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Managing Speeds in All Contexts: Best Practices

Thursday, April 9, 2025

- 11:00 a.m. - 12:00 p.m. ET
- 10:00 a.m. - 11:00 p.m. CT
- 9:00 a.m. -10:00 a.m. MT
- 8:00 a.m. - 9:00 a.m. PT

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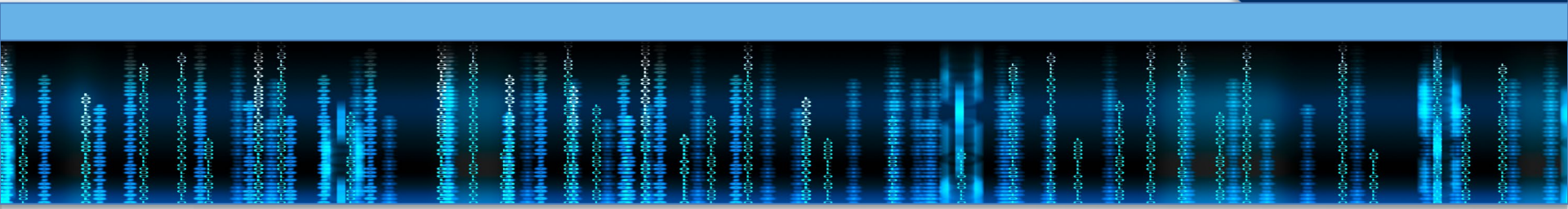

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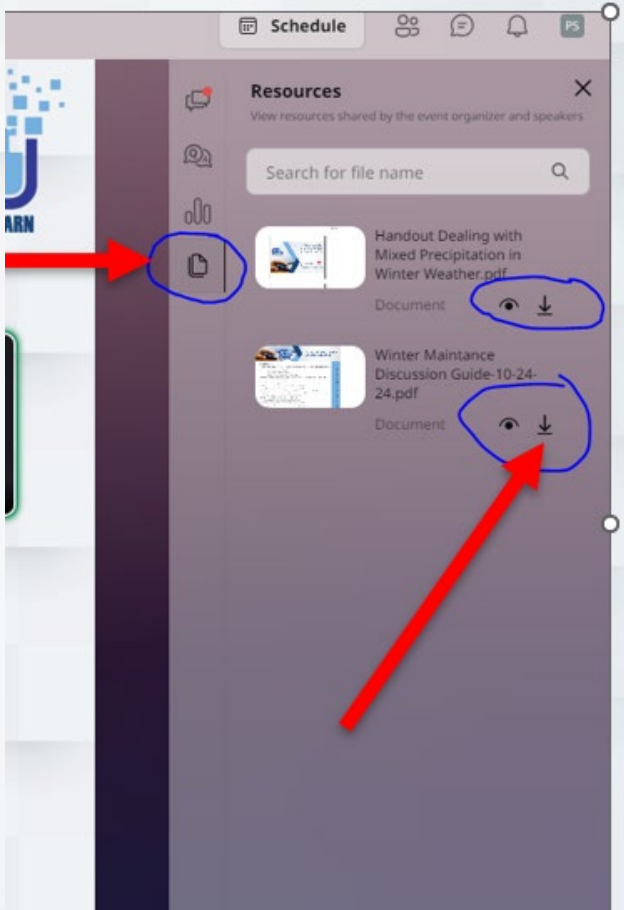

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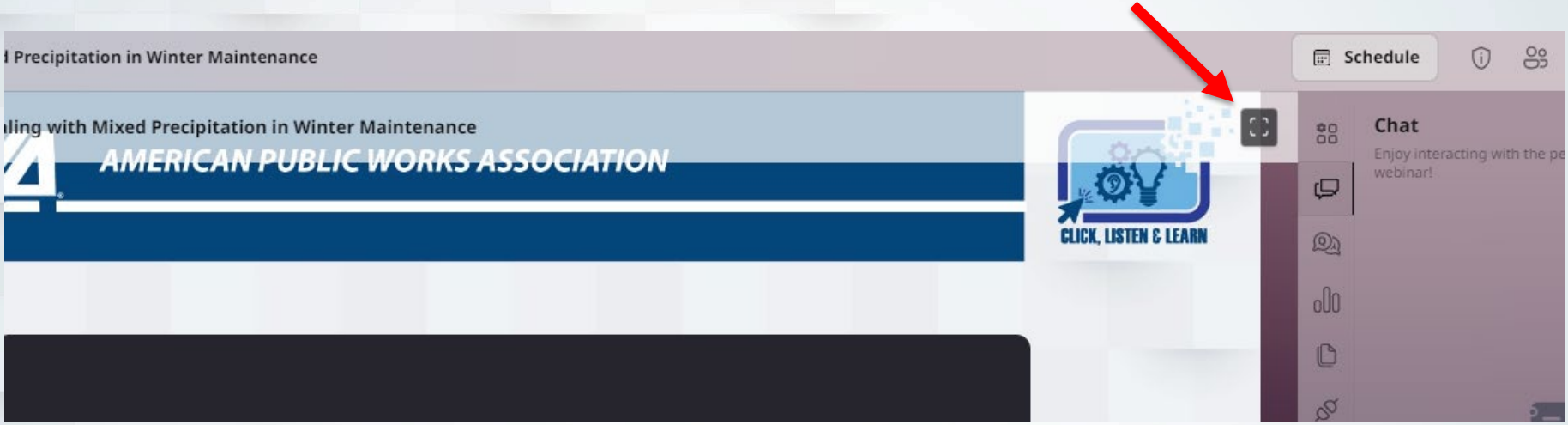
Viewing the Presentation



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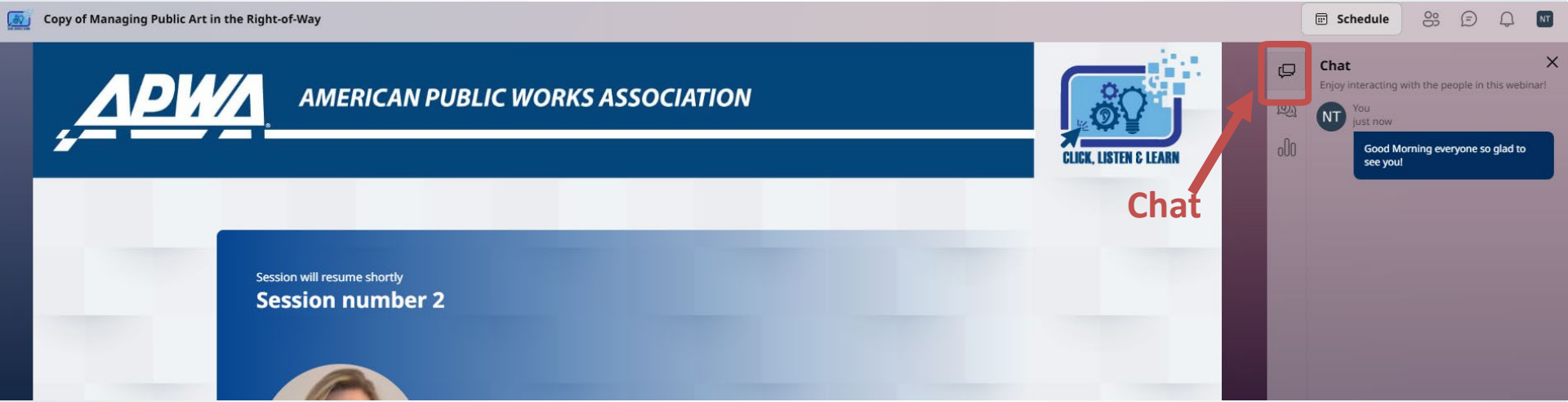
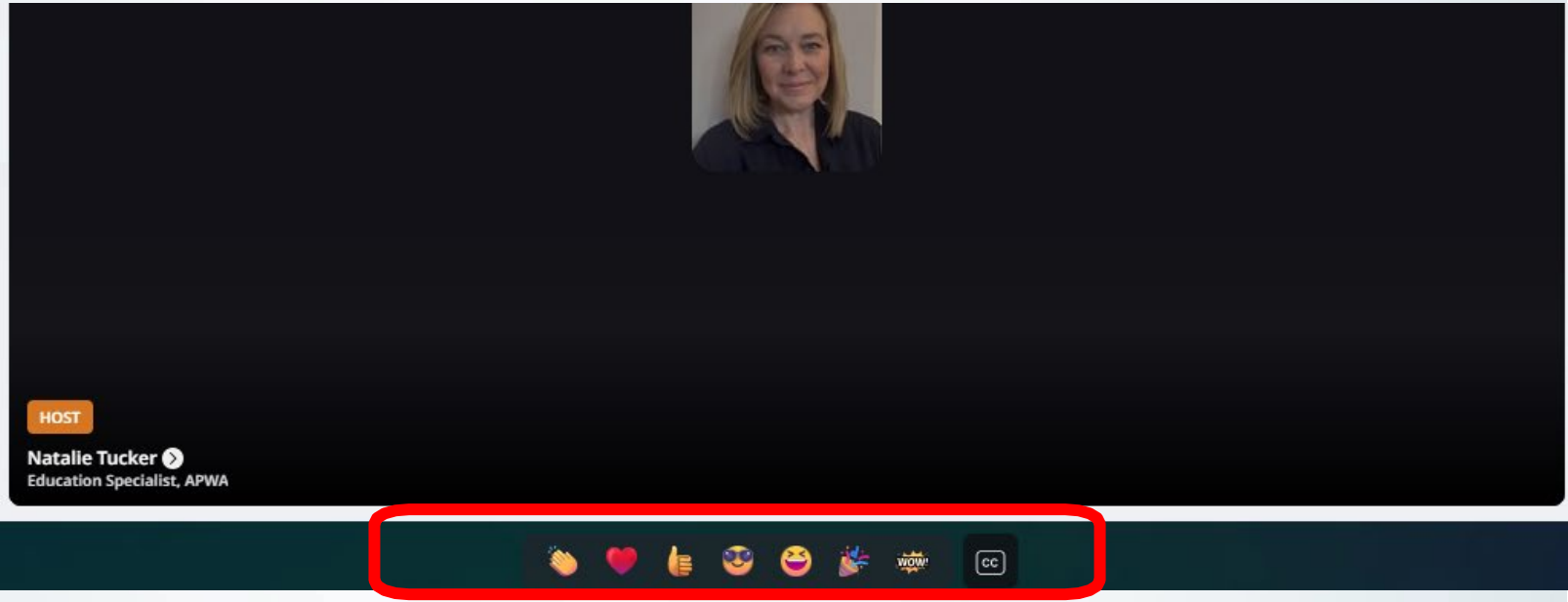
Communication & Engagement Opportunities



Reactions



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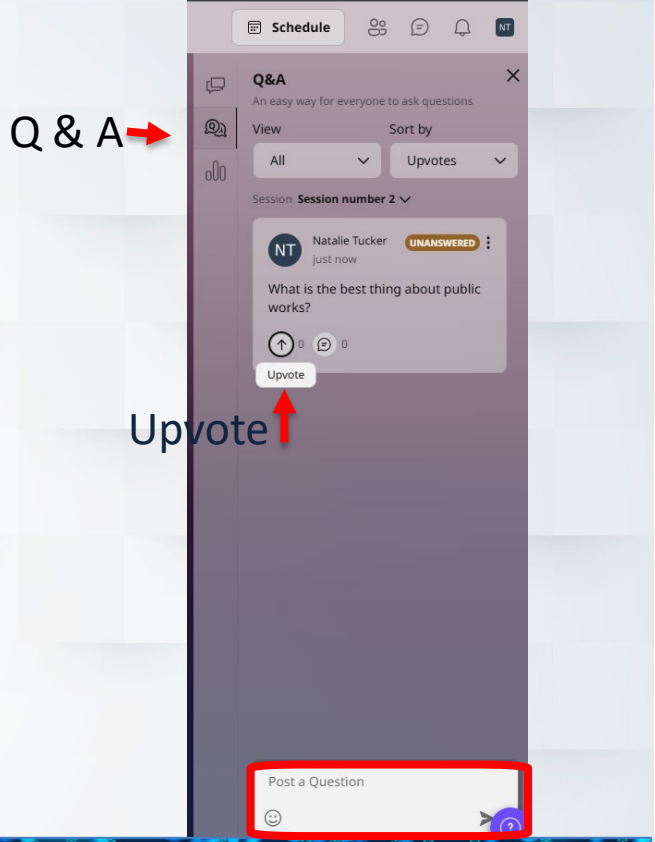
2. Choose to Upvote a question that is the same as your question.



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Today's Moderator:

Marshall Elizer

Senior Transportation Engineer

Kittleson & Associates

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Learning Objectives

After completing this course, participants will be better able to:

- *Explain key factors that influence target speed selection.*
- *Identify current speed management treatments and operational techniques used and describe situations in which they are most effective.*
- *List practical strategies for speed management and SSA implementation.*

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Today's Speakers

Kevin Elliott
Senior Marketing & Communications Strategist
Applied Research Associates, Inc.

John Murphy
Neighborhood Traffic Safety Services Manager
Bellevue, Washington

Hermanus Steyn
Senior Principal Engineer
Kittleson & Associates

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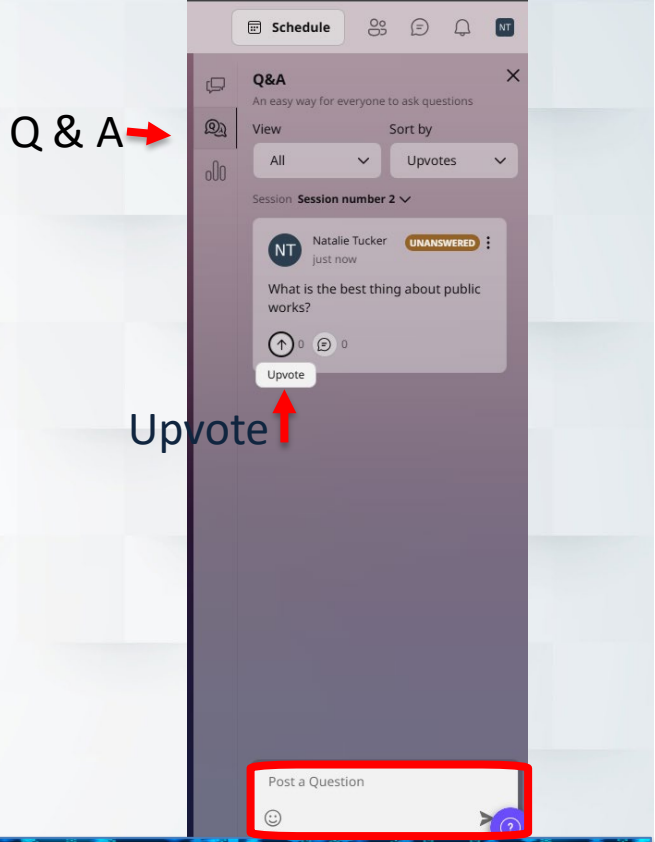

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Please join us in the virtual lounge for continued discussion

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What is the Safe System Approach?

Kevin Elliott
Senior Marketing Strategist
ARA, Inc.

What is the Safe System Approach?

A New Way of Thinking About Transportation Safety

- What it is
- How it's different
- How speed fits in

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What is the SSA?

- A philosophy / perspective shift

Traditional	Safe System

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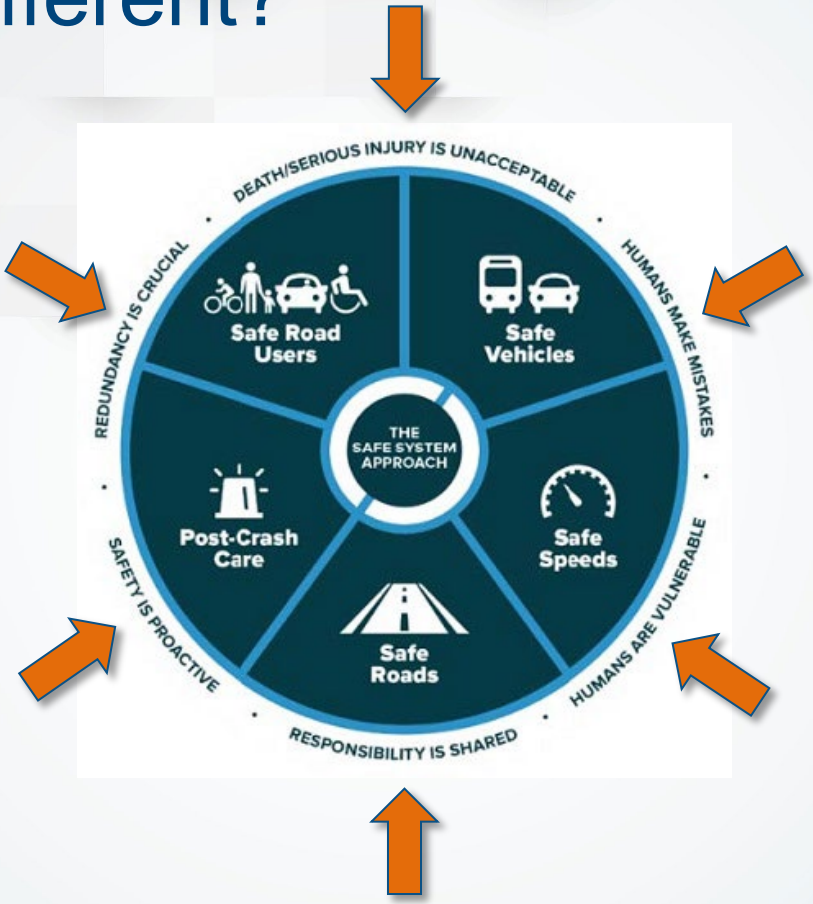
How is it different?



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SSA Principles

- Death/Serious Injury are Unacceptable
- Humans Make Mistakes
- Humans are Vulnerable
- Responsibility is Shared
- Safety is Proactive
- Redundancy is Crucial

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SSA Principles

- Death/Serious Injury are Unacceptable
- **Humans Make Mistakes**
- Humans are Vulnerable
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SSA Elements

- Safe Road Users
- Safe Vehicles
- Safe Speeds
- Safe Roads
- Post-Crash Care

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What is the Safe System Approach?

A New Way of Thinking About Transportation Safety

- Multidisciplinary
- Puts more responsibility on the system
- Ensures mistakes are not fatal

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What is the Safe System Approach?

Kevin Elliott
Senior Marketing Strategist
ARA, Inc.

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Drivers are speeding… how can we slow them down?

Making the Case for Speed Management & Traffic Calming

Hermanus Steyn
Senior Principal Engineer
Kittelson & Associates, Inc.

Presentation Outline

- Speed and Safety
- Traditional Approach to Speed
- Target Speed Concept
- Speed and Context
- Speed Management / Traffic Calming Treatments

Photo Source: Kittelson & Associates, Inc.

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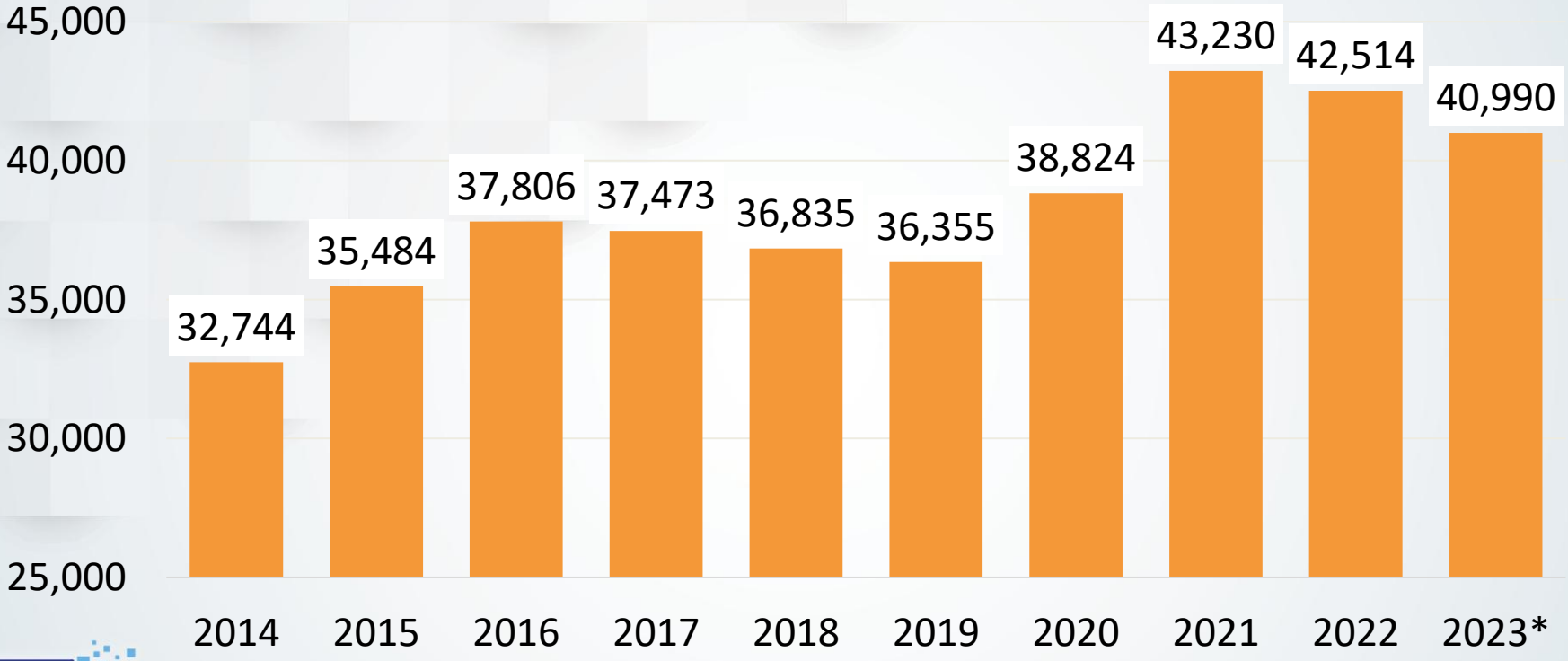
Trends in Traffic Fatalities



** 2023 number is preliminary*

Data Source: NHTSA, Graphic Source: FHWA Safe System Presentation (style modified)

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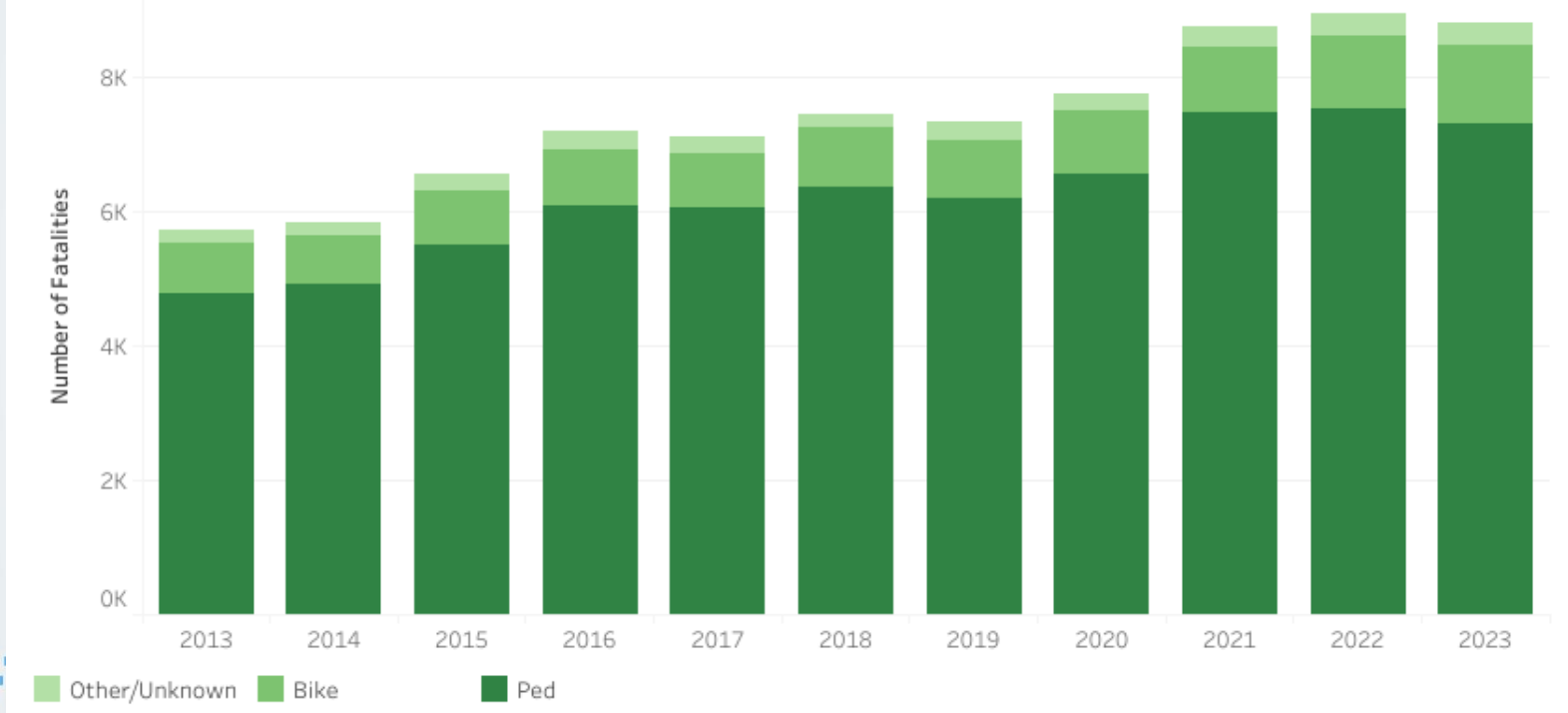
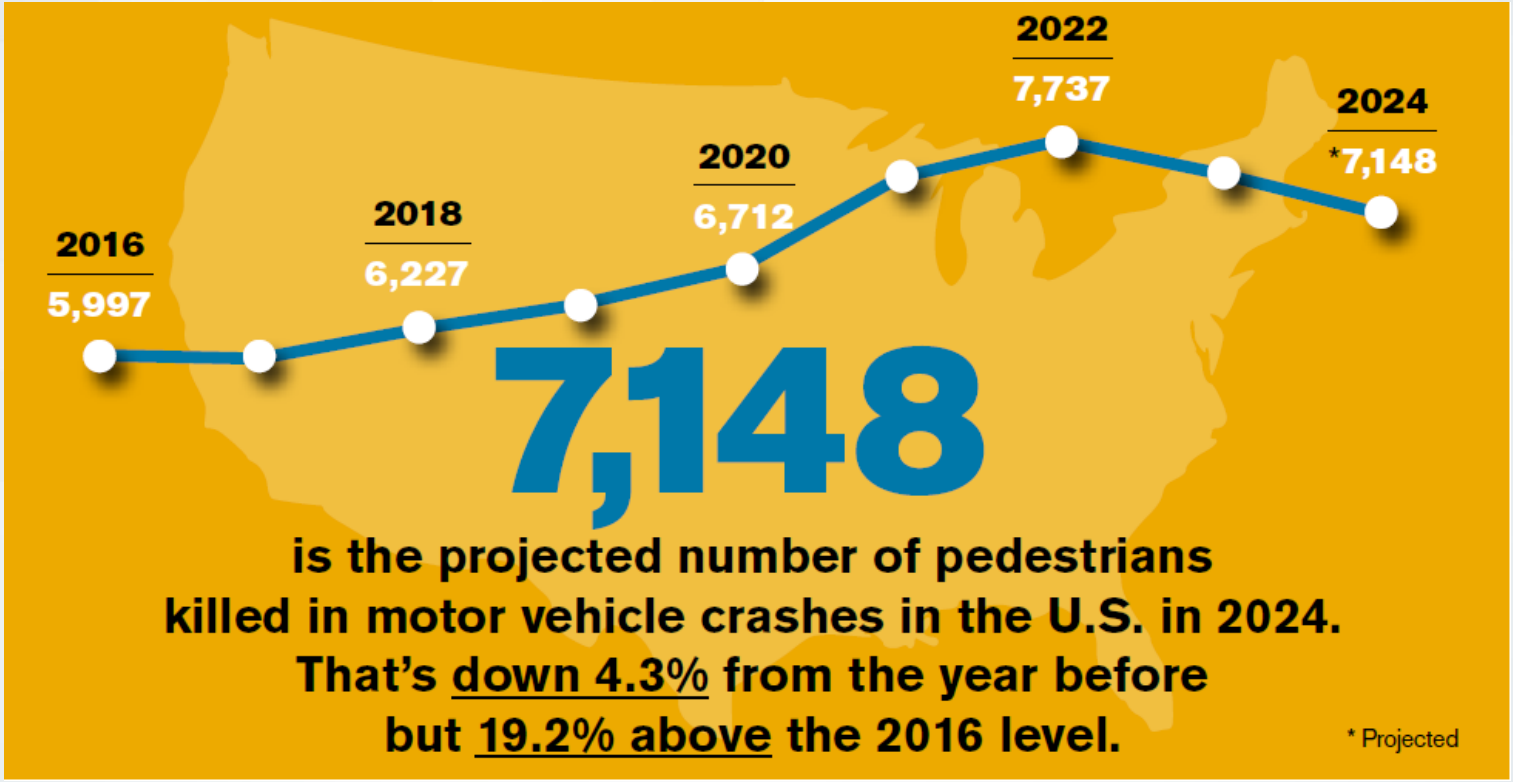
Number of Pedestrians, Bicyclists & Other Non-Motorized Fatalities



Source: PBIC, National Highway Traffic Safety Administration. (2026, January 9). Fatality Analysis Reporting System (FARS)

Pedestrian Fatality Trends



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Source: Pedestrian Traffic Fatalities by State, Governor's Highway Safety Association

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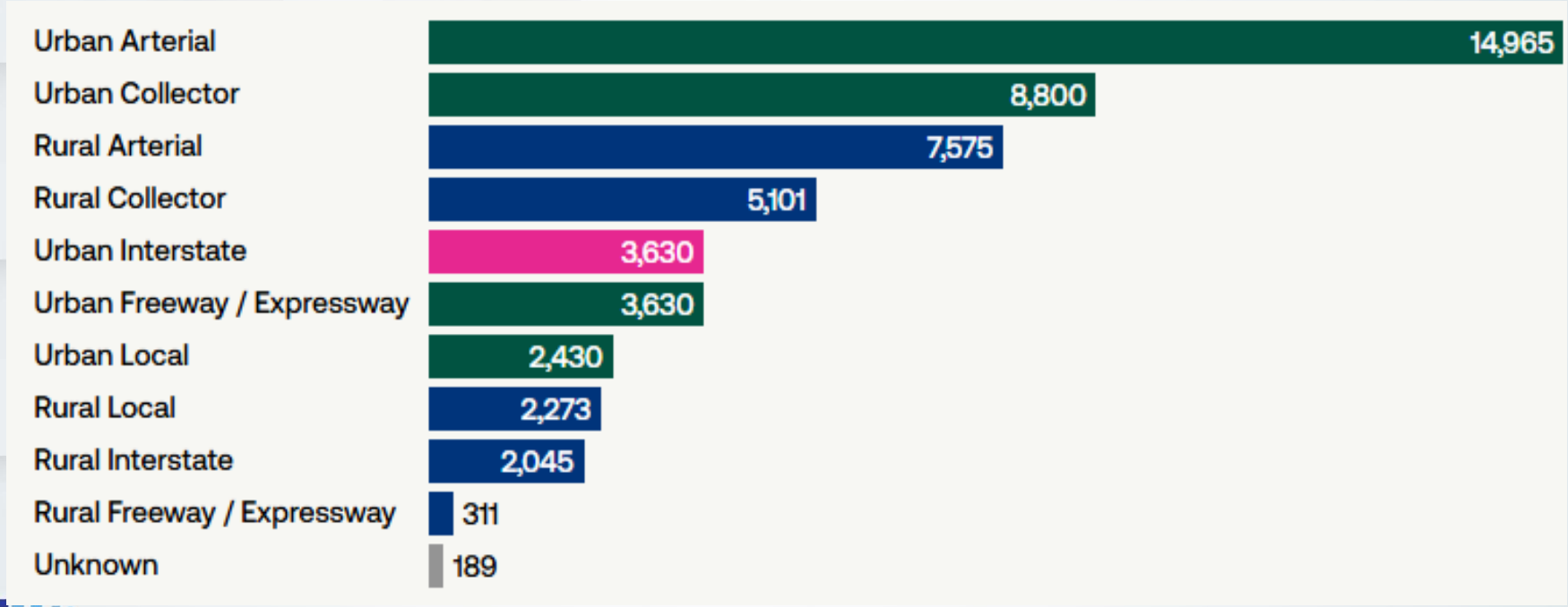
Traffic Fatalities by Type of Road, 2021

44% of all traffic fatalities occur on arterial roads



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Source: Federal Highway Administration

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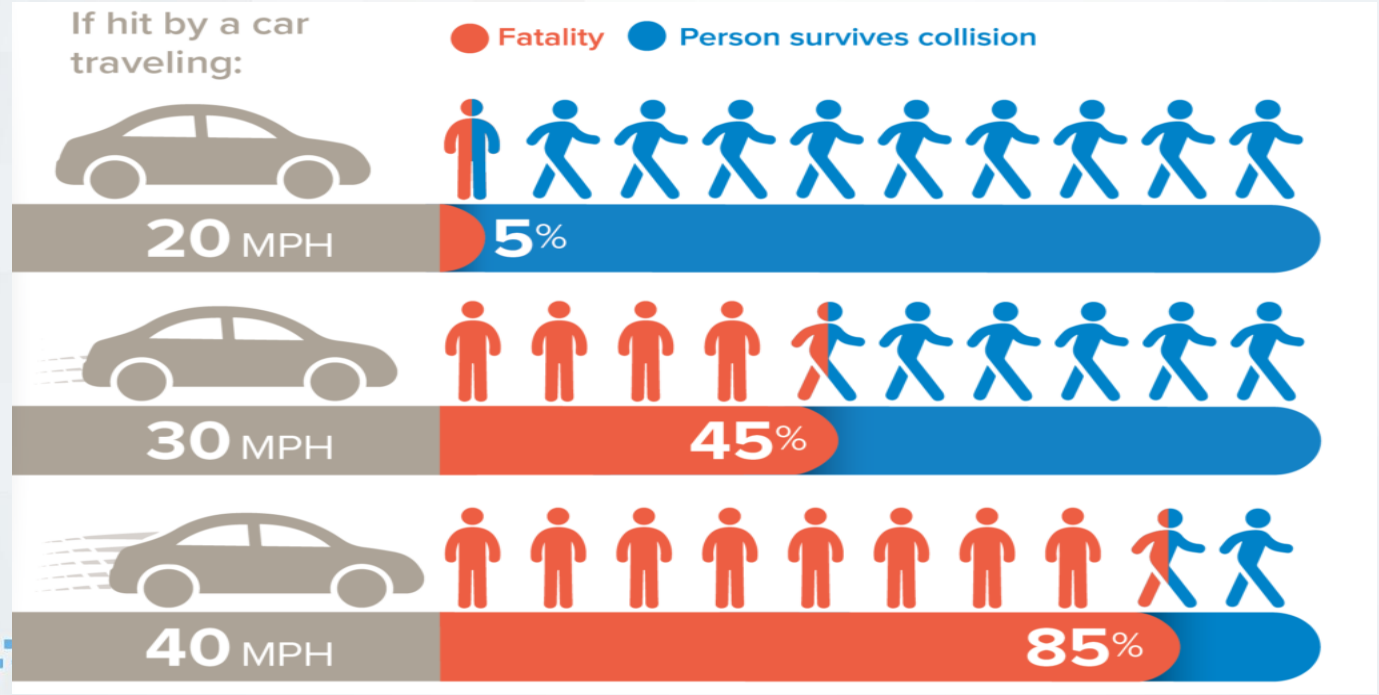
Vehicle Speed comparison to chance of Pedestrian Injury and Fatality



Data source: National Traffic Safety Board (2017) Reducing Speeding-Related Crashes Involving Passenger Vehicles

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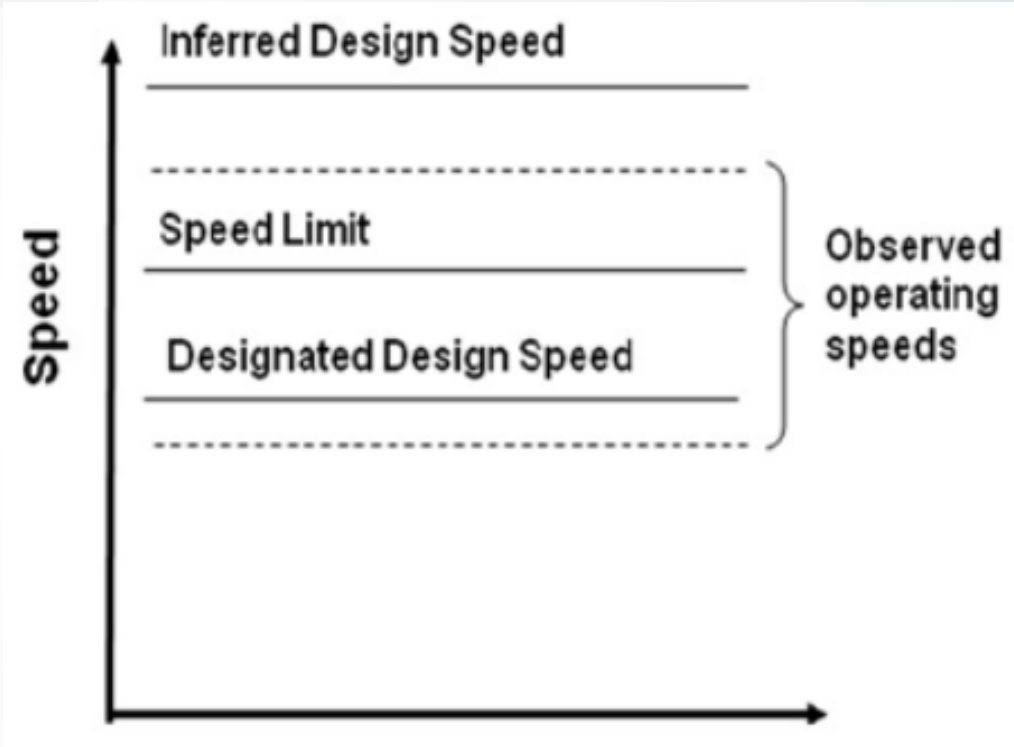
Traditional Approach to Speed

Design speed used to determine geometric design features like horizontal and vertical curvature

Posted speed limit typically based on observed 85th percentile speeds

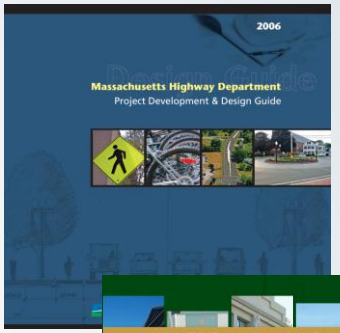


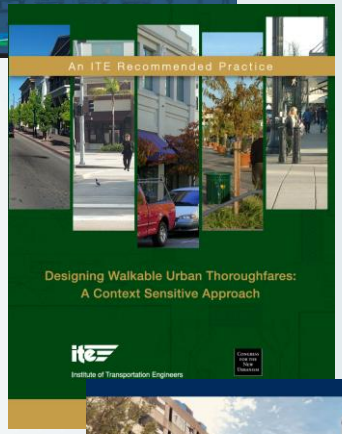
Source: FHWA, Speed Concepts: Informational Guide, 2009

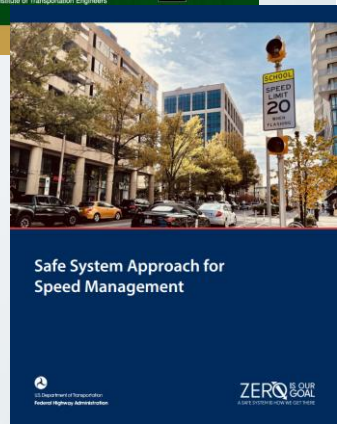
Target Speed Concept

Concept of target speed introduced in 2006 Massachusetts Project Development & Design Guide & 2010 ITE/CNU Designing Walkable Urban Thoroughfares: A Context Sensitive Approach

Target speed now used in a variety of guides and research reports, like FHWA's Safe System Approach for Speed Management (2023)







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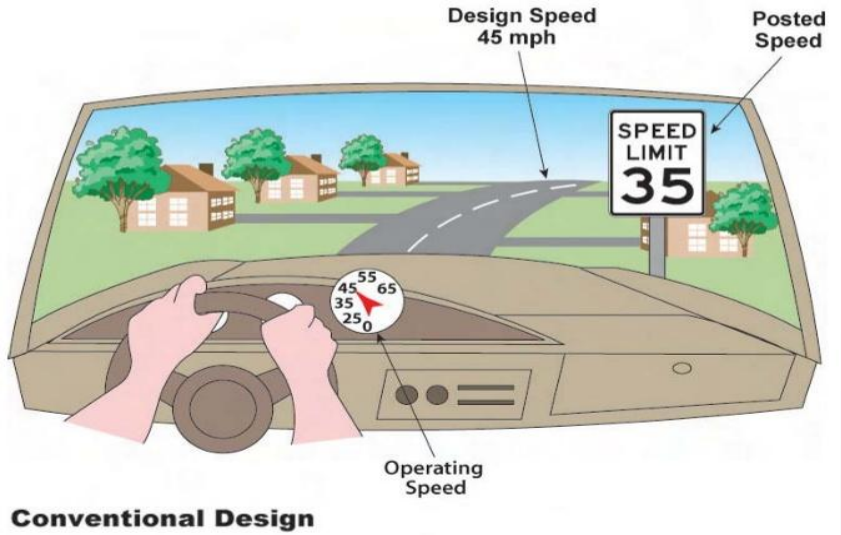
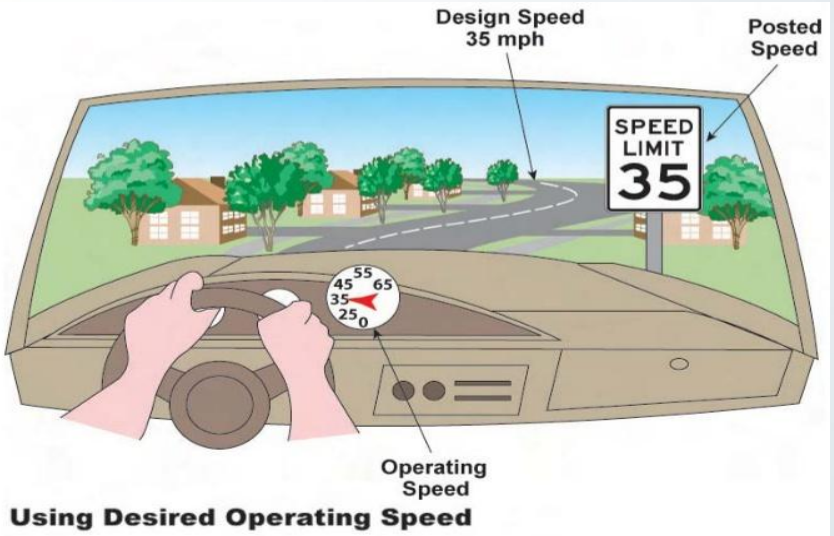
Target Speed Concept

Target Speed = Desired Operating Speed ≠ Posted Speed

Target Speed may not always equal the Design Speed





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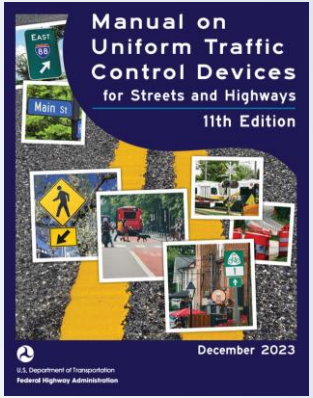
Graphic Source: NJDOT & PennDOT, Smart Transportation Guidebook, 2008

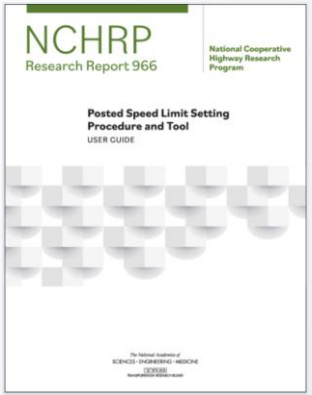
Speed and Context

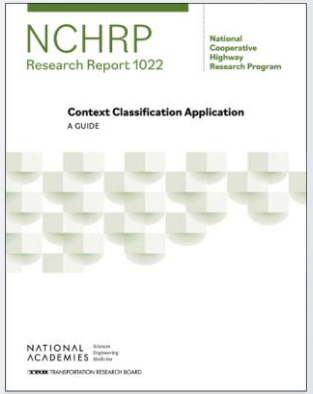
Context significant factor in determining target speed

Other current and future considerations may include:

- Multimodal activity and user types
- Adjacent land uses
- Functional classification
- Access control
- Driver characteristics
- Transportation role of the roadway
- Priority users
- Safety data
- Community and corridor plans







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Speed Management / Traffic Calming

- Nationally and many State DOTs refer to “speed management”
  - Most State DOTs focusing more on higher order roads
- Local agencies mostly use “traffic calming”

- Takeaway – following fundamental principles to implement the appropriate treatment
  - It is not picking any tool out of the toolbox
  - Understand what you want to fix and then pick the appropriate tool(s) to get the result you want

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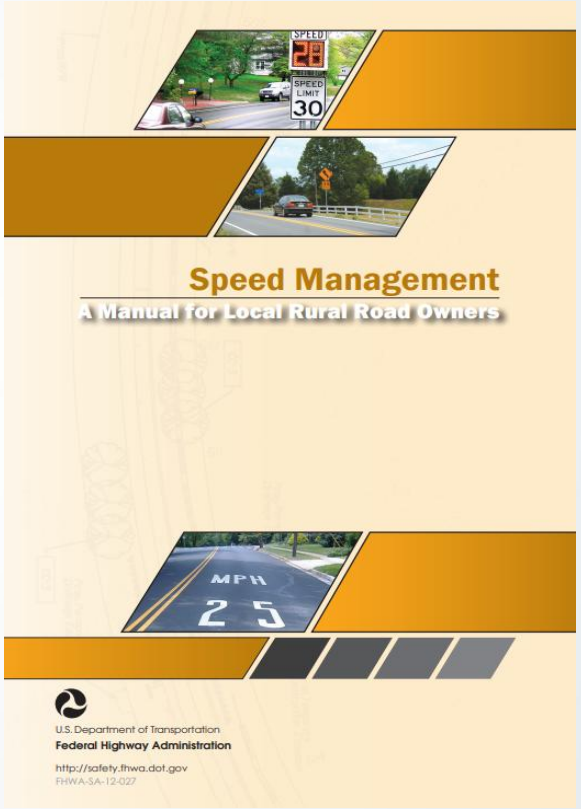
What is Speed Management?

The **FHWA Speed Management Guidebook** states that a speed management program is a strategy to address concerns of undesirable speeds at a specific location, along a corridor, or within a road network.



Source: FHWA

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Speed Management Considerations

Things to consider when selecting strategies to achieve desired operating speed:

- Roadway Context
- Target speed
- Community vision for the roadway
- Multimodal needs (including safety)
- Design vehicle and emergency vehicles
- Access management needs

Photo Source: Kittelson & Associates, Inc.

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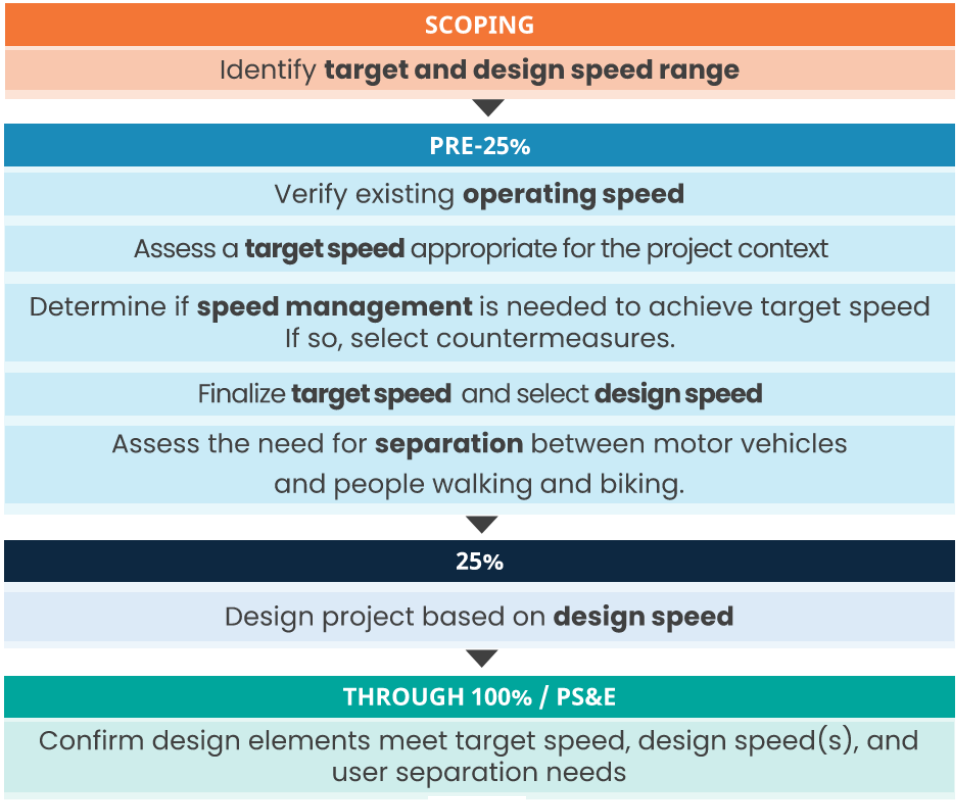
Speed Management Treatments

Examples include:

- Roundabouts and traffic circles
- On-Street Parking
- Chicanes
- Lane Narrowing
- Horizontal Deflection
- Street Trees/Landscaping
- Short Blocks
- Vertical Deflection
- Raised Intersections or crosswalks
- Speed Feedback Signs
- Speed Limit Pavement Marking
- Median Islands
- Curb Extensions/Bulb-Outs
- Terminated Vista

MassDOT: Target Speed & Countermeasures

Target Speed Process



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massDOT
Massachusetts Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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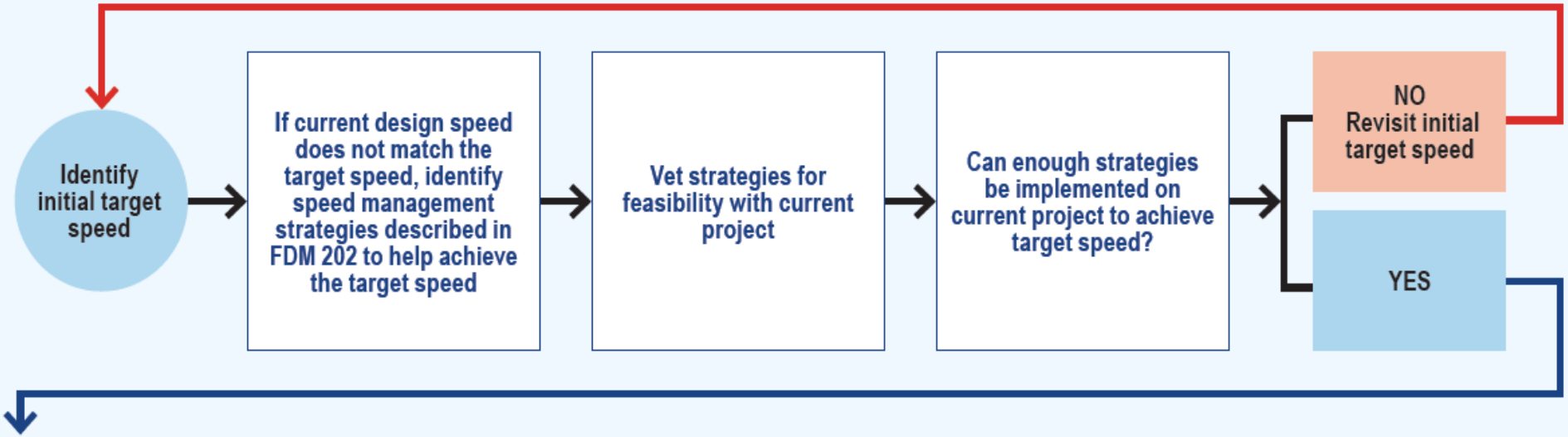
Speed Management Treatments – Florida DOT Example

REVIEW POTENTIAL COUNTERMEASURES:

Graphic Source: FDOT, Context Classification Guide, 2022



DOCUMENT TARGET SPEED: If the initial recommended target speed value is not feasible to attain in a single project, the target speed should be as close to the initial target speed values as can be achieved within the constraints of the project.

Speed Management Treatments – Florida DOT Example

Graphic Source: FDOT, Context Classification Guide, 2022 (left), Design Manual, 2024 (right)

FIGURE 20 C2T-RURAL TOWN SPEED MANAGEMENT

1. Terminated vista
2. Raised crosswalk
3. Shared lanes with sharrows
4. Street trees

Context Classification	Target Speed (mph)	Strategies																	
		Lane Repurposing	Roundabouts	On-Street Parking	Chicanes	Lane Narrowing	Horizontal Deflections	Street Trees	Short Blocks	Speed Tables	Raised Intersections	Raised Crosswalks	Speed Feedback Sign	Pedestrian Refuge Islands	Bulb-Outs	RRFBs	PHBs	Terminated Vistas	Islands in Curved Sections
C2T	40-45		X			X	X						X				X		
	35	X	X	X		X	X	X	X				X	X	X	X	X	X	
	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
C3R, C3C	40-45		X			X	X						X				X		
	35	X	X			X	X						X	X	X	X	X	X	
C4	40-45		X			X	X						X				X		
	35	X	X	X		X	X	X	X				X	X	X	X	X	X	
	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
C5	35	X	X	X		X	X	X	X				X	X	X	X	X	X	
	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
C6	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes:
1. For C1 and C2 (55-70 mph): Speed Management Strategies are not used on high-speed roadways. See ***FDM 202.4*** for information on transitions from high-speed to low-speed facilities.
2. For C3R and C3C (50-55 mph): Project-specific; see ***FDM 202.4***.

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Speed Management Treatments – Washington DOT Example

Strategy Category	Strategy	Speed Range (mph)	Hard/ Soft	Land Use				Cost		Maintain-ability
				R	SU	U	UC	Initial	Ongoing	
Circular Intersections	Neighborhood Traffic Circle	≤ 35	Hard				*	Low	Low	◕
	Mini Roundabouts	≤ 35	Hard		✓	✓	✓	Low	Low	◑
	Compact Roundabouts	All	Hard	✓	✓	✓	✓	Medium	Low-Med	◑
	Modern Roundabouts	All	Hard	✓	✓	✓	✓	High	Medium	◑
Delineation	Lane Narrowing	All	Either	✓	✓	✓	✓	Low	None	●
	Optical Speed Markings	≥ 40	Soft	✓	✓			Low	Low	◔
	Pavement Markings: Longitudinal	≤ 45	Soft	✓	✓	✓	✓	Low-Med	None	●
	Pavement Markings: Transverse	All	Soft	✓	✓	✓	✓	Low	Low	◔
	Transverse Rumble Strips	All	Either	✓	✓	✓	✓	Low	None	◑

R = Rural
SU = Suburban
U = Urban
UC = Urban Core

○ = Very Hard
◔ = Hard
◑ = Neutral
◕ = Easy
● = Very Easy

Source: WSDOT, Design Manual, 2023

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Ongoing Research

NCHRP Project 17-111: Speed Management Strategies to Improve Pedestrian and Bicyclist Safety on Arterials and Higher-Speed Roadways

NCHRP 15-76(01), Designing for Target Speed

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Thank You

Hermanus Steyn
Kittelson & Associates, Inc.
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Local and Arterial Speed Management

Case study from Bellevue, WA

John Murphy
Manager | Neighborhood Traffic Safety Services | City of Bellevue, Washington

Agenda

- Bellevue Context
- Vision Zero
- Local Streets
  - Traffic calming
  - Speed limit reduction
- Arterials
  - Speed Management Plan
  - Speed limit reduction
  - Speed safety cameras

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Bellevue Context

- Incorporated 1953; prototypical post-war, edge city
- 158,000 residents; 160,000 jobs
- 117 languages spoken in Bellevue schools

Transportation highlights:

- Light rail (6 stations) to Seattle
- 200+ signalized intersections
- 350 miles of sidewalks
- 165 miles of bicycle facilities
- 1,100 lane miles of roadway

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Vision Zero and Safe Speeds

Council adopted vision: Eliminate traffic deaths and serious injuries on Bellevue streets by 2030.

Key Safe Speeds strategies:

1. **Set appropriate speed limits**
2. Design streets for safety over speed
3. Leverage technology to manage speeds

30+ mph streets are

25%

of the street network, but account for

88%

of crashes where a person is **killed or seriously injured**

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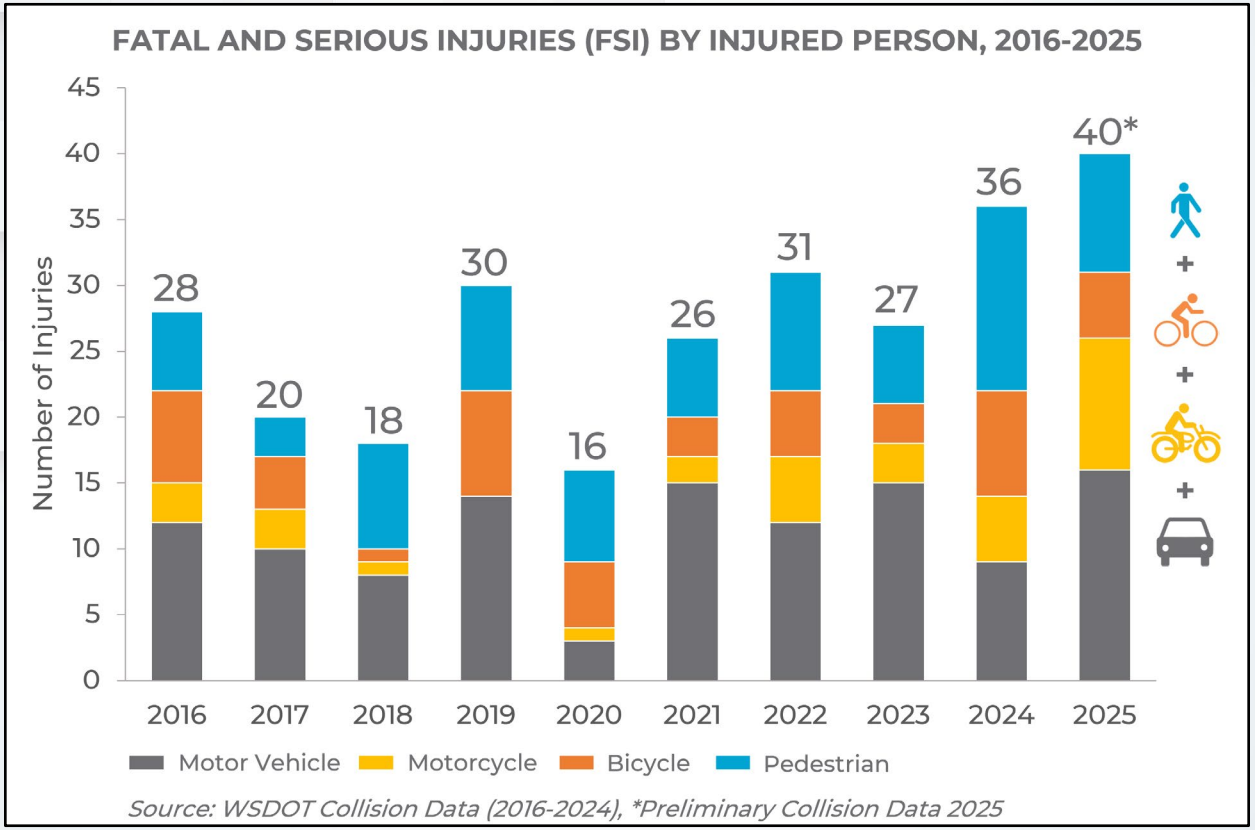
Fatal/Serious Injury Crashes in Bellevue



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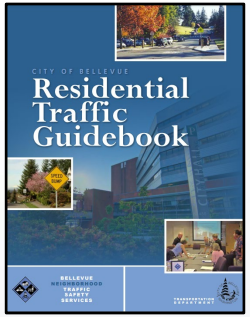
Managing Speeds on Local Streets

- Leader in traffic calming
- Applied to 25 mph streets
- 100s of speed humps, traffic circles, neighborhood entry treatments, school zone flashing beacons
- 70+ radar signs
- Strong educational and encouragement arm



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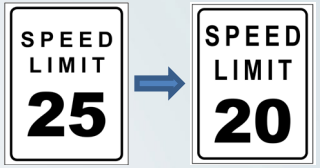
Local Street Speed Limit Reduction



- 2016: state law changed allowing cities to implement 20 mph speed limit without engineering study
- 20 mph speed limit tested (3 neighborhoods over 3 years)
- High-end speeding: reduced 19%
- “Safety starts on your street”

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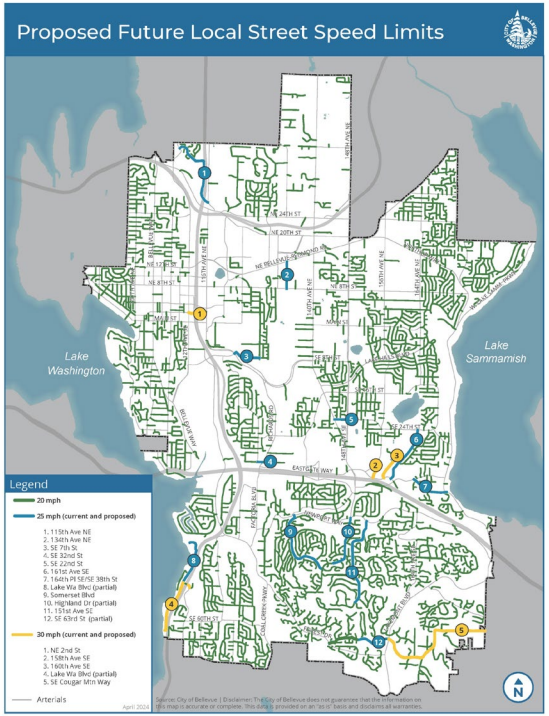
Local Street Speed Limit Reduction

- Subset of streets to remain at 25 mph or 30 mph
- 360 speed limits signs, 160 pavement legends
- Administratively: approved by city Council in October 2024 (updated city code)

If...

Access density > 65.1	*else*	Classification score <= 2.0	*else*	Mid-week average volume > 1000 and/or average speed >= 30 mph	*else*	Engineering judgment
then		*then*		*then*		
SPEED LIMIT 20		SPEED LIMIT 20		SPEED LIMIT 25		*Engineering judgment pervades final decision*



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Speed Management Plan

- Groundwork for speed limit evaluation (30+ mph streets)
- Identified highest-need streets based on speed probe data
- Developed arterial toolkit of countermeasures

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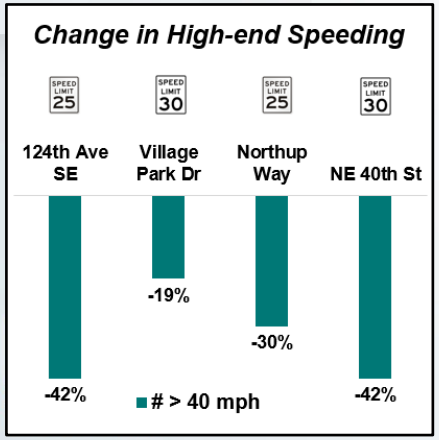
Strategy 3: Strategic Alignment and Tasks			
Action 5: Create a proactive approach to determining the "recommended" speed limits on multiple corridors.	Establish an approach for determining engineer recommended speeds limits on multiple corridors, including staff leads, sequencing and timeline. While the Speed Limit Setting tool provides a procedure to receive a "suggested" speed from the tool and then develop a "recommended speed" by the engineer(s) (which may better match the roadway context and the Vision Zero 2030 goal), this procedure is limited to a corridor-by-corridor basis.	Develop by Quarter 2, 2024.	Traffic Engineering (Lead) + Mobility Planning & Solutions (Support)

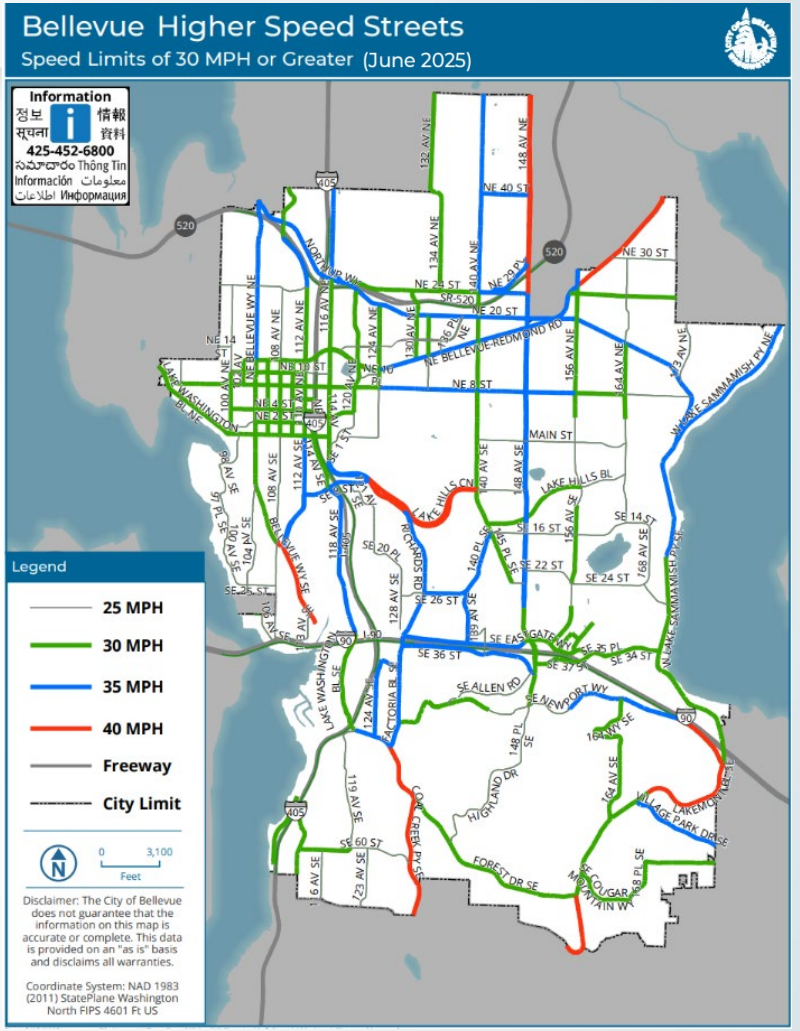
Countermeasure:	Urban Core		Urban			Suburban		
	30 MPH	35 MPH	30 MPH	35 MPH	40 MPH	30 MPH	35 MPH	40 MPH
1. Horizontal Deflection								
Lateral Shift	◒	◒	◒	◒	○	◒	◒	○
2. Vertical Deflection								
Raised Crosswalk	◒	◒	◒	◒	○	◒	◒	○
Offset/Split Speed Table	◒	◒	◒	◒	○	◒	◒	○
Raised Intersection	●	●	●	●	○	◒	◒	○
Speed Cushion	●	●	●	◒	○	◒	◒	○
3. Travel Lane Width Reduction								
Median Island	●	●	●	●	◒	●	●	◒
Travel Lane Width Reduction	●	●	●	●	◒	●	●	◒
4. Pavement Markings/Modifications								
Advisory Speed Marking	●	●	●	●	●	●	●	●
5. Signing and Speed limit Setting								
Speed Feedback Signs	●	●	●	●	◒	●	●	◒
Speed Limit Sign Density/Placement	●	●	●	●	●	●	●	●
Signs Stating Speed Ticket Fine Amount	●	●	●	●	●	●	●	●
6. Traffic Signal Operations								
Signal Coordination Set for Speed Limit	●	●	●	●	●	●	●	●
7. Enforcement Strategies								
Speed Safety Cameras (Automated Enforcement)	●	●	●	●	●	●	●	●
High Visibility Enforcement with Public Campaign	●	●	●	●	●	●	●	●

● Typically appropriate ◒ Sometimes appropriate ○ Not appropriate

Safe Speeds Bellevue

- Evaluate 30+ mph speed limits
- Target speed approach with underlying standard operating procedure (SOP)
- Tested on 4 streets first
- Robust outreach





Identifying Speed Limits

Conflicts
Frequency of potential conflicts on a street (crossing point density and modal mixing)

+

Activity
How active a street currently is or is expected to be

Activity \ Conflicts	High	Moderate	Low
High	SPEED LIMIT 25 *	SPEED LIMIT 25	SPEED LIMIT 25 *
Moderate	SPEED LIMIT 25	SPEED LIMIT 25 *	SPEED LIMIT 30
Low	SPEED LIMIT 25	SPEED LIMIT 30	SPEED LIMIT 35

* Staff used engineering judgement on streets with high activity and high conflicts to consider a 20 mph speed limit. Staff also used engineering judgement on some other street categories to select a speed limit of either 25 or 30 mph

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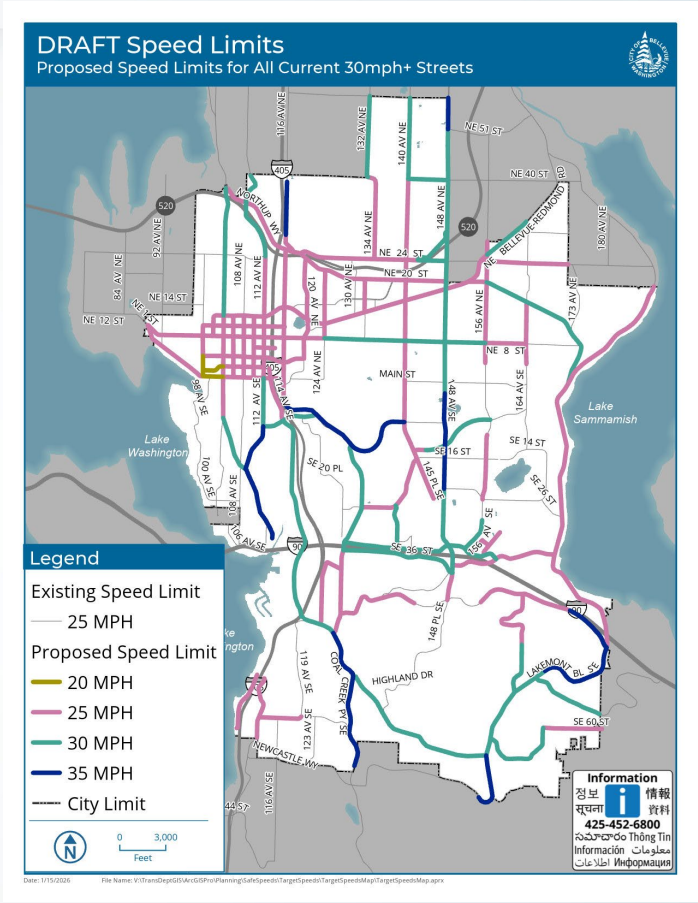
Proposed Speed Limits

- No 40 mph speed limits
- Proposed changes (by mileage)
  - No change: 21%
  - -5 mph: 59%
  - -10 mph: 20%
- Continued outreach
- Approval in June
- Implementation in 2027+ (phased)
- Additional countermeasures if needed



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Public Sentiment

“The issue isn't speed limits, it's lack of enforcement that allows a few drivers to drive recklessly.”

“We need to invest in *actual* bike and pedestrian infrastructure.”

“Should have speed cameras”

Arterial Streets

75%+ think speed of cars affects the safety of people driving, biking, and walking

70%+ say they will follow the speed limit

Local Streets

71% of respondents agree/strongly agree that THEY slow down when seeing 20 mph signs

23% of respondents agree/strongly agree that OTHERS slow down when seeing 20 mph signs

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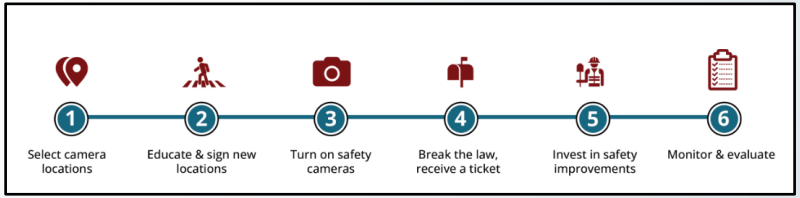
Speed Safety Cameras

- School zone and red light cameras in operation since 2009
- State law (2024): expanded use
- Criteria:
  - High-speeding crash network
  - Speeding risk network
  - Police Department citations
- Robust outreach
- 7 locations (14 cameras) planned for 2026



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Lessons Learned

1. Tie back to bigger vision.
2. Data. Data. Data.
3. Bring the community along (be omnipresent)
4. Bring the council along.
5. Anticipate the questions.
6. Emphasize: not a panacea.

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