



Transportation Safety Forum

Understanding the Connection Between Social Equity and Pedestrian Injuries



May 2021



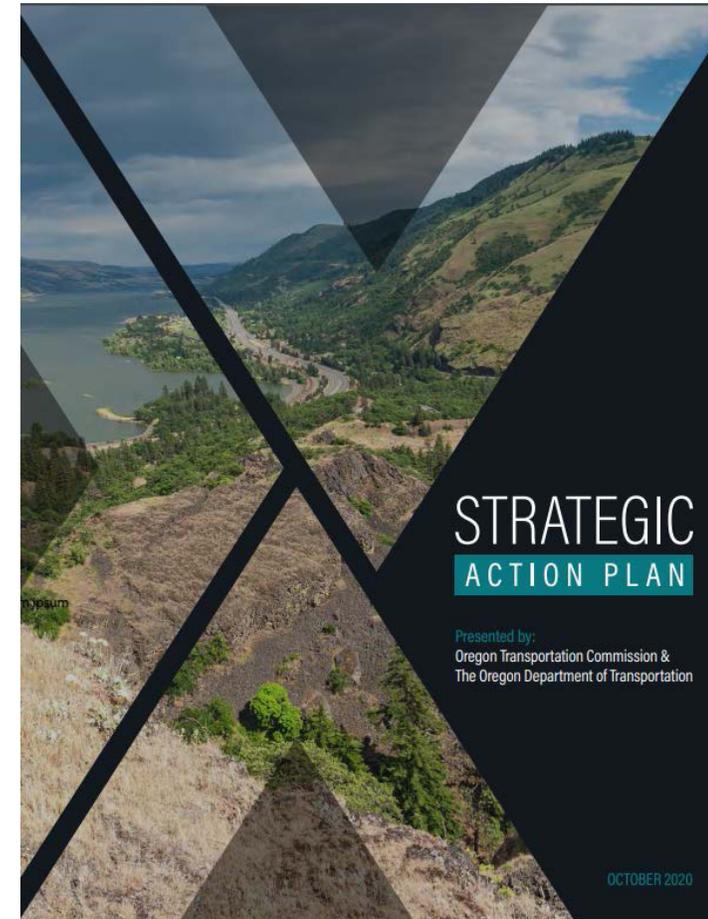
Project Background

Current Research Unit Project

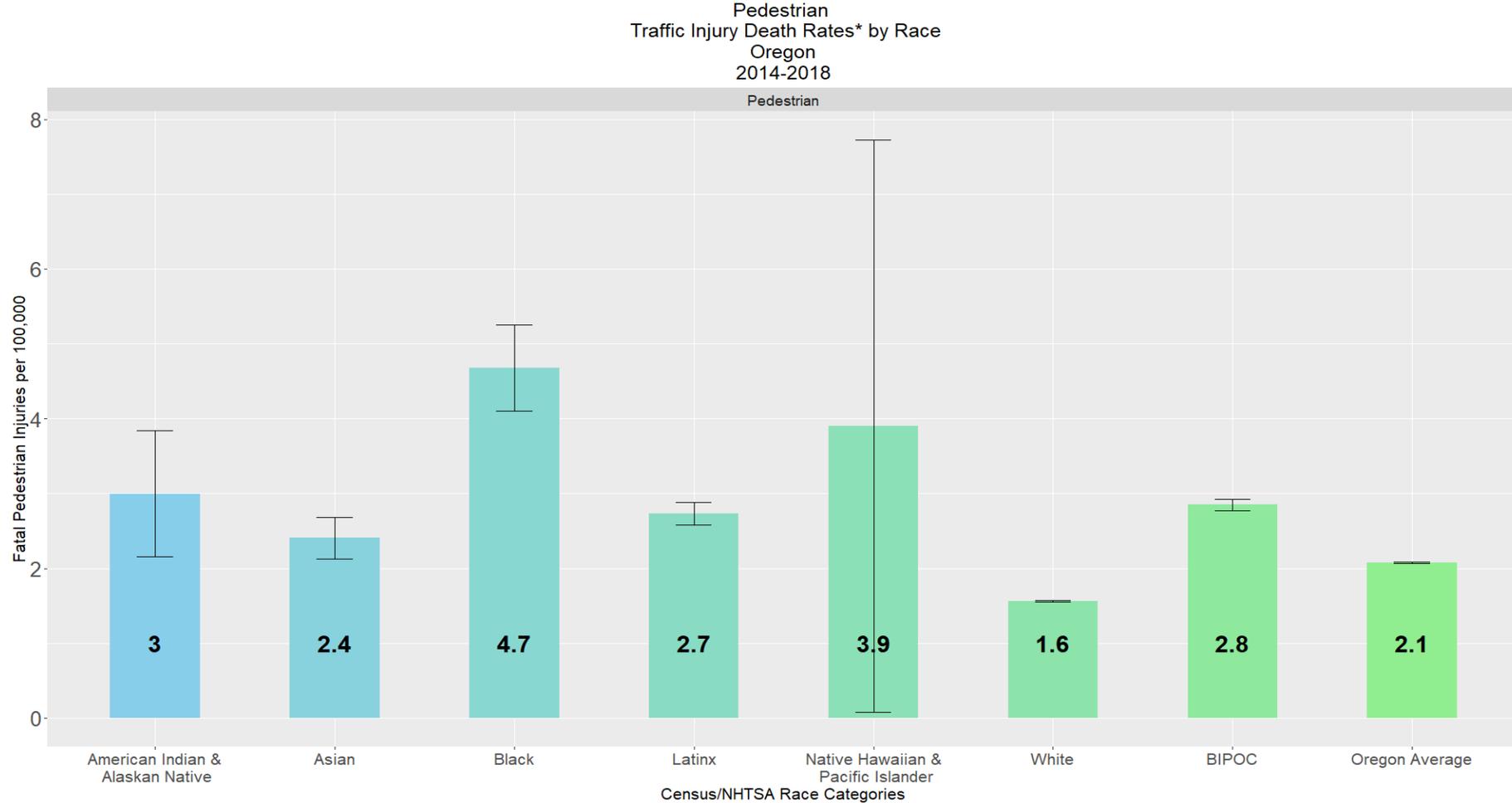
- Director's office supported effort
- Research Objective 1: Understand disparities in pedestrian injury outcomes across Oregon
- Research Objective 2: Measure how these disparities have changed over time
- Research Objective 3: Inform the ODOT Transportation System Action Plan (TSAP) update
- OTC Strategic Action Plan acknowledges disparity of pedestrian injury rates for low income & communities of color

Other ODOT Efforts

- Active Transportation Unit implementing project selection process using measures of race and income (among others)
- Pedestrian Safety Implementation plan includes systemic causes as part of funding allocation (includes residents 65+)



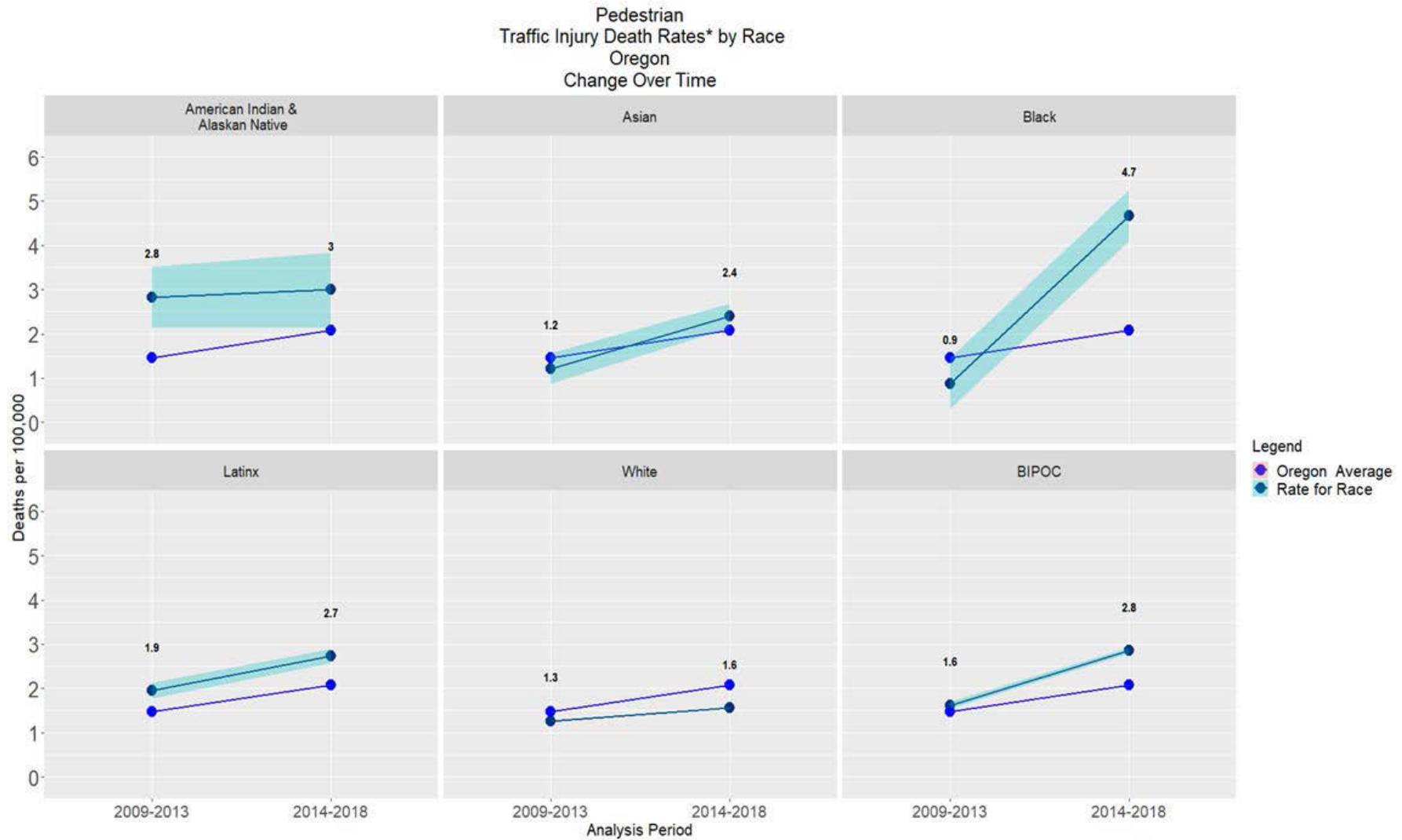
Measured Pedestrian Fatal Injury Disparities by Race



Source: FARS & Census
*Age-adjusted Rates



Fatal Pedestrian Injury Over Time

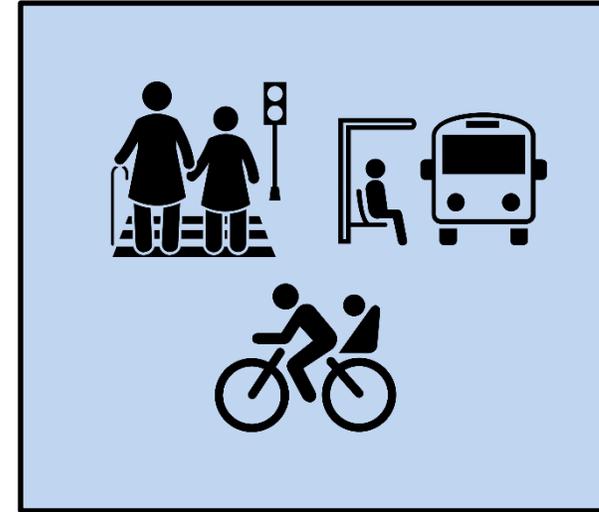


*Age-adjusted Rates
NHPI not shown due to small cell size

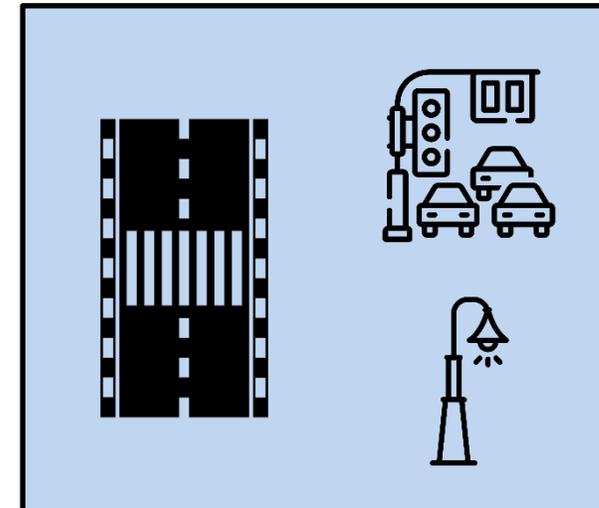


Pathways to Pedestrian Injury Disparities

- Pathway 1: More walking and transit use in tracts with higher concentrations of low income people and Black, Indigenous, and People of color

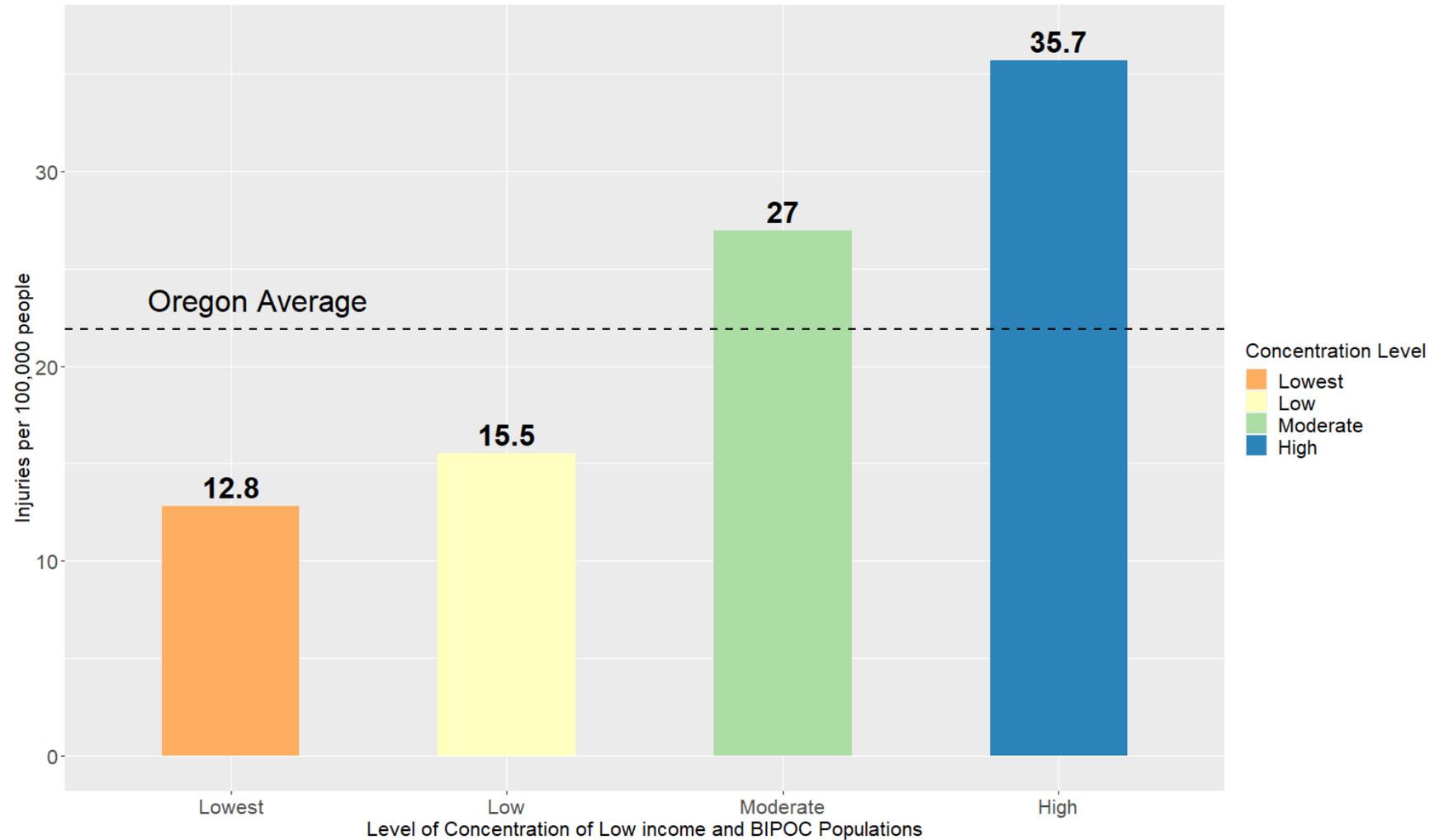


- Pathway 2: A less hospitable environment for walking and taking transit in tracts with higher concentrations of low income people and Black, Indigenous, and People of color



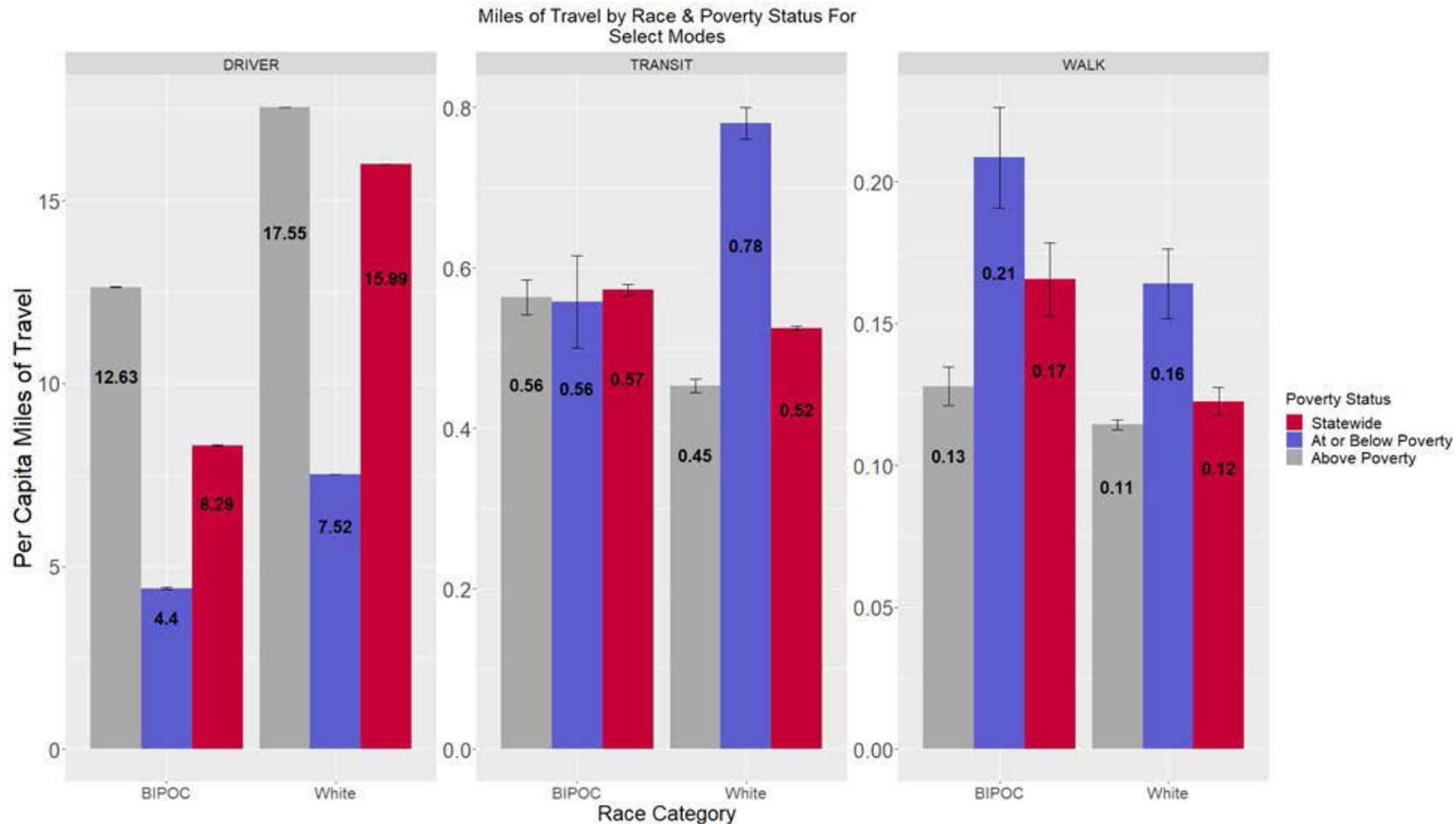
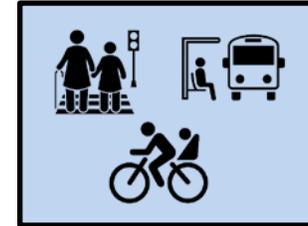
Current State of Pedestrian Injury Disparities

Pedestrian Fatal & Severe Injury Rate by
Low Income & BIPOC Populations Concentration Level
in Oregon
2014 - 2018



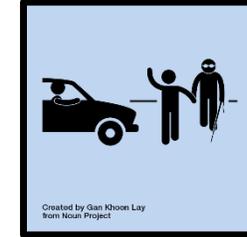
Pathways to Pedestrian Injury Disparities

- Pathway 1: More walking and transit use in tracts with higher concentrations of low income people and Black, Indigenous, and People of color

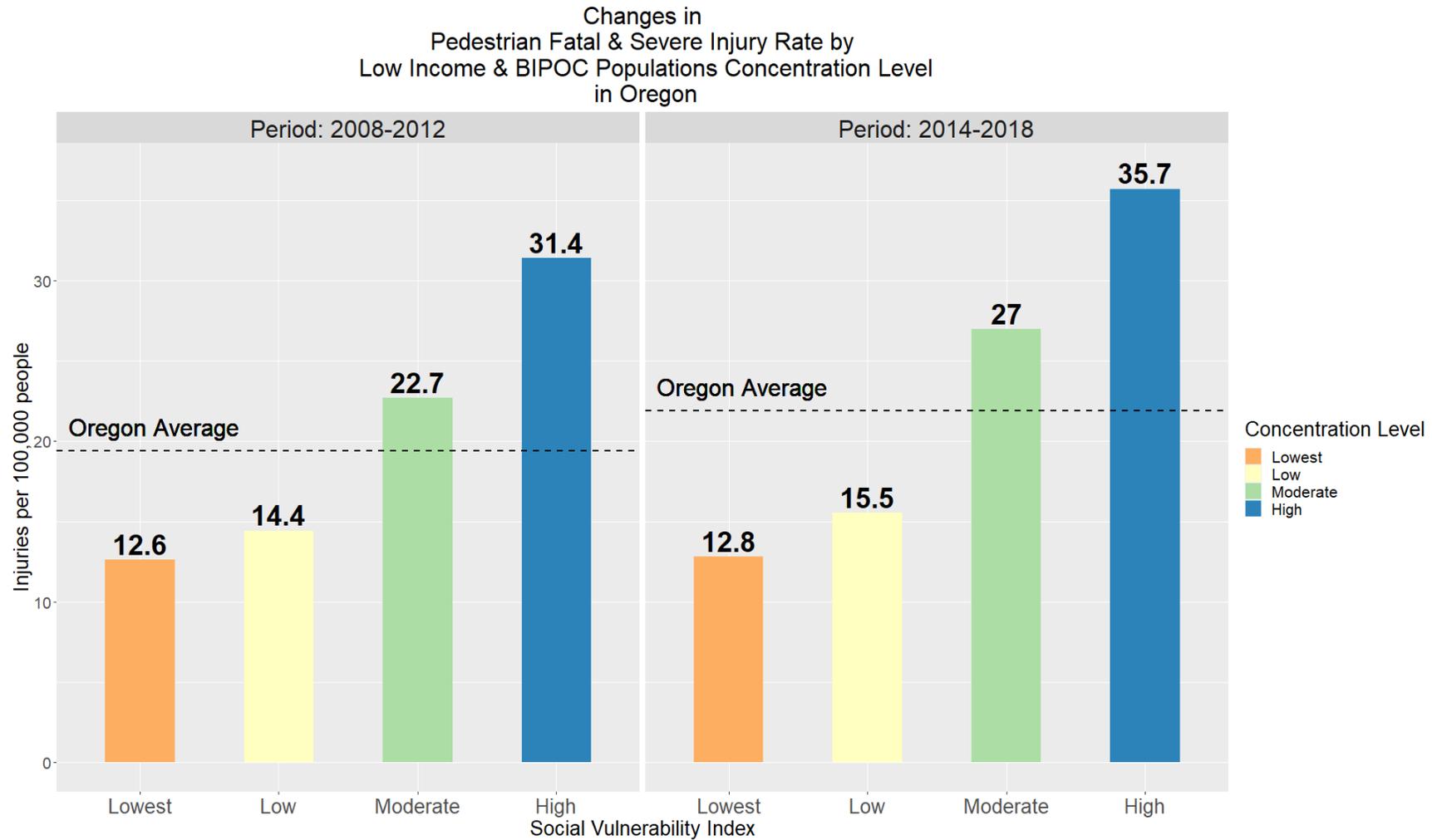


Pathways to Pedestrian Injury Disparities

- Pathway 2: A less hospitable environment for walking and taking transit in tracts with higher concentrations of low income people and Black, Indigenous, and People of color
 - Areas with higher levels of poverty and lower rates of educational attainment were less likely to implement sidewalk projects with federal funding (Craddock et al, 2009).
 - A national study found that 89% of the streets in high-income areas had completed sidewalks while only 49% of streets had complete sidewalks in lower-income neighborhoods (Gibbs et al. 2012)
 - 13% of streets in high income areas have marked crosswalks whereas only 7% of streets had this feature in low income areas (Gibbs et al. 2012)
 - 75% of streets in high-income areas have street or sidewalk lighting compared to 54% in low income neighborhoods

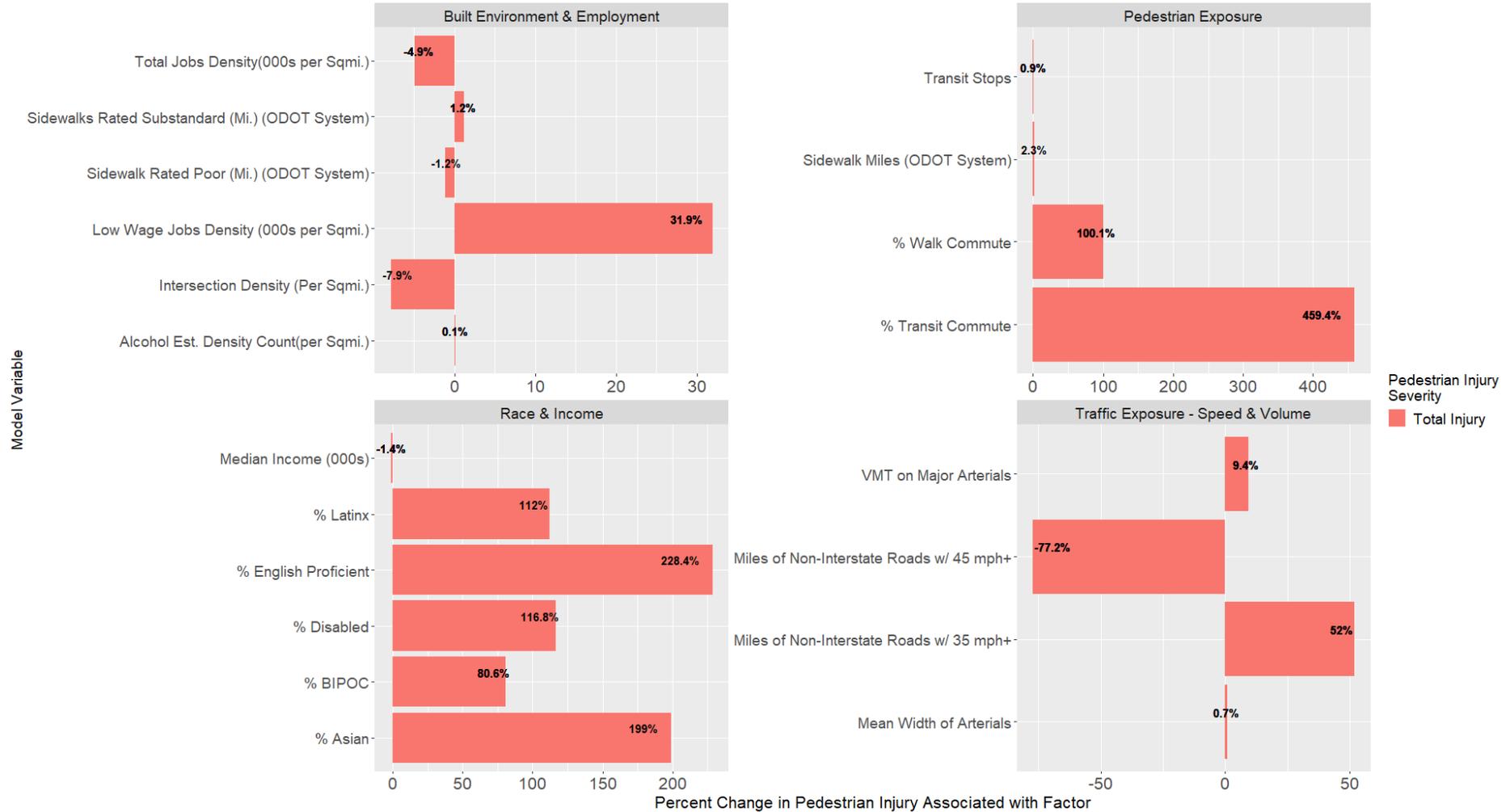


Injury Disparity Pathways



Statistical Analysis Results

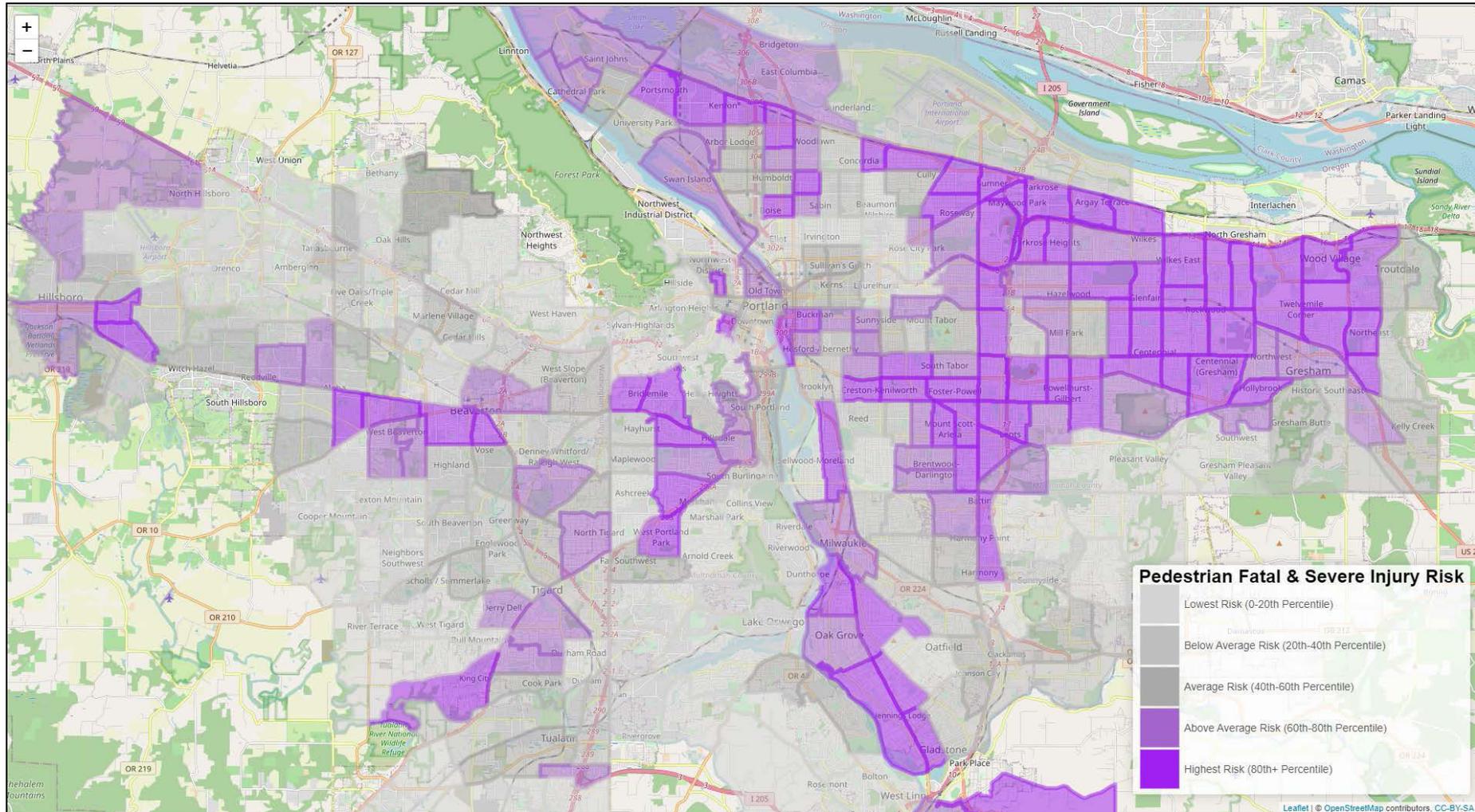
Modeling Results
Factors Correlated to Pedestrian Injuries



Source: SPR 841 - Phase 1 Technical Report



Statistical Analysis Results



Broader Research Review

Literature Review

- Over 20 studies published
- Varying levels of spatial coverage

National Study by FHWA Office

- Significant effect from race and poverty across country
- Decent controls for pathways (activity, built environment)

Variable	Summary of significant findings
Race / Ethnicity	<ul style="list-style-type: none"> • Seven studies found that higher proportions of BIPOC residents are associated with more pedestrian crashes (Abdel-Aty et al 2013; Apardian and Smirnov 2020; Chimba et al 2014; Guerra et al 2019; Lin et al 2019; Loukaitou-Sideris et al 2007; Mansfield et al 2018), including: <ul style="list-style-type: none"> ○ five finding specific connections between higher African-American or Black populations and pedestrian crashes (Apardian and Smirnov 2020; Chimba et al 2014; Guerra et al 2019; Lin et al 2019; Mansfield et al 2018); ○ two finding connections between higher Latino/a populations and pedestrian crashes (Chimba et al 2014; Loukaitou-Sideris et al 2007), and ○ one finding a connection between higher Asian populations and fatal pedestrian crashes (Mansfield et al 2018). • Conversely, two studies found higher white populations to be associated fewer pedestrian crashes (Chimba et al 2014; Yu 2014)
Income and Poverty	<ul style="list-style-type: none"> • Six studies found higher household income to be associated with fewer pedestrian crashes (Cottrill and Thakuriah 2010; Dai and Jaworski 2016 DiMaggio 2015; Jermprapai and Srinivasan 2014; Mansfield et al 2018). <ul style="list-style-type: none"> ○ One study found household income to be associated with more pedestrian crashes (Chimba et al 2014). • Five studies found that higher proportions of households in poverty to be associated with more pedestrian crashes (Chakravarthy et al 2010; Chimba et al 2014; Guerra et al 2019; Jermprapai and Srinivasan 2014; Wier et al 2009).
Non-English Language	<ul style="list-style-type: none"> • Three studies found connections between higher proportion of non-English speaking residents and more pedestrian crashes (Chakravarthy et al 2010; Dai and Jaworski 2016; Jermprapai and Srinivasan 2014).



Summary

Systemic Roots of Pedestrian Injury

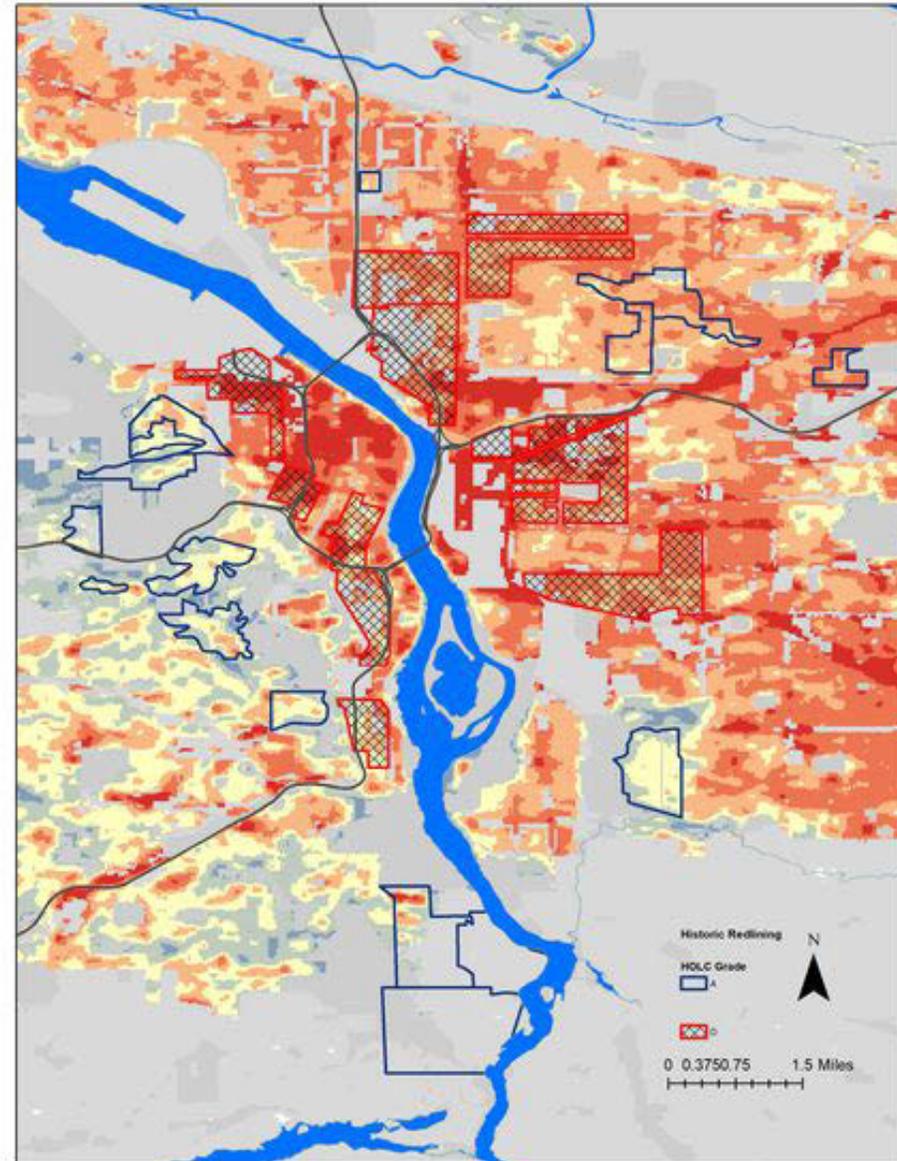
- Built environment and traffic exposure are very good predictors of pedestrian injury (& and all traffic injury)

Pedestrian Injuries and Social Equity

- Income and race are proxies for pedestrian activity and environments more hostile to activity
- Combined, these factor lead to more injuries

Nexus with Other Policies

- Housing
- Education
- Public Health
- Criminal Justice



The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas (2020)



Next Steps

Phase I Technical Report

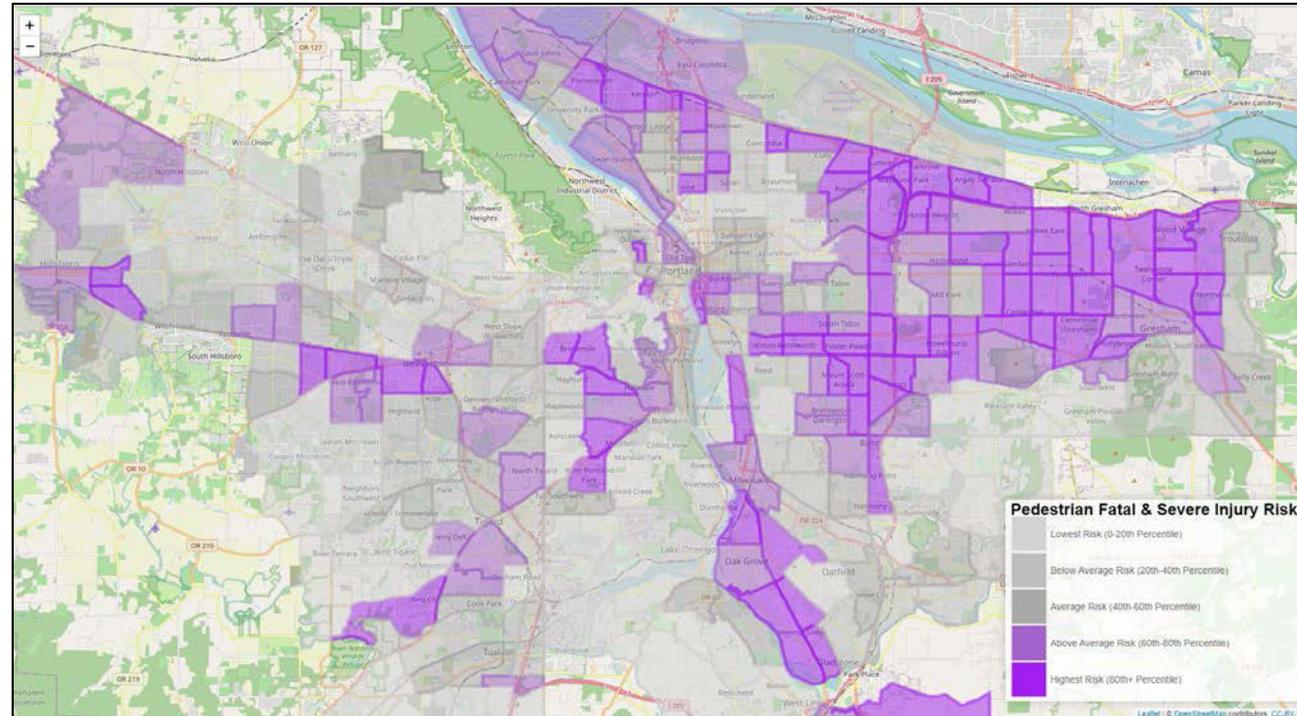
- Should be published in 6-8 weeks

Phase II Work

- Develop engineering grade tools for project selection

Data Needs

- Pedestrian features including sidewalks, crossings, traffic calming, street lighting, etc.
- Travel activity data for walk, transit, and bicycle



Questions



Questions?

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Addressing Equity and Pedestrian Safety in Portland

Dana Dickman, Traffic Safety Section Manager
Portland Bureau of Transportation

Regional Transportation Safety Forum -
Envisioning Safety, Health and Justice
May 26, 2021

BIPOC Portlanders experience more traffic violence

- In 2020, 35% of traffic deaths in Portland were BIPOC individuals (citywide BIPOC population is approximately 29%)
- East Portland has twice the number of pedestrian fatalities per capita compared to the city overall

“Black pedestrians were passed by twice as many cars and experienced wait times that were 32% longer than White pedestrians” in downtown Portland.

- Racial Bias in Driver Yielding Behavior at Crosswalks, Transportation Research

BIPOC Portlanders experience more threats to personal safety



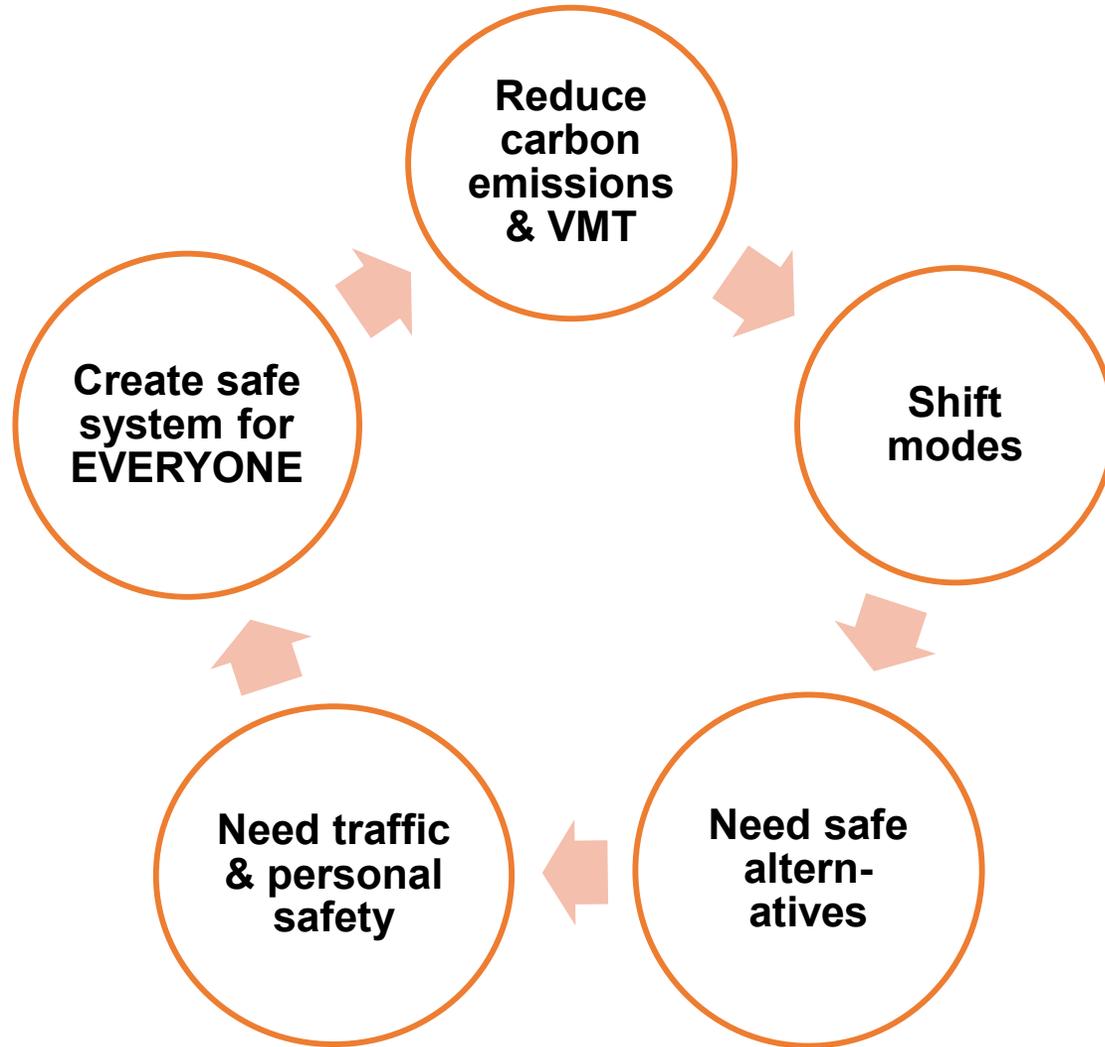
“I won’t allow my husband to run at night as a tall Black man, for I fear he won’t come home.”

- Walking While Black focus group participant

“Personal safety (in the street) means to be protected, to not be judged by color or dress code, and to not be harassed for lacking fluency in English.”

- Beyond Traffic Safety, Somali focus group participant

Holistic Solutions



“I pay a large amount of money for my son’s car insurance because it is safer for him to drive than to be exposed.”

- Walking While Black focus group participant

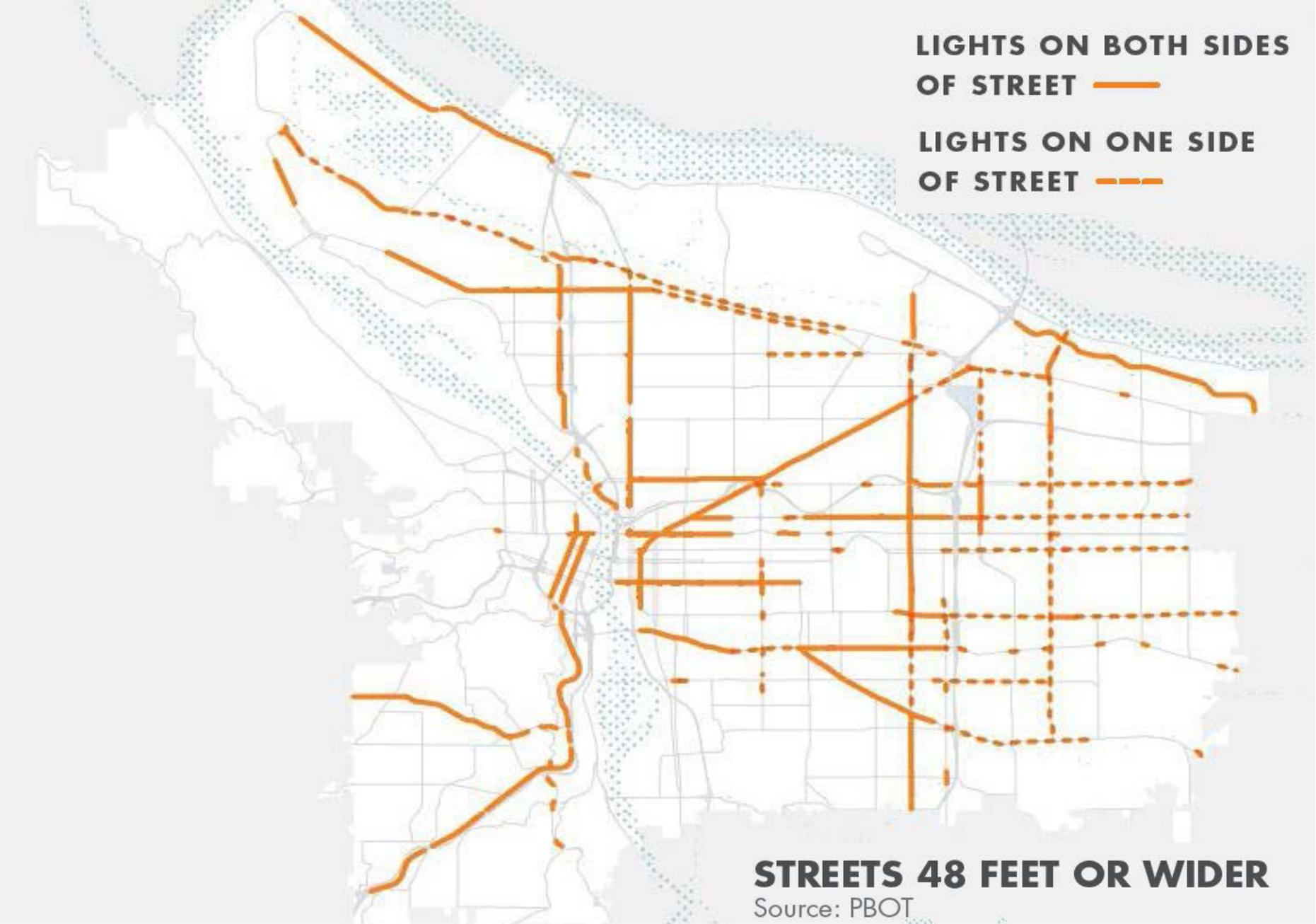
Action: Street Lighting

WHAT MAKES WALKING DIFFICULT IN PORTLAND?	WALKING WHILE BLACK	CITYWIDE
Poor Lighting	5.00	3.62
Sidewalks / walking paths missing on BUSY streets	4.94	4.66
People driving too fast on BUSY streets	4.82	4.29
Not enough safe places to cross busy streets	4.78	4.46
People driving too fast on RESIDENTIAL streets	4.74	4.44
Sidewalks / walking paths missing on RESIDENTIAL streets	4.71	4.29
Drivers not stopping for pedestrians crossing the street	4.47	4.29
Buckled / cracked / uplifted sidewalks, or other tripping hazards	4.47	3.46
Missing curb ramps at intersections	4.00	3.22
Not enough time to cross the streets	3.91	3.08

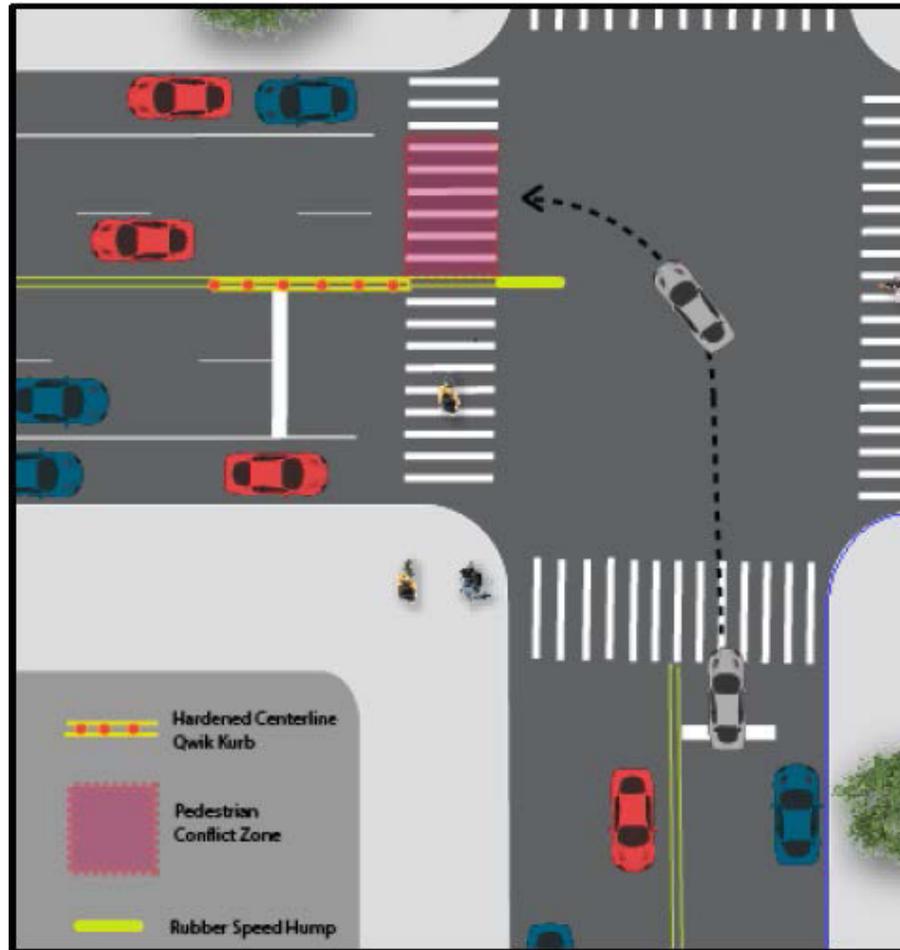
“Lighting is very important if we really want to protect Black lives...Proper lighting especially helps people with dark skin. If we had enough light everywhere, it would be safer citywide to walk while Black.”

- Walking While Black focus group participant

Action: Street Lighting



Action: Street Design Quick Builds



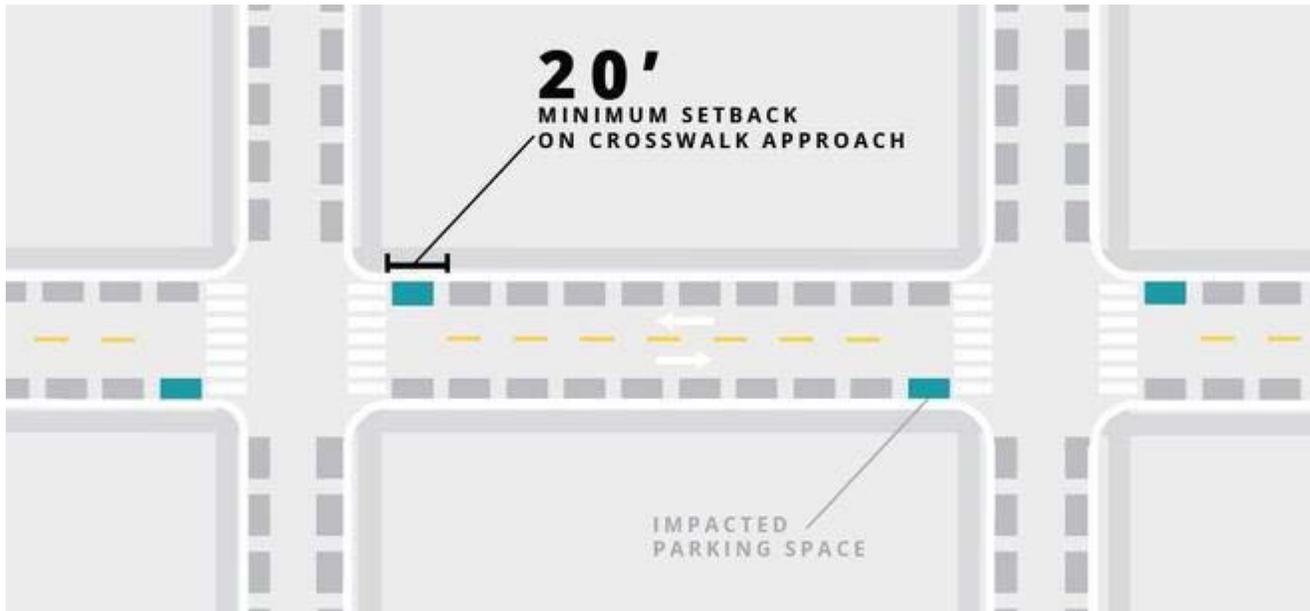
1. Turn calming

Action: Street Design Quick Builds



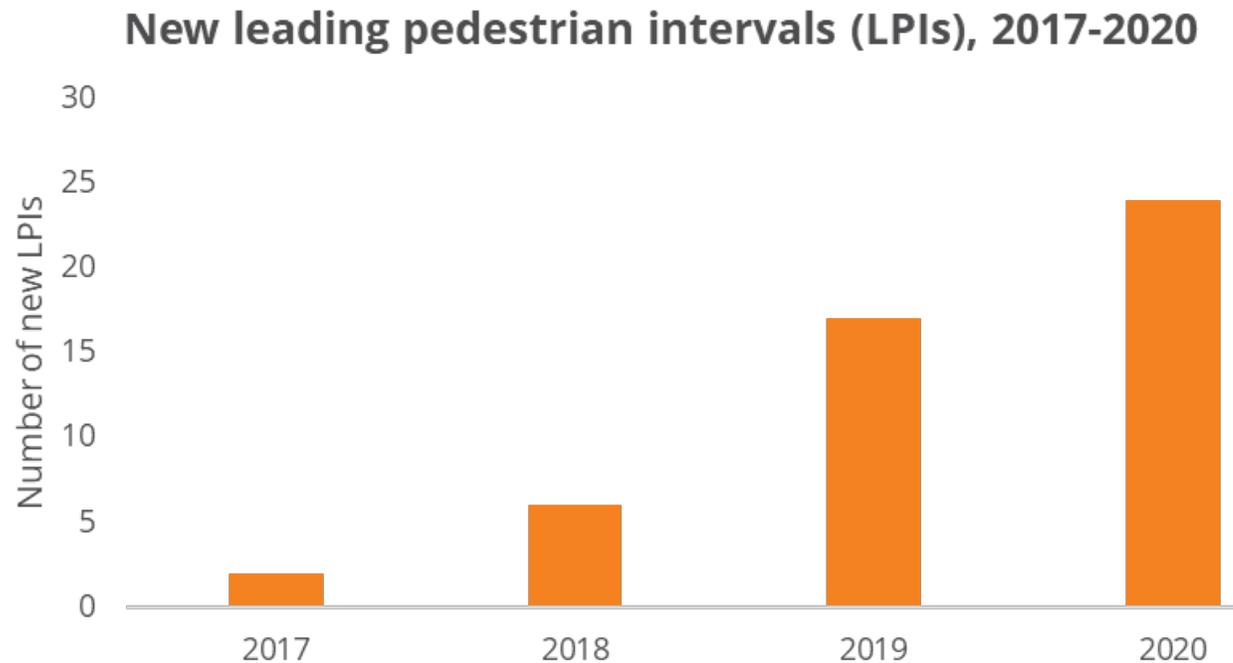
1. Turn calming
2. Protected lefts

Action: Street Design Quick Builds



1. Turn calming
2. Protected lefts
3. **Vision clearance at intersections**

Action: Street Design Quick Builds



1. Turn calming
2. Protected lefts
3. Vision clearance at intersections
4. **Pedestrian head starts (LPIs)**

Action: Street Design Quick Builds



1. Turn calming
2. Protected lefts
3. Vision clearance at intersections
4. Pedestrian head starts (LPIs)
5. **Striping high-visibility crosswalks**



Thank you!

