Bike and Pedestrian Safety for an Equitable City

EXECUTIVE SUMMARY

- *The City of Pittsburgh needed bike-ped field data for local roads.*
- *StreetLight Metrics analyzed bike-ped trips, overlaid with city crash data.*
- *Bicycle and Pedestrian Metrics revealed unexpected insights into severe crash probability.*

Pittsburgh planners are working to build an equitable city based on dignity in mobility. StreetLight's Bicycle and Pedestrian Metrics helped transportation planners better understand resident travel behavior, mode choices, and trip assignments.

Mission: Identify High-Risk Traffic Zones

City of Pittsburgh officials are deploying various initiatives to make the city safer for pedestrians and bicyclists. The goal is for the 1,300 miles of core city street network to represent the "Steel City" values of honor, respect, and love for all road users.

But the City faces many inherent challenges: various topographical barriers, scarcity of available cartway space, high demand for on-street parking, and unusual road geometry.

To identify vulnerable corridors and neighborhoods, the City of Pittsburgh's Department of Mobility and Infrastructure (DOMI) wanted to pinpoint where traffic-related crashes were occurring. Although the team had existing vehicle data, they did not have information on bicycle and pedestrian travel.
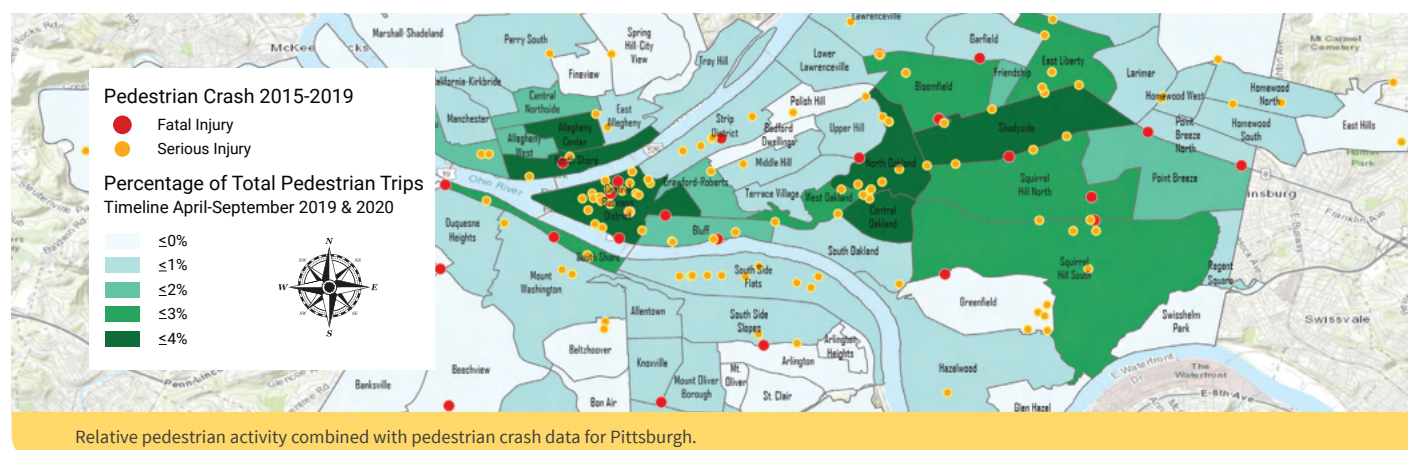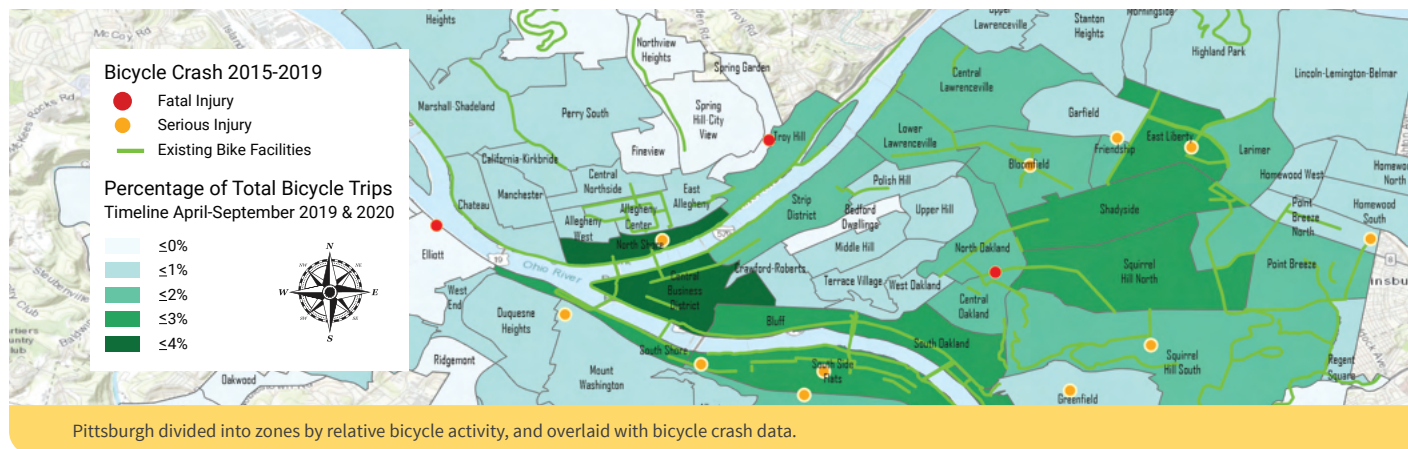
"We no longer have to make assumptions in people's trip activity and travel behaviors. Now we have data to support our research and it separates fact from fiction."

PANINI CHOWDHURY, AICP

PITTSBURGH
PENNSYLVANIA

Pittsburgh divided into zones by relative bicycle activity, and overlaid with bicycle crash data.

Relative pedestrian activity combined with pedestrian crash data for Pittsburgh.

Analysis: Deploy O-D Bike and Ped Metrics

Planners ran an analysis in StreetLight InSight® to capture Origin-Destination data for bicycle and pedestrian travel. The results included O-D analytics with indexed values for number of trips, and average trip distance for all neighborhoods specified.

The team then overlaid 2015-2019 bicycle and pedestrian crash data to see the positioning with regards to bike-ped activity layers in subsequent neighborhoods. To calculate the bike-ped activity they multiplied average daily zone traffic metrics by average all-trip length of that same zone.

This analysis also considered lower wintertime bike-ped activity probability, and collected data for April-September 2019 and 2020. Analysts created an overall metric each for Bicycle Miles Traveled (BMT) and Pedestrian Miles Traveled (PMT). To normalize the calculation, analysts distributed the total by inverse proportion to all 90 city neighborhoods.

Results: Crash Severity in Unexpected Areas

Remarkably, high-travel shopping, commercial, and educational institution corridors did not necessarily correlate with crash severity. In fact, the most severe crashes occurred in the areas with lower bike and pedestrian traffic.

For pedestrian travel, half the fatal crashes and 51% of total crashes (2015-2019) occurred in neighborhoods with low pedestrian activity. On bicycles, half of fatal crashes and 36% of the total crashes (2015-2019) occurred in neighborhoods with little or no bike infrastructure, and low bike trip activity.

Planners identified and ranked the business districts with high bicycle activity, which later helped the city efficiently deploy bike parking infrastructure.

The study proved the importance of real-world travel data to verify anecdotal claims and assumptions. For Pittsburgh, data ensures effective policy decisions and appropriate distribution of limited safety improvement funds.