Collaborative Sciences Center for ROAD SAFETY

Safe Systems Summit

Redefining Transportation Safety

Safe Systems Summit Recap and Takeaways

Randa Radwan, Laura Sandt
UNC Highway Safety
Research Center

- Safe System Summit, April 23-24, 2019, took place at the Durham Convention Center and was sponsored by:
  - CSCRS (the Collaborative Science Center for Roadway Safety)
  - NC Governor’s Highway Safety Program

The Collaborative Sciences Center for Road Safety

CSCRS unites leading transportation research, planning, public health, data science, and engineering programs at five universities

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Duke UNIVERSITY

FAU FLORIDA ATLANTIC UNIVERSITY

Berkeley UNIVERSITY OF CALIFORNIA

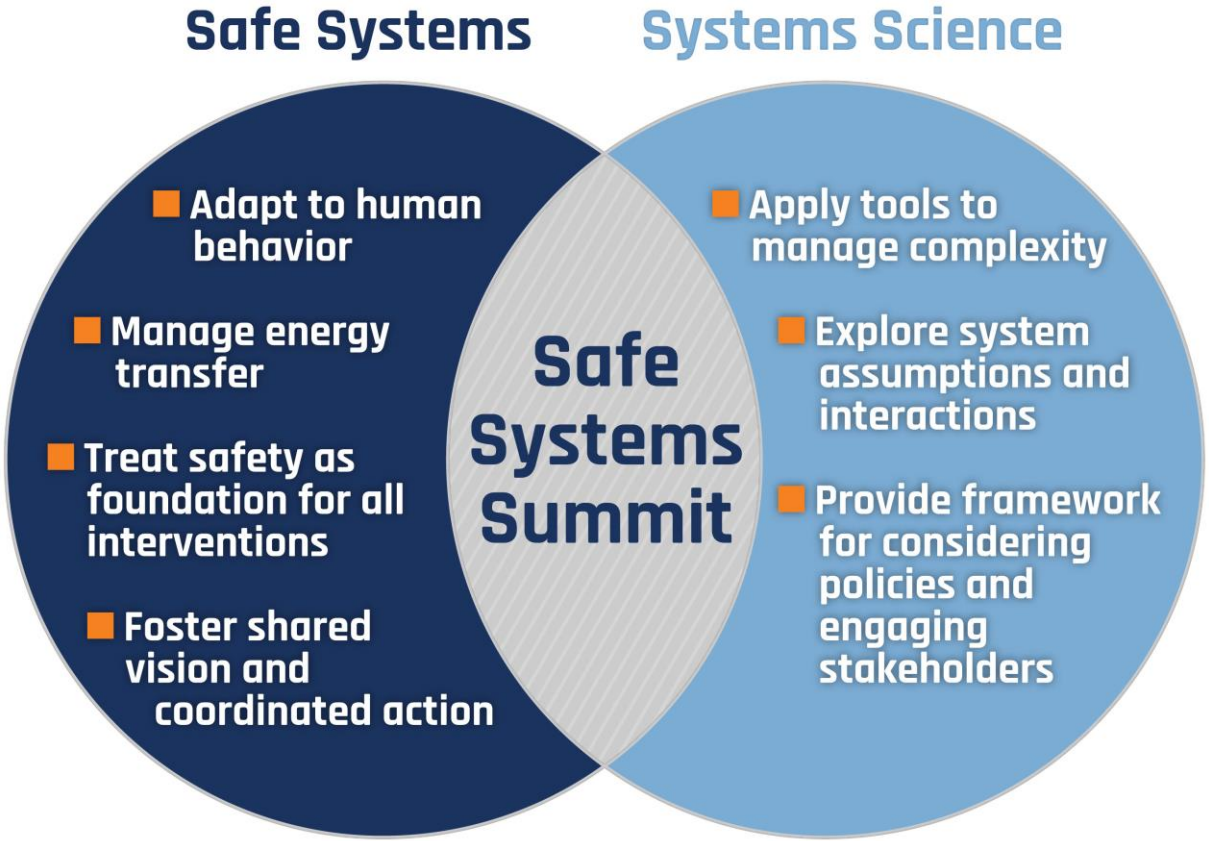
THE UNIVERSITY OF TENNESSEE KNOXVILLE

Mission: To create and exchange knowledge to advance transportation safety through a **multidisciplinary, systems-based** approach

Safety Summit Participation (350+)

- Students (14+ universities)
- Researchers
- FHWA, NHTSA, CDC, AASHTO, TRB
- State DOTs, NC DHHS
- Local practitioners from several cities
  - Law enforcement
  - Public health
  - Engineering/planning
- Industry partners

Principles of “systems” oriented approaches



What is systems science / dynamics / thinking?

"Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static 'snapshots'...Today systems thinking is needed more than ever because we are becoming overwhelmed by complexity. Perhaps for the first time in history, humankind has the capacity to create far more information than anyone can absorb, to foster far greater interdependency than anyone can manage, and to accelerate change far faster than anyone's ability to keep pace."

Peter Senge,The Fifth Discipline

Systems thinking

Is a way of approaching challenges, in which we consciously seek to

- Delineate systems of interest
- Expand our field of vision about causes and consequences
- Describe the structure of the system
- Use qualitative and quantitative models to make explicit the assumptions about the system and explore system behavior

Systems science can…

- Help us develop a **shared understanding** of the system
- Framework for **testing dynamic hypotheses** that are identified
- Teach us to **think differently** about how systems behave (that is, in terms dynamics, circular causal feedbacks, accumulations, etc)
- Allow stakeholders to **view the larger system** they are embedded within
- Provide a **framework for integrating** what we know, and determining importance of what we don't know
- Support identification of **high impact leverage points**
- Offer a virtual world in which to **"try out" and compare policies**

Slide presented by Kristen Hassmiller Lich at the Safe Systems Summit

NCDOT Research and Innovation Summit, May 7, 2019

Tom Harman, Director, FHWA Center of Acceleration Deployment

- “Resist innovation and you die, accept change and survive, lead change and thrive”

- Where to start?
    - Culture & Leadership

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Is this a new paradigm?

May 10, 2019

How is this different from the past?

Attribute or Field	Traditional practices	Emerging systems-oriented practices
Disciplines trained/involved	Engineers and planners	Engineers, planners, data scientists, programmers and software developers, law enforcement, epidemiologists, social workers, communications
Way of thinking or training	Static nodes; linear (A to B) cause and effect	Think about the whole as a series of dynamic interactions; “systems aware” and recognize that we cannot work in isolation from the public and other’s response
Agency “culture” and issue framing	Top-down decision-making; silos or tribes co-exist	Supportive of team learning, integration, and collaborative problem solving; examine group identity and values, and align around or leverage common frames that are motivating/unifying
Goal setting and leadership	Start with set of constraints and look for solutions/outcomes	Start with a desired outcome and identify opportunities and collaborations to overcome constraints

How is this different from the past?

Attribute or Field	Traditional practices	Emerging systems-oriented practices
Approach to education	Frame as individual responsibility; seek to influence road user behaviors	Influence the influencers: educate “up” to media, policy makers, legislators; evaluate the underlying frames/values inherent in messaging and how it affects culture and problem framing
Data integration	Silo’ed data sources; limited to descriptive information	Data quality is viewed as a safety investment; integrated data used for prediction (simulation, and forecasting), visualization, and community/stakeholder involvement
Budget/funding integration	Each department gets individual funds	Departments collaborate to produce joint budgets; have a shared funding stream and set of expectations (like LA DOT)
Programming	Keep doing what works; stop doing what doesn’t	Recognize that what works right now may not work in the future; learn and adapt to changing contexts; allow/support experimentation to test new approaches
Roadway Design	Hot spots; automobile centric; design for perfect human behavior	Proactive systemic risk identification; safe mobility for all road users is a civil right, several principles of systemic safety

Principles of Systematic Safety in Roadway Design

Principle	Related to:
1. Speed Control & Separation	Humans are vulnerable
2. Simplicity, Visibility, and Predictability	Humans make
3. Forgivingness and Restrictiveness	mistakes
4. Functional Harmony	A road can't serve (well) high-speed and low-speed functions
5. State Awareness	Driver state (impaired, novice)

More information: See my video, Systematic Safety: The Principles Behind Vision Zero

Slide presented by Peter Furth at the Safe Systems Summit

Key Challenges

- Systematic inequities remain
  - Historically, transportation infrastructure investments have created huge disparities in health and safety (Norton, Foxx)
- Importance of involvement from the community and buy-in from organization leadership to implement Safe Systems
- Need to adapt to a changing world and awareness of technology disruptions
  - Evolving safety technology and road user behaviors
  - **Technology is a tool, not a goal nor a value**

Top infrastructure official explains how America used highways to destroy black neighborhoods

ALAN PYKE

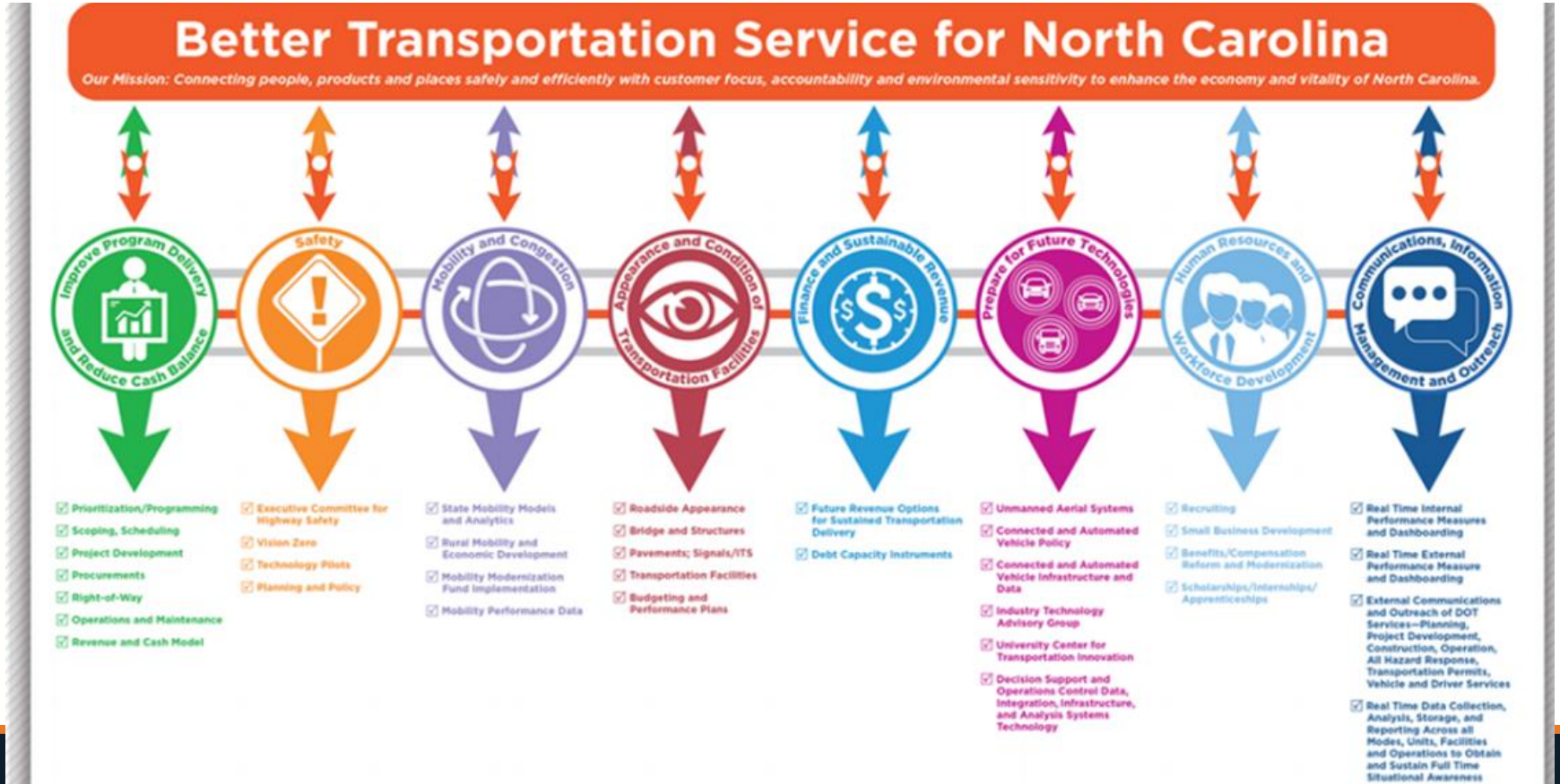
MAR 31, 2016, 12:47 PM

FAMILY PICTURES SHOW U.S. SECRETARY OF TRANSPORTATION ANTHONY FOXX AS A YOUNG MAN, AND HIS GRANDPARENTS ON THE STEPS OF THE CHARLOTTE, NC, HOME WHERE HE GREW UP CREDIT: DEPARTMENT OF TRANSPORTATION/ANTHONY FOXX

It's time for America to reckon with the role that highway projects too often play in ripping apart underprivileged communities around the country, Transportation Secretary Anthony Foxx said Wednesday at the Center for American Progress.

NCDOT Research and Innovation Summit, May 7, 2019

David Howard, Chief Deputy Secretary: Secretary's priorities



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