1-10-2014

Evaluating Driver and Pedestrian Behaviors at Enhanced Multilane Midblock Pedestrian Crossings

Nick Foster
Portland State University

Evaluating Driver and Pedestrian Behaviors at Enhanced Multi-lane Midblock Pedestrian Crossings

A Case Study in Portland, OR

Nick Foster, AICP

Portland State
UNIVERSITY

Introduction

- Problem
  - Over 4,000 pedestrian deaths in 2010
- Potential solution
  - Enhanced crossings
    - Effectiveness?
    - Use?

Project Overview

- Two marked midblock crossings
  - Rectangular rapid flash beacons (RRFB)
  - Raised median refuge islands
  - *Z-crossing (Danish offset)*
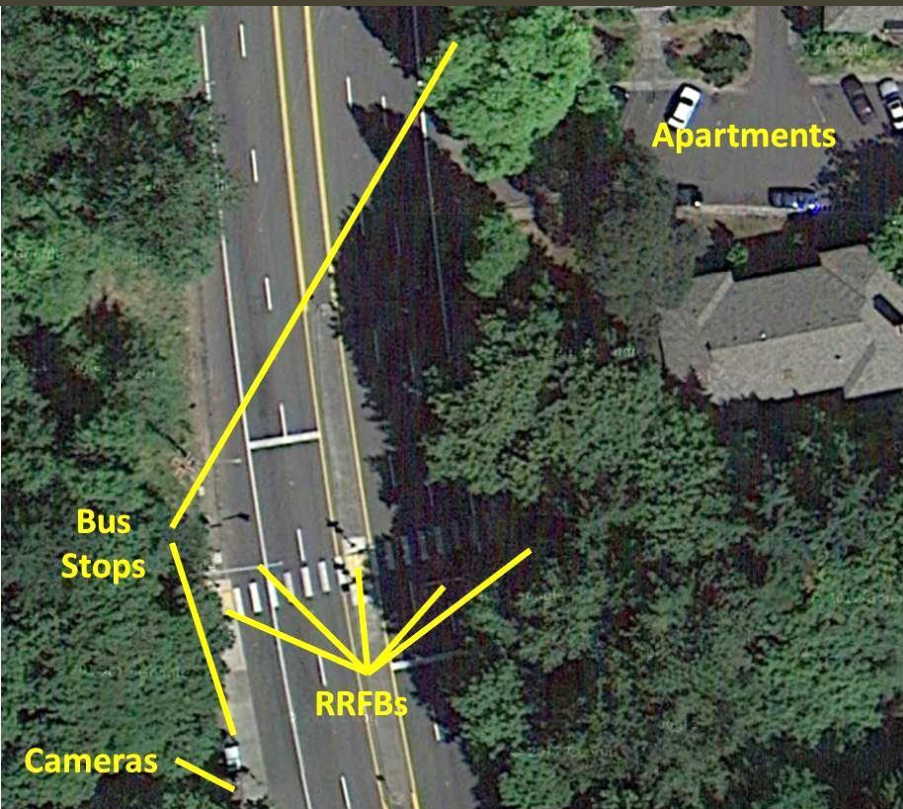   - *One site only*

Background

- RRFB research focused on drivers
  - Driver yielding rates: 54%-88%
- Crossing decisions based on distance to crosswalk
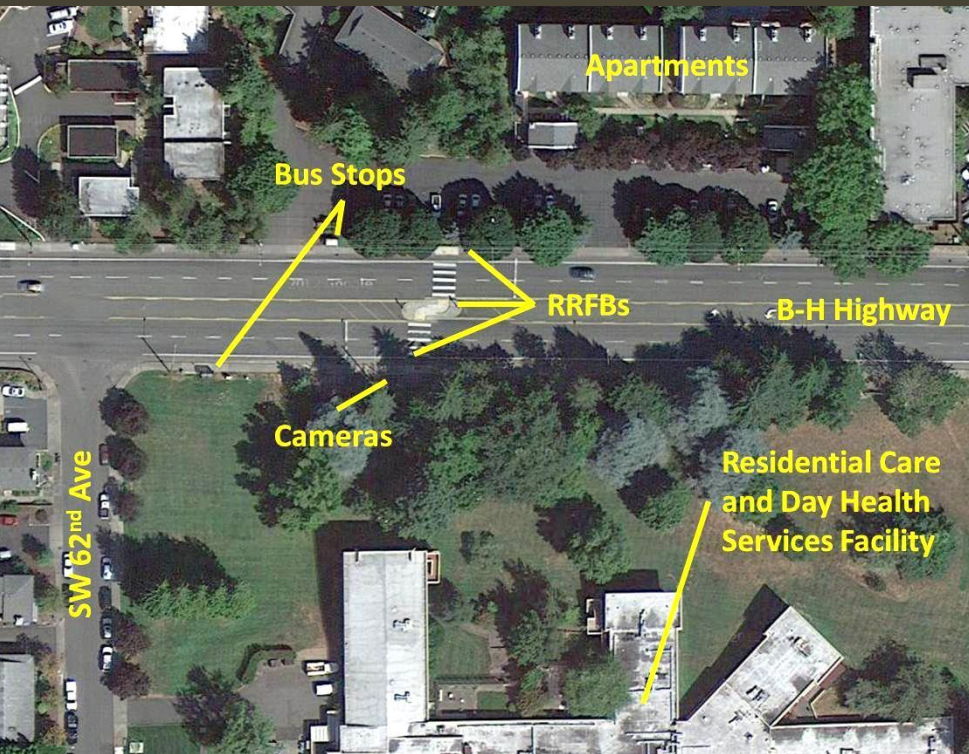 - Limited research on attraction
- No literature on Z crossing use

Site 1 – Barbur Boulevard

- 30,700 ADT
- 35 MPH

Site 2 – B-H Highway

- 26,400 ADT
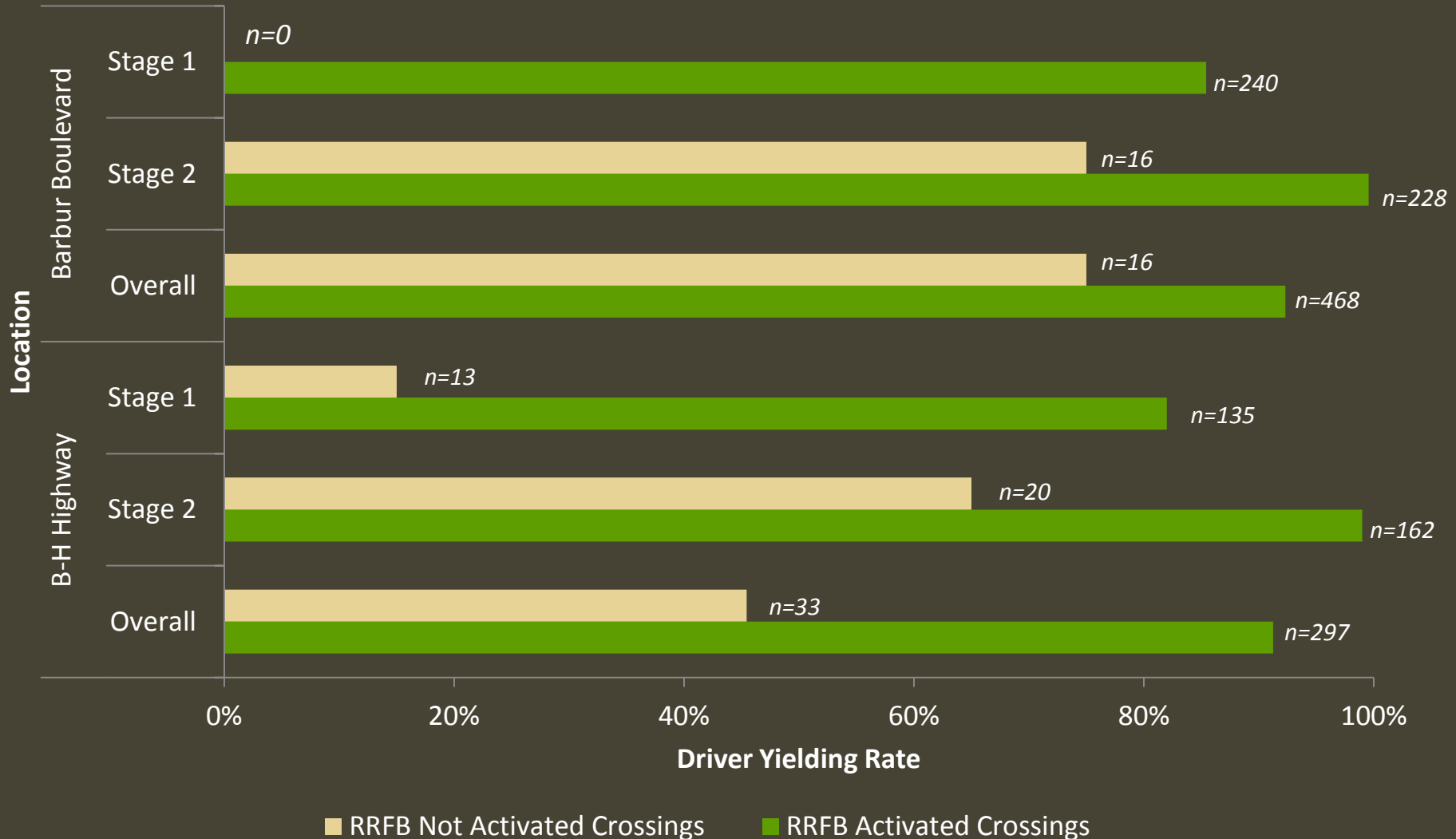- 40 MPH

Methodology

- 62 hours of video
  - Weekdays in February 2013
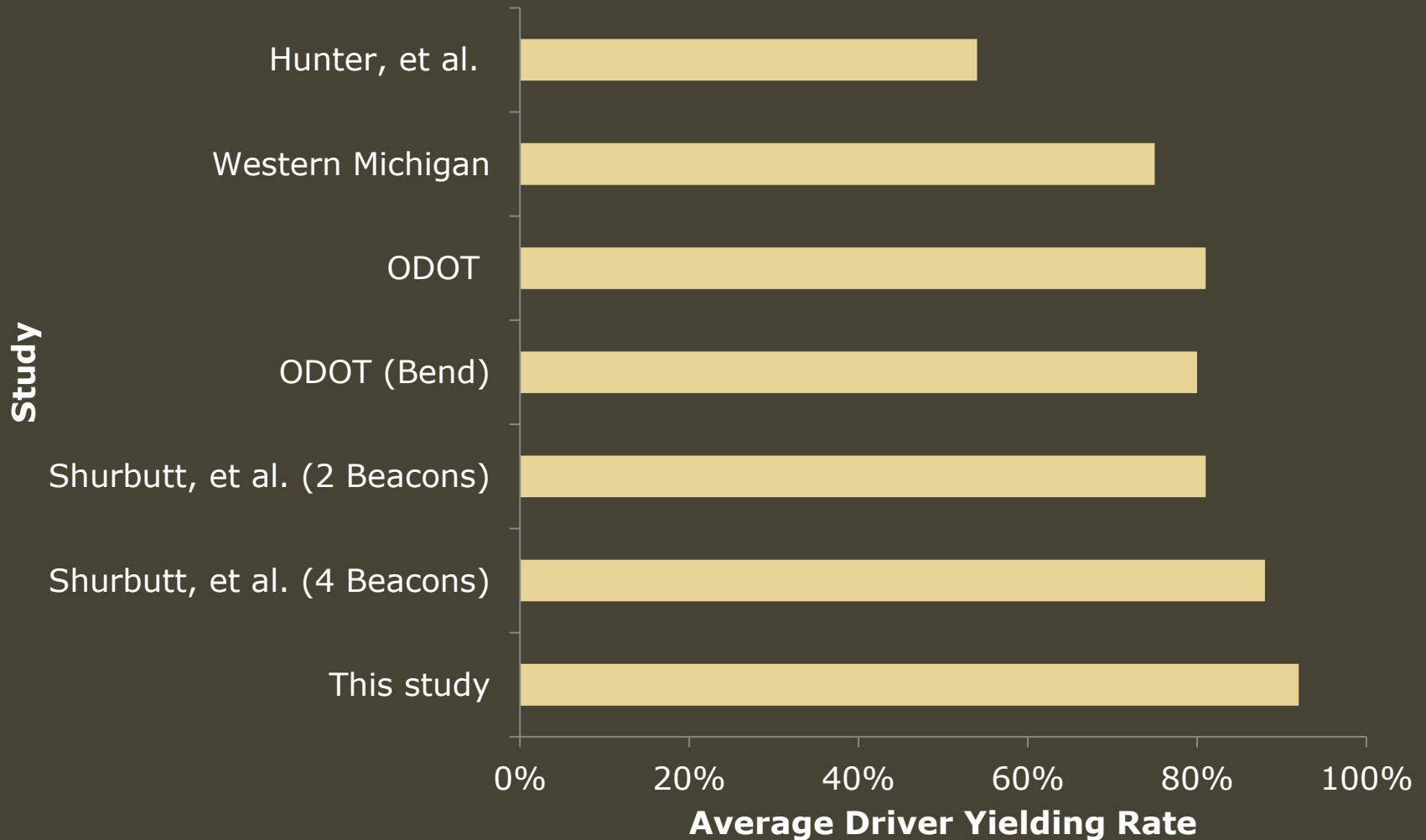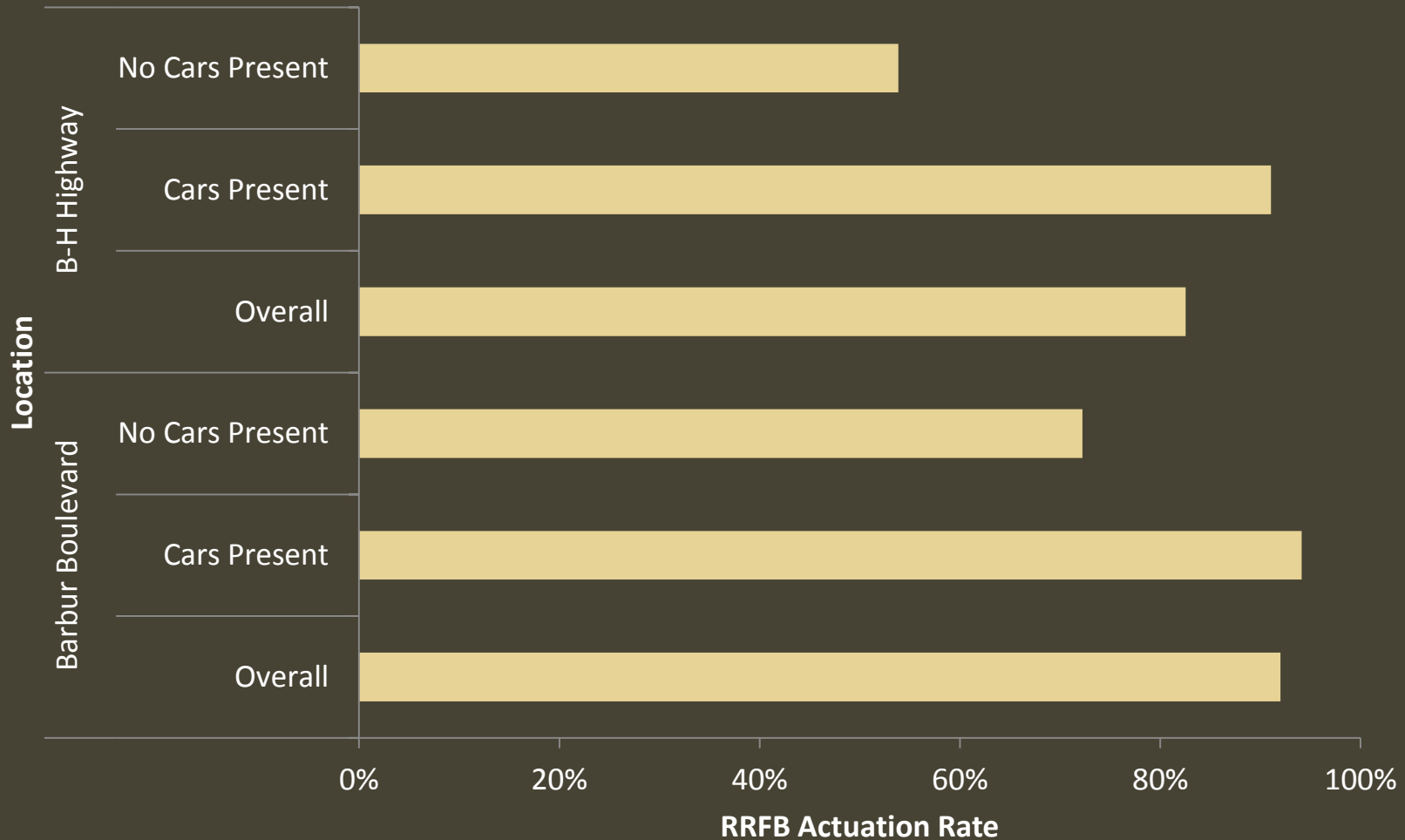- Driver and pedestrian behavior MOEs

RESULTS
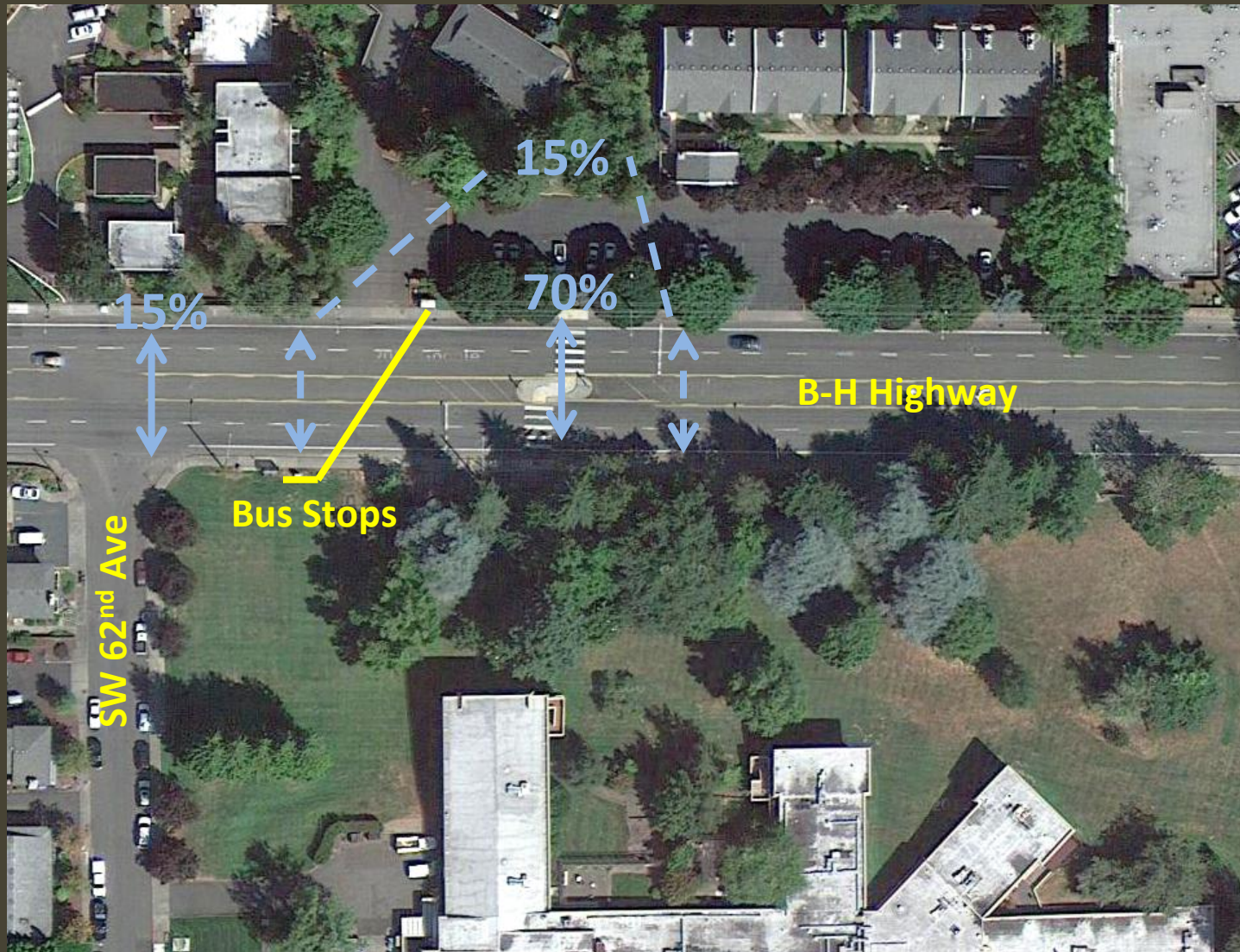
Driver Yielding Rates

Comparison to Other Studies

Pedestrian Actuation Rates

Crossing Locations

Diverted Crossings

- 52% of crossings at crosswalk are out-of-direction

Bus Stops

B-H Highway

SW 62nd Ave
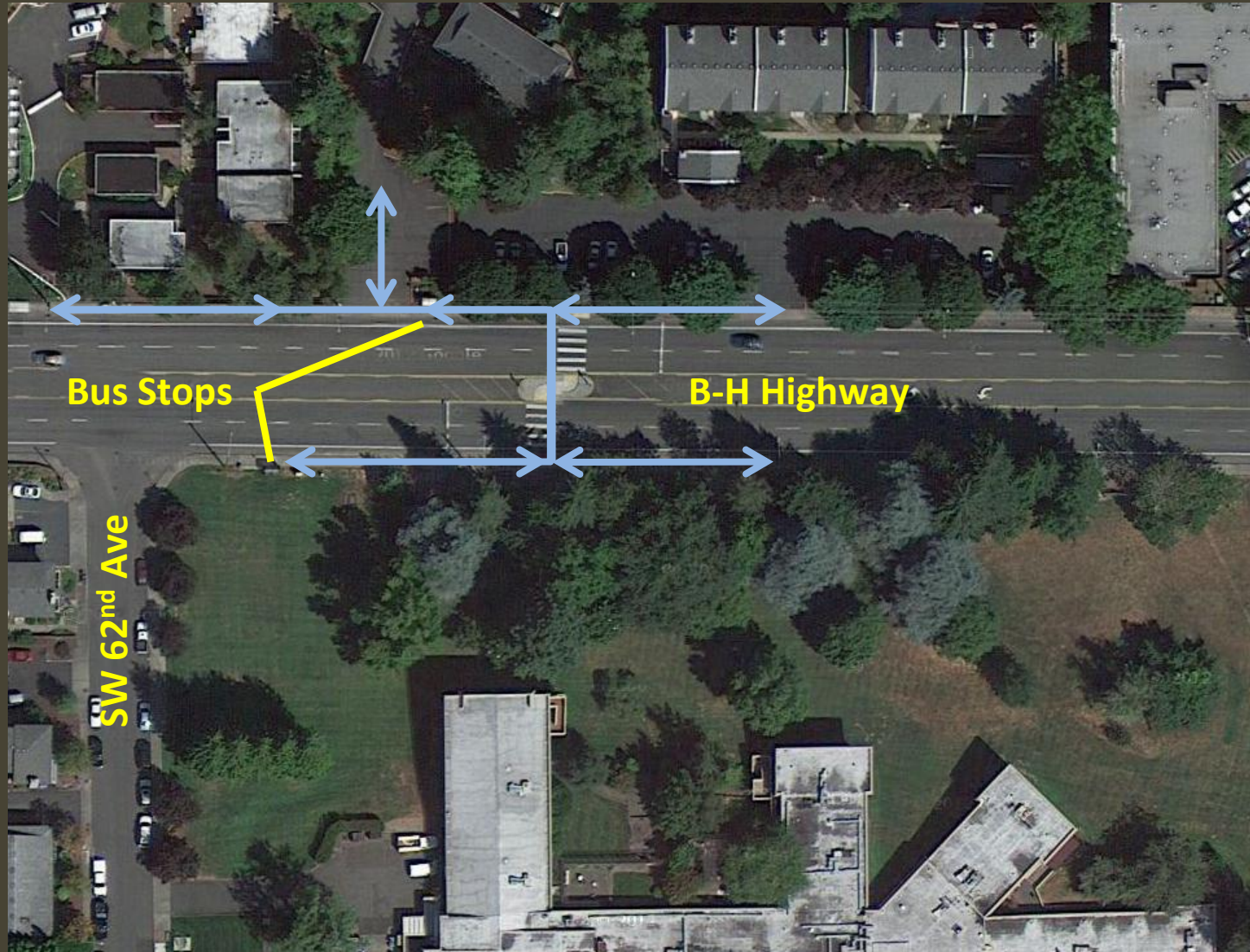
Diverted Crossings – SB Only

56%

44%

B-H Highway

SW 62nd Ave

Bus Stops
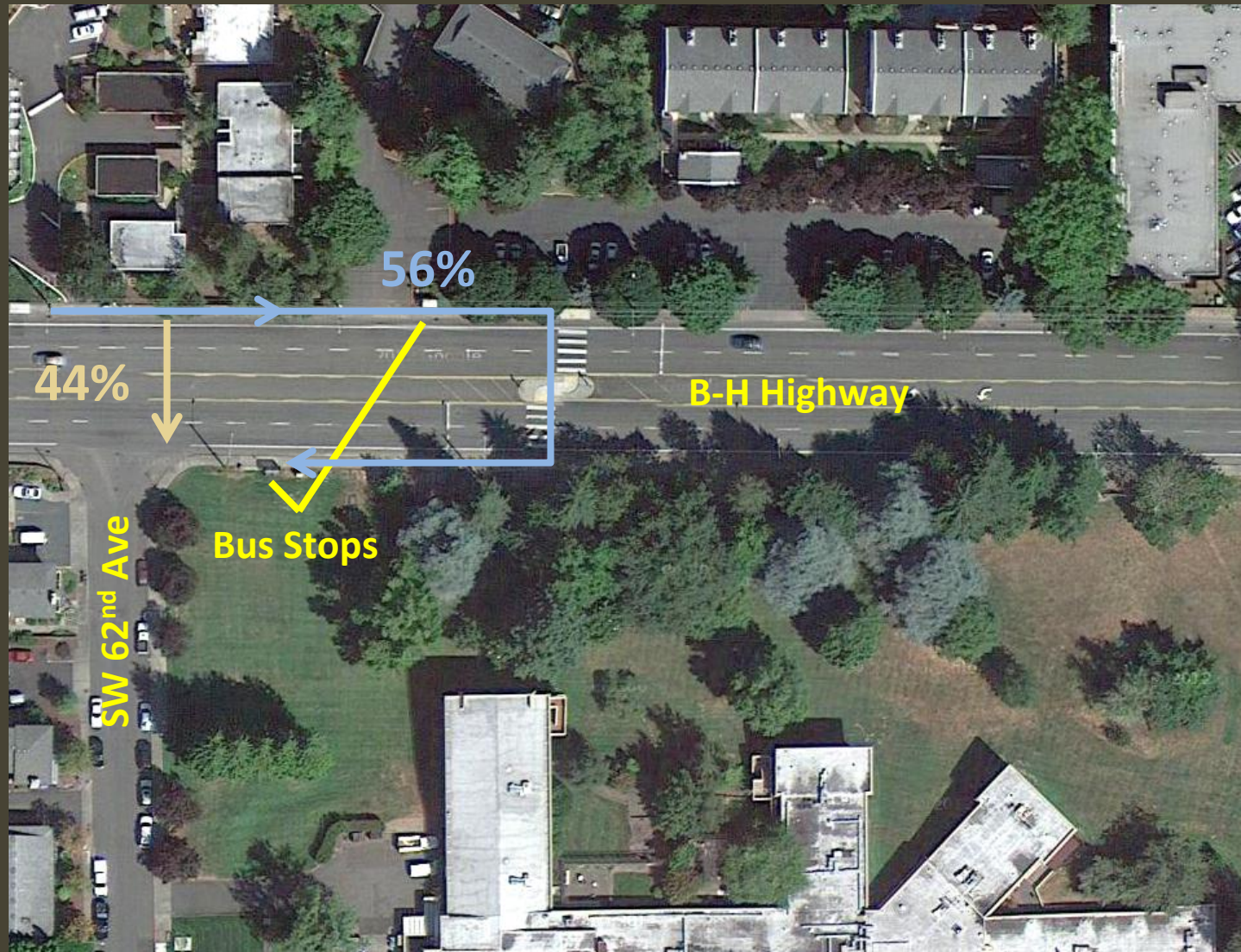
Z-Crossing Use

- Path use = 52%
  - High yielding rates

Other Findings

- Avoidance maneuvers
  - Hard braking (2)
- Stranded pedestrians
  - RRFB activated (1 – 0.3%)
  - RRFB not-activated (6 – 15%)
- Minimal pedestrian delay
  - 20 sec max (RRFB not activated)
  - All but one <15 sec (RRFB activated)

Conclusions

- 91-92% overall driver yielding rate
- Marked midblock crossing with RRFB may encourage diversion
- Z-crossing effectiveness limited
  - Adequate sight distance
  - No physical barrier

Future Research

- Pedestrian diversion
  - More sites
  - Before/after
  - Wider field of view
  - Automated analysis
  - Survey
- Z-crossing
  - More sites
- Driver understanding

Acknowledgments

- Co-authors
  - Chris Monsere
  - Katherine Carlos
- Data reduction/earlier iteration
  - Deanna George
  - Fahad Alhajri