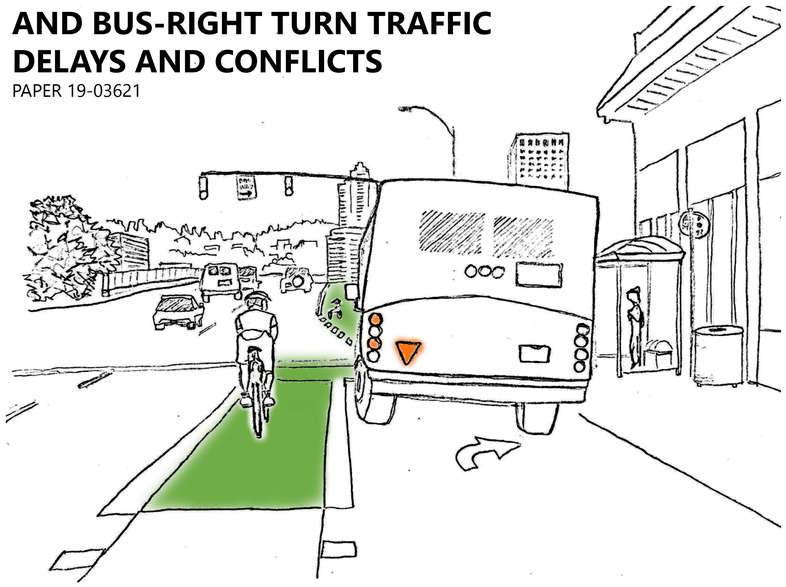
Portland State UNIVERSITY | Maseeh College of Engineering and Computer Science

TRIMET TTP Lab

Katherine Keeling Research Assistant, kkeeling@pdx.edu
Travis Glick PhD Candidate, PSU
Miles Crumley Senior Operations Analyst, TriMet
Miguel Figliozzi Professor, Principal Investigator, PSU

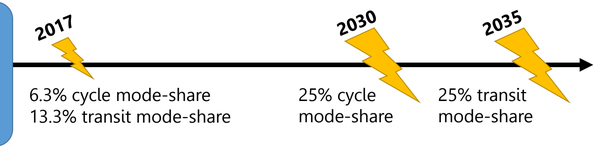
EVALUATION OF BUS-BICYCLE AND BUS-RIGHT TURN TRAFFIC DELAYS AND CONFLICTS

PAPER 19-03621



BACKGROUND

Portland has major policy in place to increase cycling and transit mode-shares.



LITERATURE

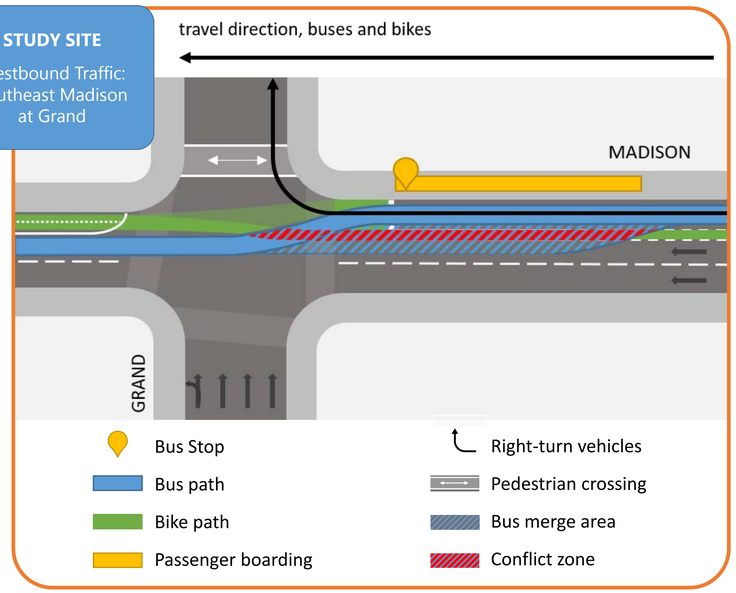
AUS, 2006 : Over half bus-bicycle accidents occur at intersections.

UK, 2001: Most common bus-bicycle collision is bus-overtaking-bicycle.

US: Lack of research on bus-bicycle conflicts and/or interactions.

STUDY SITE

Westbound Traffic: Southeast Madison at Grand



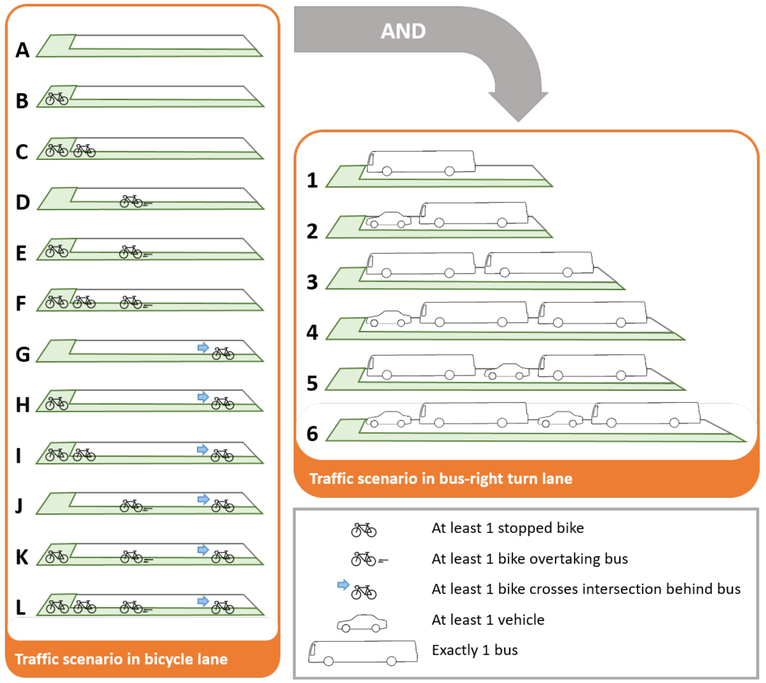
RESEARCH GOAL

Quantify bus-bicycle conflicts and check for causes of bus delay.

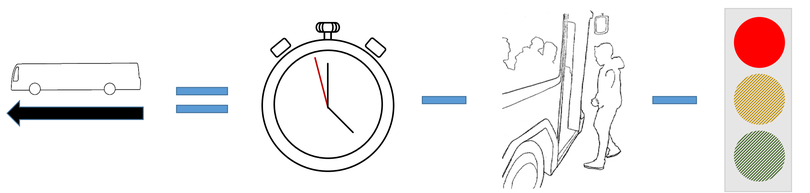
METHODOLOGY

1 VIDEO ANALYSIS: Record bicycle activity, bus activity, and right-turn vehicle activity. Data collections took place during the June, August, and September.

2 CATEGORIZATION: 72 possible combinations to describe bicycle and bus-right turn lane activity.



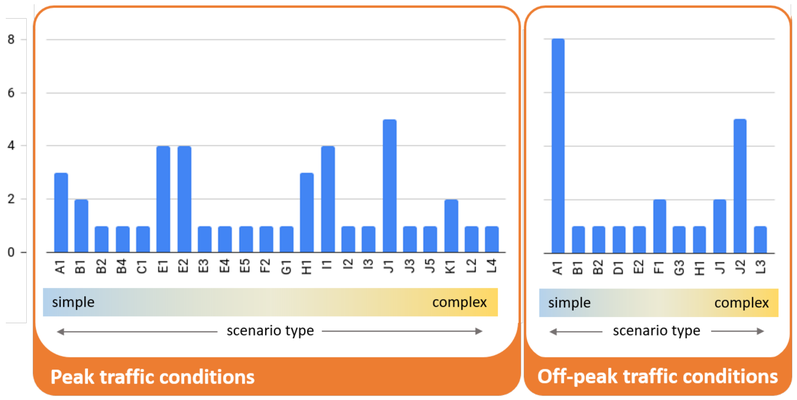
3 TRAVEL TIME ANALYSIS: Calculate the time a bus spends traveling through the study site.



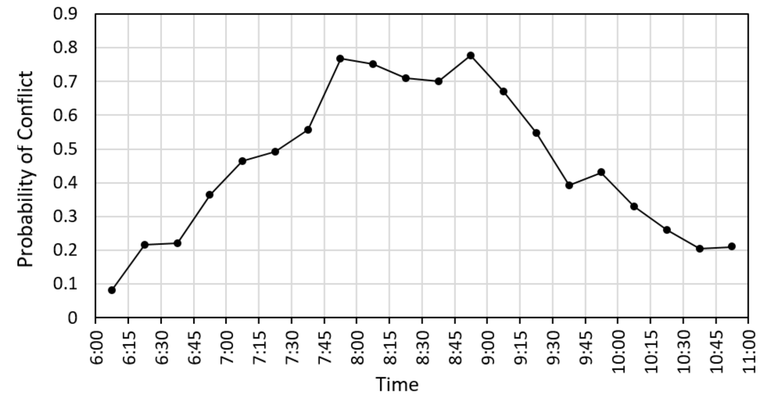
$t_{travel,bus} =$ Gross time spent from entering to leaving study site − Time spent serving passengers − Time spent waiting on red

RESULTS

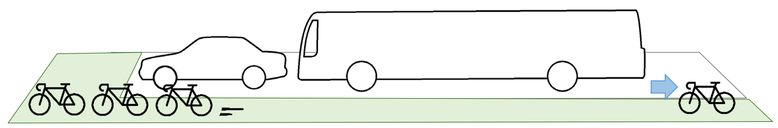
A The histograms show the variability of traffic scenarios for 219 bus events. Variability is greater during peak traffic hours, but there are also highly complex scenarios during off-peak hours.



B Using Poisson arrival theory, we can model changes in probability of bus-bicycle conflict.



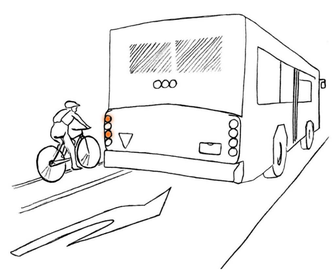
C The regression analysis checked for relationships between the independent variables and the amount of time it took a bus to travel through the study site.



No statistical evidence that these vehicles cause bus delay

Each bicycle crossing intersection after bus adds 0.52sec bus delay.

D Using our count data and the methods used to calculate AADT, the study site is estimated to incur **11,000** bus-bicycle conflicts annually.



CONCLUSION

The quantification of bus-bicycle conflicts and bicycle-caused bus delay supports the need for future street designs / improvements to minimize bus and bicycle interaction.