Conor Semler | Kittelson & Associates

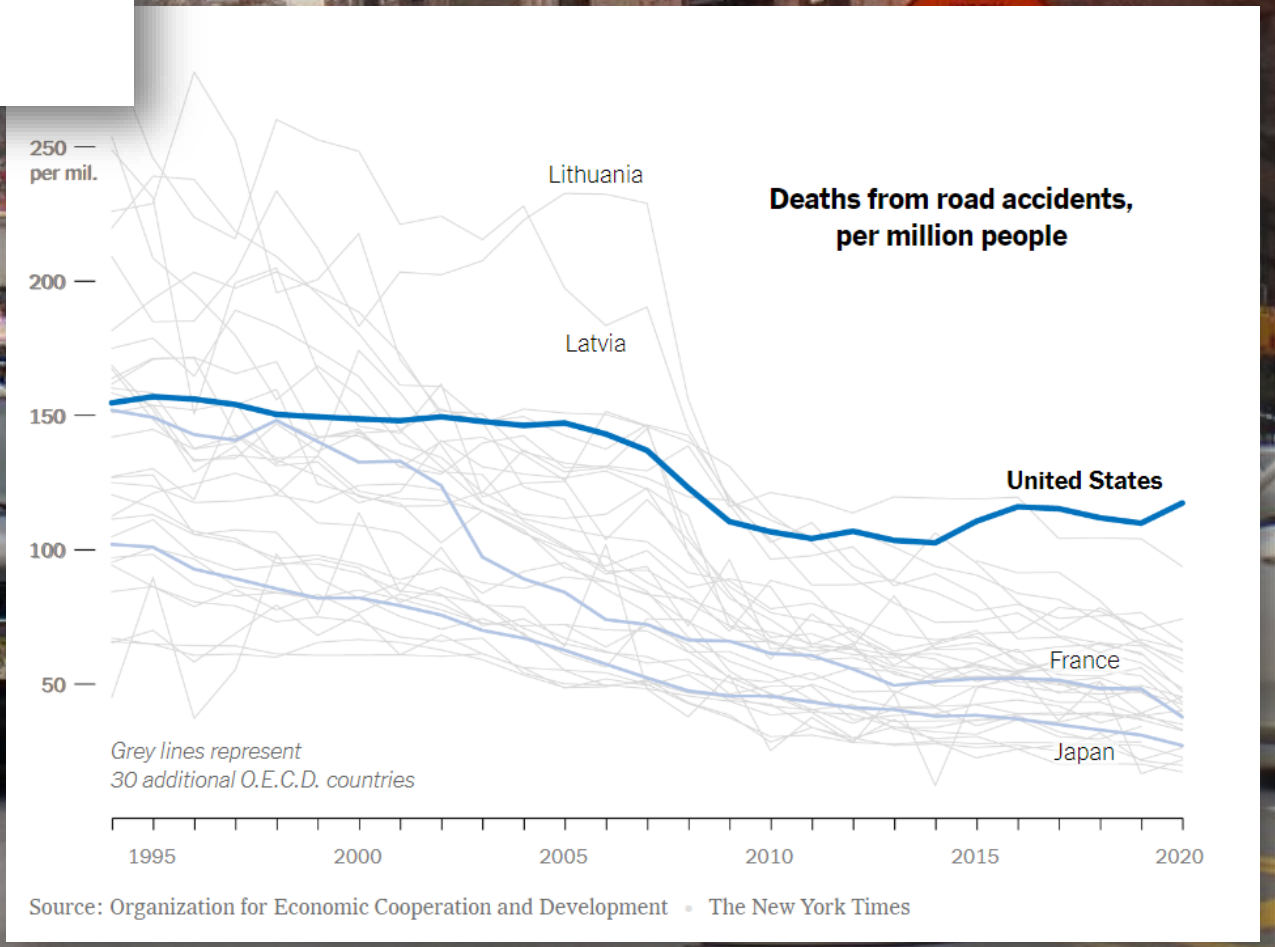
PRIORITIZING SAFETY THROUGH COMPLETE STREETS

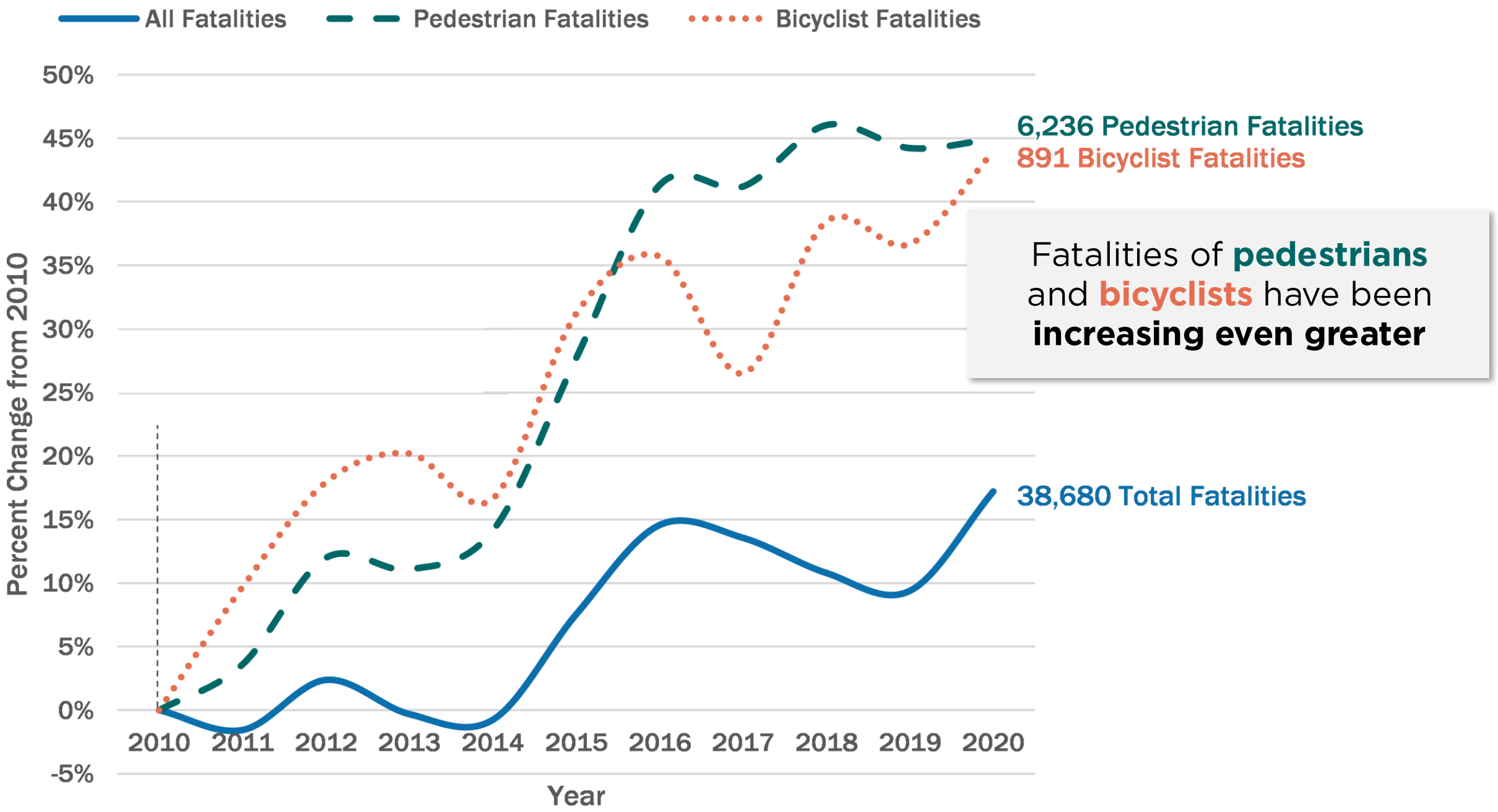
NCHRP 1036: Guidebook for Cross Section Reallocation

Nov. 27, 2022 The New York Times

The Exceptionally American Problem of Rising Roadway Deaths

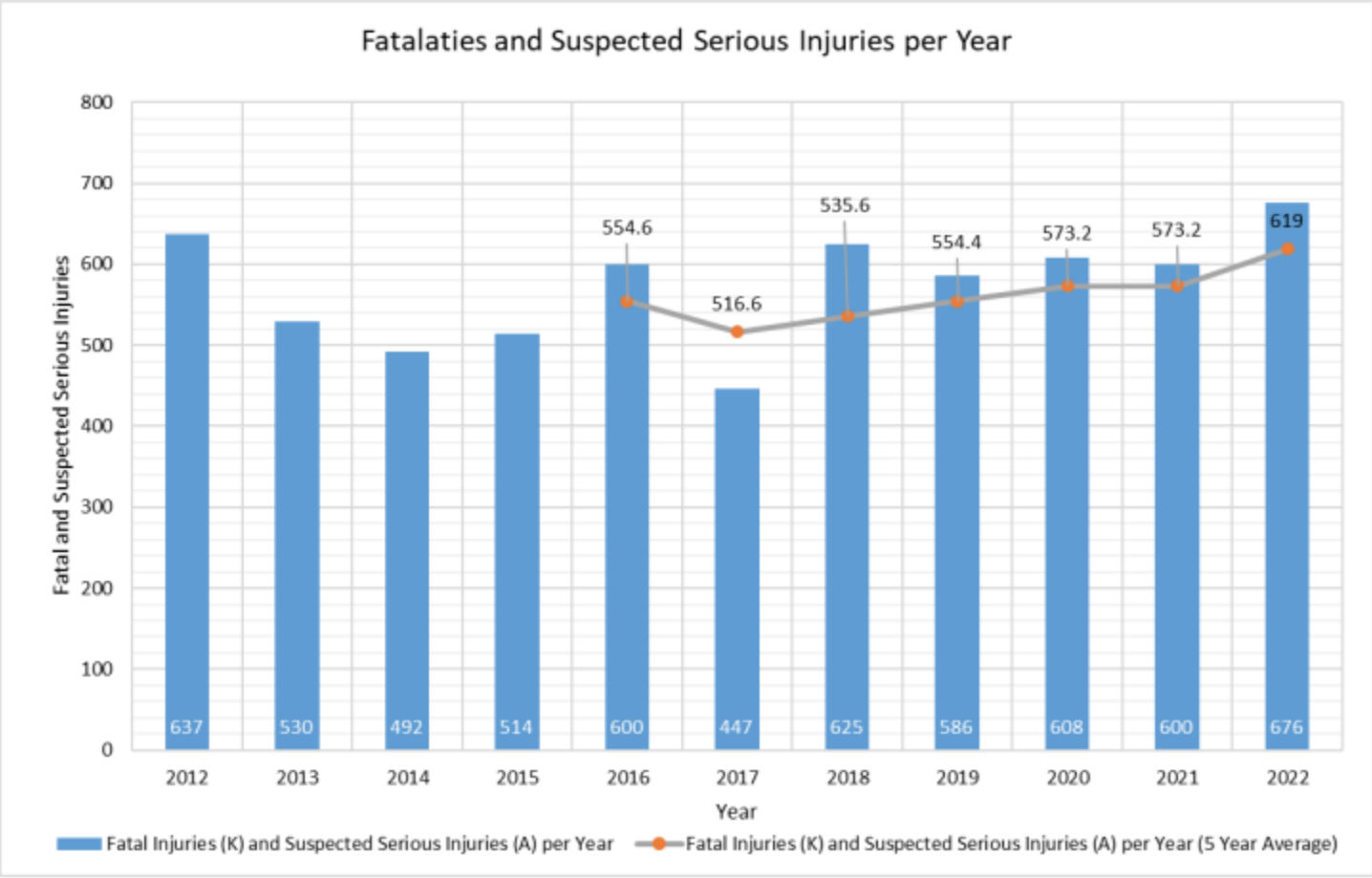
Why other rich nations have surpassed the U.S. in protecting pedestrians, cyclists and motorists.

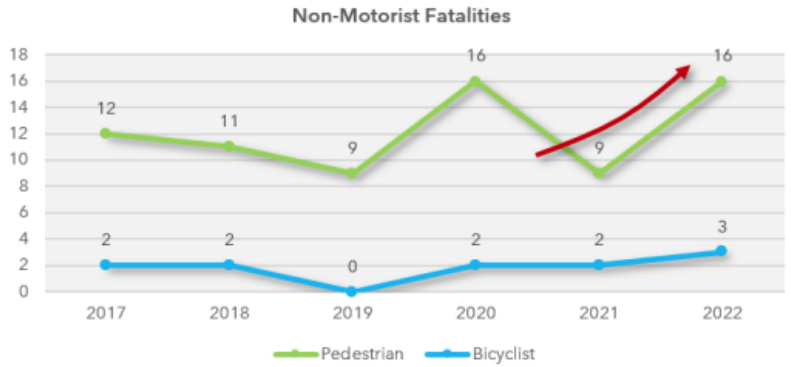




Source: US DOT

NEW HAMPSHIRE CRASH TRENDS





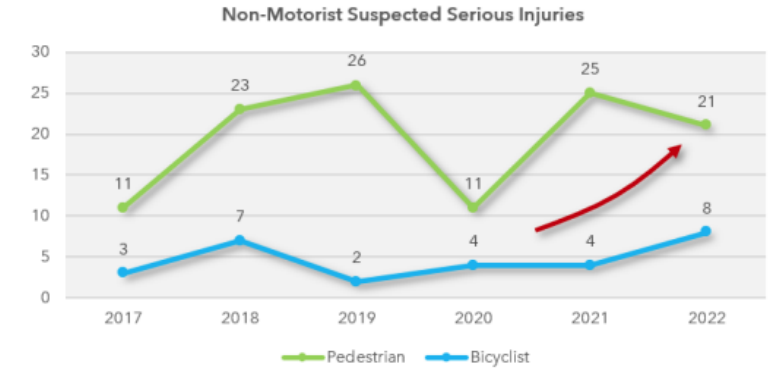
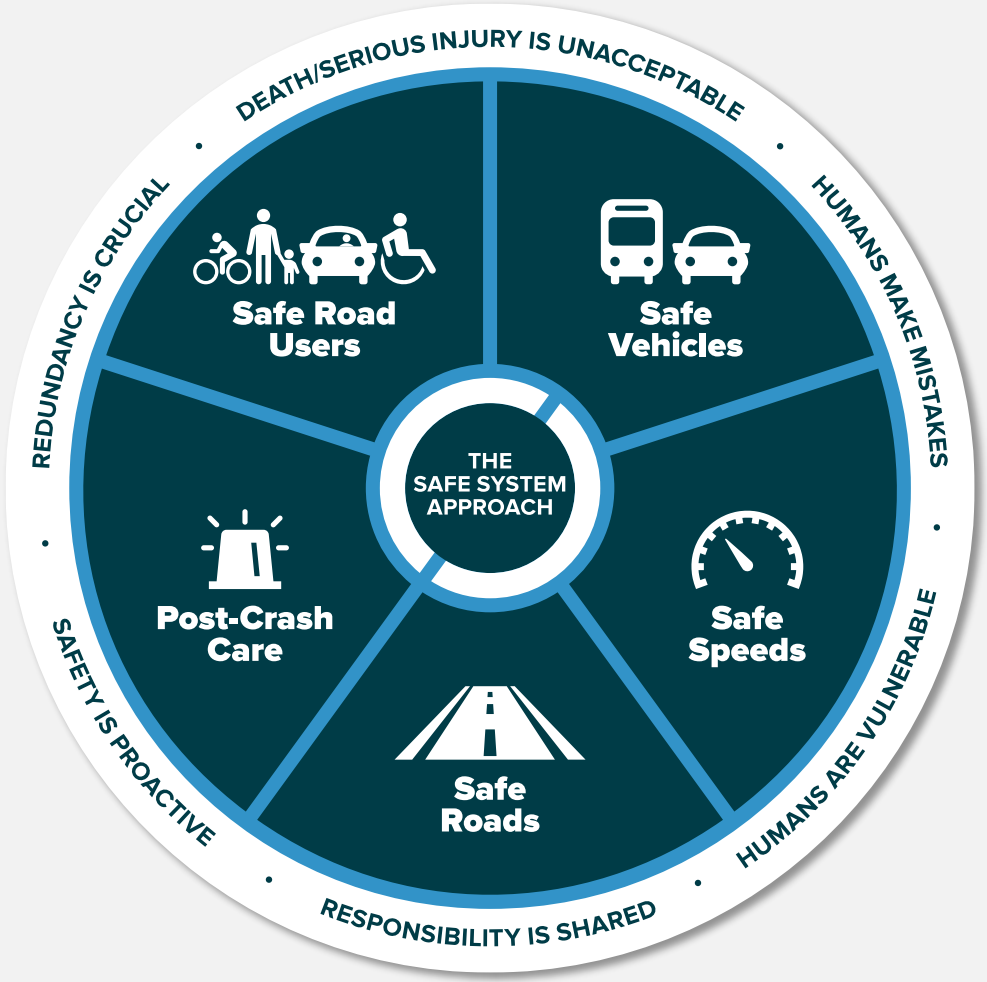


Figure 3. Annual and five-year average number of fatalities and suspected serious injuries on public roads in New Hampshire.

FHWA IS LEADING THE SHIFT TO THE SAFE SYSTEM APPROACH



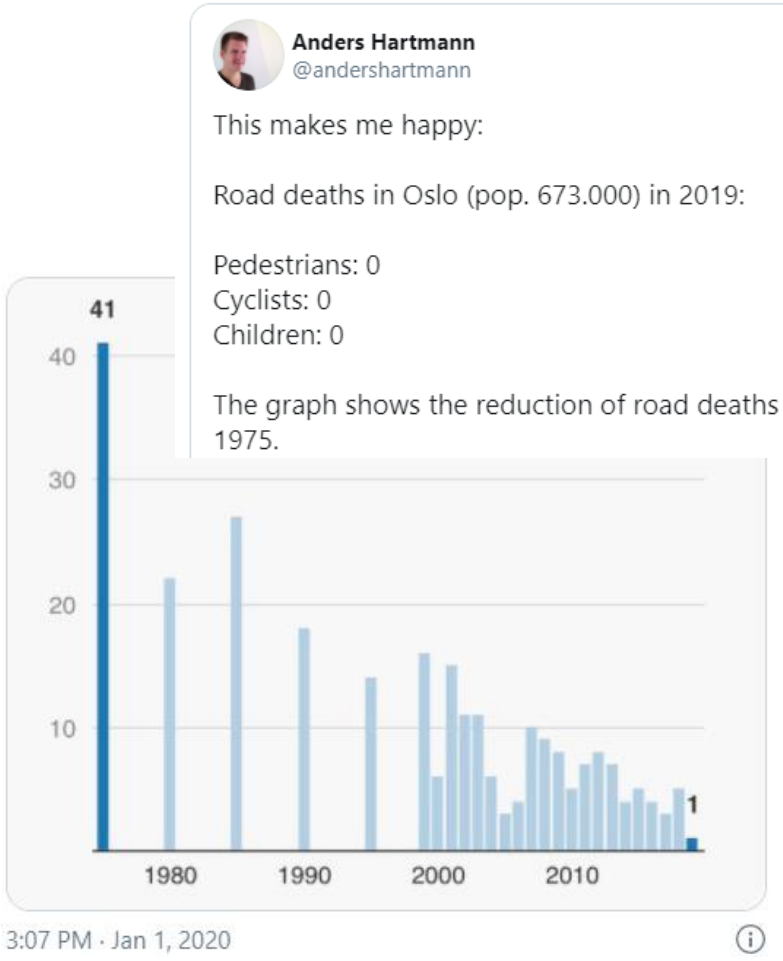
The **Safe System Approach** aims to eliminate fatal and serious injuries for all road users by:

Accommodating human mistakes

Keeping impacts on the human body at tolerable levels

ZERO IS POSSIBLE

Oslo, Norway



HOBOKEN VISION ZERO

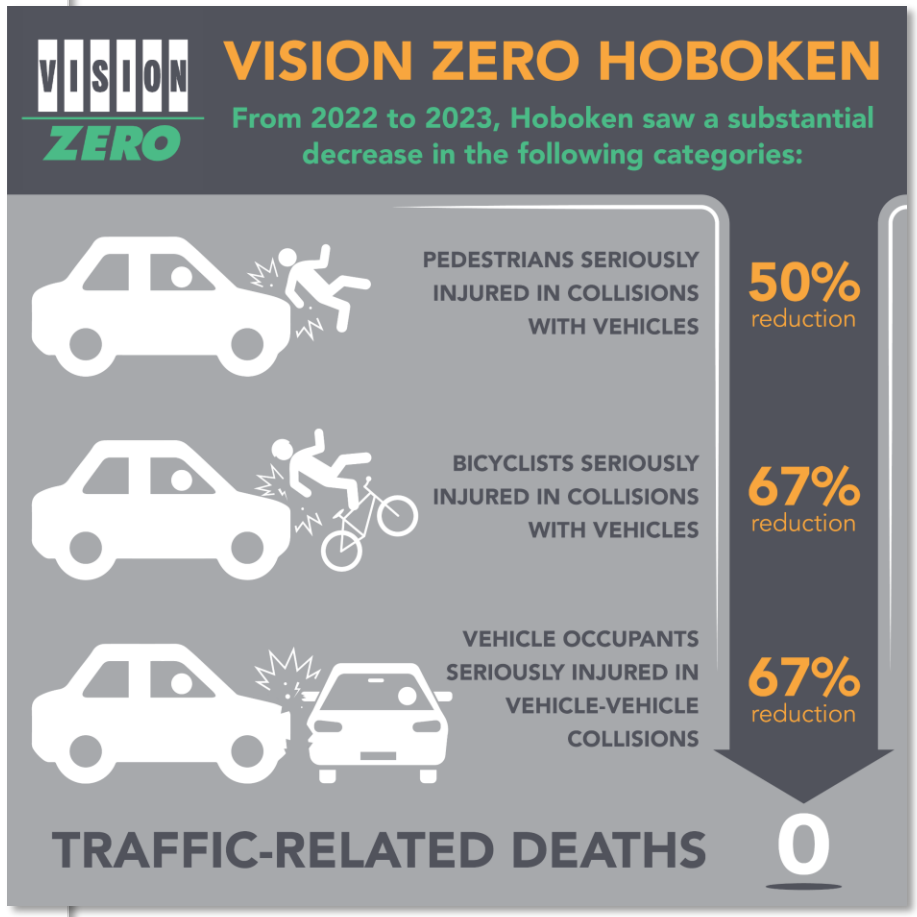
VISION ZERO

‘We Have the Power To Reshape our Cities’: Hoboken Mayor Reflects on Seven Years of Vision Zero Success

"Change is scary and painful sometimes. And it would be easy to give in and say maybe now is not the time. But it is our duty, as elected officials, public policymakers, and advocates, like many of us here today, to face these challenges head on, and recognize that the status quo doesn’t always cut it."

By **Ravi S. Bhalla**

12:01 AM EDT on May 16, 2024



New Hampshire Department of Transportation

MISSION

Transportation excellence enhancing the quality of life in New Hampshire.

"...is fundamental to the state's sustainable economic development and land use, enhancing the environment, and preserving the unique character and quality of life."


ONE WAY
BIKE LANE
NO TURN ON RED
PARKWAY
ONE WAY
NO TURN ON RED
LEASE
313 568-7222
advocare


Hey Dolls♥
come shop our
NEW collections!
• Upcycled Designer accessories
• Fall & winter clothing/accessories
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~HolidayGifts~
TRUEGGER'S BAGELS
Edward Jones | INVESTMENTS
JEFF CARBONE INSURANCE
TURNERS TAKE OUT
DINING ROOM
SEAFO

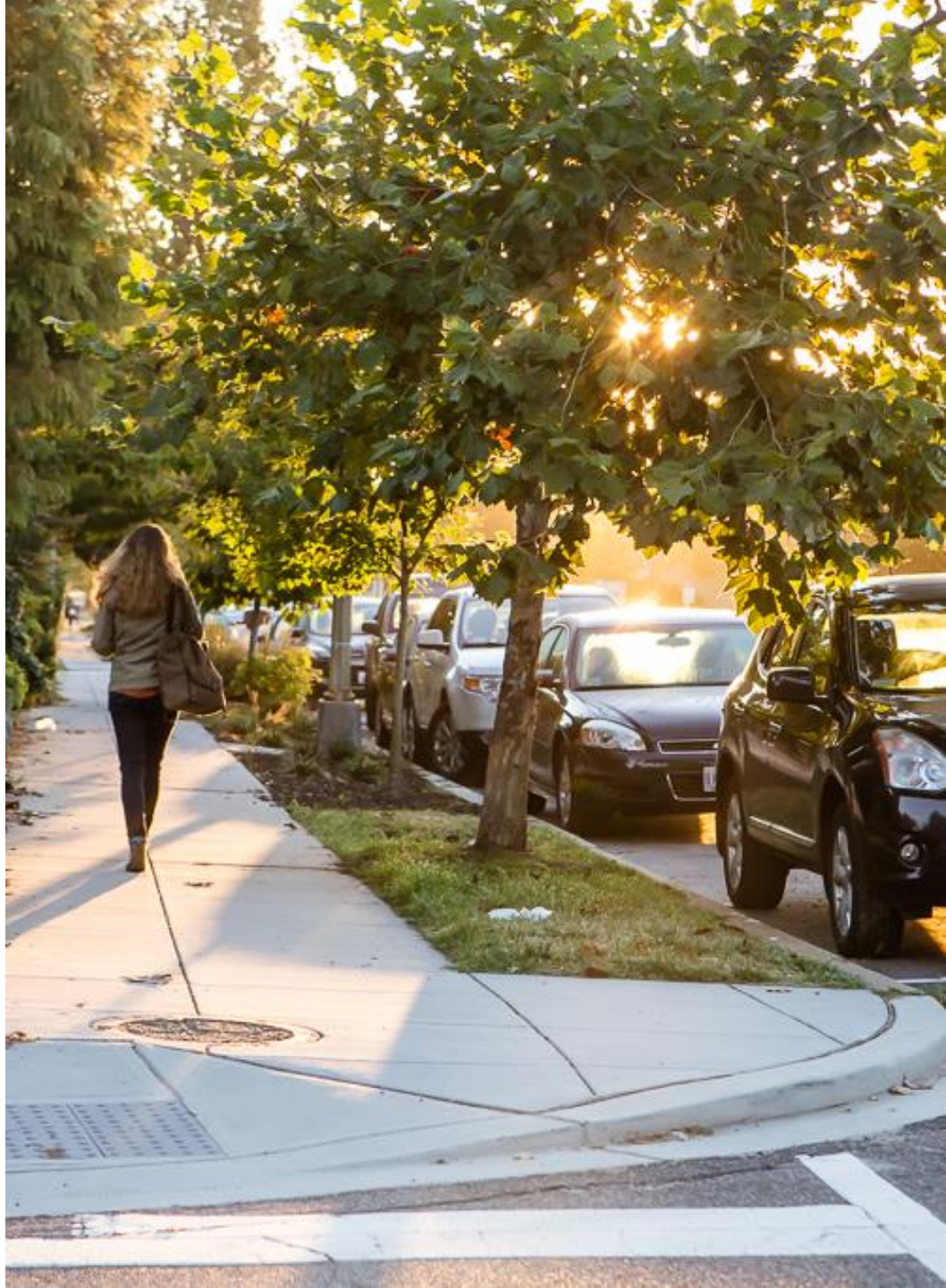

BOWL
ONE WAY
BJG


NAVEGO
Mocha
GIRO

We know what safe streets look like; but how do we get there?

BARRIERS TO SAFE STREET DESIGN

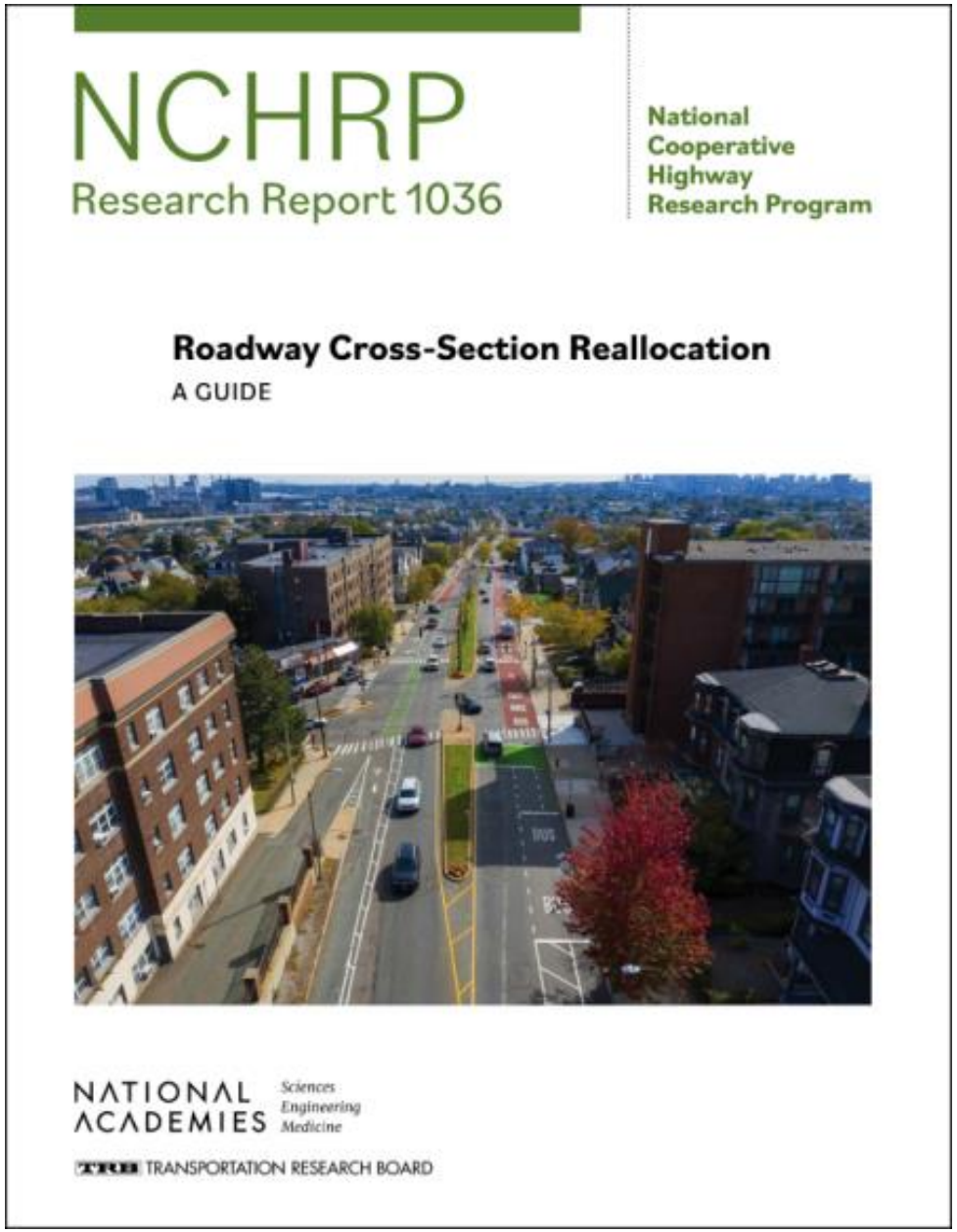
- Agencies are looking for information to support changes to the cross section
- Peak hour intersection operations limit cross section opportunities
- Lack of transparency in the decision-making process
- In practice, safety has not always been the top priority



Rethinking how we use our streets

A NEW PARADIGM

- NCHRP 1036: Roadway Cross Section Reallocation – A Guide
- Daylighting decision-making
  - A new framework for allocating roadway space
  - Raising the floor on safety
  - Connecting decisions to outcomes



1 Define your limits and set your goals.

How much space do you have to work with?

What purpose does the road serve?

What are your community's priorities?

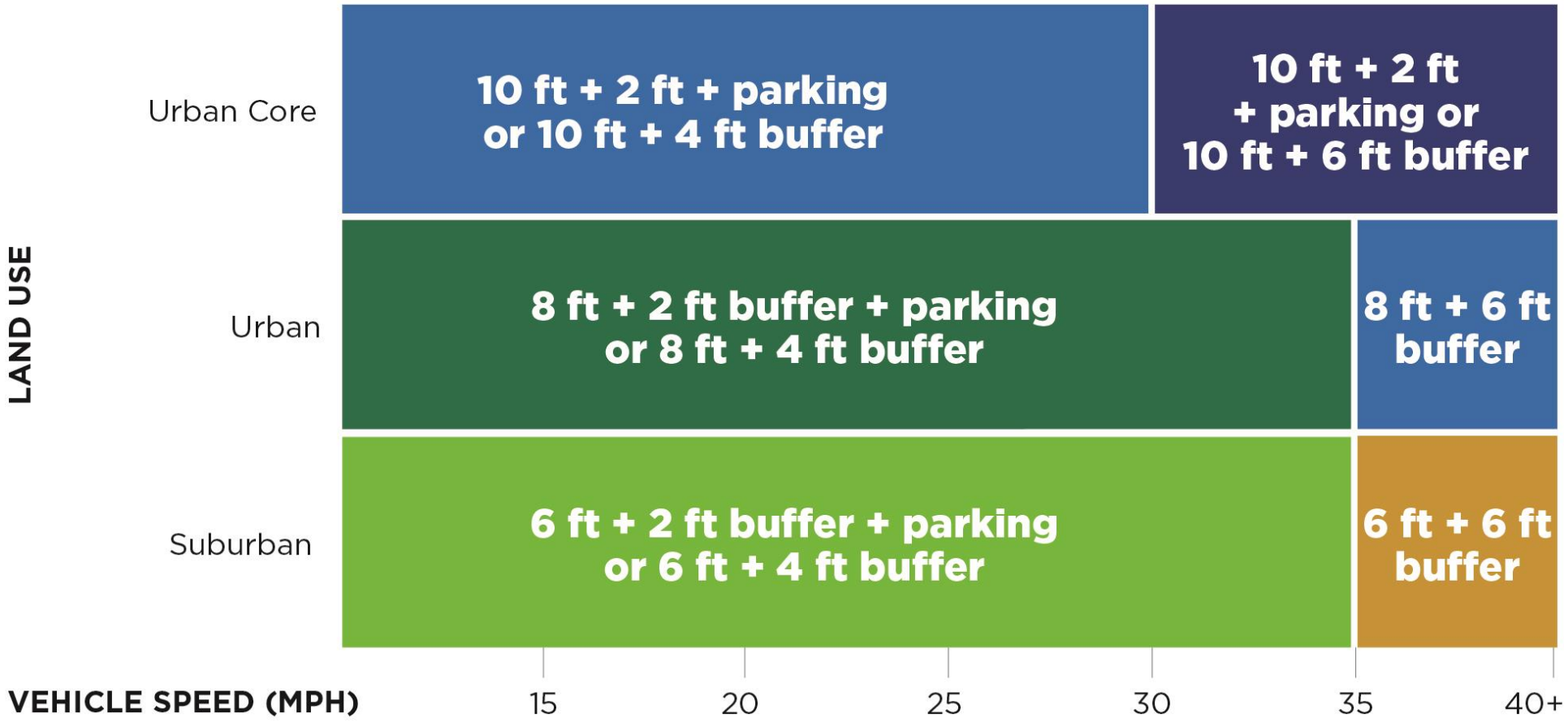
2 Consider the context through a safety lens.

A safe street must be safe for all users!

Determine the **minimum safe travel space** for people walking, bicycling, riding transit, and driving.

2 Consider the context through a safety lens.

Recommended sidewalk and buffer widths



3 Is there enough space to build a safe road?

NO

Work within your constraints to ensure safety.

4 Overcome the physical barriers to safe road design.

Reduce dimension needed for driving

Reduce dimension needed for bicycling/walking

Lower speed

Reduce vehicle volumes

Safe parallel facility

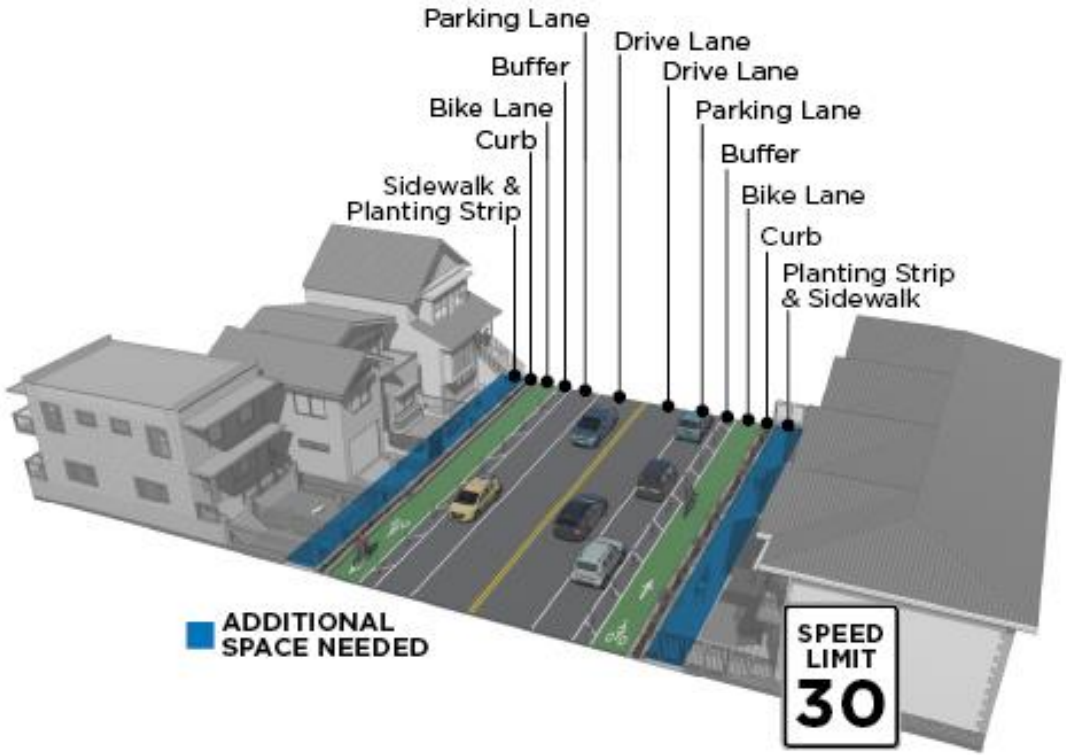
Convert

Close street to traffic

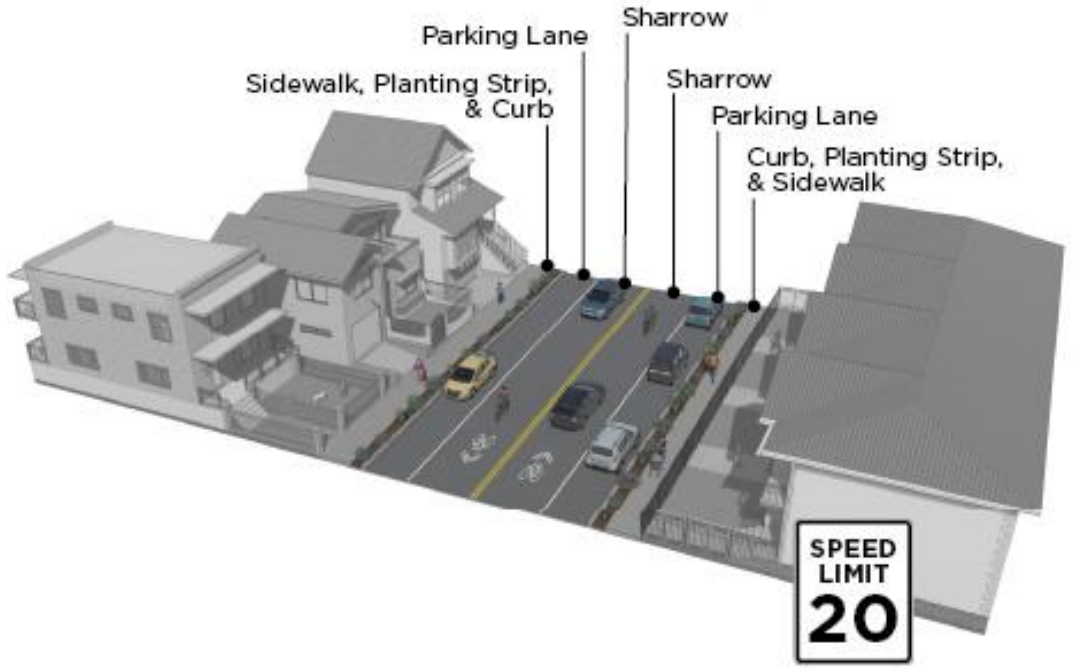
Convert to shared street (woonerf)

4 Overcome the physical barriers to safe road design.

Lower Speeds



~35+ mph design speed



~20 mph design speed

3 Is there enough space to build a safe road?

YES

What do you want to achieve beyond safety?

5 Develop design options: what happens when you change your cross section?

Choose a few suitable alternatives to evaluate. The community priorities from Step 1 may make some options more desirable.

Wider Sidewalk

Bus-Only Lanes

On-street parking

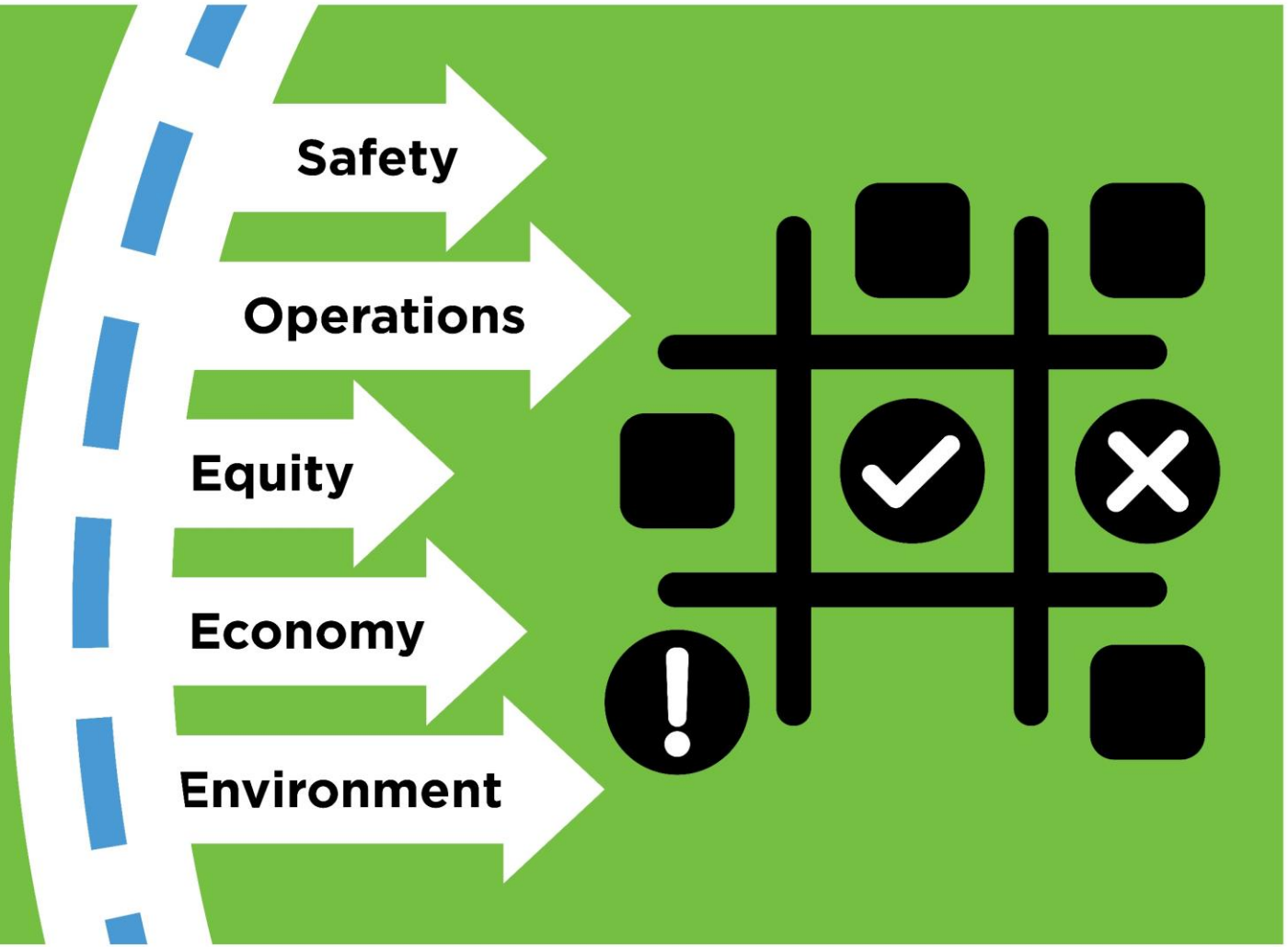
Add Traffic Lanes

Medians

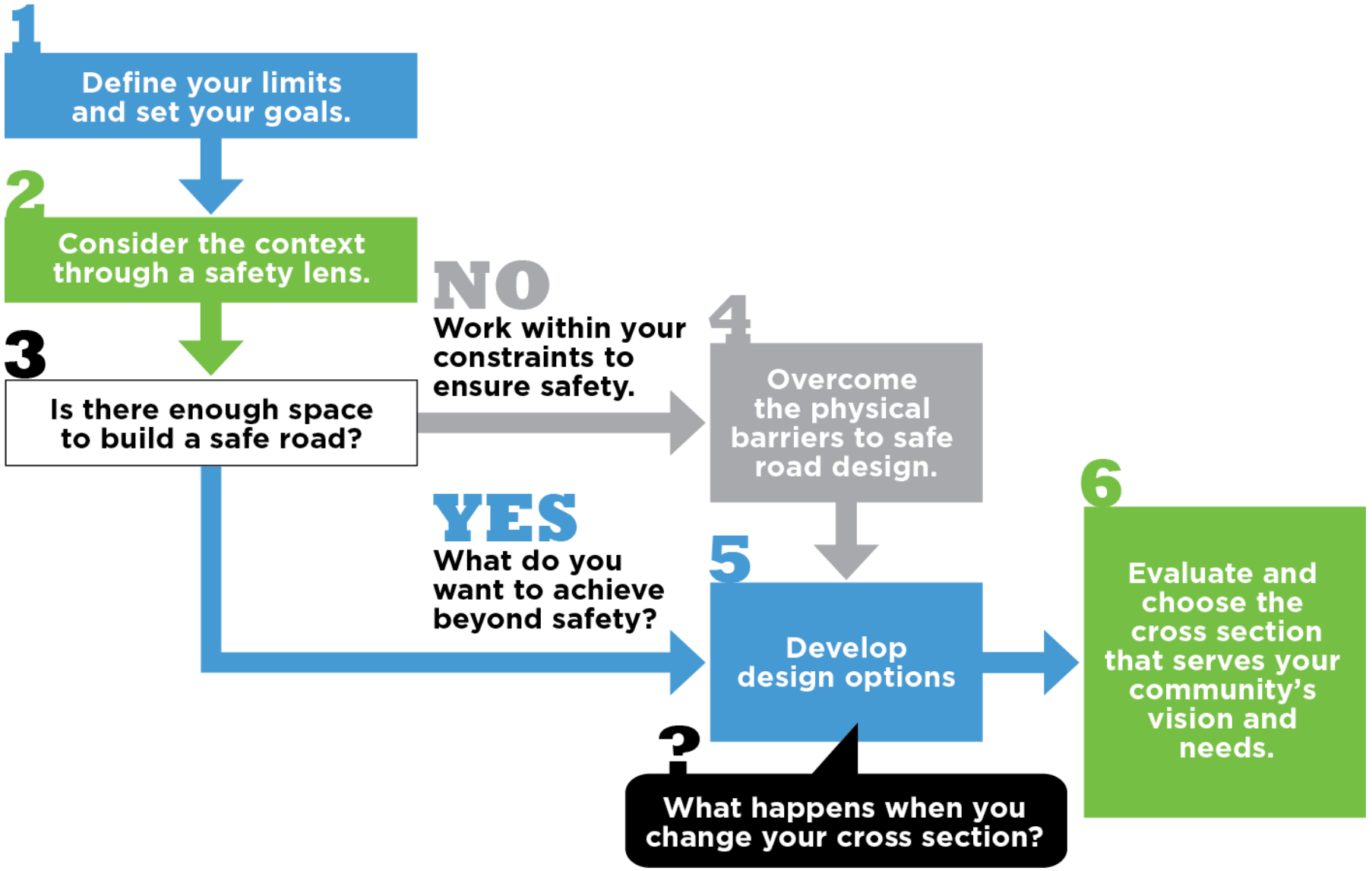
Wider Bike Lanes

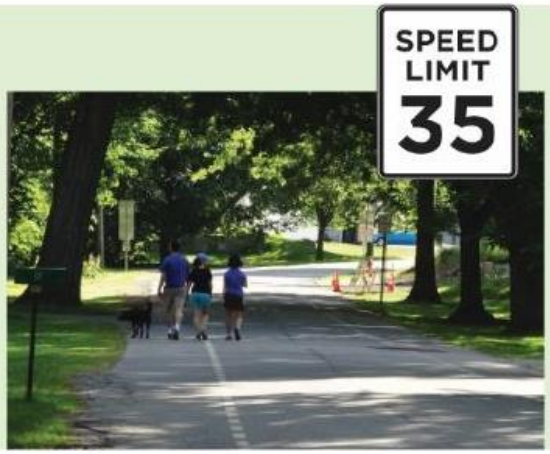
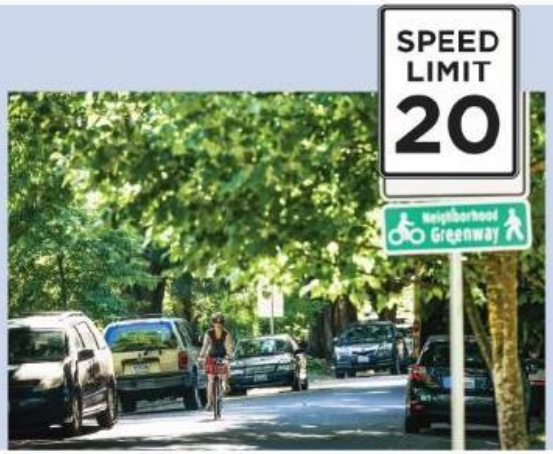
6 Evaluate and choose the cross section to serve your vision and needs.

Compare the likely outcomes of the alternatives you developed in Step 5.



A NEW DECISION-MAKING FRAMEWORK

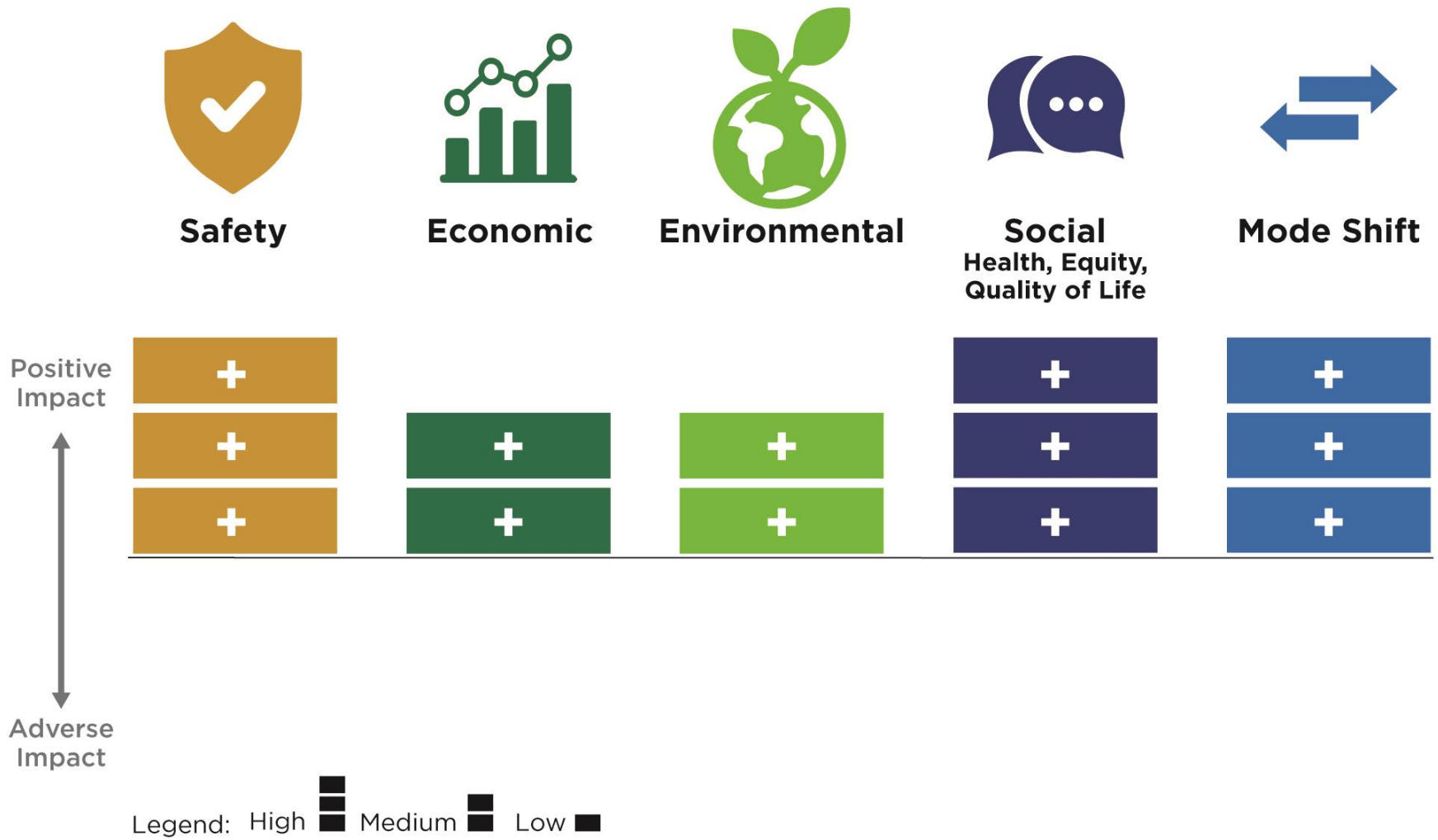


	Access	Distributor	Through
Rural			
Urban/ Suburban			
	Mixed Traffic	Separated Cycling Facilities	Separate Corridor or Route

Active Transportation Needs

Raising the floor

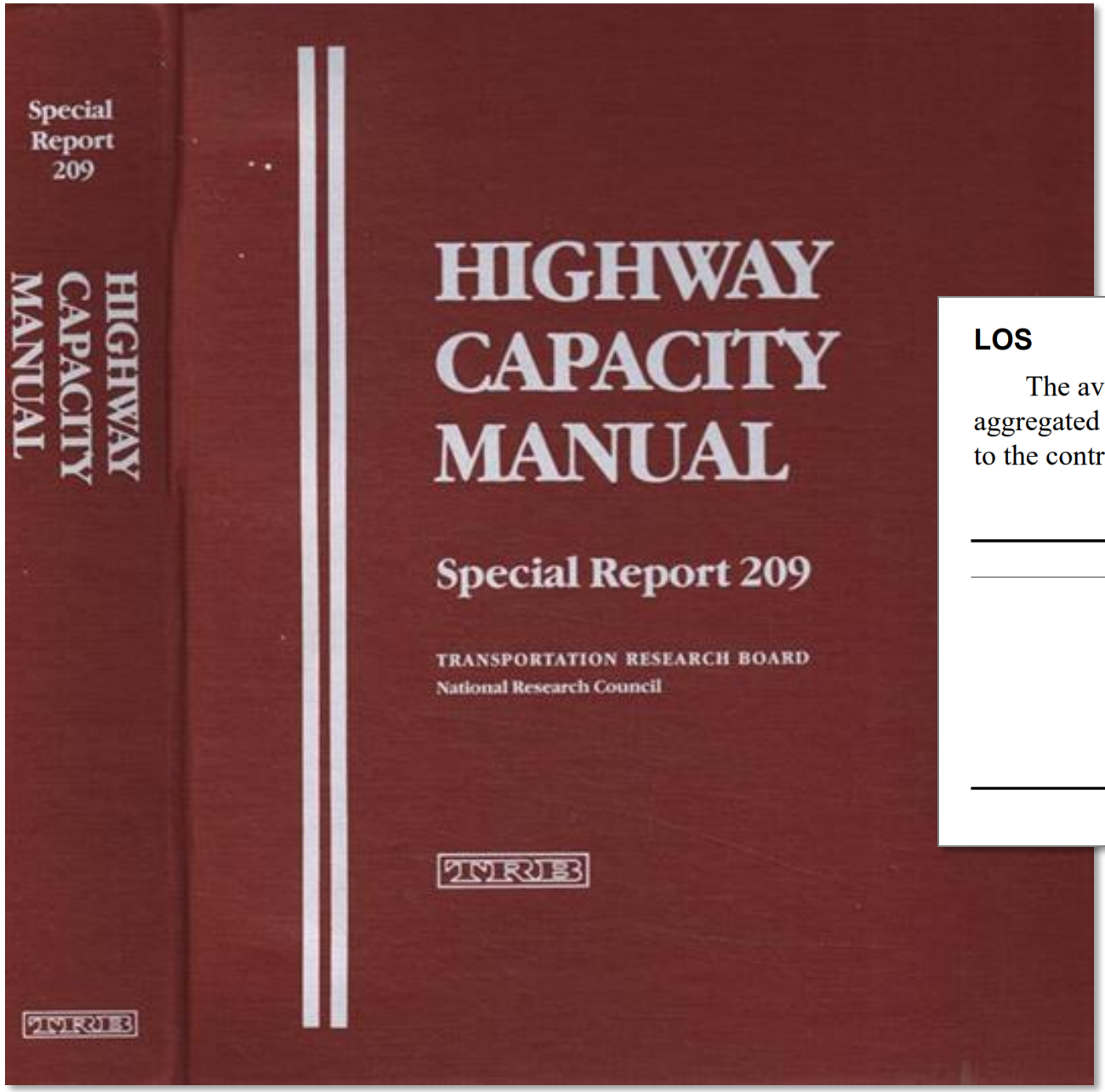
CONNECTING DECISIONS TO OUTCOMES



Outcomes of adding bicycle lanes

“That won’t work.”

WHAT IS FAILURE?



LOS

The average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. LOS is directly related to the control delay value. The criteria are listed in Exhibit 16-2.

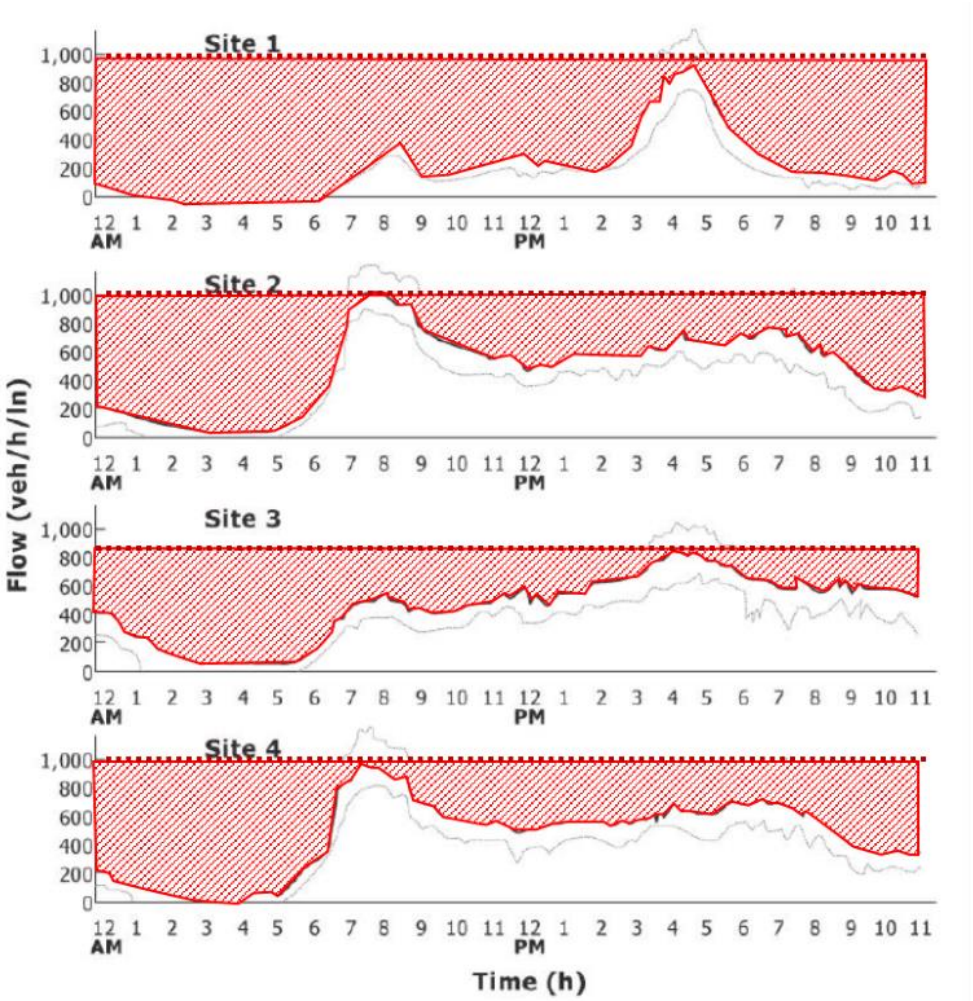
EXHIBIT 16-2. LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

WHAT ISN'T?

WHY REVISIT?

Designing for peak-hour capacity and the 30th highest hourly volume results in unused capacity for most of the day!



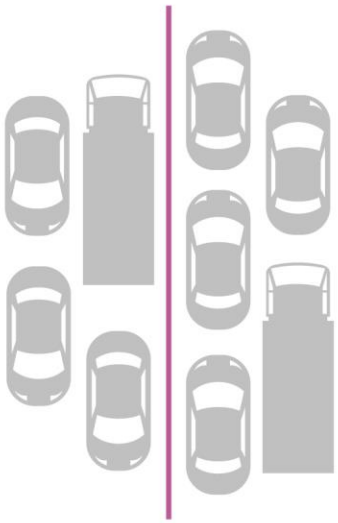
WHAT'S WRONG WITH UNUSED CAPACITY?

UNDER CAPACITY = HIGHER SPEEDS

WHICH ARE ASSOCIATED WITH INCREASED AND MORE SEVERE CRASHES

OVERDESIGNING FACILITIES

FOR CARS MAKES THEM LESS SAFE FOR PEOPLE WALKING AND BIKING

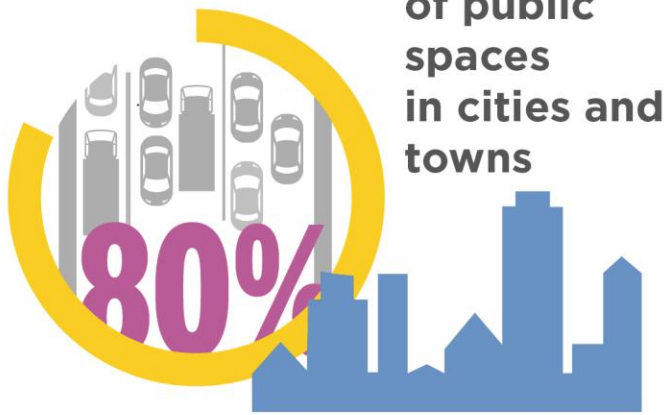


THE MORE TRAVEL LANES, THE

LONGER WAIT TIMES

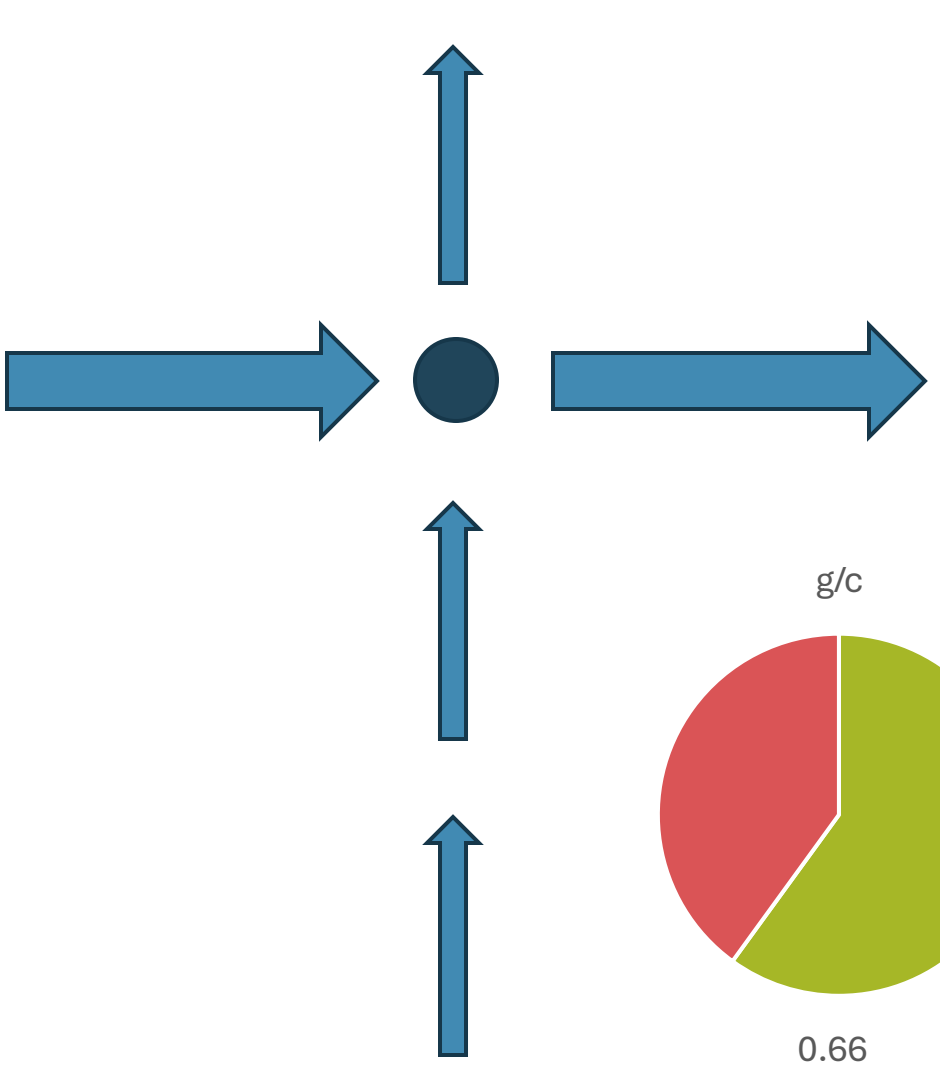
FOR ALL MODES

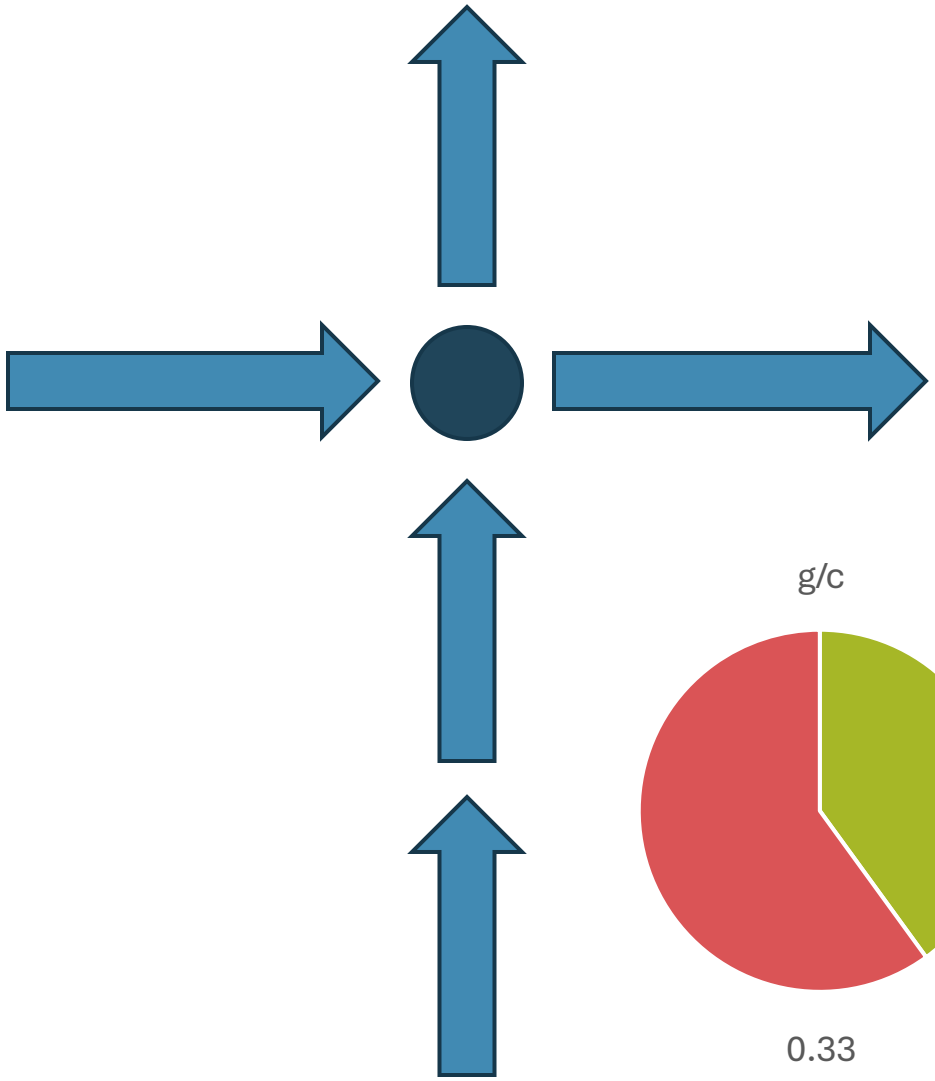
STREETS MAKE UP MORE THAN

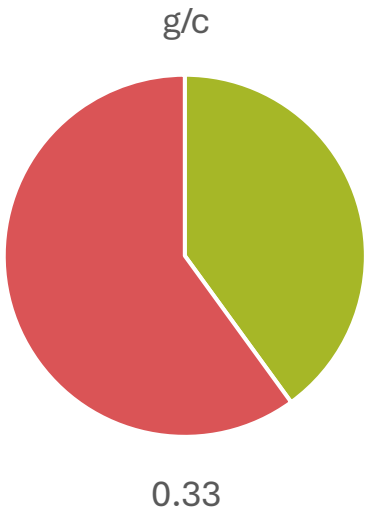


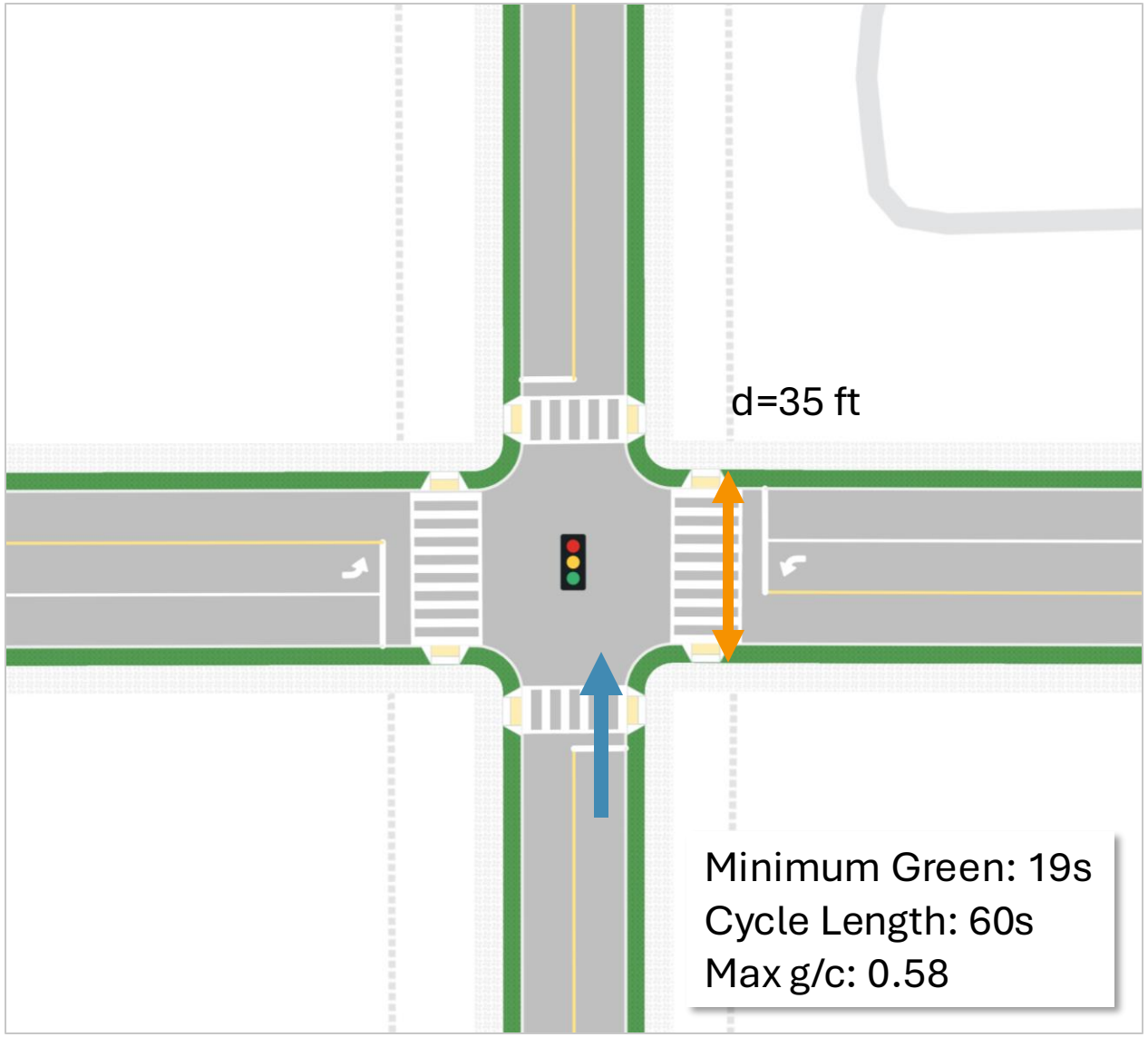
of public spaces in cities and towns

UNDERSTANDING CAPACITY

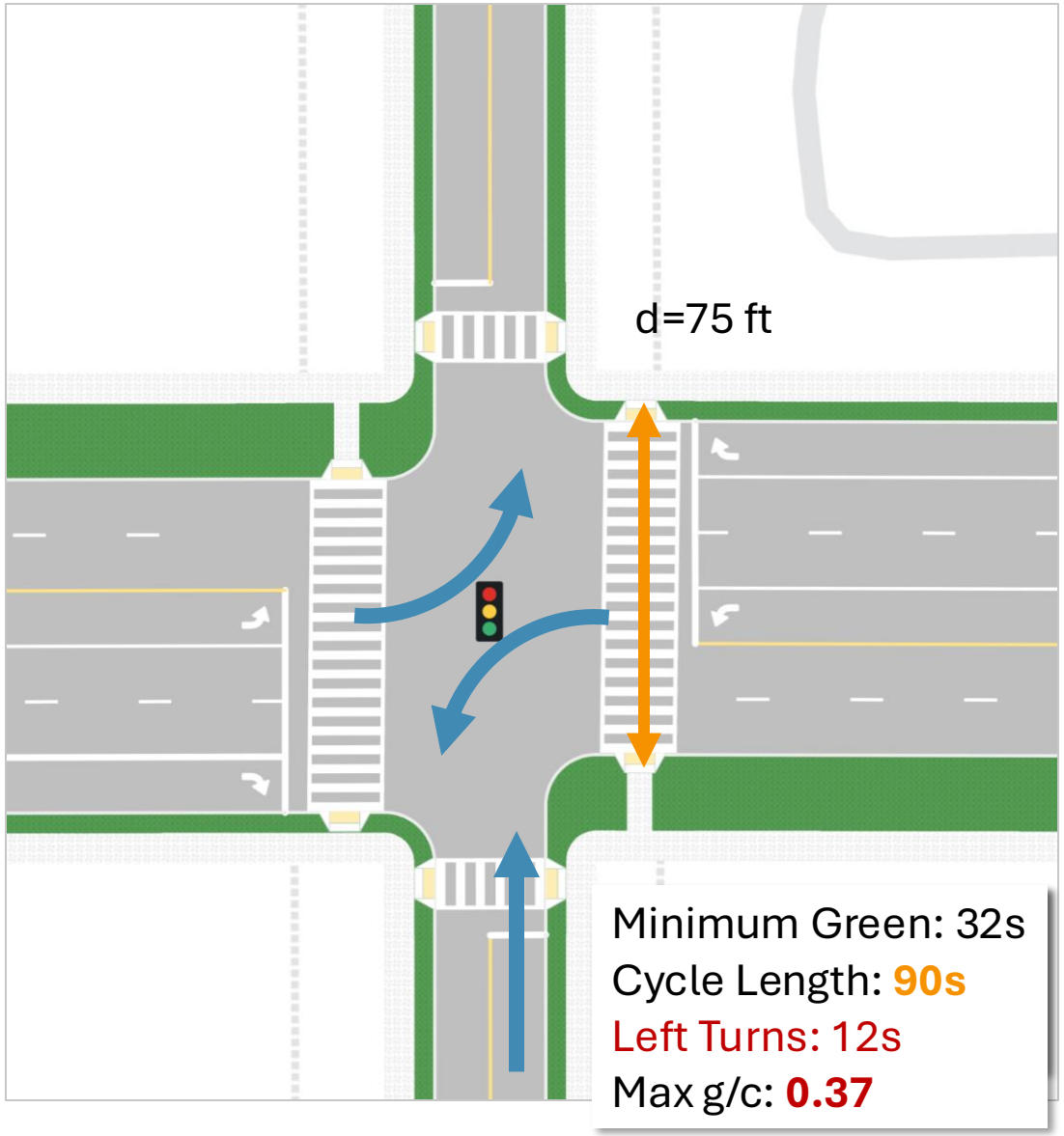








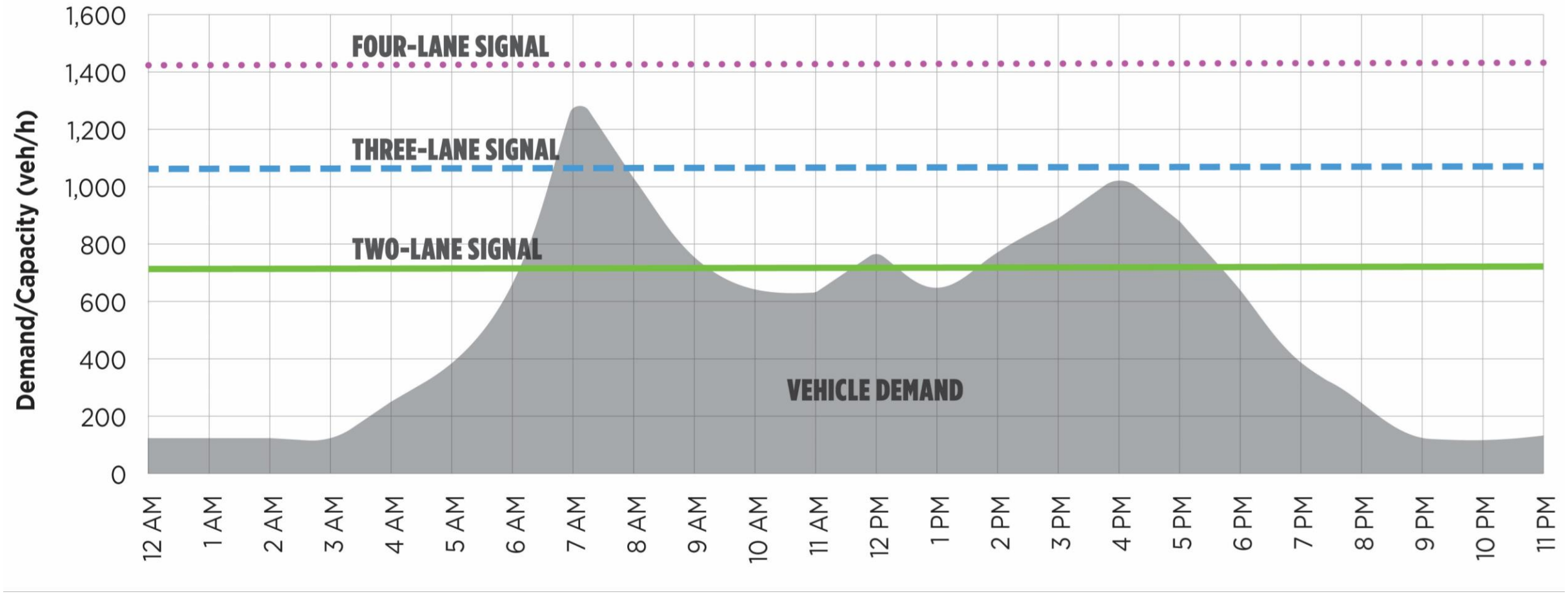
Max vehicles per hour: 1,050



Max vehicles per hour: 1,360

ALL-DAY INTERSECTION ASSESSMENT

Illustrative Example



THE 24-HOUR CAPACITY FRAMEWORK

HOURLY DEMAND-TO-CAPACITY (D/C) RATIO

allows practitioners to assess whether demand exceeds capacity at any time during the day and, if so, for how long

16hr
EFFICIENCY

The percentage of the hours between 5:00 a.m. and 9:00 p.m. the street utilizes at least 60% of its potential capacity

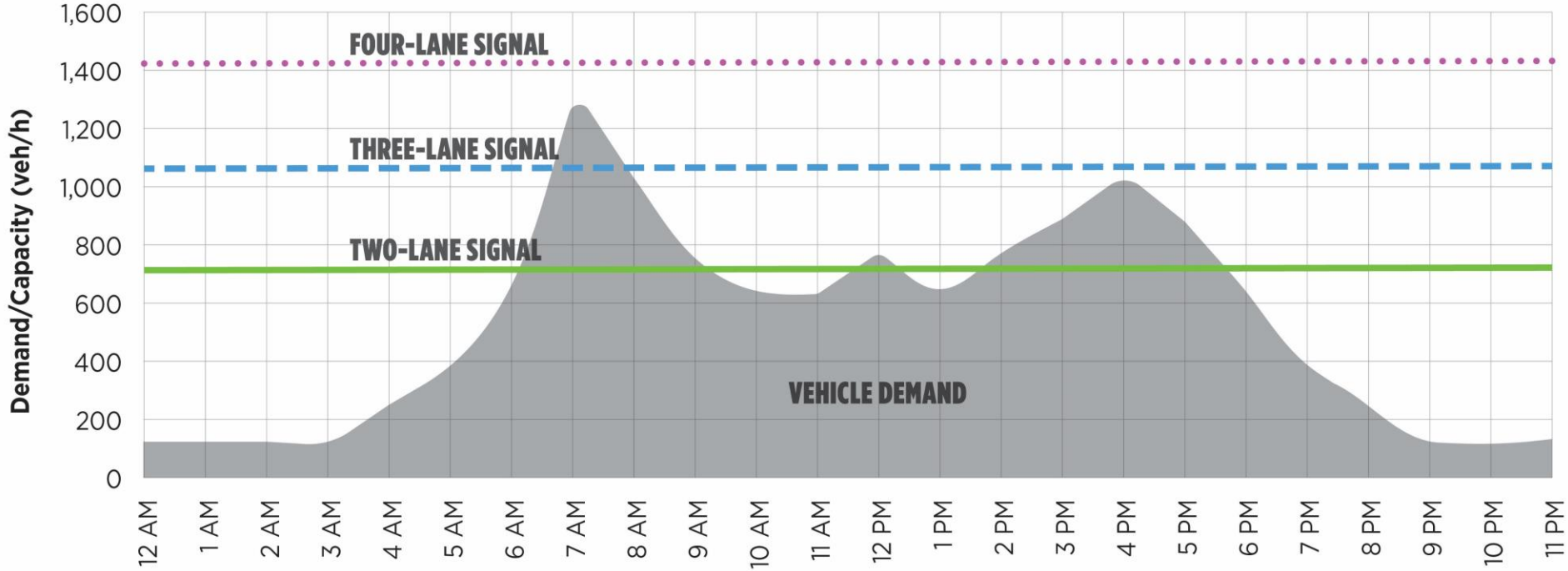
16hr
EXCESS LANE-CAPACITY

The lane-capacity provided for but unused during that 16-hour period

TOTAL HOURS BELOW CAPACITY

The number of hours (out of 24) during which the street is operating below capacity

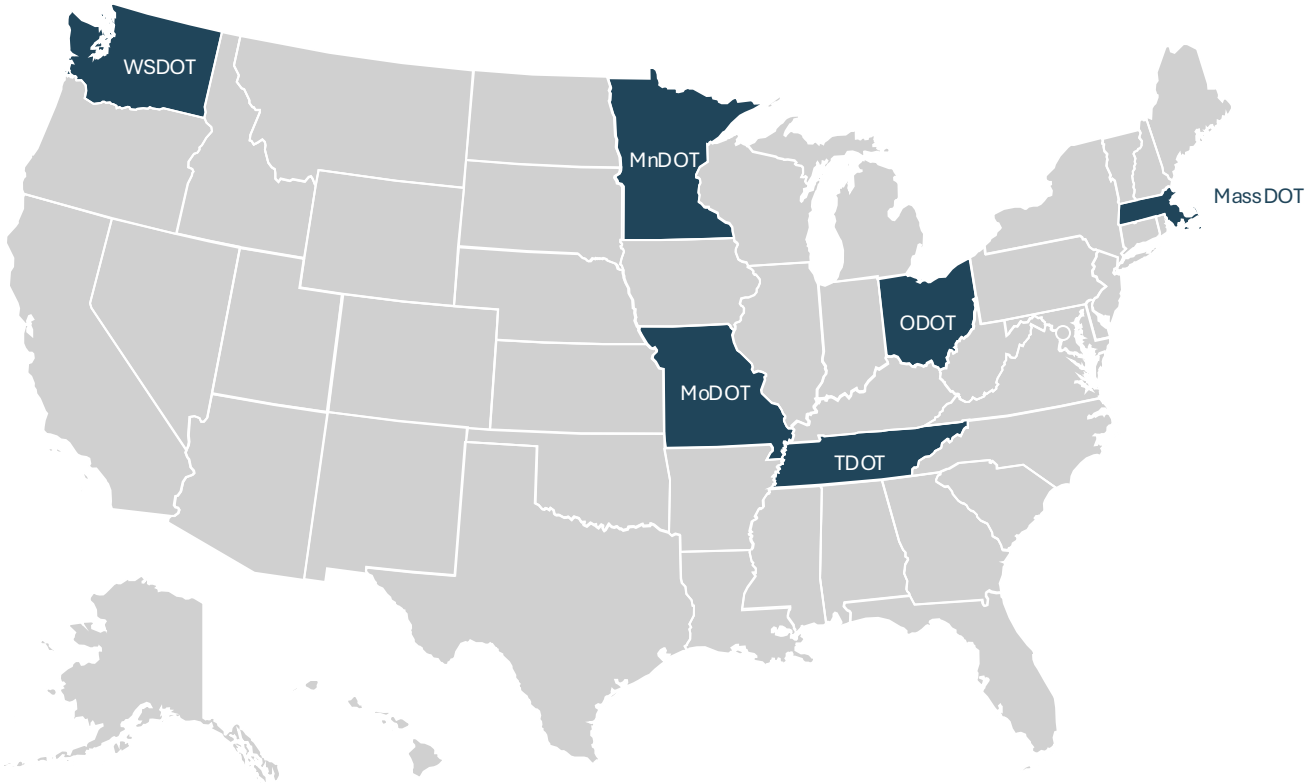
ALL-DAY INTERSECTION ASSESSMENT

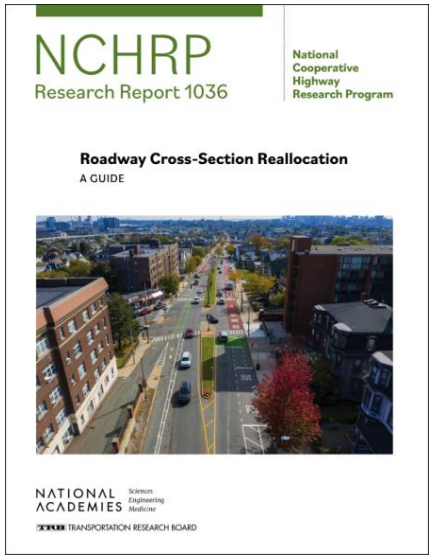


Intersection Control	Max Demand-to-Capacity Ratio (d/c)	16-Hour Efficiency	16-Hour Excess Capacity (Lane Hours)	Total Hours Below Capacity
FOUR-LANE SIGNAL	0.89	31.3%	15.9	24
THREE-LANE SIGNAL	1.18	50.0%	8.2	23
TWO-LANE SIGNAL	1.77	81.3%	2.2	16

IMPLEMENTING THE RESEARCH

- NCHRP 20-44(52) Pilot Workshops
- New Communications Materials
- Updates to Spreadsheet Tools
- Workshop Plan





Let's Change the Parameters

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