THE SAFE SYSTEM APPROACH

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

How the Safe System Approach and Complete Streets Complement Each Other

U.S.Department of Transportation
Federal Highway Administration

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

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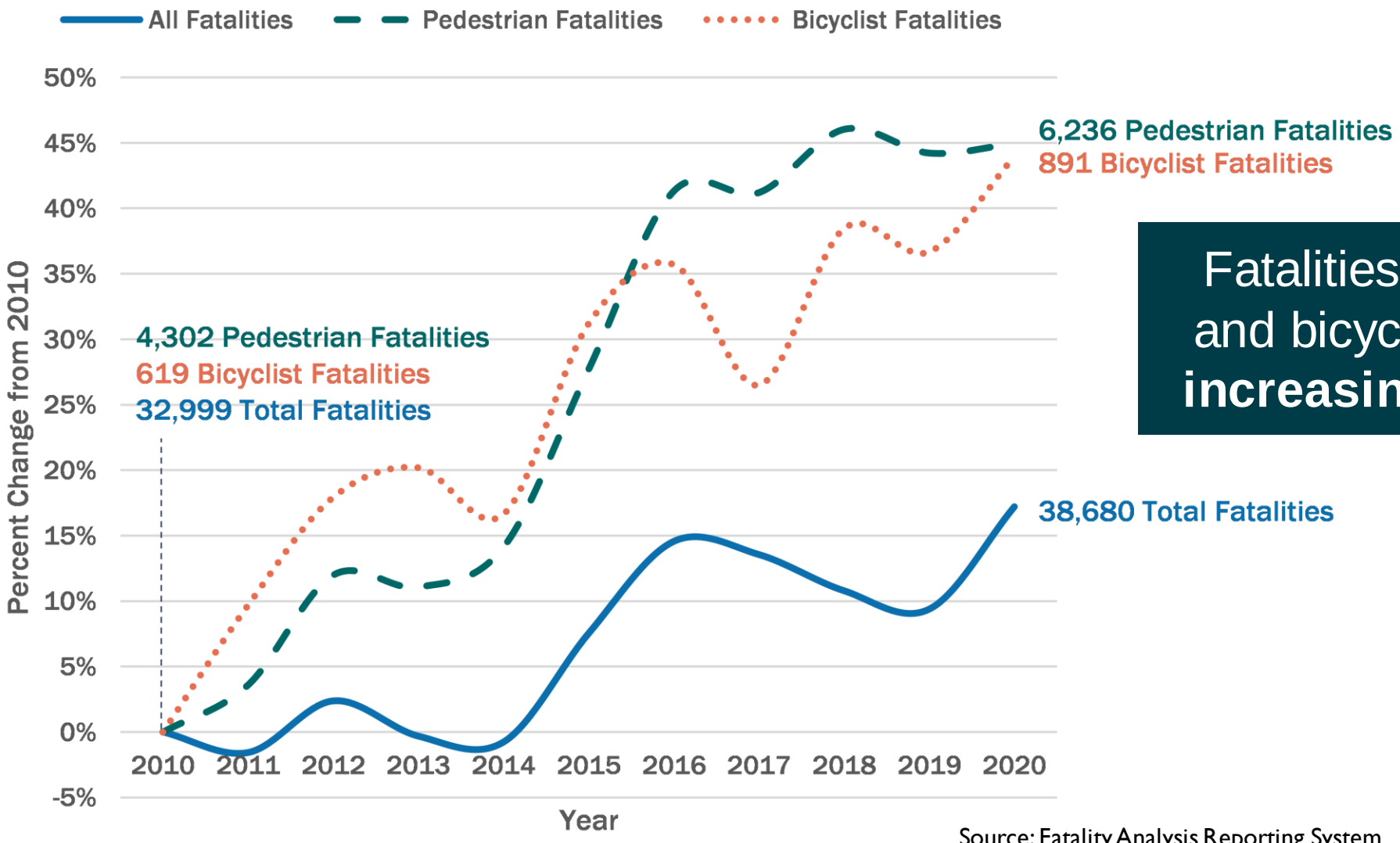
WE HAVE A NATIONAL ROADWAY SAFETY PROBLEM



Fatalities of pedestrians and bicyclists have been **increasing even greater**

Source: Fatality Analysis Reporting System

Source: US DOT

What is a Complete Street?

“A Complete Street is safe, and feels safe, for all users.”

References: https://highways.dot.gov/complete-streets

Image Source: FHWA

What is the Safe System Approach?

"A guiding principle to address the safety of all road users. It involves a paradigm shift to improve safety culture, increase collaboration across all safety stakeholders, and refocus transportation system design and operation on anticipating human mistakes and lessening impact forces to reduce crash severity and save lives."

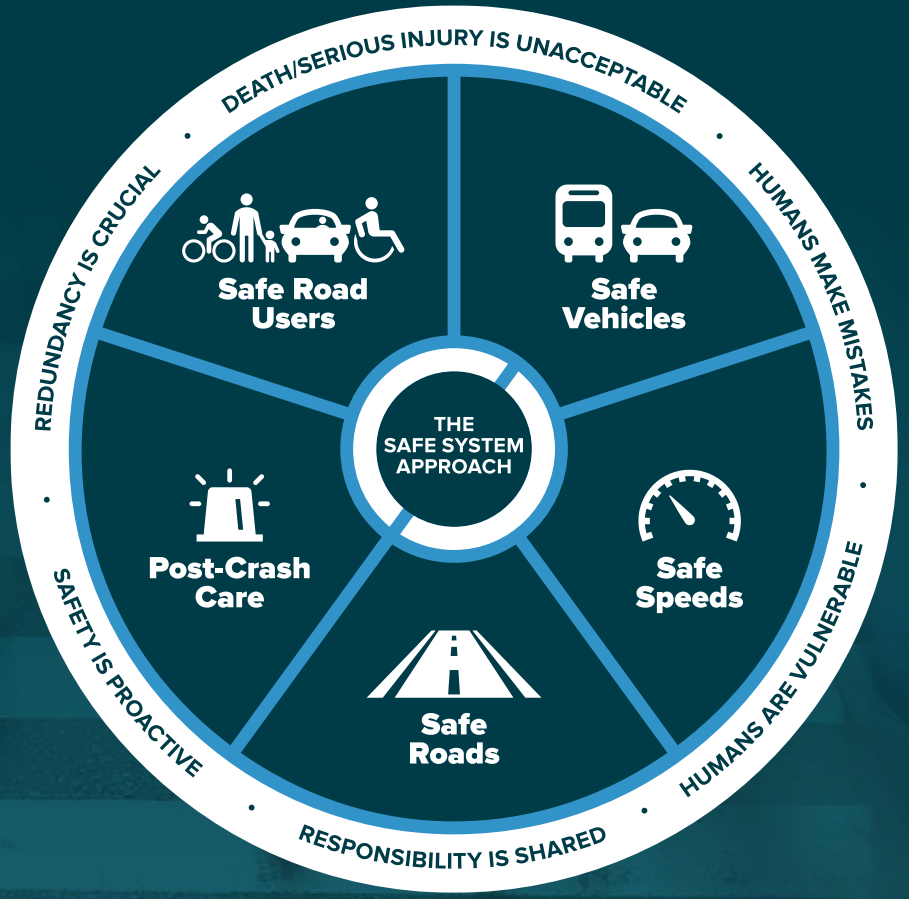
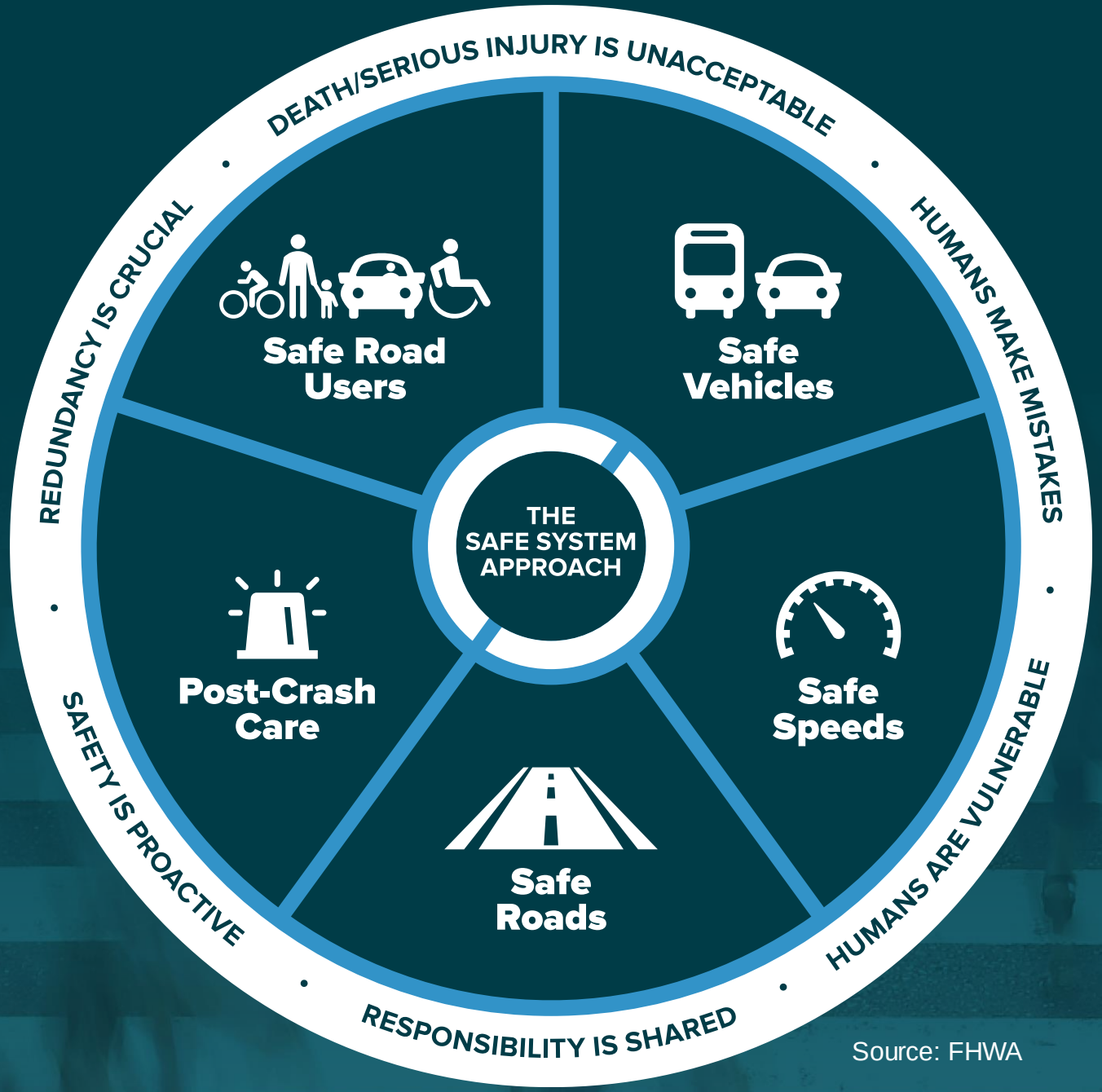


Image Source: FHWA

References:
https://www.transportation.gov/NRSS/SafeSystem
www.transportation.gov/grants/ss4a/nofo



Death/serious injury is unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

Redundancy is crucial

Source: FHWA

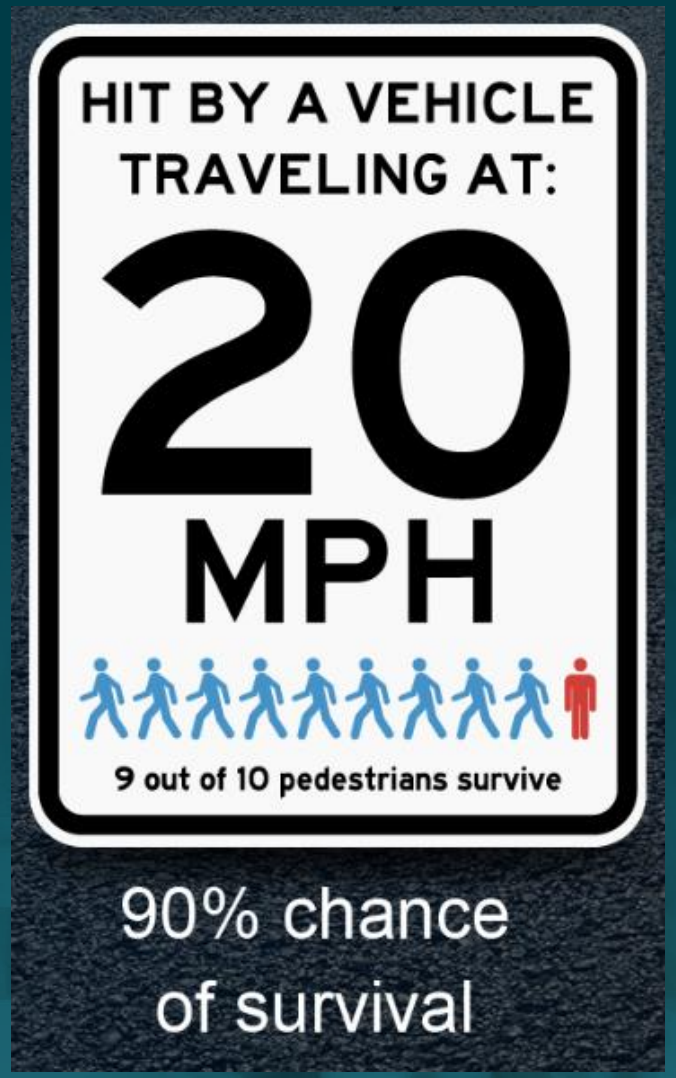
A NEW PARADIGM

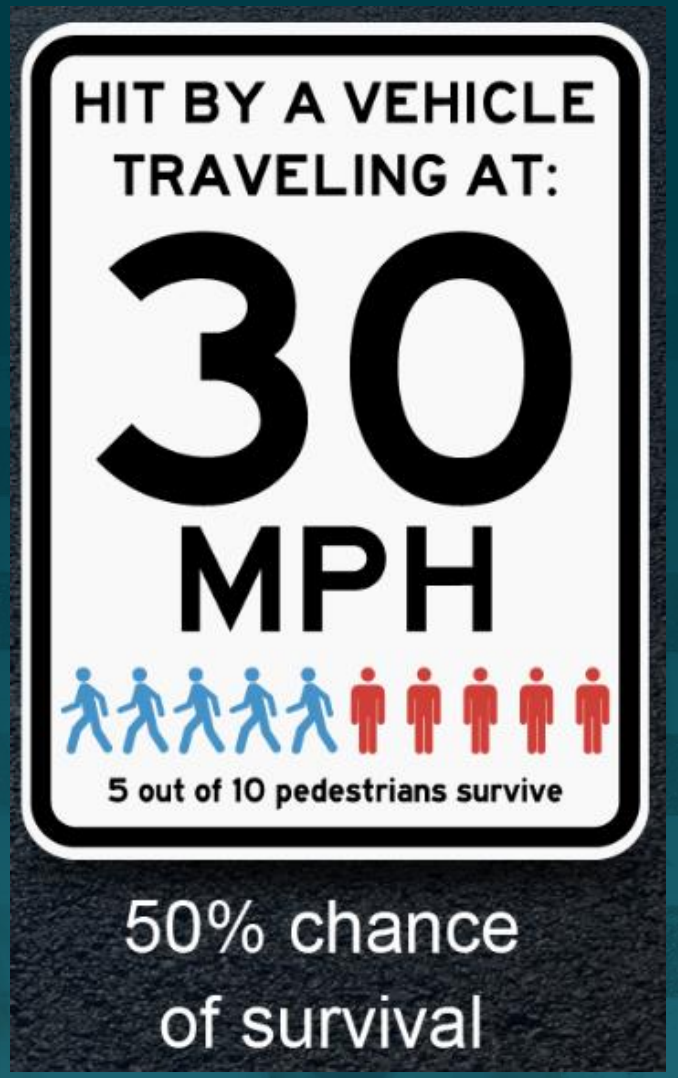
The Safe System approach aims to eliminate fatal and serious injuries for all road users by:

Accommodating human mistakes

Keeping impacts on the human body at tolerable levels

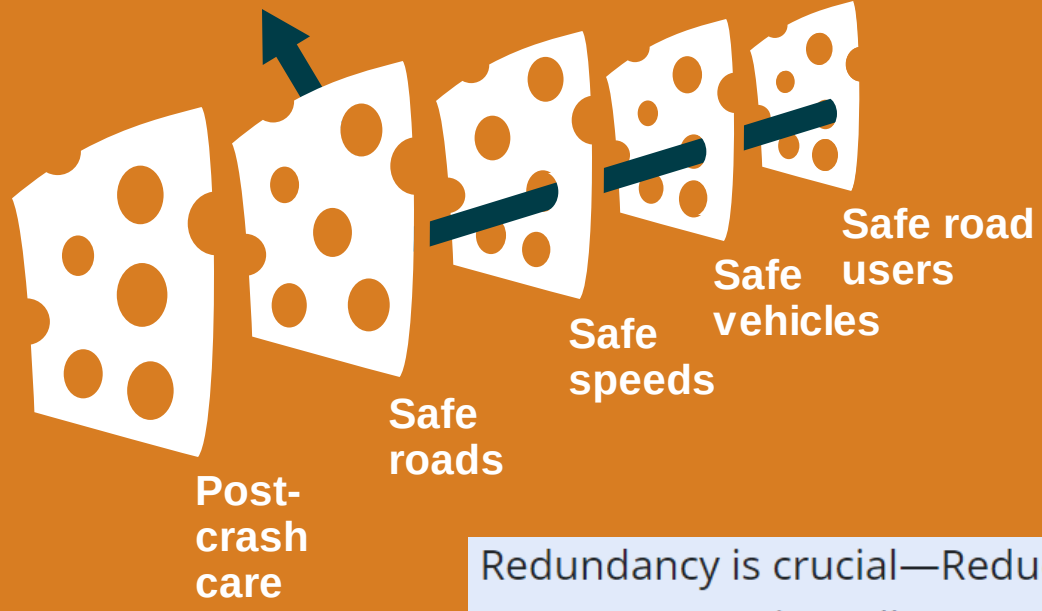
Safe Speeds: Vulnerable User Focus





THE 5 SAFE SYSTEM ELEMENTS CREATE REDUNDANCY

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



Redundancy is crucial—Reducing the risk of severe crash outcomes requires all parts of the system to be strengthened, so that if one element fails, the others still protect road users.

Source: FHWA

Some roads are engineered to accommodate higher speeds …

… and others not.

Safe Speeds

SAFE SPEEDS

The Safe System approach is about matching operating speeds to what is appropriate for the road conditions that exist.

SAFE SPEED AND ROAD DESIGN

Intersection geometry with little influence on speed

Source: Fehr & Peers

Roundabout geometry influences speed

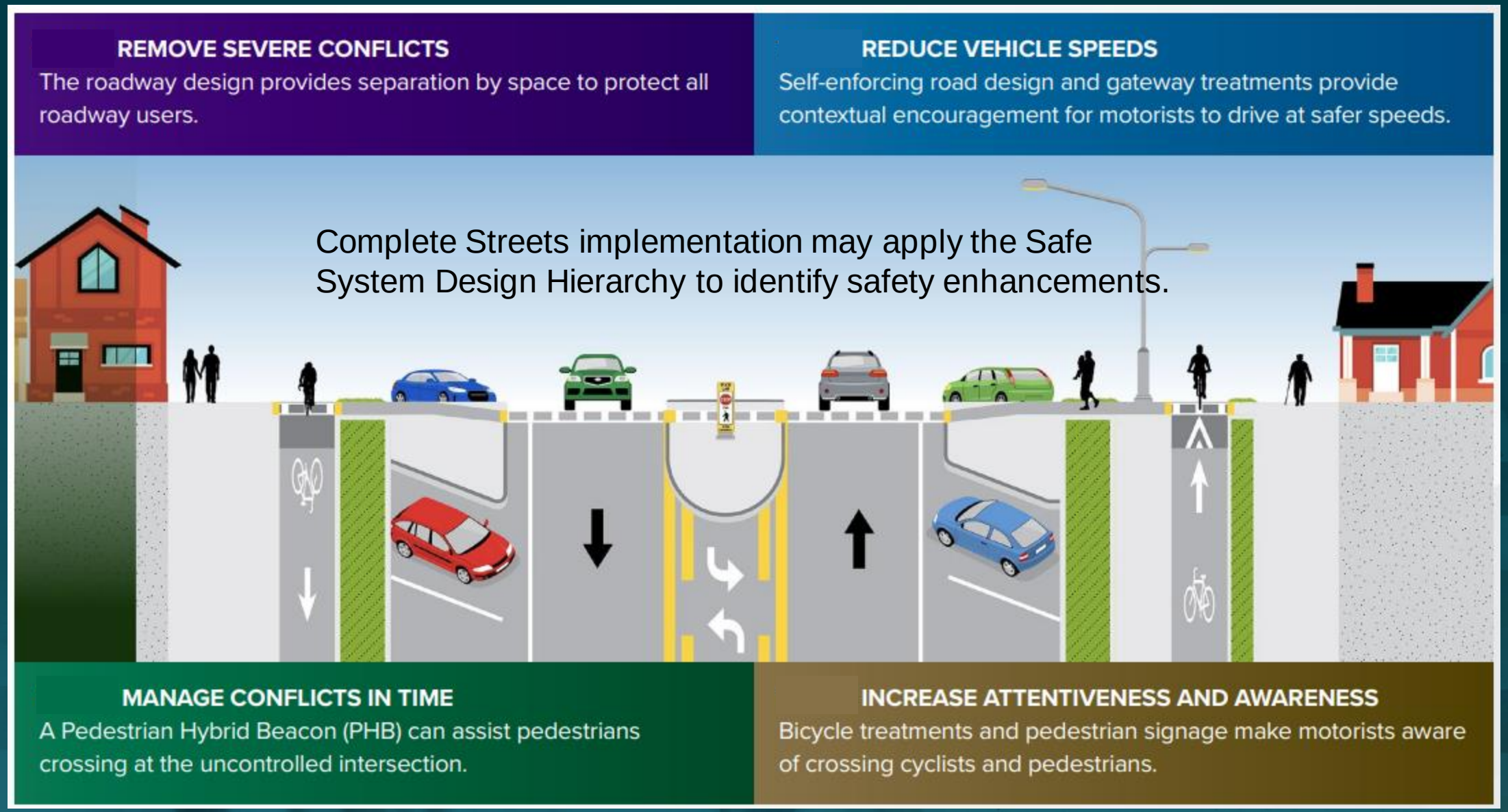
Source: City of Carmel, IN

SAFE ROADS

Safe roads are designed and operated to:

1. **Prevent crashes among all users**
    1. **Separating users**
2. **Keep impacts on the human body at tolerable levels**
    1. **Managing kinetic energy**

HOW CAN THE SAFE SYSTEM APPROACH COMPLEMENT COMPLETE STREETS EFFORTS?



Source: FHWA

Example of Separated Bike Path

Image Source: FHWA

REMOVE SEVERE CONFLICTS

Removing severe conflicts involves the elimination of specific high-risk conditions. Road users moving at different speeds or different directions are separated in space to minimize conflicts with other road users. This often involves providing physical separation between motorized and non-motorized users with a dedicated part of the right-of-way, removing certain intersection crossing conflicts, removing fixed objects along the roadside, or eliminating railway-highway crossings. These countermeasures support both the Safe Roads and Safe Road Users elements of the Safe System Approach.

REDUCE VEHICLE SPEEDS

Implementing design features and speed management strategies to reduce vehicle speeds effectively reduces the kinetic energy involved in a crash should it occur. States and local jurisdictions should set appropriate speed limits to reduce the significant risks drivers impose on others—especially vulnerable road users—and on themselves. To achieve desired speeds, agencies often implement other speed management strategies concurrently with setting speed limits, such as self-enforcing roadways, traffic calming, and speed safety cameras. Self-enforcing roads involve the use of road and roadside design elements, such as lane narrowing, intersection channelization, and horizontal and vertical deflection, to elicit lower travel speeds of motor vehicles along the roadway. This also includes features for pedestrians and bicyclists, such as median islands, raised crosswalks, and buffered bicycle lanes. These countermeasures support the Safe Roads, Safe Speeds, and Safe Road Users elements of the Safe System Approach.

Example of raised pedestrian crosswalk

Image Source: FHWA

Example of conflict separation between motor vehicles and pedestrians using a Pedestrian Hybrid Beacon

Image Source: FHWA

MANAGE CONFLICTS IN TIME

Managing conflicts in time assumes that users will need to occupy the same physical space on the roadway but creates a safer environment by separating the users in time using traffic control devices, such as traffic signals or hybrid beacons, to minimize vehicle conflicts with vulnerable road users. Providing discrete and alternating opportunities for users to navigate the roadway environment is not only a safety strategy, but also one that relates to user comfort and convenience, especially for non-motorized users. These solutions support the Safe Roads, Safe Speeds, and Safe Road Users elements of the Safe System Approach.

Example of daylighting an intersection to improve visibility of people crossing on foot by approaching motorists.

Image Source: FHWA

INCREASE ATTENTIVENESS AND AWARENESS

Increasing attentiveness and awareness involves alerting roadway users to certain types of conflicts so that appropriate action can be taken consistent with the Safe System Approach principle that responsibility is shared. Examples that fall into this category include crossing visibility enhancements, backplates with retroreflective borders, and rumble strips/stripes. These countermeasures support the Safe Roads, Safe Speeds, and Safe Road Users elements of the Safe System Approach.

Implementing the Safe System approach is our shared responsibility, *and we all have a role.*

Source: Fehr & Peers

Source: Arlington County, VA

Source: Fehr & Peers

Source: Fehr & Peers

FHWA RESOURCES

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Safe System Materials

Find more resources at: highways.dot.gov/safety/zero-deaths