

# Shifting the Paradigm: Safe Systems Principles

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# Outline

- A fun, awesome, spectacular, interactive activity
- Review of the many “zero traffic deaths” initiatives in the U.S.
- Intro to Safe Systems
- Exploration traffic safety paradigms

# Hello, Neighbor!

Partner up with **someone you don't know**; share answers with each other. Ask each other the following:

- Name
- Organization, city, town, state, etc. you are representing here
- The biggest safety issue we are dealing with in my community is...
- I came to this session because...
- I think a Safe Systems approach can help me...

# Three “Zero” Initiatives in the U.S.

- Toward Zero Deaths
- Vision Zero
- Road to Zero

# Toward Zero Deaths

## **TOWARD ZERO DEATHS:**

A NATIONAL STRATEGY ON HIGHWAY SAFETY

### **SECTION 3: KEY AREAS**

- 1. Safer Drivers and Passengers**
- 2. Safer Vulnerable Users**
- 3. Safer Vehicles**
- 4. Safer Infrastructure**
- 5. Enhanced Emergency Medical Services**
- 6. Improved Safety Management**

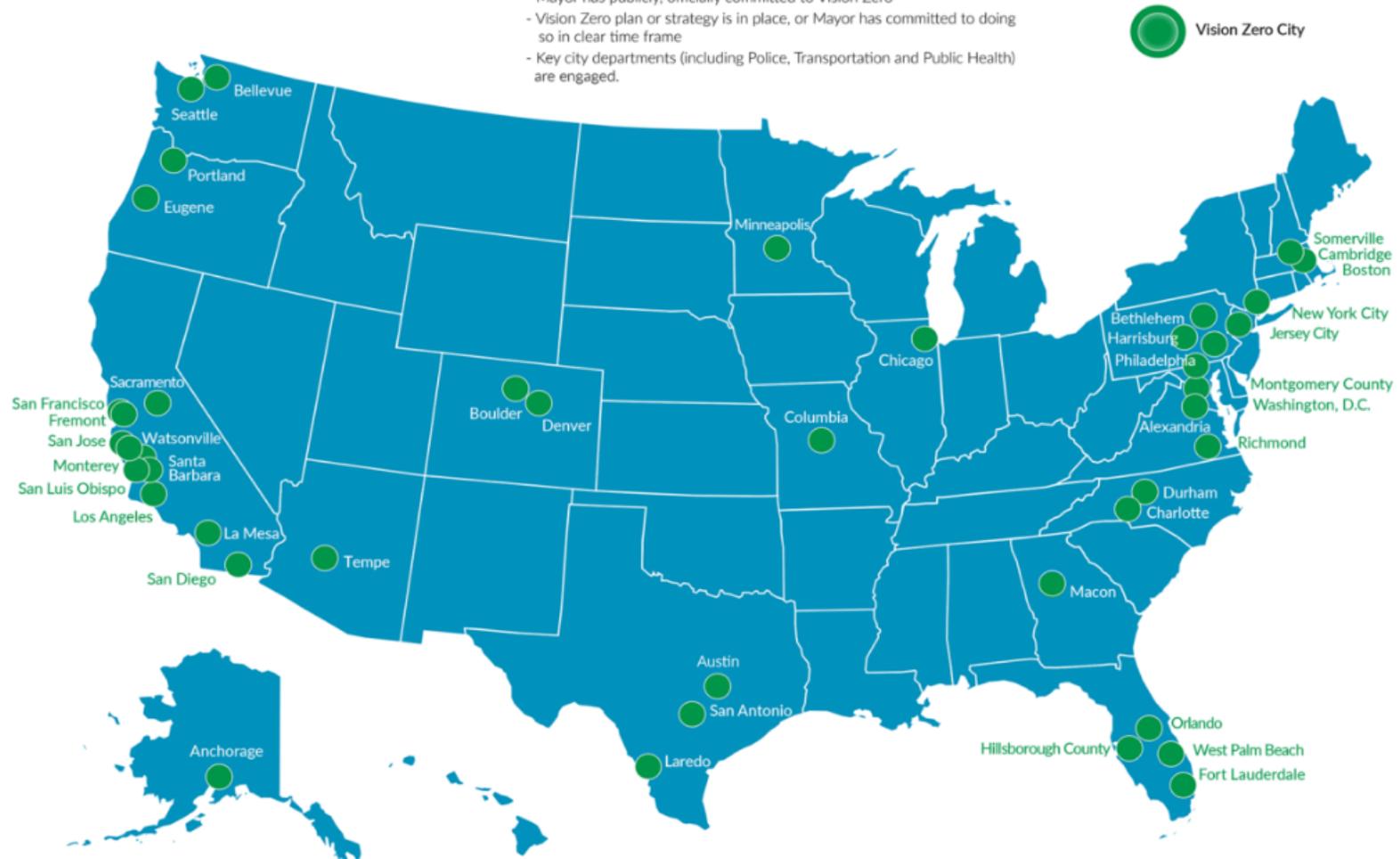
Source: [https://www.towardzerodeaths.org/wp-content/uploads/TZD\\_Strategy\\_12\\_1\\_2014.pdf](https://www.towardzerodeaths.org/wp-content/uploads/TZD_Strategy_12_1_2014.pdf)

# Vision Zero Cities

## Vision Zero Cities

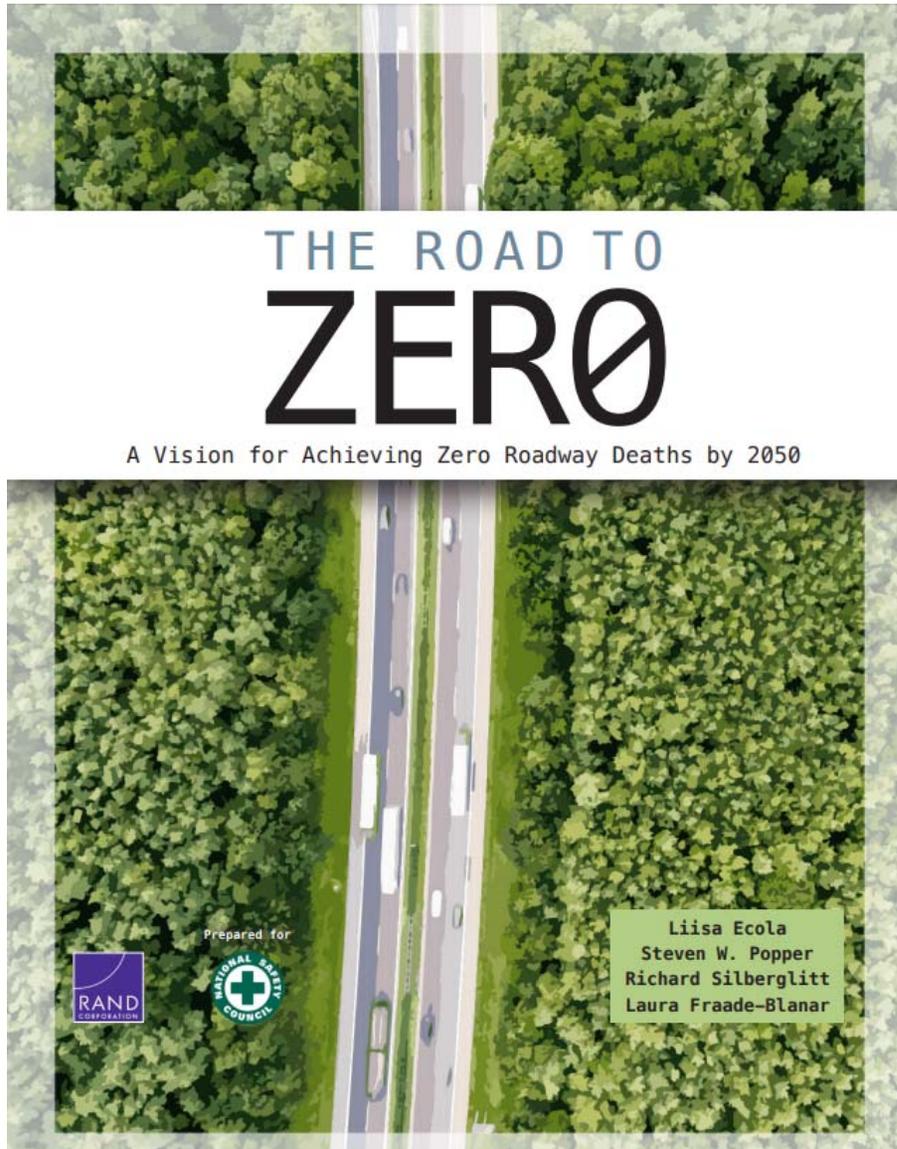
A Vision Zero City meets the following minimum standards:

- Sets clear goal of eliminating traffic fatalities and severe injuries
- Mayor has publicly, officially committed to Vision Zero
- Vision Zero plan or strategy is in place, or Mayor has committed to doing so in clear time frame
- Key city departments (including Police, Transportation and Public Health) are engaged.



Source: <https://visionzeronetwork.org/resources/vision-zero-cities/>

# The Road to Zero



1. Double Down on What Works
2. Accelerate Advanced Technology
3. Prioritize Safety

We rightly desire a zero-fatality future. How do we get there?

# Enter: Safe Systems

# Premises

- Achieving zero serious and fatal traffic injuries is only possible through application of a **Safe Systems approach** to road user safety
- Transitioning to a Safe Systems approach requires a **shift in our traffic safety paradigm**

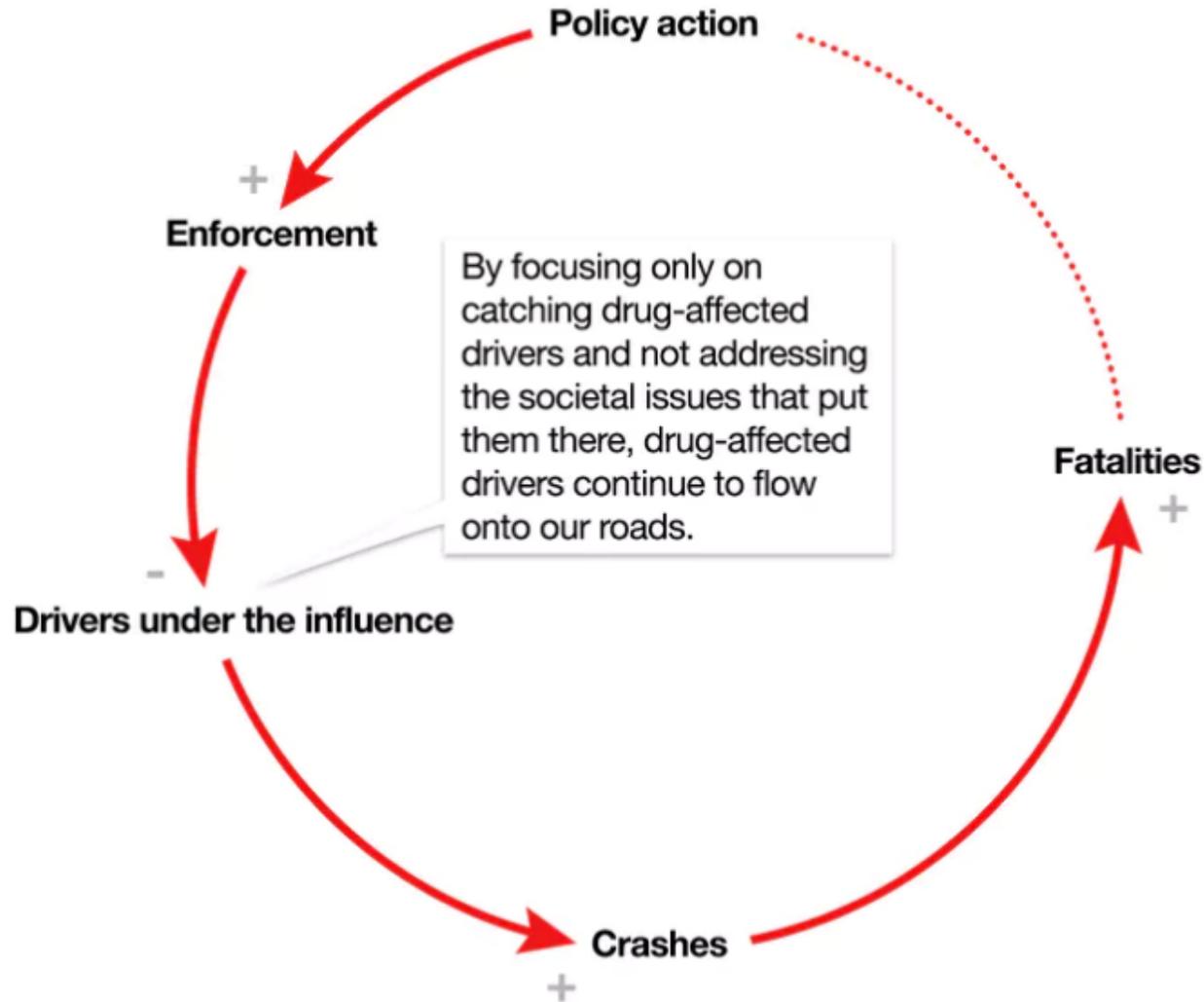
# What is Safe Systems?

# First, some perspective

- *“A new, systems-thinking-based approach is required that considers the **broader societal systems** whose effects manifest inside the road system.”*

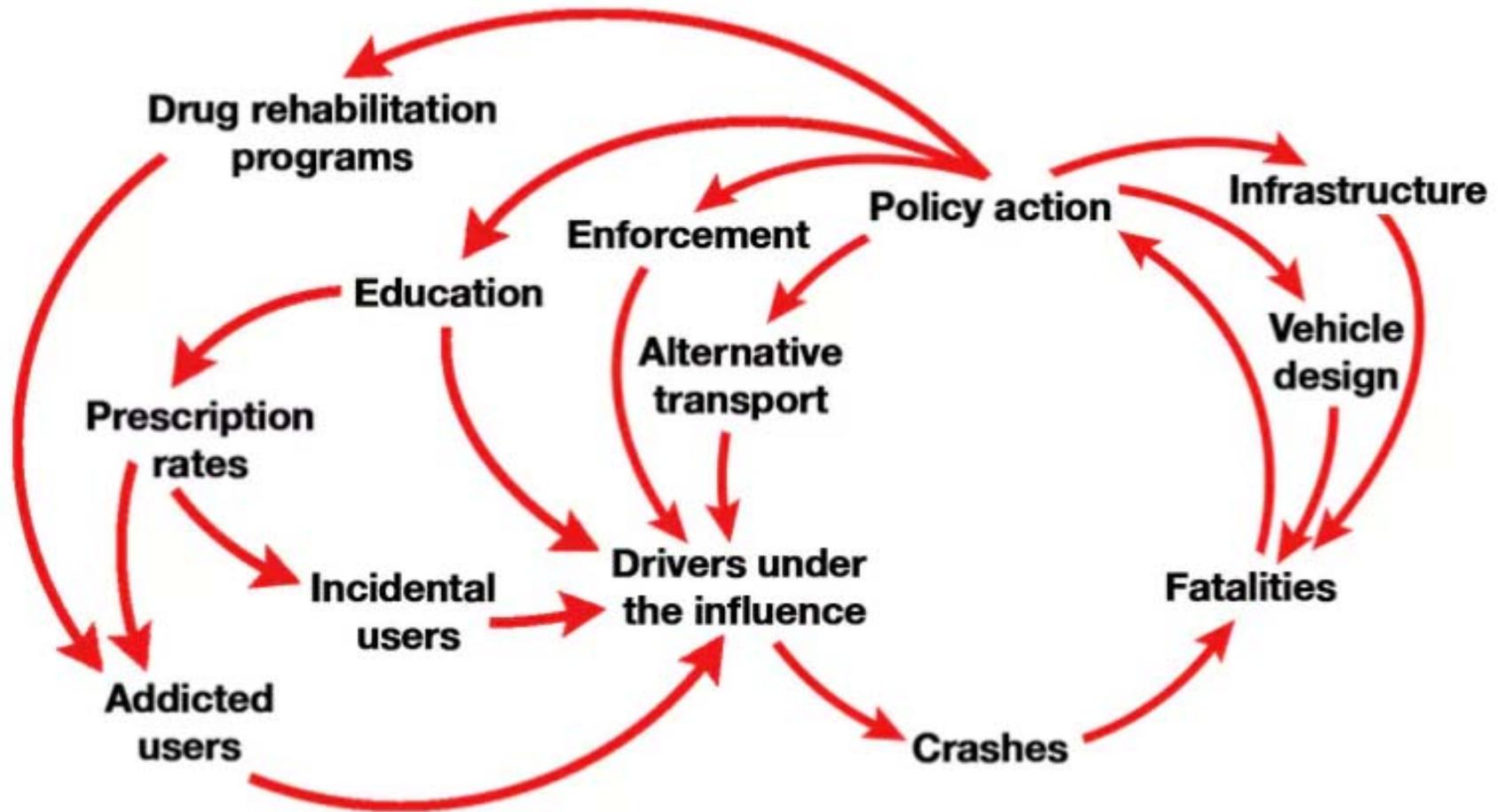
*McClure (2017)*

# Traditional approach to addressing a problem



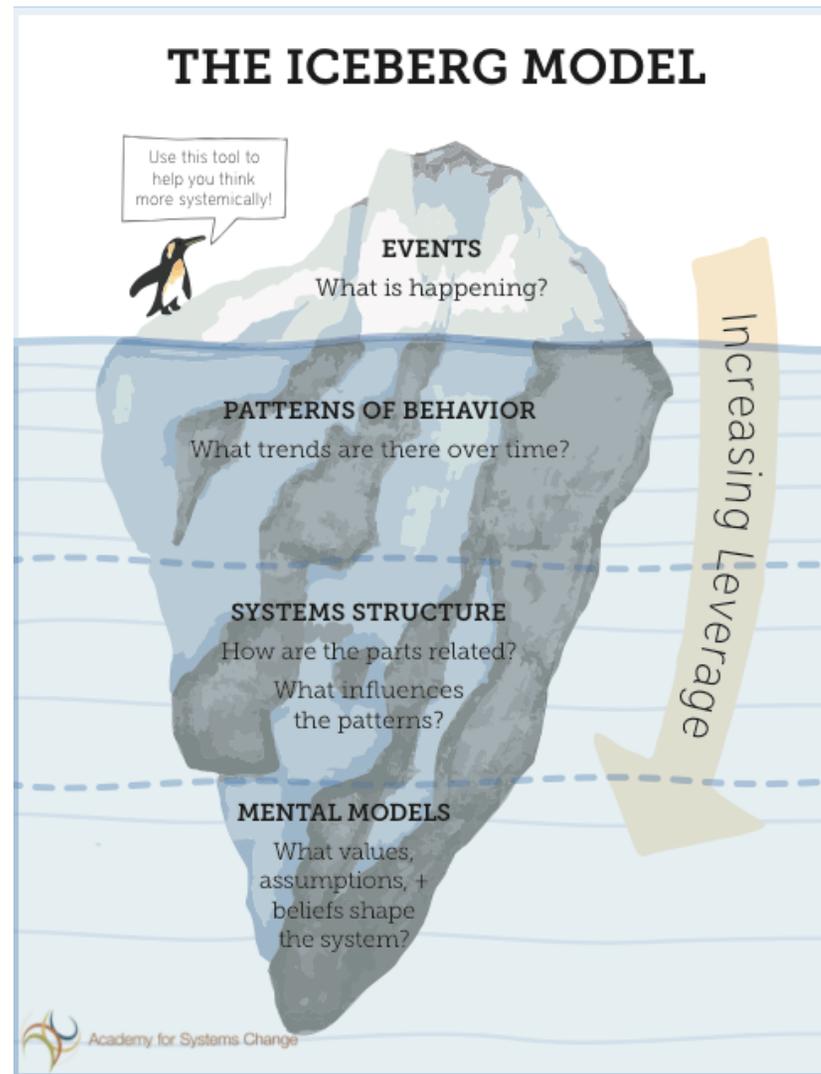
Source: McClure (2017)

# Toward a Safe Systems approach



Source: McClure (2017)

# Safe Systems deal with what lies below the surface



Crashes

Secular trends

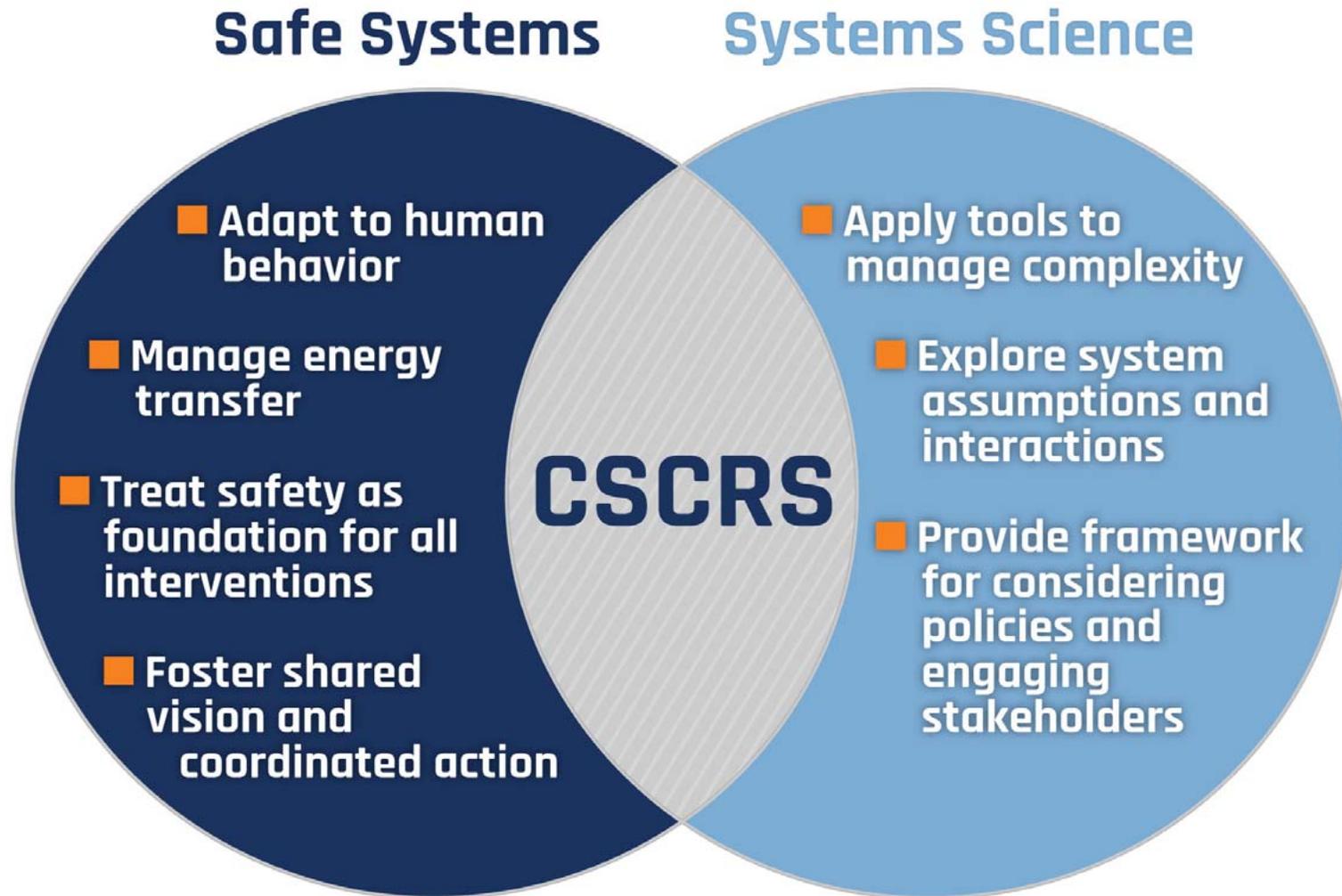
Transportation and land use decision-making

The philosophy or purpose of the transportation system

# Safe Systems principles\*

\*as currently understood and envisioned

# Safe Systems...



# Safe Systems...

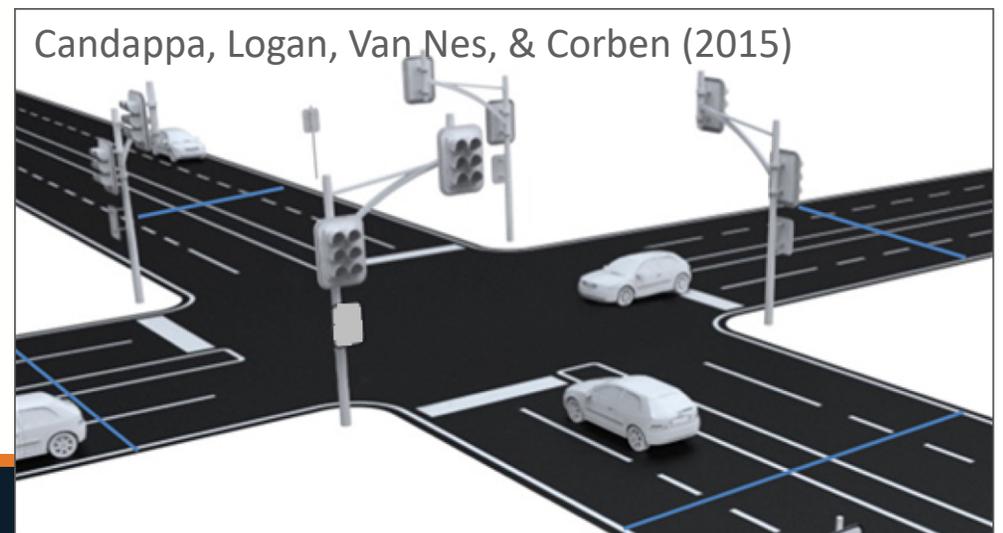
## 1. Adapt the structure and function of the system to the complexities and needs of humans

- Shift from “blaming” or “ignoring” human nature to **adapting system to humans’ complexities and needs**
- **Humans are:**
  - Physically vulnerable
  - Prone to error
  - Impatient (*Furth, 2019*)
  - Driven by (1) the values they hold dear; and (2) their social environments (*McLoughlin et al., 2019*)

# Safe Systems...

## 1. Adapt the structure and function of the system to the complexities of human behavior

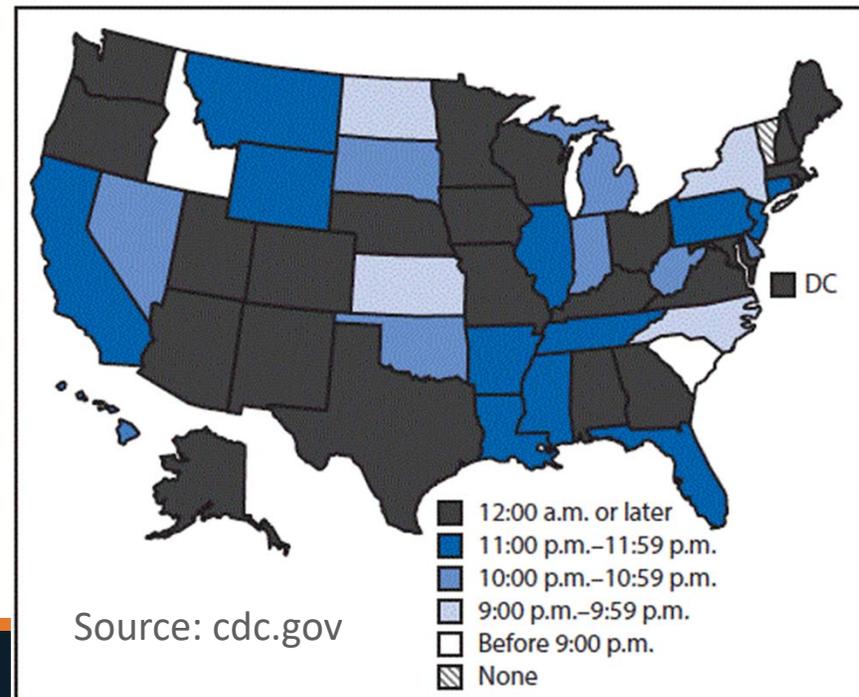
- Minimize likelihood of road user mistakes
  - Graduated Driver Licensing (GDL)
  - Dutch program to train child bicyclists
  - Blind spot detection
  - “Green light” speeds at intersection approaches



# Safe Systems...

## 1. Adapt the structure and function of the system to the complexities of human behavior

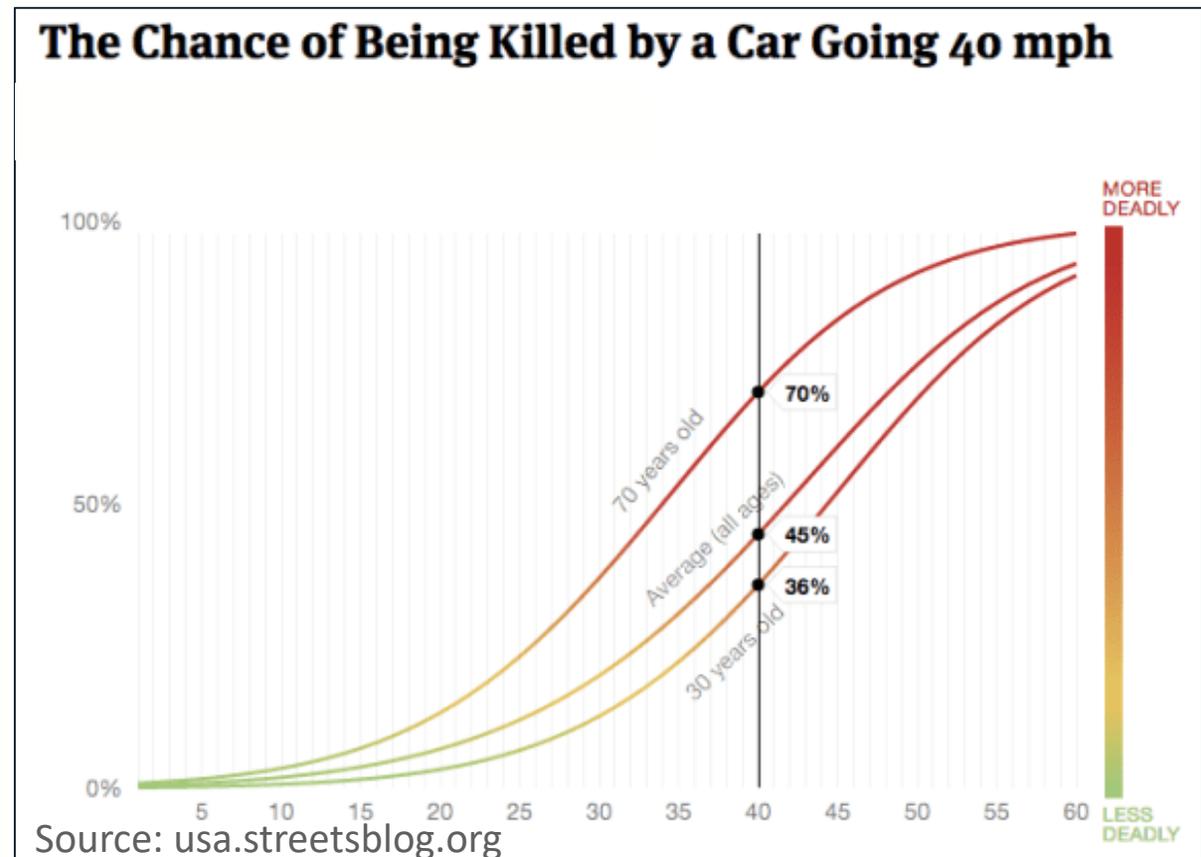
- Ensure consequences of mistakes are less severe
  - GDL principle to reduce # of teens in the car
  - “System redundancies” – if one part of the system fails, users are still protected
  - Managing traffic speeds



# Safe Systems...

## 2. Manage the kinetic energy transferred among road users

- Kinetic energy transfer kills road users, not collisions per se



# Safe Systems...

## 2. Manage the kinetic energy transferred among road users

- Many ways to manage kinetic energy—i.e., equifinality
  - automatic braking to reduce energy transfer in crash events
  - reducing approach speeds in road user interaction zones



Source: nacto.org

# Safe Systems...

## **3. Treat road user safety as the foundation of all system interventions**

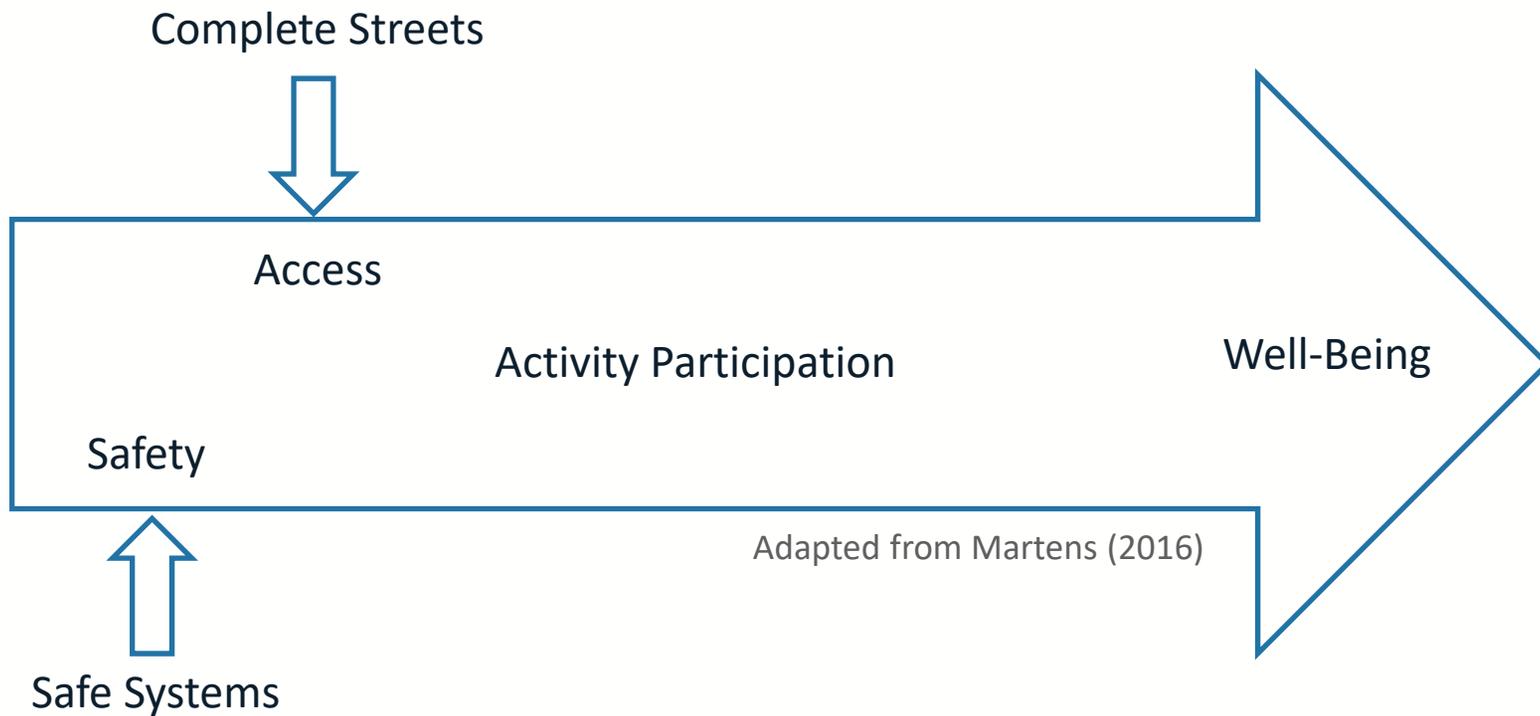
- “Basic safety” is foundational. It’s not about eliminating crashes, but eliminating fatal and serious injury
- Requires further discussion on what is “safe enough” and what “mobility” and “access” mean
- Requires an organized, mobilized safety culture

# Safe Systems...

## **3. Treat road user safety as the foundation of all system interventions**

- From the bedrock of “basic safety” spring:
  - Mobility and access (the ease of getting places)
  - Comfort
  - Participation in civic life
  - Enhanced well-being

# Example: Safe Systems & Complete Streets



# Safe Systems...

## 4. Foster the creation of a shared vision, coordinated action, and systems perspective

- *Shared vision*: Transportation, injury prevention, trauma centers, law enforcement, EMS, media, vehicle manufacturers, and the public share a vision of basic safety for all road users

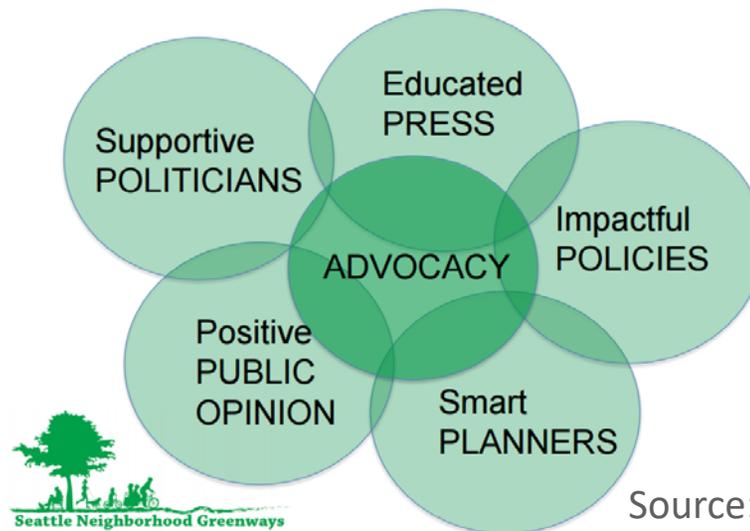


# Safe Systems...

## 4. Foster the creation of a shared vision, coordinated action, and systems perspective

- *Coordinated action*: Practitioners coordinate their funding, planning, programming, and evaluations toward eliminating fatal and serious roadway injury

### The 5 “P’s” of Vision Zero

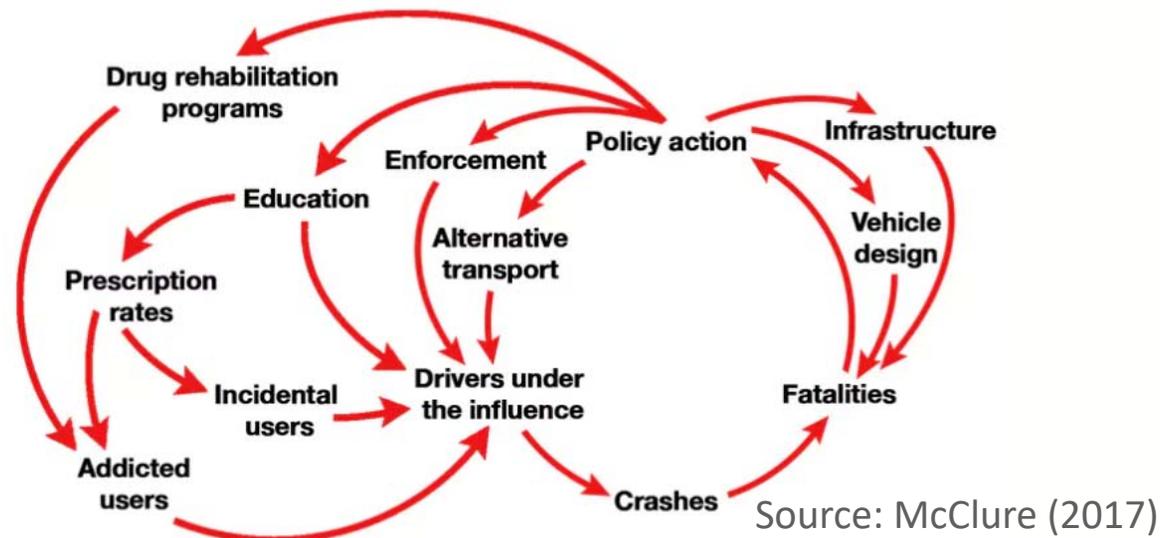


Source: [pedbikeinfo.org](http://pedbikeinfo.org)

# Safe Systems...

## 4. Foster the creation of a shared vision, coordinated action, and systems perspective

- *Systems perspective*: Practitioners implement evidence-based approaches toward eliminating serious and fatal injury, and prepare for unanticipated consequences and developments



Transitioning to a Safe Systems approach  
requires a **shift in our traffic safety  
paradigm**

# Four paradigms in US traffic safety history

1. **Safety First** (1900s-20s): Speed management is critical; drivers are responsible
2. **Control** (1920s-60s): Expert control through the “3 Es”— Engineering, Education, and Enforcement; speeding can be safe with good road design; drivers are reckless
3. **Crashworthiness** (1960s-80s): Cars redesigned for greater occupant protection; drivers not responsible
4. **Responsibility** (1980s-today): Crash victims are responsible; speeding can be safe with sober, alert drivers (*Norton, 2015*)
5. How do we usher in a 5<sup>th</sup>, “Safe Systems paradigm?”

# Emergence of paradigm shifts

**“In both political and scientific development the sense of malfunction that can lead to crisis is prerequisite to revolution.”**

- *Kuhn, 1962*

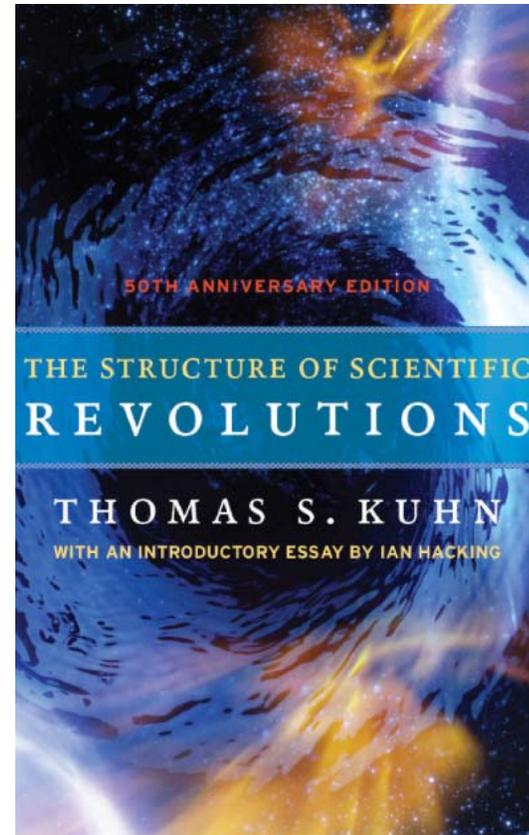
- Initially adequate responses to traffic deaths and injuries (e.g., “roadway deaths are inevitable”) became difficult to maintain



- The field **enters a state of crisis**, whereby a growing number of leaders challenge the existing paradigm (e.g., “94% of accidents are caused by human error”)
- New methods (e.g., systems thinking tools), problems (e.g., rise in pedestrian fatalities), and accepted solutions (e.g., speed management) usher in a new paradigm

# How safety culture accelerates paradigm shift

1. Growing numbers of insiders and leaders highlight the failures of the old paradigm
2. They confidently extol the virtues of the new paradigm
3. They place new paradigm champions in visible positions of power
4. They work with diverse group of locally embedded change agents to appeal to the vast population of open-minded people and implement new paradigm



# Thank you

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