

# Safe System Approach: Safer Speeds

January 22, 2024  
Wichita Area MPO  
Technical Advisory Committee



# Agenda

- Safe System
- Current Practices and Legislature
- Impacts of Speed
- Speed Management Strategies
- Related Data

# Safe System Approach

*"Speed is a variable that we can control or at least influence."*

(AAA Foundation for Traffic Safety)



Appropriate Speed Limits **VTO**  
for All Road Users



Speed Safety Cameras



Variable Speed Limits



# Safer Speeds Objective



*Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, targeted education, outreach campaigns and enforcement.*

U.S. DOT

# Safer Speeds Objective




*Speed is at the heart of a forgiving road transport system. It transcends all aspects of safety: without speed, there can be no movement, but with speed comes kinetic energy, and with kinetic energy and human error come crashes, injuries, and even deaths.*

Organization for Economic Co-operation and Development

# National Roadway Safety Strategy

## U.S. DOT Actions

| Action Title   | NRSS Area   | Lead(s) | 2022   |        |        |        | 2023   |        |        |        | Q1 |
|--|---|---------|--------|--------|--------|--------|--------|--------|--------|--------|----|
|  |   |         | Q1     | Q2     | Q3     | Q4     | Q1     | Q2     | Q3     | Q4     |    |
| Promote safer speeds through a robust, multimodal speed management program   |  FHWA, NHTSA   |         | Active | Active | Active | Active | Active | Active | Active |        |    |
| Promote safer speeds through improvements to Proven Safety Countermeasures and the Manual on Uniform Traffic Control Devices   |  FHWA          |         | Active | Active | Active | Active | Active | Active | Active |        |    |
| Promote safer speeds for all users through context-appropriate speed limits, road designs, and other practices                 |  FHWA          |         | Active | Active | Active | Active | Active | Active | Active |        |    |
| Prevent speeding by studying and piloting the equitable application of enforcement strategies, including automated enforcement |  FHWA, NHTSA |         | Active | Active | Active | Active | Active | Active | Active |        |    |
| Consider further rulemaking actions to limit the maximum speed of CMVs   |  FMCSA       |         |        |        |        |        |        | Active | Active | Active |    |



# Current Legislation

- 8-1557: Basic Rule governing speed of vehicles
- 8-1558: Maximum speed limits
- 8-1559: Alteration of maximum speed limits
- 8-1560: Alteration of maximum speed limits; powers of local authorities

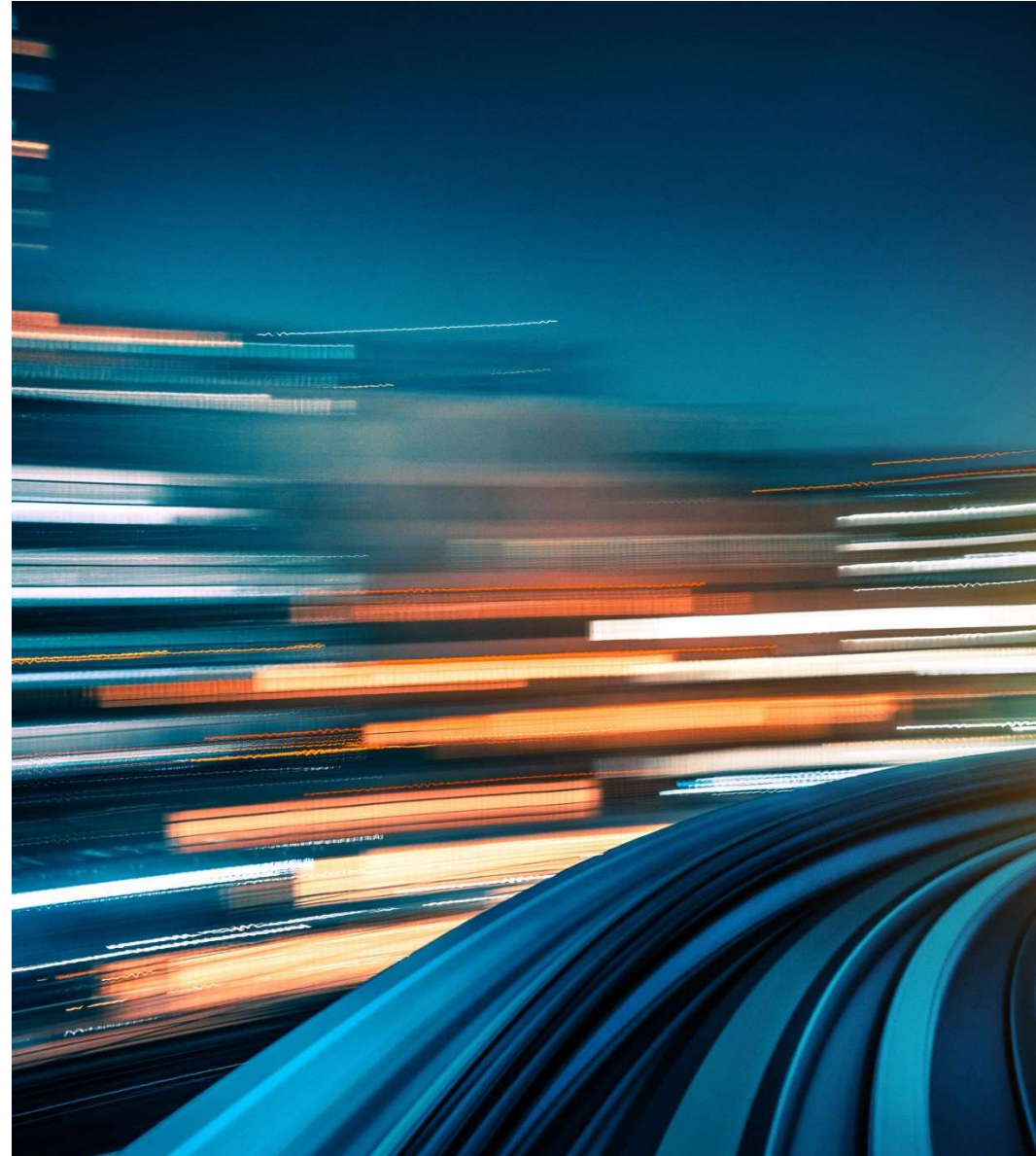
# KDOT Speed Setting Practices

- Traffic Studies
- Speed Distribution
  - 50<sup>th</sup> or 85<sup>th</sup> percentile
  - Speed Limit vs. Operating Speed
  - Cannot simply reduce the speed limit
- Setting context-appropriate speed limits



# Managing Kinetic Energy

"... the Safer Speeds objective of the SSA is critically important to road users who are **more susceptible to severe injury**. The **kinetic energy exchange** in a crash, or a combination of mass differential and speed differential, is the most critical factor in injury severity. Prevention activities focused on vehicle speed management are important to reducing these injury severities"  
(Khorasani-Zavareh, 2015).



# Humans are vulnerable

Hit by a vehicle  
traveling at

23

MPH

10% risk of death



Hit by a vehicle  
traveling at

42

MPH

50% risk of death



Hit by a vehicle  
traveling at

58

MPH

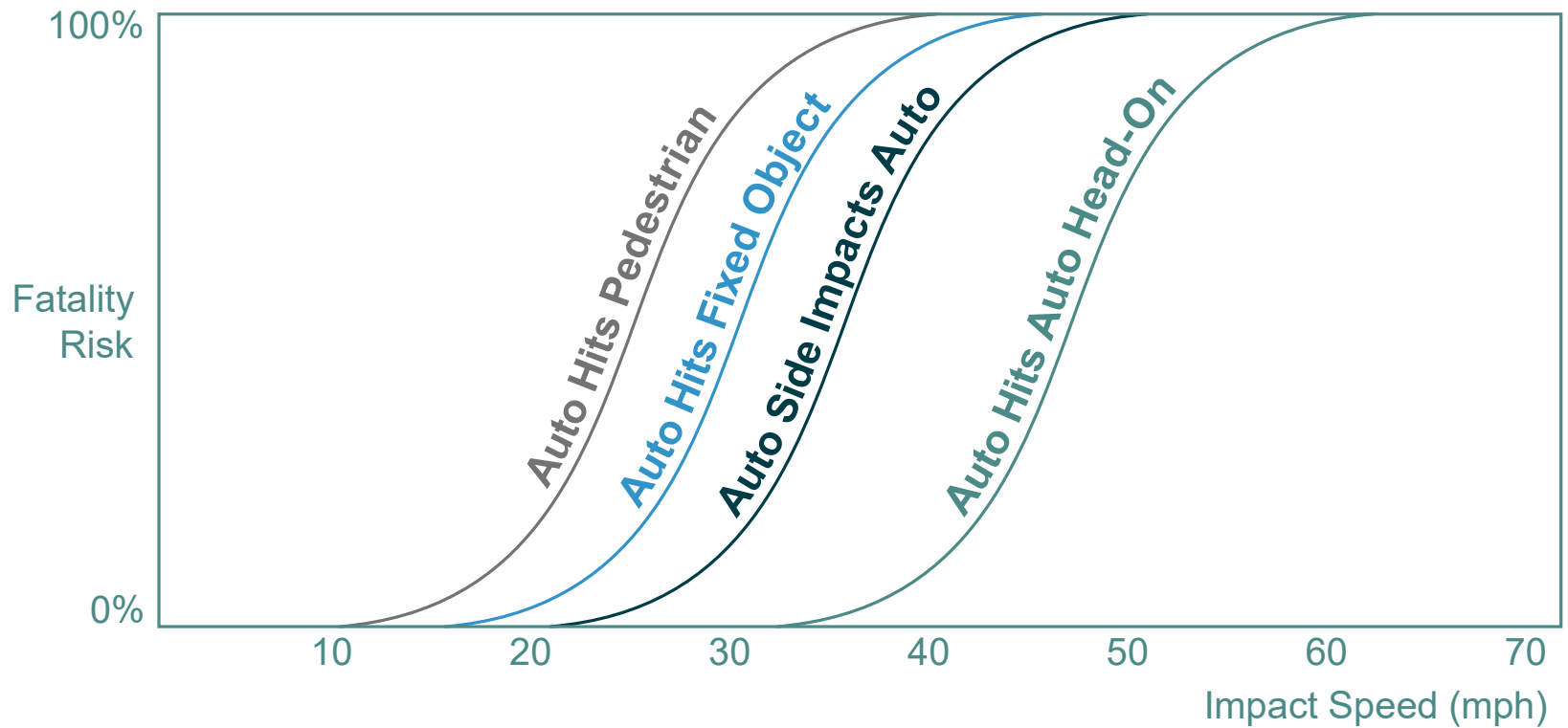
90% risk of death



Source: FHWA. Adapted from USDOT Pedestrian Safety Action Plan



# Fatality Risks



Source: FHWA. Adapted from graphic created by Australian Roads and Traffic Authority of New South Wales.



# WHY SPEED MATTERS

**75%**

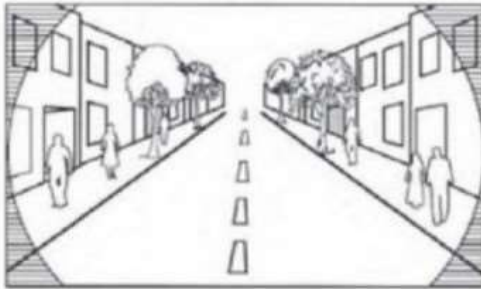


Drivers yield  
**75%** of the time  
when traveling  
**20 MPH**

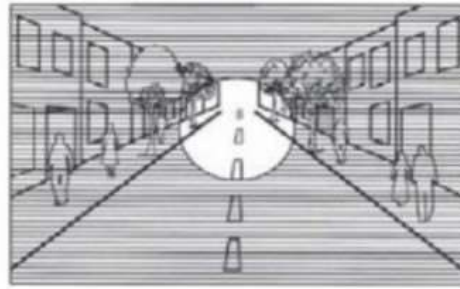
**17%**



Drivers yield only  
**17%** of the time  
when traveling  
**37 MPH**



Field of vision at 15 MPH



Field of vision at 30 to 40 MPH

# Vulnerable Road User (VRU) Safety Assessment Recommendations

*Roadways with the highest risk to VRUs are local roadways with 30-35 mph posted speed limits.*

- Traffic Calming Measures
- Speed Management Programs
  - Posted Speed Limit Setting Procedure and Tool ([NCHPR966](#))
- Speed Feedback Signs
- Automated Speed Enforcement



## SAFE SPEED: TREATMENTS THAT MINIMIZE INJURIES

Speed through typical intersection



Source: Fehr & Peers

Speed through Safe System intersection



Source: City of Carmel, IN

# Speed Management Strategies

## Safe System Roadway Design Hierarchy

- ✓ Remove Severe Conflicts
  - ✓ Reduce Vehicle Speeds
  - ✓ Manage Conflicts in Time
  - ✓ Increase Attentiveness and Awareness
- Self-enforcing designs
    - Physical changes and separation
    - Visual changes
  - Speed enforcement
  - Shared roadway environment
  - Visibility enhancements

| Proven Safety Countermeasure  | Tier 1<br>Remove Severe<br>Conflicts | Tier 2<br>Reduce Vehicle<br>Speeds | Tier 3<br>Manage<br>Conflicts in Time | Tier 4<br>Increase Attentiveness<br>and Awareness |
|---|--------------------------------------|------------------------------------|---------------------------------------|---|
| <b>Speed Management</b>   |                                      |                                    |                                       |   |
|  <u>Appropriate Speed Limits for All Road Users</u>  |                                      | ✓                                  |                                       |   |
|  <u>Speed Safety Cameras</u>                         |                                      | ✓                                  |                                       |   |
|  <u>Variable Speed Limits</u>                        |                                      | ✓                                  |                                       | ✓   |
| <b>Pedestrian/Bicyclist</b>   |                                      |                                    |                                       |   |
|  <u>Bicycle Lanes</u>                                | ✓                                    |                                    |                                       |   |
|  <u>Crosswalk Visibility Enhancements</u>            |                                      |                                    |                                       | ✓   |
|  <u>Leading Pedestrian Interval</u>                  |                                      |                                    | ✓                                     |   |
|  <u>Medians and Pedestrian Refuge Islands</u>        | ✓                                    | ✓                                  |                                       |   |
|  <u>Pedestrian Hybrid Beacons</u>                    |                                      |                                    | ✓                                     |   |
|  <u>Rectangular Flashing Beacons (RRFB)</u>         |                                      |                                    |                                       | ✓   |
|  <u>Road Diets</u>                                 | ✓                                    | ✓                                  |                                       |   |
|  <u>Walkways</u>                                   | ✓                                    |                                    |                                       |   |
| <b>Roadway Departure</b>  |                                      |                                    |                                       |   |
|  <u>Enhanced Delineation for Horizontal Curves</u> |                                      |                                    |                                       | ✓   |
|  <u>Longitudinal Rumble Strips and Stripes</u>     |                                      |                                    |                                       | ✓   |
|  <u>Median Barriers</u>                            | ✓                                    |                                    |                                       |   |

| Proven Safety Countermeasure  | Tier 1<br>Remove Severe<br>Conflicts | Tier 2<br>Reduce Vehicle<br>Speeds | Tier 3<br>Manage<br>Conflicts in Time | Tier 4<br>Increase Attentiveness<br>and Awareness |
|---|--------------------------------------|------------------------------------|---------------------------------------|---|
| <b>Roadway Departure (continued)</b>  |                                      |                                    |                                       |   |
|  <u>Roadside Design Improvements at Curves</u>   | ✓                                    |                                    |                                       |   |
|  <u>SafetyEdge<sup>SM</sup></u>  | ✓                                    |                                    |                                       |   |
|  <u>Wider Edge Lines</u>   |                                      |                                    |                                       | ✓   |
| <b>Intersections</b>  |                                      |                                    |                                       |   |
|  <u>Backplates with Reflective Borders</u>   |                                      |                                    |                                       | ✓   |
|  <u>Corridor Access Management</u>   | ✓                                    |                                    |                                       |   |
|  <u>Dedicated Left and Right Turn Lanes at Intersections</u>                                       | ✓                                    |                                    |                                       |   |
|  <u>Reduced Left Turn Conflict Intersections</u>   | ✓                                    |                                    |                                       |   |
|  <u>Roundabouts</u>  | ✓                                    | ✓                                  |                                       |   |
|  <u>Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections</u> |                                      |                                    |                                       | ✓   |
|  <u>Yellow Change Intervals</u>   |                                      |                                    | ✓                                     |   |
| <b>Crosscutting</b>   |                                      |                                    |                                       |   |
|  <u>Lighting</u>   |                                      |                                    |                                       | ✓   |
|  <u>Local Road Safety Plans</u>  | ✓                                    | ✓                                  | ✓                                     | ✓   |
|  <u>Pavement Friction Management</u>   | ✓                                    | ✓                                  |                                       |   |
|  <u>Road Safety Audit</u>  | ✓                                    | ✓                                  | ✓                                     | ✓   |





The diagram shows how: 1) crossing islands; 2) signalized crossings; and 3) raised bike and pedestrian crossings can improve displaced left turn intersections.



Source: Green Colored Paint,

Sections for Pedestrians and Bicycles



Source: Raised Crosswalk, City of Cambridge, Massachusetts

# Speed-related severe injury crashes (2018-2022)

- Statewide
  - 1,333 fatal and serious injury
    - 422 fatalities, 1,264 serious Injuries
- Sedgwick County
  - 248 fatal and serious injury
    - 79 fatalities, 226 Serious Injuries



# Support the Drive to Zero Coalition!

Kansas' Drive To Zero Plan Update will kick off in 2024!

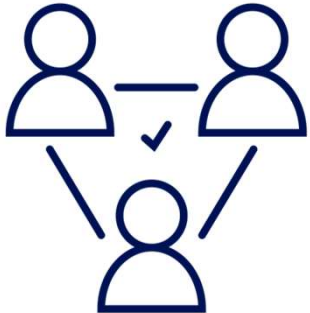
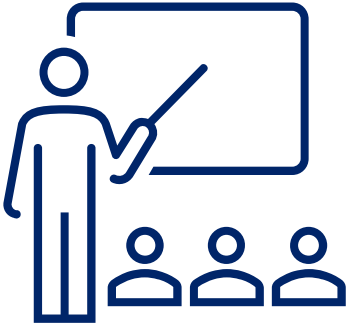
- Including the addition of a *Safer Speeds Strategy Team*.
- **Join a Safe System Strategy Team**
- **Become a "Friend of the DTZ Coalition"**
  - Allows you to watch DTZ Coalition Meetings in listen-only mode





*Alone we cannot solve this problem.  
Together we can.*

Haley Dougherty  
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KDOT Bureau of Transportation Safety  
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<https://floridaltap.org/ltap-recordedwebinars/>

<https://austroads.com.au/latest-news/safe-system-assessment-framework>

<https://www.transportation.gov/NRSS/SaferSpeeds>

[Handout - Applying a Safe System Solutions Hierarchy.pdf](#)

[Safe System Approach for Speed Management.pdf](#)