THE SAFE SYSTEM APPROACH

Zero is our goal. A Safe System is how we get there.

U.S.Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

Imagine our country as a place where *nobody* has to die from vehicle crashes.

Source: Fehr & Peers

Presentation Overview

1 Introduction

2 Safe System Principles

3 Safe System Elements

4 Conclusion & Resources

A NEW DIRECTION

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

SUCCESSFUL SAFE SYSTEM ADOPTERS

Sweden

Vision Zero

60-70%

Reduction in fatalities
1994-2015

Netherlands

Sustainable Safety

50-60%

Reduction in fatalities
1994-2015

Australia

Safe System

50-60%

Reduction in fatalities
1994-2015

New Zealand

Safer Journeys

50-60%

Reduction in fatalities
1994-2015

Source: World Resources Institute

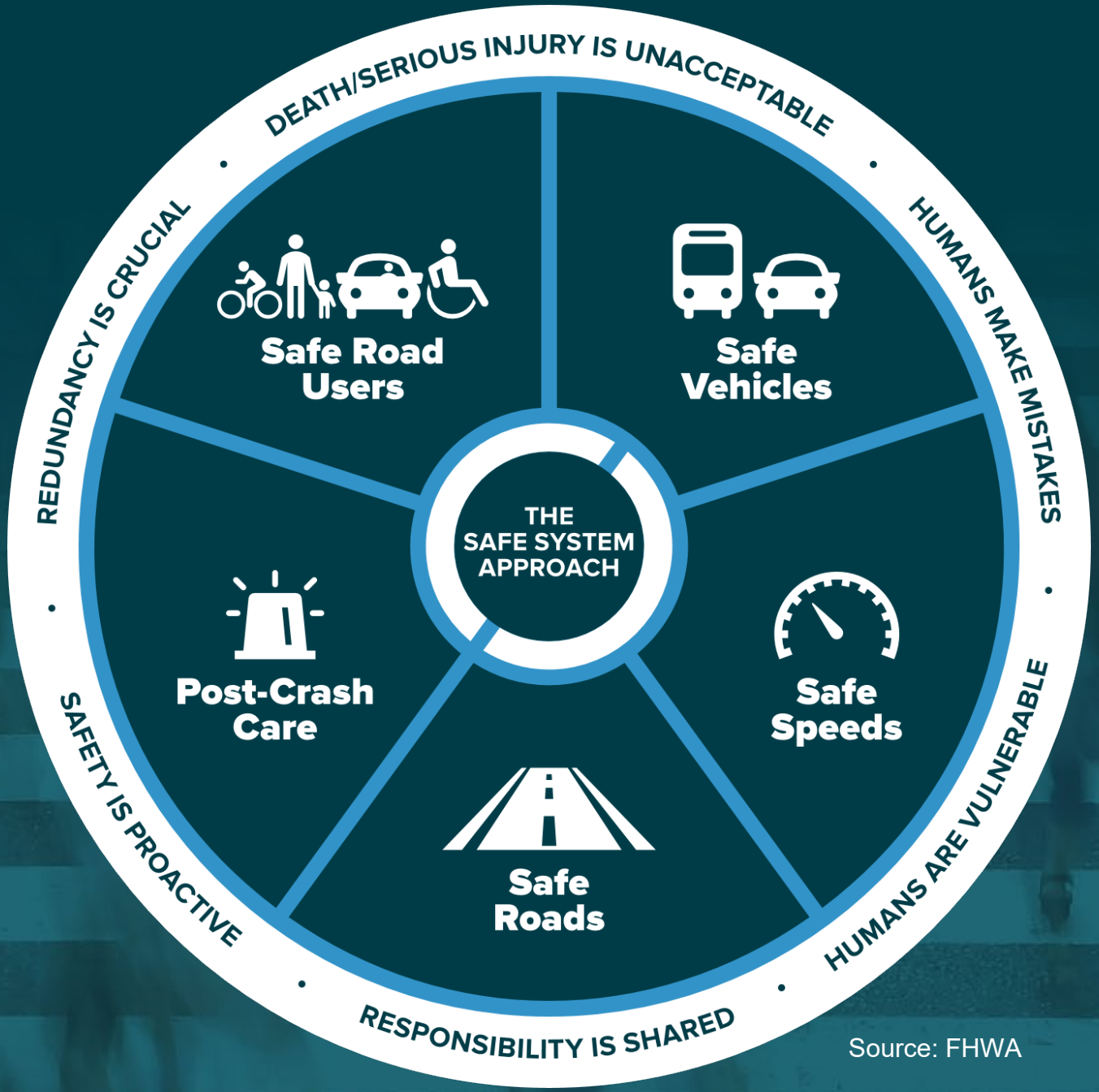
SAFE SYSTEM IN THE UNITED STATES

ROAD TO ZERO

TZD Toward Zero Deaths®
National Strategy on Highway Safety

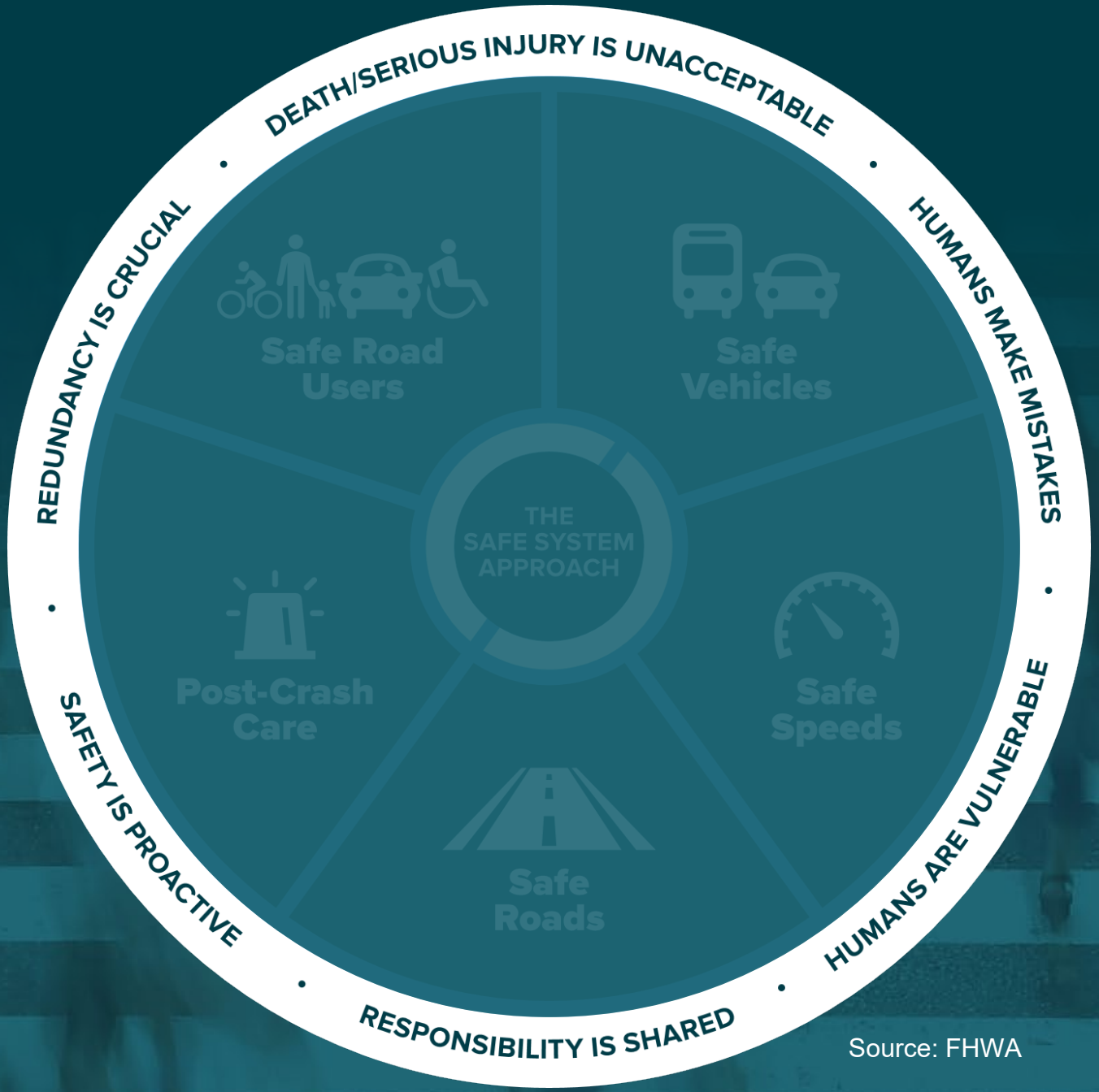
VISION ZERO NETWORK

THE SAFE SYSTEM APPROACH



Source: FHWA

THE 6 SAFE SYSTEM PRINCIPLES



Source: FHWA

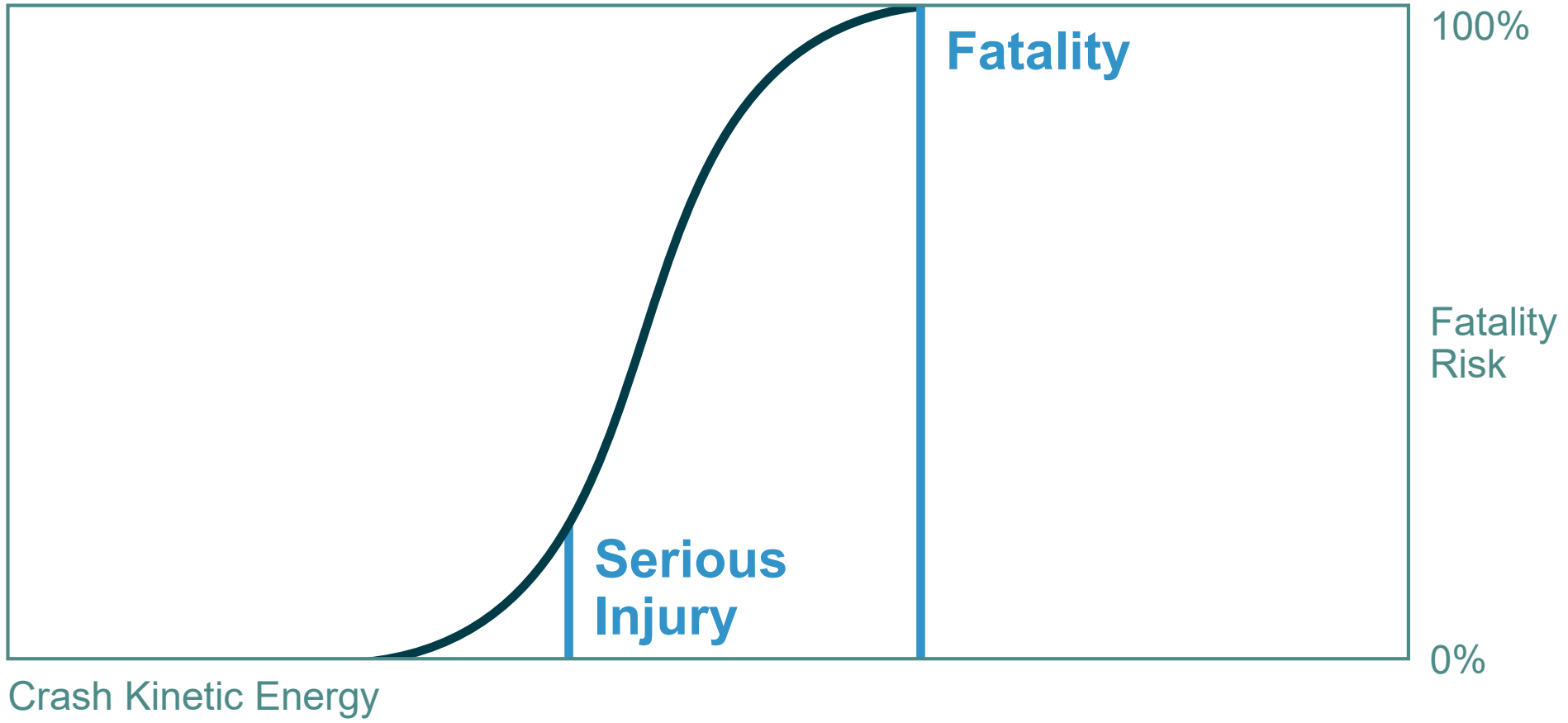
DEATH/SERIOUS INJURY IS UNACCEPTABLE

Source: Vision Zero Network

HUMANS MAKE MISTAKES

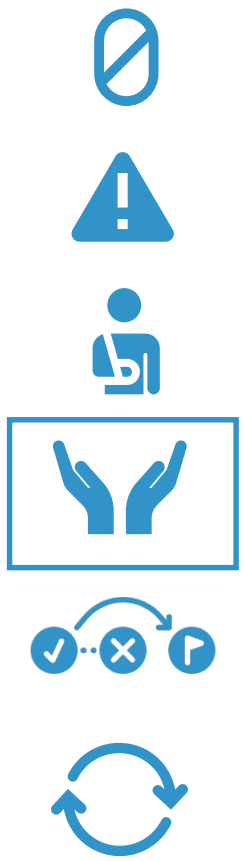
Source: Fehr & Peers

HUMANS ARE VULNERABLE



Source: FHWA

RESPONSIBILITY IS SHARED



System managers

Planners, designers, builders, operators, maintenance workers

Vehicle manufacturers

Law enforcement personnel

Post-crash personnel

System users

SAFETY IS PROACTIVE

Identify risks

Mitigate risks

REDUNDANCY IS CRUCIAL

Safe road users

Safe vehicles

Safe speeds

Safe roads

Post-crash care

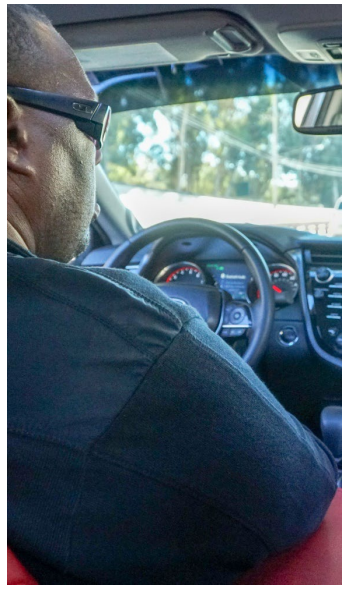
THE 5 SAFE SYSTEM ELEMENTS

Source: FHWA

SAFE ROAD USERS

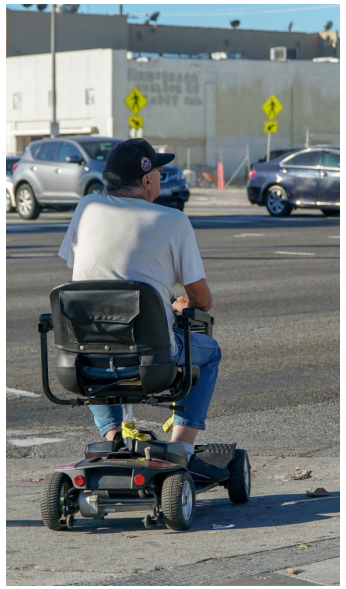
Walk

Bike



Drive

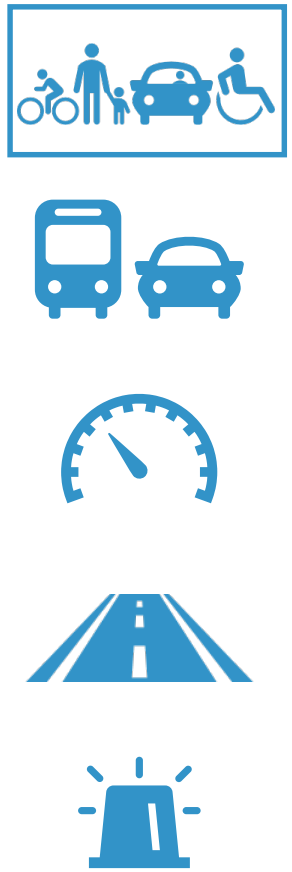
Transit

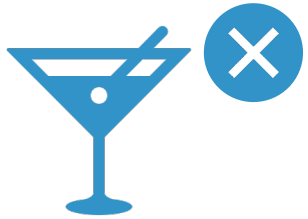


Other

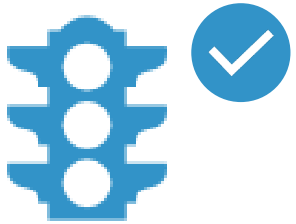
Source for all images: Fehr & Peers

SAFE ROAD USERS – CONTINUED

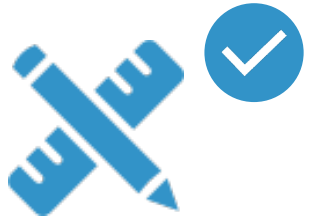




Not distracted or impaired

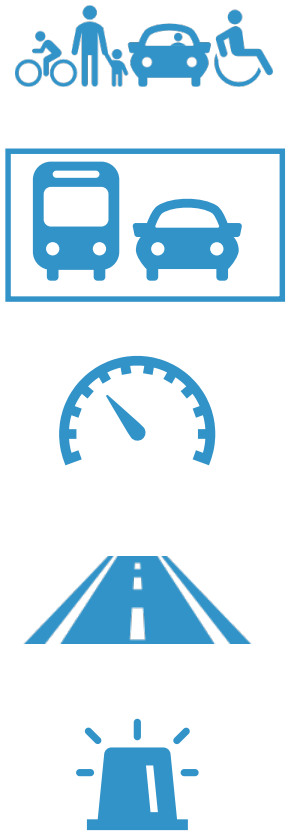


Follow rules



Act within the limits of the road design

SAFE VEHICLES



Active safety

Measures to reduce the chance of a crash occurring

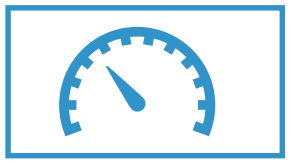
- Lane departure warning
- Autonomous emergency braking

Passive safety

Protective systems for when crashes do occur

- Seatbelts and airbags
- Crash-absorbing vehicle crumple zones

SAFE SPEEDS



> 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."

Organisation for Economic Co-operation and Development

SAFE SPEEDS: REDUCING PEDESTRIAN FATALITIES

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

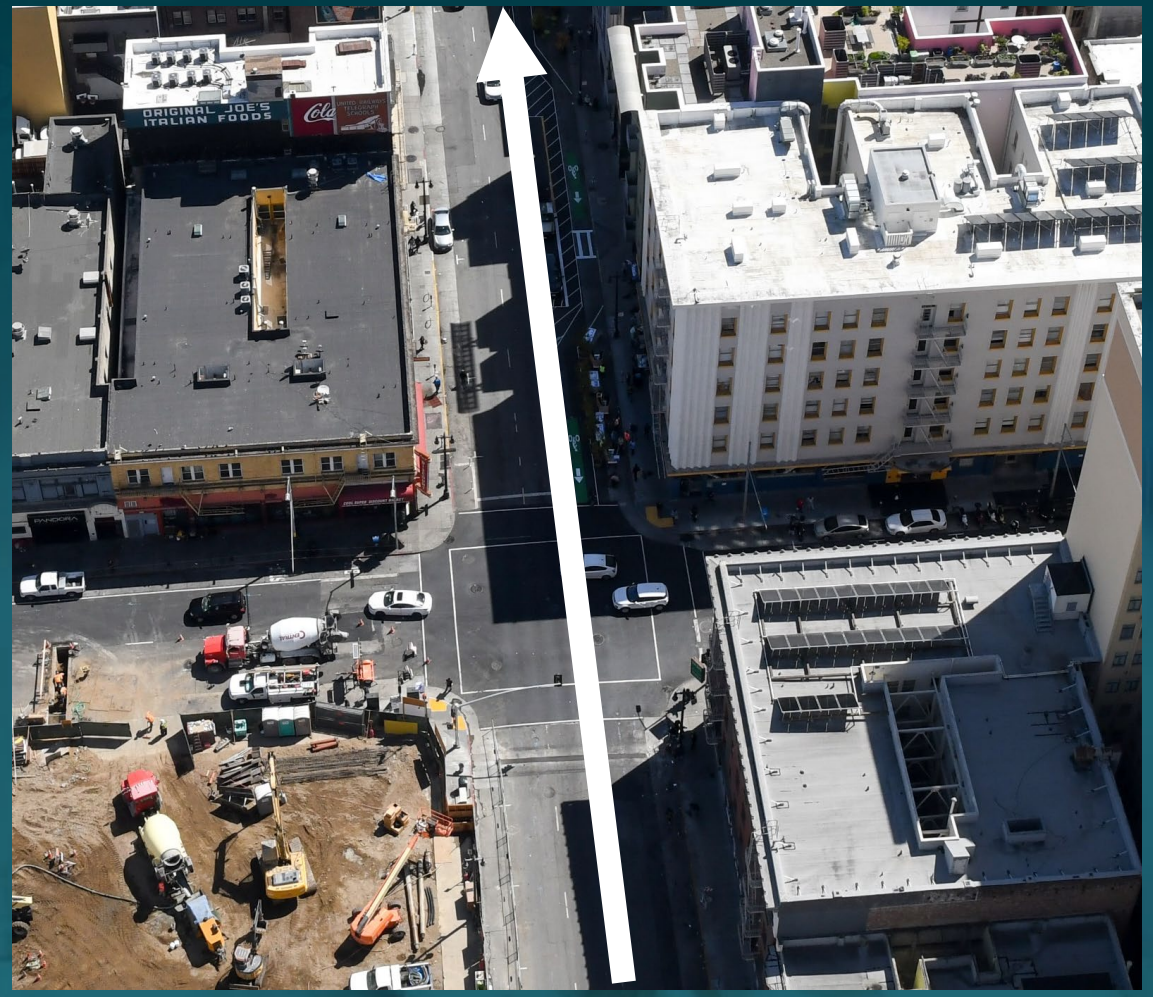
MPH

90% risk of death

Source: FHWA

SAFE SPEED: TREATMENTS THAT MINIMIZE INJURIES

Speed through typical intersection

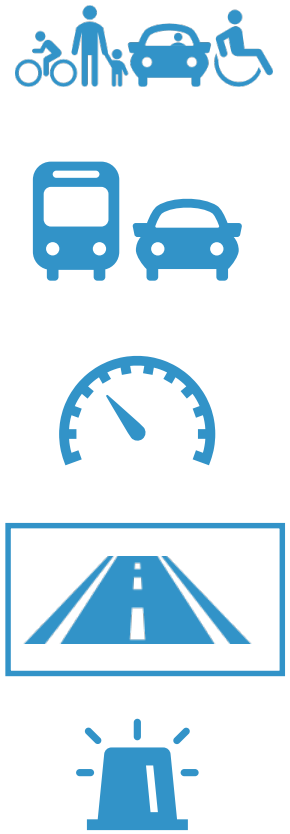


Source: Fehr & Peers

Speed through Safe System intersection

Source: City of Carmel, IN

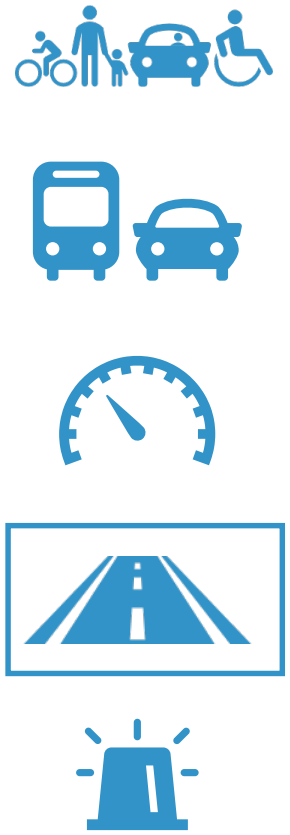
SAFE ROADS



Safe roads are designed and operated to:

1. **Prevent crashes**
2. **Keep impacts on the human body at tolerable levels**

SAFE ROADS: AVOIDING CRASHES



Avoiding crashes involves:

Separating users in space

Separating users in time

Increasing attentiveness and awareness

Source for all images: Fehr & Peers

SAFE ROADS: CRASH KINETIC ENERGY

Managing crash kinetic energy involves:

Managing speed

Manipulating mass

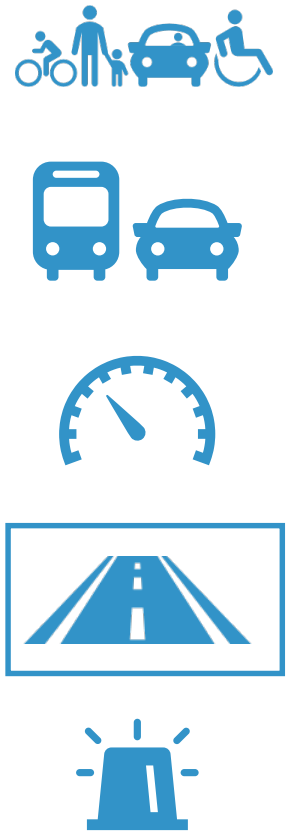
Manipulating crash angles

Source: Fehr & Peers

Source: Fehr & Peers

Source: City of Carmel, IN

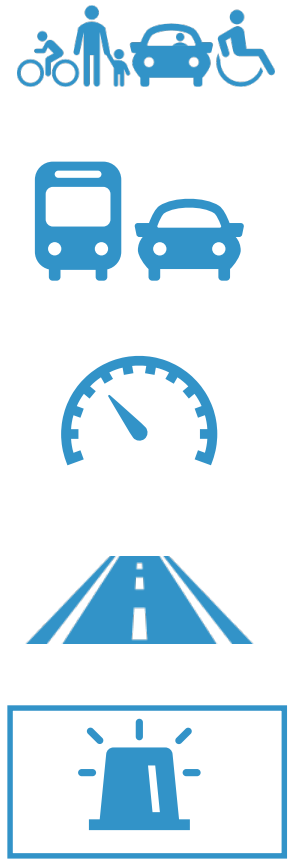
SAFE ROADS: ALL ASPECTS OF THE ROADWAY SYSTEM



Safe roads include all aspects of the roadway system:

- Design
- Construction
- Maintenance
- Operation

POST-CRASH CARE

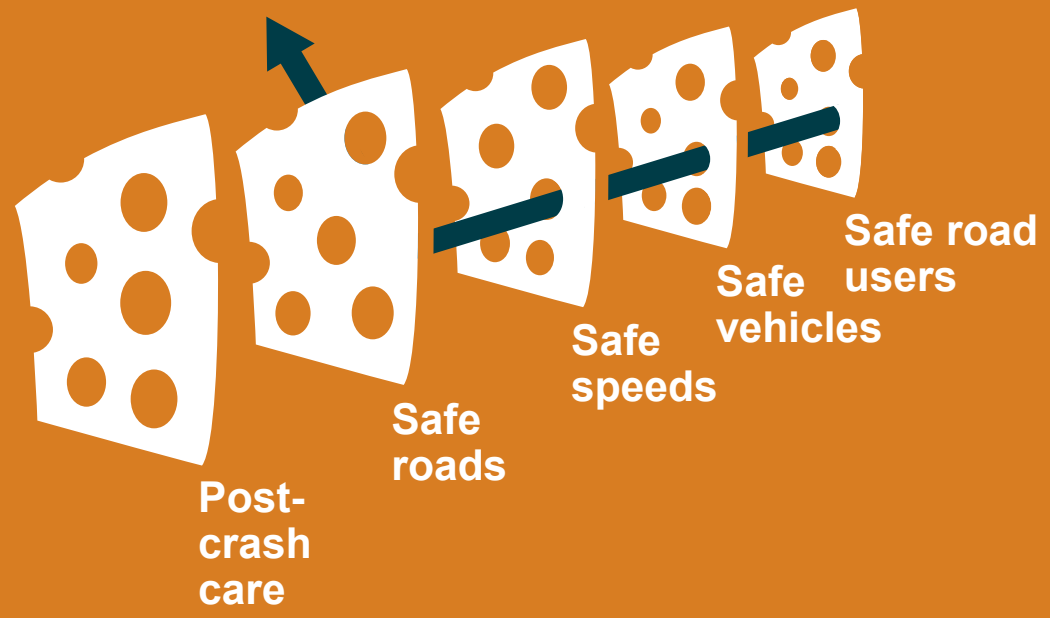


Vital post-crash actions include:

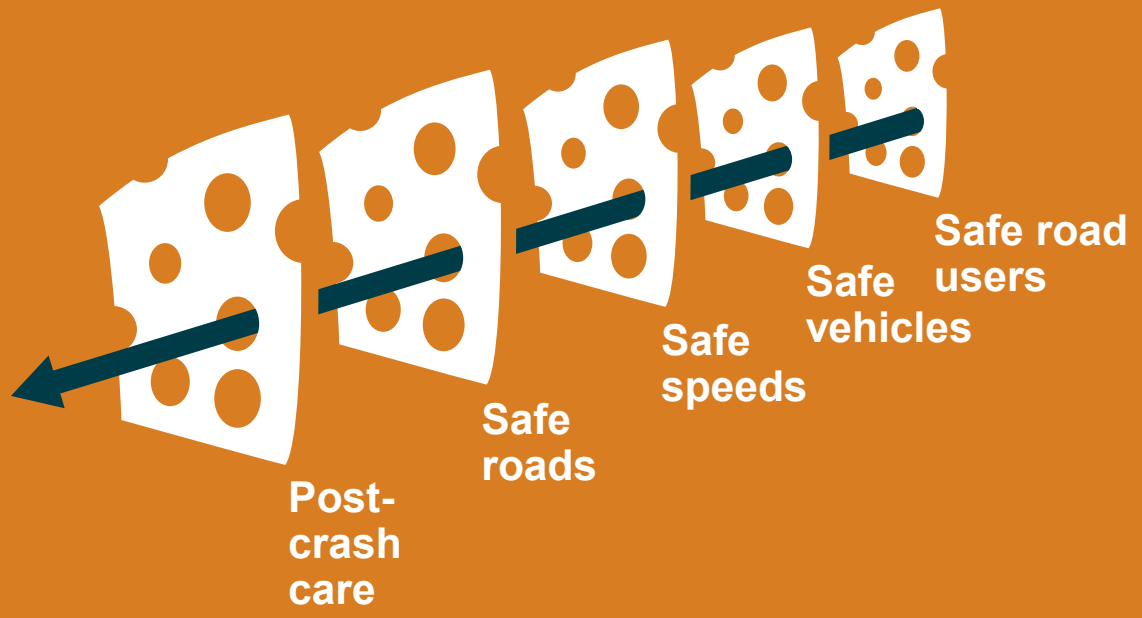
- First responders
- Medical care
- Crash investigation
- Traffic incident management
- Justice

THE 5 SAFE SYSTEM ELEMENTS CREATE REDUNDANCY

The “Swiss Cheese Model” of redundancy creates layers of protection



Death and serious injuries only happen when all layers fail

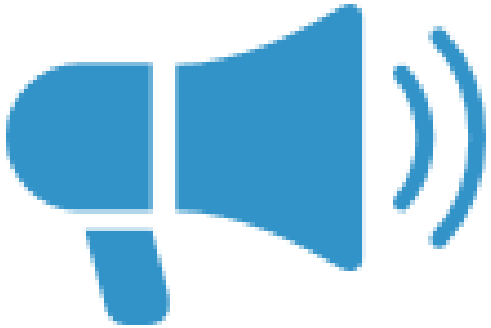


Source: FHWA

WHERE ARE YOU ON THE SAFE SYSTEM JOURNEY?

Traditional approach		Safe System approach
Prevent crashes	→	Prevent death and serious injuries
Improve human behavior	→	Design for human mistakes/limitations
Control speeding	→	Reduce system kinetic energy
Individuals are responsible	→	Share responsibility
React based on crash history	→	Proactively identify and address risks

FHWA RESOURCES



Safe System Materials

Find more resources at: safety.fhwa.dot.gov/zerodeaths

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A Safe System is how we get there.

Questions?