



CAMBRIDGE
SYSTEMATICS

Think  Forward

SAFE SYSTEMS

Defining and Applying

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Safe Systems Buzz Phrases

- Adapt to human behavior
- Manage energy transfer
- Safety is foundation for all interventions
- Shared vision and coordinated action
- Integrate system redundancies (simplify)
- Design, build, maintenance safety focus
- Advanced EMS
- Stronger education/enforcement
- Proactive, Integrated, and Adaptive
- Collaborative
- Systemic



A “simple” definition

- Systems (agencies, public, transportation networks, legislation, funding) that work together to prevent fatalities and serious injuries.

A system where people don't die

**SAFER
PEOPLE**



**SAFER
ROADS**



**SAFER
SPEEDS**



**SAFER
VEHICLES**



But a “challenging” approach

- Need to look at safety issues and needs over entire system (not just top 3-5 issues....)
- Requires multiple agency engagement, coordination, innovation, and learning
- Adaptive leadership that encourages multidisciplinary solutions and innovative funding solutions



A safe systems example



➤ Increased funding for bridge inspection and maintenance



Systems Science Approach

- **Coordinate** to identify problems
- **Anticipate** risks by understanding patterns and trends and underlying causes
- Develop (and package) a range of **proactive solutions** (efficiencies!) to address “system” needs
- **Coordinate** implementation
- **Adapt** as needed

Framework for seeing interrelationships rather than things. Seeing patterns rather than static snapshots.

A “systems science” example



You actually do this everyday

Systems Level View

Mobility
Economics
Safety
Security
Accessibility
Environment
Connectivity
Operations
Resiliency
Preservation

Transportation Planning Process

- Stakeholder Engagement
- Data Analysis
 - » Trends
 - » Forecasting/Alternatives
 - » Performance
- Project Prioritization and Programming
- Implementation
- Monitoring

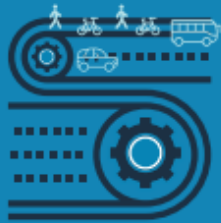


But yes, there are challenges

- Safety is one factor amongst many “system” considerations
 - » Resource, data, and time constraints
- Prioritizing safety (leadership)
- Developing a safety culture
- Funding safety across all modes/needs (not necessarily at hot spots)
- Better integration into everything
 - » Internal and external coordination
- Education on safe systems



Vision Zero Model, maybe?



CORE ELEMENTS FOR VISION ZERO COMMUNITIES

Leadership and Commitment

1. Public, High-Level, and Ongoing Commitment.

The Mayor and key elected officials and leaders within public agencies, including transportation, public health, and police, commit to a goal of eliminating traffic fatalities and serious injuries within a specific timeframe. Leadership across these agencies consistently engages in prioritizing safety via a collaborative working group and other resource-sharing efforts.

2. Authentic Engagement. Meaningful and accessible community engagement toward Vision Zero strategy and implementation is employed, with a focus on equity.

3. Strategic Planning. A Vision Zero Action Plan is developed, approved, and used to guide work. The Plan includes explicit goals and measurable strategies with clear timelines, and it identifies responsible stakeholders.

4. Project Delivery. Decision-makers and system designers advance projects and policies for safe, equitable multi-modal travel by securing funding and implementing projects, prioritizing roadways with the most pressing safety issues.

Equity and Engagement

Elevating equity and meaningful community engagement, particularly in low-income communities and communities of color, should be a priority in all stages of Vision Zero work.



Vision Zero Model, maybe?

Safe Roadways and Safe Speeds

5. Complete Streets for All. Complete Streets concepts are integrated into communitywide plans and implemented through projects to encourage a safe, well-connected transportation network for people using all modes of transportation. This prioritizes safe travel of people over expeditious travel of motor vehicles.

6. Context-Appropriate Speeds. Travel speeds are set and managed to achieve safe conditions for the specific roadway context and to protect all roadway users, particularly those most at risk in crashes. Proven speed management policies and practices are prioritized to reach this goal.

Data-driven Approach, Transparency, and Accountability

7. Equity-Focused Analysis and Programs. Commitment is made to an equitable approach and outcomes, including prioritizing engagement and investments in traditionally under-served communities and adopting equitable traffic enforcement practices.

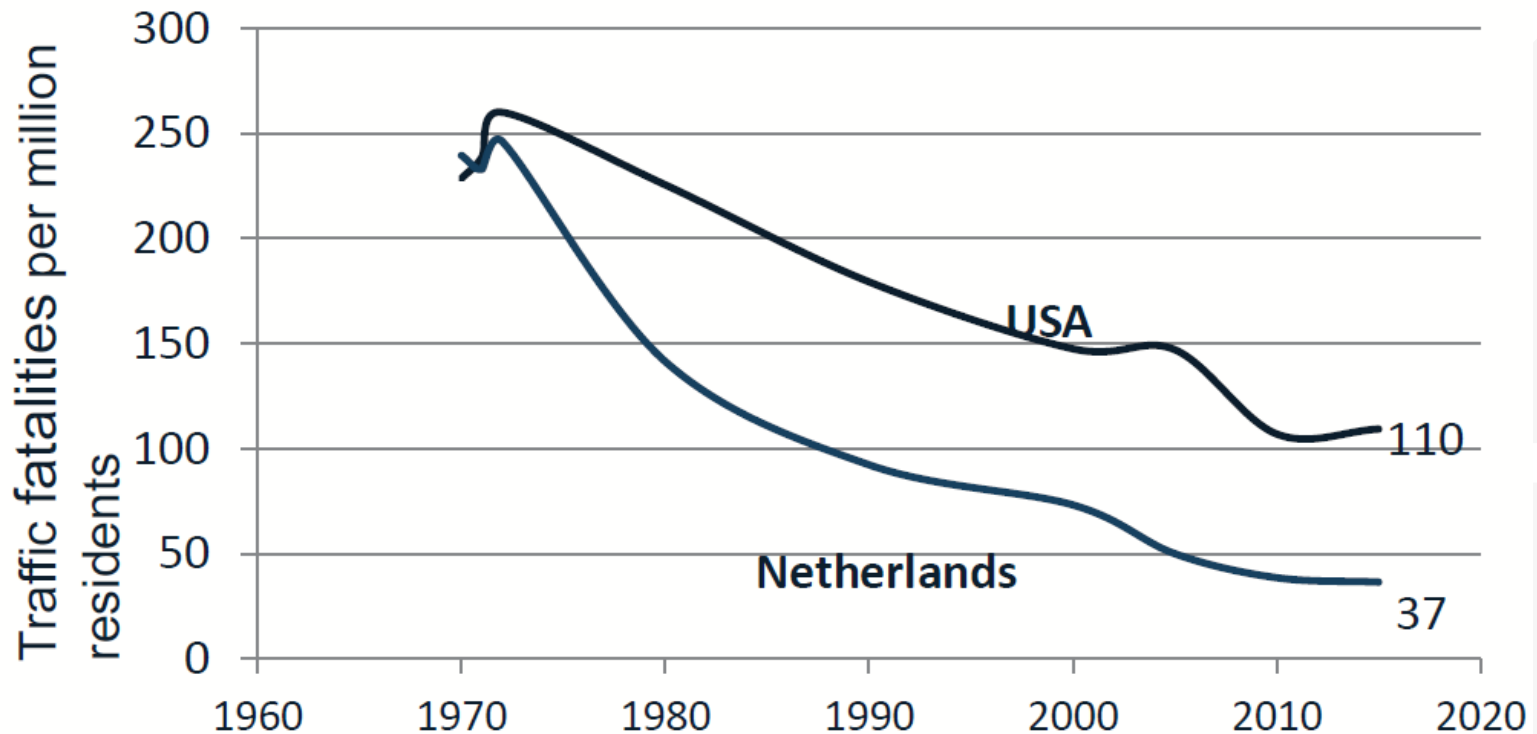
8. Proactive, Systemic Planning. A proactive, systems-based approach to safety is used to identify and address top risk factors and mitigate potential crashes and crash severity.

9. Responsive, Hot Spot Planning. A map of the community's fatal and serious injury crash locations is developed, regularly updated, and used to guide priority actions and funding.

10. Comprehensive Evaluation and Adjustments. Routine evaluation of the performance of all safety interventions is made public and shared with decision makers to inform priorities, budgets, and updates to the Vision Zero Action Plan.



What did the Netherlands do?



Dutch Values

- **Value #1: Safe Mobility is a Civil Right**
 - » Entitled to safe mobility (reality vs. assumption)
- **Value #2: Road System Owner is Responsible for Ensuring Road Safety**
 - » Humans are vulnerable, make mistakes, are impatient
- **Value #3: Traffic Safety Programs Go Beyond Hot Spot Treatment**
 - » Fix one intersection, but what about the 20 others just like it?

Not Just One Location....

SYSTEMIC TREATMENTS		
Issue	Human Association	Treatment
Speed	Vulnerability	<ul style="list-style-type: none">- 75% of streets converted to 20mph- Traffic signals for speed control
Vehicle/Person Interactions	Vulnerability and Mistakes	<ul style="list-style-type: none">- Thousands of crossing islands installed- Bike lanes separated on streets with speeds with more than 20mph
Number of Lanes/Options	Impatience	<ul style="list-style-type: none">- Installed 10,000 roundabouts and made default intersection type- Road diets implemented to avoid 4+ lanes where possible
Driver state	Mistakes	<ul style="list-style-type: none">- Education and Enforcement
Mid-Block (Pedestrians)	Mistakes	<ul style="list-style-type: none">- Safe crossings at all bus stops

In conclusion...



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