EXPLORATORY INNOVATION AND MOBILITY

- 19th Annual New Jersey Department of Transportation Research Showcase Keynote
- October 25th, 2017
- Dr. Jim Shurbutt, Federal Highway Administration

THE FHWA EXPLORATORY ADVANCED RESEARCH PROGRAM

- Focus on high-risk, high payoff research
- Merit review to enhance quality of research processes and results
- Research stakeholders involved throughout
- Commitment to successful project handoff

WHAT IS 'INNOVATION'?

- According to Merriam-Webster…
  - The introduction of something new
  - A new idea, method, or device

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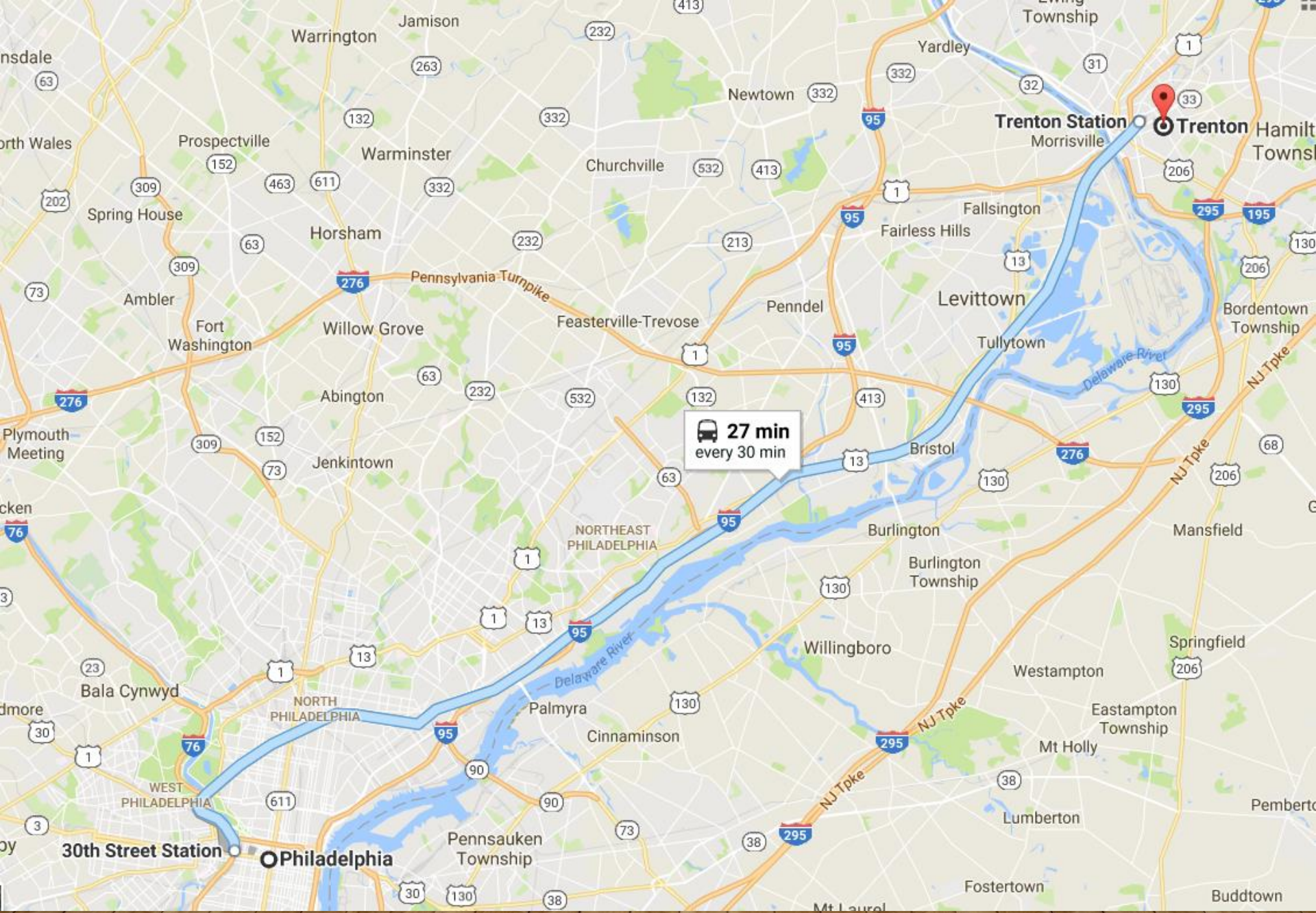
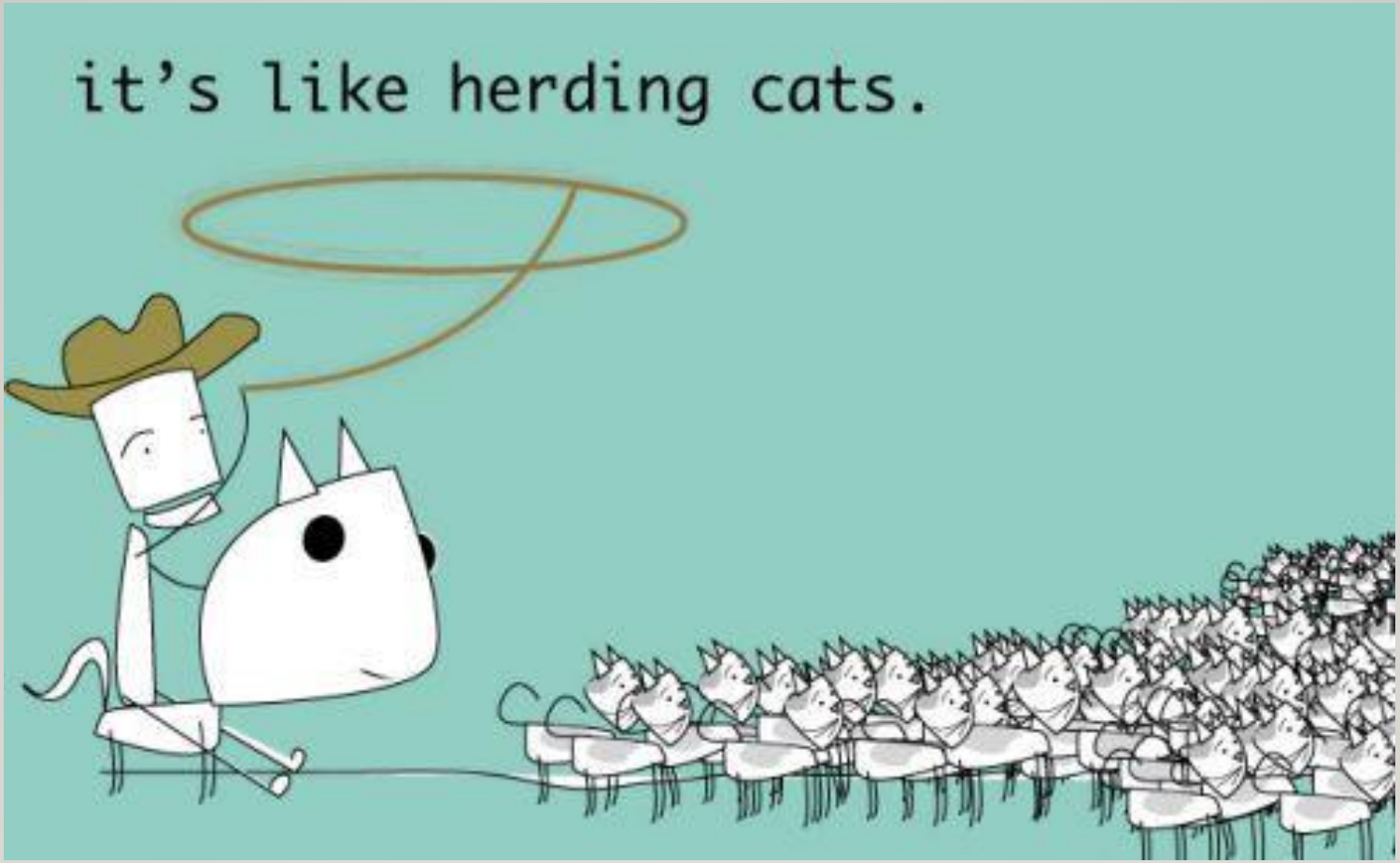
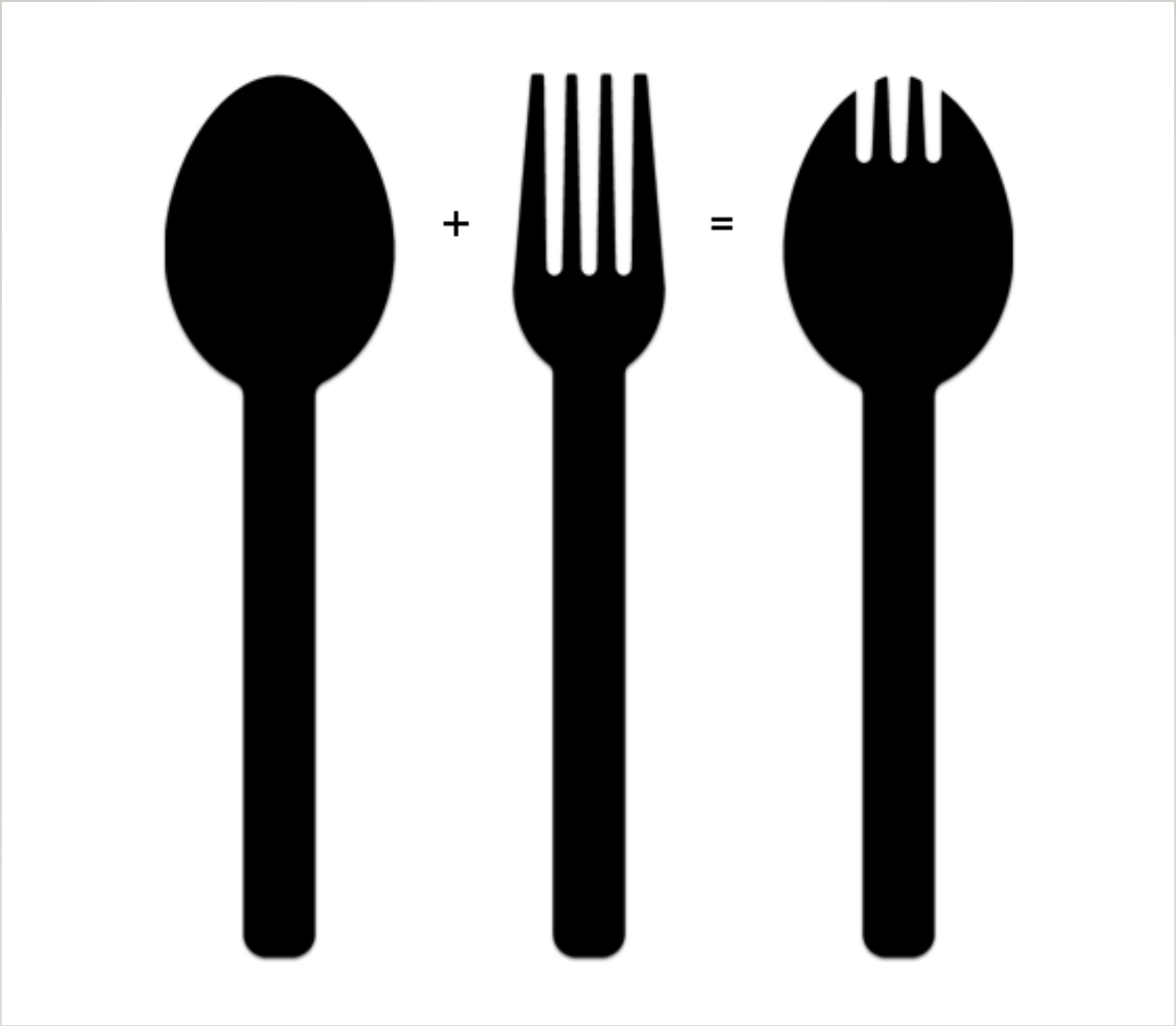

27 min
every 30 min
Trenton Station
Trenton
30th Street Station
Philadelphia
Pennsylvania Turnpike
Delaware River
NJ Tpke
NORTHEAST PHILADELPHIA
NORTH PHILADELPHIA
WEST PHILADELPHIA
Warrington
Jamison
Yardley
Newtown
Morrisville
Prospectville
Warminster
Churchville
Spring House
Horsham
Fallsington
Fairless Hills
Levittown
Ambler
Fort Washington
Willow Grove
Feasterville-Trevose
Penndel
Tullytown
Bordentown Township
Abington
Jenkintown
Plymouth Meeting
Bristol
Burlington
Burlington Township
Mansfield
Willingboro
Palmyra
Cinnaminson
Westampton
Springfield
Eastampton Township
Mt Holly
Lumberton
Pennsauken Township
Bala Cynwyd
Fostertown



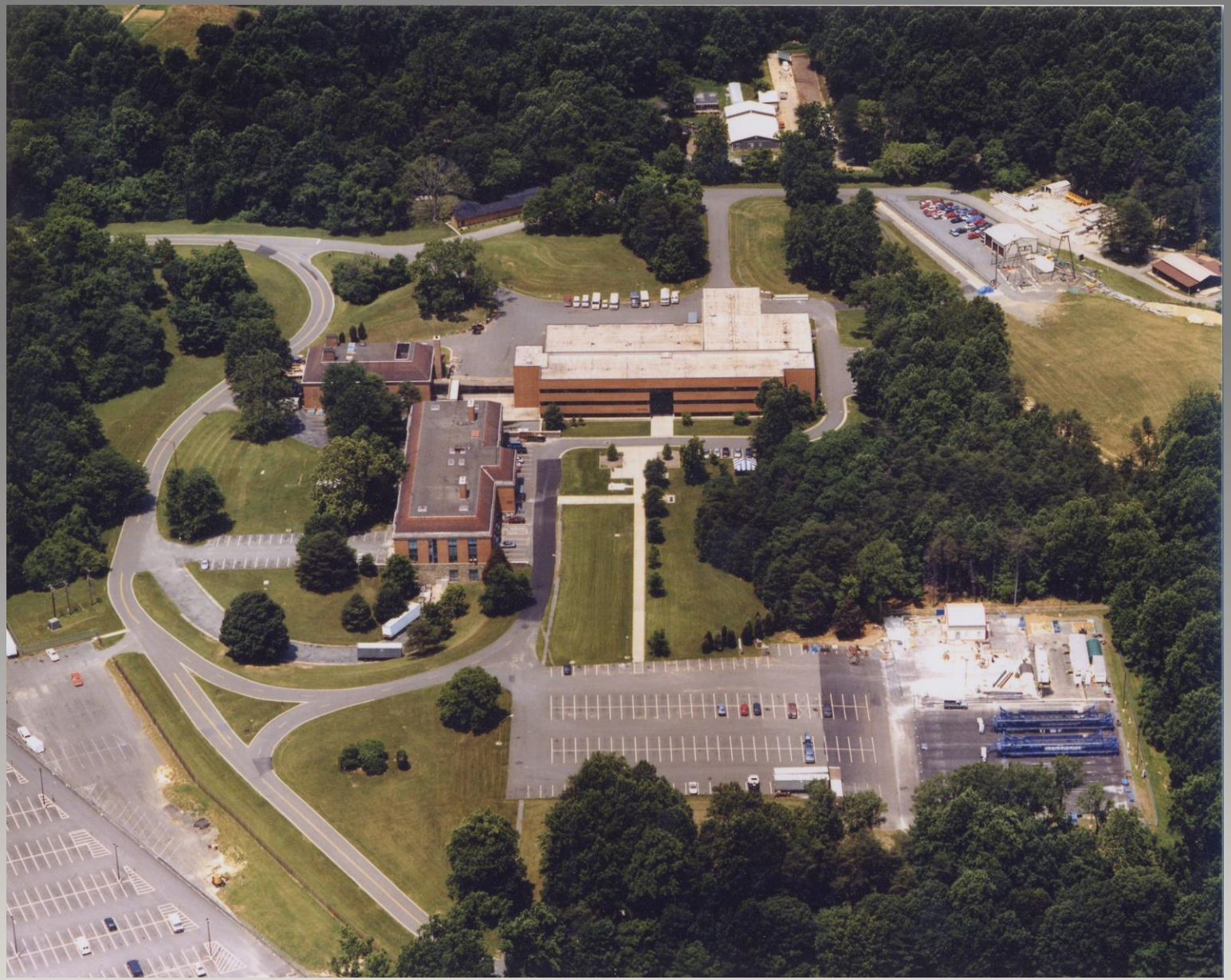
And Innovation can be similar……..

Maybe for a breakout, which is better, and why?

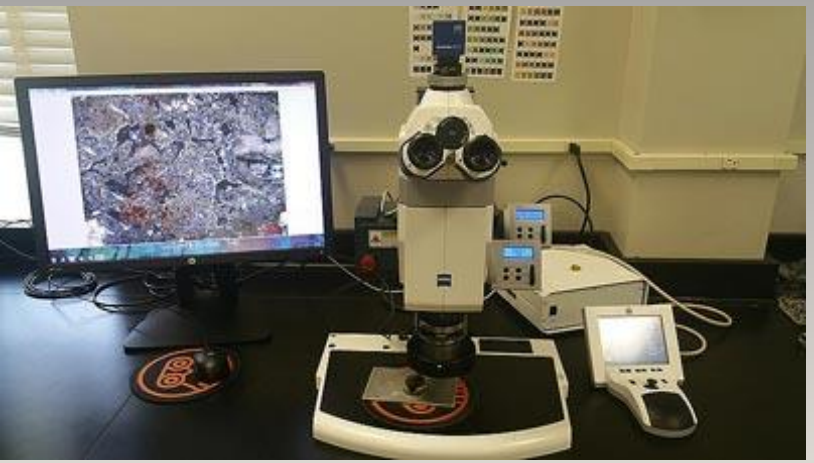


NEW

8th St N



HAAKE MARS



LAB

Federal Highway Administration ■ Office of Safety R&D

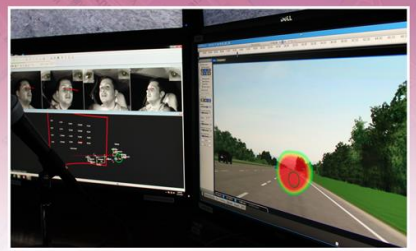
Highway Driving Simulator

Behavioral Research

Everyday Drivers

Safely and economically investigate human behavior in conceptual designs.

Novel Roadway Interaction



Eye Gaze

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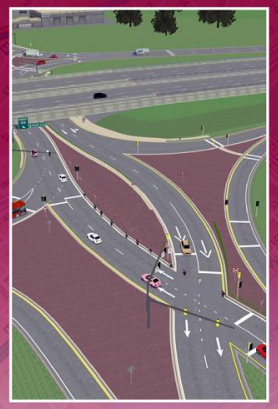
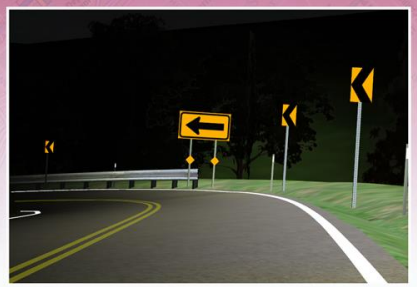
Highway Driving Simulator

Visualization

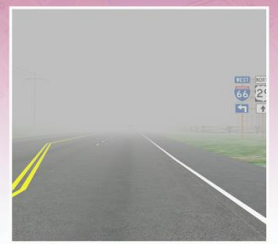
Virtual exploration of environmental states, traffic conditions, and new roadway designs.



New Intersection Designs



Realistic Nighttime Visibility



Simulated Weather

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Human Factors Laboratory

Data Analysis

Sign Lab

Diverse methods and tools used to explore a broad spectrum of human performance.

MiniSim

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Not Real

Innovation and Forensics

EXPLORATORY ADVANCED RESEARCH CONCERNED WITH INNOVATION AND MOBILITY

- Research to improve the mobility and lifestyle of those pedestrians with one of more impairments (blind, physical, cognitive)
- Includes indoors, outdoors, and transitions
  - Particularly in GPS derogated environments
- Three projects were awarded ~2012

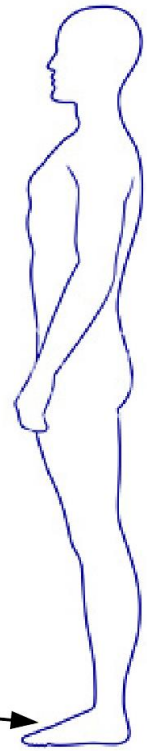
PROTOTYPE

IMU
(mounted to camera)

DSRC Radio

GPS Antenna
(mounted on backpack)

Stereo camera
(mounted to chest)



iPhone

Tactile Vest / Belt

GPS Receiver
(contained within backpack)

Pedometry IMU
(mounted rigidly to shoe)

Navigation Computer
(contained within backpack)

Research Archive
- Safety
- Mobility
- Environment
- Road Weather
- Policy
- Connected Vehicle Technology
- CV Pilots Deployment Project
- Automated Vehicle
- Intermodal
  - Active Transportation and Demand Management
  - Integrated Corridor Management
  - Accessible Transportation Technologies Research Initiative
- Exploratory
- ITS Cross-Cutting Support
- Success Stories

Intermodal Research

Accessible Transportation Technologies Research Initiative

ATTRI News and Events

- Accessible Transportation Technologies Research Initiative (ATTRI) Application Development Awards
- State of the Practice, Innovation, and Assessment of Relevant Research Reports Now Available
  - State of the Practice Report
  - Innovation Report
  - Assessment of Relevant Research Report
- ATTRI Applications Workshop – Transportation Research Board (TRB) Annual Meeting 2017 Presentations
- ITS Transit Standards Training: ATTRI Module Now Available
- New ATTRI Video Released
- FHWA, FTA, and ITS JPO release Broad Agency Announcement for ATTRI Application Development
- Department of Health and Human Services Administration for Community Living National Institute on Disability, Independent Living, and Rehabilitation Research Disability and Rehabilitation Research Projects (DRRP) Program: Accessible Transportation Grant
- Stakeholder and User Needs Report – Final Report Now Available
- International Technology and Persons with Disabilities Conference - CSUN 2016 Presentation

travel, addressing individual mobility needs. The initiative will enhance the capability of travelers to reliably, safely, and independently accomplish their unique travel plans.

ATTRI leverages recent advances in vehicle, infrastructure, and pedestrian-based technologies, as well as accessible data, mobile computing, robotics, artificial intelligence, object detection, and navigation. These technologies are enabled by ever present wireless communications that connect travelers and their mobile devices, vehicles, and roadside infrastructure.

The program is being implemented in three phases: 1) exploratory and user needs research; 2) innovation, prototype development, and testing; and 3) a demonstration phase. ATTRI has completed Phase 1 and is currently focused on Phase 2 activities.

ATTRI research focuses on the needs of three stakeholder groups: people with disabilities, veterans with disabilities, and older adults.

Persons with Disabilities

Veterans with Disabilities

Older Adults

ATTRI will also develop technological solutions to lower or remove barriers to transportation according to four functional disabilities: visual, hearing, cognitive and mobility.

THE COMPLETE TRIP

After his doctor's appointment, Andy decides to take a spontaneous trip to meet a friend at a coffee shop in an unfamiliar part of town. Using ATTRI's **pre-trip concierge**, **wayfinding and navigation**, **robotics and automation**, and **safe intersection crossing** applications, Andy can travel with confidence throughout his trip.

1. Plan and Book a Trip

Andy uses a **pre-trip concierge application** to plan and book his trip from the doctor's office to the coffee shop.

2. Travel to Transit Station

An **automated shuttle** (rideshare service) is dispatched to take Andy to the transit station based on his booked trip. Once there, an **assistive robot** helps Andy to his bus platform.

3. Ride the Bus

While on the bus, Andy receives direction on when to pull the Stop Request cord from his **wayfinding and navigation application**. After he departs the bus, the application provides Andy with turn-by-turn walking directions to the coffee shop.

4. Cross the Street

As Andy approaches an intersection, his **safe intersection crossing application** communicates with the traffic signal to ensure sufficient time for him to safely cross the street, and notifies him when it is safe to begin crossing. The application also communicates with nearby cars to notify them of Andy's presence in the intersection.

5. Arrival at Destination

Andy safely arrives at his destination, while the **pre-trip concierge application** plans his return trip home.

For more information on the ATTRI program status and details on the ATTRI application areas and foundational considerations see the progress and insights page.

Subscribe

Thanks….

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ATTRI