

Orlando, FL

November 7-8, 2024



2024 TRANSPORTATION SYMPOSIUM

Target Speed



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FDOT, Central Office

REGENCY 1: Target Speed

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**State Safety
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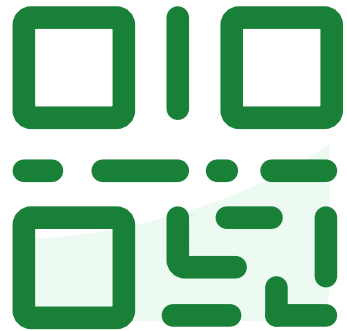
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Audience Q&A

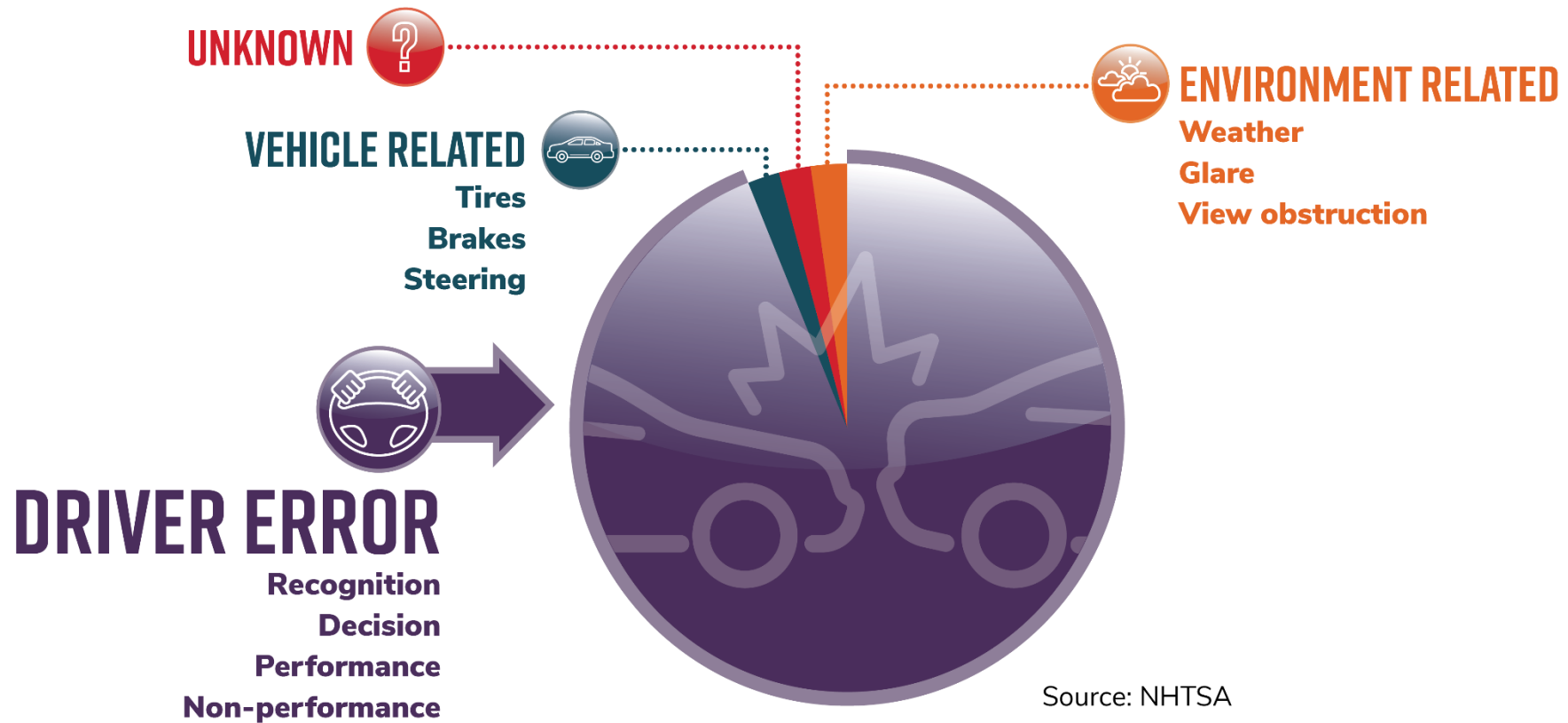
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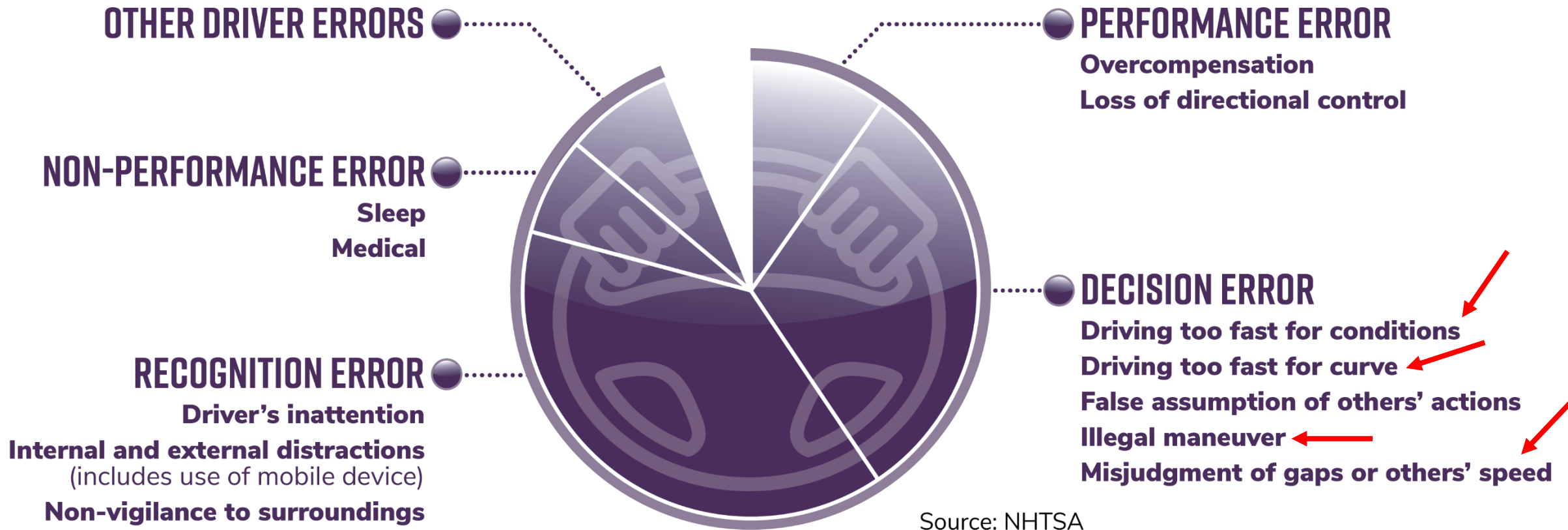


Brenda Young
State Safety Office

Our National Safety Challenge



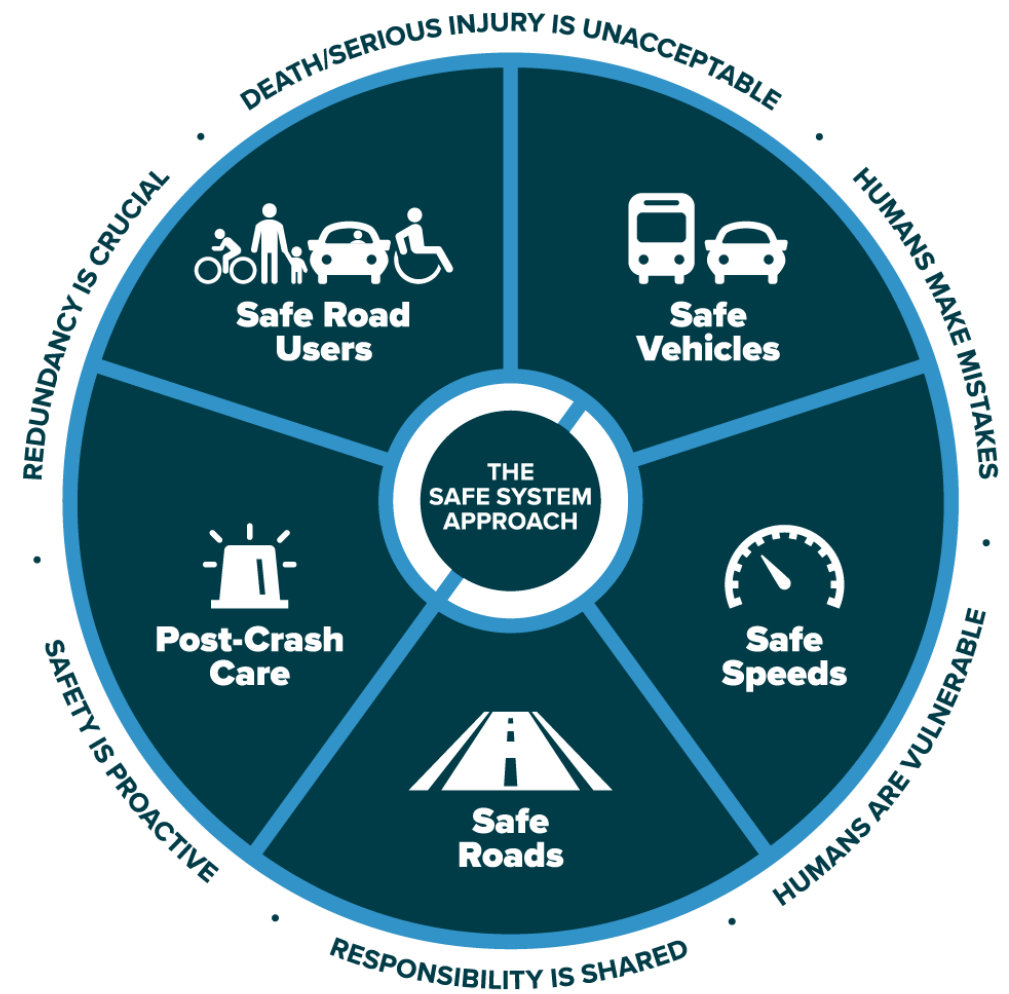
NHTSA National Driver Behavior/Error Details



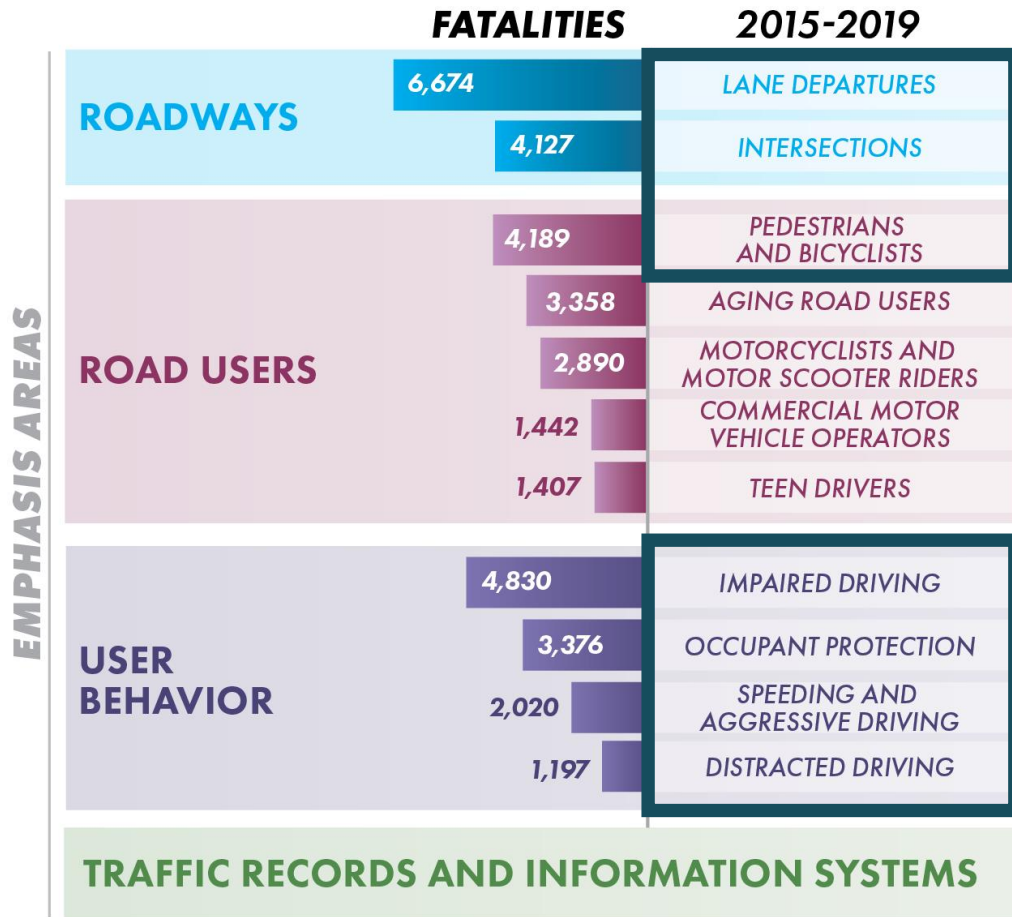
Safe System Approach to Safety



Source: Florida Strategic Highway Safety Plan, 2021



Emphasis Areas



SAFETY COALITIONS



DRIVE SAFELY
IN MEMORY

9 OUT OF EVERY 10 FATAL CRASHES

3 OUT OF EVERY 4 INJURY CRASHES

TARGET ZERO
FATALITIES & SERIOUS INJURIES

FOCUS BEHAVIORS

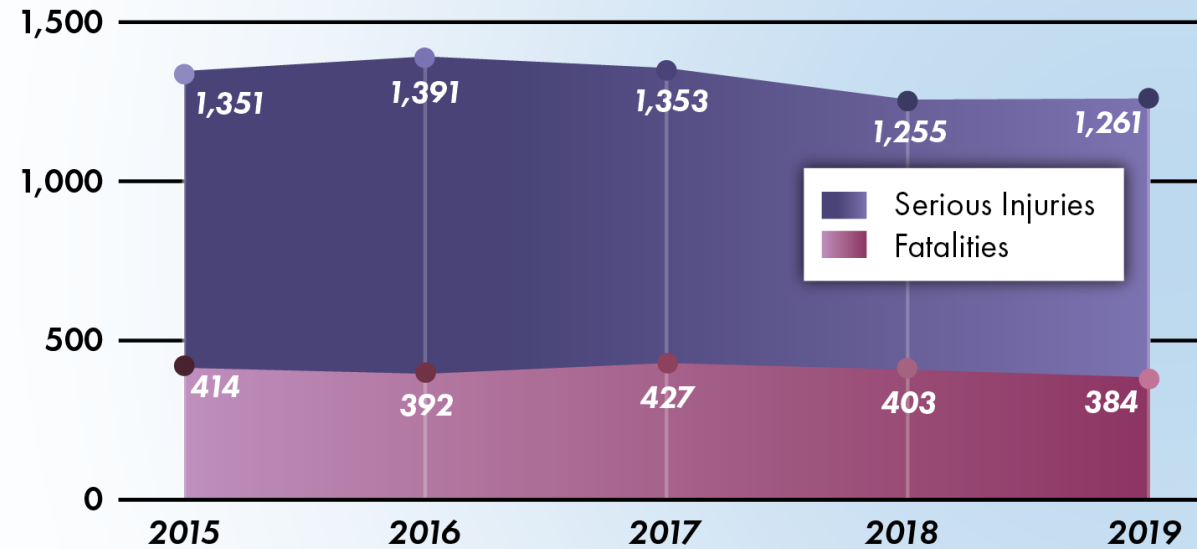
SPEEDING AND AGGRESSIVE DRIVING

DISTRACTED DRIVING

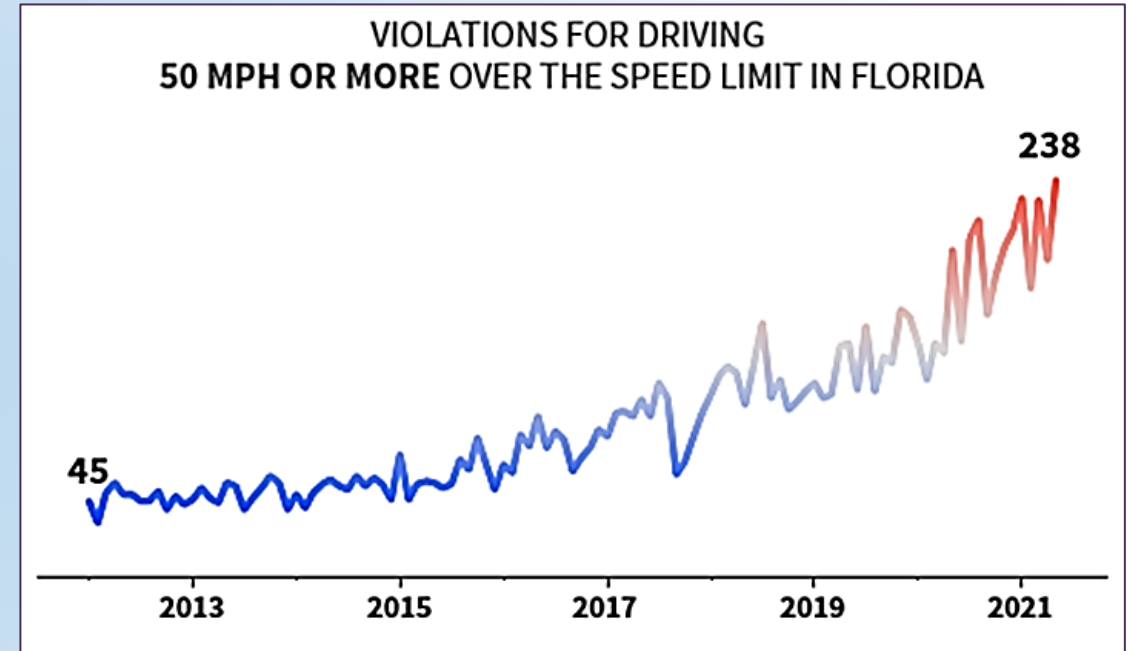
Speeding and Aggressive Driving



FATALITIES AND SERIOUS INJURIES INVOLVING SPEEDING AND AGGRESSIVE DRIVING



Source: 2021 Florida Strategic Highway Safety Plan



Source: 2021 FLHSMV FHP Joint Media Release

FHP Traffic Stop Data

Safety Office: Campaign Targeting Tool
Target Zero Fatalities and Serious Injuries

[f](#)
[t](#)
[l](#)

All Crashes
Intersections
Lane Departure
Pedestrians (Motorists)
Pedestrians (Non-Motorist)
Bicyclists (Motorist)
Bicyclists (Non-Motorist)
Traffic Stops

Selectors	County All	Zipcode All	Violation All	DMA All
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967,354
Total Stops

51%
497,836 Selected

497,836
Selected Stops

* Note: Default map is a static map of total traffic stops by zip code. **Map does not change with chart-based filtering.**

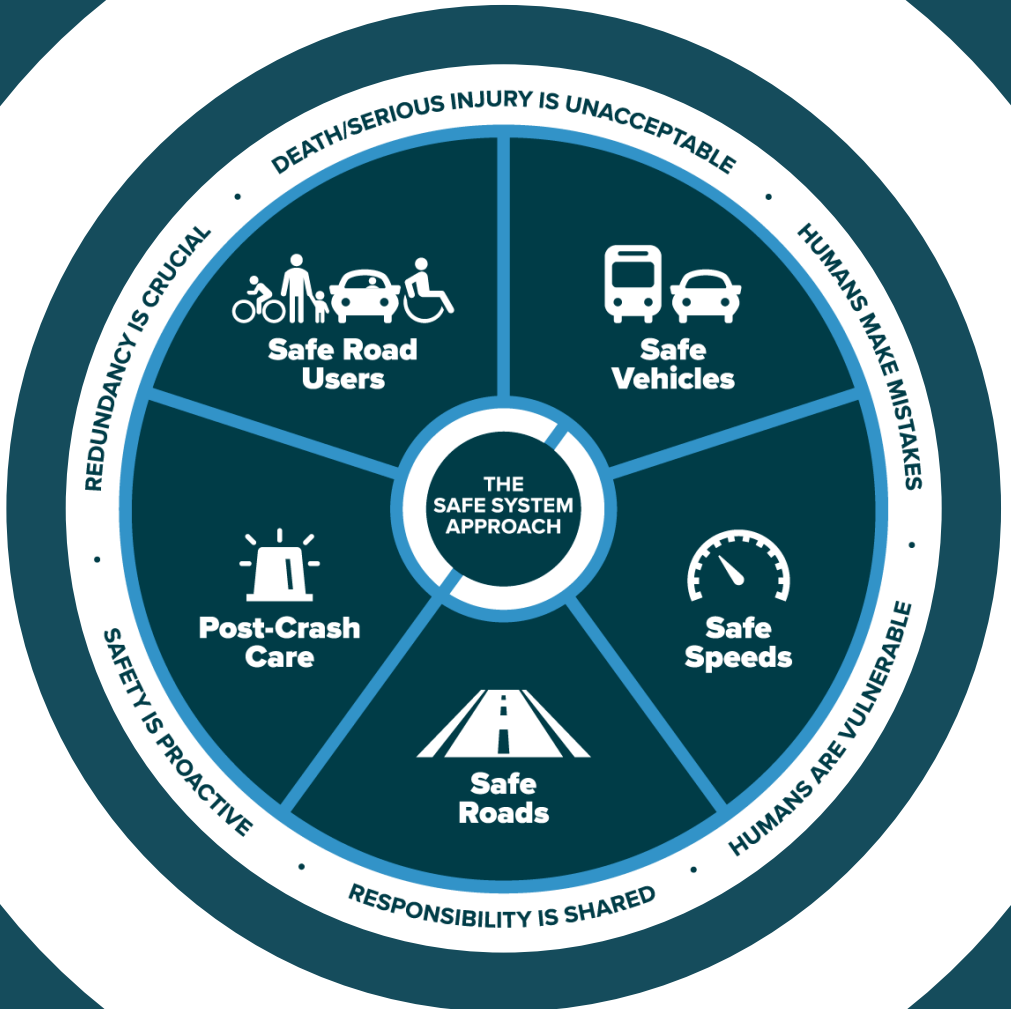
Esri, HERE, Garmin, USGS, EPA, NPS | Florida Department of Transportation | Powered by Esri

10k
Show all

Zip Code	Stops (Approx.)
34945	9500
34117	8500
34990	7500
32667	6500
34772	5500
32317	5000
32344	5000
32351	4500
32966	4500
32327	4500
32025	4500
34739	4000
34747	4000

400k
Show all

Violation Type	Stops (Approx.)
Infraction Arrest - Speed	350k
Warning - Speed	180k
Driver Issued - CMV Inspection	150k
Infraction Arrest - Seatbelt (Driver)	100k
Infraction Arrest - Violations Of Traffic Control Device	100k
Warning - Other Moving Violations	100k
Infraction Arrest - Move Over Law	100k



Speed vs.
Speeding

Speed and Survivability



Speed and Driver's Vision

Driver's Peripheral Vision at 10-15 MPH



Driver's Peripheral Vision at 30-35 MPH



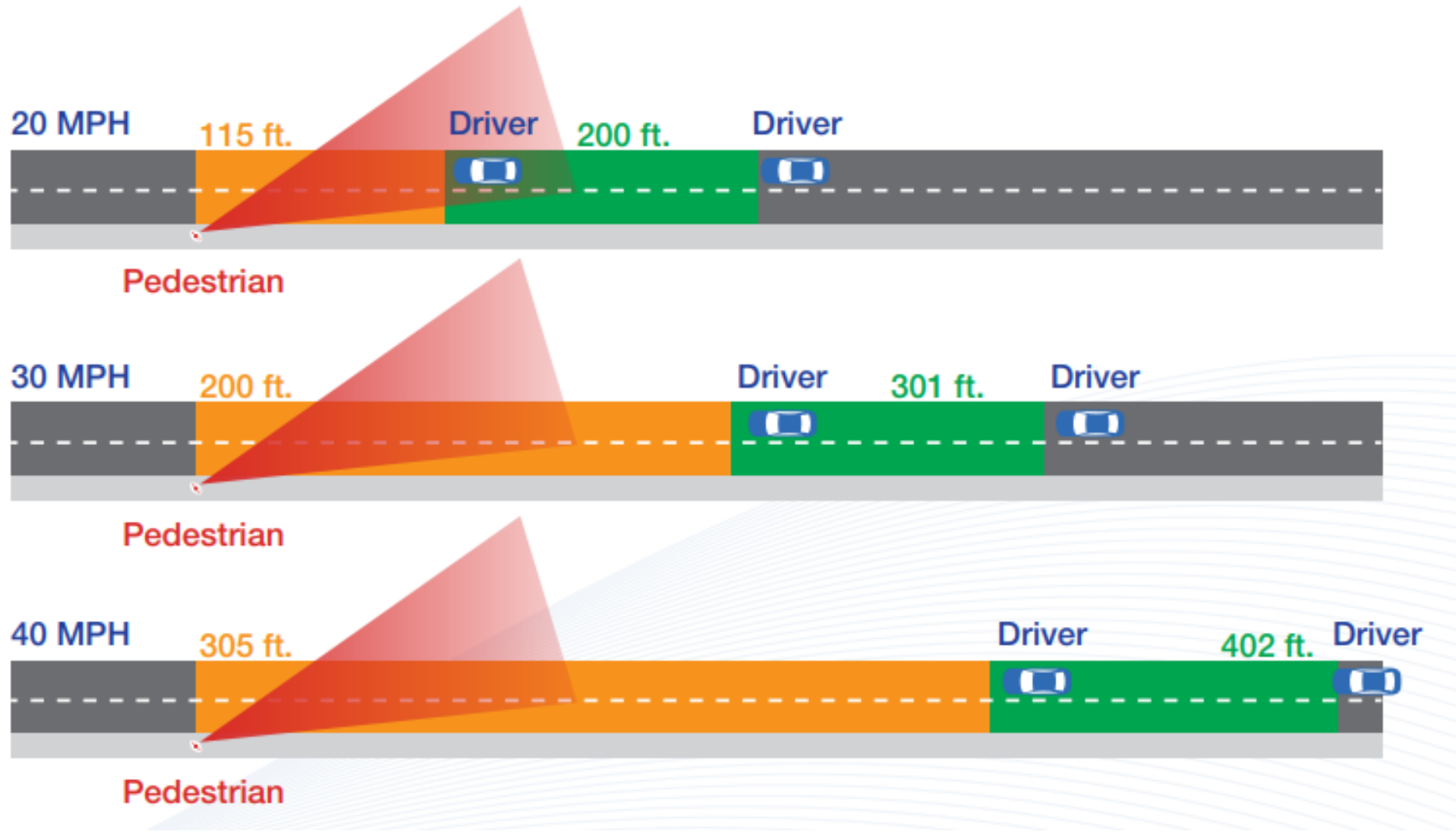
Driver's Peripheral Vision at 20-25 MPH



Driver's Peripheral Vision at over 40 MPH



Speed, Distance, and Ability to Stop or Yield



Safe Road Users: Behavior Campaigns for Speeding

SPEEDING/TIME MANAGEMENT

Call to action: Leave early for your trip or arrive late.

\$1M October 2022; \$1M June 2023

Target Audience: Males, Age 22-27



TOTAL PAID IMPRESSIONS
73,670,866

MEDIA CHANNELS
social media, audio and video streaming, gas pump videos, radio, billboards

WEB PAGE VISITS
63,041



Behavioral Surveys: Long Term Monitoring

400 young male respondents per region **before and after** October and/or June **30-day campaigns:**



KNOW

**Campaign Recall
+
Risk Recognition**

- Campaign Recall: 85%
- 15% of respondents identified these behaviors as extremely unlikely to result in a crash or close call



FEEL

**Social Norms
+
Perceived Behavioral
Control**

- Younger respondents more likely to believe that it is acceptable to exceed the speed limit to make up for lost time
- More than half of respondents feel they do not have control over anxiety and stress while driving
- Respondents who feel less control over anxiety and stressors while driving, also feel less control over other driving behaviors



DO

**Self-Reported Behavior
+
Intent to Change**

- 15% exceed the speed limit to make up for lost time on an almost daily or daily basis
- 40% report driving especially close to the car in front of them once a week or more
- Respondents with a larger number of reported crashes were more likely to report exceeding the speed limit

- **High statistical correlation between young male driver behaviors and what peers think are socially acceptable (social norms)**
- **Low statistical correlation between young male driver behavior and perceived risk of penalty or consequence**

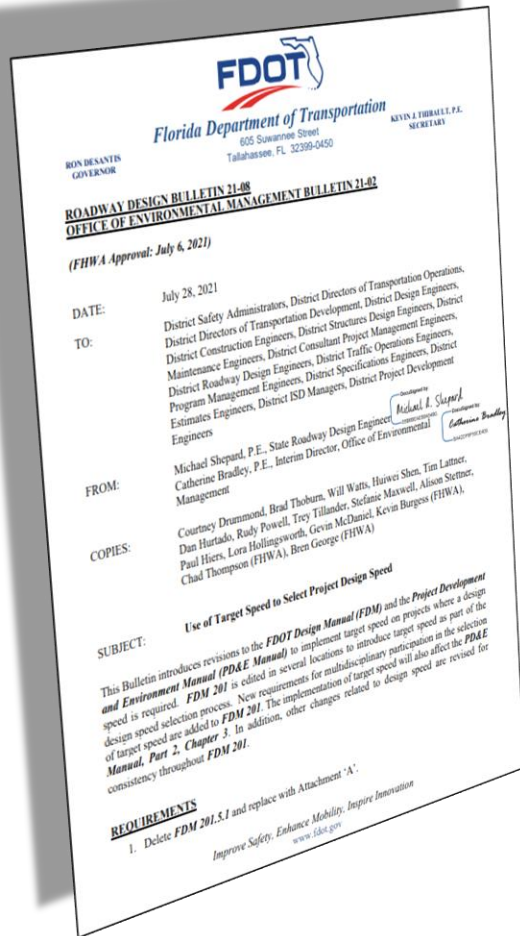
- 35% of respondents have been a driver in a crash in the last 5 years
- 40% have been stopped by law enforcement in the past year (Half of this group has been stopped more than once)

Safe Roads, Safe Speeds: Engineering for Speed

Establishment of Target Speed Policy

“This bulletin requires use of the target speed in the consideration of design speed selection, to provide greater application of context-based design principles in support of roadway safety.”

“This Bulletin introduces revisions to the FDOT Design Manual (FDM) and the Project Development and Environment Manual (PD&E Manual) to implement target speed on projects where a design speed is required.”





DeWayne Carver

Roadway Design Office

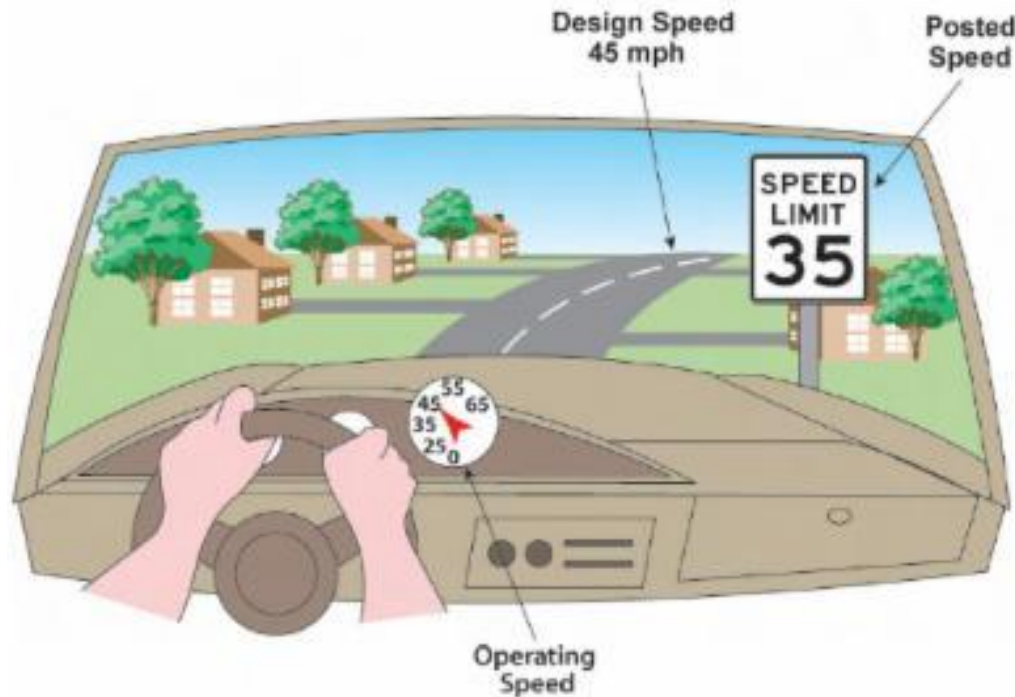
Pop Quiz! What's the Posted Speed?



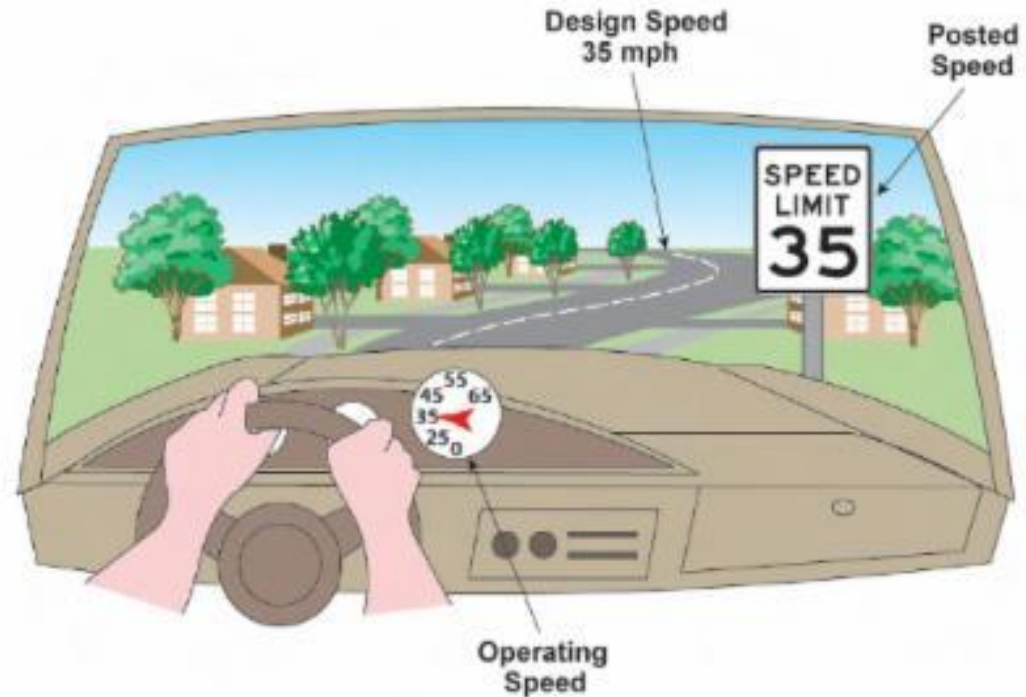
Pop Quiz! What's the Posted Speed?



Speed Management Aligns Look with Intent



Conventional Design



Using Desired Operating Speed
Source: NJDOT and PennDOT Smart Transportation Guidebook



Design speed Selected speed used to determine roadway geometric elements



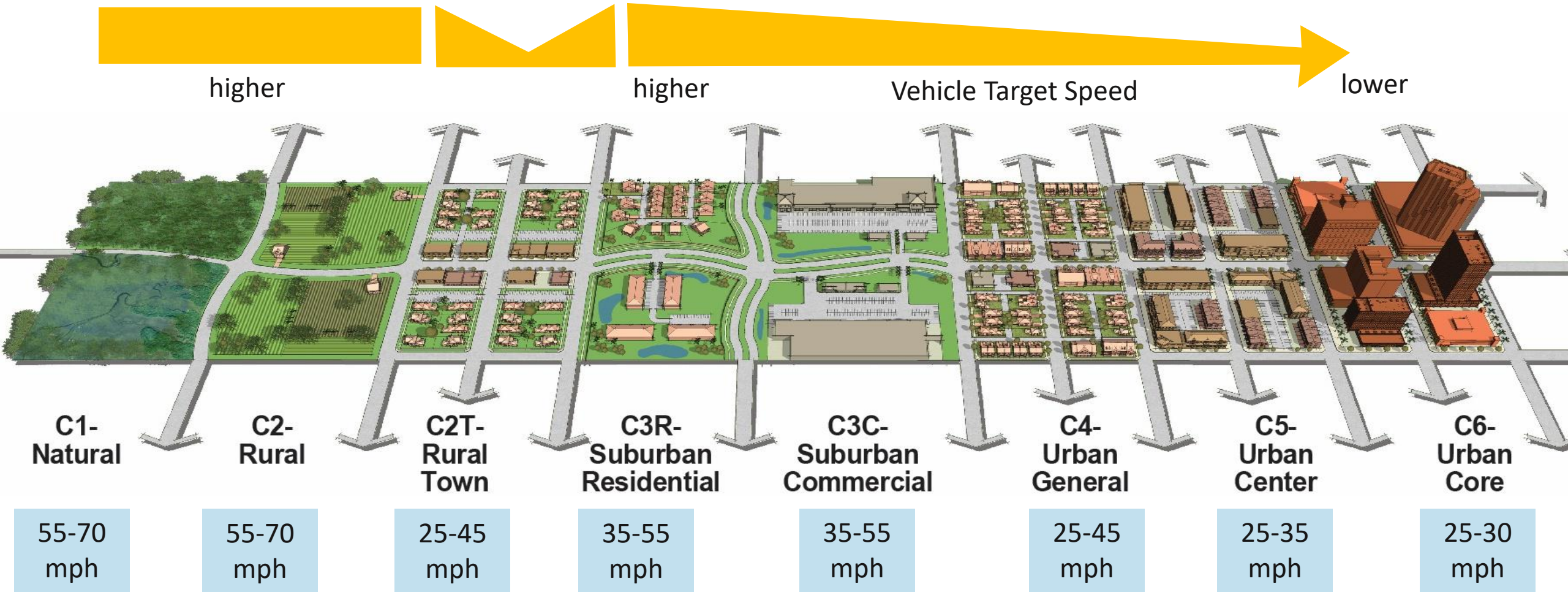
Target speed
Highest speed at which vehicles should operate in a specific context



Operating speed
Speed at which drivers are observed traveling



Posted speed limit
Established by methods described in the Speed Zoning Manual



Design Speed by Context Classification

Chapter 3 Context Based Speeds

Vehicle speed concepts can be classified into four types:



Design speed—the selected speed used to determine various geometric elements of the roadway.¹



Posted speed limit—established by methods described in the Speed Zoning for Highways, Roads, and Streets in Florida Manual. This manual is adopted by Rule 14-15.012, F.A.C.



Operating speed—the speed at which drivers are observed traveling during free flow conditions.²



Target speed—the highest speed at which vehicles should operate in a specific context, consistent with the level of multimodal activity generated by adjacent land uses, to provide both mobility for motor vehicles and a supportive environment for pedestrians, bicyclists, and public transit users.³

Target speeds should be within the design speed range provided in the *FDM* for each context classification, as shown in Table 8. Ideally, the target speed, design speed, and posted speed are all the same where speeds are 45 mph or less. When these speeds are different, it can result in inconsistent driver expectation about the intended operating speed. The concept of target speed is to identify a desired operating speed and develop design strategies and elements that reinforce operating speed. Design speed and posted speed may take time to change and may need to be changed over the course of several projects.

The target speed is influenced by context classification and should be selected to provide for both the safety and mobility needs of all anticipated users.

TABLE 8 FDOT CONTEXT-BASED DESIGN SPEEDS FOR ARTERIALS AND COLLECTORS

CONTEXT CLASSIFICATION	ALLOWABLE DESIGN SPEED RANGE (MPH)	SIS MINIMUM (MPH)
C1 Natural	55-70	65
C2 Rural	55-70	65
C2T Rural Town	25-45	40
C3 Suburban	35-55	50
C4 Urban General	25-45	45
C5 Urban Center	25-35	35
C6 Urban Core	25-30	30

¹ American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011
² American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011
³ FDOT Design Manual, 2021.

STEPS TO DETERMINING TARGET SPEED

1. **DETERMINE *FDM* CONSISTENCY:** Identify context classification, current design and posted speed, SIS designation, and *FDM* design speed range
2. **IDENTIFY STARTING POINT FOR TARGET SPEED:**



In C1 and C2, start at the high end of the design speed range and **justify reduction.**

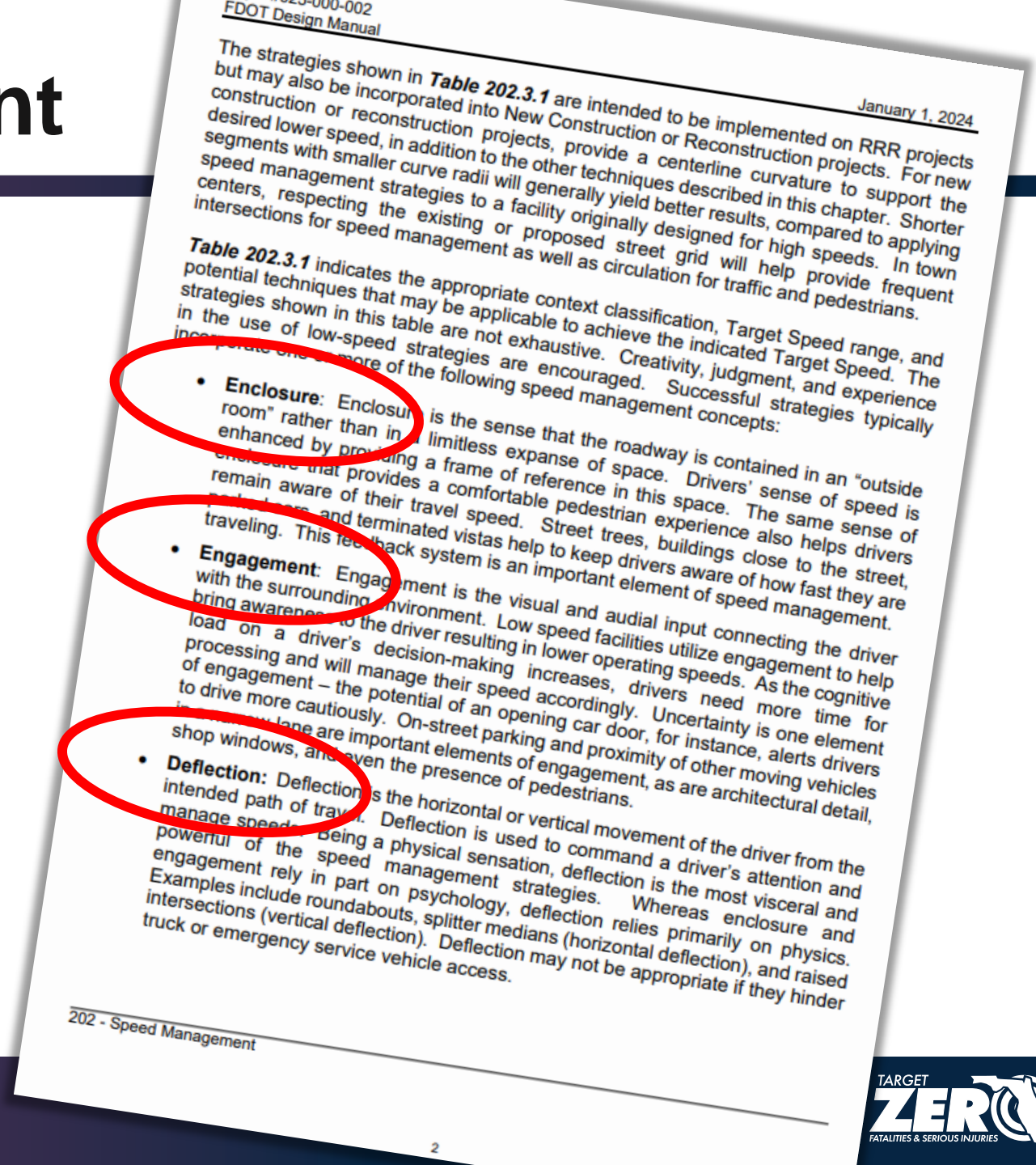


In C2T, C3R, C3C, C4, C5, and C6 start at the low end of the design speed range and **justify increase.**



Speed Management

- Enclosure
- Engagement
- Deflection



The strategies shown in **Table 202.3.1** are intended to be implemented on RRR projects but may also be incorporated into New Construction or Reconstruction projects. For new construction or reconstruction projects, provide a centerline curvature to support the desired lower speed, in addition to the other techniques described in this chapter. Shorter segments with smaller curve radii will generally yield better results, compared to applying speed management strategies to a facility originally designed for high speeds. In town centers, respecting the existing or proposed street grid will help provide frequent intersections for speed management as well as circulation for traffic and pedestrians.

Table 202.3.1 indicates the appropriate context classification, Target Speed range, and potential techniques that may be applicable to achieve the indicated Target Speed. The strategies shown in this table are not exhaustive. Creativity, judgment, and experience in the use of low-speed strategies are encouraged. Successful strategies typically incorporate one or more of the following speed management concepts:

- **Enclosure:** Enclosure is the sense that the roadway is contained in an "outside room" rather than in a limitless expanse of space. Drivers' sense of speed is enhanced by providing a frame of reference in this space. The same sense of enclosure that provides a comfortable pedestrian experience also helps drivers remain aware of their travel speed. Street trees, buildings close to the street, plantings, and terminated vistas help to keep drivers aware of how fast they are traveling. This feedback system is an important element of speed management.
- **Engagement:** Engagement is the visual and audial input connecting the driver with the surrounding environment. Low speed facilities utilize engagement to help bring awareness to the driver resulting in lower operating speeds. As the cognitive load on a driver's decision-making increases, drivers need more time for processing and will manage their speed accordingly. Uncertainty is one element of engagement – the potential of an opening car door, for instance, alerts drivers to drive more cautiously. On-street parking and proximity of other moving vehicles in the travel lane are important elements of engagement, as are architectural detail, shop windows, and even the presence of pedestrians.
- **Deflection:** Deflection is the horizontal or vertical movement of the driver from the intended path of travel. Deflection is used to command a driver's attention and manage speed. Being a physical sensation, deflection is the most visceral and powerful of the speed management strategies. Whereas enclosure and engagement rely in part on psychology, deflection relies primarily on physics. Examples include roundabouts, splitter medians (horizontal deflection), and raised intersections (vertical deflection). Deflection may not be appropriate if they hinder truck or emergency service vehicle access.

Speed Management

- Enclosure
- Engagement
- Deflection

To be used in conjunction



Speed Categories

- Very low-speed (25 mph - 35 mph)
- Low-speed (40 mph – 45 mph)
- ~~High-speed (50 mph and greater)~~
- Stay in your lane category



Mariano Amicarelli

Traffic Engineering & Operations

Approach to Setting Speed Limits

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What has historically triggered a posted speed limit re-evaluation in your jurisdiction? Select your top two options.

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Historical Approach to Setting Speed Limits



Vehicles

- Reliable
- Safe
- Fast



All Road Users

- Reliable
- Safe
- Efficient

What does the MUTCD say regarding setting speed limits?

2009 MUTCD Section 2B.13

Standard:

Speed zones (other than statutory speed limits) **shall** only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study **shall** include an analysis of the **current speed distribution of free-flowing vehicles**.

MUTCD 11th Edition Section 2B.21

Standard:

Speed zones (other than statutory speed limits) **shall** only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study **shall consider the roadway context**.

MUTCD Guidance on the use of 85th Percentile Speeds

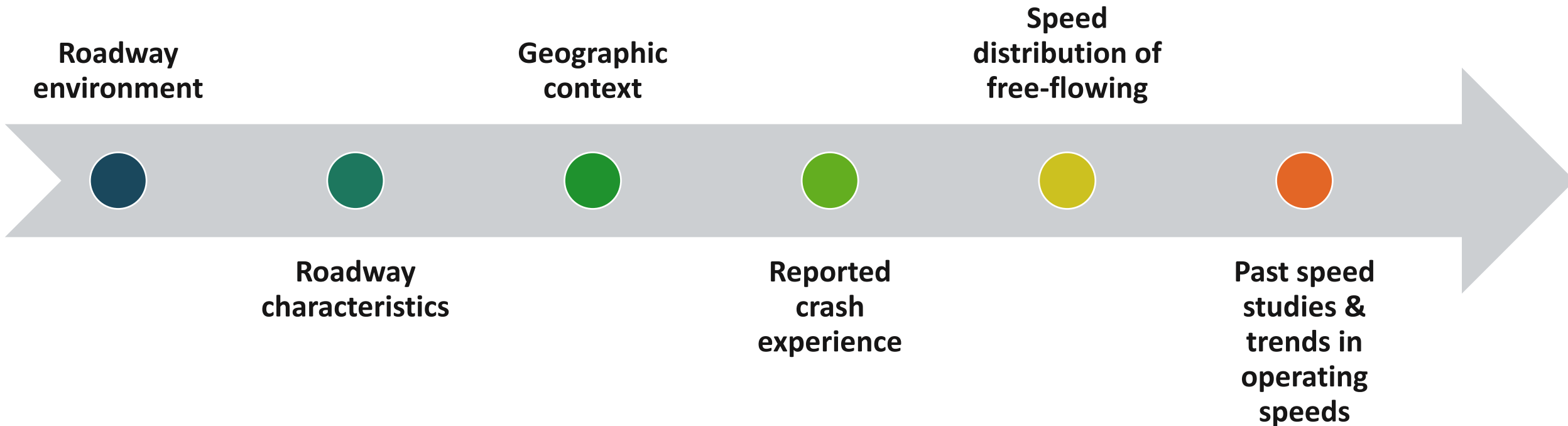
Guidance:

On urban and suburban arterials, and on rural arterials that serve as main streets through developed areas of communities, the 85th-percentile speed **should not** be used to set speed limits without consideration of all factors described in Paragraph 7 of this Section.

MUTCD 11th Edition *Section 2B.21* Engineering Study Factors

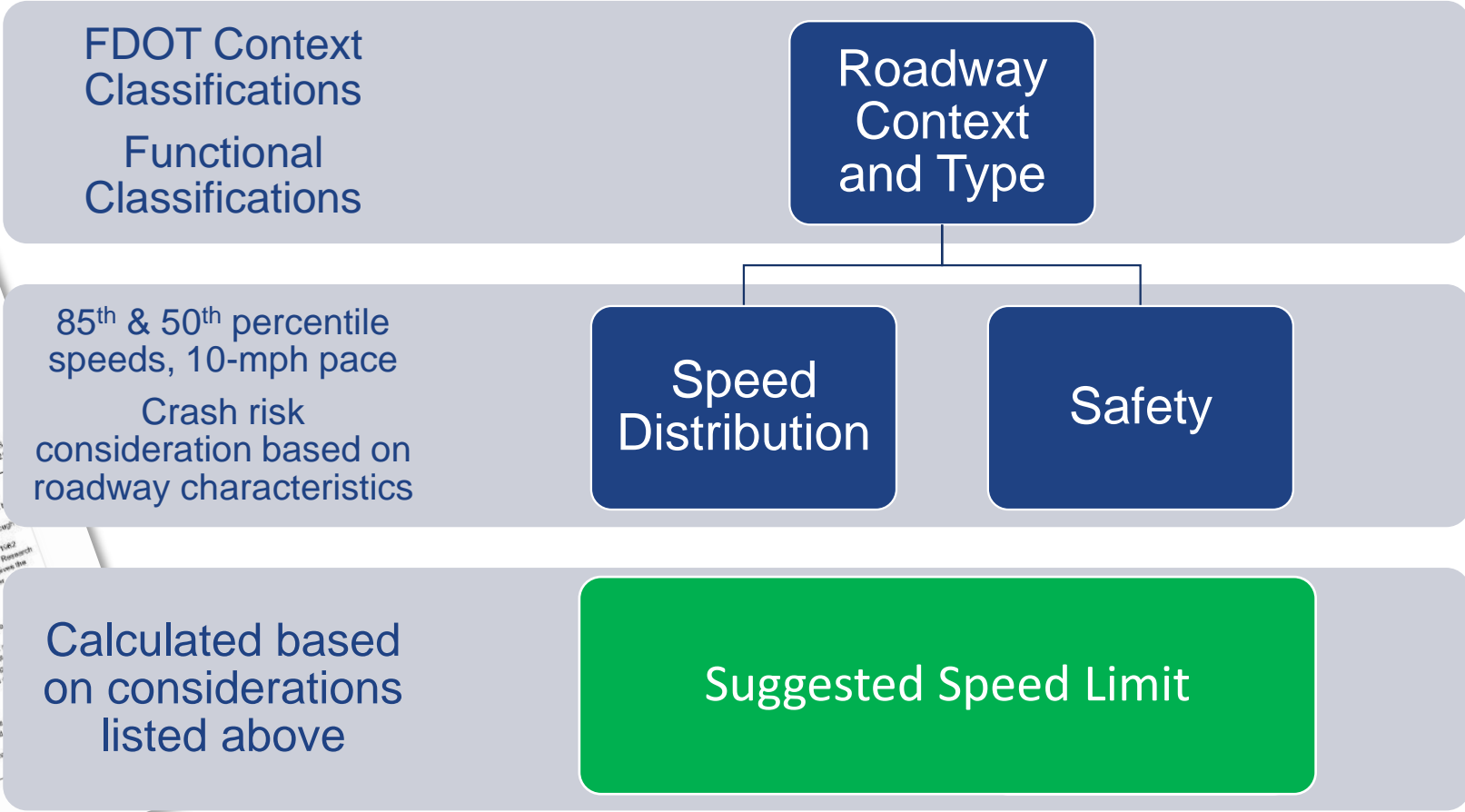
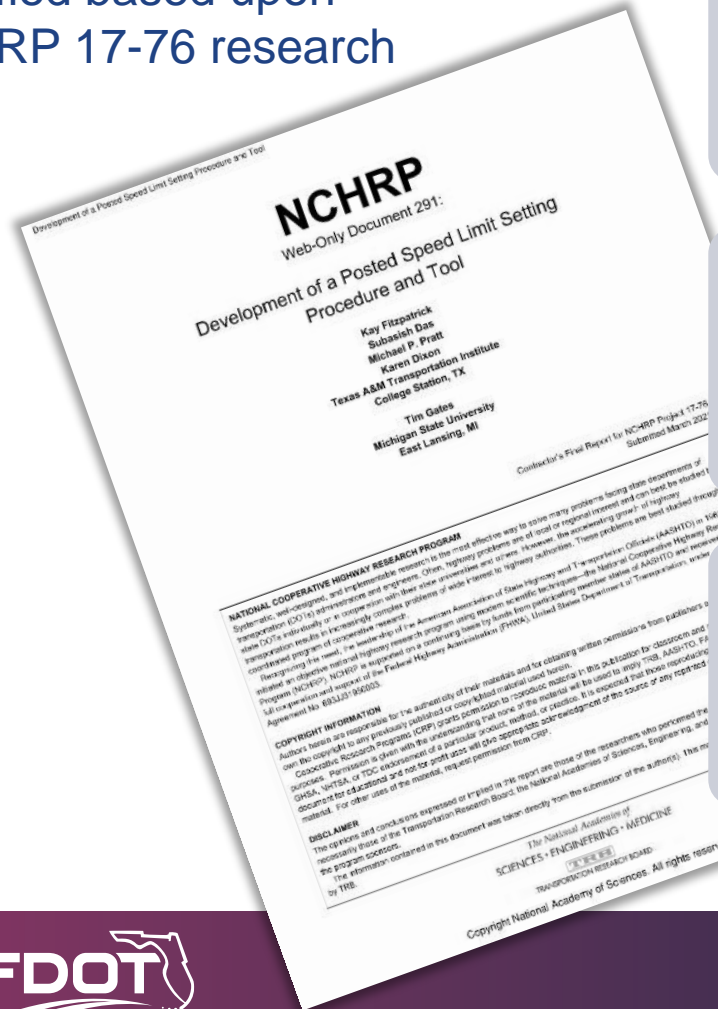
Guidance:

Consider the following factors when conducting an engineering study to establish or reevaluate speed limits (*Paragraph 7*)



Proposed *Speed Zoning Manual* Changes

- Speed Zoning Manual modified based upon NCHRP 17-76 research



FDOT Context Classifications
Functional Classifications

Roadway Context and Type

85th & 50th percentile speeds, 10-mph pace
Crash risk consideration based on roadway characteristics

Speed Distribution

Safety

Calculated based on considerations listed above

Suggested Speed Limit

Proposed *Speed Zoning Manual* Changes

Required for all speed limit setting groups:

- Context Classification
- Roadway Type (Functional Classification)
- Crash data
- Operating speeds (50th, 85th, and 10-mph pace)
- Site Characteristics

Type/Context	C1 Natural	C2 Rural	C2T Rural Town	C3R Suburban Residential	C3C Suburban Commercial	C4 Urban General	C5 Urban Center	C6 Urban Core	
Principal arterial	Undeveloped		Developed				Full access		
Minor arterial									
Collector									
Local									

13 Site Characteristics
 Closest 50th
 Rounded-Down 85th
 Closest 85th

8 Site Characteristics
 Closest 50th
 Rounded-Down 85th
 Closest 85th

12 Site Characteristics
 Rounded-Down 50th
 Closest 50th

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What has historically triggered a posted speed limit re-evaluation in your jurisdiction? Select your top two options.

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- How do you tie the Suggested Speed Limit results to
 - Target Speed
 - Speed Management
- What happens if the suggested speed limit is higher than the **posted speed**?
- What happens if the suggested speed limit is lower than the **posted speed** but higher than the **target speed**?

Tying into an example...

- What happens if the posted speed limit and the design speed are 45 mph on a C4 arterial roadway and the spot speed study shows:
 - 85th percentile speed – 50 mph
 - 50th percentile speed – 45 mph
 - Suggested speed limit is – 45 mph
 - Target speed is – 40 mph

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Audience Q&A

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Thank You!

Safety Message



Contact Us



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