Bicycle and Pedestrian Safety Analysis
What is Vision Zero?

• End traffic deaths and serious injuries by 2030
• Multi-faceted approach through data driven action and the many E’s of Safety:
  – Engineering
  – Education
  – Enforcement
  – Evaluation
  – Equity
Pedestrian and bicycle collisions make up 7% of total crashes but 40% of fatalities.

9 out of 10 bike/ped collisions result in injury.
Purpose of Bicycle and Pedestrian Safety Analysis

- Better understand risk factors contributing to pedestrian and bicyclist crashes
- Proactively and systemically address risk factors to mitigate potential crashes
- Advance Seattle’s Vision Zero Goals
Data At a Glance – Crash Data

- 3,726 pedestrian crashes
  - 445 serious or fatal

- 3,120 bicycle crashes
  - 237 serious or fatal
Bicycle Collision Trends

BICYCLE CRASHES BY YEAR AND HIGHEST SEVERITY

![Graph showing bicycle crash trends from 2007 to 2014. The red line represents total crashes, which shows an increasing trend. The black line represents serious or fatal injuries, which remains relatively flat.](image)
Pedestrian Collision Trends

PEDESTRIAN CRASHES BY YEAR AND HIGHEST SEVERITY

- Black line: Serious or Fatal Injury
- Red line: Total Crashes
Data Up Close – Roadway Data

Lane Data + Crash Data = Crashes Associated with Lane Data

Crosswalk Data + Crash Data = Crashes Associated with Crosswalks
Exploratory Analysis

74.5% of bicycle crashes and nearly 80% of pedestrian crashes happen on arterial streets.
## Exploratory Analysis - Bicycle

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<th>Collision Type</th>
<th>% of Total</th>
<th>% of Severe/Fatal</th>
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Exploratory Analysis - Bicycle

5% of all bike crashes were dooring crashes
And accounted for 6% of all serious and fatal crashes

- Bike Lane: 19%
- Curb Lane: 43%
- Travel Lane with Sharrow: 25%
## Exploratory Analysis - Pedestrian

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Exploratory Analysis

THE MAJORITY OF BICYCLE AND PEDESTRIAN CRASHES HAPPEN AT INTERSECTIONS
Exploratory Analysis

Pedestrian intersection crashes more likely to happen at locations with traffic signals.
Accounting for Exposure

Exposure = level of pedestrian/bicycling activity

Pedestrian Activity
- Annualized count data
- Trip generators

Bicycle Activity
- Annualized count data
- Trip generators
- Strava data
- Bicycle Network

Trip generators: housing units (single family or multifamily), commercial destinations, transit locations, and universities or schools.
A Proactive, Systemic Approach

Focusing on modeled collision rates at intersection locations based on the 5 following prioritized collision types:

- Total bicycle collisions
- Total pedestrian collisions
- Opposite direction bicycle collisions
- Angle bicycle collisions
- Angle pedestrian collisions
Leading Edge Analysis

Multivariate Analysis

Identify Risk Factors

Ranked Lists of Locations by Safety Performance Factor
**A Proactive, Systemic Approach**

- **Data Analysis**
- **Significant Risk Factors**
  - Ranked list of locations where intervention may be needed
- **Field Investigations**
- **Identify Safety Improvements**

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A Proactive, Systemic Approach
A Proactive, Systemic Approach
How is Seattle Going to Use Findings?

• Identify locations where street or signal design changes may be needed
• Make informed decisions around prioritizing safety improvements
• Proactively treat locations with the intention of mitigating potential crashes
Key Takeaways

- Consistent and accurate collision data is key to a data-driven approach.
- Simple statistical and spatial analysis can reveal informative patterns that may not be apparent.
- Understanding exposure is key to understanding risk, prioritizing safety improvements.
Where do we go from here?

• Incorporate more collision data inputs
• Validate countermeasure approaches
• Further develop predictive volume models for the entire city
• Rerun BPSA in future with better bicycle data after bicycle network is developed
• Promote education and enforcement
Questions?

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http://www.seattle.gov/visionzero