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# Evaluating Driver and Pedestrian Behaviors at Enhanced Multilane Midblock Pedestrian Crossings

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

A Case Study in Portland, OR



Nick Foster, AICP

# 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*

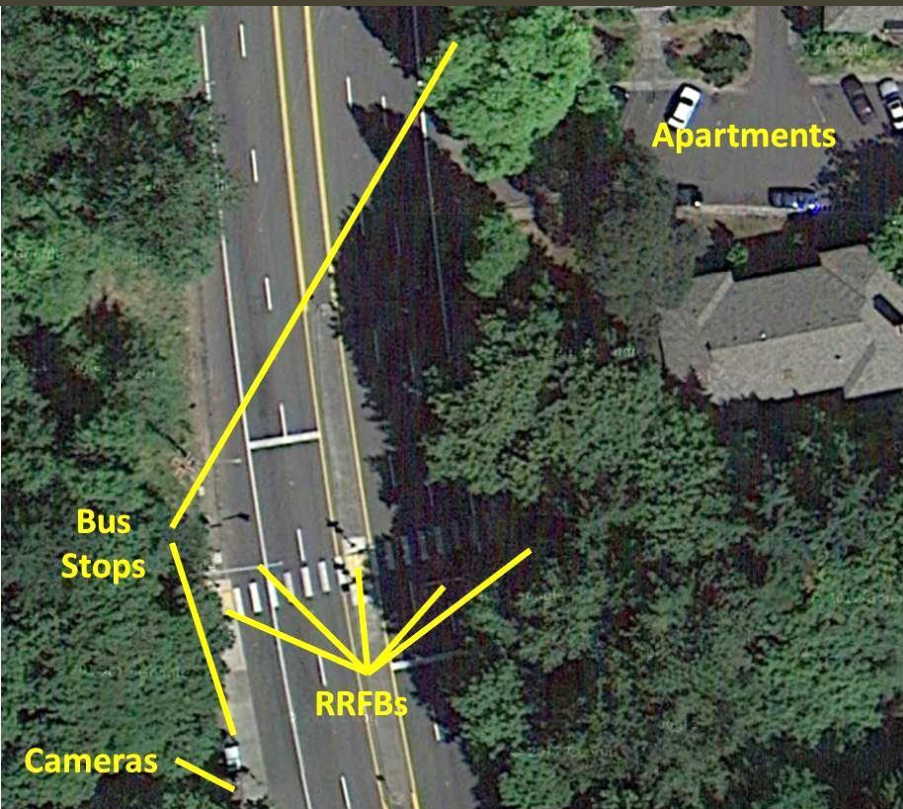


# Background

- 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



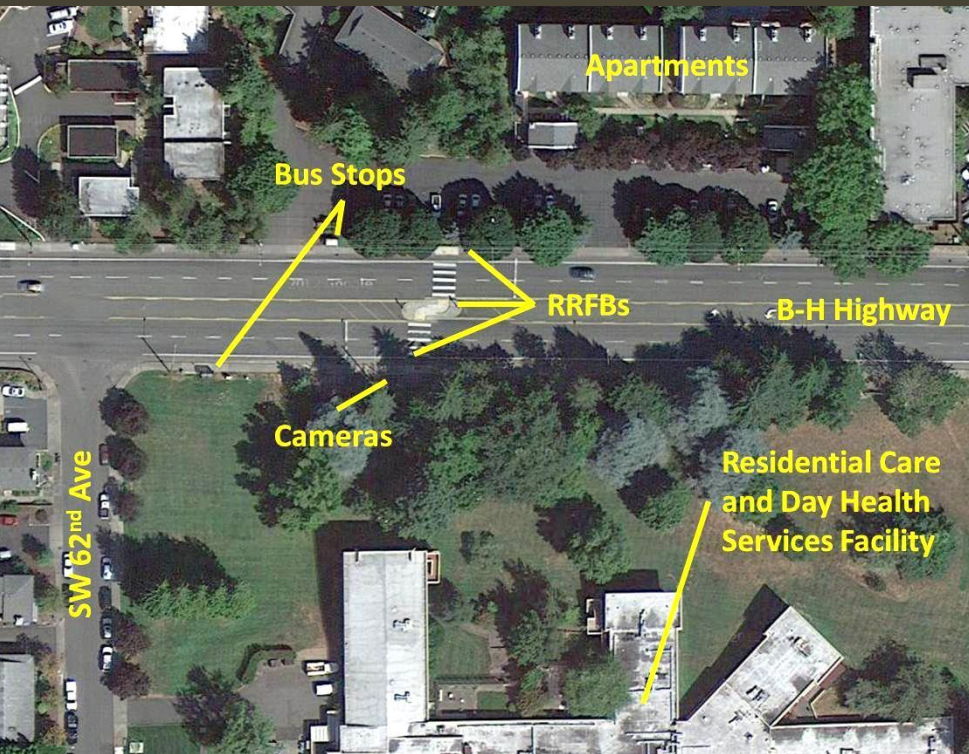
# Site 1 – Barbur Boulevard



- 30,700 ADT

- 35 MPH

# Site 2 – B-H Highway



- 26,400 ADT

- 40 MPH

# Methodology

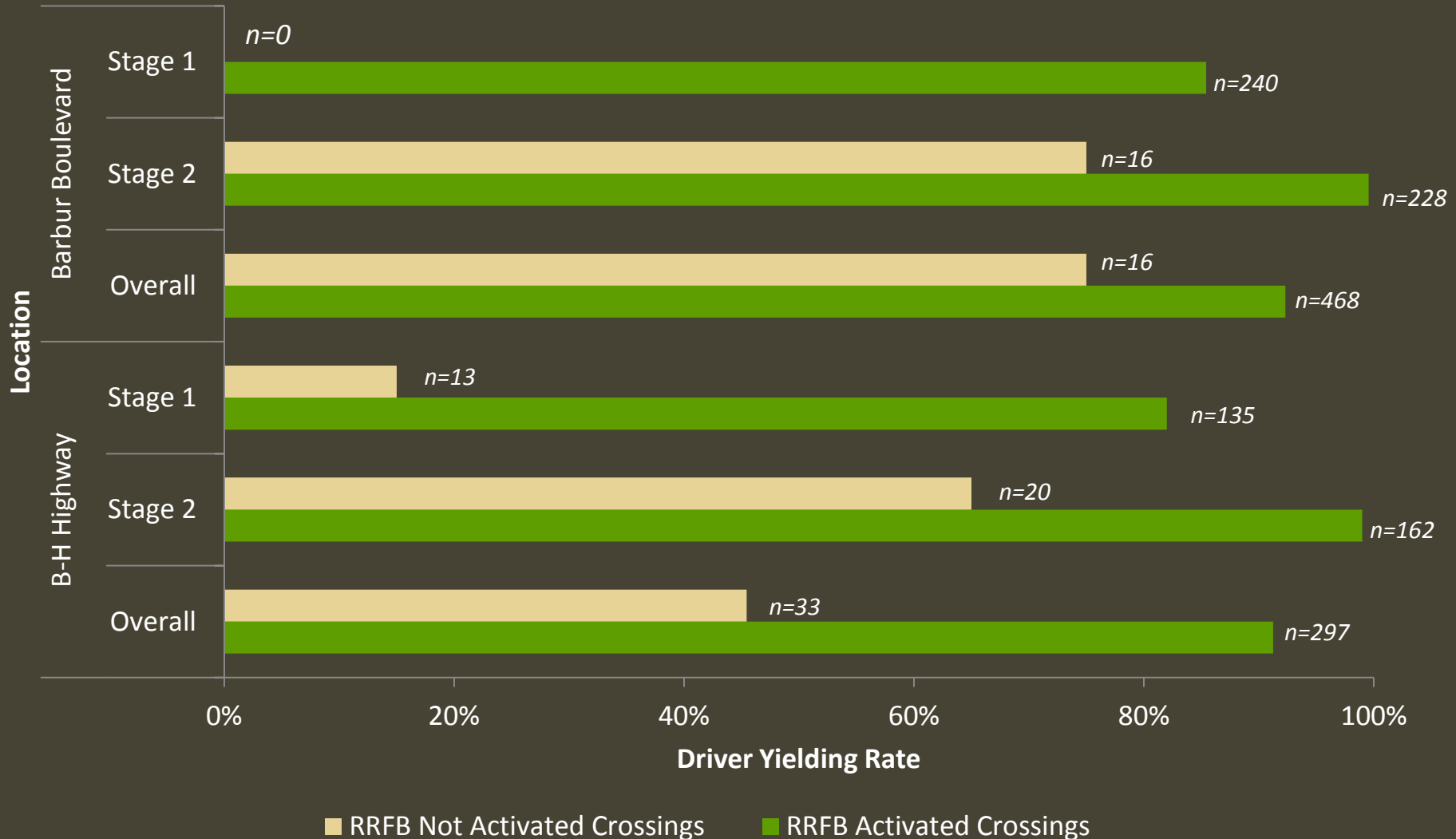
- 62 hours of video
  - Weekdays in February 2013
- Driver and pedestrian behavior MOEs



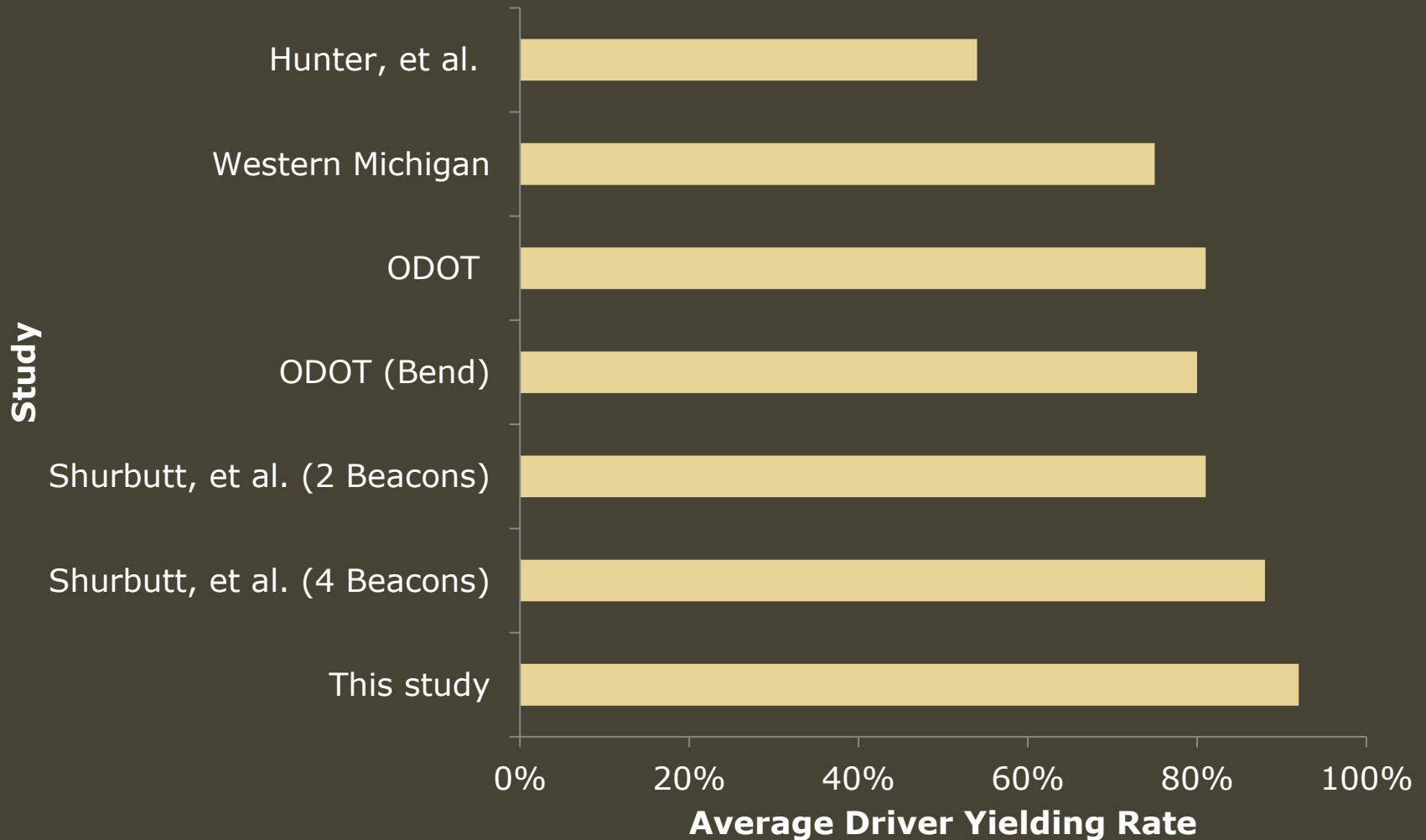


# RESULTS

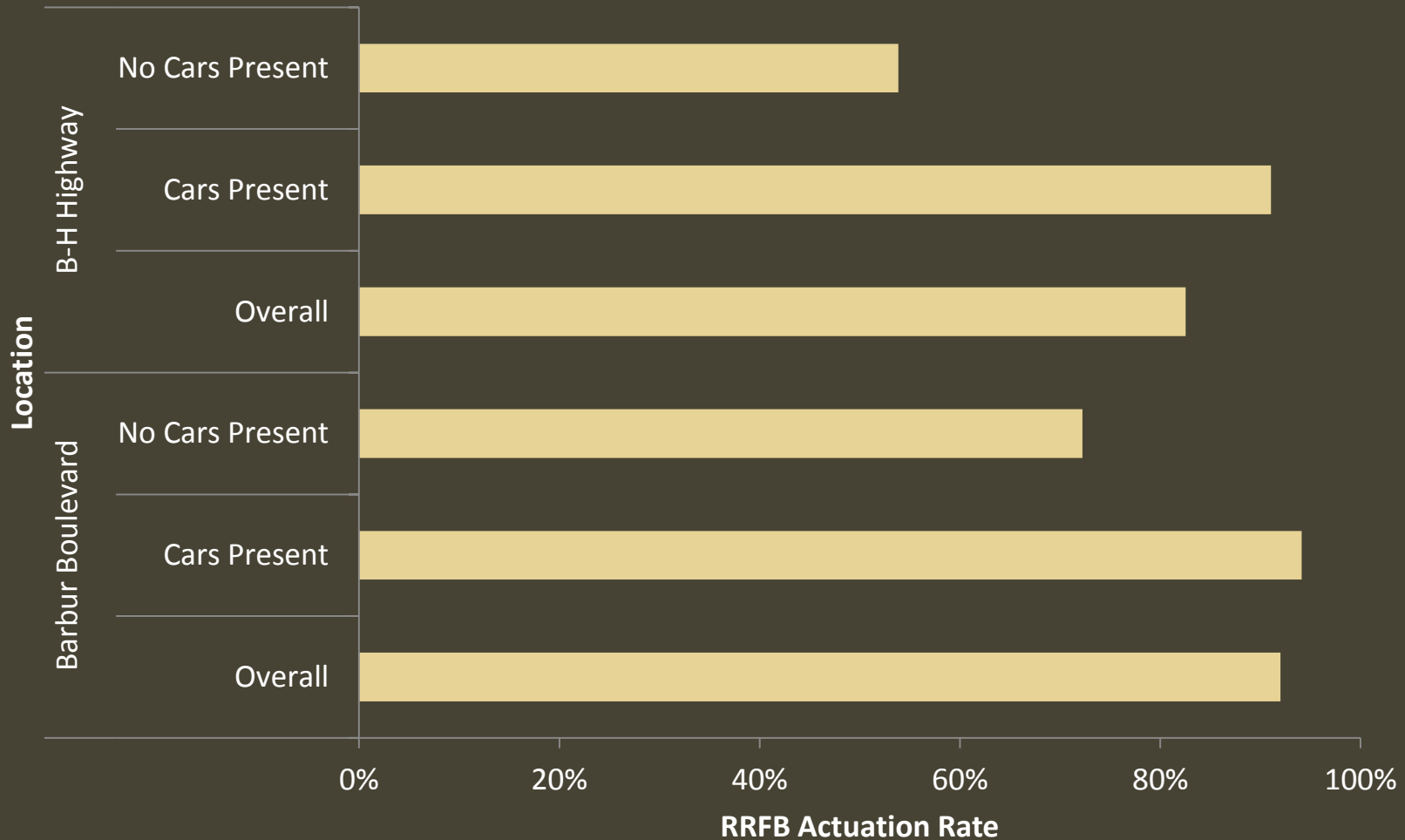
# Driver Yielding Rates



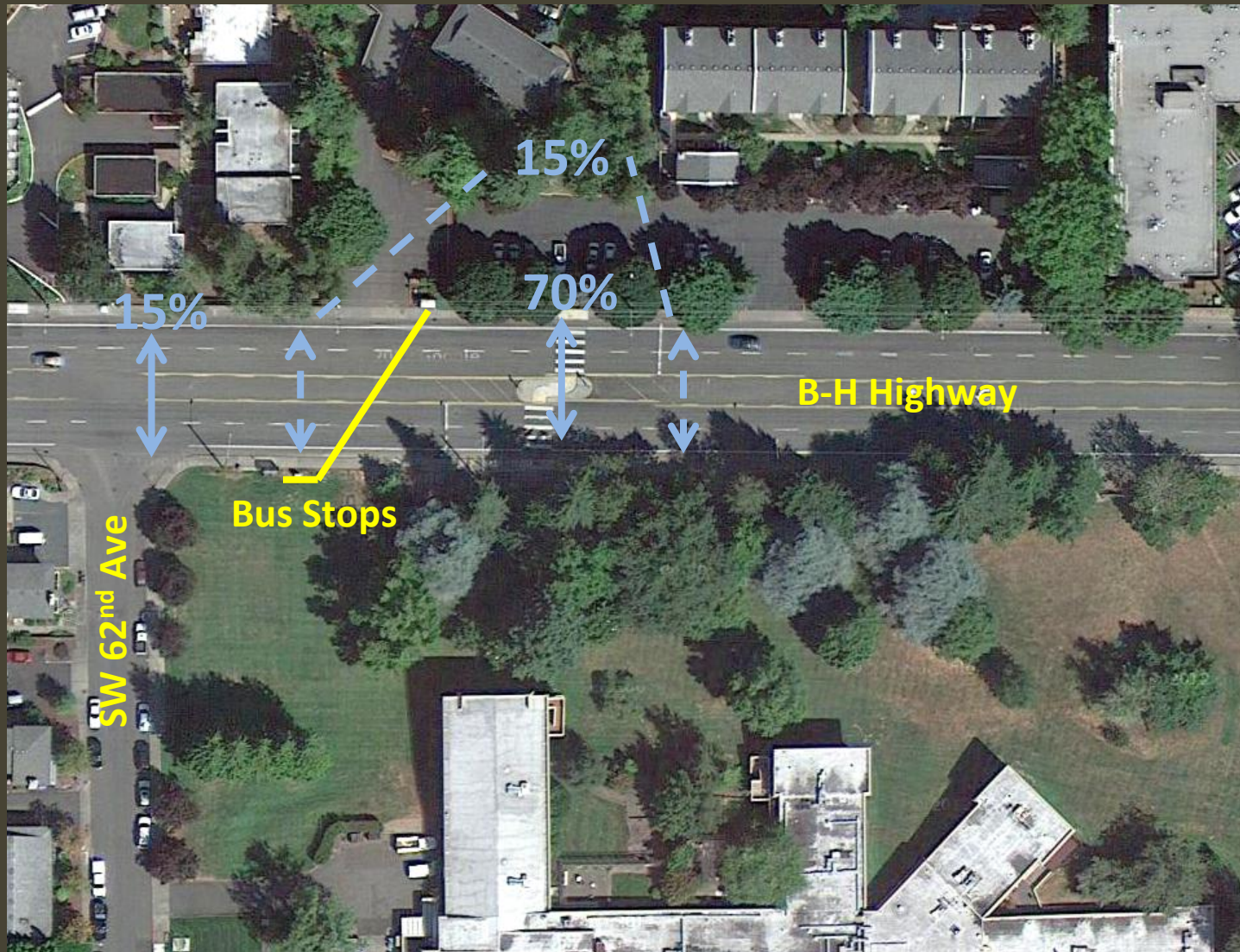
# Comparison to Other Studies



# Pedestrian Actuation Rates

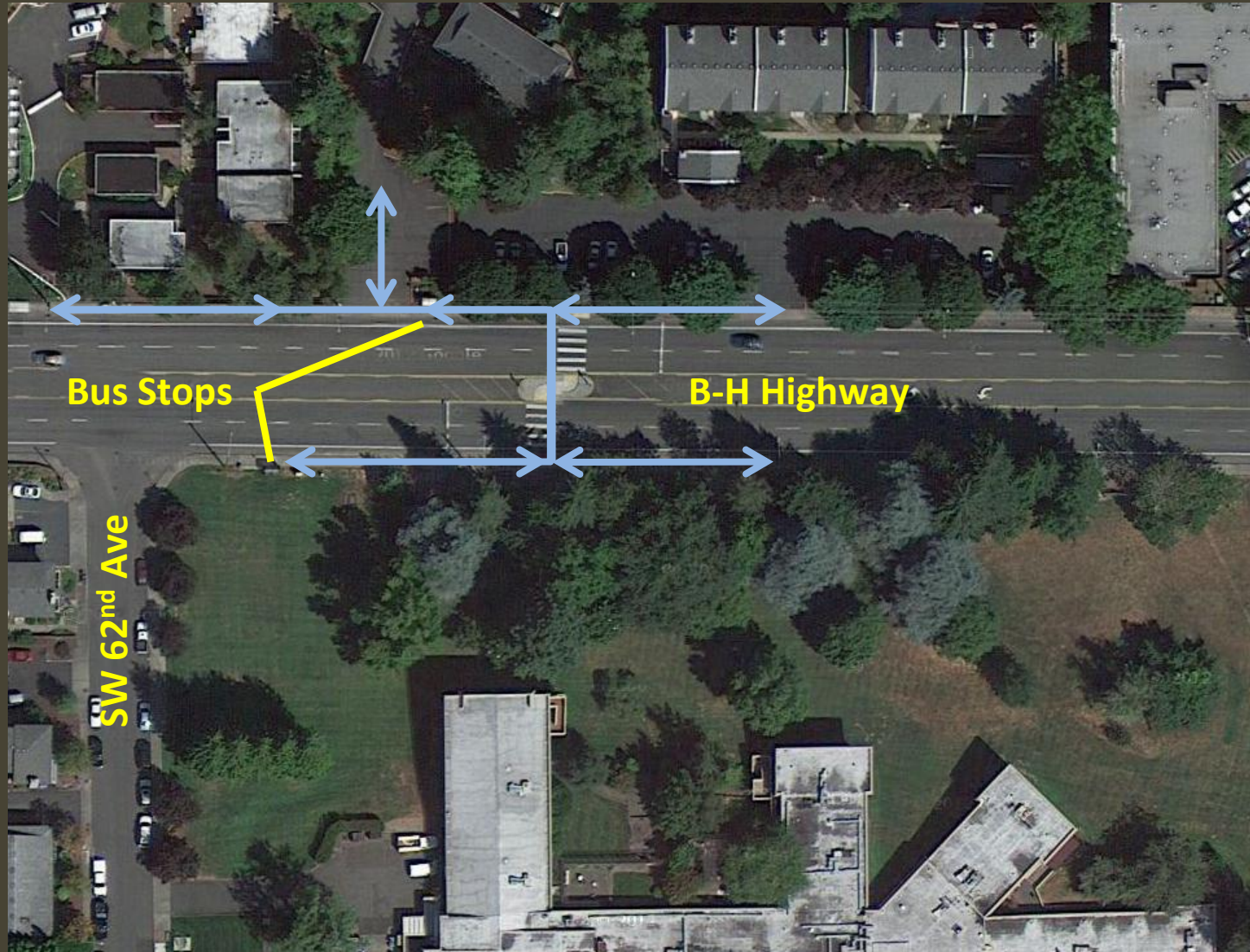


# Crossing Locations

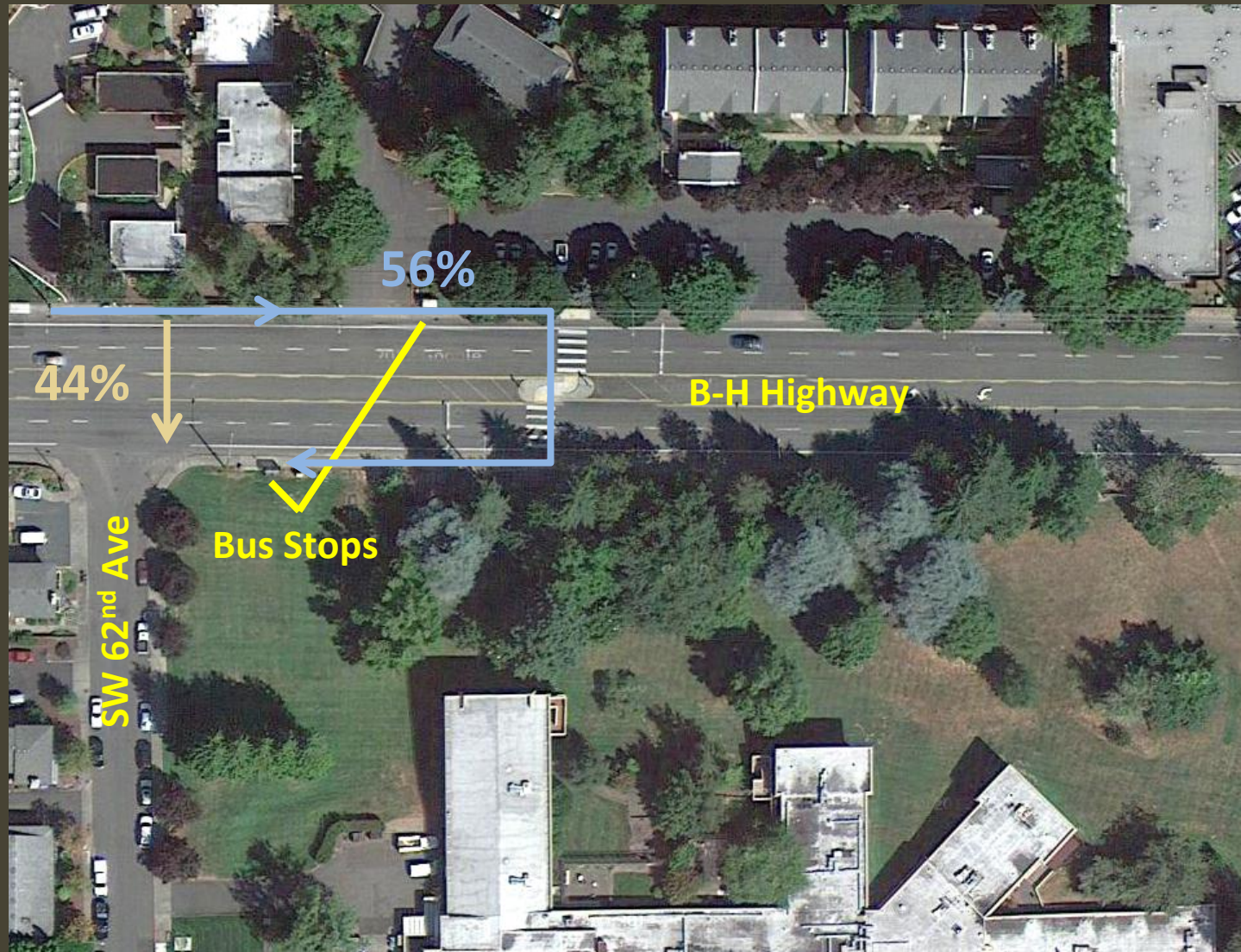


# Diverted Crossings

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



# Diverted Crossings – SB Only



# 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

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