2016-2020 Regional High Injury Corridors overview & methods

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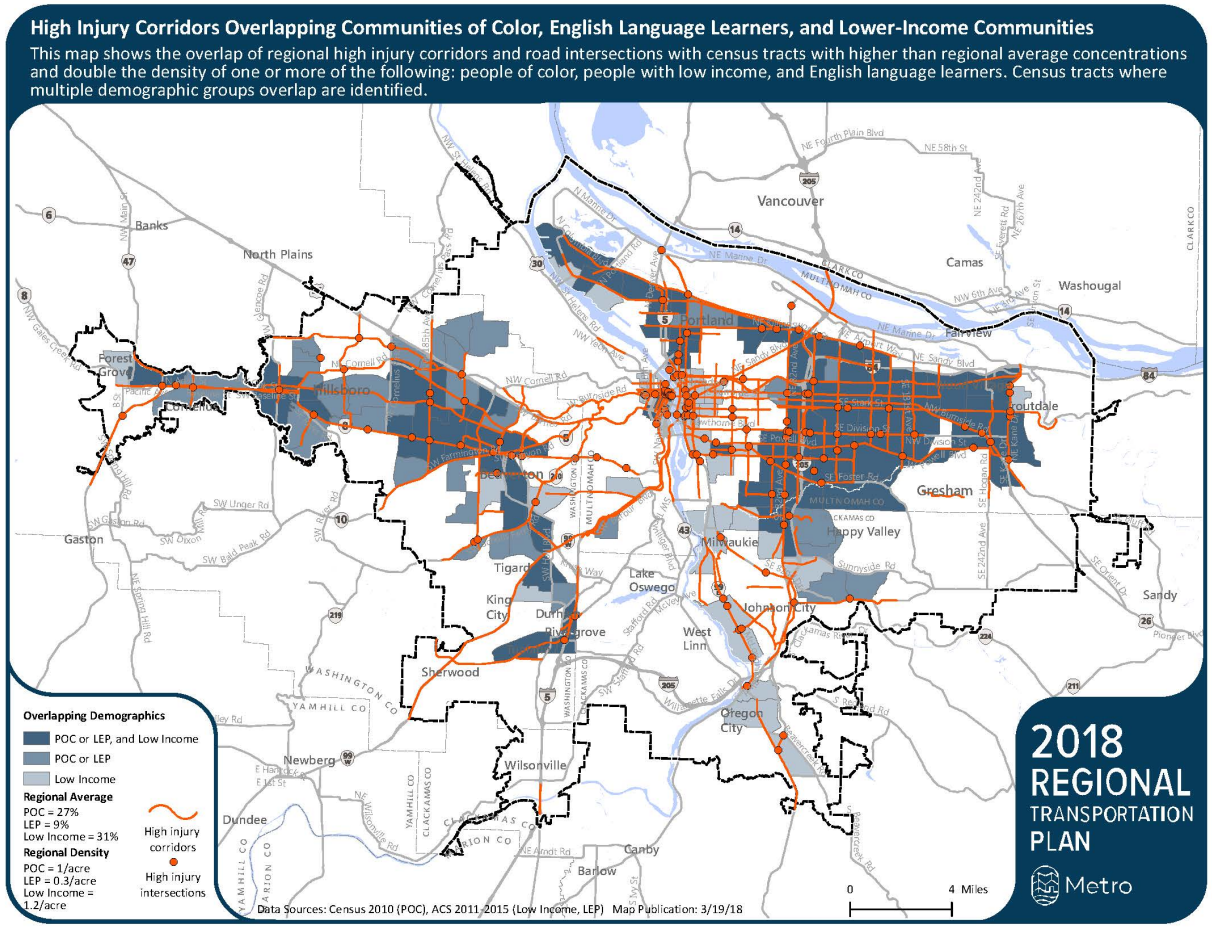
EMCTC TAC, Nov.2, 2022

Source: FHWA

First high injury corridors identified in 2017 using methodology determined by regional working group

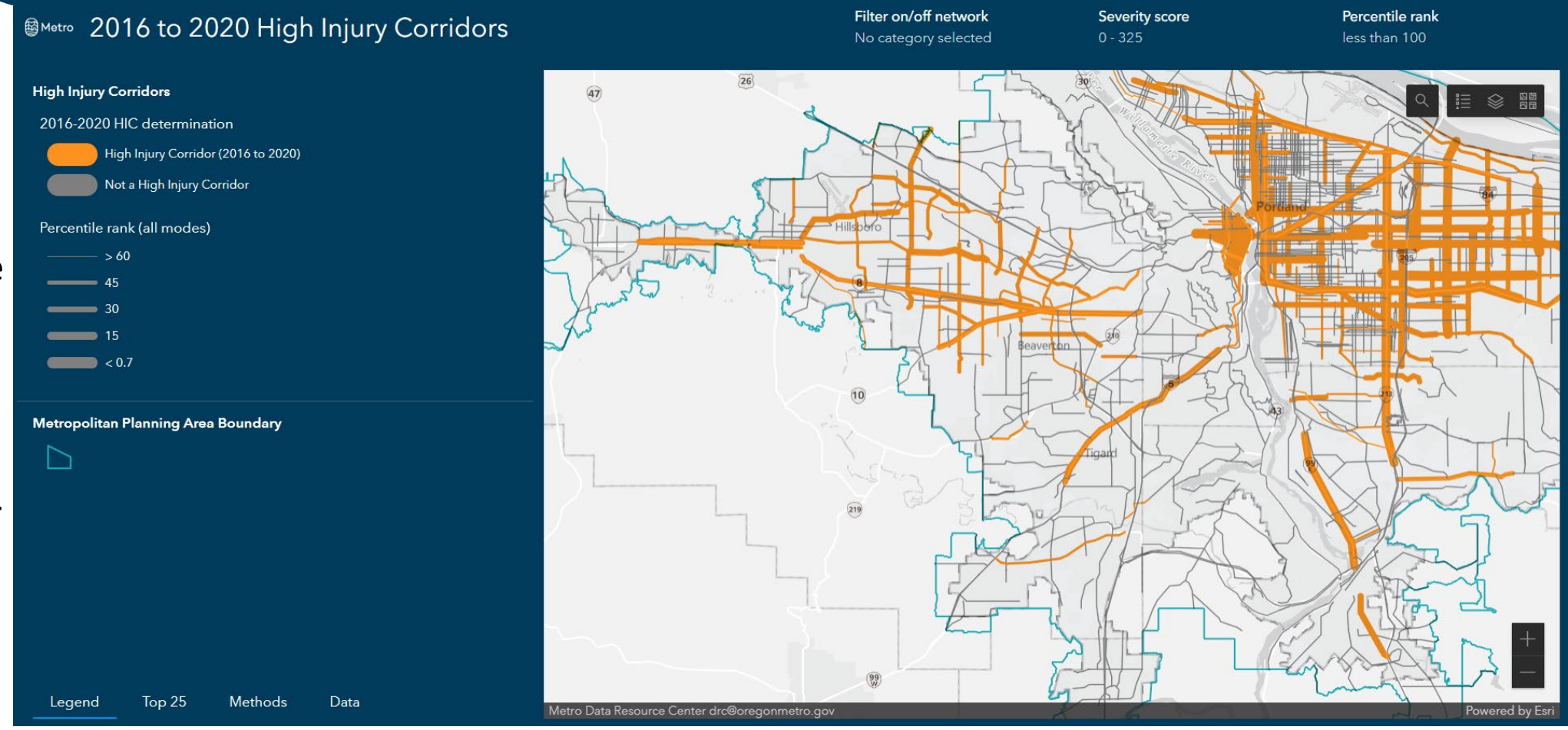
High injury corridors are included in the *2018 Regional Transportation Plan* and *Regional Transportation Safety Strategy*



High injury corridors are roadways with the highest concentrations of serious crashes and injury pedestrian and bicycle crashes occur during a given time frame.

This map shows all corridors 1-5 miles long where serious crashes and all injury pedestrian and bicycle crashes occurred between 2016-2020.

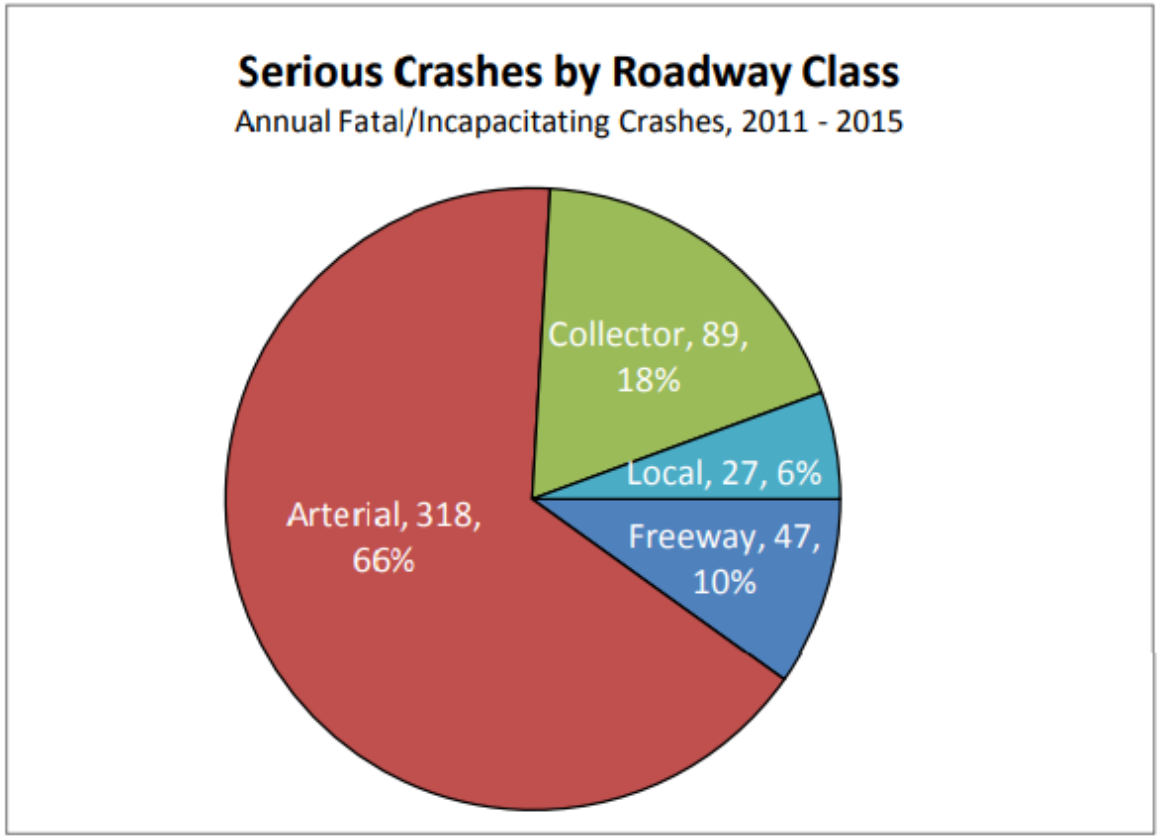
Corridors where 60% of these crashes occur are shown in orange.

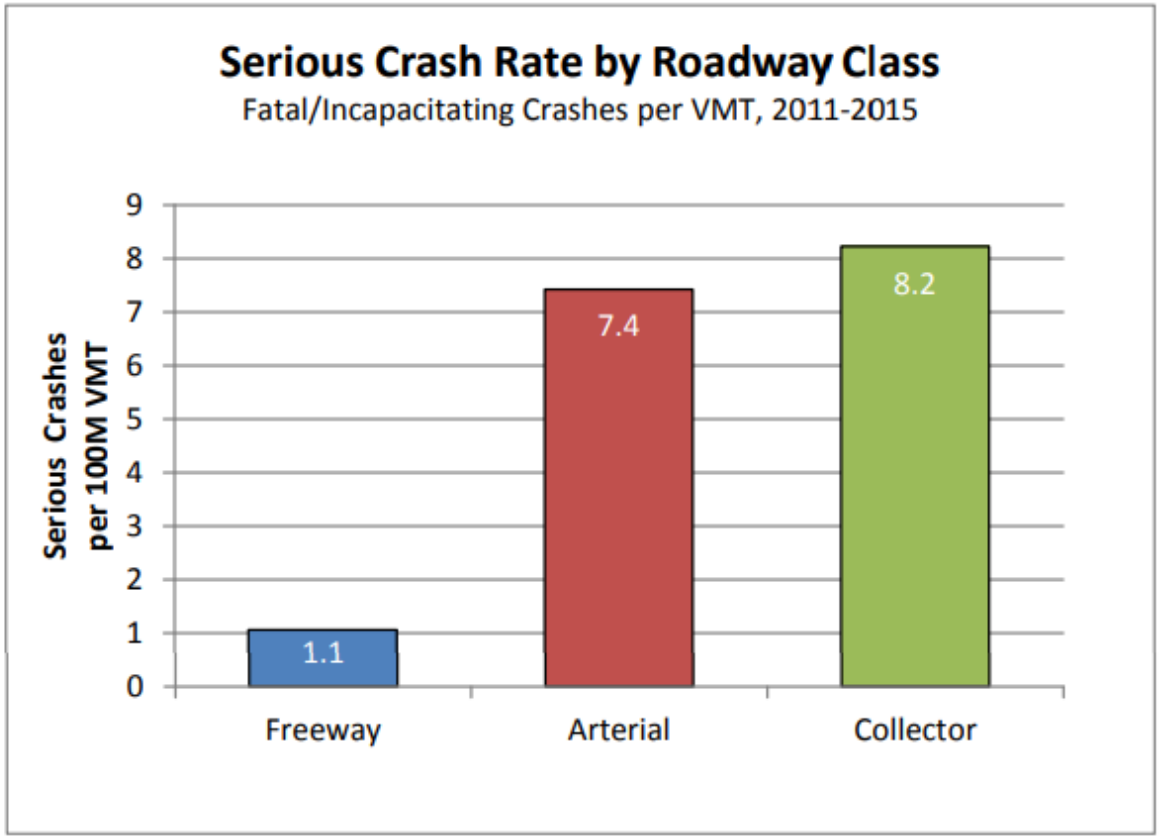


2016-2020 High Injury Corridors dashboard map:
https://experience.arcgis.com/experience/6b5ae16aad814e6e81546bcc4ffdf964

Why identify high injury corridors? Regional analysis found that a majority of serious crashes occurred on arterials – but which ones?

Figures 2-8 and 2-9



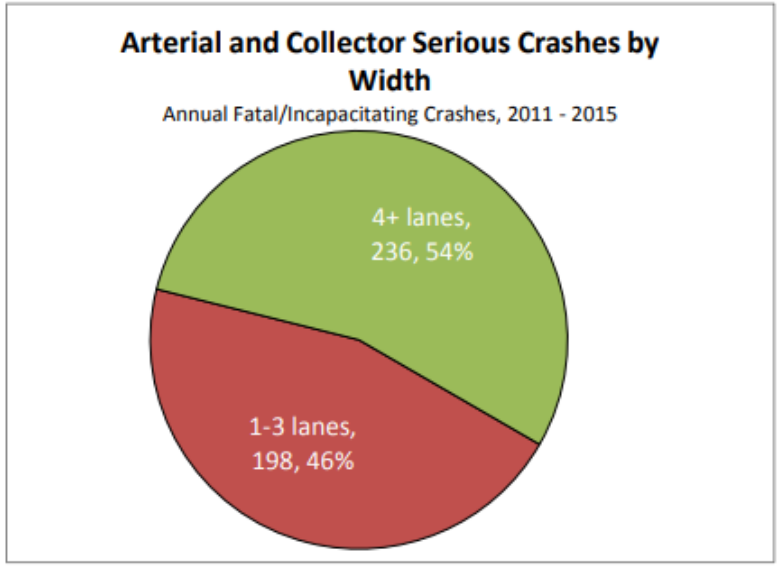


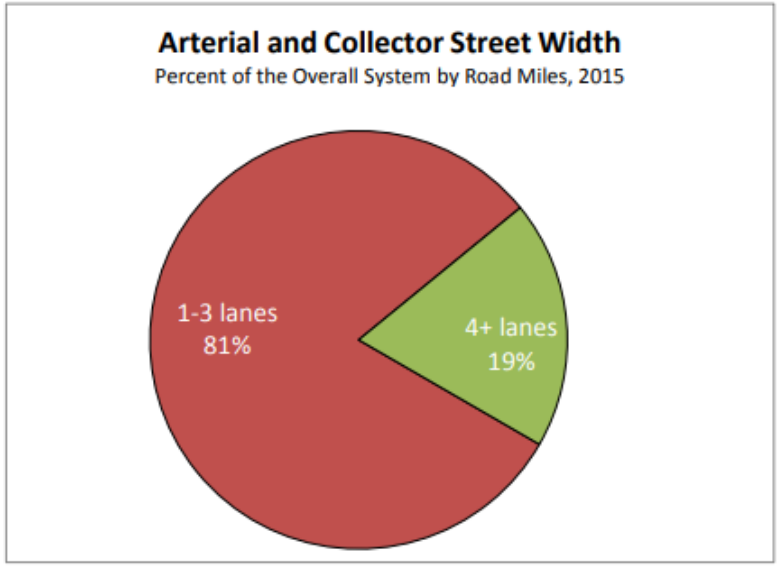
2018 Metro State of Safety Report

Regional analysis also found that a majority of serious crashes occurred on arterials with 4+ lanes– but which ones?

Number of Arterial/Collector Lanes	Total Road-Miles	Annual VMT (2015)	2011-2015 Annual Crashes		
			All	All Injury	Serious
1 – 3 Lanes	1,427	2,972,000,000	8,932	4,217	198
4+ Lanes	340	2,738,000,000	10,597	5,532	236

Figures 3-5 and 3-6

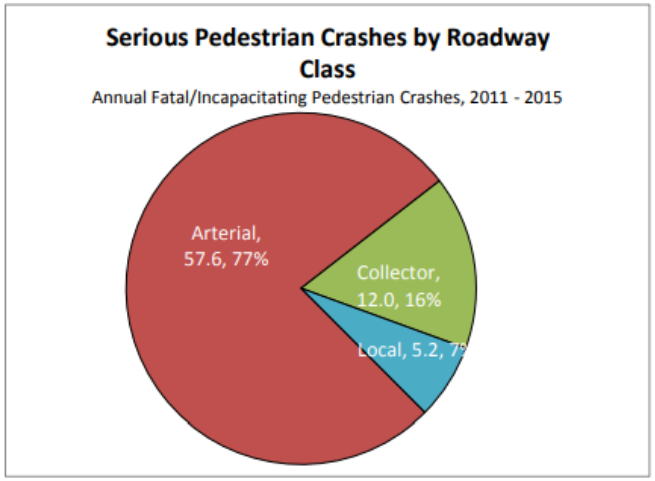


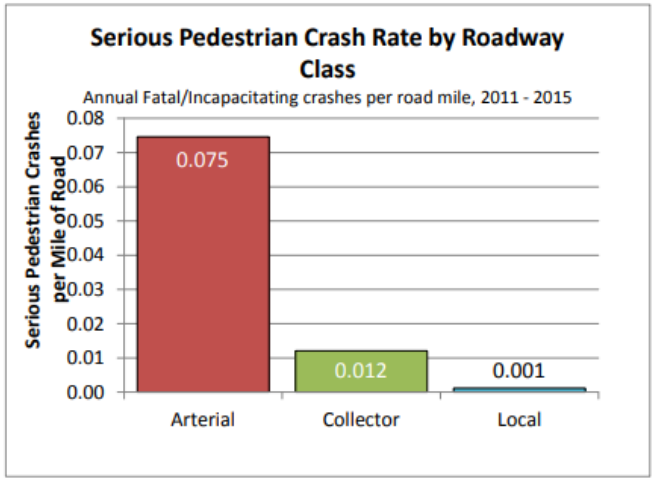


2018 Metro State of Safety Report

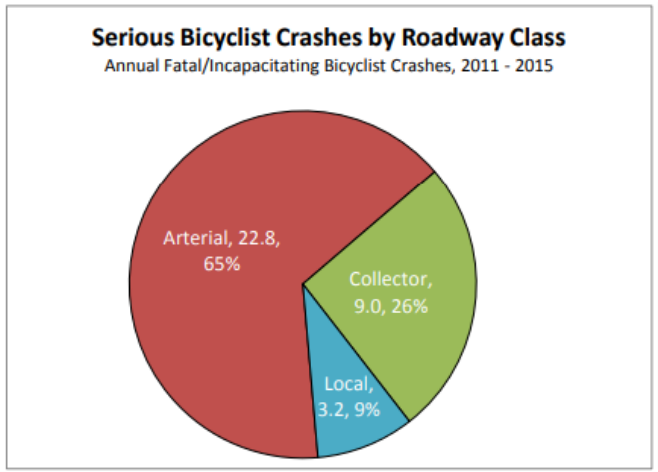
Regional analysis also found that a majority of serious pedestrian and bicycle crashes occurred on arterials– but which ones?

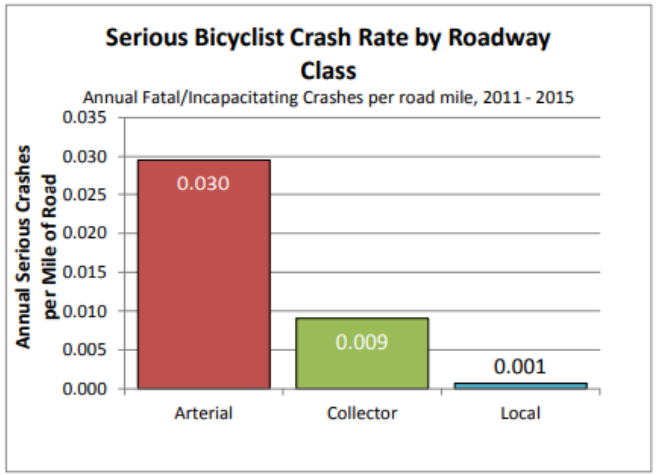
Figures 5-9 and 5-10



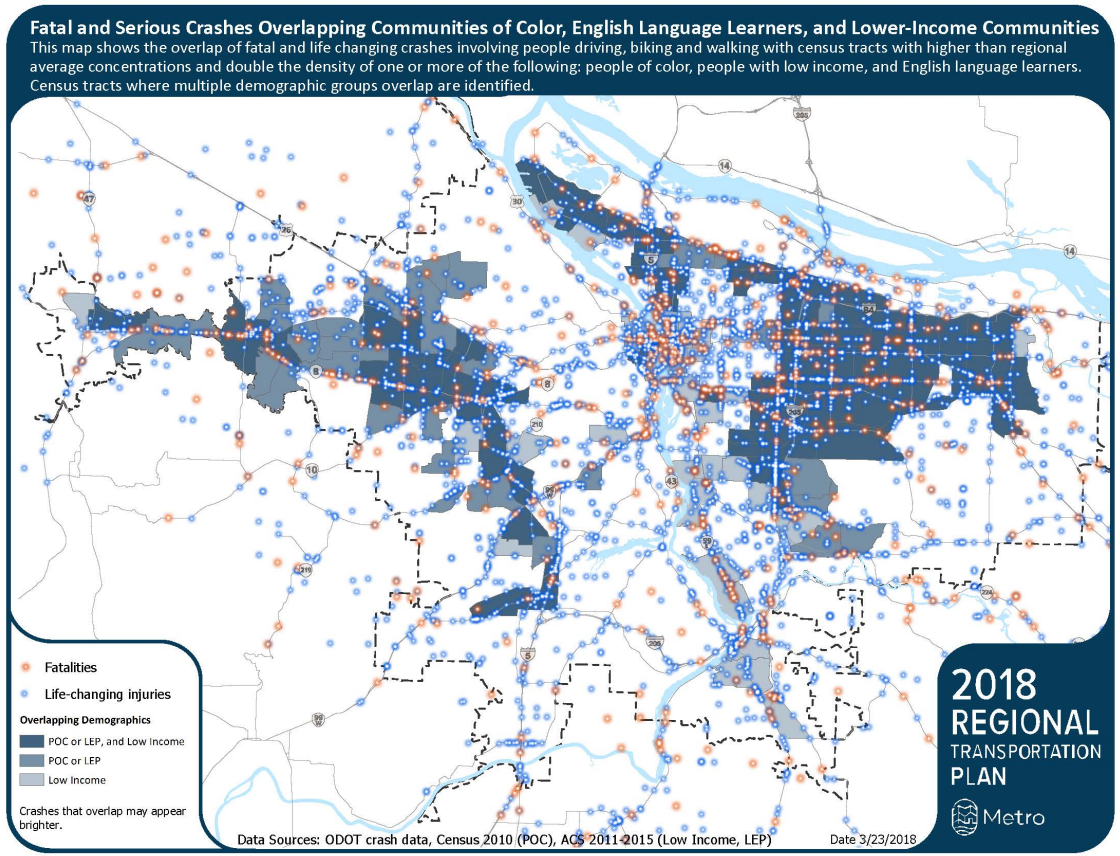


Figures 6-9 and 6-10

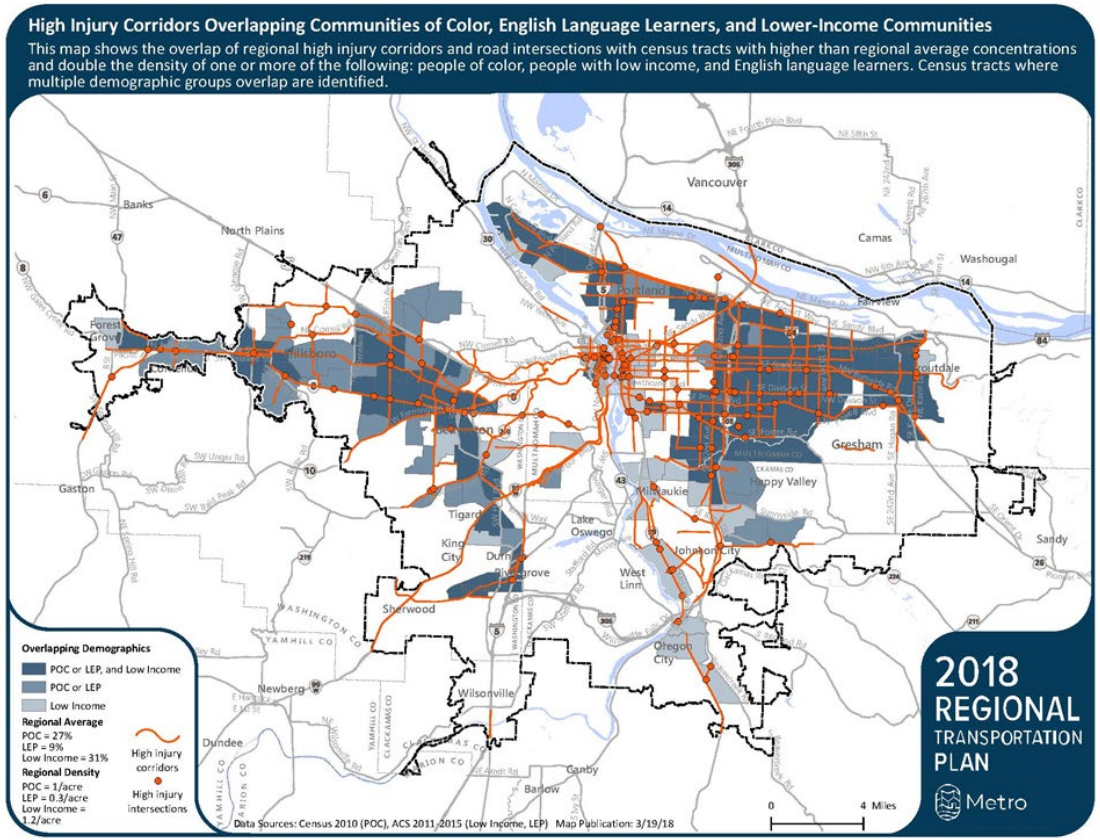




Identify high injury corridors to focus countermeasures where they can make the biggest impact on serious crashes and for vulnerable users



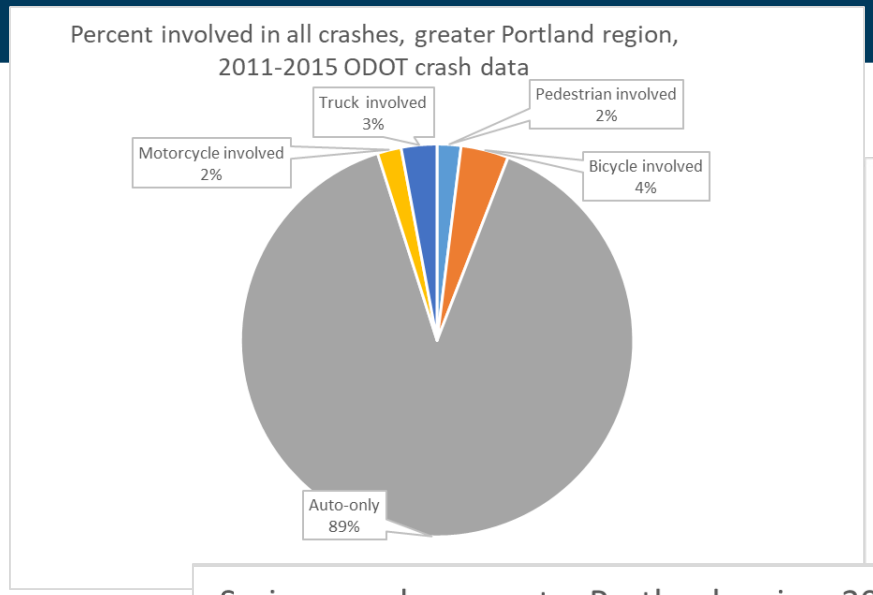
Total number of fatal and serious injury crashes

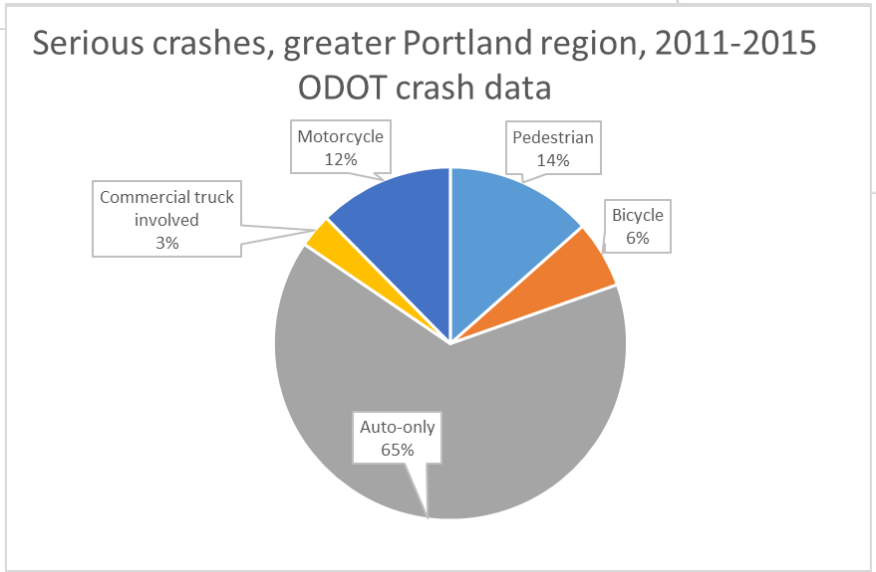


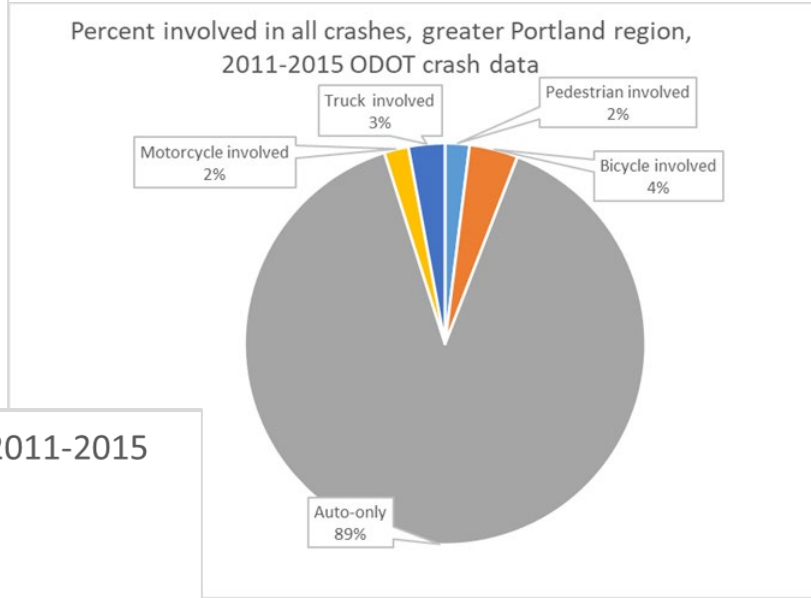
60% of fatal and serious injury crashes and all injury pedestrian and bicycle involved crashes

Why include all injury pedestrian and bicycle crashes in the analysis if the focus is on reducing serious crashes?

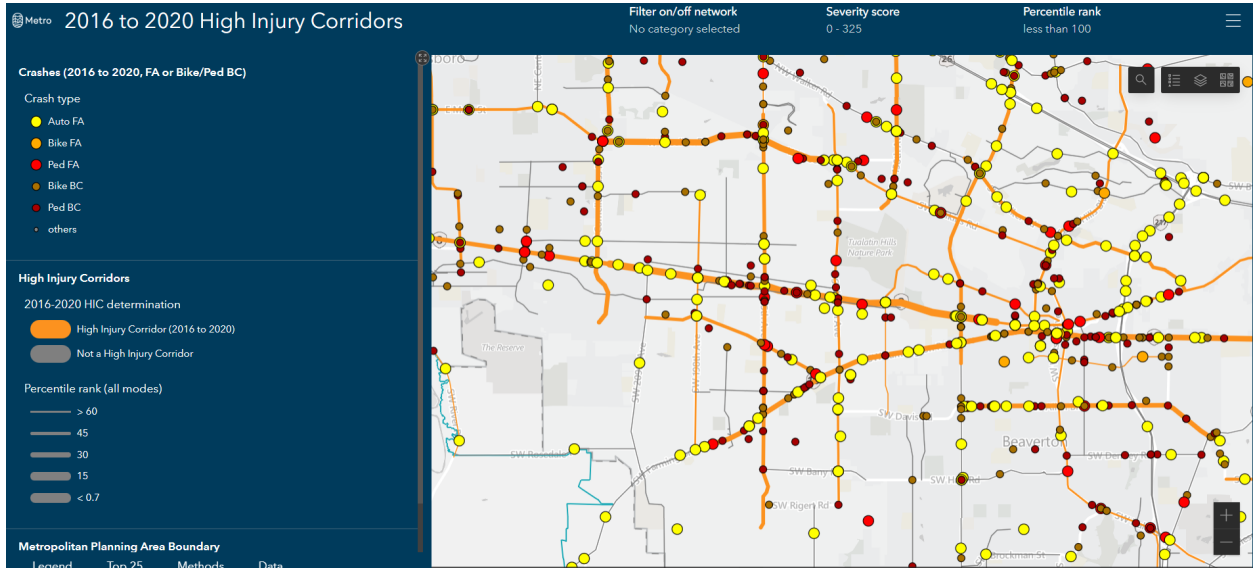
- People walking and bicycling are much more vulnerable to being killed or seriously injured in a crash
- If a person walking or bicycling is involved in a crash the difference between a serious or minor crash can often be just a few inches
- There are far fewer total pedestrian and bicycle crashes so can get “lost” in the data
- Local and regional goals and policies seek to increase the number of people walking, bicycling and taking transit



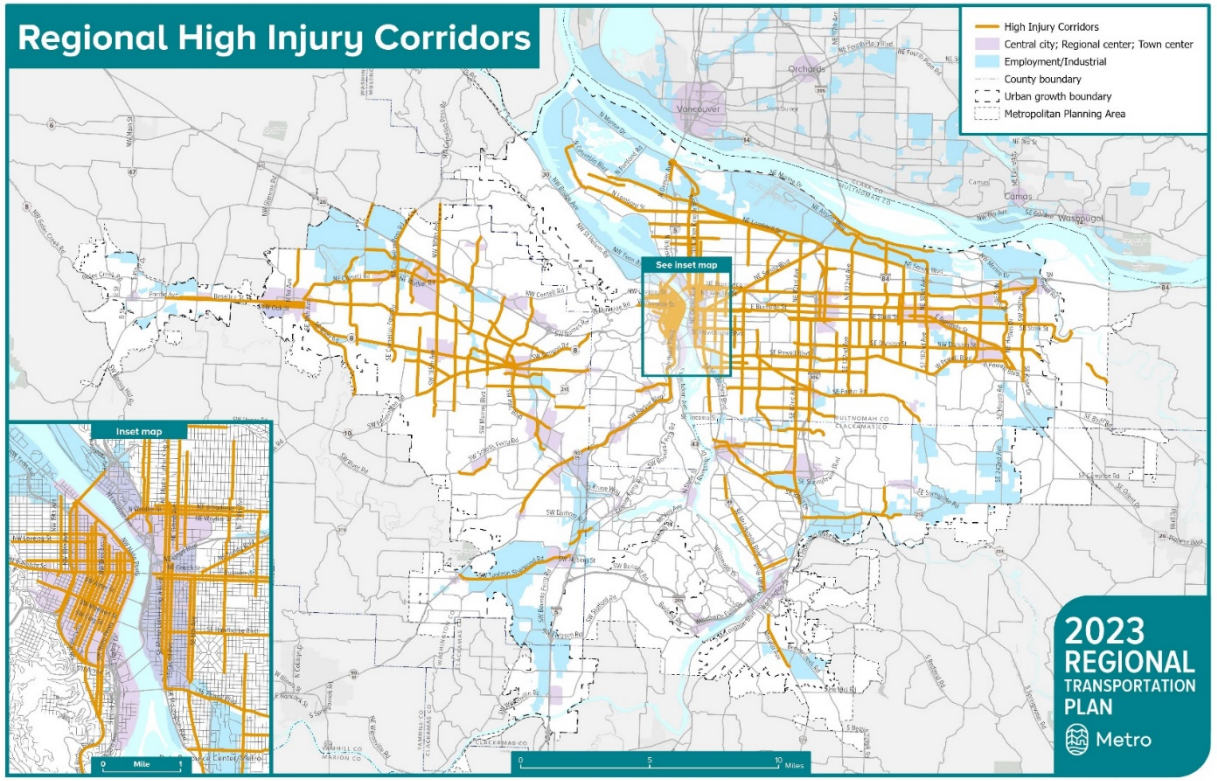




High injury corridors updated for the 2023 RTP with 2016-2020 crash data



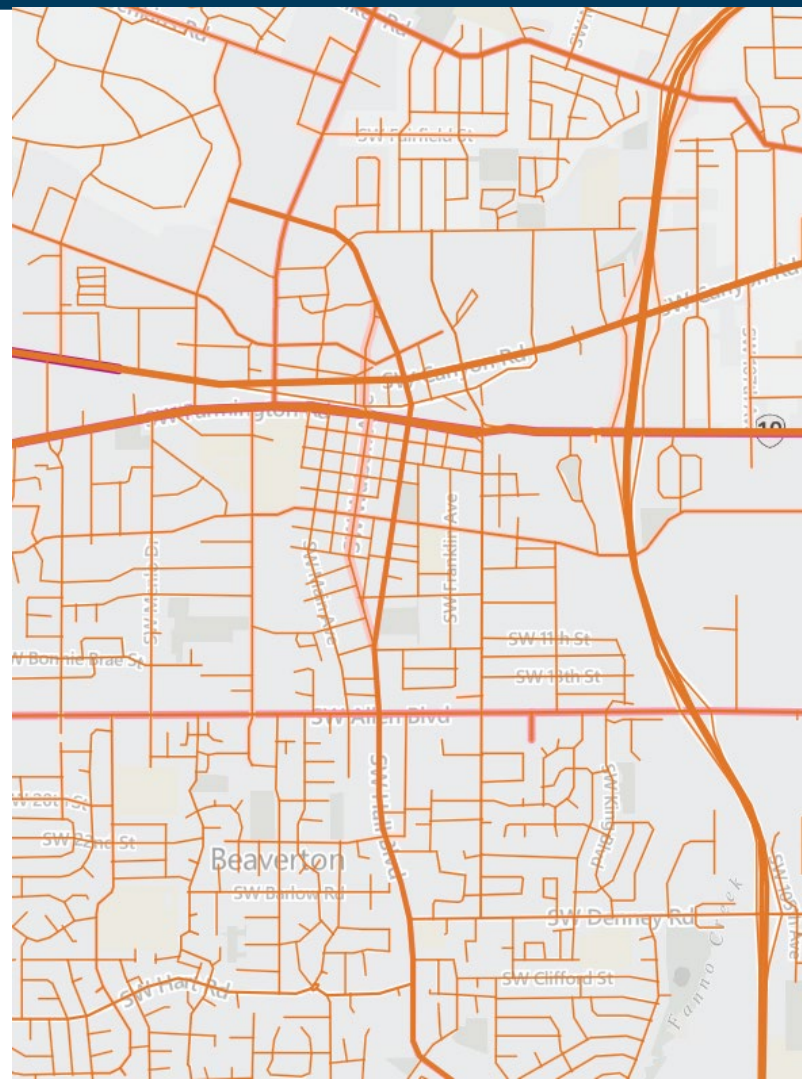
All fatal and serious injury crashes, and all injury pedestrians and bicycle crashes in 2016-2020 analyzed to identify roadways with 60% of fatal and serious crashes



Methodology Part 1: Streets
Create dissolved corridors

Start with RLIS streets

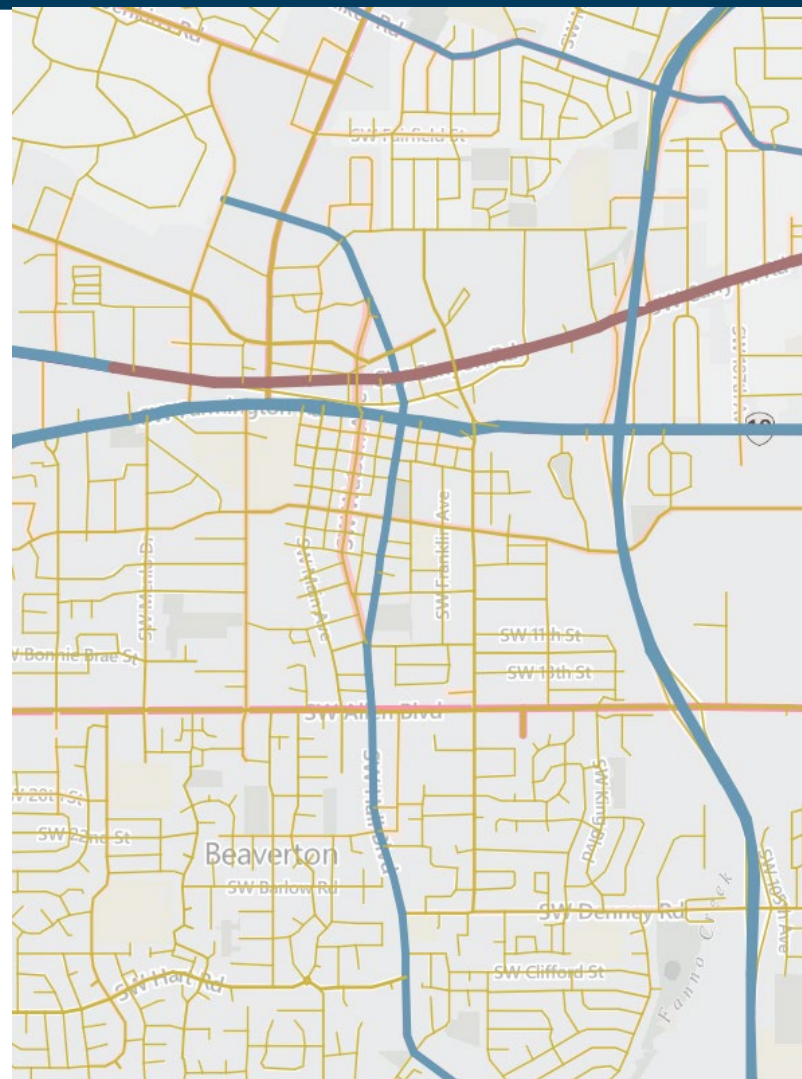
Purpose: to create a standard name for the whole corridor, e.g. Hwy 8 (the dissolved corridor)



Methodology Part 1: Streets
Break "dissolved corridors" into corridors

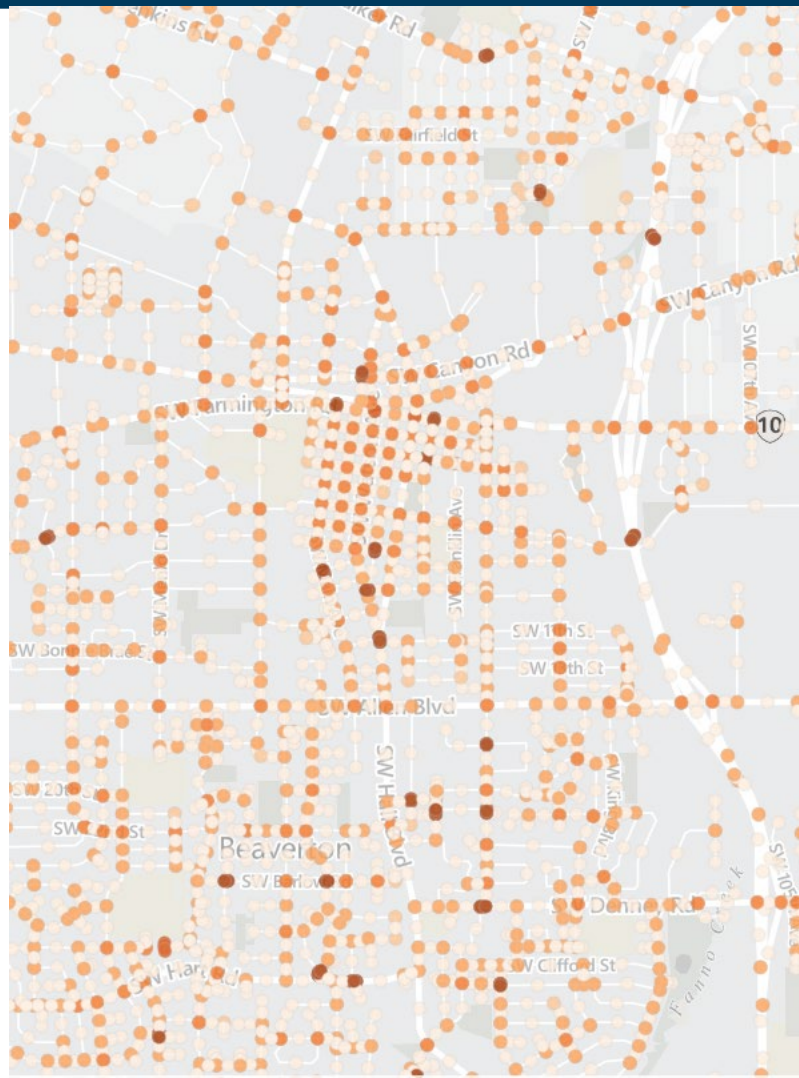
Break the "dissolved corridors", which are of varying lengths, into corridors no shorter than 1 mile, no longer than 5 miles

Purpose: Create corridors for scoring. Corridors are not defined by crashes, so that may be compared over time



Methodology Part 1: Streets
Create intersections and segment midpoints

Purpose: Create intersections and midpoints in each corridor to ‘snap’ the crashes to

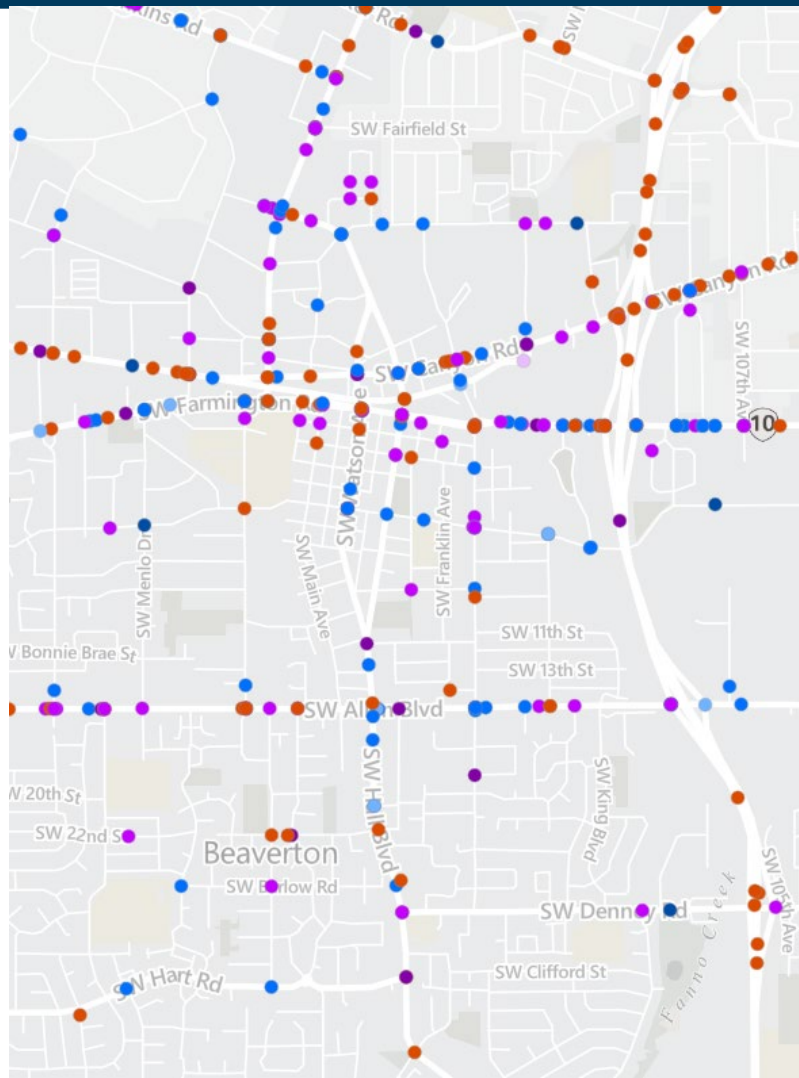


Methodology Part 2: Crashes
Add fields to crashes and calculate

Purpose: Assign a crash type and weight to each crash (each crash can only have one weighted crash type)

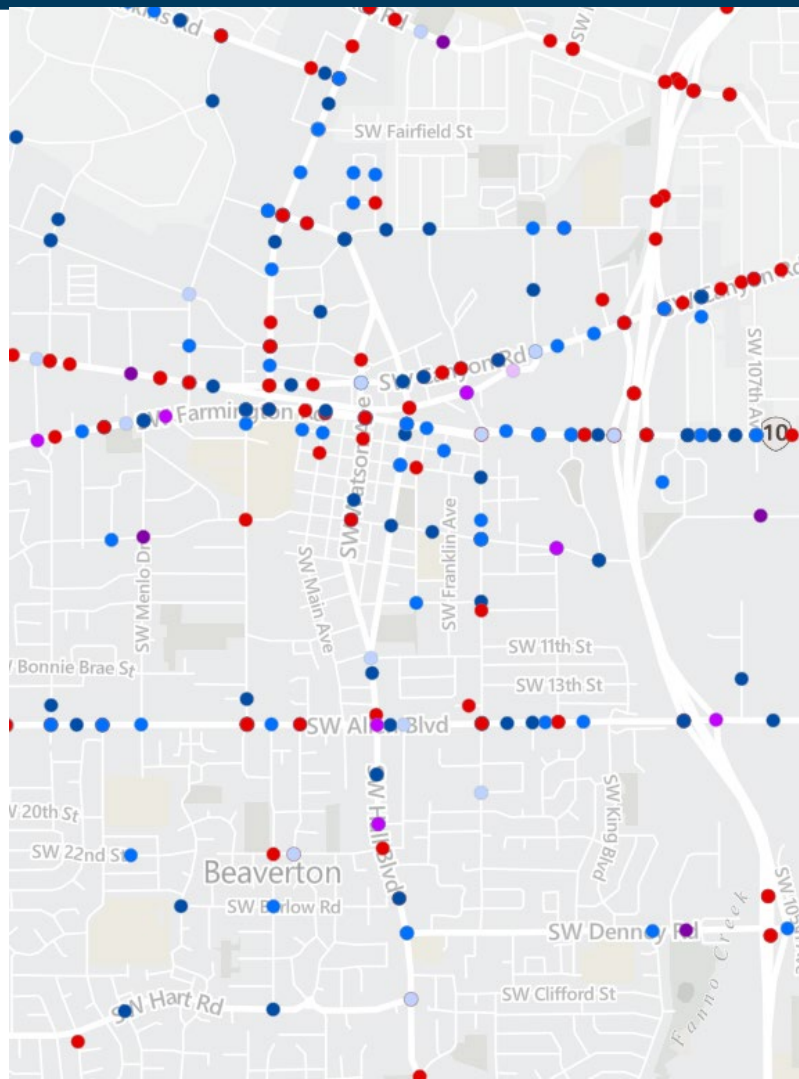
Crash	Crash type	Weight
Auto Fatal or Injury A (includes truck and motorcycle)	Auto_FA	10
Pedestrian Fatal or Injury A	Ped_FA	10
Bicycle Fatal or Injury A	Bike_FA	10
Pedestrian Injury B or C	Ped_BC	3
Bicycle Injury B or C	Bike_BC	3

Injury A=Serious injury; Injury B and C= moderate, minor injury



Methodology Part 2: Crashes
Snap crashes to intersections or midpoints

Purpose: Join the weighted crash types to the corridors; snap to either an intersection (for calculating high injury intersections) or a midpoint, depending on distance from intersection



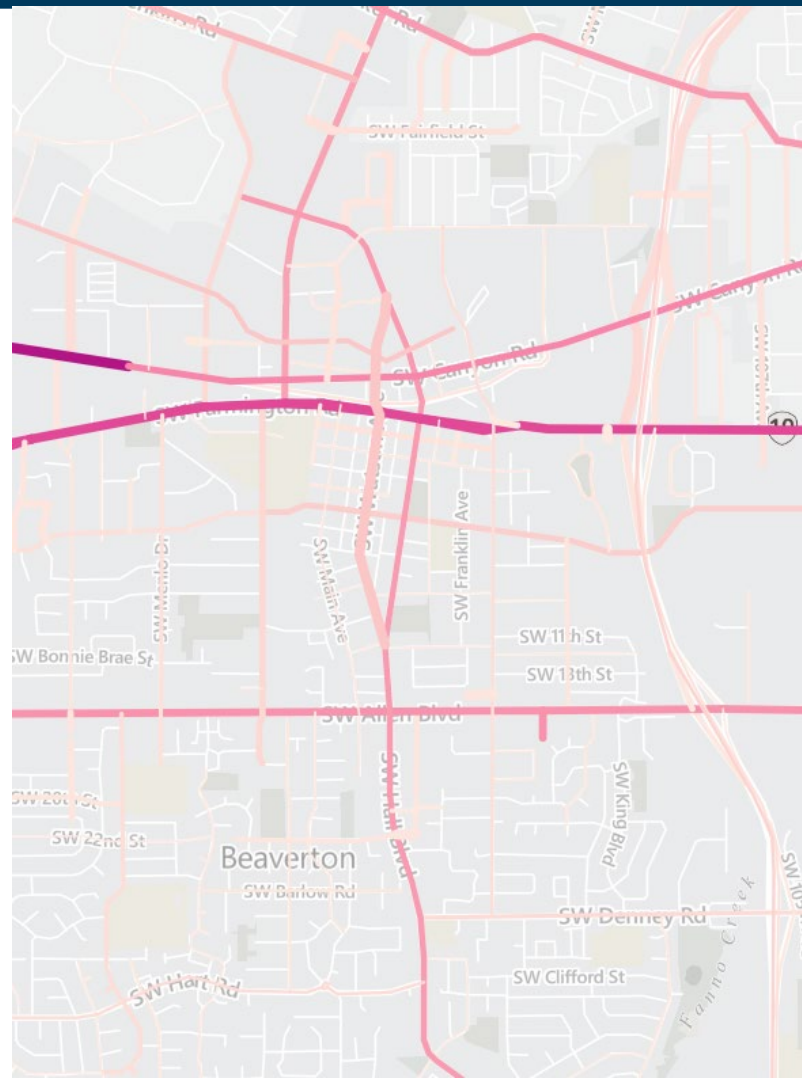
Methodology Part 3: Score Corridors
Calculate corridor scores

Purpose: Calculate nScore for each corridor as sum of crash types (frequency * weight)

nScore = (# FAx10) + (# Ped/Bike BCx3)

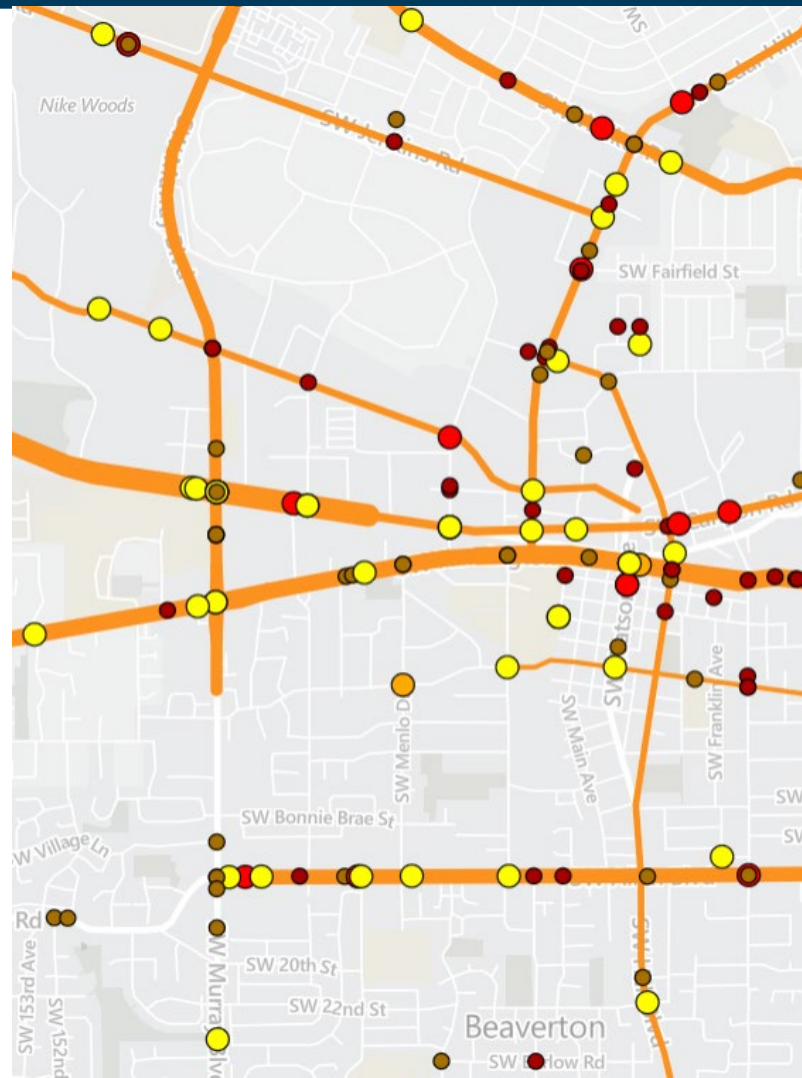
Calculate severity score for each corridor (score normalized by length of corridor)

Normalization (Severity score) = nScore * 10,000 / Length of corridor (feet)

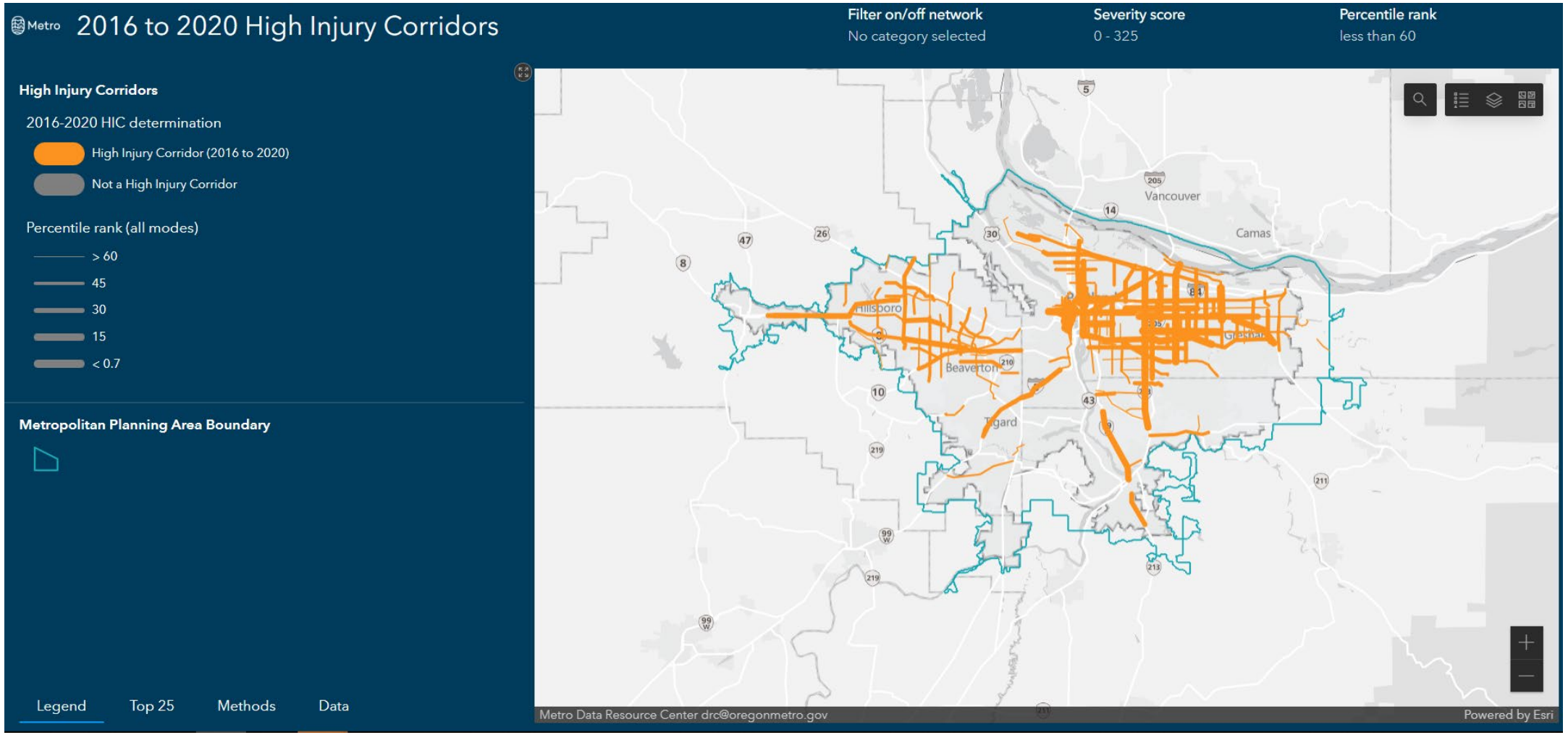


Methodology Part 3: Score Corridors
Calculate percentiles and rank corridors

Purpose: Identify the corridors where 60% of fatal and serious injury crashes are occurring; identify the corridors with the highest severity scores and lowest percentile rank

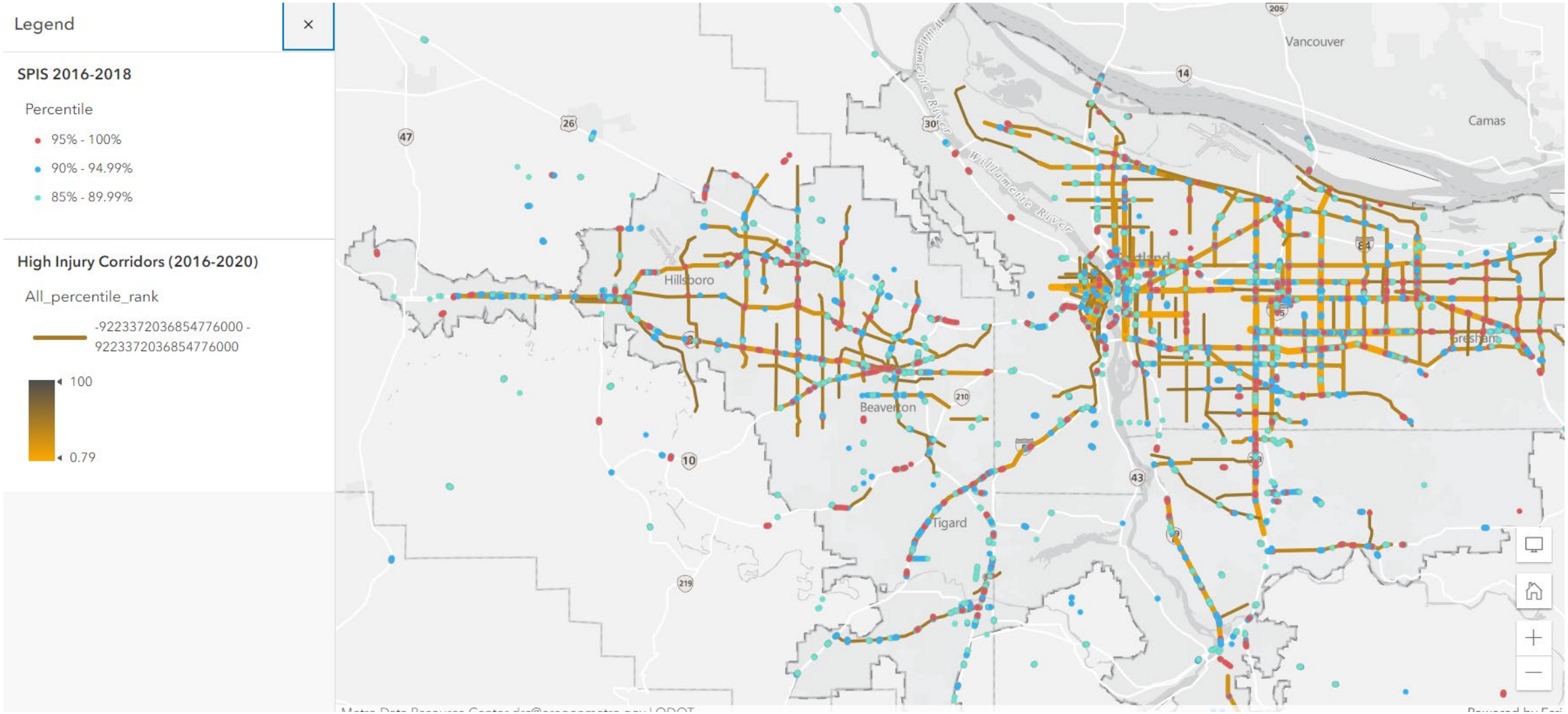


2016-2020 High Injury Corridors dashboard



Comparison of HICs and SPIS sites

Two different approaches to help prioritize investments in safety



Metro Regional High Injury Corridors (HICs)	Oregon Safety Priority Index System (SPIS)
Purpose: Identify roadway corridors where **60%** of fatal and serious injury crashes are occurring	Purpose: Identify potential locations that have exhibited high instances of crash activity; SPIS sites are those with at least one fatal crash or three injury crashes
Data: ODOT crash data, Metro RLIS streets	Data: ODOT crash data, ODOT roadway
Time-period: 5-year window of data (e.g. 2016-2020)	Time-period: 3-year window of data (e.g. 2017-2019)
Type: Corridor	Type: Intersection
Compares all roadways within the Metropolitan Planning Area	Compares all roadways within the state (or county)
Segments analyzed: at least 1 mile, no longer than 5 miles	Segments analyzed: 0.10 mile segments “sliding window” (crashes may be assigned to more than one segment)
Crashes analyzed: All fatal and serious (Injury A) and all injury pedestrian and bicycle crashes (Injury B &C)	Crashes analyzed: All injury crashes
Weights applied to crashes (severity): • Fatal & serious injury (Injury A): 10 • Pedestrian/bicycle moderate injury (B & C): 3	Weights applied to crashes (severity) (50% of SPIS score): • Fatal and serious injury (injury A): 100 • Moderate injury (Injury B & C): 10 • Property Damage Only were included up until the 2018 SPIS with a weight of 1; they are no longer included
Frequency: Number of serious injury crashes per corridor segment during 5-year window	Frequency: Number of crashes per 0.10 mile segment during 3-year window (25% of SPIS score)
Normalization: Number of fatal/serious crashes per mile	Normalization: Number of crashes per 1 million ADT (25% of SPIS score)
HIC severity score = ((# FAx10) + (# Ped/Bike BCx3)(10,000 / Length (feet)); highest score is the highest score	SPIS score = (IV Freq + IV Rate + IV Severity); highest score is 100

Thank you

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www.oregonmetro.gov/regional-transportation-safety-plan