Safety21
INNOVATING SAFETY FOR ALL

US DOT National
University Transportation Center for Safety

Carnegie Mellon University

Penn · The Ohio State University · CCAC · Community College of Philadelphia · The University of Texas Rio Grande Valley · Morgan State University

PA Transportation Alliance

Karen Lightman
Executive Director
Safety21
Carnegie Mellon University

December 17, 2024

Overview

- Introduction to Safety21
- Our Research and Development and Deployment (R&D&D)
- PennSTART and Connected Corridor
- Stay in Touch

Metro21
SMART CITIES INSTITUTE

Carnegie Mellon University

Safety21 Overview

Safety21: US DOT National University Transportation Center on Safety

- **Safety21's mission is *Innovating Safety For All***

Our Focus Areas

- Connected and Autonomous Vehicles (CAVs)
- Physical & Digital Infrastructure that enhances safety and enables connectivity

Our Objectives

- Improve the safety, equitability & comfort for vulnerable users on the road
- Deploy solutions and impact real-world usage
- Fostering faculty & students through our education & workforce development initiatives

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Safety21 Advisory Council

- **Tara Andringa**, Executive Director, Partners for Automated Vehicle Education
- **Amanda Ballantyne,** Director of the AFL-CIO Technology Institute
- **Raymond T. Betler,** Chairman of LB Foster, Former President and CEO of Wabtec Corp.
- **Nat Beuse**, Chief Safety Office, Aurora
- **Rebecca M. Brewster,** President and Chief Operating Officer of the American Transportation Research Institute
- **Michael Carroll**, Secretary of Transportation, Pennsylvania Department of Transportation
- **Robin Chase,** Co-founder Zipcar, Veniam, NUMo
- **Kendra Davenport**, President and CEO, Easter Seals
- **Charles L. Hammel III,** President and owner, PITT OHIO Express
- **Tom Keane,** Associate Administrator, Federal Motor Carrier Association
- **Jane Lappin**, Former Director, Public Policy & Government Affairs, Toyota Research Institute
- **Lorraine Martin**, President & CEO, National Safety Council
- **Ken McLeod,** Policy Director at The League of American Bicyclist
- **James A. Misener,** Senior Director, Product Management and the Global C-V2X Ecosystem Lead at Qualcomm and former Director of UC Berkley PATH
- **Henry Posner,** Chairman, Railroad Development Corporation
- **April Rai**, President and CEO, COMTO
- **Paul Skoutelas,** President and Chief Executive Officer of The American Public Transportation Association
- **Donald Smith,** President, Regional Industrial Development Corporation
- **Alexandra Taylor**, Program Officer, Hillman Foundation
- **C. Y. David Yang**, President and Executive Director, AAA Foundation for Traffic Safety

Safety21 Academic Partners

What We Do

RESEARCH

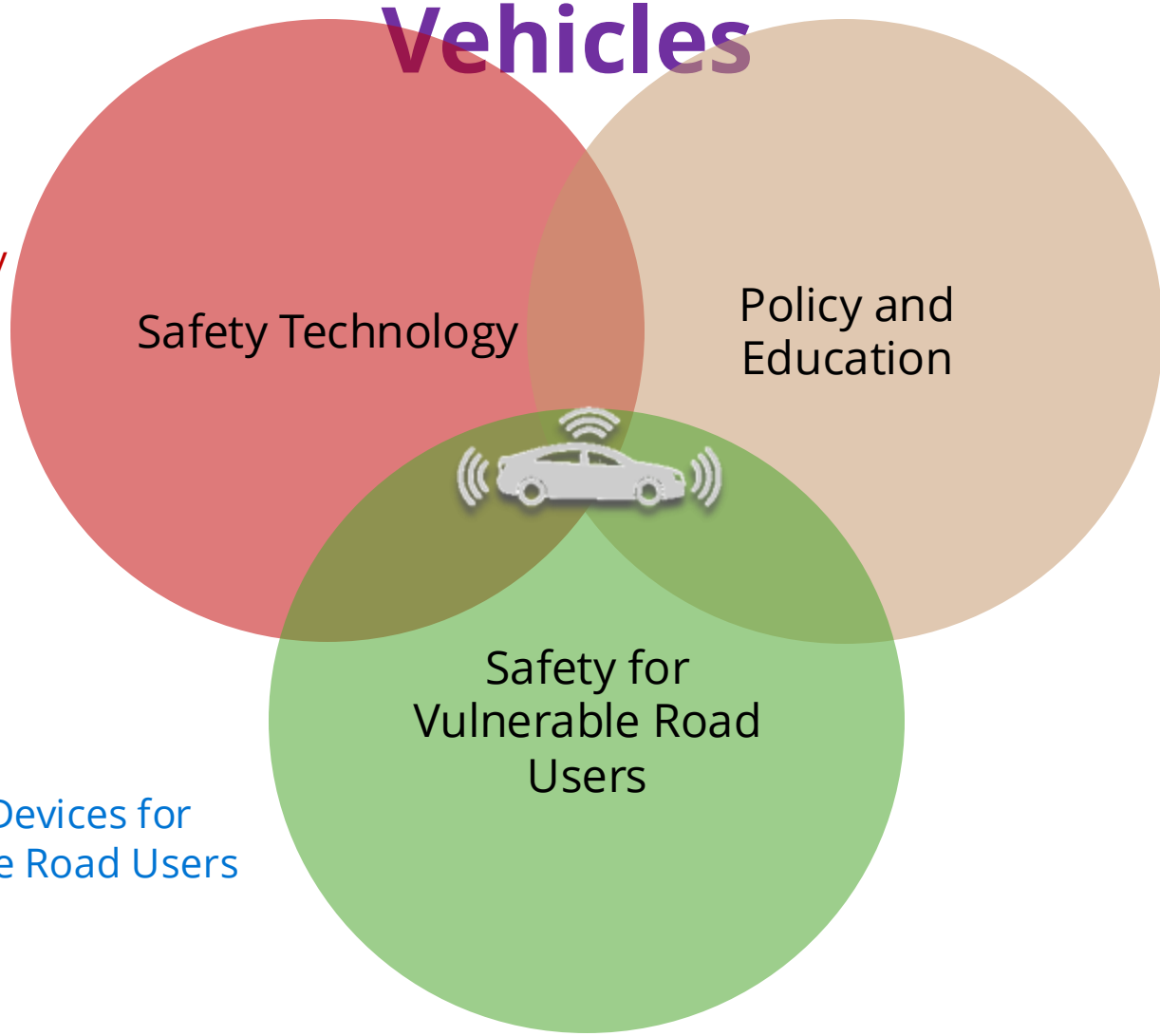
EDUCATION & WORKFORCE DEVELOPMENT

TECHNOLOGY TRANSFER

COLLABORATION

Automated and Connected Vehicles

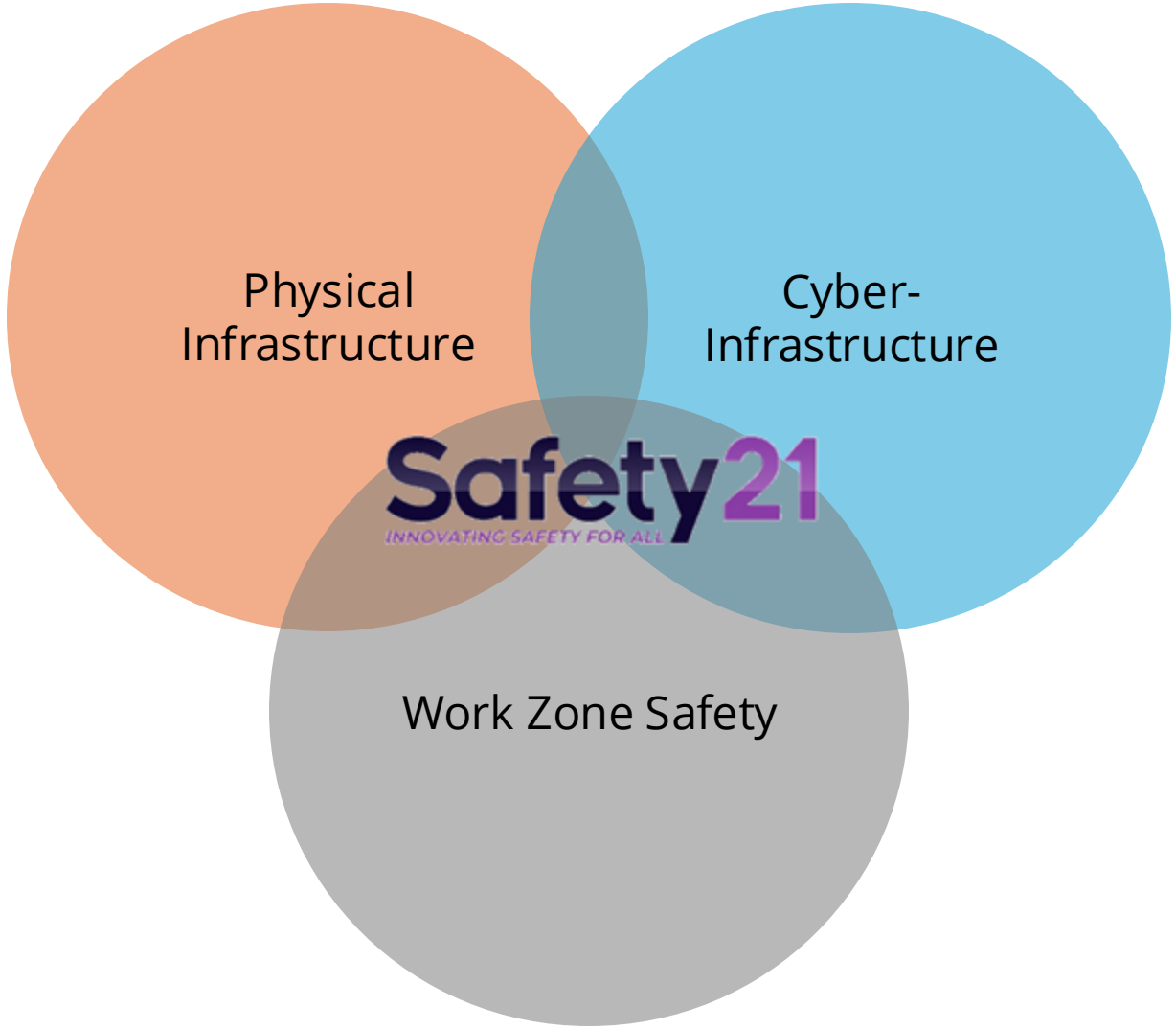
Technologies for Safety, Safety Assurance, Safety Assessment and Trustworthiness



Analyses and Recommendations for Policy and Regulatory Matters

Safety Devices for Vulnerable Road Users

Smart Physical and Digital Infrastructure



Education and Workforce Development

Photo courtesy of the US Dept of Transportation

- ✓ *Research*
- ✓ *Engaging K – 12 Students*
- ✓ *Offering Courses and Capstones*
- ✓ *Scholarships*

Technology Transfer – How we Share Knowledge and Information through:

- Safety21 website (safety21.cmu.edu)
- Safety21 monthly e-publication: "What's Happened at Safety21?"
- Weekly newsletter reaches 5,000+ subscribers from 13 countries
- In-person Seminars and Webinars – available on our YouTube Channel (122 videos and counting)
- Reports, publications, media stories: 82
- Conference Presentations
- Spinouts

Collaboration through our Deployment Partner Consortium

Over 230 worldwide collaboration partners spanning industry, federal/state/local government, and nonprofit sectors

- 3M
- 412 Food Rescue
- Access Transportation Systems
- AECOM
- AFL-CIO
- Airport Corridor Transportation Association
- ALCO Parking
- Alcosan
- Allegheny Conference on Community Development
- Allegheny County
- Allegheny County Airport Authority
- Allegheny County Office of Children, Youth and Families
- Allegheny General Hospital
- Allies for Children
- Alstom (formerly Bombardier)
- Ambulance Service Management Corporation
- American Association of Retired Persons
- American Association of State Highway and Transportation Officials
- American Public Transportation Association
- American Traffic Signals (part of Verra Mobility)
- American Transportation Research Institute
- Association of American Railroads
- Aurora Innovation
- Automatic Labs (a SiriusXM company)
- Automotive Career Development Center
- Azuga
- Babst Calland Law Firm
- Beep
- Benedum Foundation
- East Liberty Development Group
- Easter Seals
- Econolite
- Economy League of Greater Philadelphia
- Econsult Corp.
- Emovis
- Ericsson
- Federal Highway Administration
- Ford Motor Company
- Freedom Transit
- GAI Consultants
- Gannet Fleming
- General Motors Global Research & Development
- Green Building Alliance
- Greene County Commissioners
- Greene County Transportation
- Greater Pittsburgh Chamber of Commerce
- Gyeongsang National University
- Hitachi Rail
- Healthy Ride
- Heinz Endowments
- Heritage Community Initiatives
- Hill District CDC
- Hillman Family Foundations
- Honda
- Hungarian Mobility Development Agency
- IBM
- Indiana University
- iNetworks Advisors
- Innovation Works
- INRIX
- Intel
- Intelligent Transportation Society of America
- International Council on Clean Transportation
- Jackson/Clark Partners
- Pennsylvania Turnpike Commission
- Pi-Lit
- PITT OHIO
- Pittsburgh Community Reinvestment Group
- Pittsburgh Department of Mobility and Infrastructure
- Pittsburgh Downtown Partnership
- Pittsburgh International Airport
- Pittsburgh Parking Authority
- Pittsburgh Parks Conservancy
- Pittsburgh Regional Transit
- Pittsburgh Technology Council
- Pittsburgh Transportation Group, Ztrip
- Port of Pittsburgh Commission
- Portfolio Associates
- PPG Industries Inc.
- Precision Neuroscopics LLC
- Propel IT, Inc.
- Puget Sound Regional Council
- Purdue University
- Quaker Valley Council of Governments
- Qualcomm
- Quality Counts LLC
- Radium
- Railroad Development Corporation Pittsburgh
- Rapid Flow Technologies
- Regional Industrial Development Corporation
- Richard King Mellon Foundation
- Roadbotics by Michelin
- Robotics Institute Summer Scholars
- RobotWits
- RubyRide
- SAE
- Safety Vision
- Salvo Strategies

PennSTART and Connected Corridor

Pennsylvania Safety Transportation and Research Track (PennSTART) & Connected Corridor

- **PennSTART:** High speed test track and proving grounds to accelerate transportation safety, innovation (EVs, AVs, UAVs), and workforce and traffic incident management training.

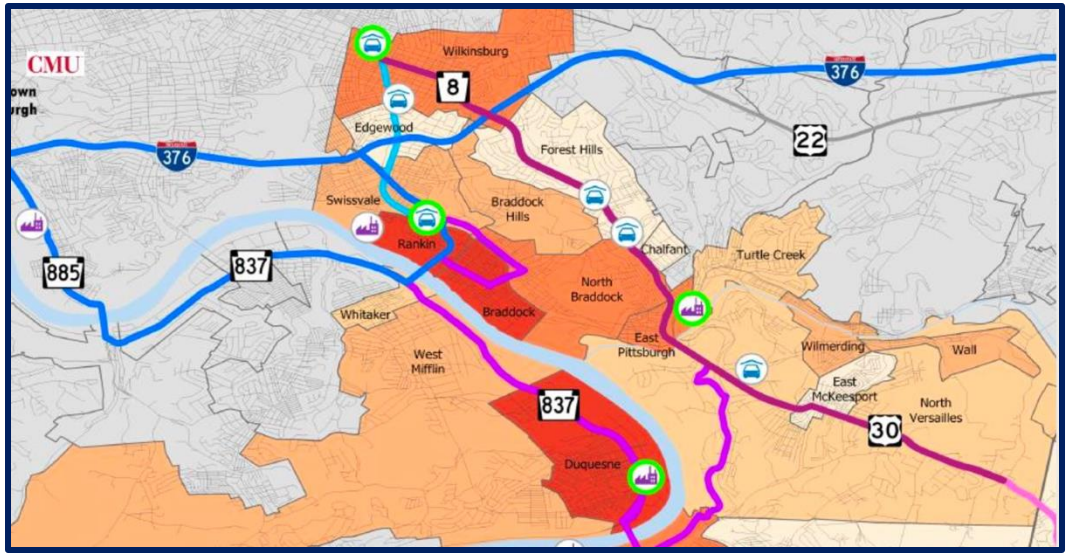
- **Connected Corridor:** 39-mile deployment corridor in distressed Mon Valley between Mill 19 and PennSTART focused on safe mobility and community impacts.

- **Partners:** Carnegie Mellon University, PennDOT, PA Turnpike, RIDC , Westmoreland & Allegheny Counties and their respective Community Colleges.

- **Mission:** Engage community, academic, government and industry stakeholders for the safe transportation innovation and deployments that solve real world challenges

- **Update**
  - PennSTART facility design process underway
  - Safety21 supporting planning- site test features, AV validation framework and site safety protocols
  - Safety21 researchers scoping PennSTART research & testing projects for safe autonomy integration

PennSTART Site
RIDC Westmoreland Innovation Center



Connected Corridor Area of Focus

CMU Faculty PennSTART Projects

Principal Investigator(s)	Project Name
Dr. Chris Hendrickson	Transforming Transportation Planning and Policy for Safety
Dr. Beibei Li	Advancing Traffic Incident Management Training In Pennsylvania
Karen Lightman	PennSTART Training Committee, Communications Committee, Technical Committee
Dr. Sean Qian	Mobility Data Analytics Center- Improving Mobility Services through Transit Coordination & Real-Time Demand Prediction
Dr. Raj Rajkumar	PennSTART Operating Committee
Dr. Pingbo Tang and Dr. Peter Zhang	Designing and Maintaining Resilient Sensor Systems for Smart Corridors and Future Transportation Technologies
Dr. Peter Zhang	Developing PennSTART Digital Infrastructure & Safety Standards
Dr. Ding Zhao	How to Evaluate Proving Grounds for Self-Driving? PennSTART Track Design Methods
Dr. Ding Zhao	Certification of Connected and Autonomous Vehicles for Vulnerable Road Users

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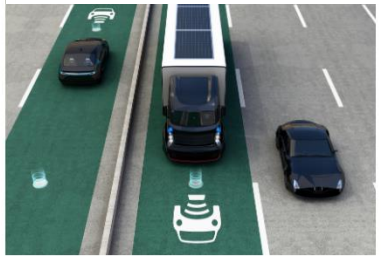
Policy Papers

Informed, research-driven policymaking is central to improving our transportation sector. Our expertise in this area helps guide civic leaders to harness the power of intelligent transportation systems, while managing the inherent risks and protecting constituents. Based in the rigorous, cutting-edge findings of Carnegie Mellon University faculty and drawing upon Heinz College's expertise in data-driven public policy, our policy papers are a roadmap for the future of transportation policy.

Driving Warning Technologies and Partial Vehicle Automation

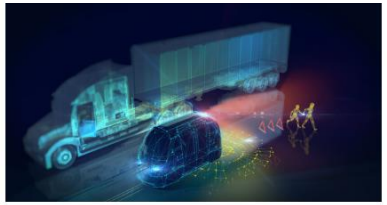


Proposal for a National Task Force on Connected Vehicles

How to Make Sense of Bus Transit Automation

Developing Relevant Policy for the Future of Transportation

Mixed-Autonomy Era of Transportation



Unpacking Myths & Realities of Connected & Automated Vehicles

Improving Clean Energy Policy Through Research-Driven Insights

How COVID-19 Affects Major Trends and Forces Shaping the Future of Transportation

Identifying Alternative Fuel Technologies for Transit Buses

Transportation R & D & D:
Research & Development & Deployment through partnerships

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Check us out - Stay in touch

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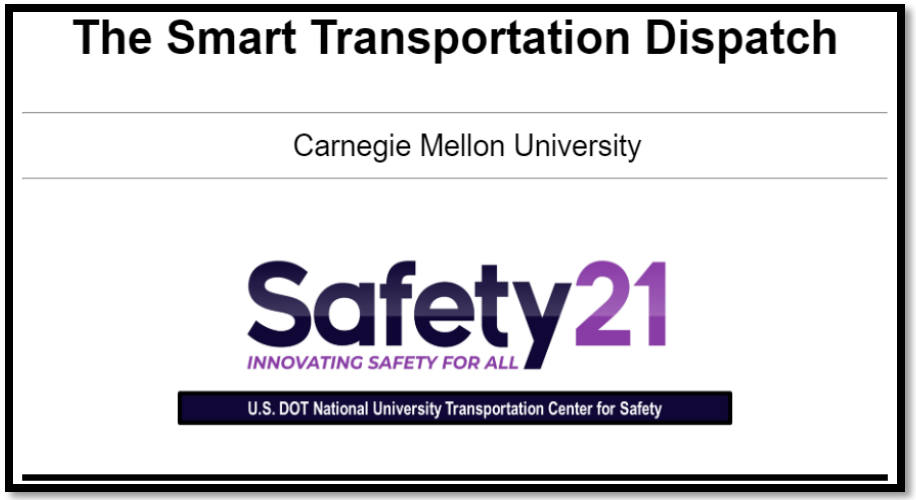

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