


TRANSPORTATION RESEARCH BOARD

# A conversation on speed management

Monday, March 9, 2020  
2:00-3:30 PM ET



***The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Providers Program. Credit earned on completion of this program will be reported to RCEP. A certificate of completion will be issued to participants that have registered and attended the entire session. As such, it does not include content that may be deemed or construed to be an approval or endorsement by RCEP.***



**REGISTERED CONTINUING EDUCATION PROGRAM**



# Learning Objectives

At the end of this webinar, you will be able to:

- Identify the contributing factors behind speed-related crashes
- Discuss techniques that effectively address speed
- Determine how to better prioritize speed management among stakeholders and the public



# A Conversation on Speed Management

TRB Webinar  
March 9, 2020

# Today's Panel

- u Libby Thomas, UNC Highway Safety Research Center
  - u Rebecca Sanders, Arizona State University
  - u Megan Wier, San Francisco Department of Public Health
  - u Dongho Chang, City of Seattle
- 
- u Eric Tang, VHB, *Moderator*

# What Will You Learn Today?

- u Understand factors that contribute to speed-related crashes
- u Learn about key challenges and gaps when dealing with these crashes
- u Determine how to better prioritize speed management among stakeholders and the public
- u Hear about notable practices that have made an impact

# A Conversation on Speed Management

**Highlights from TRB Annual Meeting 2020  
Sunday Workshop 1033**

**The Nexus of Speed Management and Human Factors**

**Libby Thomas  
University of North Carolina  
Highway Safety Research Center**

March 9, 2020

# The Nexus of Speed Management and Human Factors as a Focal Point of Safe Systems, TRB Workshop 1033

## Organizers

- Joseph Marek, Clackamas County
- Offer Grembek, University of California, Berkeley

## Presenters

-



# Safe Systems – LaJeunesse

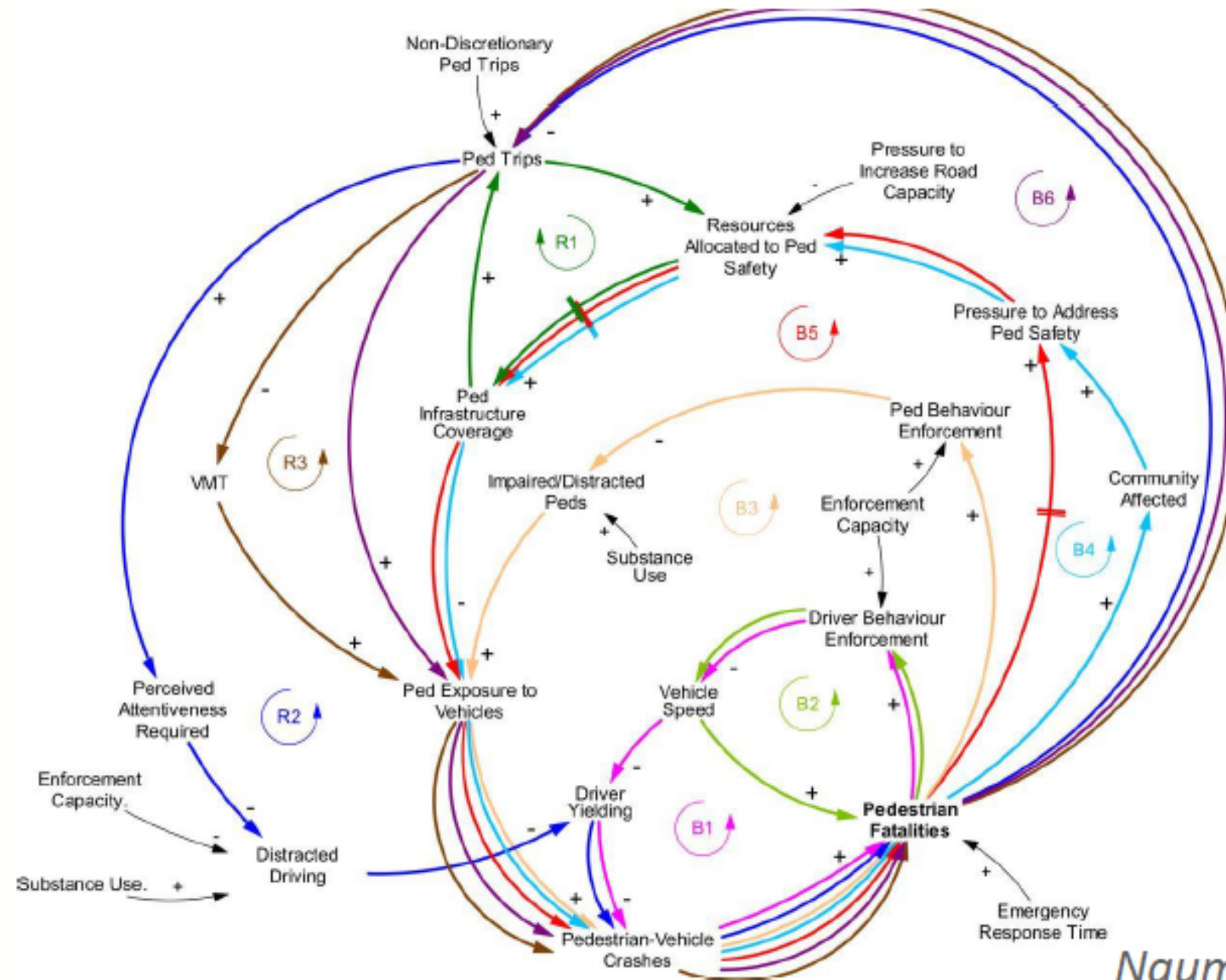
High Speed as:

- Legal (Limits, Enforcement and Adjudication) problem
- Road Design problem (Cues, Speed lowering/raising)
- Human Fallibility problem (Impairment, Fatigue, etc.)
- Land Use problem (Closing Vast Distances, Functional Disharmonies, Space Allocation)
- Also – life/work/housing stresses, social norms



Source: Dumbaugh and Rae (2009)

# Linear vs. Systems Thinking



Naumann et al. (2019), p. 3

# IMPACT

- Recognize diverse social-ecological impacts
- Identify common causes, shared goals, and effective leverage points in the system
- Align strategic goals

## Five Conditions for Collective Impact



Figure adapted from: [Channeling Change: Making Collective Impact Work](#)



What are the most effective speed-controlling leverage points in the complex speed and safety system?

# Current Efforts

- Speed Limits
- Other Legal/Policy Factors (e.g. enforcement, adjudication)
- Culture / Socio-speed selection be affected; many efforts at individual level)
- Roadway Factors (design, operations, context)
  
- Vehicle Factors
- Land Use
- Freight / Consumer Demand
- ?

# Vehicle Factors – Harkey

Increased POWER



Increased SPEED

## 2019 common vehicles horsepower



**Toyota Camry**  
**1983 - present**  
1983 horsepower = 92  
1983 price = \$10,328



**Toyota Camry**  
Horsepower = 203 – 301  
Price = \$24,765 – \$35,530



**Jeep Grand Cherokee**  
**1993 - present**  
1993 horsepower = 180 – 220  
1993 price = \$20,321



**Jeep Grand Cherokee**  
Horsepower = 285 – 360  
Price = \$33,190 – \$60,330  
TrackHawk horsepower = 707  
TrackHawk = \$88,145



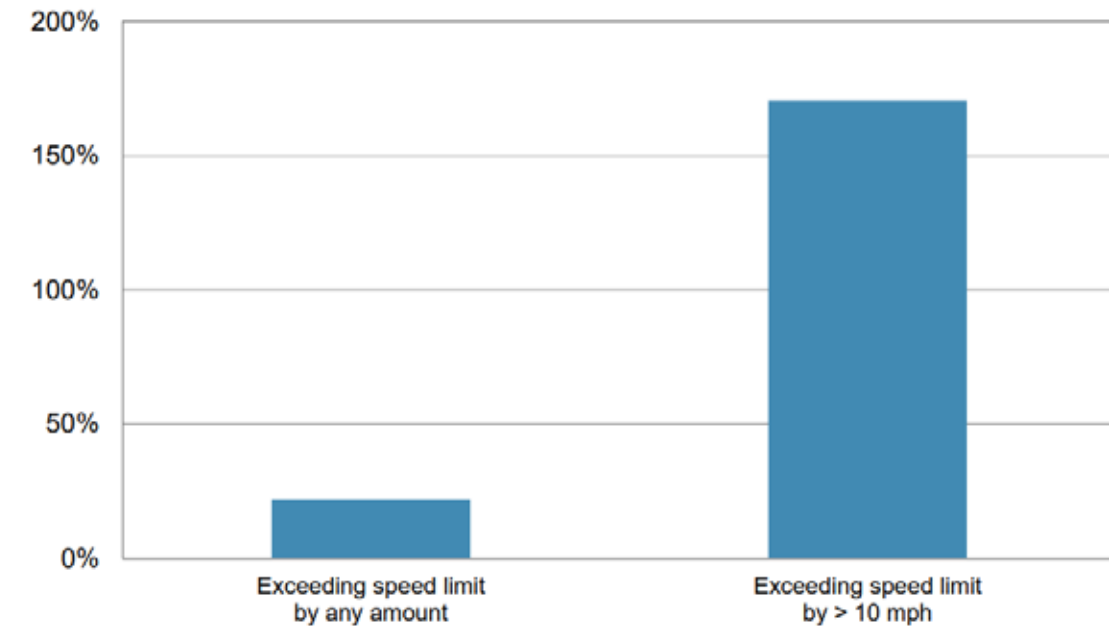
**Ford F-150**  
**1981 - present**  
1981 horsepower = 115 – 165  
1981 price = \$8,939



**Ford F-150**  
Horsepower = 250 – 375  
Price = \$29,650 – \$42,295  
Raptor horsepower = 450  
Raptor = \$57,335

## Likelihood of speeding increased as power increased

Percent increase in likelihood of exceeding speed limit per 10 horsepower/100 lb. increase



McCartt, Anne T., Hu, Wen.

May 2016).

<https://www.iihs.org/topics/bibliography/ref/2119>

# Vehicle Factors – Harkey

Automakers' efforts to implement speed limiters in the U.S. has focused on teens and commercial fleets



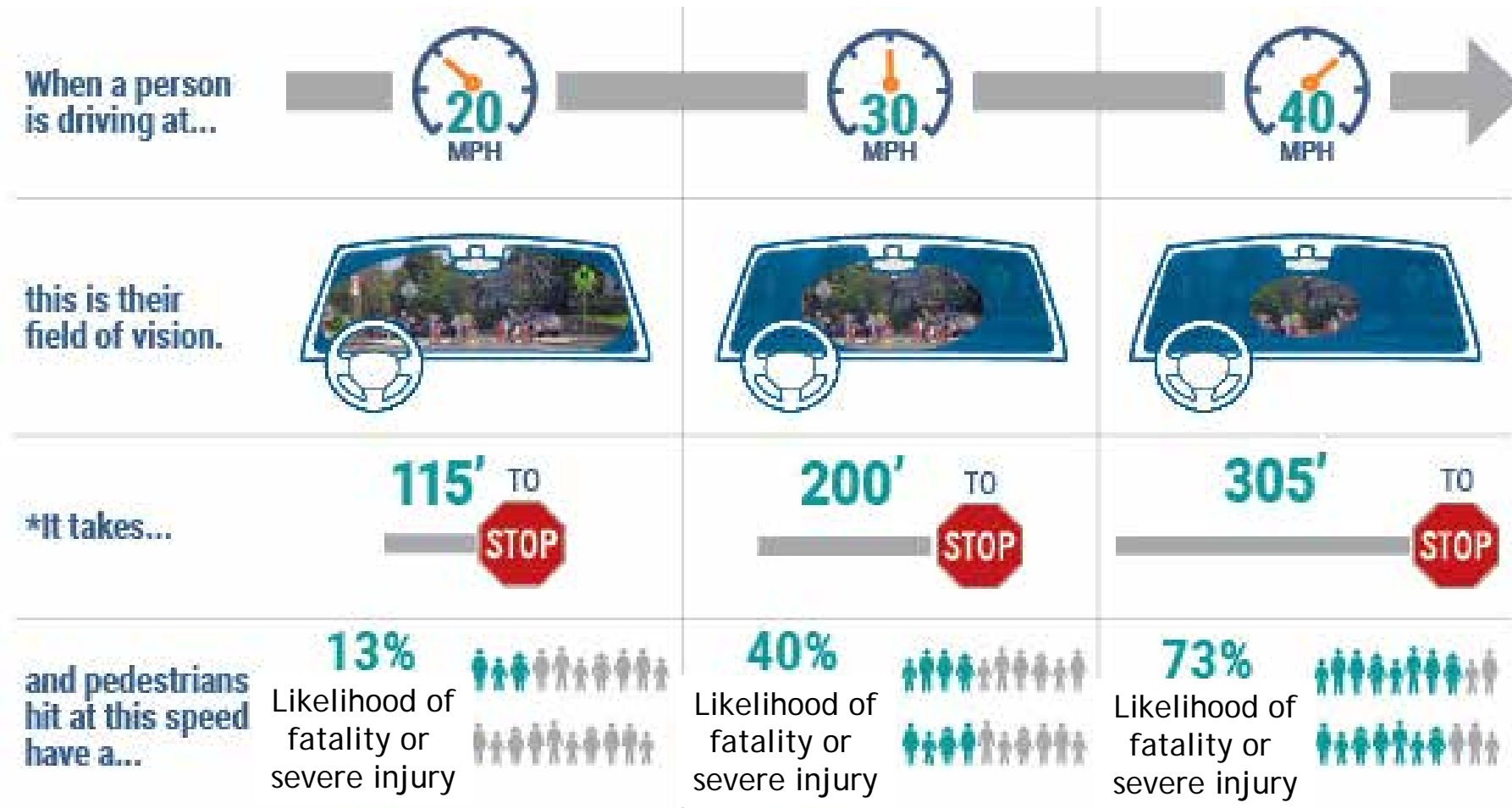
Volvo Vision 2020

**Top speed of 112 mph**

“And while a speed limitation is not a cure-all, it’s worth doing if we can even save one life.”

-Håkan Samuelsson, president/ceo, March 4, 2019

# Speed and Safety



\*Braking distance includes 2.5 sec of reaction time

Image Source: Toole Design



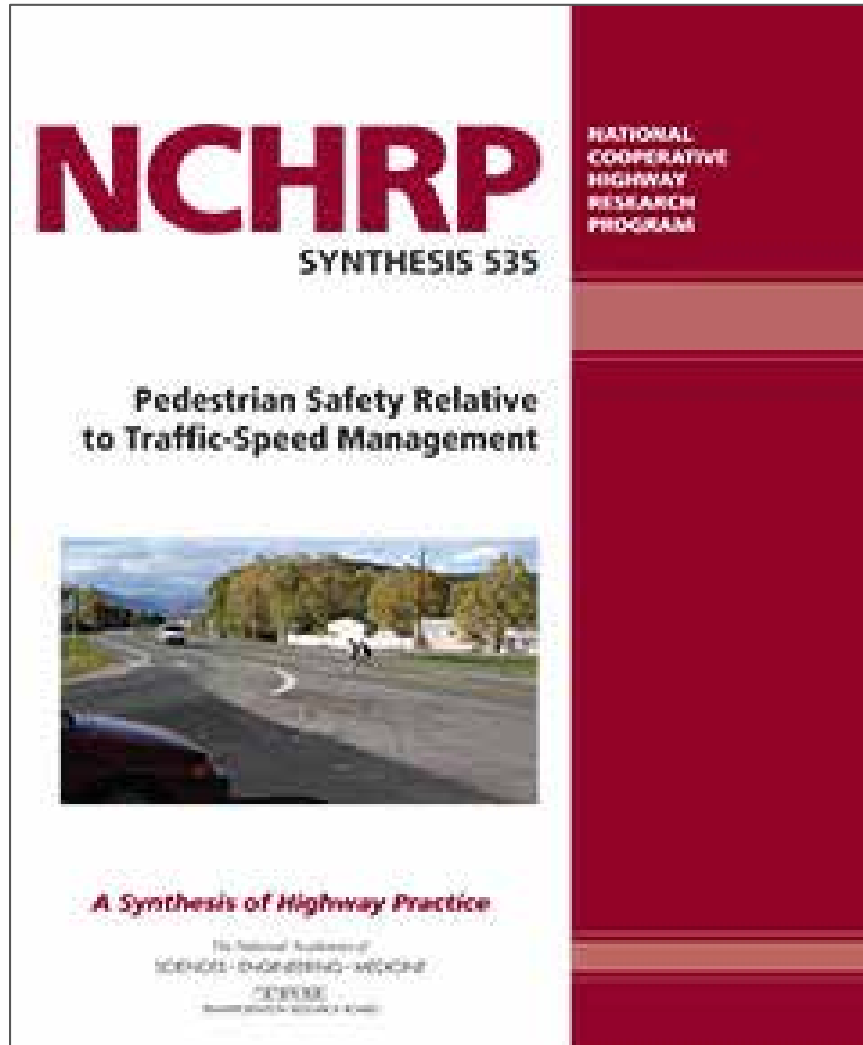
## Speed and Safety

Ave risk  
for 70-yo  
struck at  
20 mph

00  
E

Ave risk  
for 30-yo  
struck at  
32 mph

# Speed and Safety



- Proven and promising countermeasures
- Examples from Vision Zero case cities
- Research needs

## (A Few of the) Research Needs

- Effective solutions for slowing speeds along arterials
- Strategies for changing driving culture
- City-State collaboration/cooperation on setting speeds
- Solutions for pedestrian fatalities at night

# Slowing Vehicle Speeds Is Core to San Francisco's Vision Zero Strategy to Eliminate Traffic Deaths



**Saving Lives**



**Prevention**



**Equity**



**TRANSFORMATIVE  
POLICIES**



**Speed**



**Safe Streets**



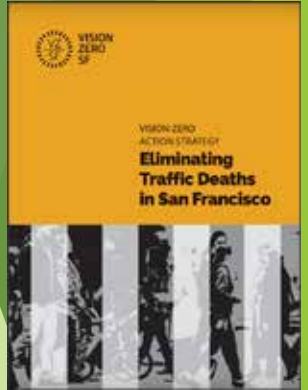
**Safe People and  
Safe Vehicles**



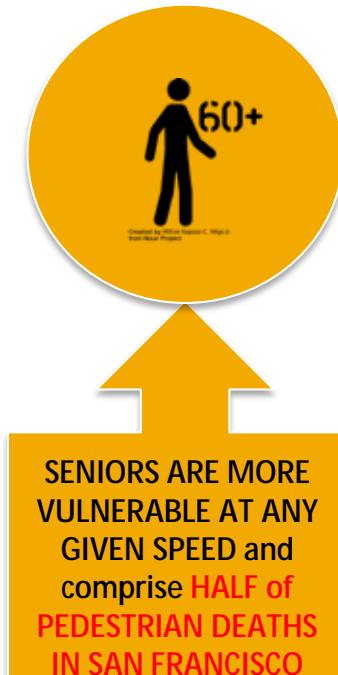
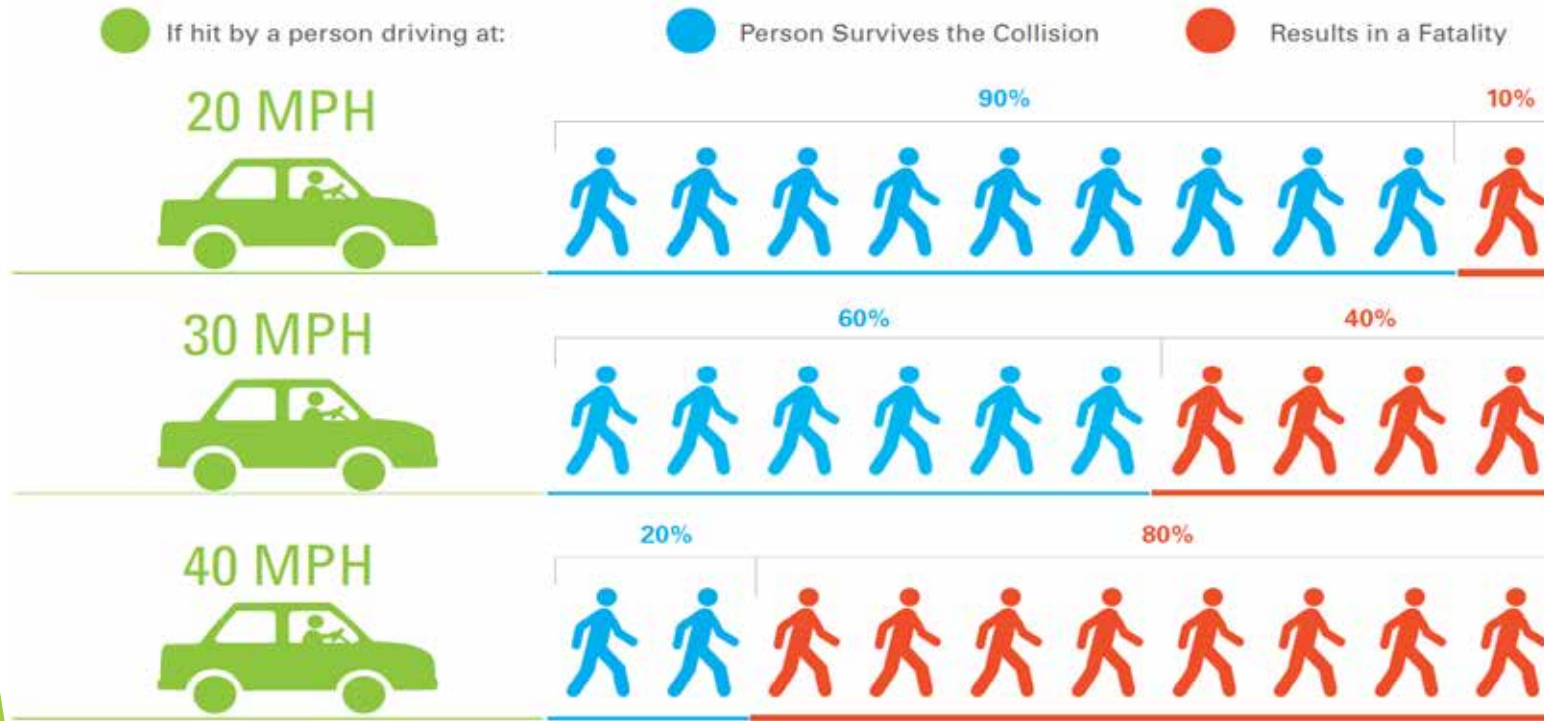
**Automated  
Enforcement**



**Urban Speed  
Limit  
Setting**



# Slowing Speeds Saves Lives



# Speeding is a serious problem in San Francisco. High Visibility Enforcement (HVE) slows speeds – but requires sustained effort.

Targeted enforcement by SFPD on 11 corridors + citywide, variable message signs, targeted media and local community education activities.

1800 citations issued on campaign corridors – *85% to drivers travelling 10 mph or more above the speed limit.* 3200 citations issued citywide.



## Evaluation Findings:

During HVE: *5% reduction in 85<sup>th</sup> percentile driver speeds.*

One hour *Before* the Campaign began: Modest speed reductions when variable-message signage present.

One week *After* HVE: *Reductions* in driver speeds *began to diminish.*

One year *After* HVE: There was not a lasting effect once the campaign ended.



# California Zero Traffic Fatalities Task Force: *Automated Speed Enforcement Recommendations*

**ASE as a Force Multiplier:** Automated Speed Enforcement should supplement, not supplant, existing law enforcement personnel.

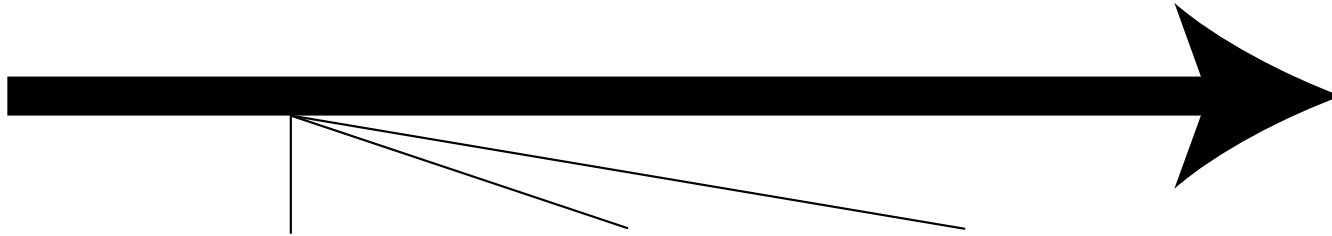
## Framework for Potential Program:

- Citation amount
- Citation type
- Locations
- Privacy
- Public noticing
- Speed tolerance level
- Incorporate lessons learned
- Revenue





# California Zero Traffic Fatalities Task Force: *Establishing Speed Limits Recommendations*



**Near Term Recon**





# Designing Streets and Speed Limits in Seattle





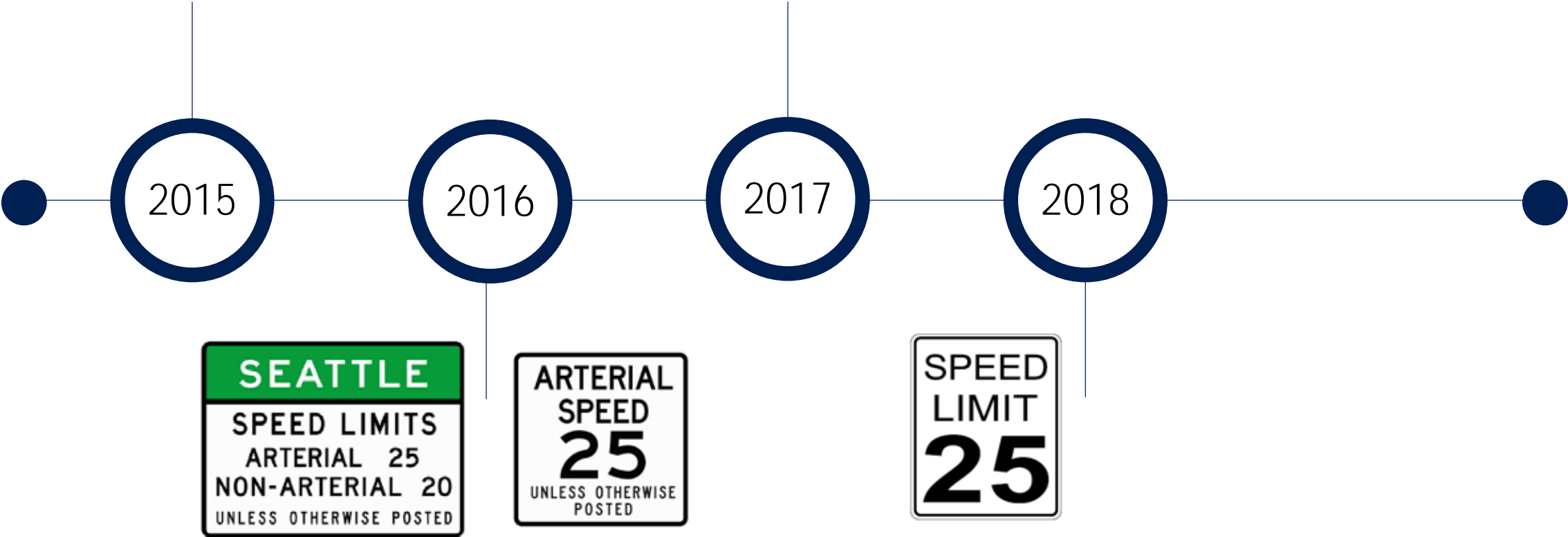
# Timeline

Rainier Ave S (30)



**80%**  
of pedestrian  
collisions occur  
within or near our  
city's urban villages

Began urban village evaluations



# Methodology

## Traditional

(no longer using this)

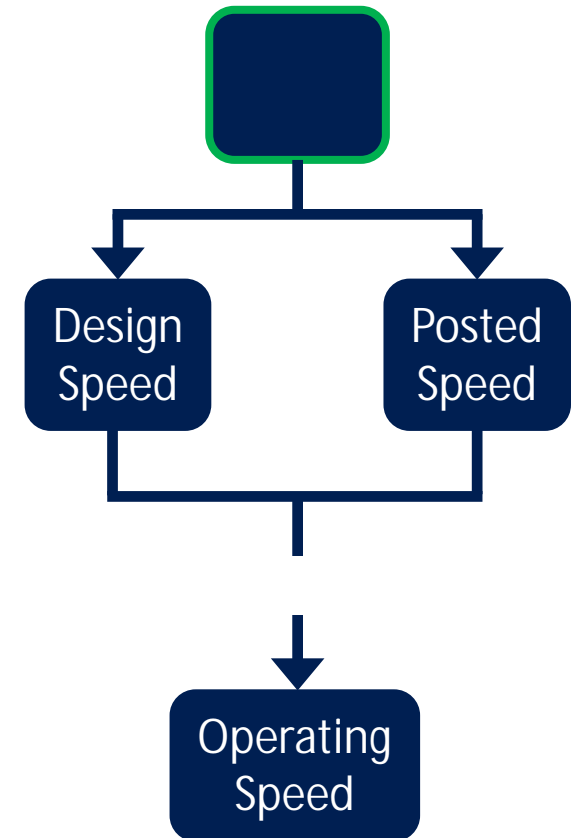


## Urban villages

- 50<sup>th</sup> percentile speeds (USLIMITS2)
- Top operating speed of priority modes



## Proposed



Principal  
Arterials



Industrial Access



Urban Center Connector



Downtown



Urban Village Main

25-35 mph

Minor/  
Collector  
Arterials



Minor Industrial Access  
(non-arterials in MIC)



Neighborhood Corridor



Downtown Neighborhood



Urban Village Neighborhood

20-30 mph

Non-  
Arterials



Commercial Alleys



Neighborhood Yield



Downtown Neighborhood Access



Urban Village Neighborhood Access

15\*-20 mph

Movement

Place

\*Alleys and Parks Blvd per Municipal Code





# Seattle Streets Illustrated

## Street Types Map



King County Public Locator



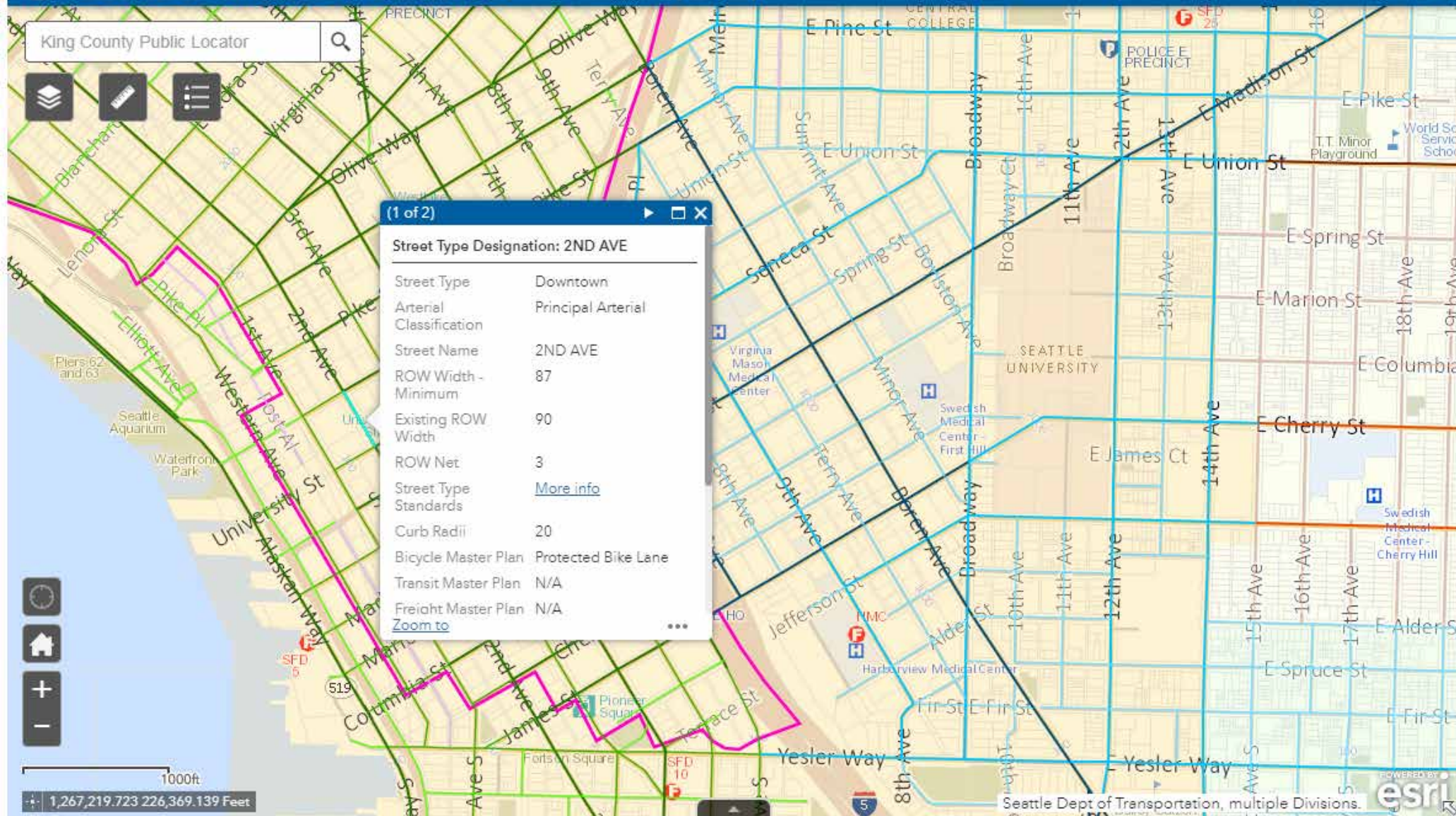
(1 of 2)

### Street Type Designation: 2ND AVE

Street Type	Downtown
Arterial Classification	Principal Arterial
Street Name	2ND AVE
ROW Width - Minimum	87
Existing ROW Width	90
ROW Net	3
Street Type Standards	<a href="#">More info</a>
Curb Radii	20
Bicycle Master Plan	Protected Bike Lane
Transit Master Plan	N/A
Freight Master Plan	N/A
<a href="#">Zoom to</a>	...



1000ft  
1,267,219.723 226,369.139 Feet

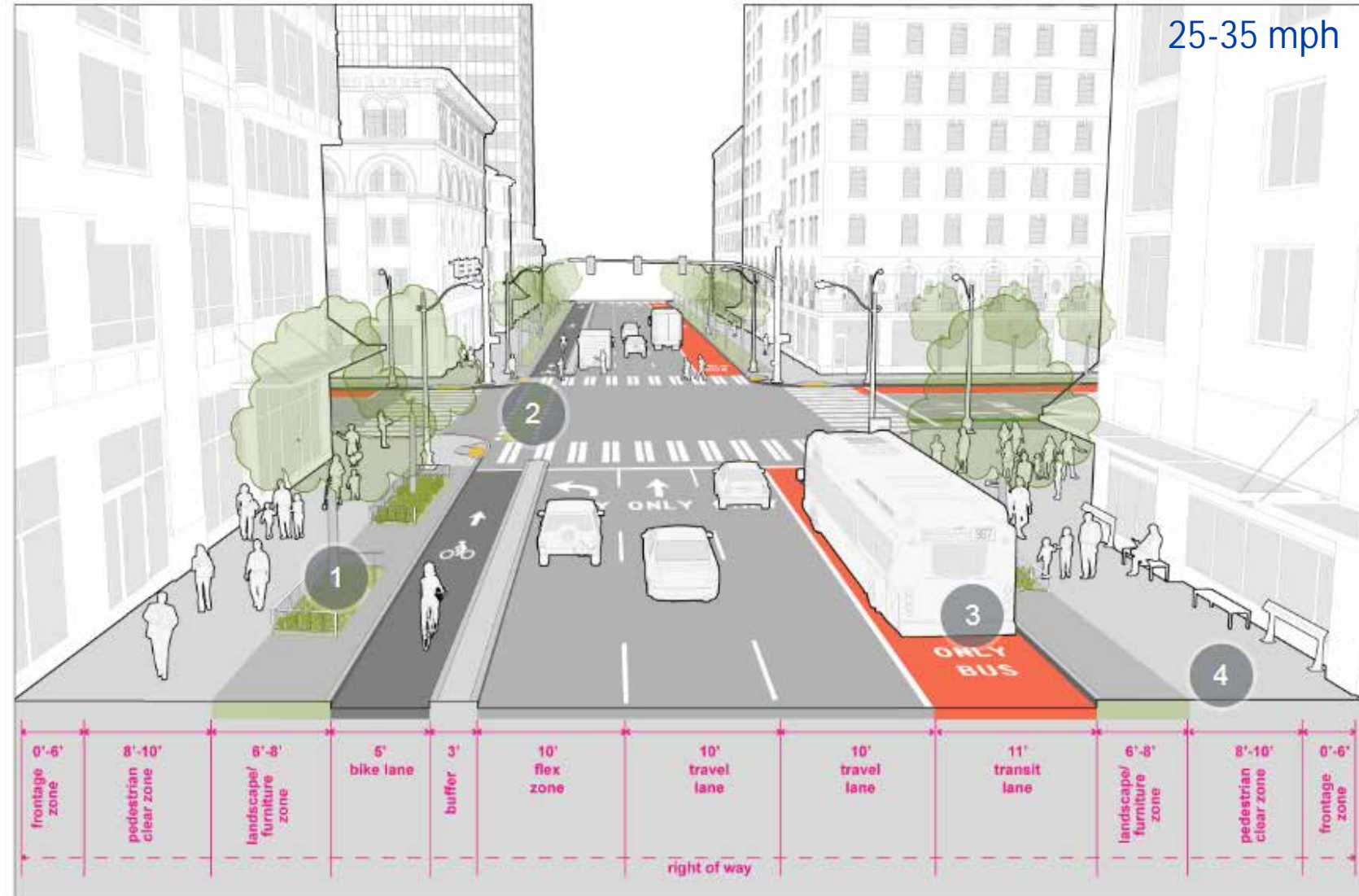




Downtown Streets have a vibrant streetscape that supports active street-level uses and provides access to downtown businesses, residences and transit services.

# 2<sup>nd</sup> Ave

- Principal Arterial
- Downtown Design Standards
- 25 mph

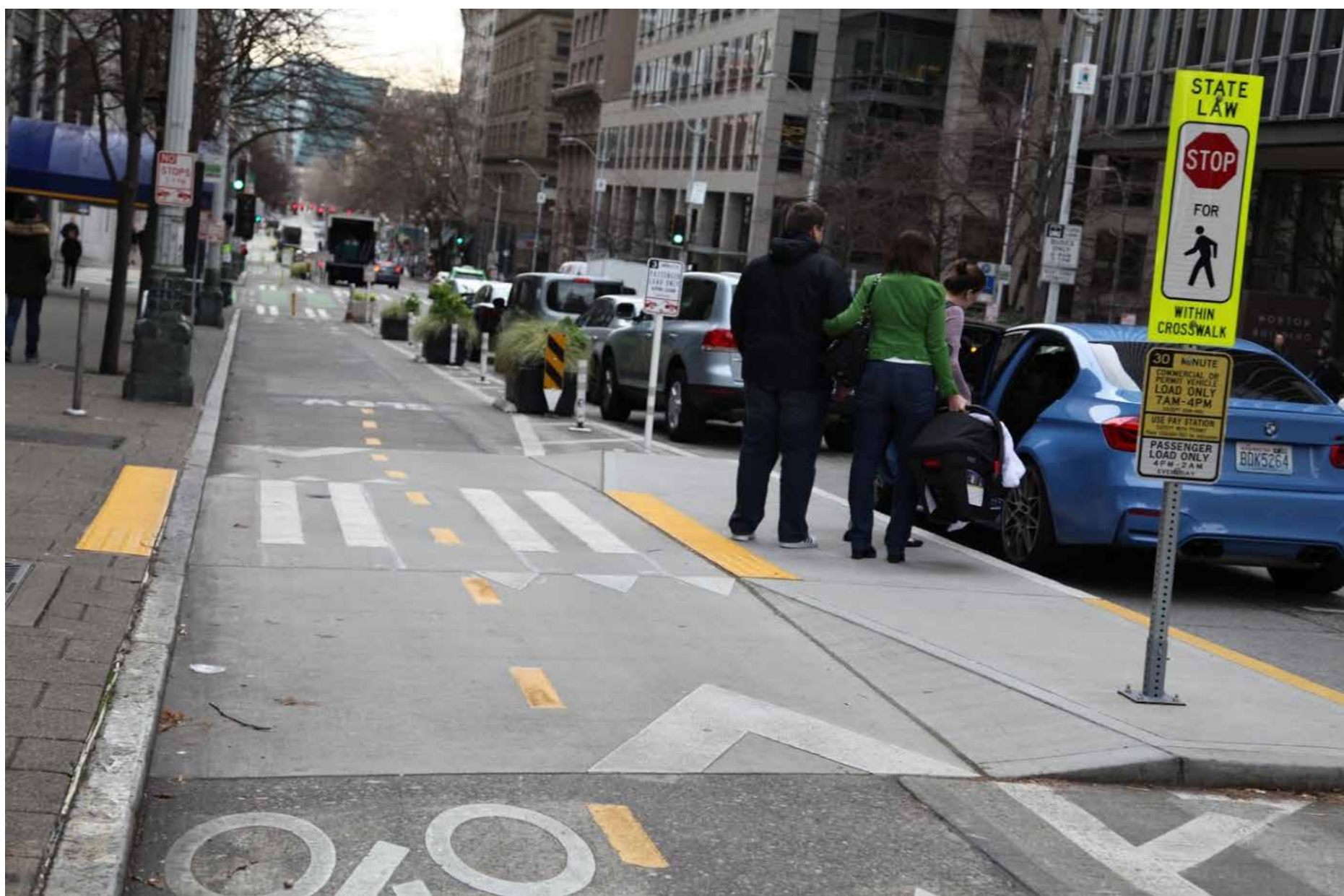






# 2<sup>nd</sup> Ave

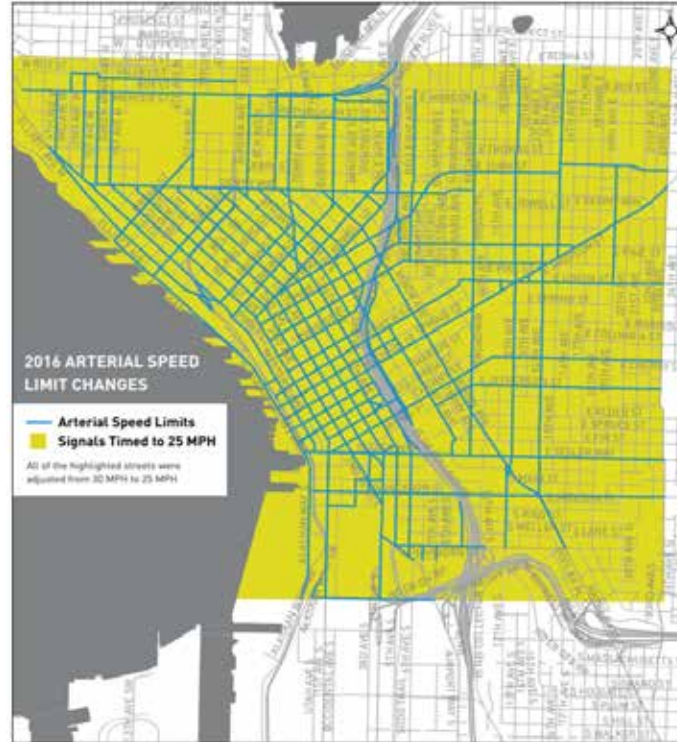
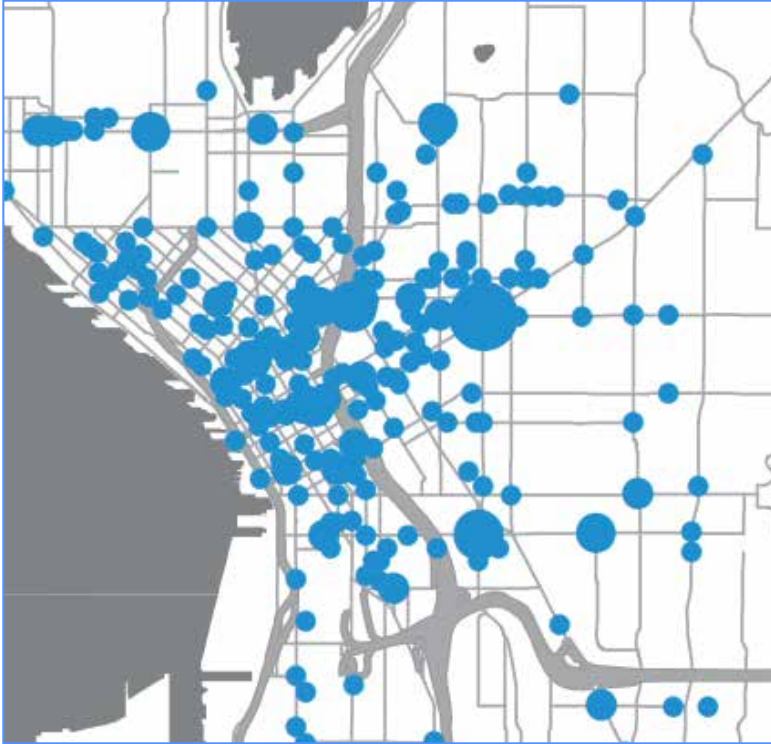
- Two-way PBL
- Bus Only Lane
- Flex Curb Lane





# Program Prioritization

Focused on where pedestrian crashes are happening

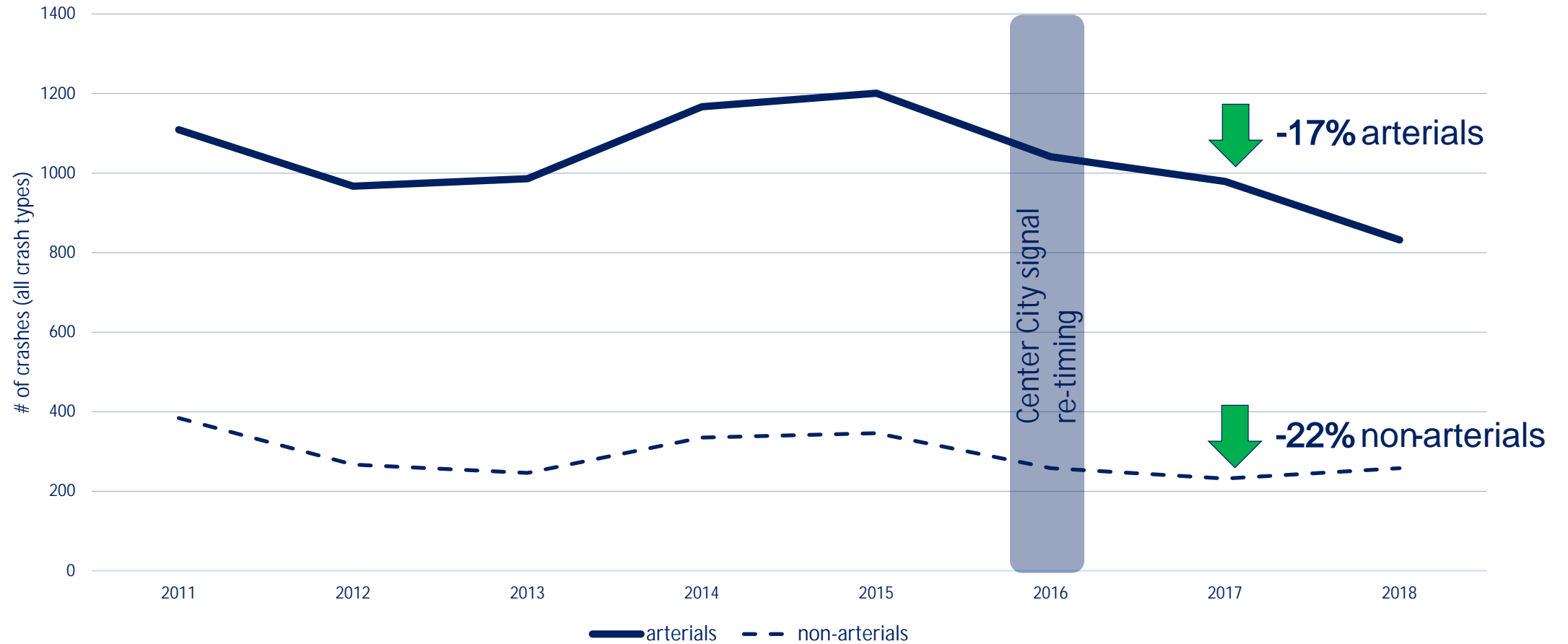


## CBD signal timing

- Lowered speed limits within CBD to 25 MPH
- Roughly 400 signals were retimed for 25 MPH (40% of citywide signal network)
- Posted gateway signs at all ferry and interstate ingress points into downtown



# Center City crashes



# Speed Limits: Greenwood Ave N/Phinney Ave

## Action

- Replaced existing 30mph signs (1 mile spacing) and installed new 25mph signs at ¼ mile spacing
- Implemented February 2018

## Results

- 85<sup>th</sup> %tile speed reduction of 34 to 31mph
- 50<sup>th</sup> %tile speed reduction of 29 to 27 mph
- 34% reduction in all crashes (30 to 20 a year)
- 10% reduction in injury crashes (12 to 11 a year)



# Speed Limits: N 85th St

## Action

- Existing unposted 30 mph speed limit
- Installed new 25mph signs at ¼ mile spacing
- Implemented February 2018

## Results

- 50<sup>th</sup> %tile speed reduction of 27 to 26mph
- Number of drivers speeding reduced by 4%
- 53% reduction in all crashes (36 to 17 a year)
- 40% reduction in injury crashes (15 to 9 a year)



18th Ave NW to Fremont Ave N (1.4 miles)



# Speed cushions

## Boyer Ave E

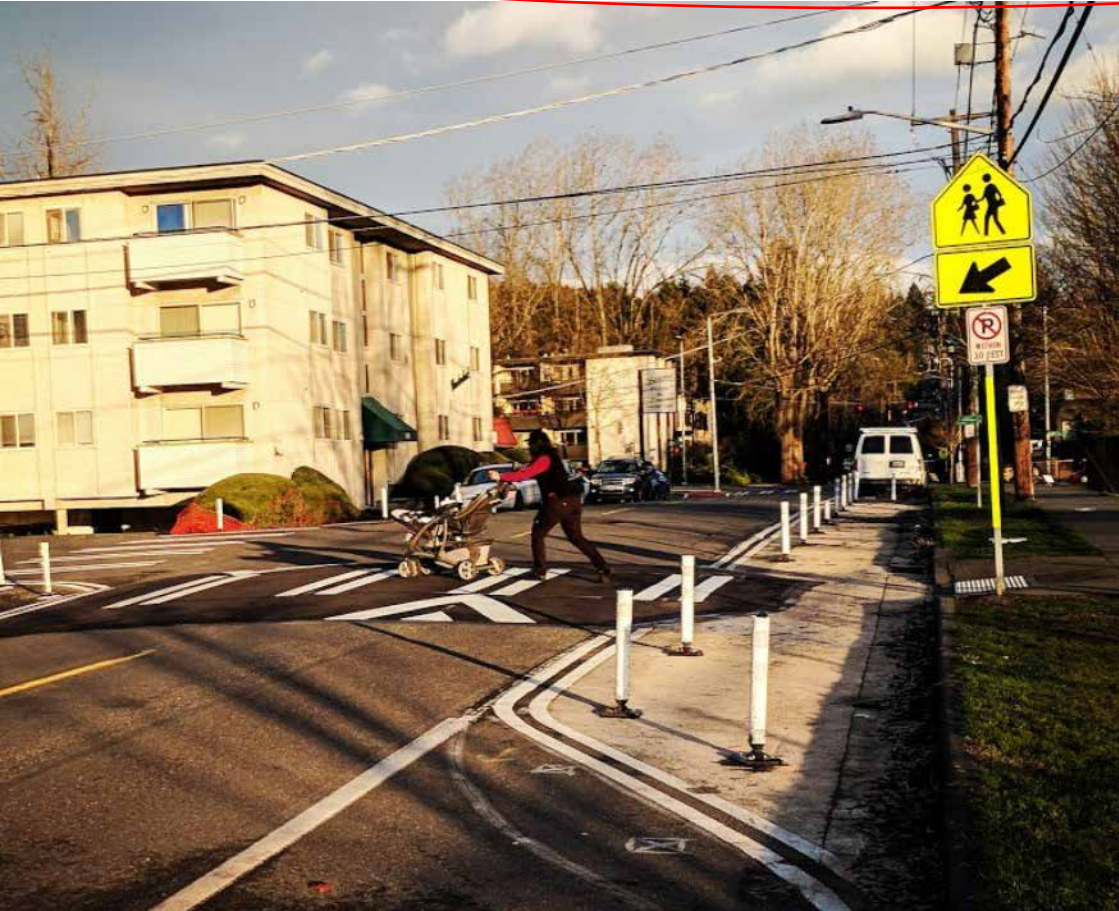
- Installed 6 speed cushions over 1.2 miles
- Overall vehicular speeds reduced 10-12%



Boyer w/o Everett	31.5 mph	28.5 mph	-10% ↓
Boyer e/o 16 <sup>th</sup>	29.5 mph	26.0 mph	-12% ↓
Boyer e/o 22 <sup>nd</sup>	30.0 mph	27.0 mph	-10% ↓



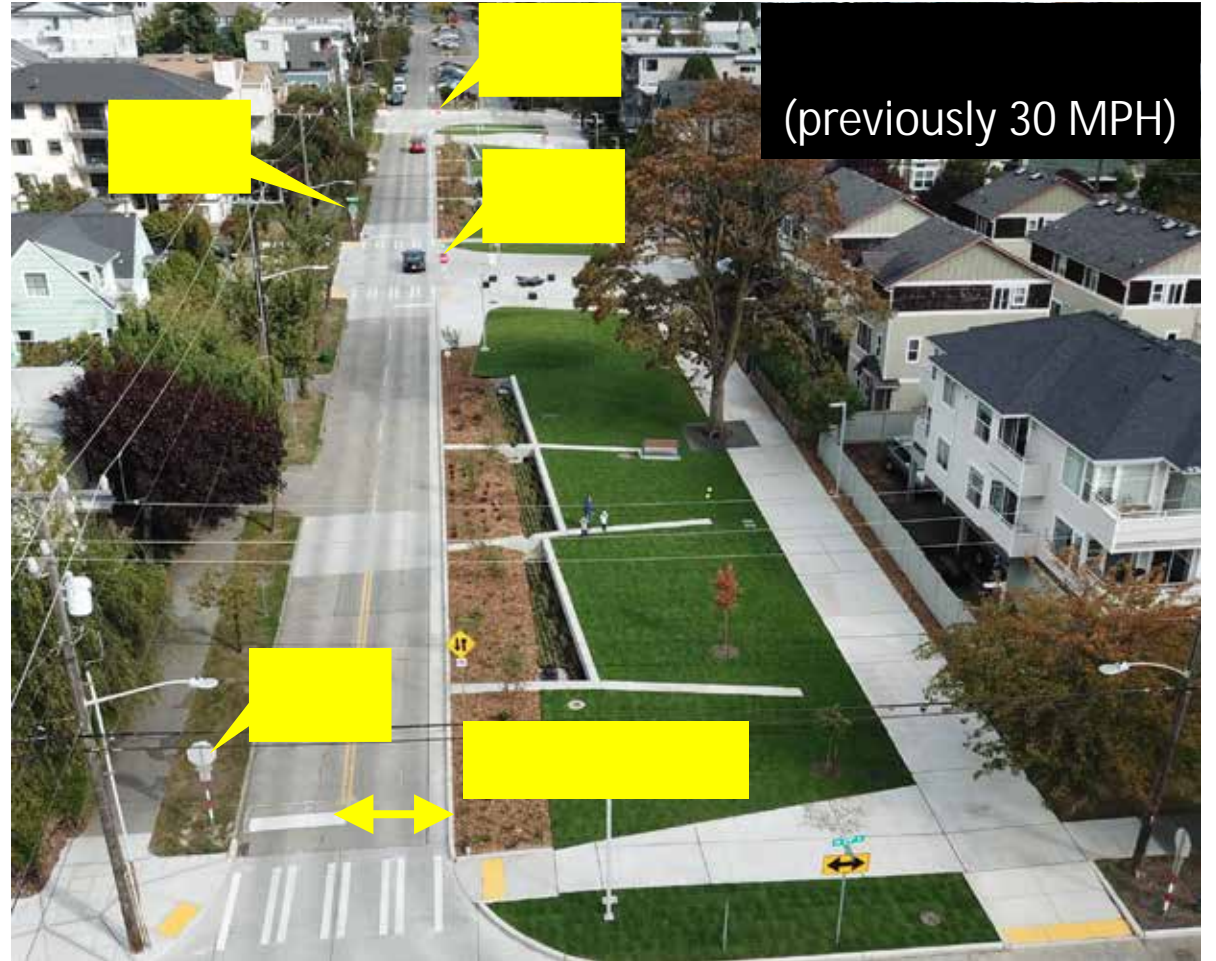
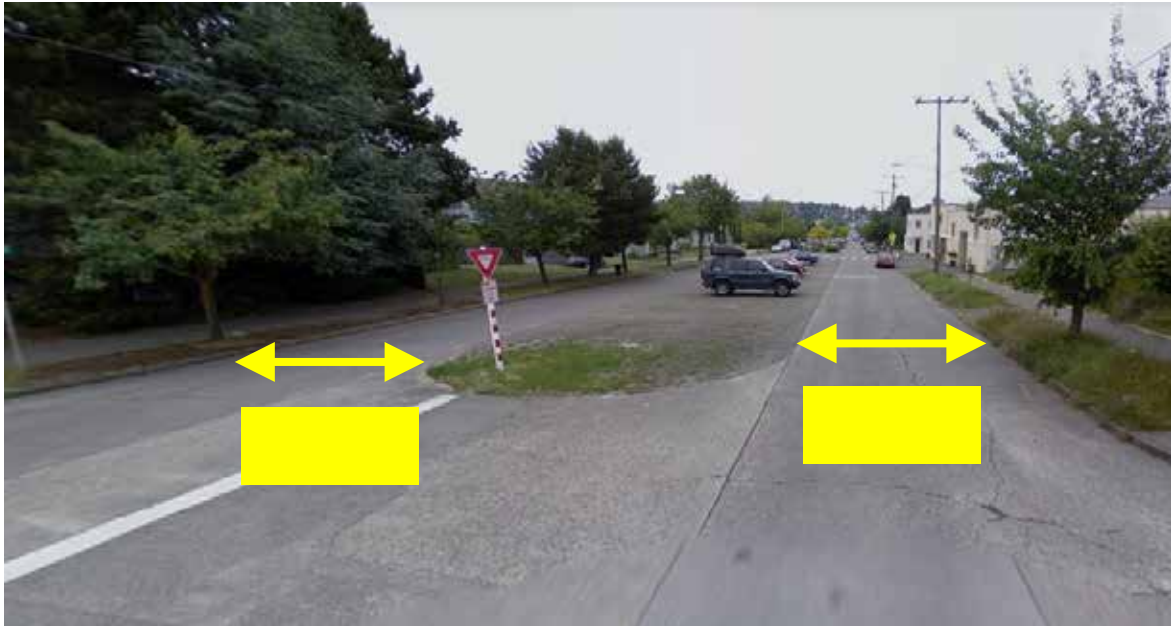
Change in speeding over 25 mph	-79%	-73%	-88%
Change in speeding over 35 mph	-80%	-81%	-91%





# Gemenskap Park Development

## Ballard (14<sup>th</sup> Ave NW)



# Today's Speakers

- Eric Tang, [etang@vhb.com](mailto:etang@vhb.com)
- Megan Wier, [megan.wier@sfdph.org](mailto:megan.wier@sfdph.org)
- Libby Thomas, [thomas@hsrc.unc.edu](mailto:thomas@hsrc.unc.edu)
- Rebecca Sanders, [rlsanders@asu.edu](mailto:rlsanders@asu.edu)
- Dongho Chang,  
[Dongho.Chang@seattle.gov](mailto:Dongho.Chang@seattle.gov)





# Get Involved with TRB

- Getting involved is free!
- Join a Standing Committee  
(<http://bit.ly/2jYRrF6>)
- Become a Friend of a Committee  
(<http://bit.ly/TRBcommittees>)
  - Networking opportunities
  - May provide a path to become a Standing Committee member
- For more information: [www.mytrb.org](http://www.mytrb.org)
  - Create your account
  - Update your profile



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Research  
Board

# TRB turns 100 on November 11, 2020

100  YEARS  
2020

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- Recognize, honor, and celebrate the TRB community; and
- Highlight 100 years of accomplishments.

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