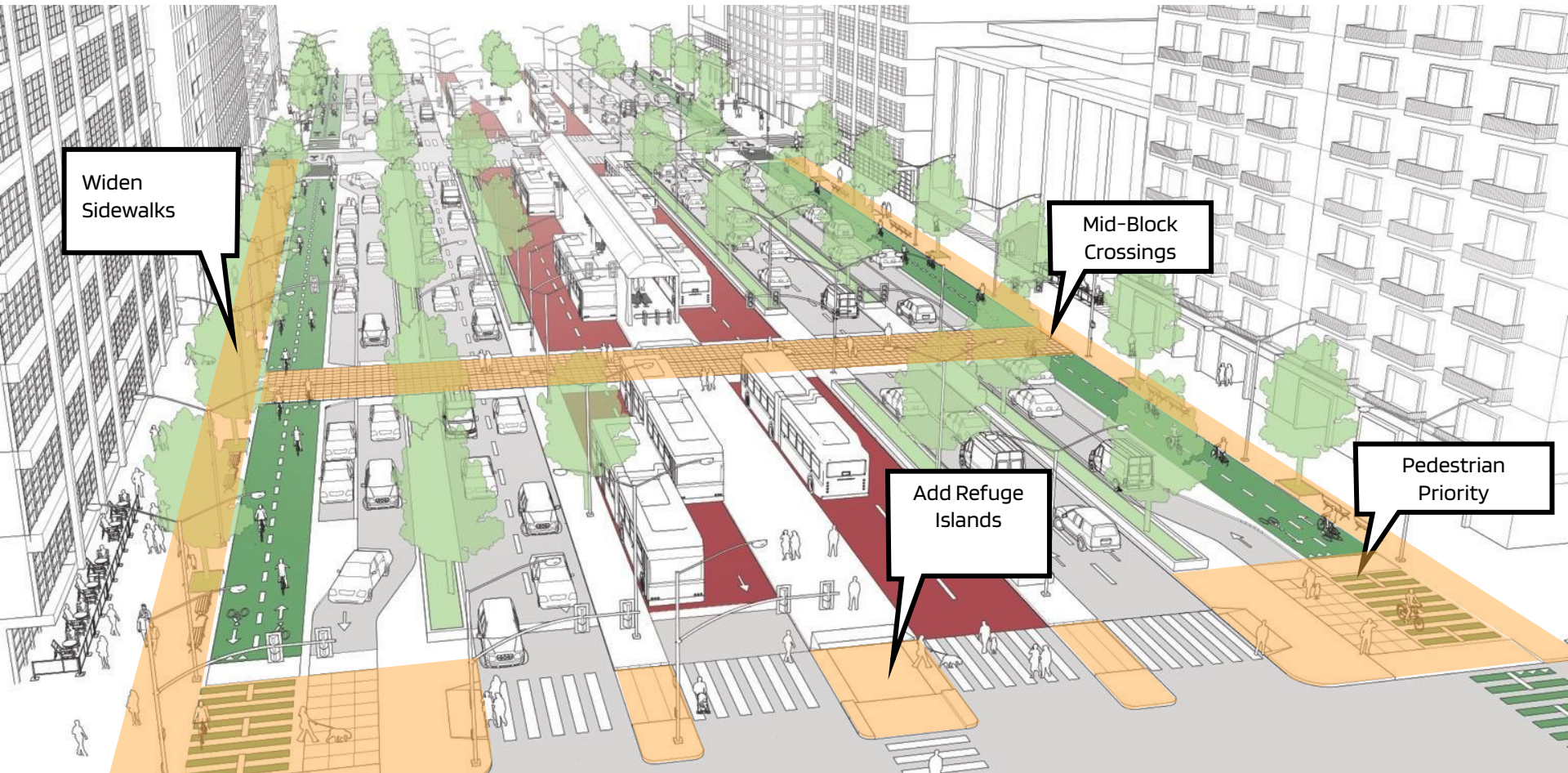






Separate Through and Local movement



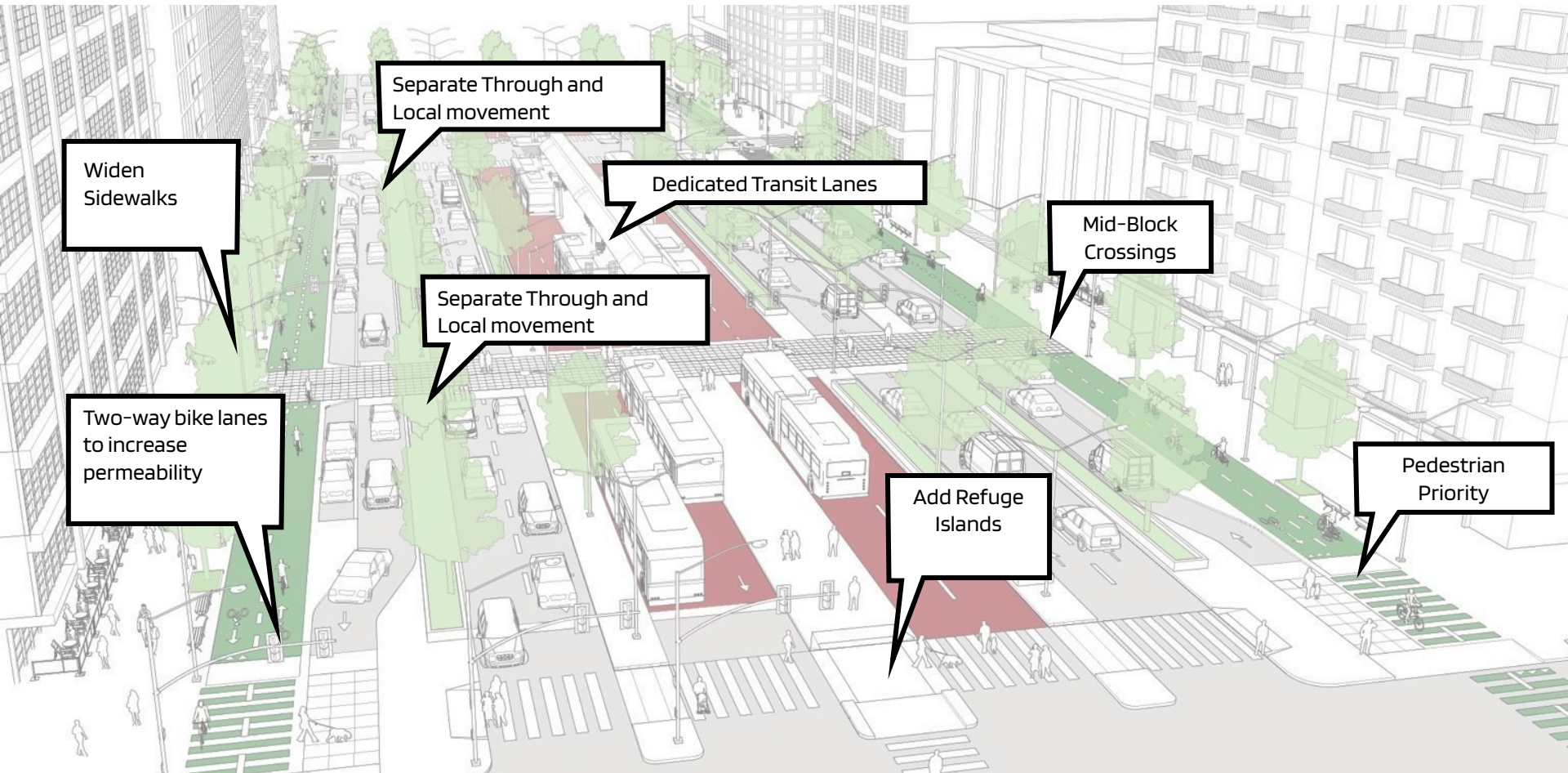


Widen
Sidewalks

Mid-Block
Crossings

Add Refuge
Islands

Pedestrian
Priority



Widen
Sidewalks

Separate Through and
Local movement

Dedicated Transit Lanes

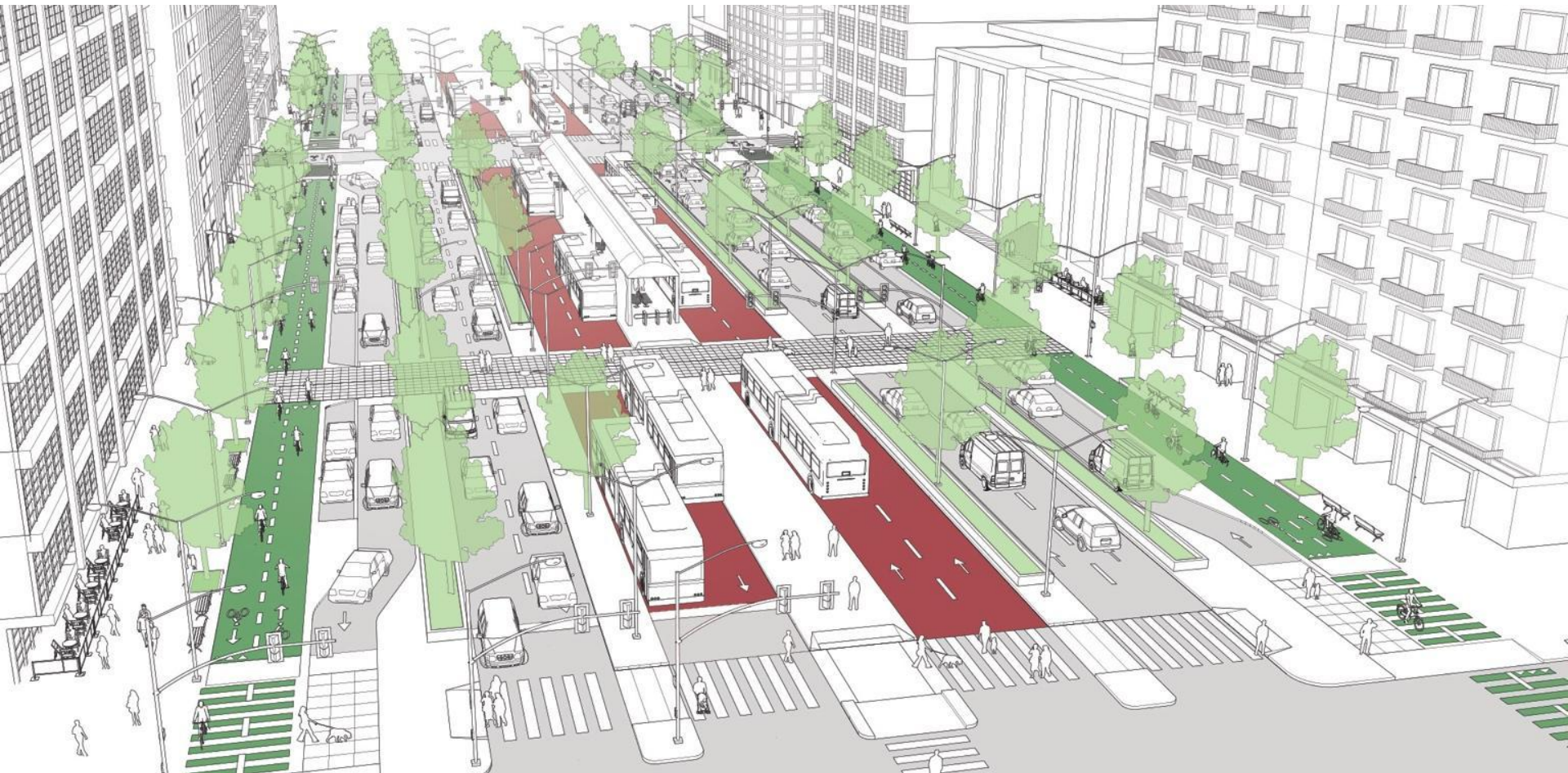
Mid-Block
Crossings

Separate Through and
Local movement

Two-way bike lanes
to increase
permeability

Add Refuge
Islands

Pedestrian
Priority

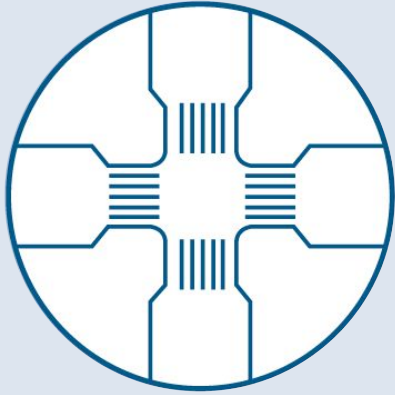


A photograph of a busy street intersection in a developing city. In the foreground, several orange and white traffic cones are placed on the asphalt. A group of pedestrians, including women and children, are walking across the street. In the background, there are multi-story buildings, shops with colorful awnings, and parked cars. A white arrow sign points left on the right side of the street.

Intersection

Transformations

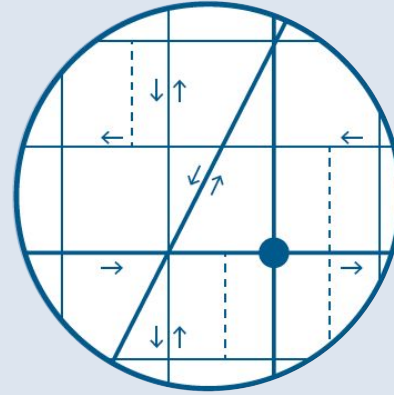
Intersection Design Strategies



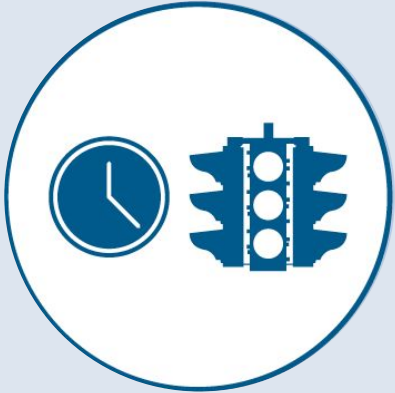
Design Compact Intersections



Simplify Geometry



Analyze Networks



Integrate Time and Space

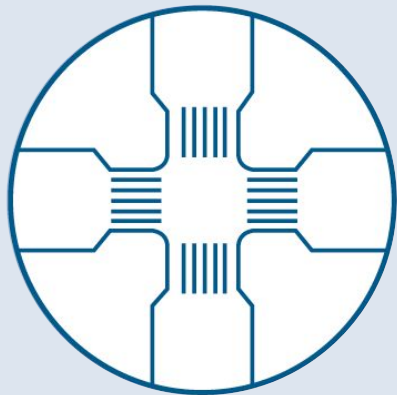


Increase Pedestrian Space



Start with Vulnerable Users

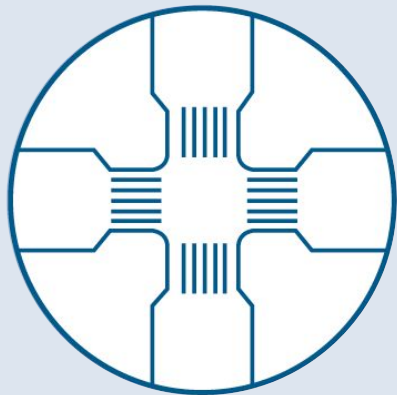
Intersection Design Strategies



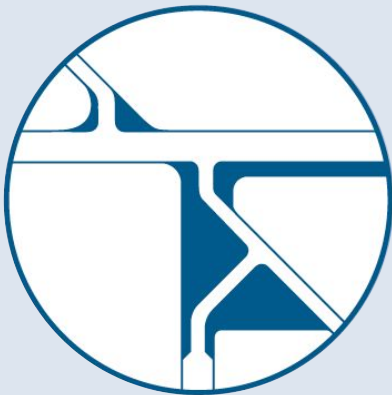
Design Compact Intersections



Intersection Design Strategies



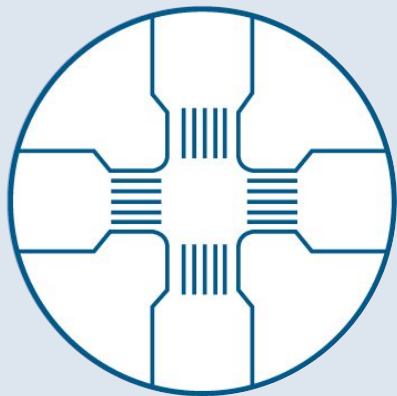
Design Compact Intersections



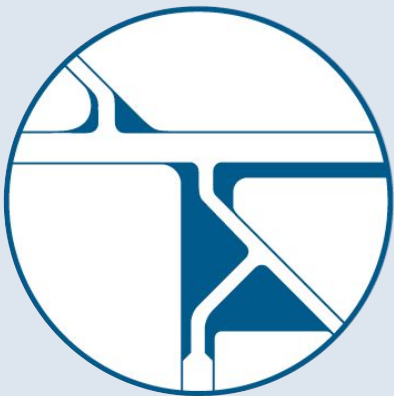
Simplify Geometry



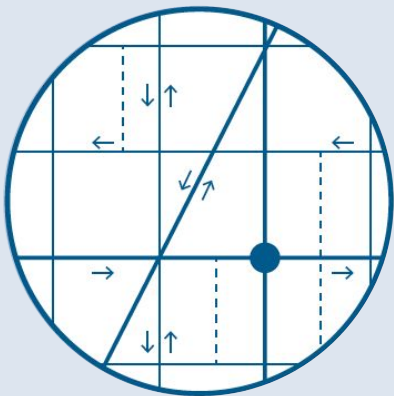
Intersection Design Strategies



Design Compact Intersections



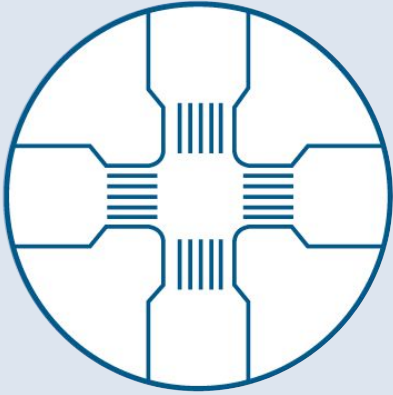
Simplify Geometry



Analyze Networks



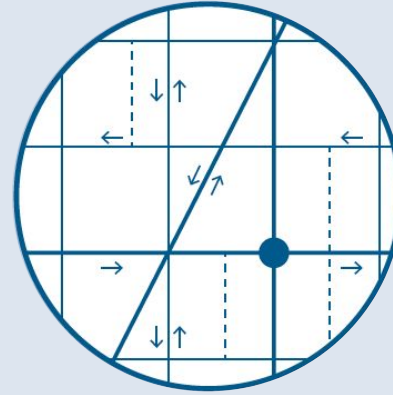
Intersection Design Strategies



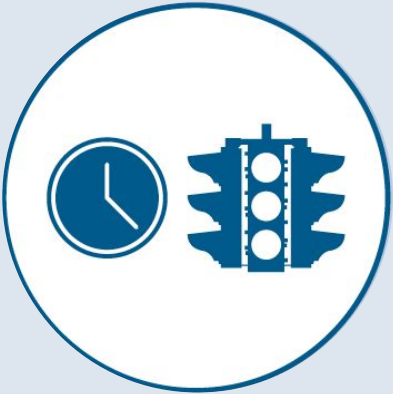
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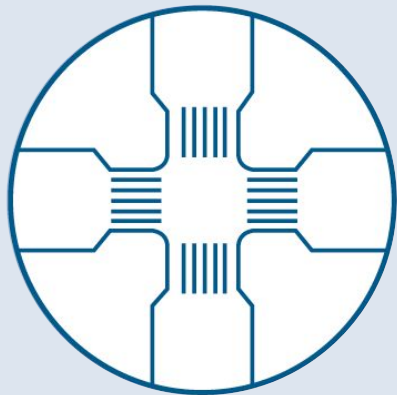


Analyze Networks



Integrate Time and Space

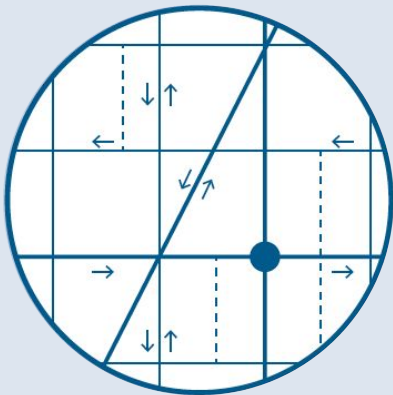
Intersection Design Strategies



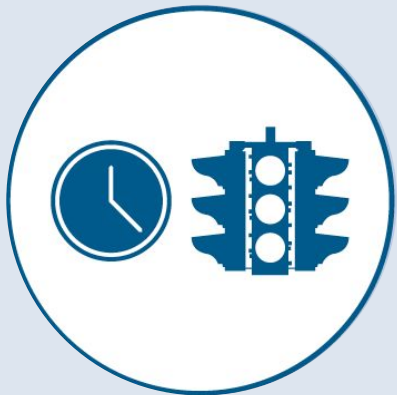
Design Compact Intersections



Simplify Geometry



Analyze Networks



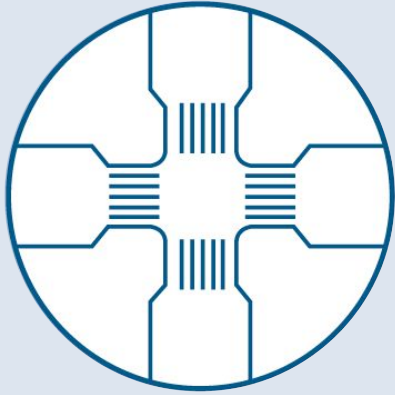
Integrate Time and Space



Increase Pedestrian Space



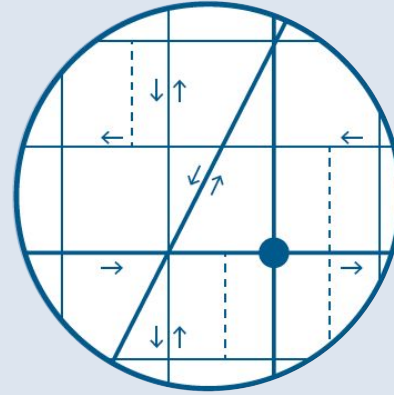
Intersection Design Strategies



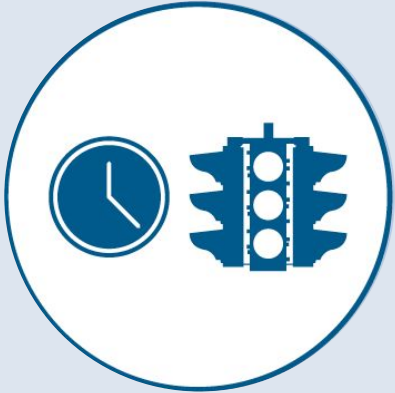
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Simplify Geometry



Analyze Networks



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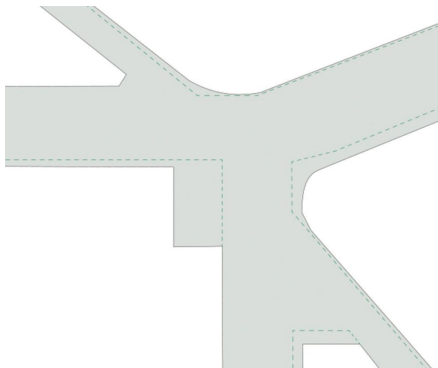
Increase Pedestrian Space



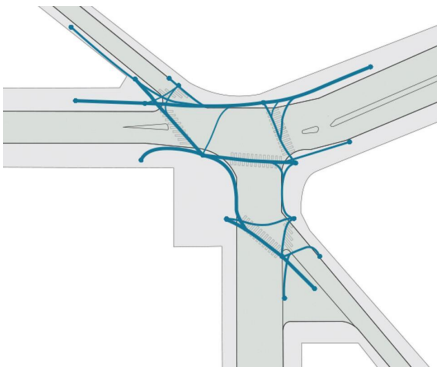
Start with Vulnerable Users

How to analyze Intersections

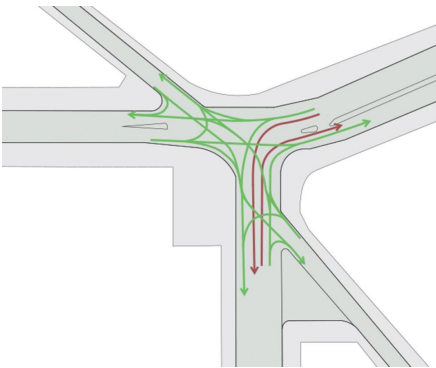
Intersection analysis



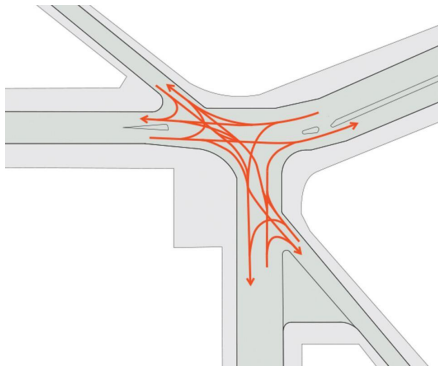
Context



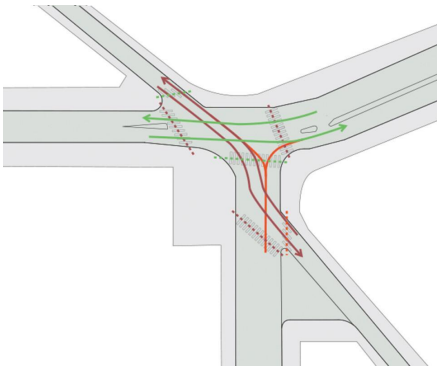
Pedestrian Activity



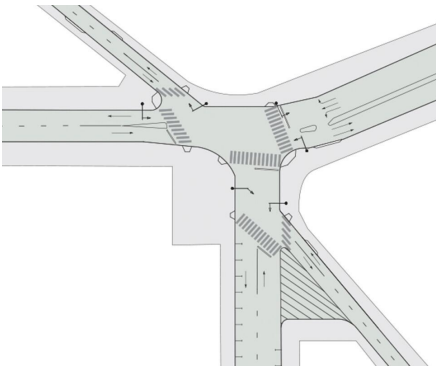
Transit and Cycle Activity



Vehicle Volumes

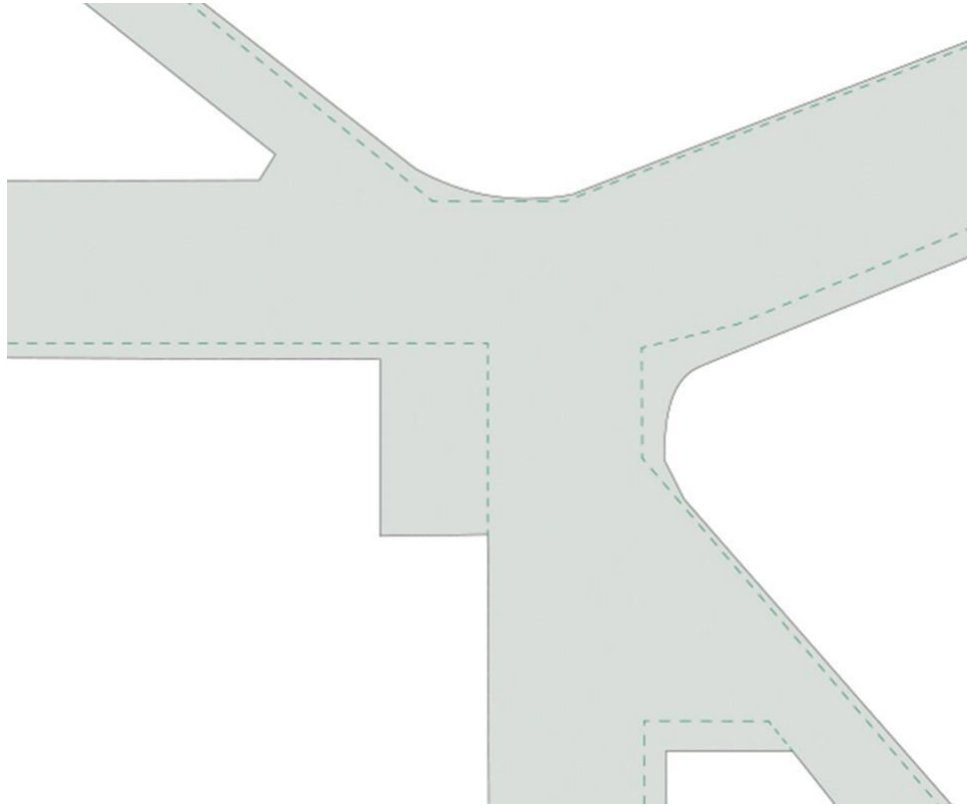


Signalization



Geometry, Signals, Signs, and Markings

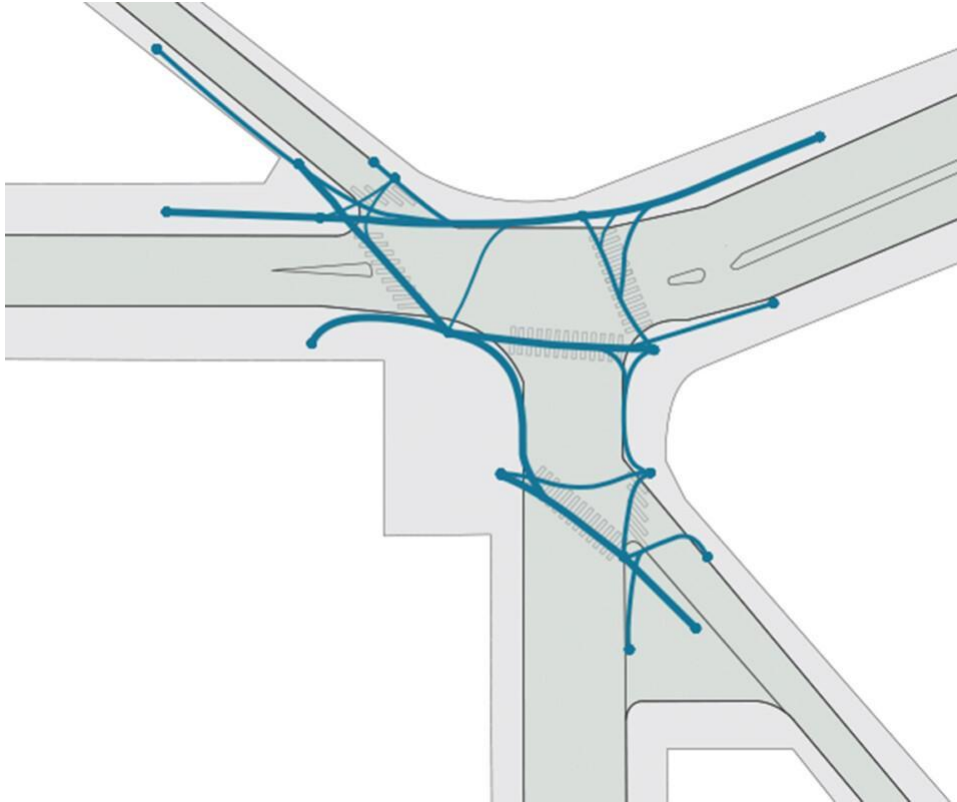
1. Understand the context and urban design qualities
2. Document how pedestrians use and activate the intersection
3. Assess the volume and movement of cyclists and transit
4. Map vehicle movements and turns
5. Plot the signal phases to show how the intersection flows
6. Survey how people move based on the existing markings and geometry



Context

- 1.** Understand the context and urban design qualities
- 2.** Document how pedestrians use and activate the intersection
- 3.** Assess the volume and movement of cyclists and transit
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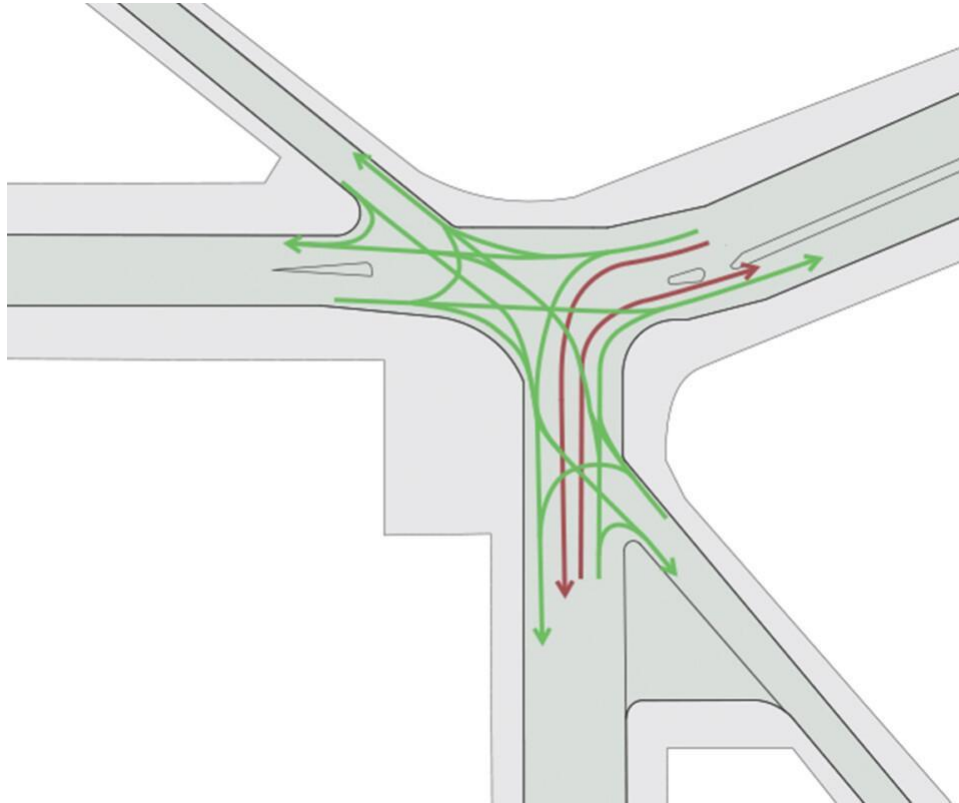
Intersection analysis



Pedestrian Activity

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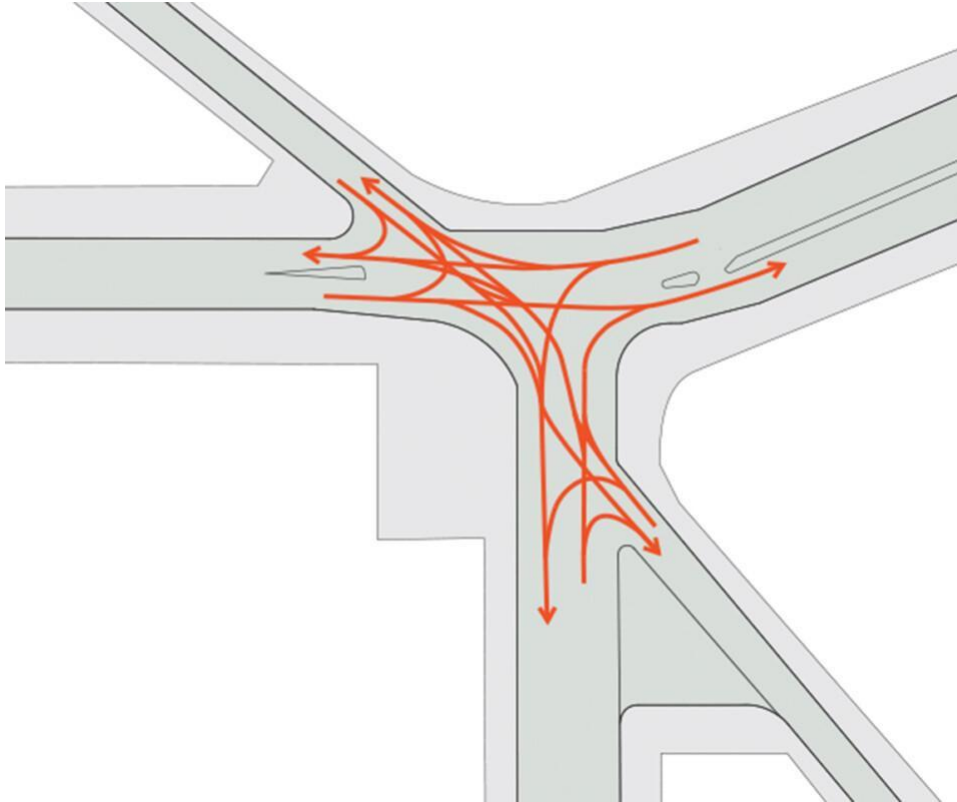
Intersection analysis



Transit and Cycle Activity

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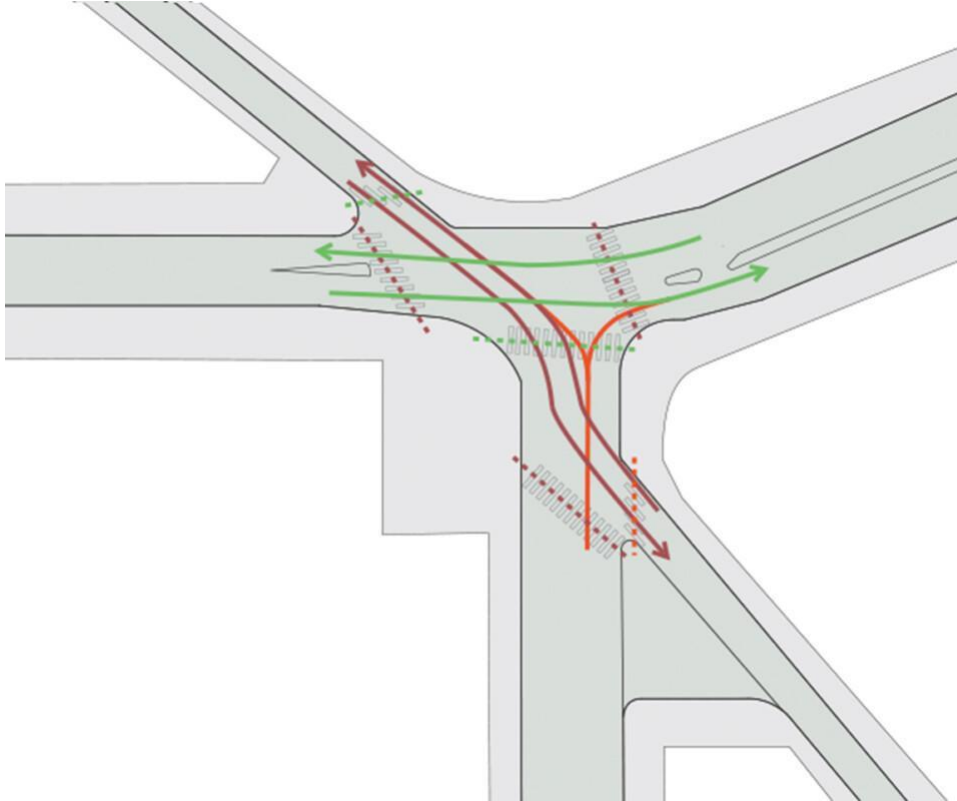
Intersection analysis



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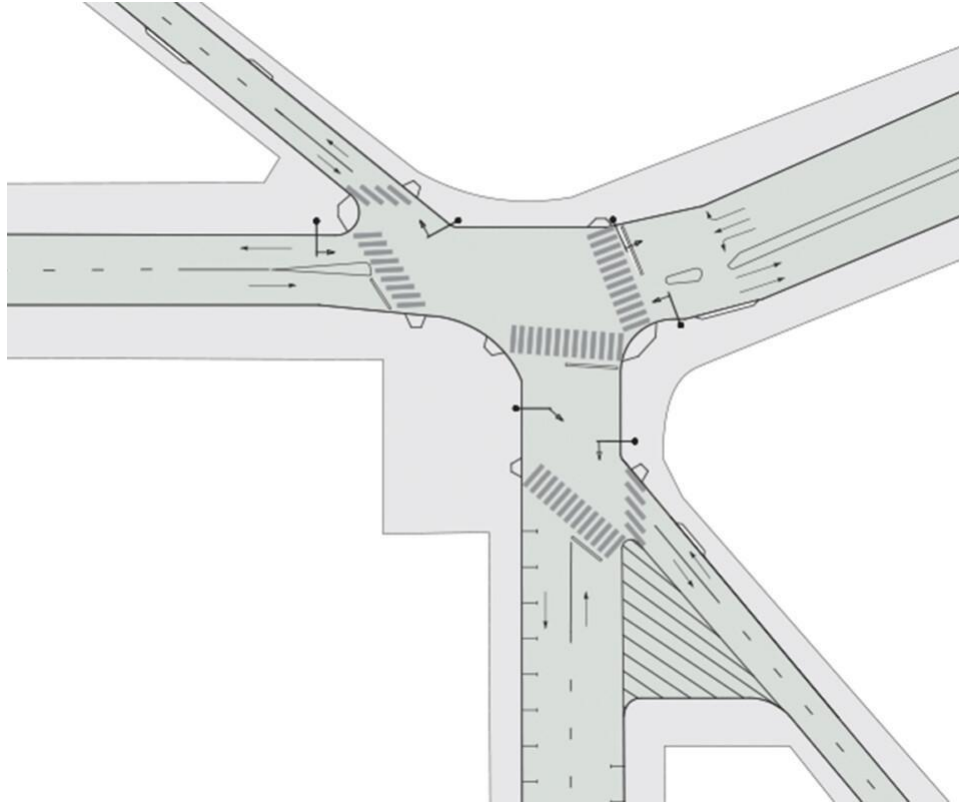
Intersection analysis



Signalization

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Intersection analysis



Transit and Cycle Activity

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You have learned how your intersection works

1. Understand the context and urban design qualities
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3. Assess the volume and movement of cyclists and transit
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What is next?

1. Understand the context and urban design qualities
2. Document how pedestrians use and activate the intersection
3. Assess the volume and movement of cyclists and transit
4. Map vehicle movements and turns
5. Plot the signal phases to show how the intersection flows
6. Survey how people move based on the existing markings and geometry

Check the cross-sections!

Why
right-sizing
lanes?

Right-size (3 m-wide max) lanes:

1. Are **safer**
2. Encourage **slow speeds**
3. Carry **more vehicles**
...or at least as much as wider lanes

How do your corridors look?

Right-sizing travel lanes



How do your corridors look?

Right-sizing travel lanes



Motorists



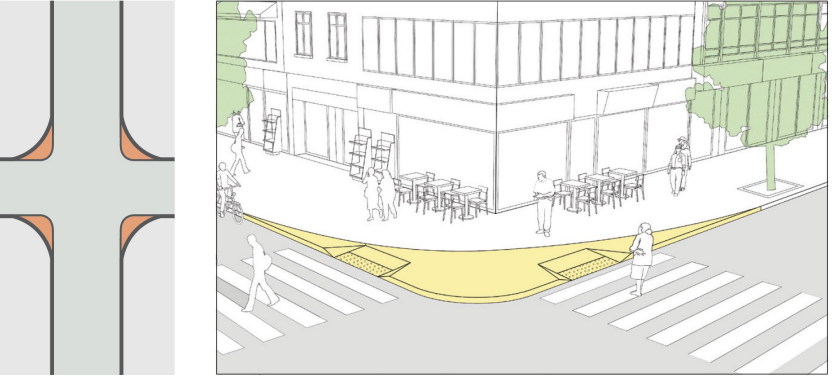
Lane Narrowing



Gateway Treatments

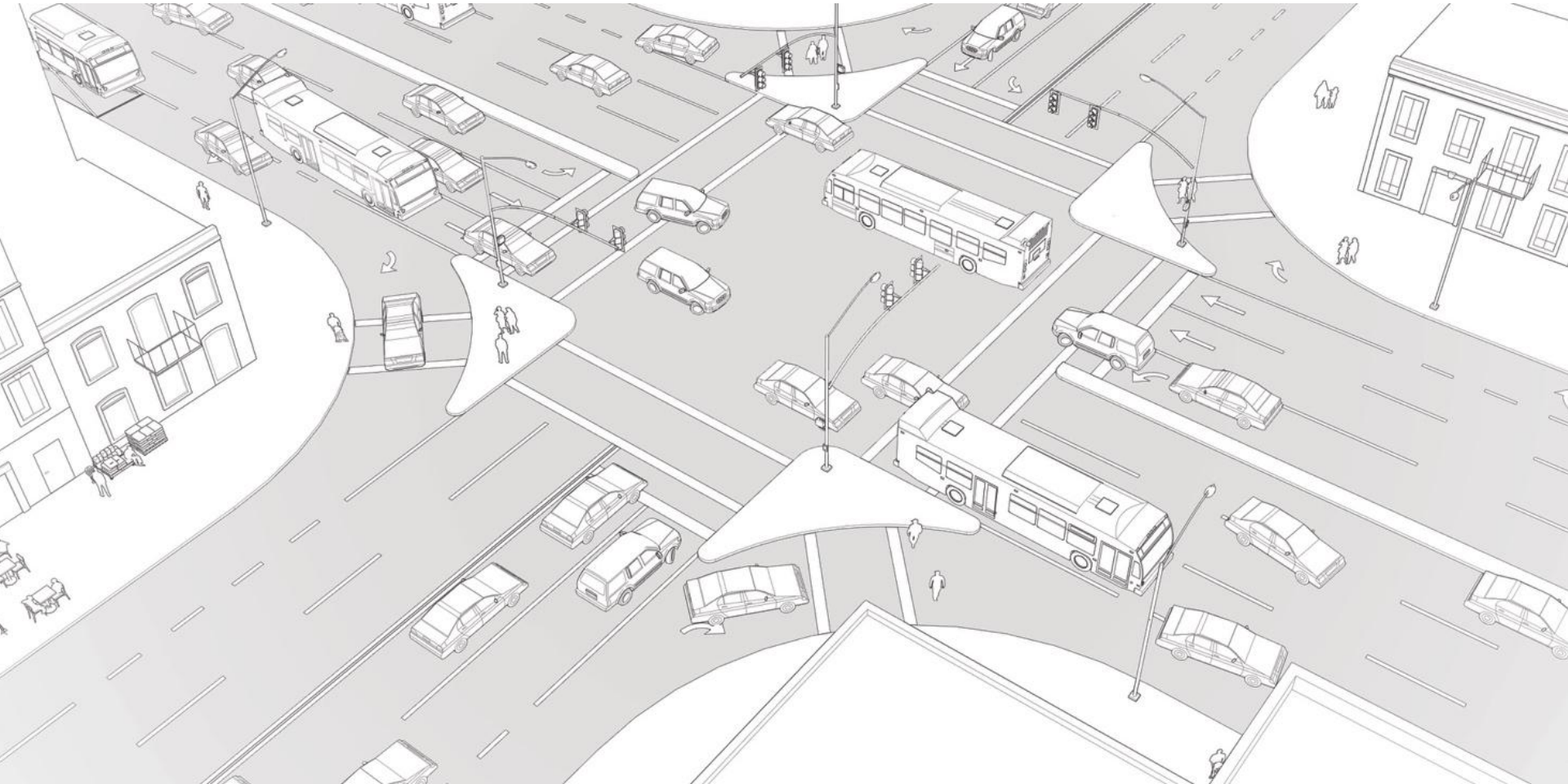


Chicanes and Lane Shifts

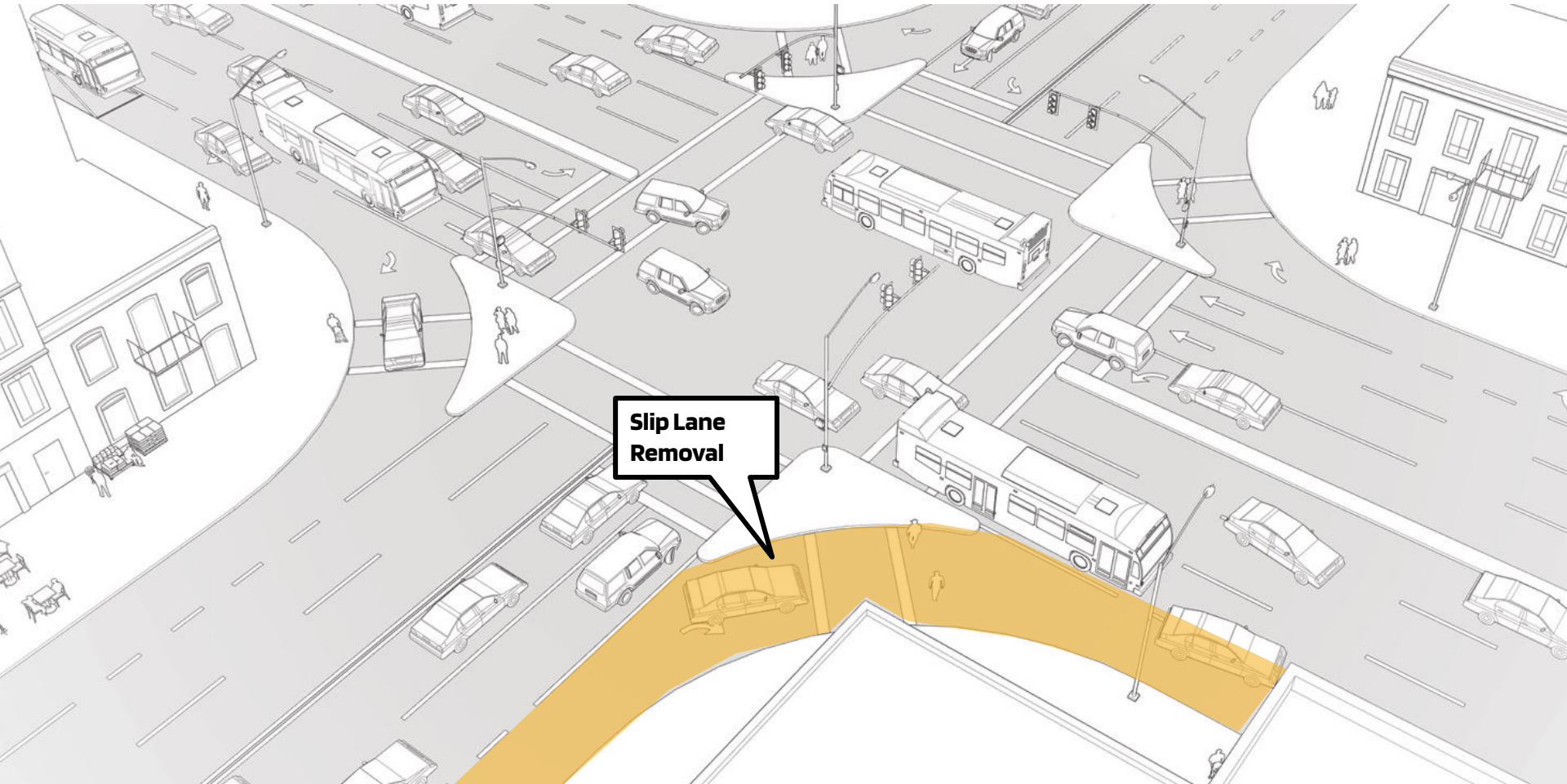


Corner Radii

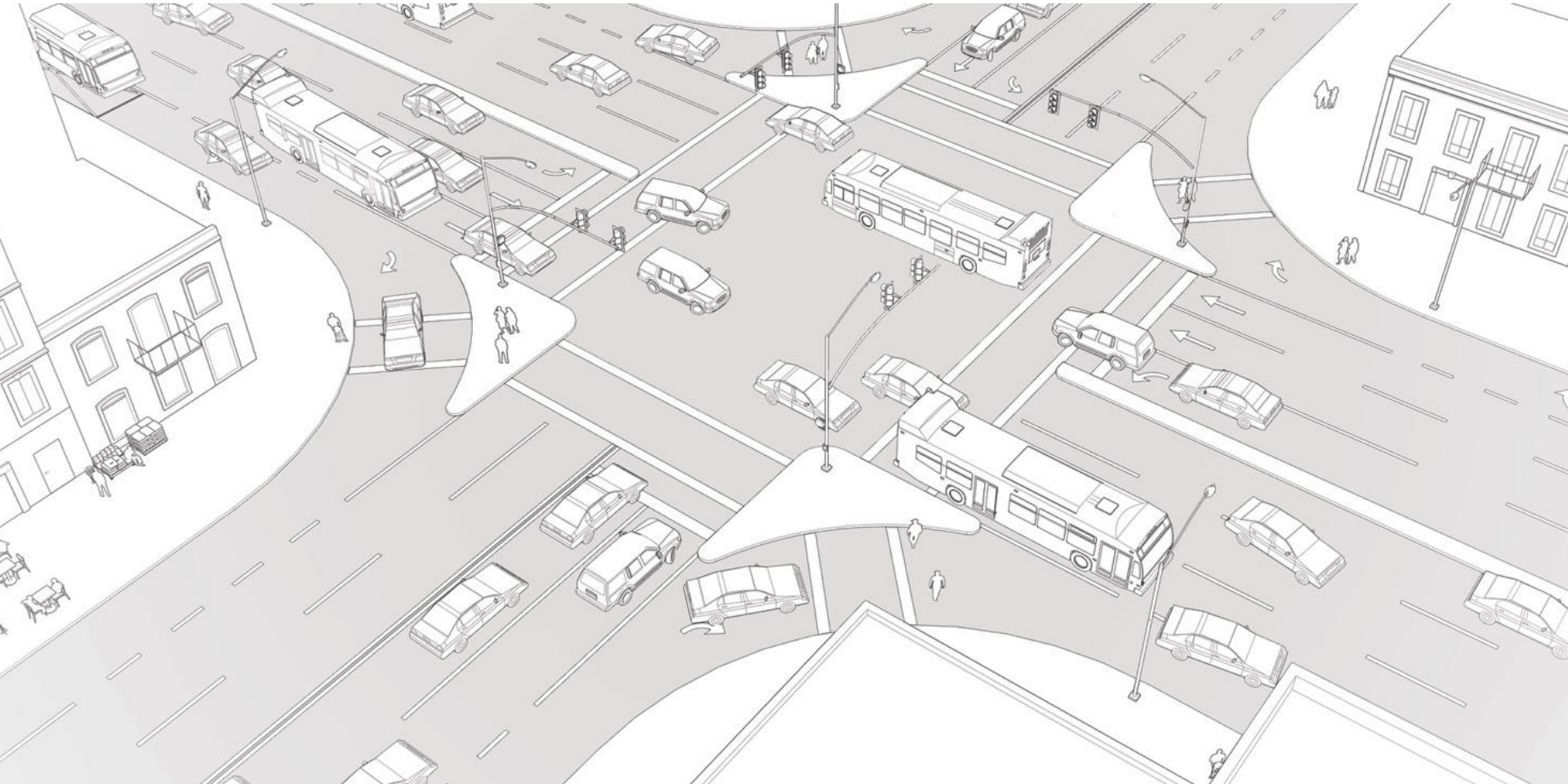
Slip Lanes to Protected Intersection



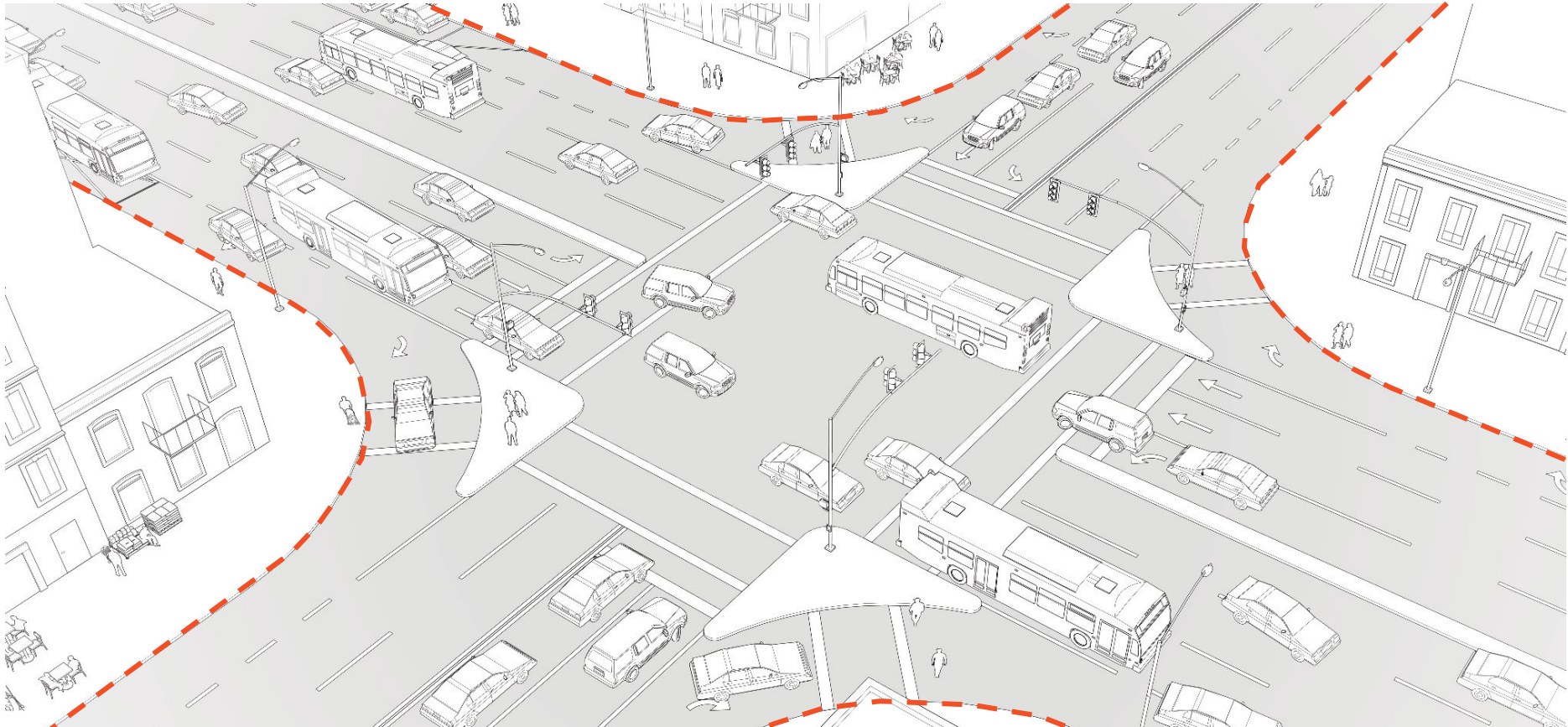
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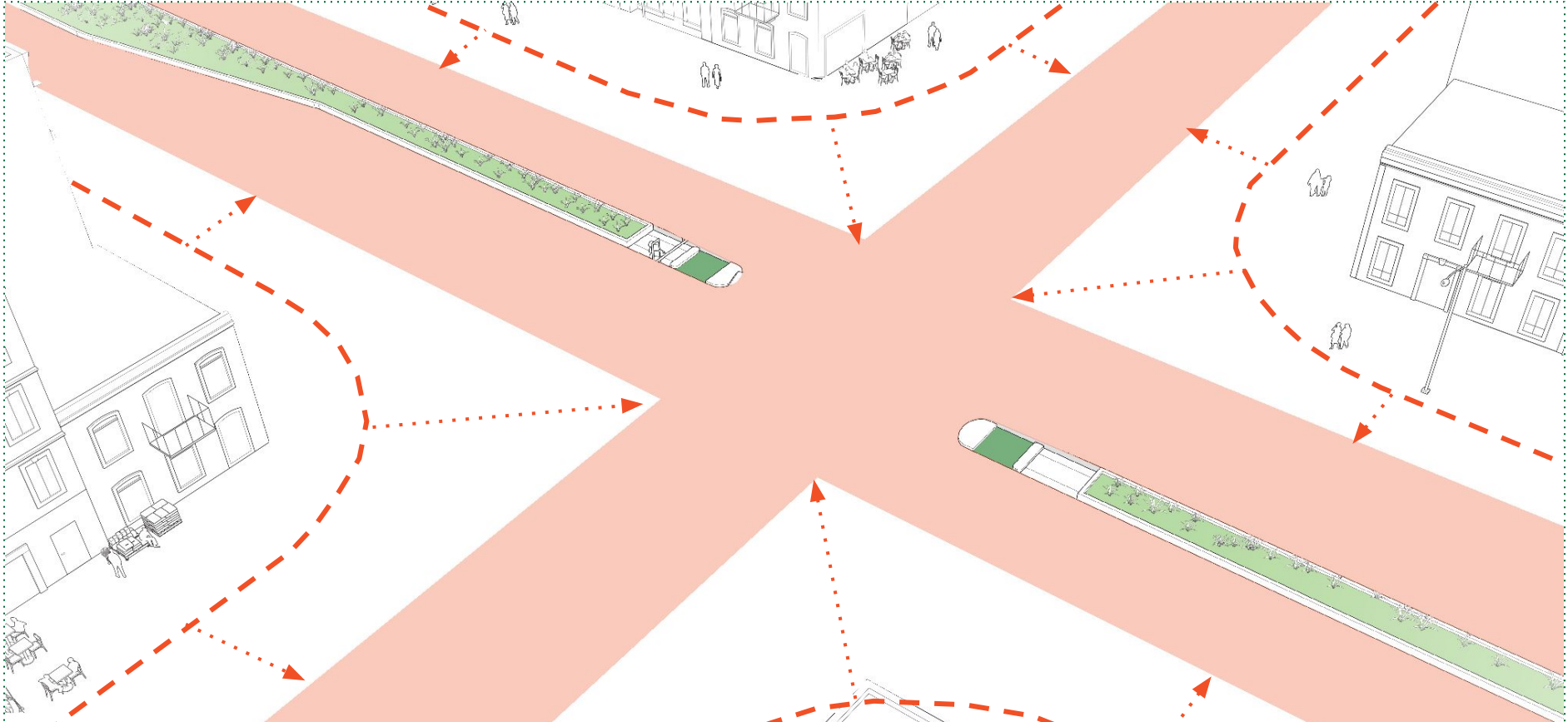
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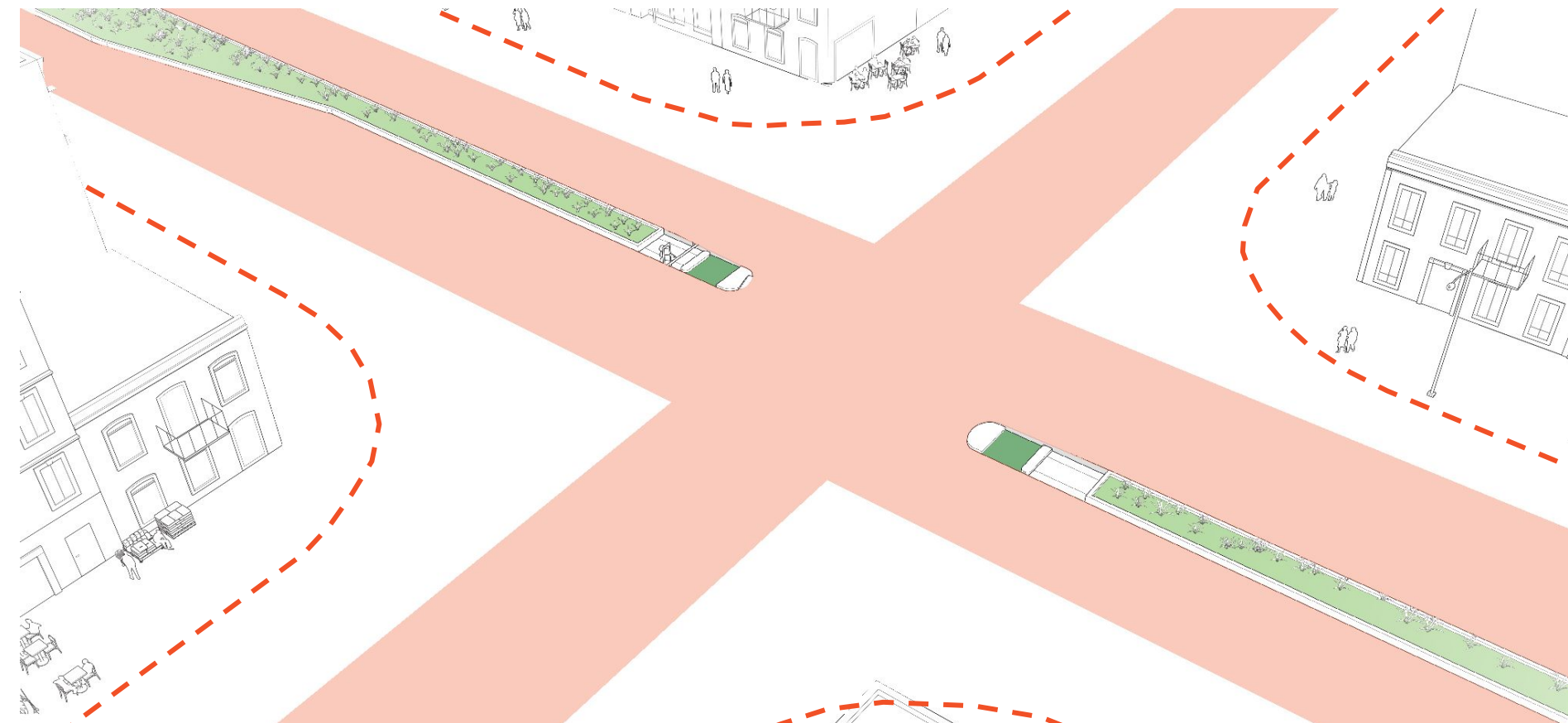
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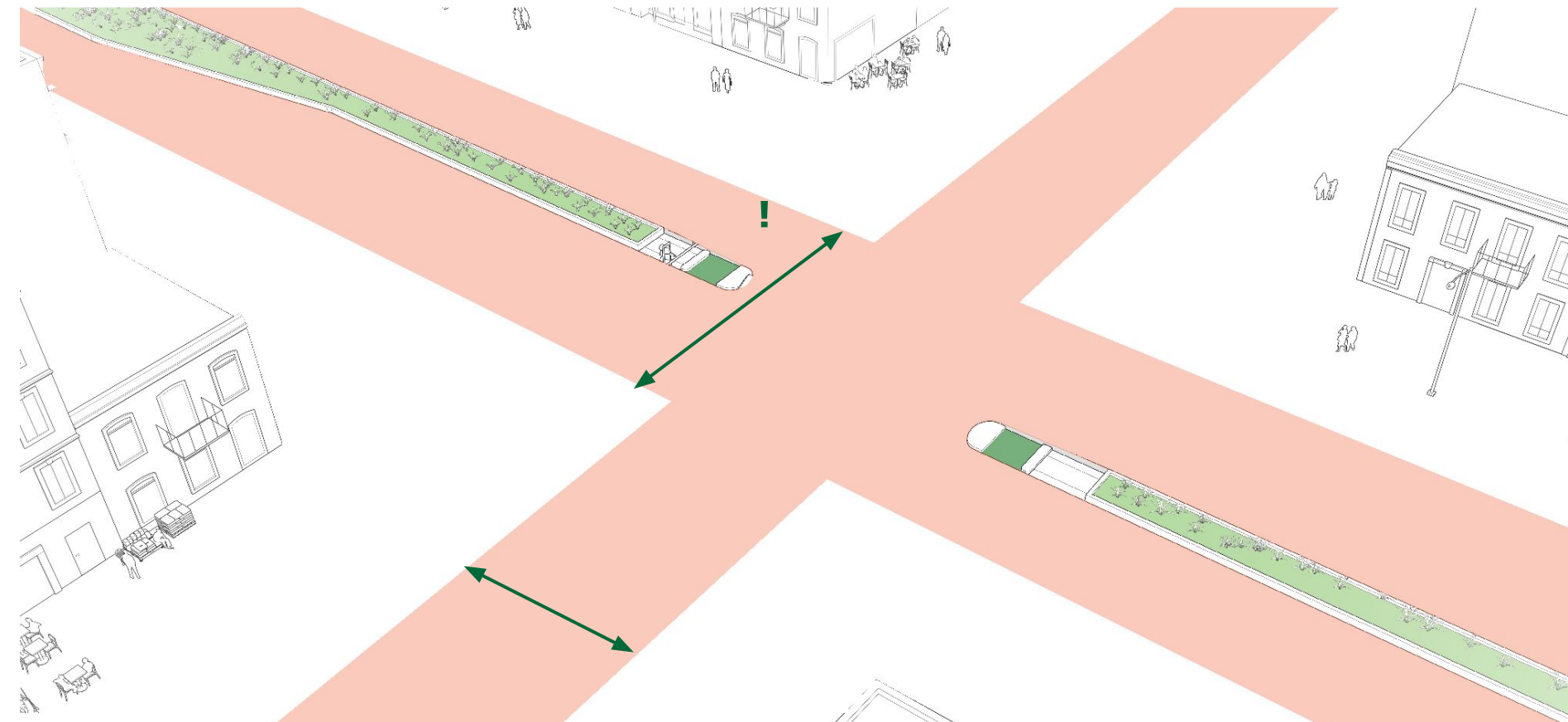
Slip Lanes to Protected Intersection



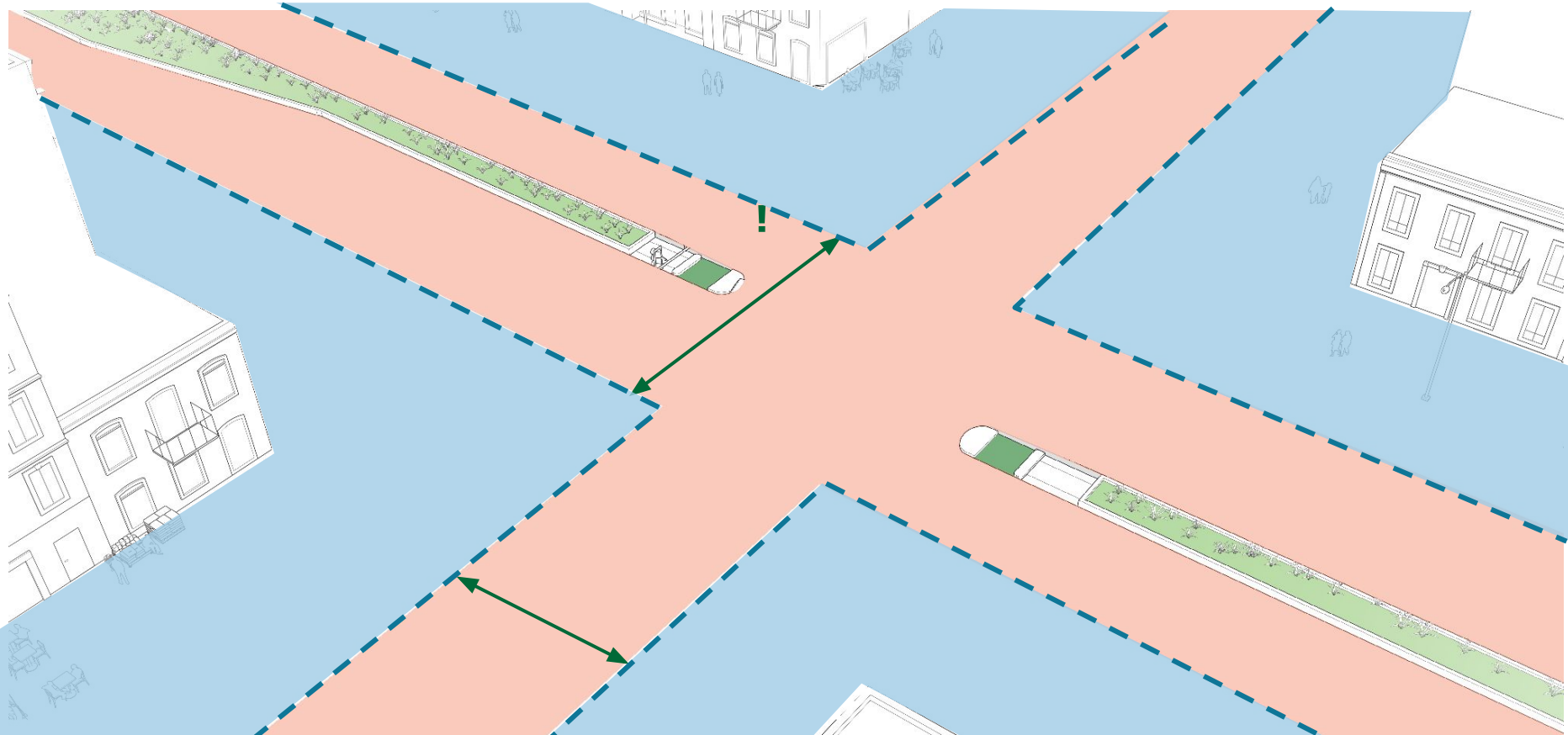
Slip Lanes to Protected Intersection



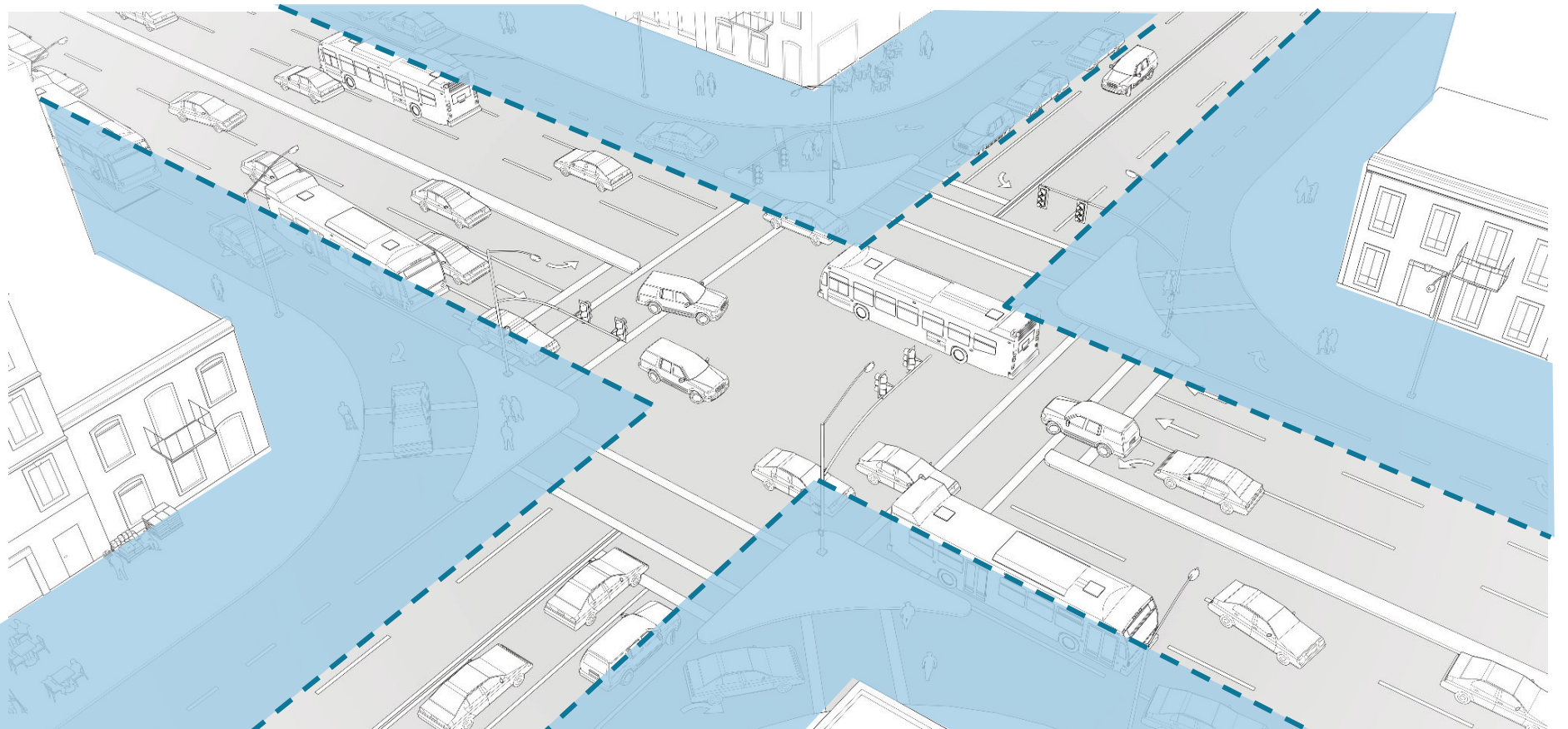
Slip Lanes to Protected Intersection



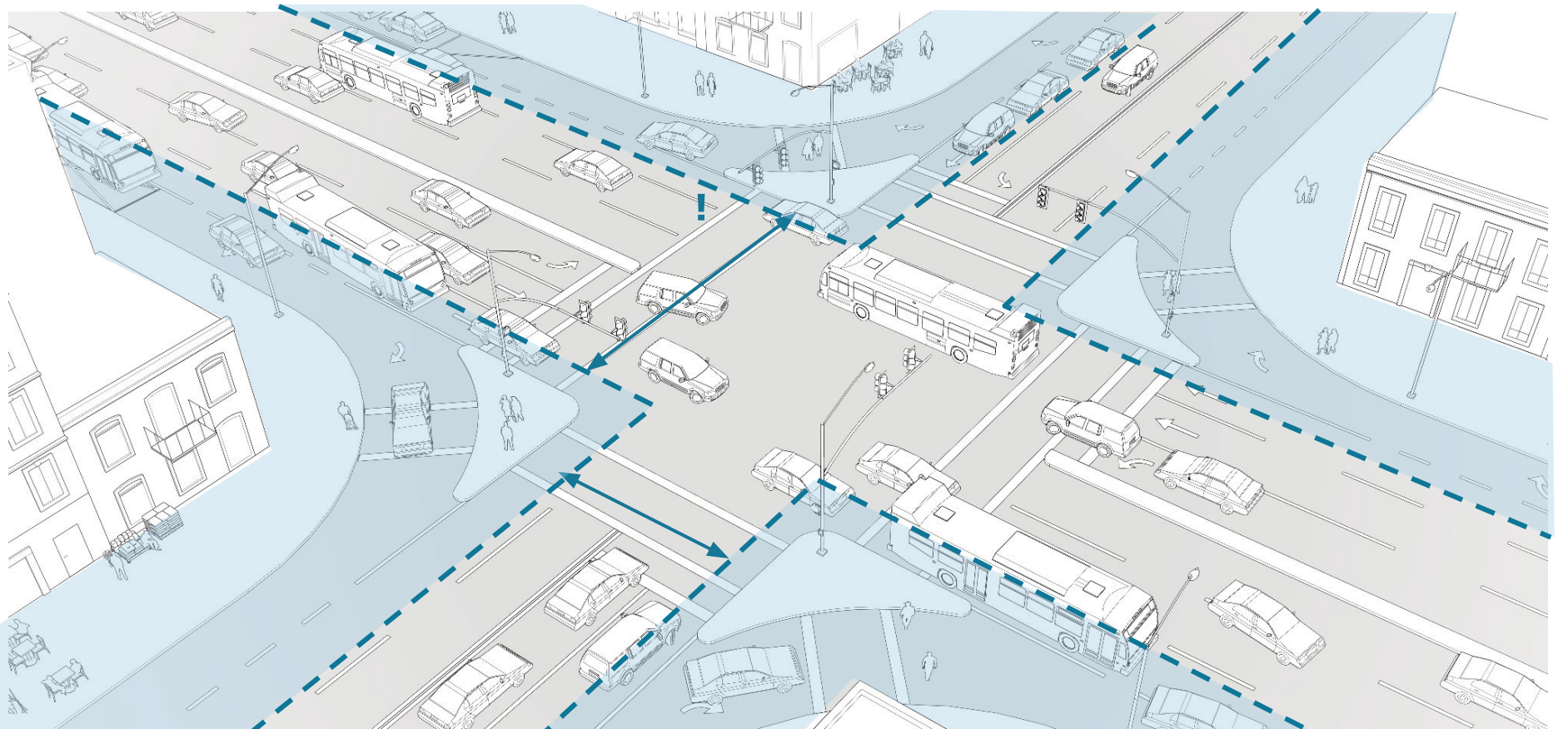
NACTO Global Designing Cities Initiative



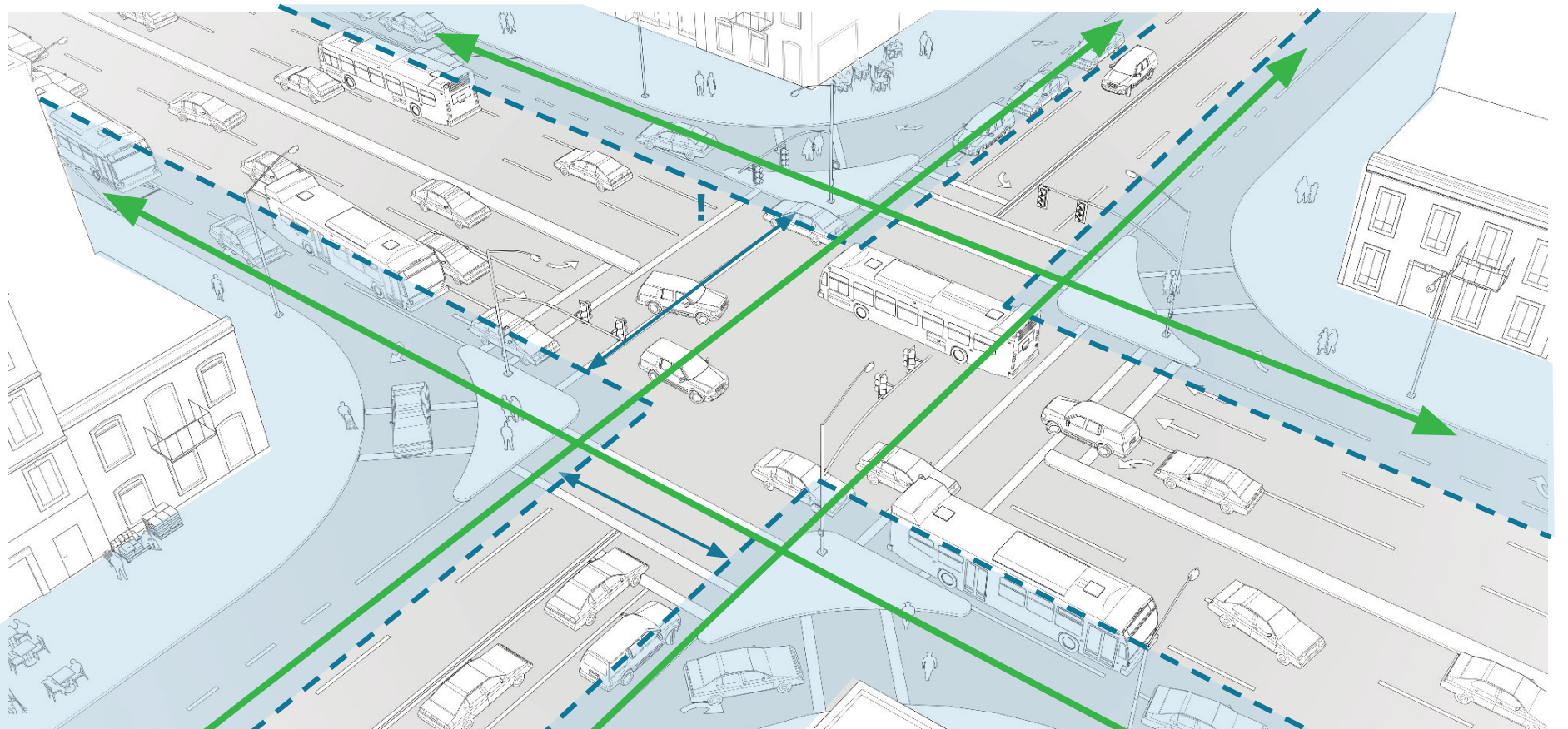
Slip Lanes to Protected Intersection



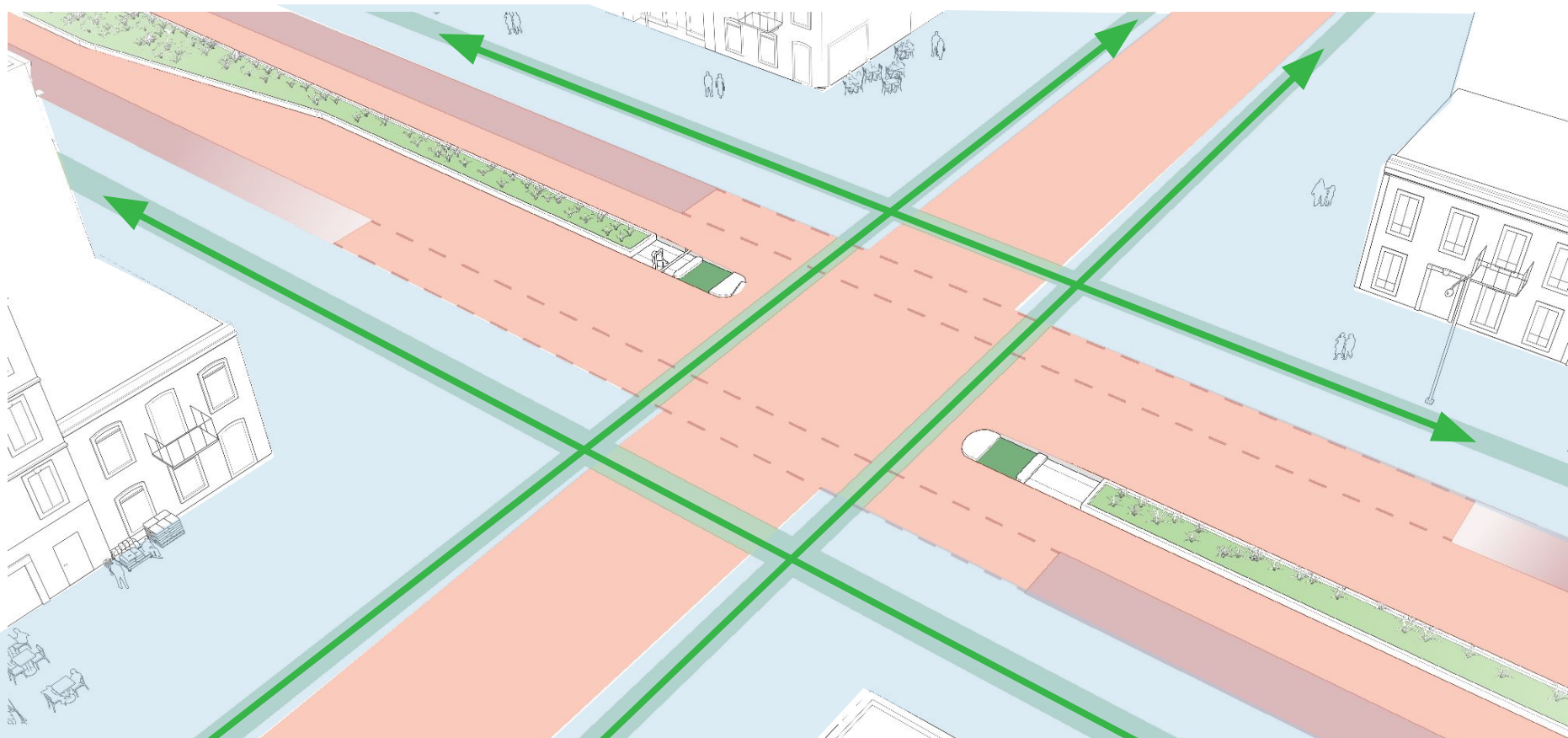
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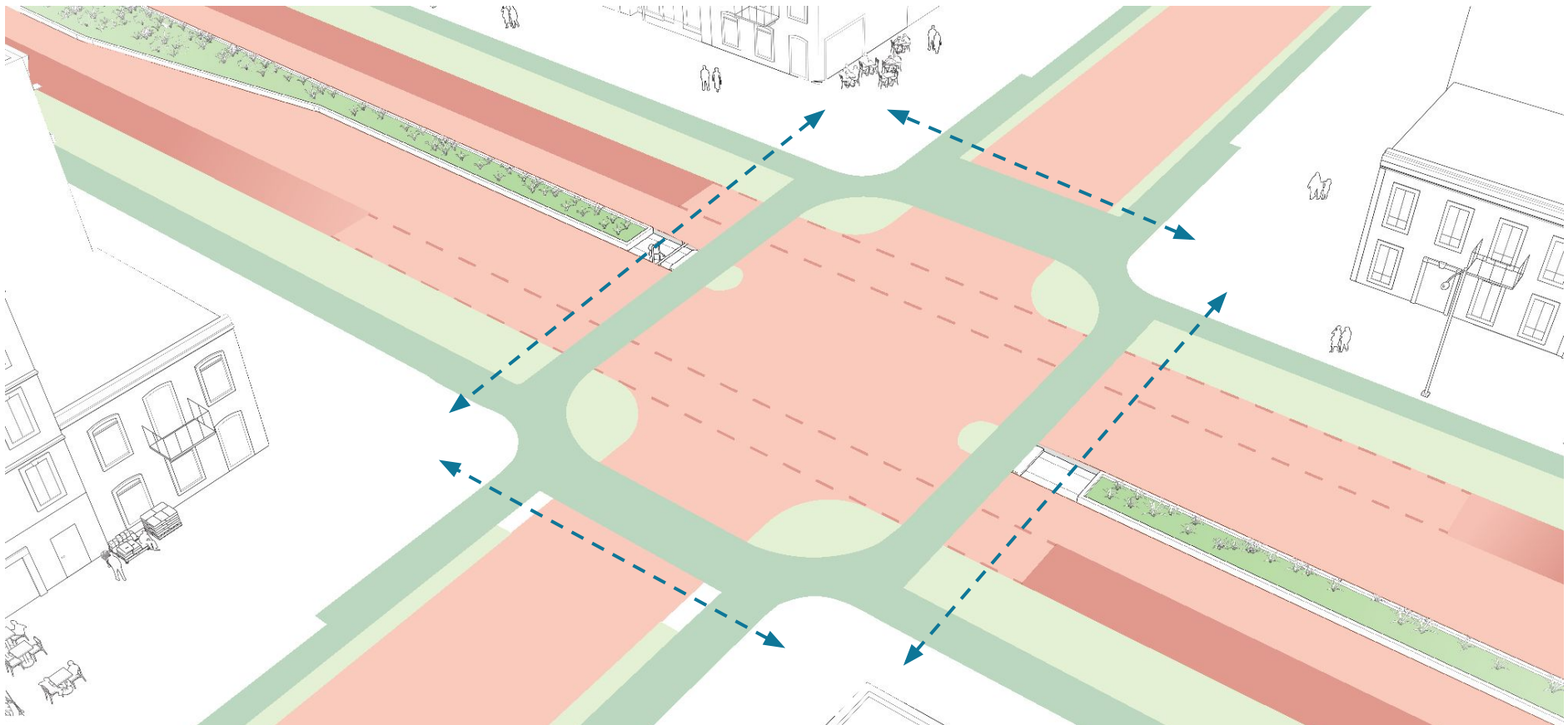
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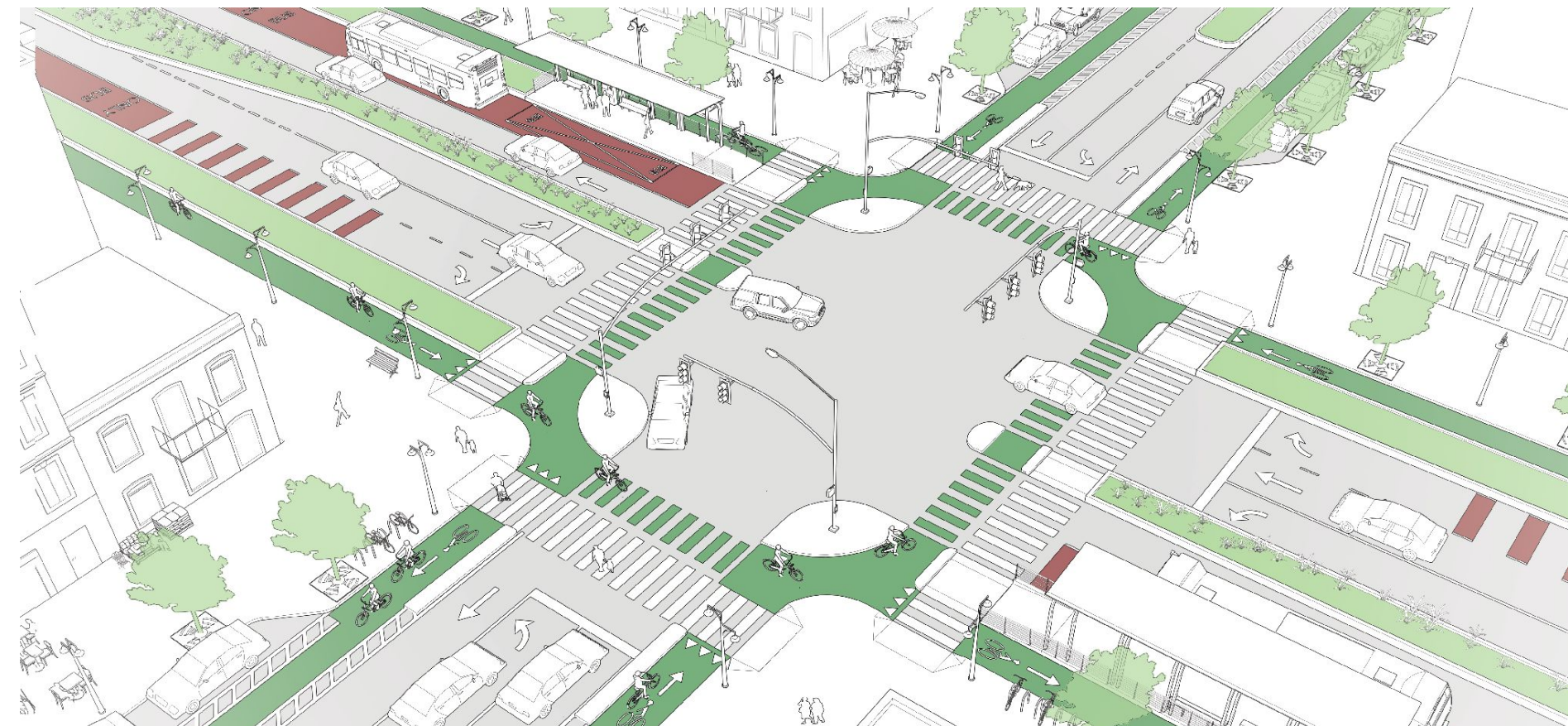
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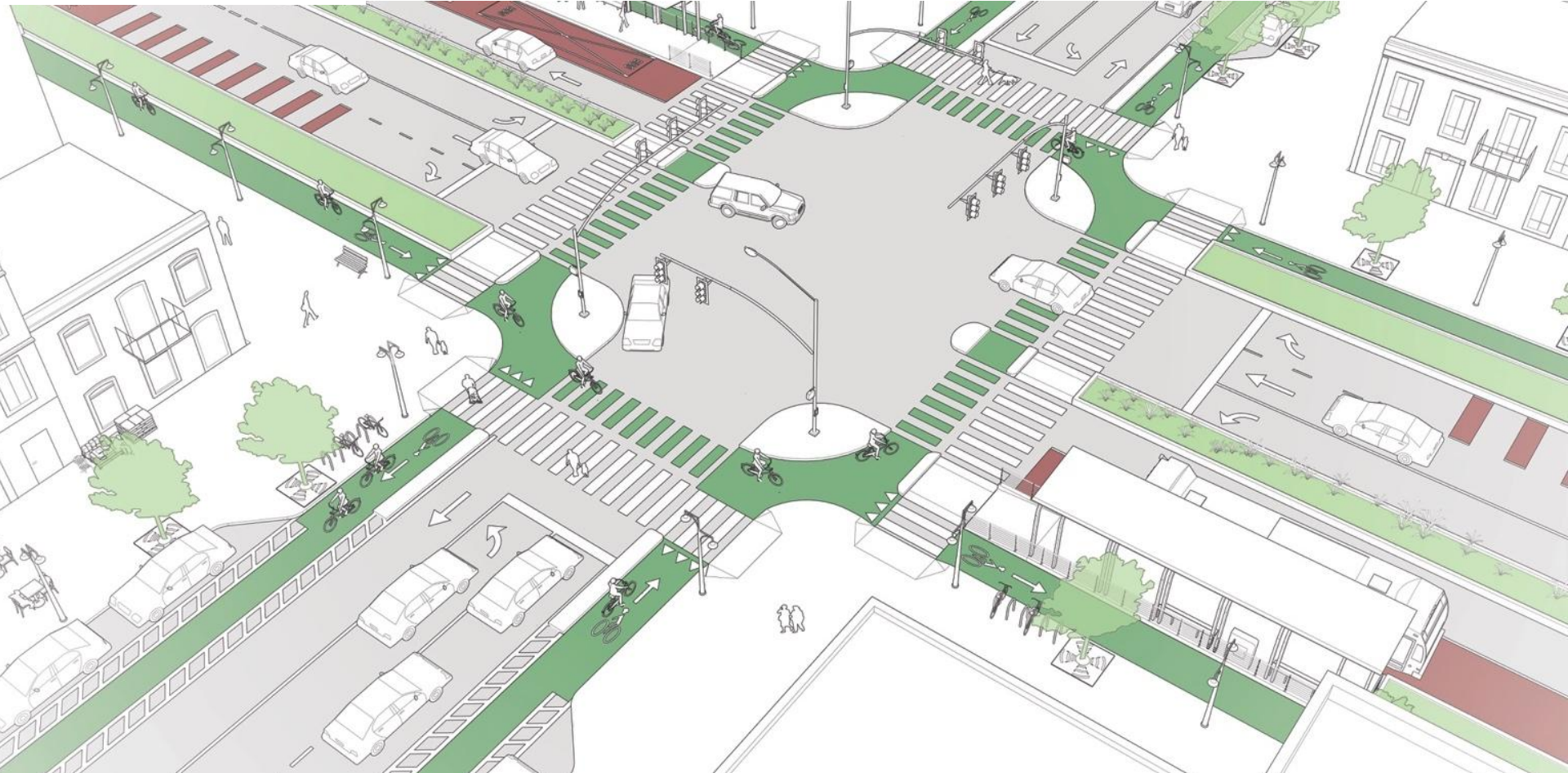
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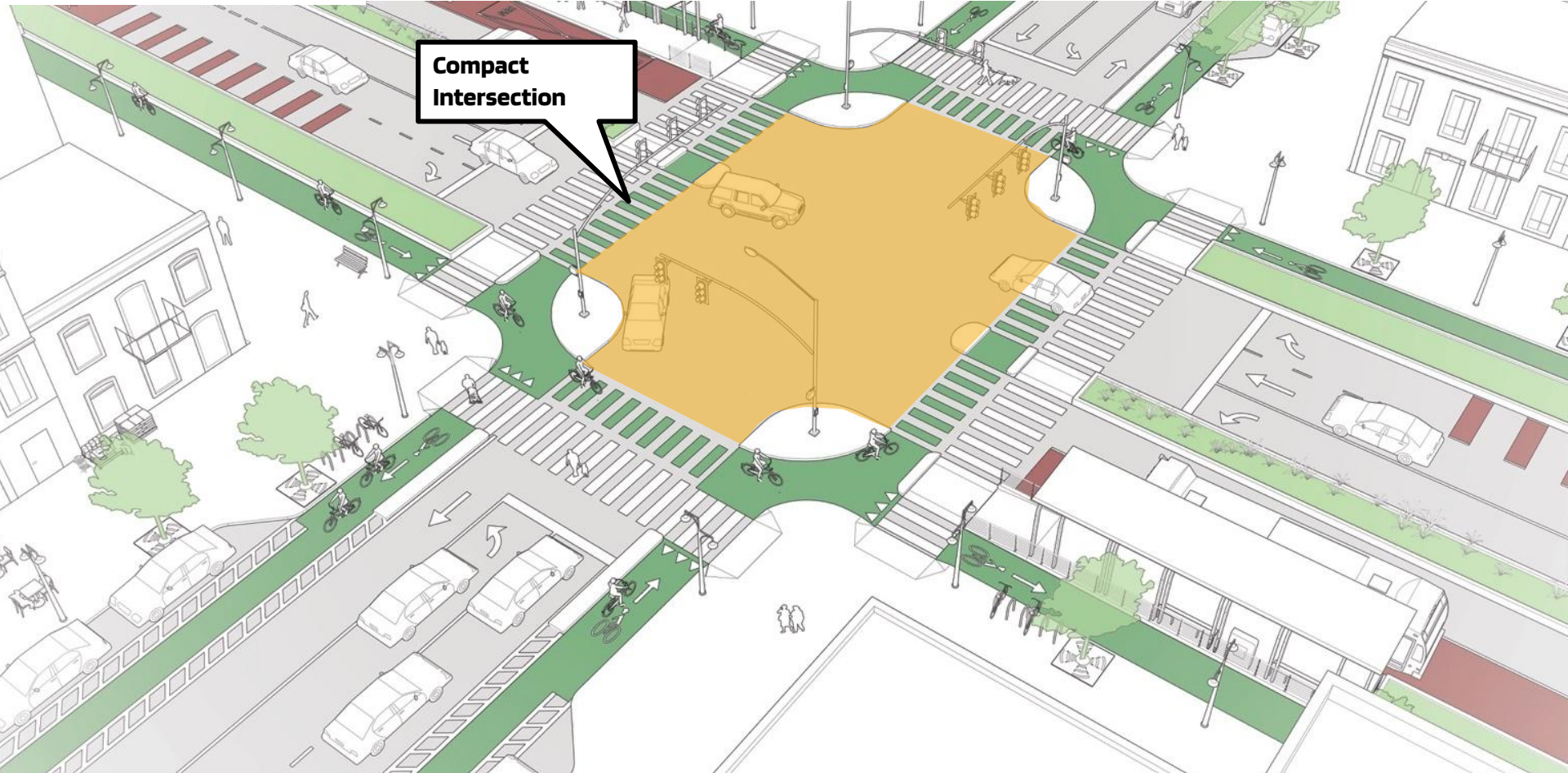
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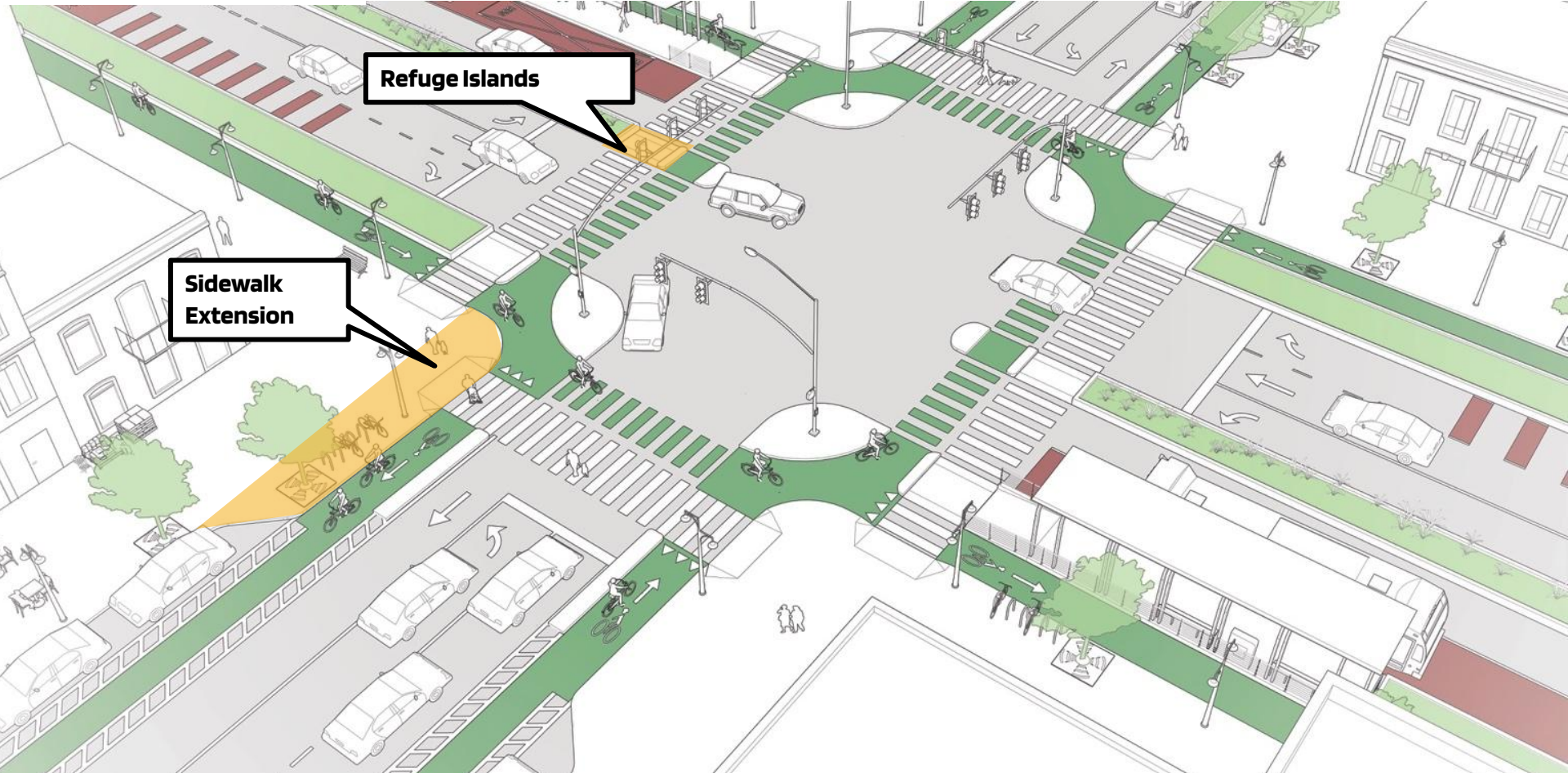
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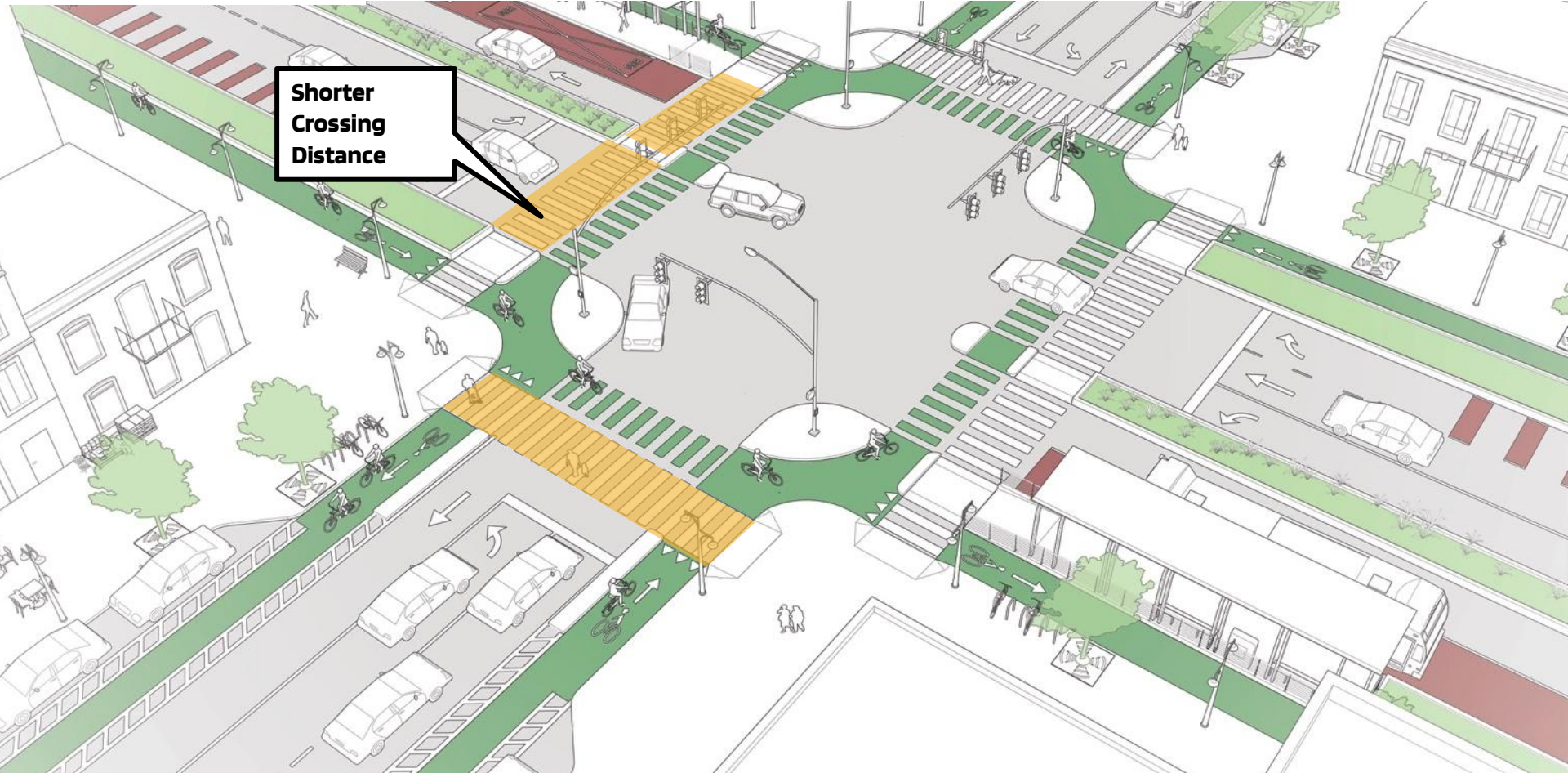
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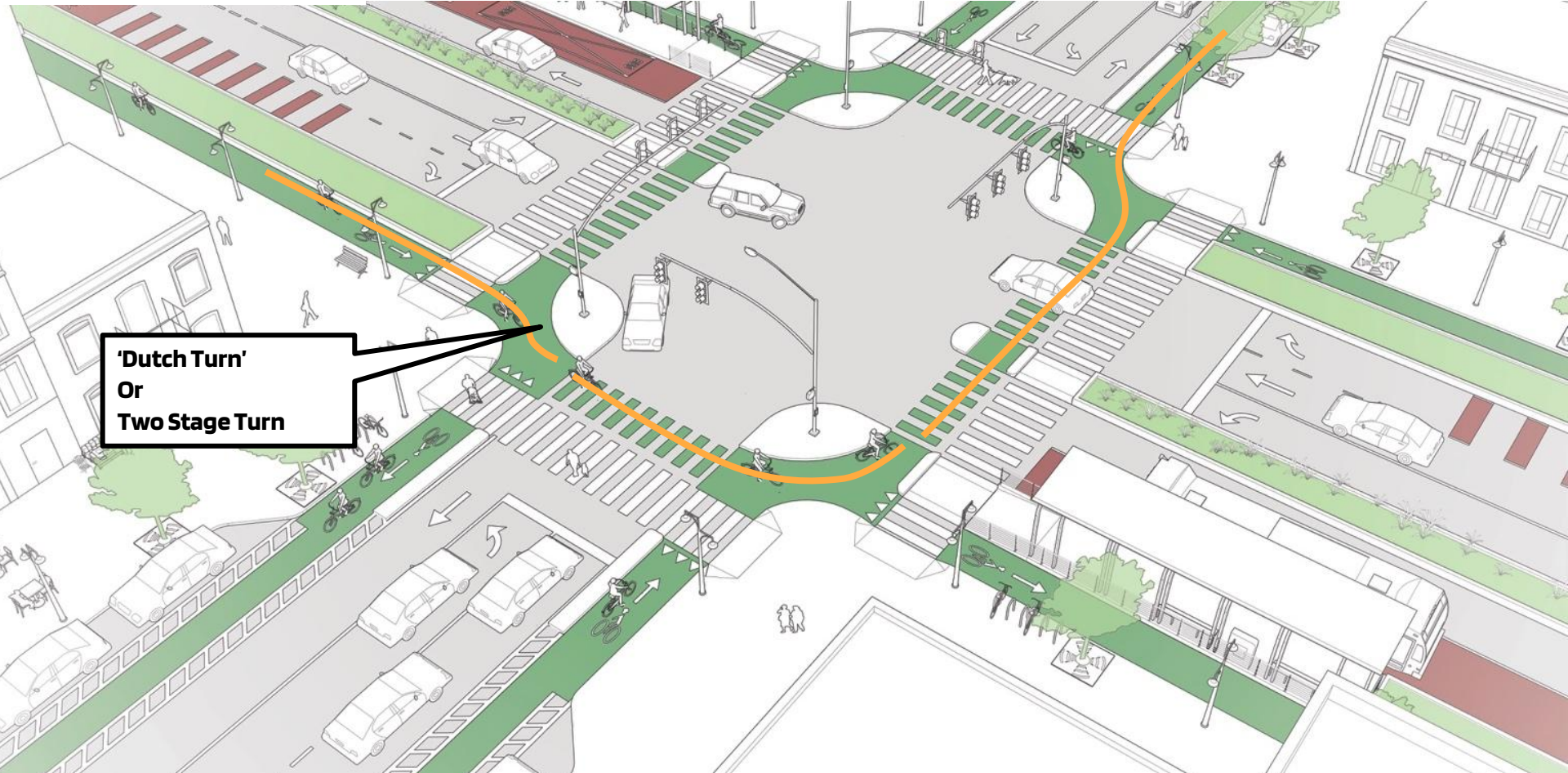
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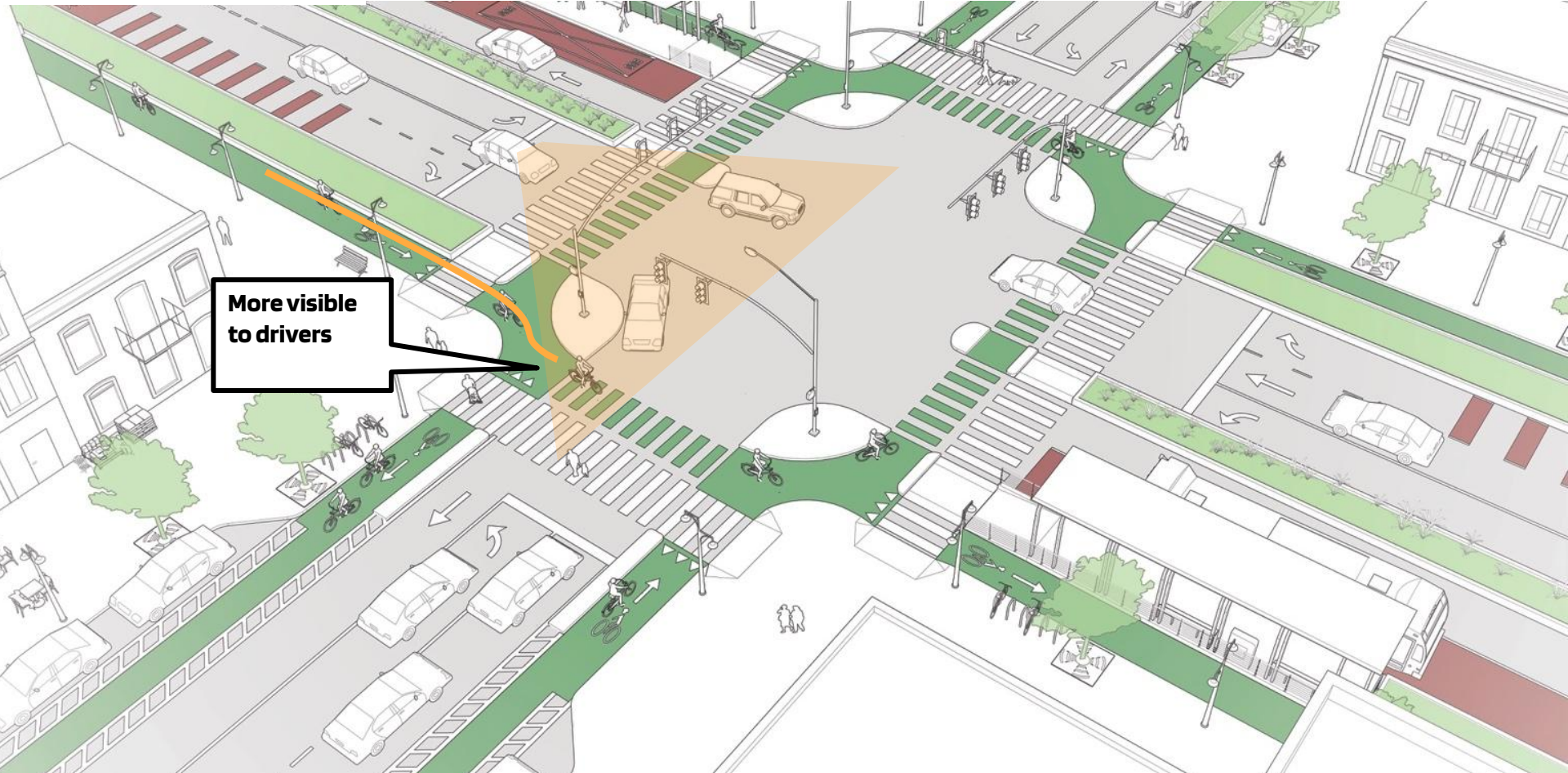


Slip Lanes to Protected Intersection

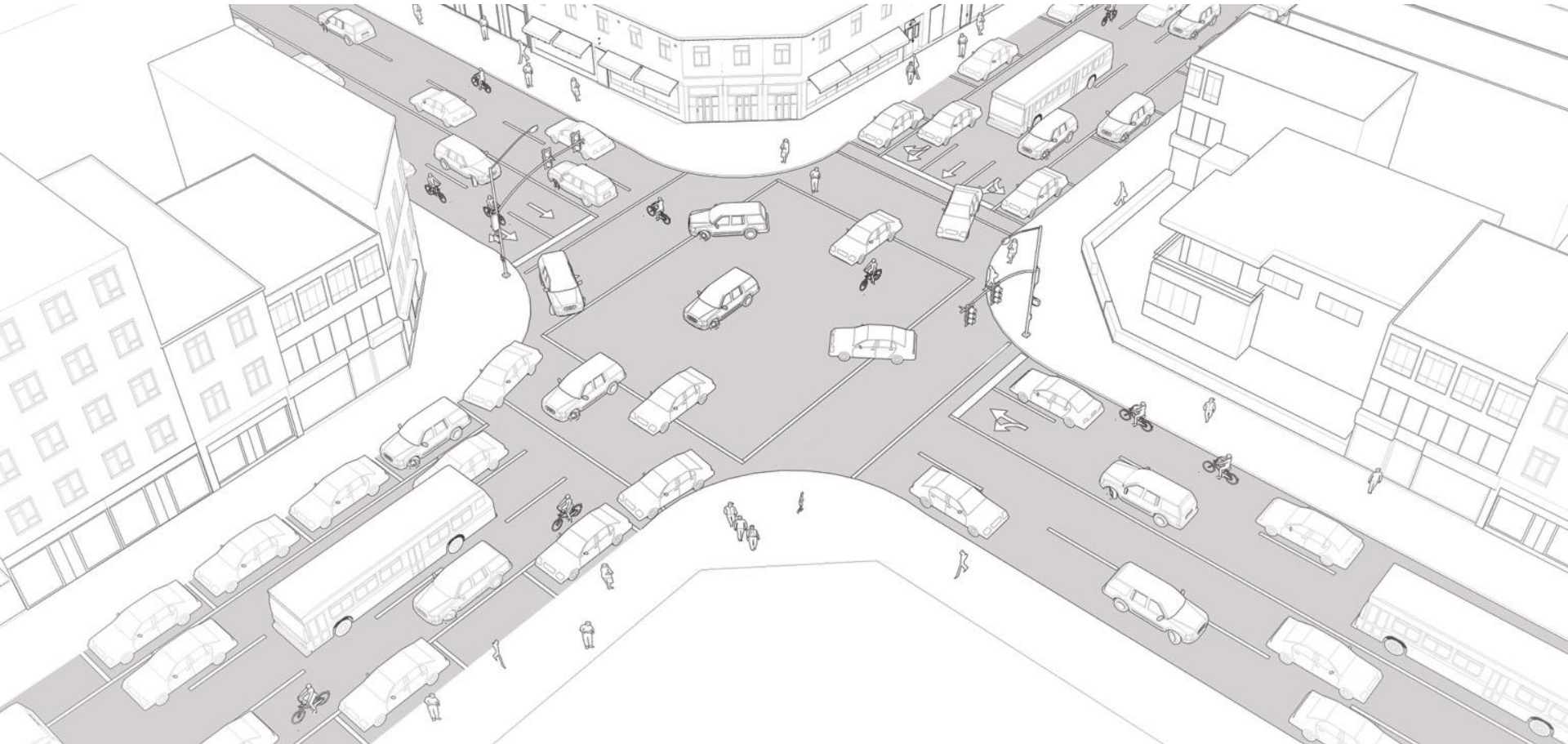


**'Dutch Turn'
Or
Two Stage Turn**

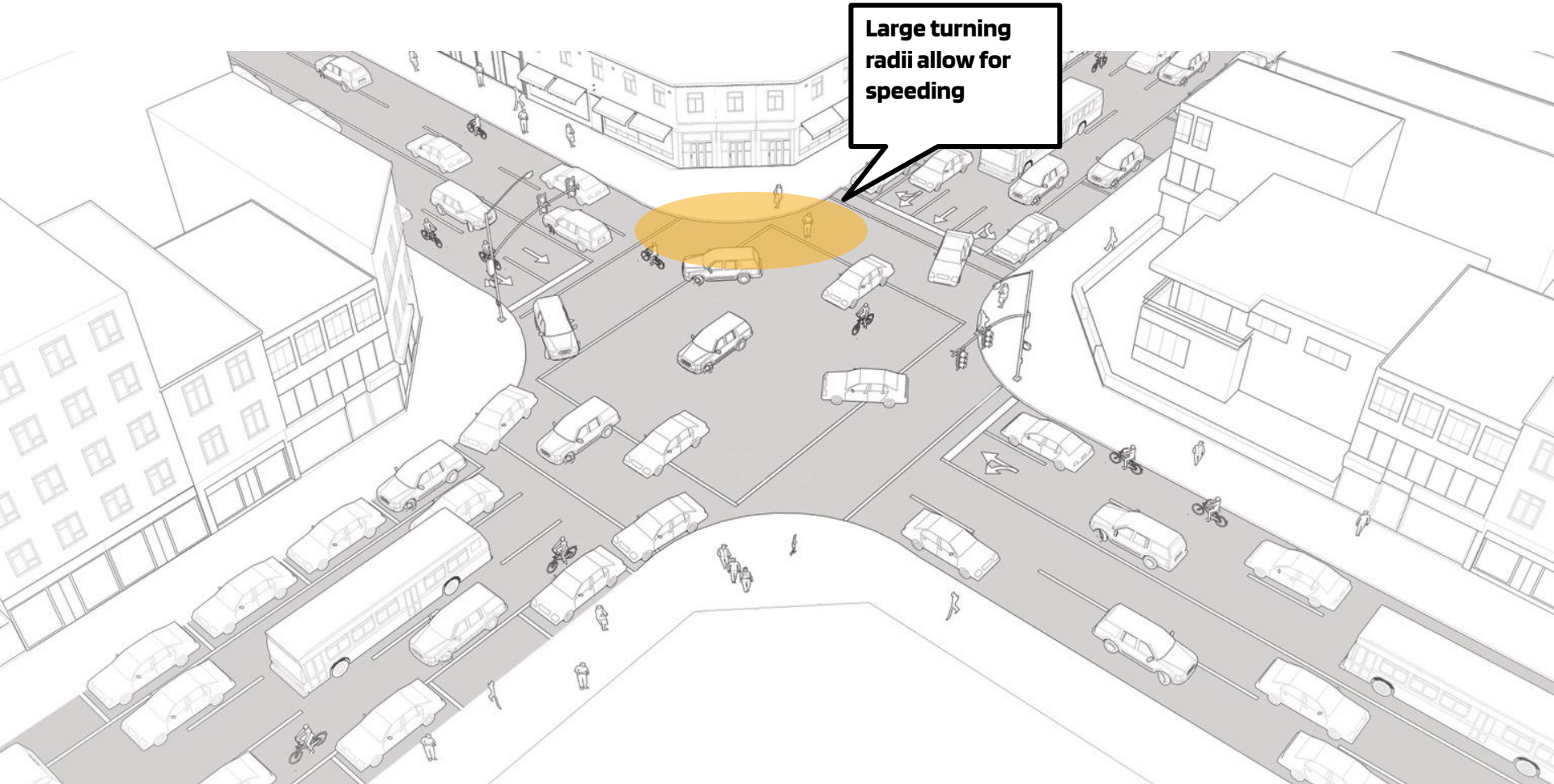
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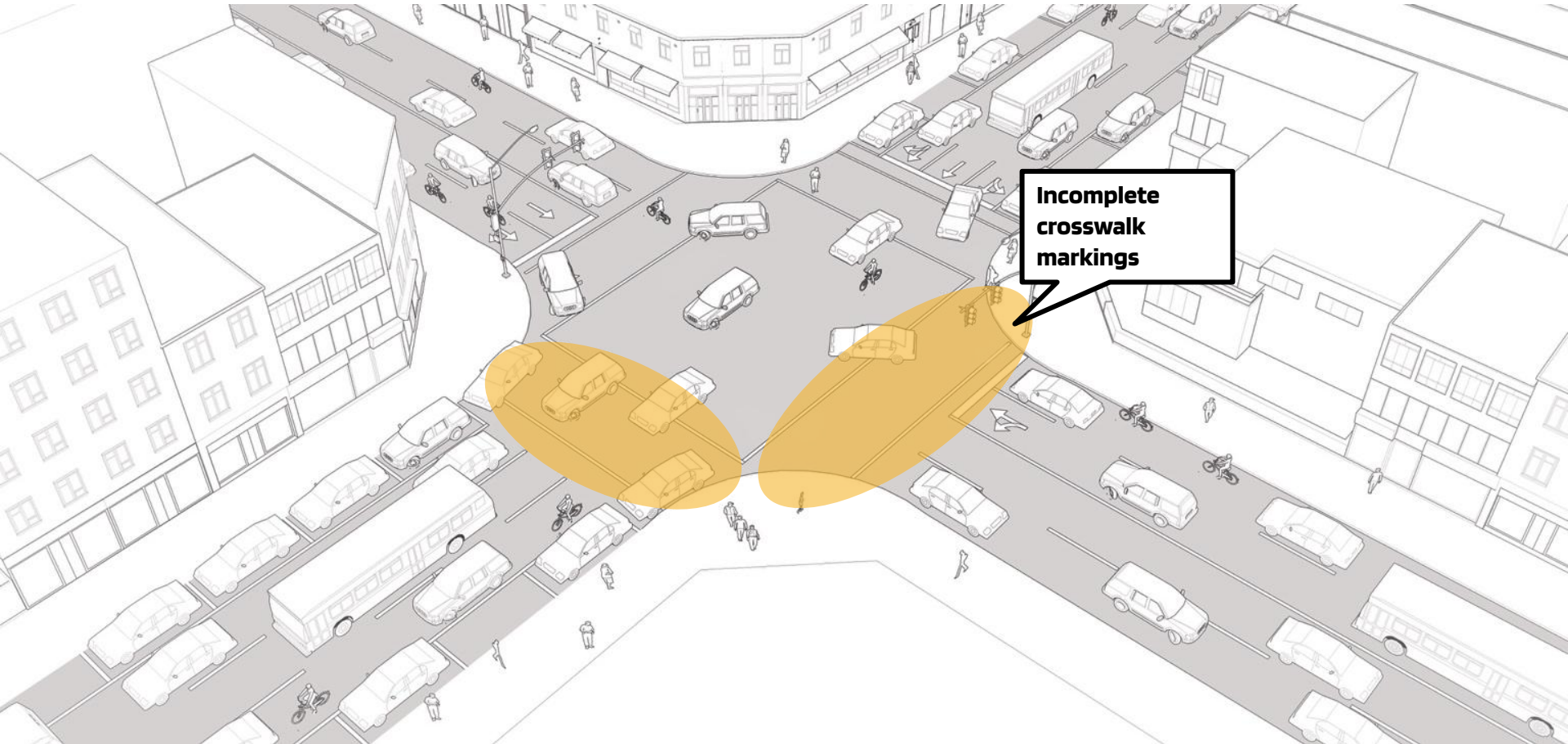
Two-way Meets One-way Streets



Two-way Meets One-way Streets

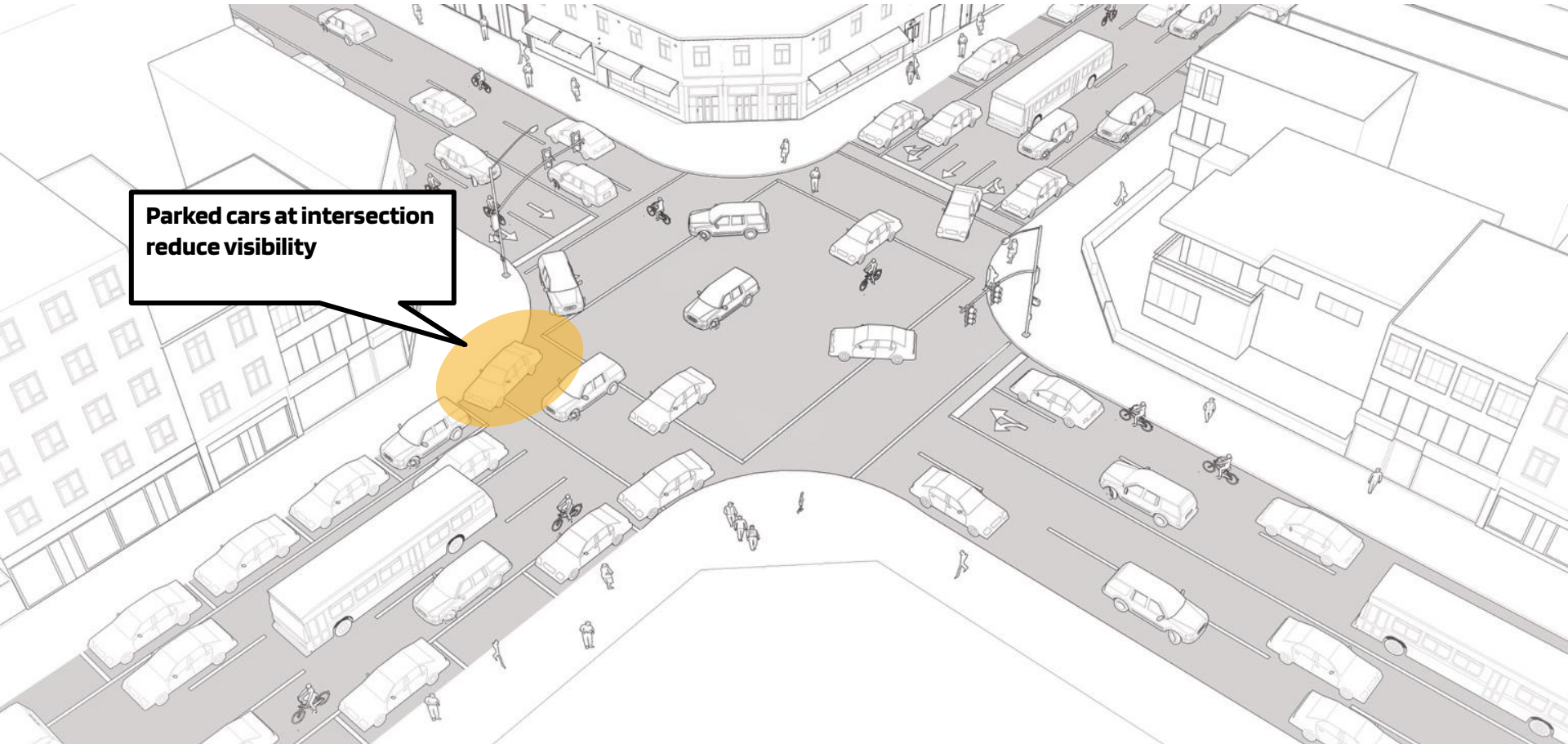


Two-way Meets One-way Streets

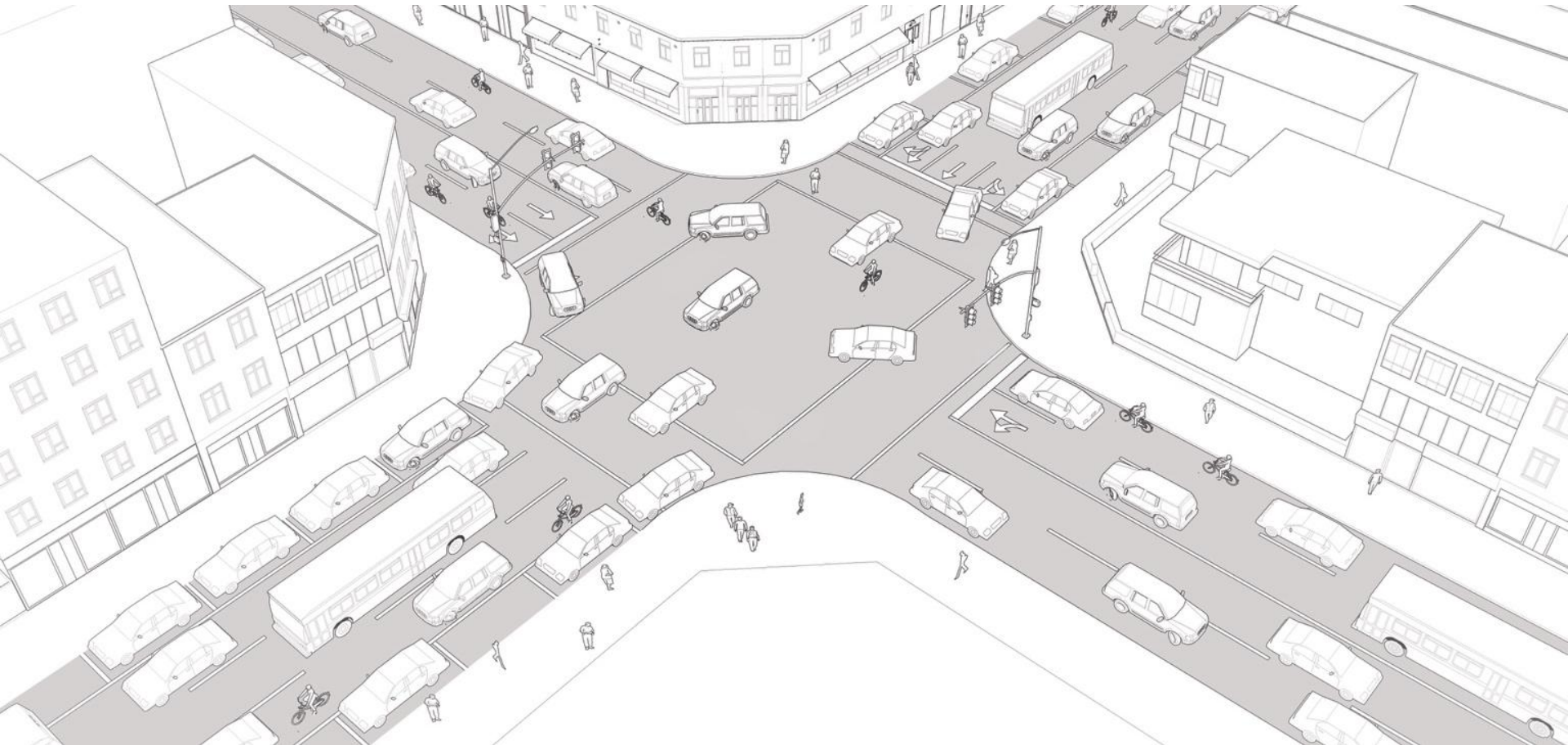


Two-way Meets One-way Streets

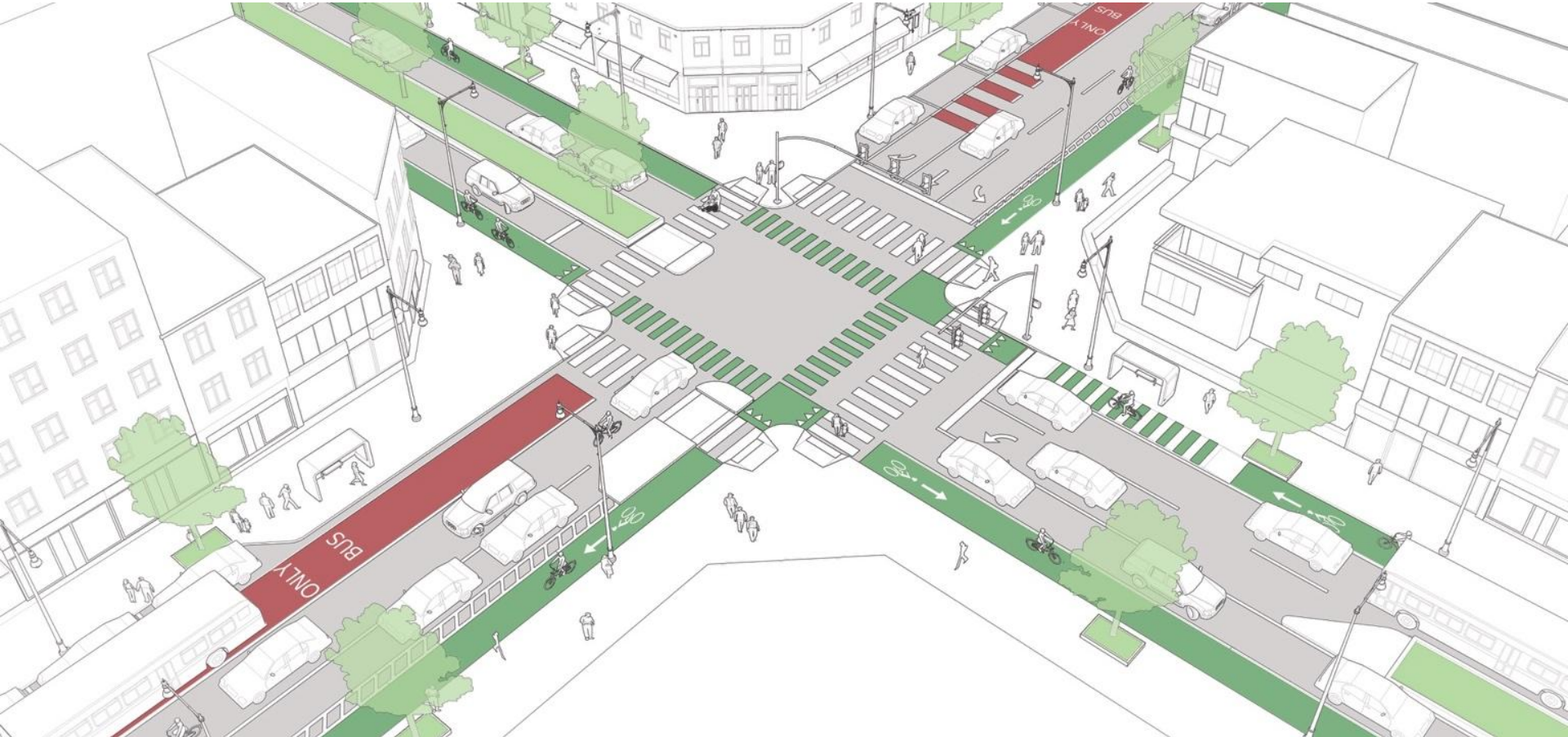
**Parked cars at intersection
reduce visibility**



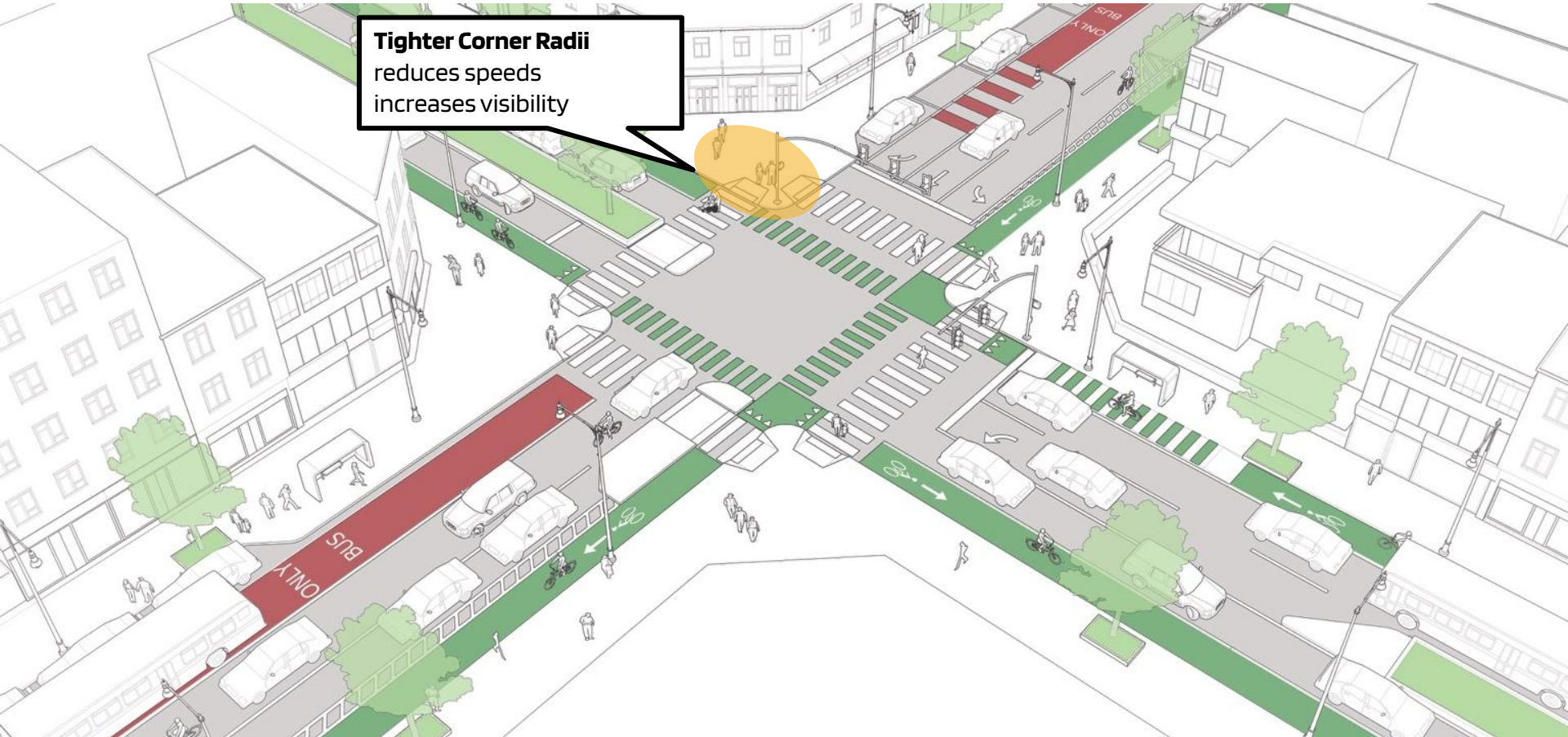
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Two-way Meets One-way Streets



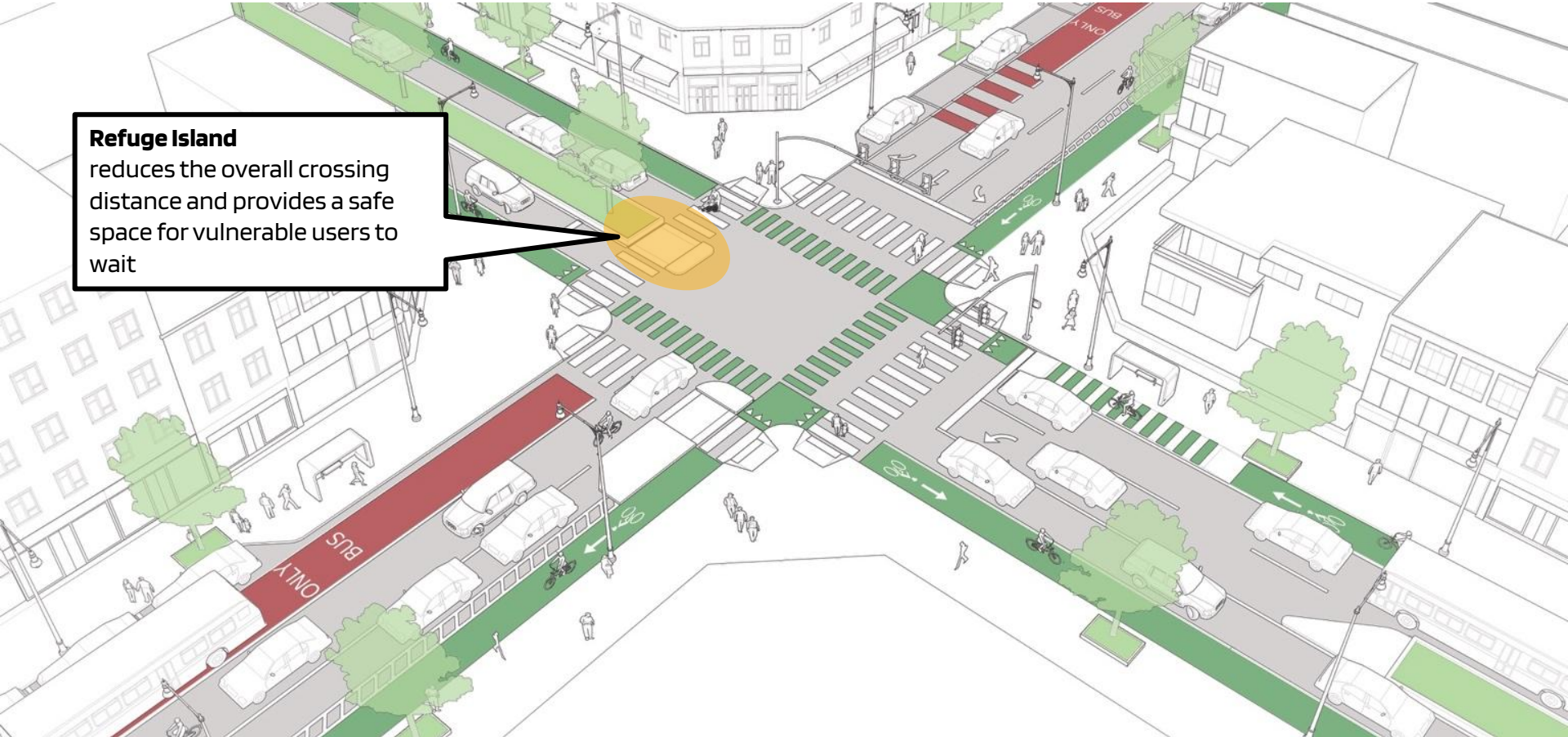
Two-way Meets One-way Streets



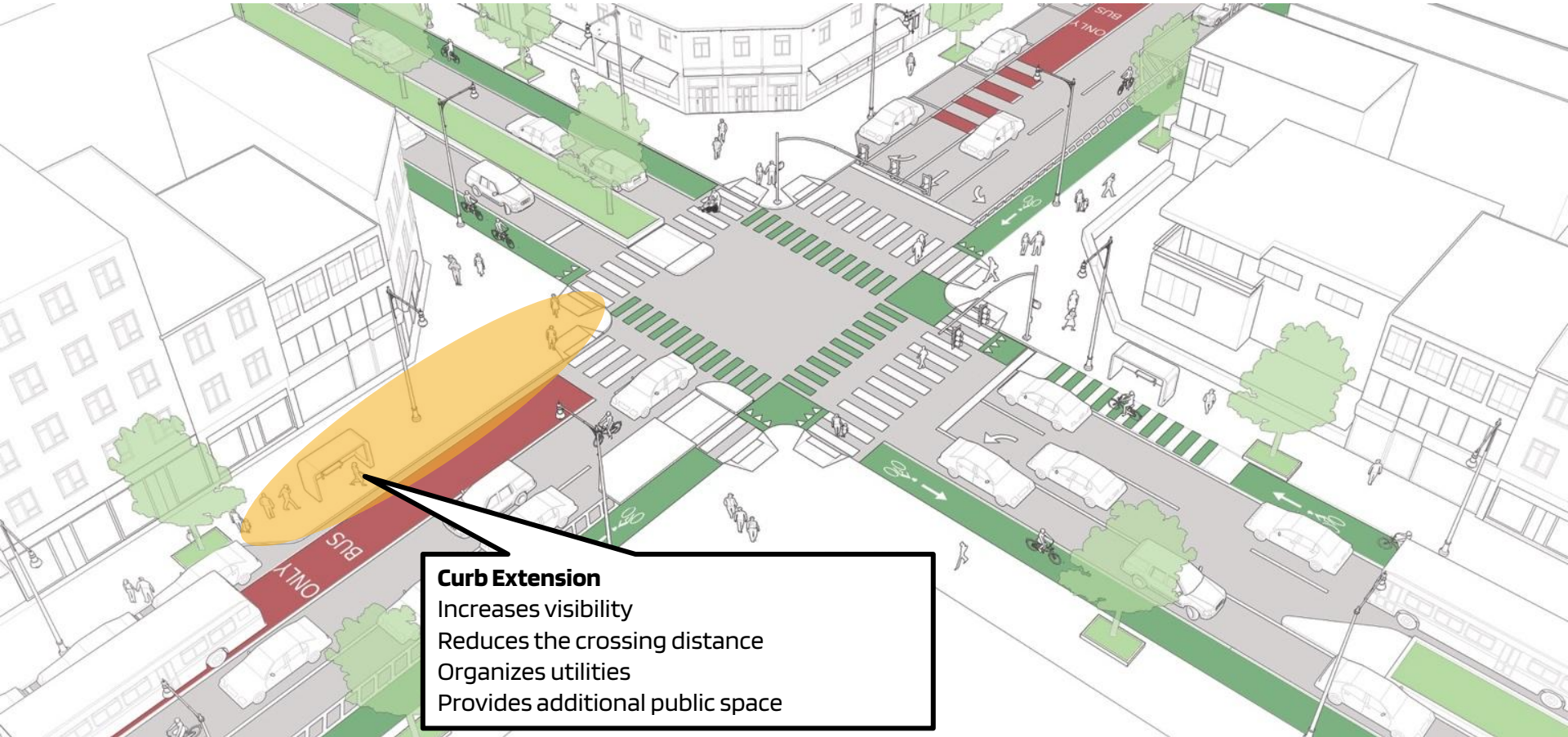
Two-way Meets One-way Streets

Refuge Island

reduces the overall crossing distance and provides a safe space for vulnerable users to wait



Two-way Meets One-way Streets

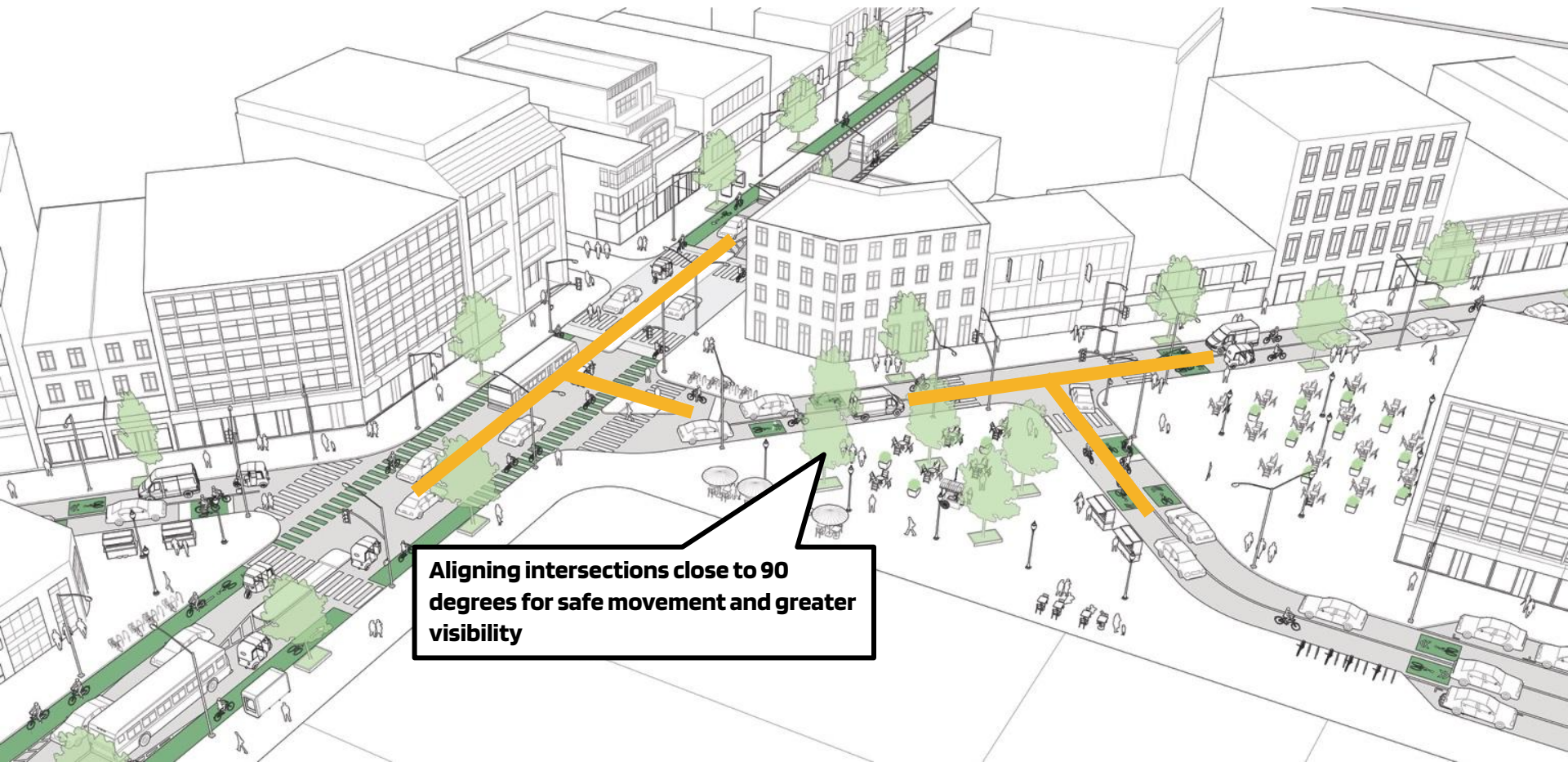


Curb Extension

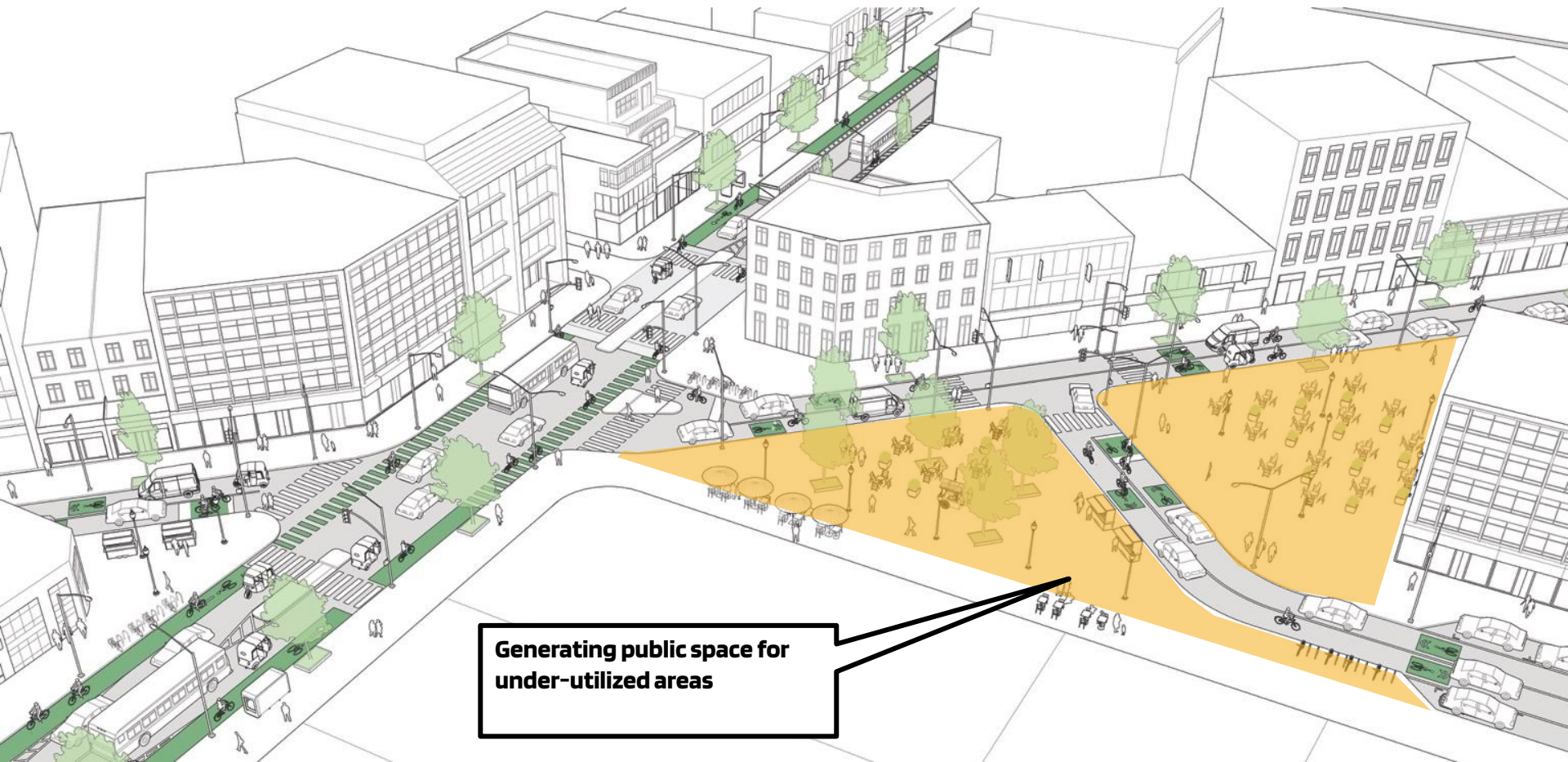
- Increases visibility
- Reduces the crossing distance
- Organizes utilities
- Provides additional public space







Aligning intersections close to 90 degrees for safe movement and greater visibility



**Generating public space for
under-utilized areas**

An aerial photograph of a city street. The street is paved and has several trees planted along its sides. Buildings with various roof colors (red, grey, blue) line the street. In the foreground, there are some colorful circular markings on the pavement, possibly for a community event or art installation. The text "Streets can change— Act now!" is overlaid in white on a semi-transparent dark blue background.

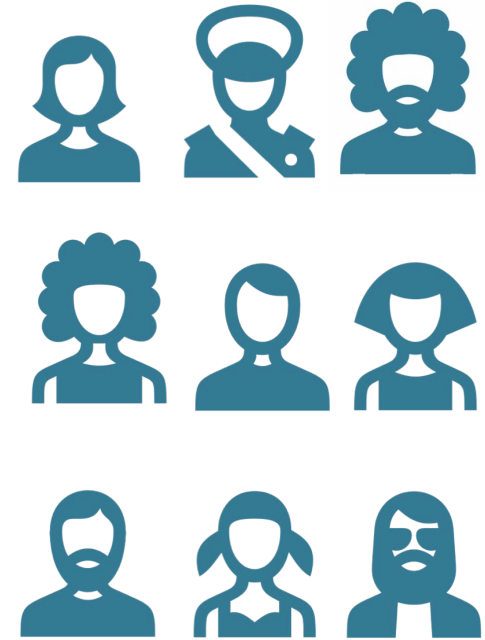
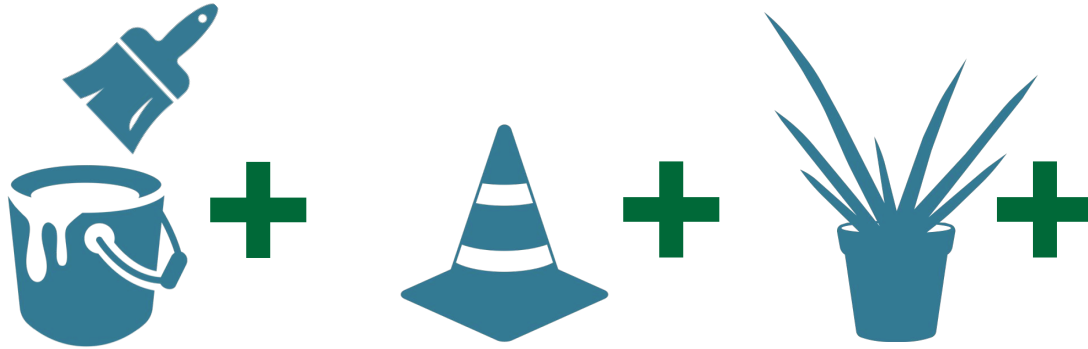
Streets can change— Act now!

Interim

Interventions

Short- Term Interim Transformations

Simple Toolkit





Short-term Transformations

Process of Implementation



Short-term Transformations

Process of Implementation



An aerial photograph of a city street intersection, overlaid with a semi-transparent white box containing text. The background shows a busy street with cars, buses, and colorful, winding pedestrian paths in shades of blue, yellow, and green. The text is arranged in three numbered points.

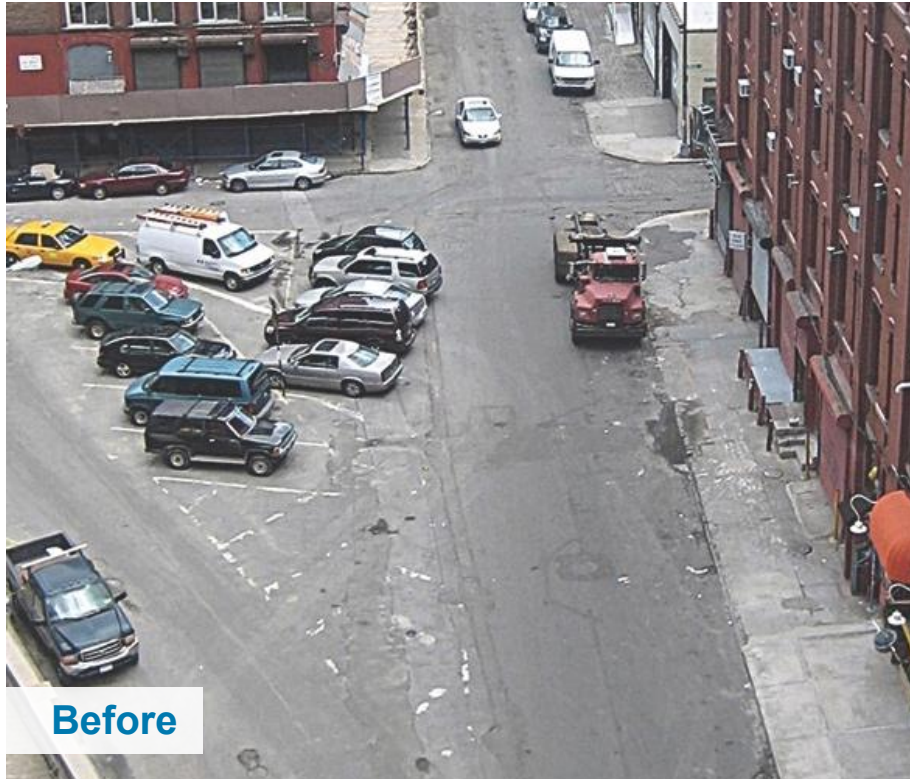
1. Test and Trials
that help measure change

2. Show 'What's Possible?'
to build support

3. Interim Measures
for immediate action

Short- Term Interim Transformations

New York City



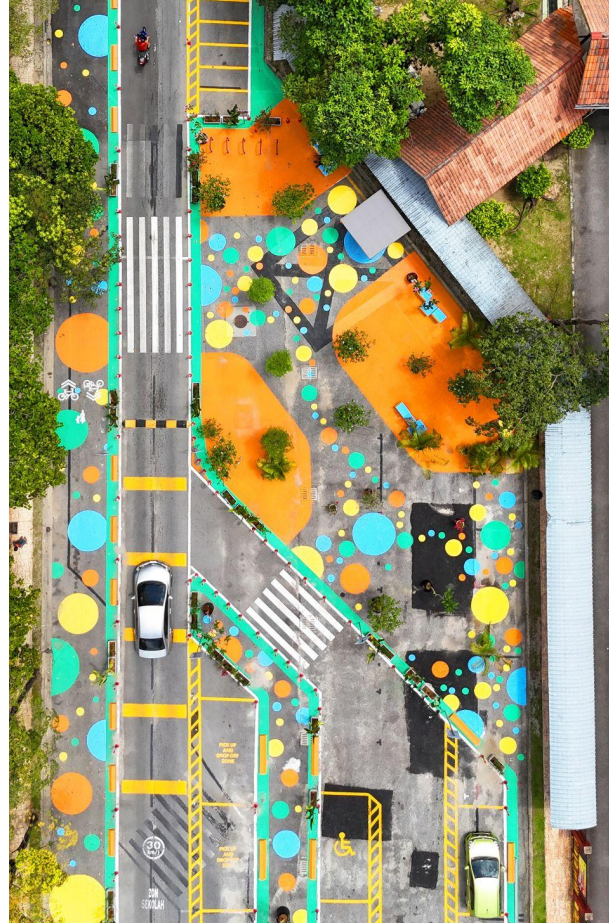
Before



After



Interim : Glimpses



Before



After



Before



After





35%

Speed reduction
in motorcycle
speeds



Vehicle Speed - Highest Speeds



Before
intervention

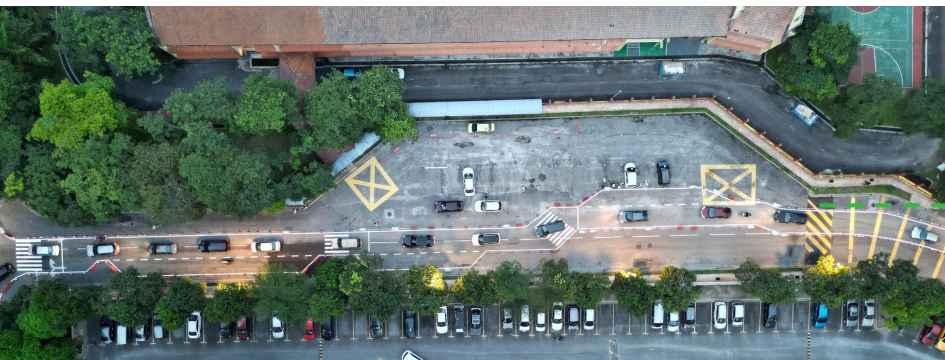


40



40

km/h



Pop Up

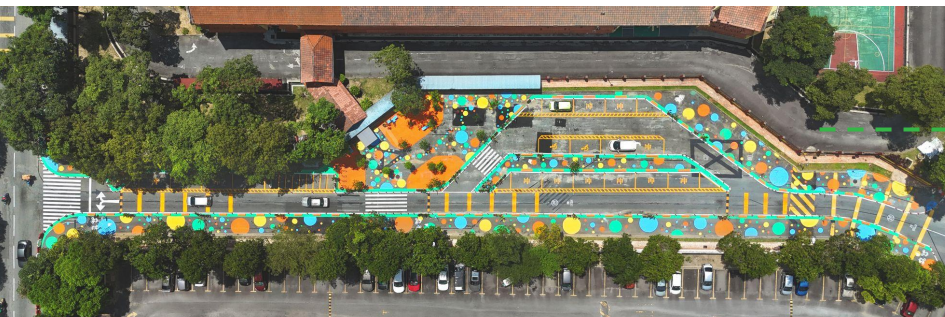


29



34

km/h



Interim



23



26

km/h

Interim : Street Users



Interim : Street Users



Interim : Street Users



Interim : Street Users



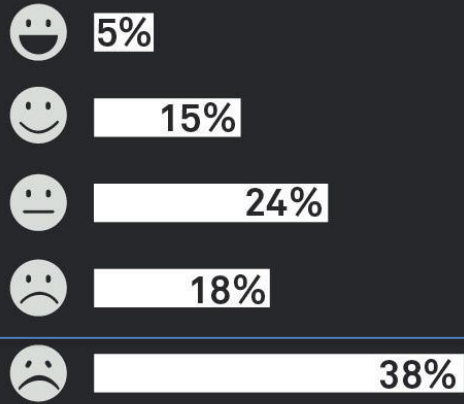
São Paulo | Getulio Vargas



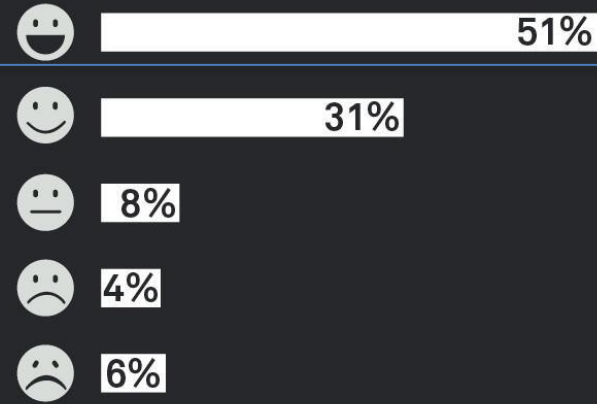
São Paulo | Getulio Vargas



BEFORE



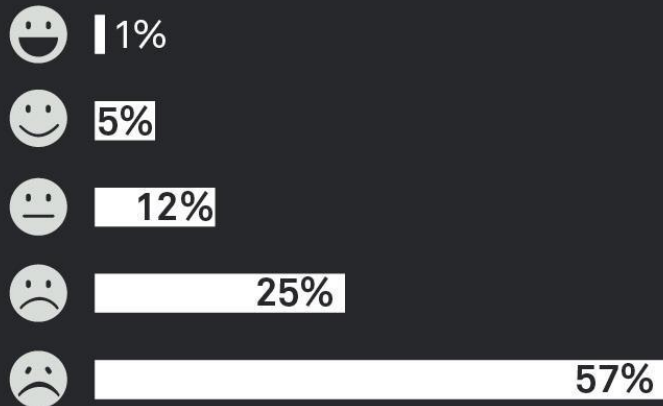
AFTER



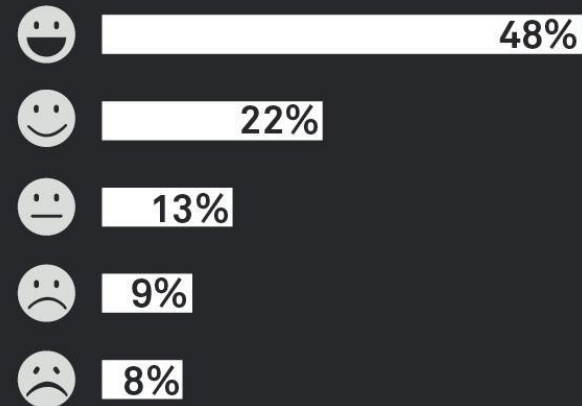
How safe did pedestrians feel on the sidewalk?



BEFORE



AFTER



How safe did pedestrians feel on the crosswalk?





930 Vehicles per hour



33 km/h Average Speed

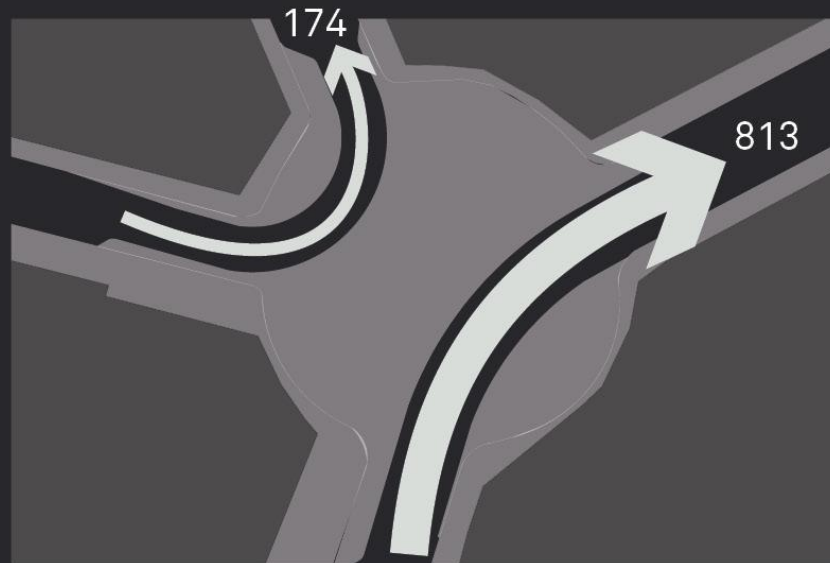
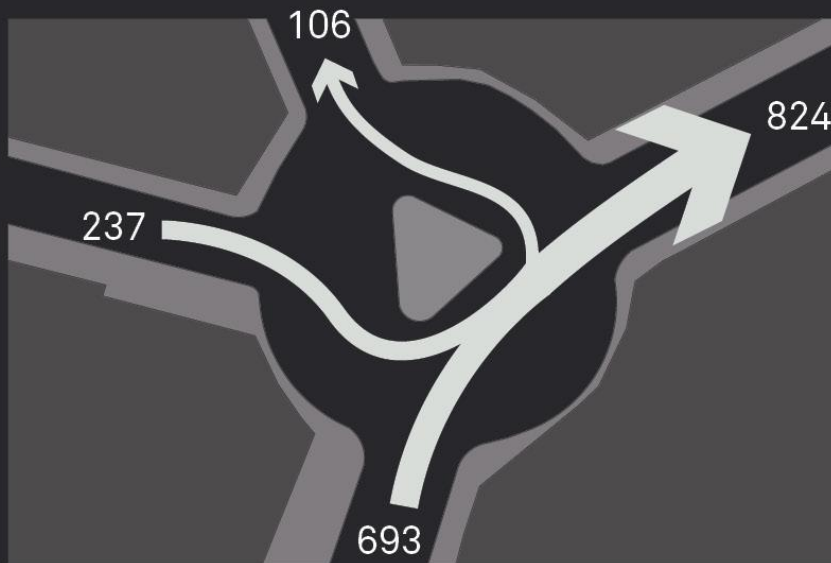


987 Vehicles per hour



21 km/h Average Speed

Throughput was higher, in spite of safer speeds



Provide the tools to **reimagine, reinvent, and redesign**
safer, more sustainable streets!

