traffic21
a transportation research initiative of Carnegie Mellon University

Technologies for Safe and Efficient Transportation
A U.S. DOT UNIVERSITY TRANSPORTATION CENTER
Carnegie Mellon University
UNIVERSITY of PENNSYLVANIA

UTC National Summit For Safety
March 19 – 20th, 2015
Pittsburgh, PA
Report

Background:
Technologies for Safe and Efficient Transportation University Transportation Center (T-SET UTC), the National US Department of Transportation UTC for Safety, hosted an inaugural summit of UTCs to help align university research/education and the transportation safety problems of the real-world.

The summit was held on March 19 and 20, 2015 in Pittsburgh, Pennsylvania, and included 65 participants. Fourteen safety-focused UTCs, which are comprised of over 50 universities, participated in the summit along with national representatives from government, industry and community organizations focused on transportation safety.

US Department of Transportation Assistant Secretary for Research and Technology Greg Winfree provided the keynote address. Winfree highlighted the importance of bringing UTCs together with government and industry leaders to address the DOT's top priority: safety.

After welcoming remarks from Carnegie Mellon University and the University of Pennsylvania, the first session highlighted transportation safety priorities from the government perspective. Panelists represented the Federal Highway Administration, the Federal Railroad Administration, Intelligent Transportation Systems Joint Program Office and the American Association of Highway and Transportation Officials.

The second session featured national transportation safety priorities from the industry and community perspective. Panelists represented the American Automobile Association, the American Society of Civil Engineers, the American Trucking Association, the Insurance Institute for Highway Safety, the Intelligent Transportation Society of America, the League of American Bicyclists, and the Transportation Research Board.

In the third session, each of the 14 participating UTCs had an opportunity to present their safety-related research thrusts and education initiatives.

In each of these sessions participants were encouraged to post issues or topics that resonated with them. These issues and topics were then synthesized into four break out groups scheduled for the following morning. This real-time responsive "unconference" style allowed for breakout sessions to be developed around specific interest areas of the participants as opposed to prescribed topic areas. The breakout sessions included:

- Human Factors and Behavior
- Safety Policy
- Intelligent Transportation Systems
- Innovation, Deployment and Workforce
- Data

Each breakout session was asked to address the following questions:

Needs/Assets
Research
Education
Disciplinary skills needed to address
What partnerships?
What do we need to get there?

Summit Outcome

Government, industry, community and UTC representatives welcomed the opportunity to learn about each other's activities and discuss how they can work together through research and education to address transportation safety needs. The overall group urged for an annual gathering that can continue to foster relationships and identify the pressing safety needs that the UTCs can help to address.

Since this summit targeted representatives of national transportation organizations it was suggested that the next summit be held in Washington DC so more participants may attend without traveling.

Therefore the next UTC Safety Summit is scheduled for March 31st, 2016 at Carnegie Mellon University's Heinz College Washington DC Campus located on Capitol Hill.

Below are notes from the summit presentations and breakouts. Presentation slides can be access online at http://utc.ices.cmu.edu/utc/summit-presentations.html

I. Notes from Sessions 1 and 2, Transportation Safety Needs

Government and Industry Perspectives
Monique Evans, the Director of Safety R&D of the **Federal Highway Administration** presented FHWA's focus areas:

Integrated Roadmaps
- Data and Analysis
- Intersections
- Pedestrians and Bicyclists
- Roadway Departure

Coordinated Program Plans
- Human Factors
- Local and Rural Roads

And also emerging areas of interest to FHWA: performance based practical design, data quality standards, data management, and asset management for safety.

Kevin Kesler, Chief – Rolling Stock R&D of the **Federal Railroad Administration** discussed FRA's concern with their workforce demographics: 51% of the rail workforce is 45 years or older and women represent only 9% of the rail workforce (38% less than the national average) and outlined their research needs and potential areas of engagement:
- Crude Oil and Natural Gas Safe Transport
- Improved Passenger Safety & Accessibility
- High Speed Rail – Adapting foreign technology
- FRA Broad Agency Announcement
FRA-BAA-2015-1
15 research areas
Closing Date May 4th
- Partnering with existing FRA R&D Contractors

Jeffrey Onizuk, Acting Managing Director, **Intelligent Transportation Systems Joint Program Office** framed why his office is focused on the Emerging Safety Applications for Transportation of DSRC-based vehicle-to-vehicle, vehicle-to-infrastructure communications technology, and Automated vehicles and operations to move the US Towards a Data-Driven Transportation Environment

Kelly Hardy, Safety Program Manager of the American Association of State Highway and Transportation Officials presented **AASHTO**'s research priorities:
- *Draft SCOHTS Strategic Research Plan*
  - *NCHRP 20-7 (353); PI is Frank Gross, VHB*
- Evaluation of 4E Countermeasures
- Data
  - Research with limited data
  - Linking and analyzing roadway, crash, medical data
  - Data governance
- SHRP2

Avery Ash, Director, Federal Affairs, presented **AAA**'s research interests:
- Cognitive Distraction - Phase III
- Vehicle Technology, Autonomy, and Driver Performance
- Crash Causation
- Drugged Driving: Cannabis Studies
- Teen Driver Learning
- Senior Safety and Mobility Needs
- Traffic Safety Culture Index
-

Terry Neimeyer, Fellow, presented the **American Society of Civil Engineers**' research interests:
- Workzone
- Fall Protection
- High Steel
- Confined Space
- Excavating & Trenching
- Lock out Tag out-Electrical, Steam, Power Source
- Asbestos & Lead
- Ladder and Scaffolding

Sean Garney, Director of Safety Policy, presented the **American Trucking Association**'s research interests:
- Understanding CSA outliers
- MCMIS crash record completeness
- Impacts of higher speed limits on stopping distance
- True safety impacts of obstructive sleep apnea

Jessica Cicchino, Sr. Research Scientist, presented the **Insurance Institute for Highway Safety**'s research interests:
- Collision avoidance technologies
- Autobrake performance
- Roundabouts

Patrick Son**,** Senior Technical Programs Specialist, presented the **Intelligent Transportation Society of America**'s research interests:
- V2I Applications
- ICM with DSS
- Data Management
- Wireless spectrum congestion
- Sustainability

Andy Clarke, President and CEO, presented the **League of American Bicyclists'** concerns:
- Prioritizing cycling as a mode
- Safety for cyclists

Bernardo Kleiner, Senior Program Officer, presented the **Transportation Research Board**'s research interests:
- Pedestrians and Bicycles
- Volume Data
- Planning Guidelines
- Safety Analysis
- Prediction Models/Crash Modification Factors
- Systemic Safety Analysis
- Safety Management
- Safety Culture/Toward Zero Deaths
- Serious Injury Data

Paul Jovanis, Emeritus Professor, Larson Institute – Penn State presented about **SHRP2** and issues moving forward:
- Most studies are problem-specific: road departures
- Limited attention to basic methodological issues
- How to address relative lack of crashes in NDS
- How to combine with "near-crash" (NC) or "safety-critical events" to conduct a safety analysis
- SHRP 2 NDS: 100's of crashes; thousands of NC's
- State Crash: 10,000 crashes; no NC's

II. Session 3, List of UTC Presenters

Raj Rajkumar, Director, Technologies for Safe and Efficient Transportation, Carnegie Mellon University

Constantine Tarawneh, Director, University Transportation Center for Railway Safety, University of Texas Pan-American

Max Donath, Director, Roadway Safety Institute, University of Minnesota

Umit Ozguner, Director, Crash-Imminent Safety University Transportation Center, Ohio State University

Lidia Kostyniuk, Research Coordinator, Center for Advancing Transportation Leadership and Safety, University of Michigan

Charles Reider, Researcher, Institute for Safety and Operations of Large-Area Rural-Urban Intermodal Systems, University of Nevada, Reno

Shauna Hallmark, Midwest Transportation Center, Iowa State University

Zhibin Li, Research Associate, Pacific Northwest Transportation Consortium, University of Washington

Jennifer Dill, Director, National Institute for Transportation and Communities, Portland State University

Paul Jovanis, Emeritus Professor, Penn State University Larson Institute.

Moshen Jafari, Professor and Chair, National Center for Advanced Infrastructure and Transportation, Rutgers, the State University of New Jersey

Stephen Richards, Director, Southeastern Transportation Center, University of Tennessee

Jen Duthie, Research Engineer, Data-Supported Transportation Operations and Planning Center, University of Texas at Austin

David Noyce, Professor, University of Wisconsin-Madison, The Safety Research Using Simulation Center, The University of Iowa

III. Outcomes from Breakout Sessions

The second half of the summit was structured as an "unconference." Participants had the opportunity to respond to the presentations and post about issues or topics that they wanted to discuss. These issues and topics were grouped into themes for breakout sessions: 1) Human Factors and Behavior, 2) Safety Policy, 3) Intelligent Transportation Systems, 4) Innovation, Deployment and Workforce, and 5) Data.

Each breakout session was asked to address the following questions:
> Needs/Assets
> Research
> Education
> Disciplinary skills needed to address
> What partnerships?
> What do we need to get there?

1. Human Factors and Behavior
Needs
Learning to drive – young driving
Humans = 24 hour humans, outside the vehicle considerations
How to reset the human mood once in the vehicle, behavior, and tailor experience to personality
More than just human factors, also behavior

Research
Meyers Briggs – behind the wheel
HCI applications
Situation awareness in automation
> When to take back control
> Shared control
Transition

Training people and design

Opportunity
Training at dealership level, shared control
Design
Standardization
Transitions
Line painting – also money to do so.

Discipline
Behavior
      Cognitive
      Industrial
Sociologists
Design
Leadership education
1st level human centered design
All populations
Traditional Transportation
      Engineers cooperate with experts
Communications
      Campaigns like seat belts and drunk driving
      Disseminate information to the public/agencies

Communications and Policies
Revenue driver into safety programs is a non-starter
Campaigns
Safety culture
Kid-centered education
      Recycling and seat belt examples
Licensing

Partnerships- Stakeholder engagement
Education focused
Advocates in organizations
Feedback/surveys
Public officials
Labor Unions
RESTRUCTURE THE FINANCIAL MODEL
      Healthcare
      Insurance
      Cities/towns/administrations
Manufacturers

What next?
The next steps are to get buy in and interest from private organizations and develop partnerships, then show success. Frame the appropriate research question, ensure

that they are multi disciplinary and addressing real world issues. Also, it will be crucial to understand barriers/challenges to automation.

2. Safety Policy

Know who is on Capitol Hill and use that to push your research ideas. The point is to get people talking about your research. The more people who are talking about it, the more way you will gain support from capital hill. In addition, discuss with deans, presidents and leaders from your university the research being conducted as these leaders typically meet with members from Capitol Hill on a regular basis.

3. Intelligent Transportation Systems

Needs

Data management
- Utilize?
- Deliver information?

Regulations

Consolidate research
- Engage other disciplines

Education

TMC- Associate degree
- Engineers as managers

Industry – GIS

Whose tying experts together?
- Varied expertise

Project Management

Spectrum management!!!

Emerging fields

Opportunities

Mobility on demand

Disadvantaged communities

Poor communities

Urban vs. rural

Research

Behavioral consequences

Impact on non-motorized users

Outside the vehicle

Acceptance/Expectation curve

FREIGHT!
- Economic competitiveness
- Safety concerns
- Platooning
- Urban issues
  - Last mile delivery

Partners

High tech industry
Logistics
Planners
Cyber security – DOD
AARP
ITSJPO
UAV & distraction
University Programs
FAA – NASA
ITS AMERICA
CUTC
Smart Cities – RESILIENCE
Utilities
Insurance

4. Innovation, Deployment and Workforce

The big take away from this session is to work backwards when trying to decide a research idea. By starting with the big idea and finished vision of the city, work backwards to decide what type of research needs to be completed to accomplish this goal. This is ideal because people within the office change every few years and while the people are changing, their agendas might change as well. However, if you continue to show how your research will advance towards the vision, it is more likely your project will still receive funding.

Have an extra pot of money for the deployment of any one project. As many funders like to see how the research will directly affect an organization, have a separate pot of money to kick-start the deployment of the research into the field.

5. Data

Naturalistic Driving data use is challenging because of small number of crashes and privacy concerns; specific studies such as how drivers deal with rail crossings should be possible.

New sources of data are appearing, for use (such as real time trajectories of transit vehicles or twitter feeds), but willingness of agencies and companies to share data varies considerably.

GPS tagged vehicle travel may be available voluntarily, but is likely to be limited due to privacy issues.

Gaining IRB approval for using different data sources is often challenging; may be a good place of UTC co-operation.

Data standards, particularly for connected vehicle data, would be useful. Also, sharing connected vehicle data would be useful.