Considerations on Speed Management

Presented by
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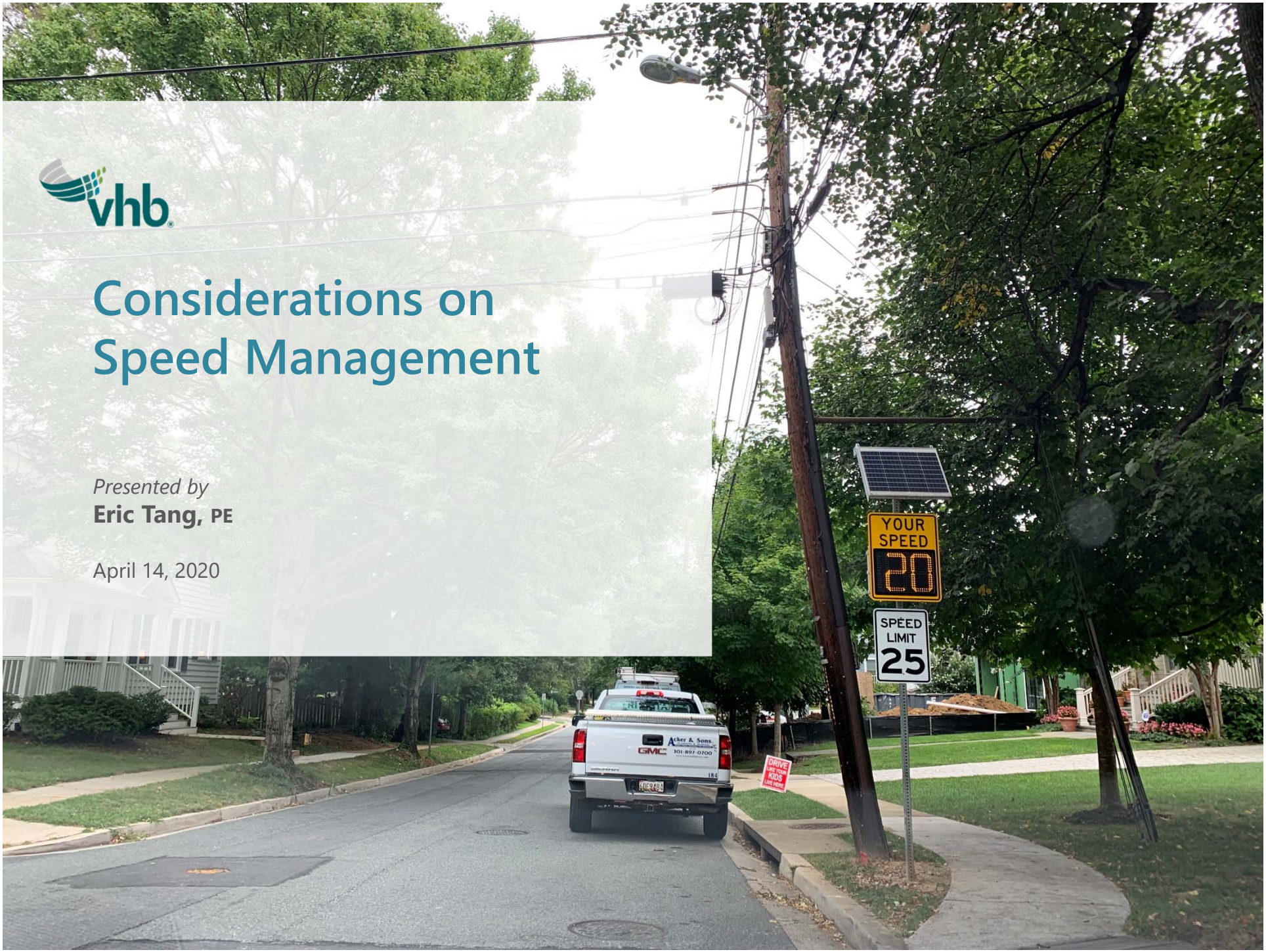
April 14, 2020



Background

- The Transportation Research Board (TRB) held a speed-management workshop at their annual meeting in January 2020.
- TRB also held a webinar in March 2020 to continue the discussion from the workshop.
- Both discussed emerging approaches to manage traffic speed.

Speed as a Factor

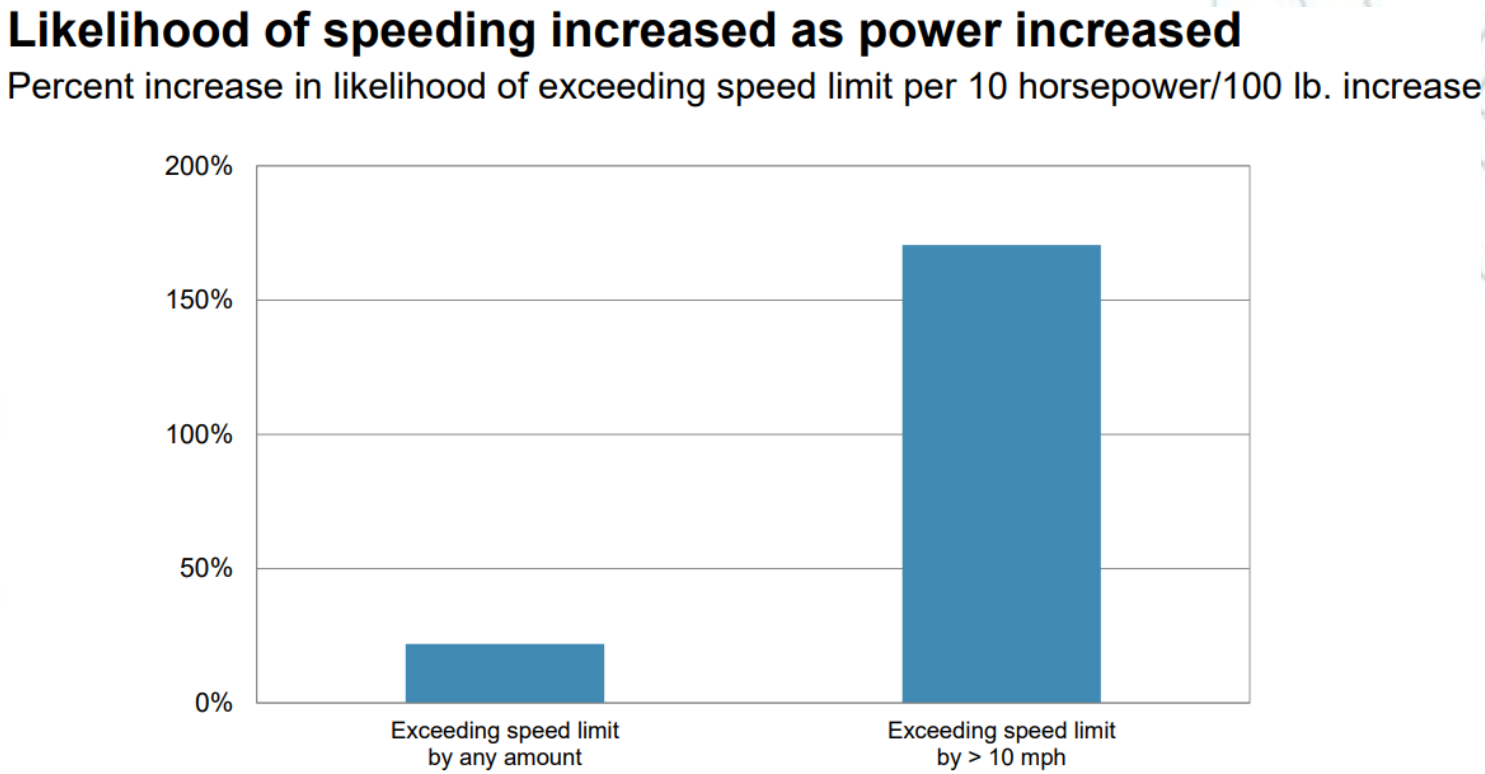
- In 2017, data from the National Highway Traffic Safety Administration (NHTSA) showed speed was a fatality factor in:
  - 55% of DC traffic fatalities
  - 29% in Maryland
  - 26% in Virginia
  - *26% U.S. average*
- Of the drivers involved in these speed-related fatalities:
  - 67% were unrestrained and 72% were alcohol-impaired in DC
  - 42% and 41% respectively in Maryland
  - 57% and 43% respectively in Virginia
  - *49% and 37% respectively for U.S. average*

Speed as a Factor

- Nationally:
  - More males than females involved in speed-related crashes.
  - Alcohol is twice as much of a factor for speeding-drivers in fatal crashes compared to non-speeding drivers.
  - Similarly, half of speeding drivers were unrestrained in fatal crashes compared to one-fifth of non-speeding drivers.
  - Motorcycle riders are involved in fatal crashes more than any other vehicle type.

Vehicle Power is Increasing…

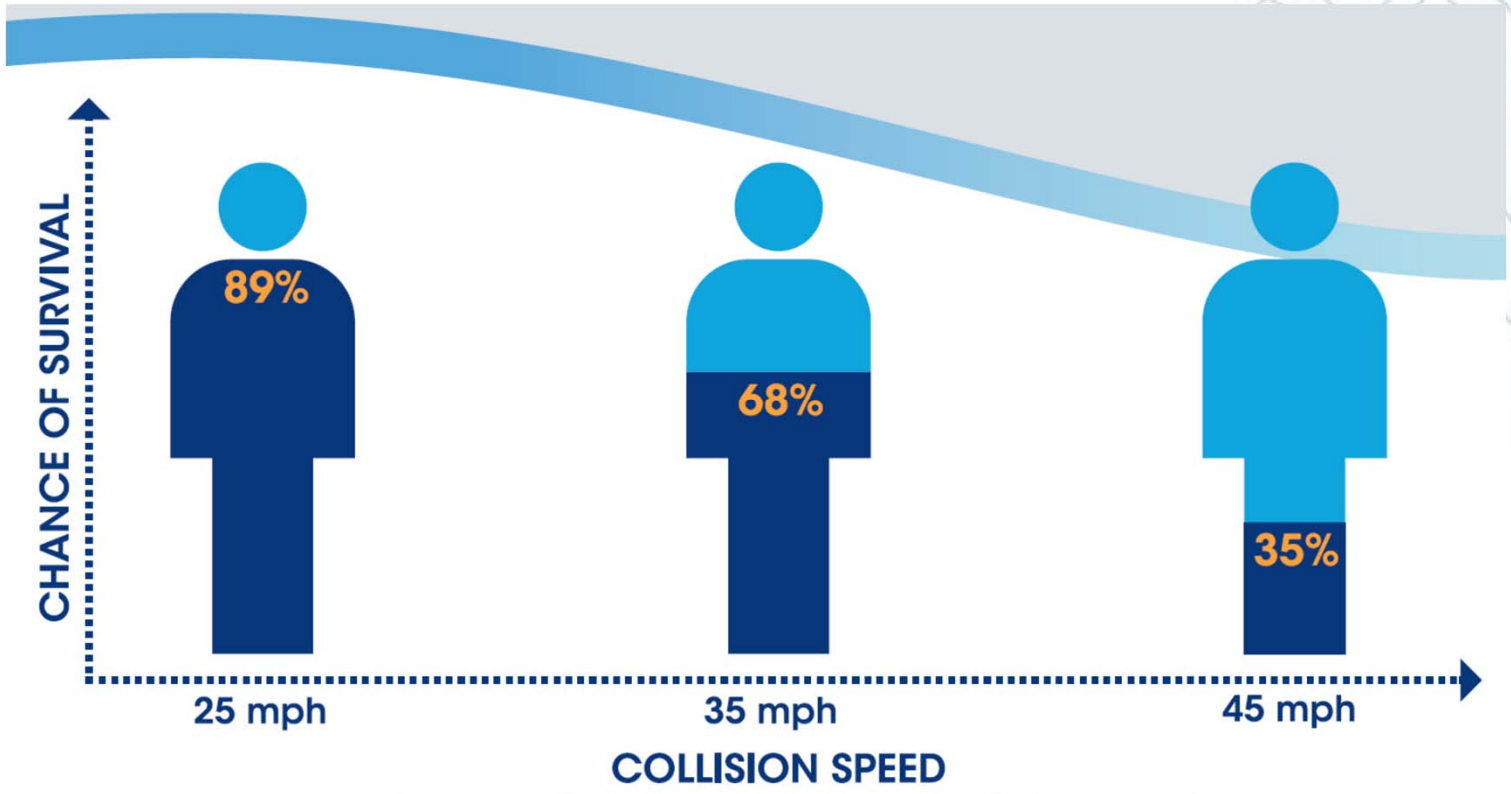
- As larger vehicles become the vehicle of choice in the U.S.:



McCartt, Anne T., Hu, Wen. Traffic Injury Prevention (May 2016).
https://www.iihs.org/topics/bibliography/ref/2119

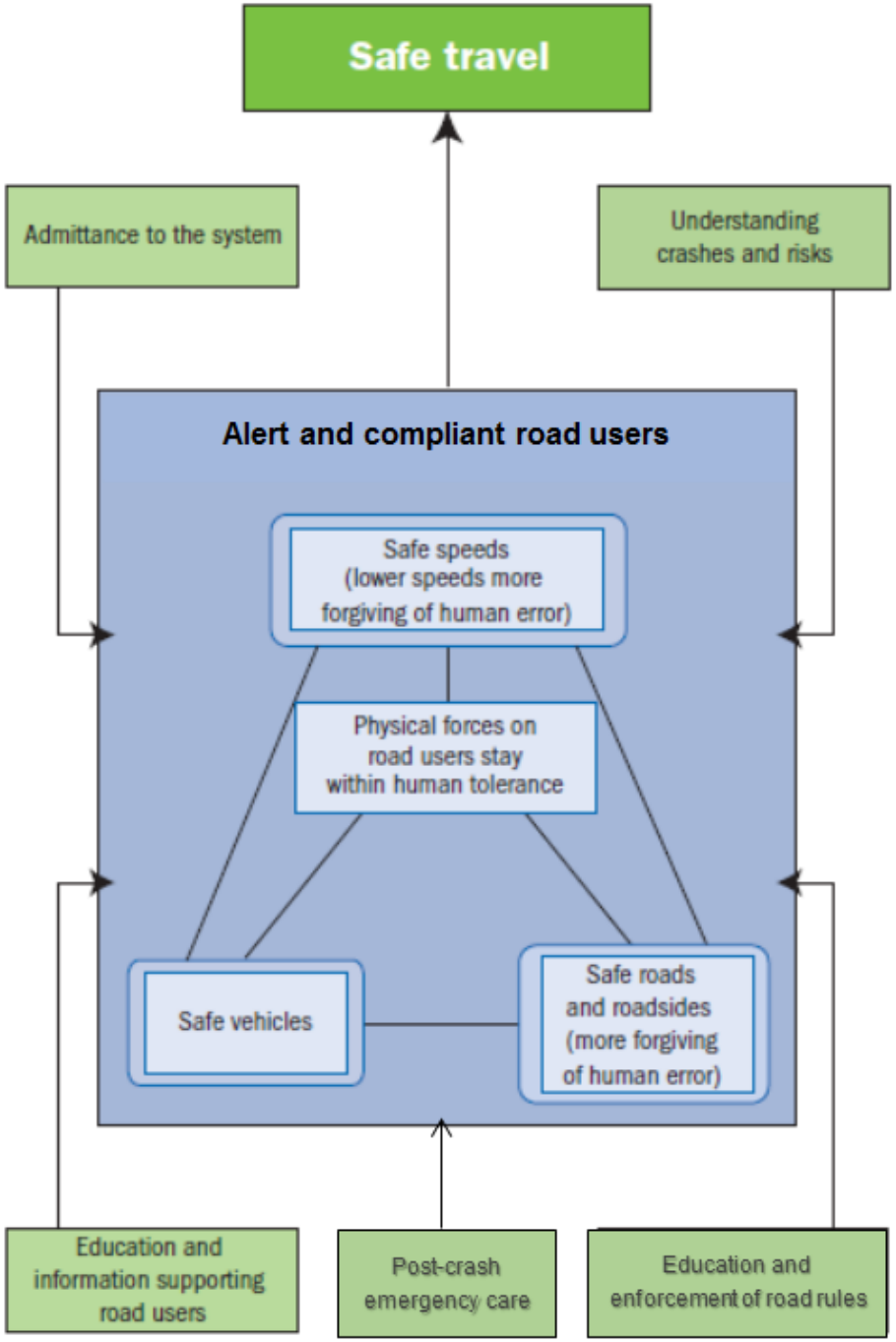
Crash Survivability

- Survivability from crashes declines exponentially as speed increases.



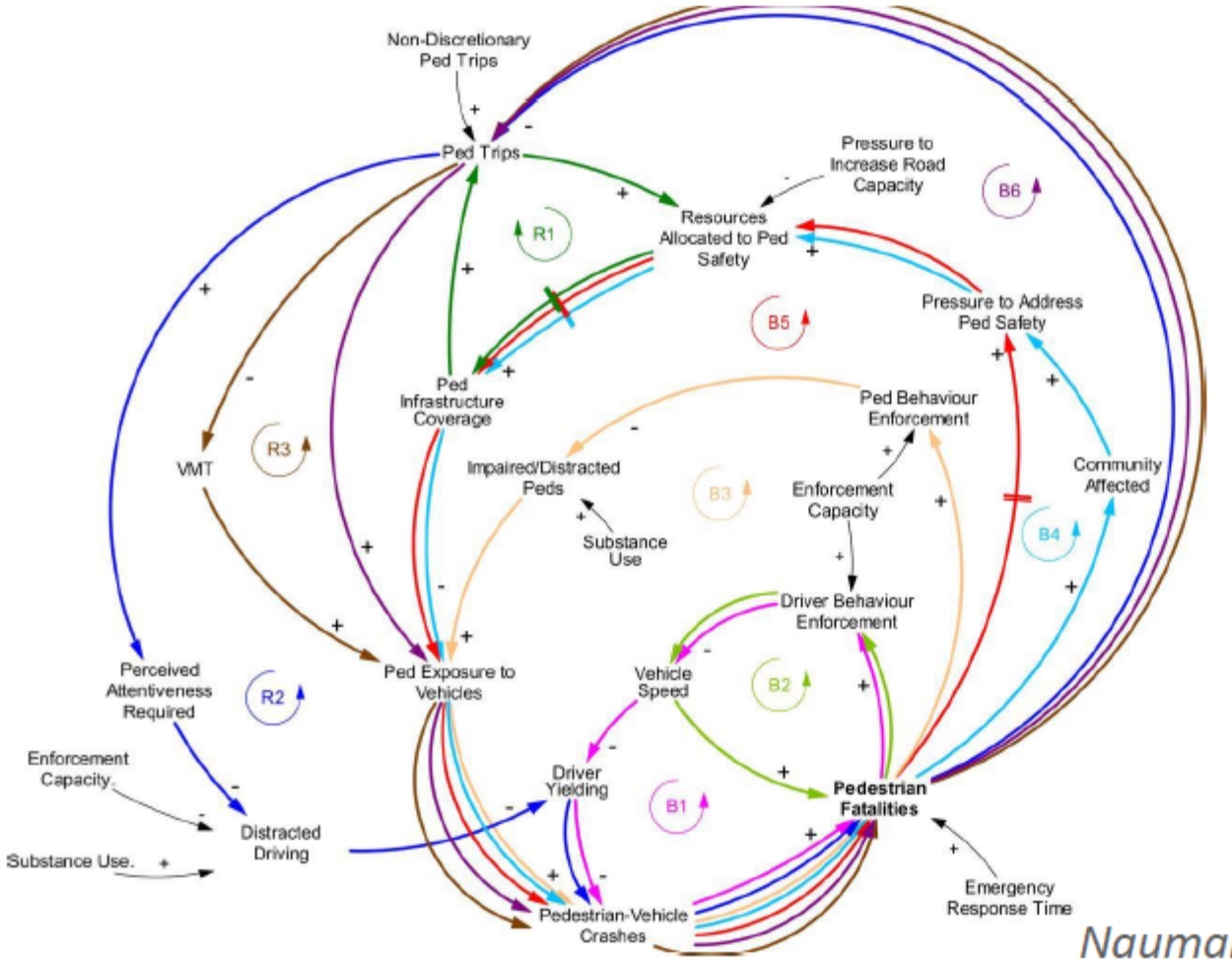
Tefft, B.C Impact speed and a pedestrian's risk of severe injury or death, Accident Analysis & Prevention 50 (2013), 871-878.

Safe System Model



Source: PIARC, adapted from OECD/ITF, 2008; ATC, 2009.

Linear vs. Systems Thinking



Naumann et al. (2019), p. 3

NCHRP 17-76 Guidance on the Setting of Speed Limits

Frequency	Factor Used by 31 States
All or Most of States	• **85th percentile speed** • Crash history
Over half of states	• Roadside development or land use • Traffic (pedestrians, bicyclists) condition or volume • Maximum or minimum speed allowed in state • Sight distance
About 1/3	• Parking, shoulder, pavement condition, access
<1/3 states, but > 3 states	• Functional class, pedestrians, transitions, urban streets • Alignment (e.g., grade, horizontal and/or vertical curves) • Cross section (e.g., lane width, roadway width) • Traffic control devices

Source: Fitzpatrick, Kay et al, 2019

NCHRP 17-76 Guidance on the Setting of Speed Limits

Speed Limit Setting Groups

Context Type	Rural	Rural Town	Suburban	Urban	Urban Core
Freeways	Limited Access	Limited Access	Limited Access	Limited Access	Limited Access
Principal Arterial	Undeveloped	Developed	Developed	Developed	Full Access
Minor Arterial	Undeveloped	Developed	Developed	Developed	Full Access
Collector	Undeveloped	Full Access	Developed	Full Access	Full Access
Local	Undeveloped	Full Access	Full Access	Full Access	Full Access

Excel Tool under development

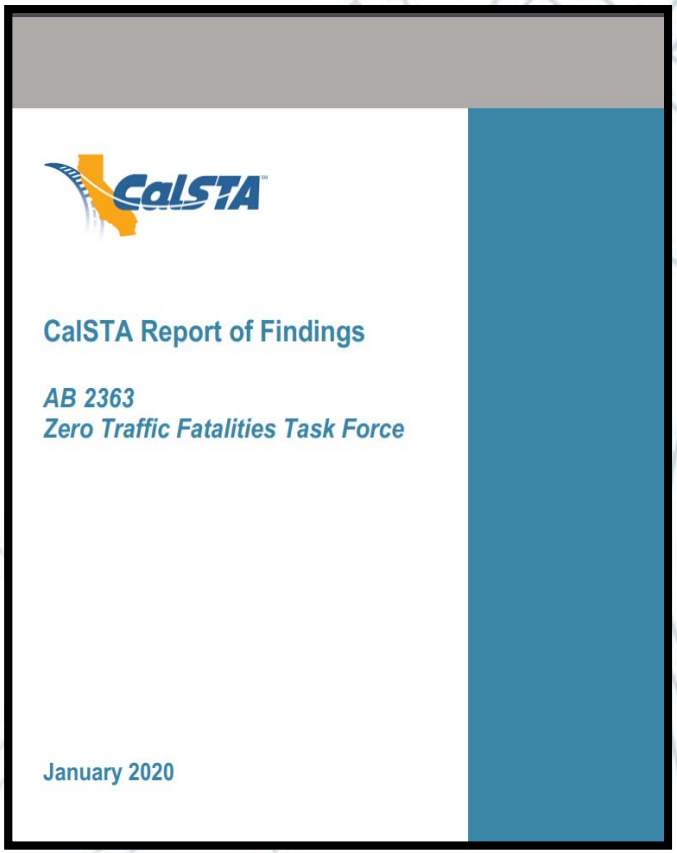
Source: Texas A&M University, 2019

Suggested Speed Limit Starting Point…

Speed Limit Setting Groups	Method, Engineering • Use decision rules to identify percentile speed (and rounding) based on roadway characteristics & crashes • Check maximum speed limits, where appropriate	
Limited access Undeveloped Developed	• Closest 85th (C85)	• Roadway conditions OK
	• Rounded down from 85th (RD85)	• Between
	• Closest 50th (C50)	• Not favorable to all users or crashes a significant concern
Full Access (< 30 mph typically)	• Closest 50th (C50)	• Roadway conditions OK
	• Rounded down from 50th (RD50)	• Not favorable to all users or crashes a significant concern

California Speed Limit Study

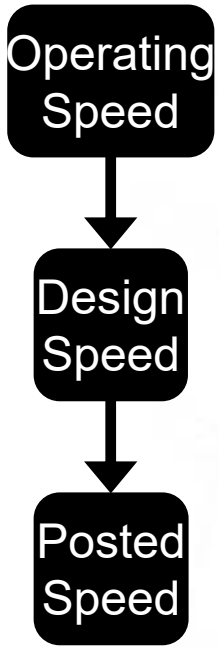
- Afford more flexibility when setting speed limits on high-crash corridors
- Create new prima facie zones in complex multimodal environments
- Protect the most vulnerable road users from fast vehicular traffic
- Allow lowering of artificially high-speed limits to reflect actual travel speeds
- Plan for instituting Safe Systems approach by replacing existing 85th percentile speed limit setting practices



Seattle Speed Limit Setting

Traditional

(no longer using this)



Urban villages

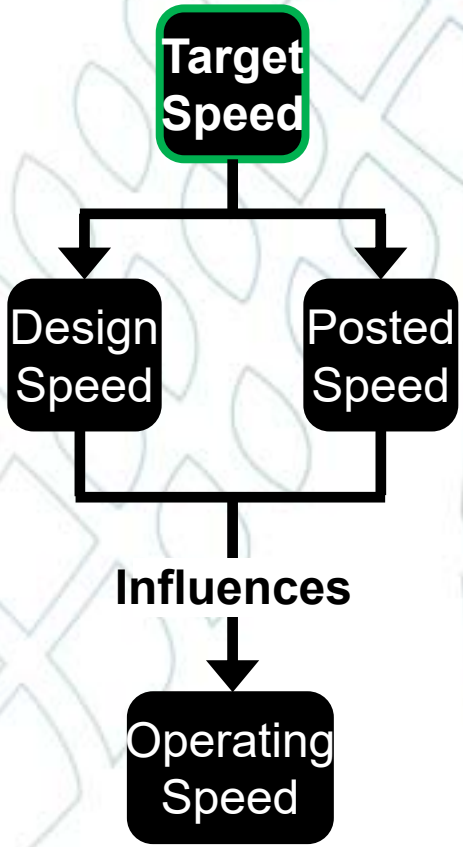
- 50th percentile speeds (USLIMITS2)
- Top operating speed of priority modes

~3 MPH

10-15 MPH

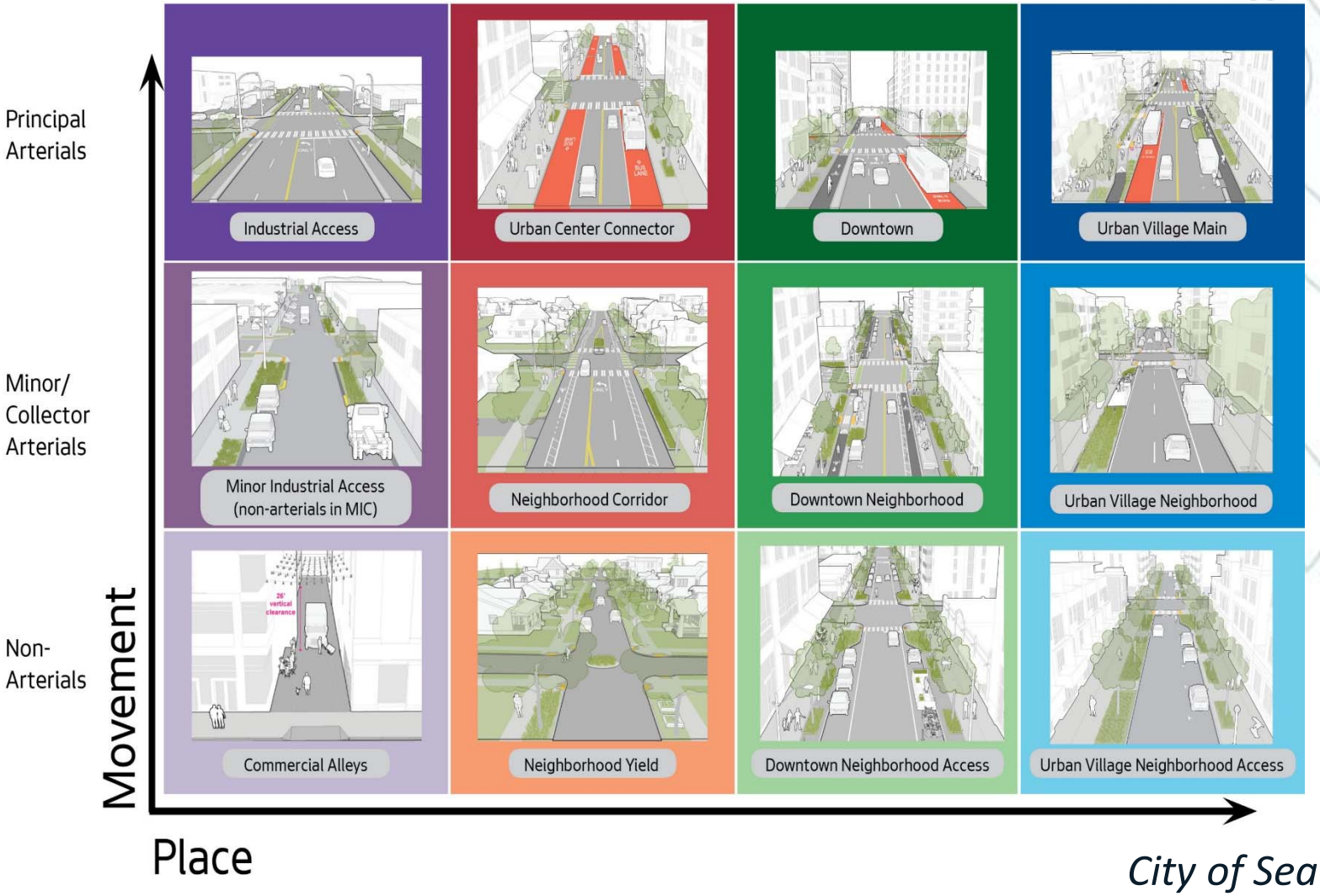
10-25 MPH

Proposed



City of Seattle. 2020.

Seattle Stratification of Speed Limits

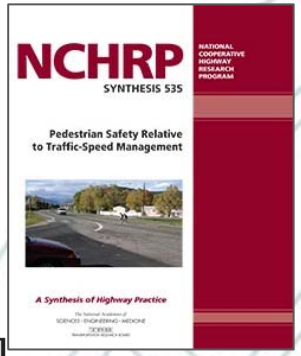


City of Seattle. 2020.

Countermeasures

VDOT, 2018.

NCHRP Synthesis 535



Design	Profiled Jurisdiction										
	Arlington	Calgary	Chicago	Durham	Fremont	Green Bay	Los Angeles	Nashville	Portland	San Francisco	Seattle
Reallocate roadway space—roadway reconfigurations/lane conversions.	x	x	x	x	x	—	x	x	x	x	x
Adjust curb radii.	x	x	x	—	x	x	x	—	x	x	x
Install curb extensions.	x	x	x	—	x	x	—	—	—	x	x
Add or remove on-street parking.	x	—	x	—	—	x	—	—	—	—	x
Reduce lane size (from 12 ft to 10–11 ft).	x	—	x	x	x	x	x	x	x	x	x
Add right side bike lanes.	x	x	x	—	x	x	x	x	—	x	x
Install pedestrian islands.	—	x	x	—	x	x	x	x	—	x	x
Pedestrian-focused street branding/signs.	—	—	—	—	—	—	—	x	—	—	—
Convert peak hour lanes to full-time parking.	—	—	x	—	—	—	x	—	—	x	—
Increase street lighting.	—	—	—	—	x	x	—	—	—	—	—
Speed humps or cushions.	x	x	x	—	x	x	x	x	x	x	x

— = N/A.

Sanders, Rebecca, et al., 2020.

Questions?

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