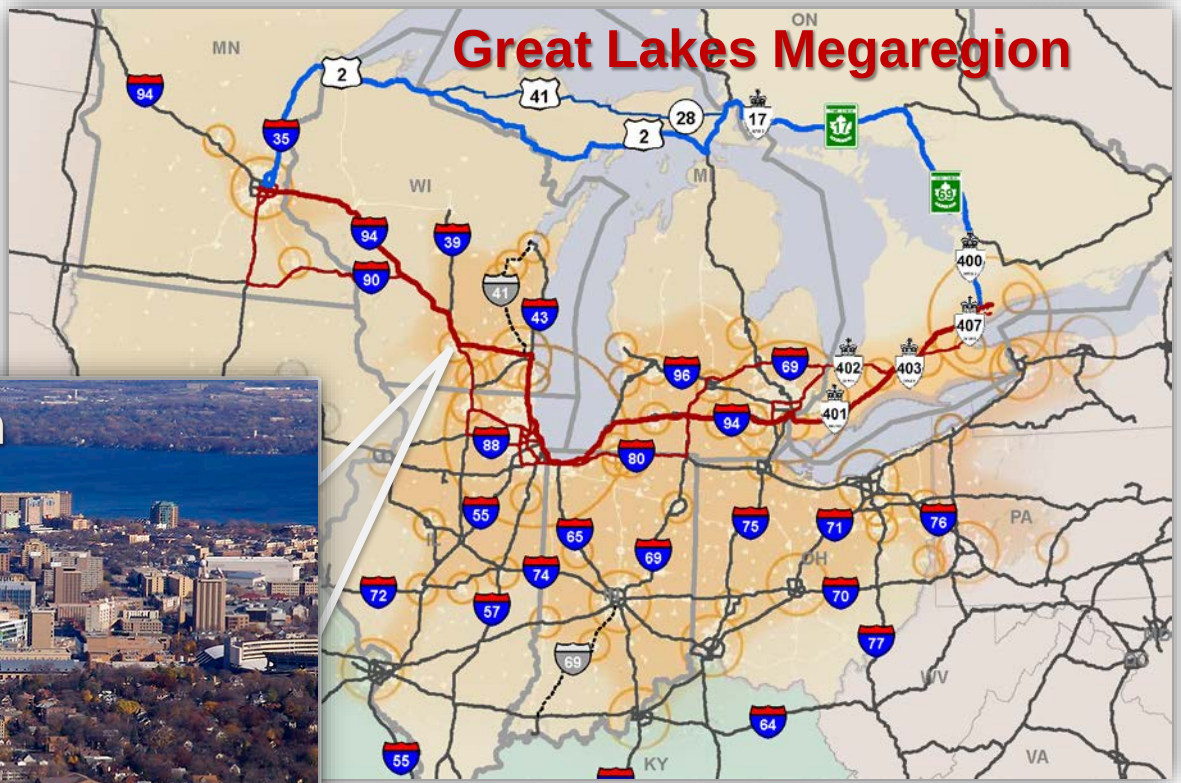
Wisconsin Automated Vehicle Proving Grounds

Introduction and Overview

March 2017

Civil and Environmental Engineering

UNIVERSITY OF WISCONSIN–MADISON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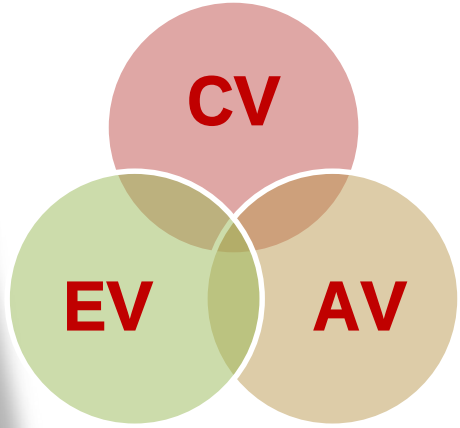
City of Madison

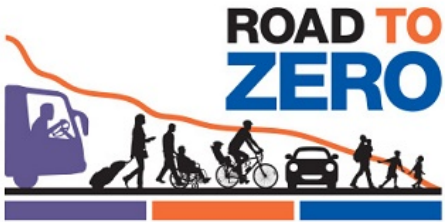
Building a Smart Madison
for Shared Prosperity


CV
EV
AV

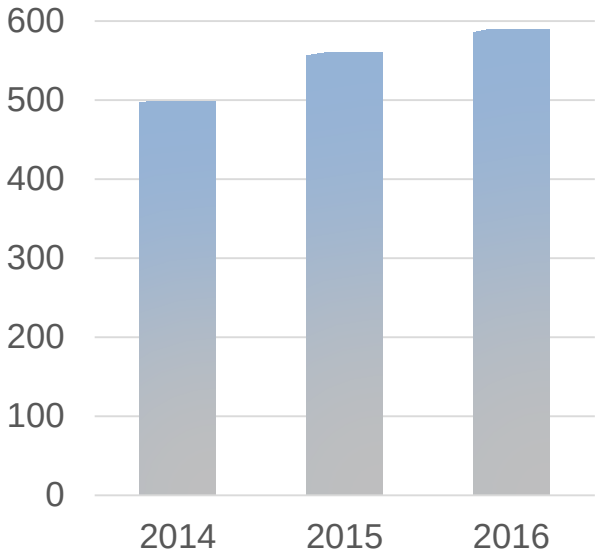
Traffic Fatalities Rising

Nationally:

- Increased for 2nd straight year
- Largest two-year increase in 50 years
- Approaching 40,000 deaths
- Road to Zero emphasizes AV



Wisconsin:



ZERO IN WISCONSIN

Sources: National Highway Traffic Safety Administration, National Safety Council, and Wisconsin DOT

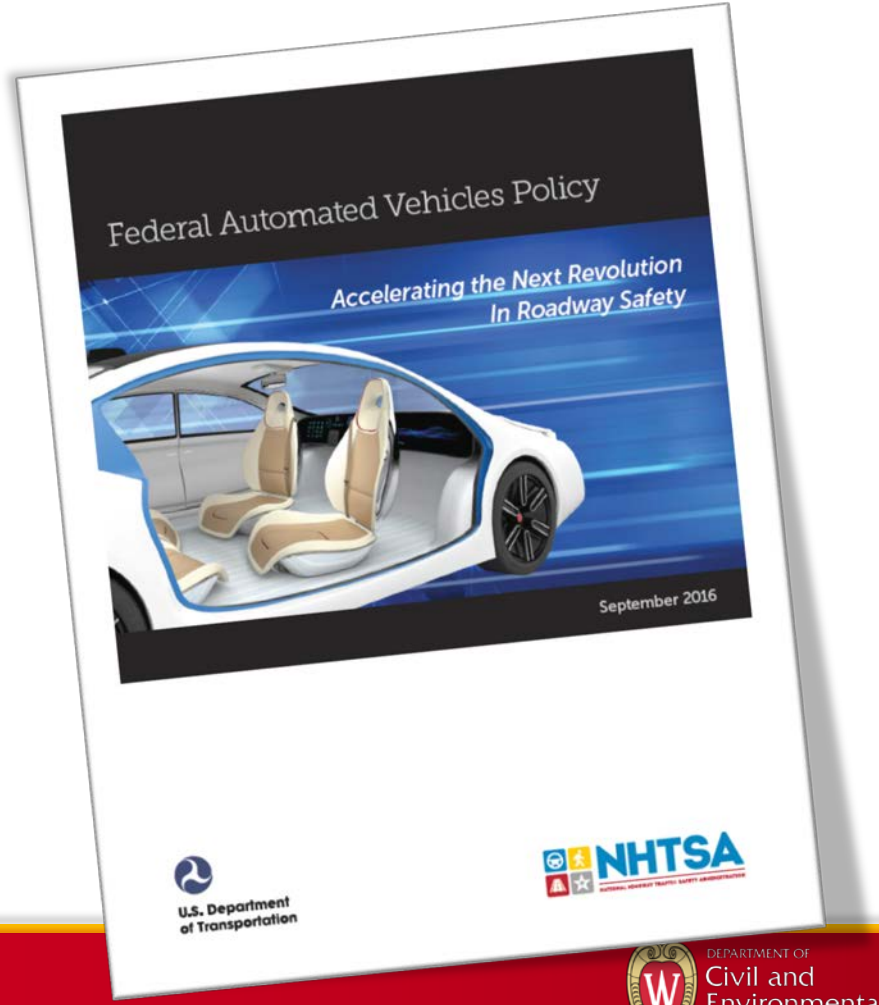
Motivations and Opportunities

- Motivated primarily by safety gains
  - ~90% of crashes attributable to human error
  - Distracted driving continues to worsen
  - Need to carefully navigate the era of partial automation
- Many other motivations:
  - Economic development
    - Startup and tech jobs
  - Underutilized vehicles
  - Efficient use of infrastructure
  - Accessibility and equity
  - Agriculture and defense sectors
  - AVs integral to automation, artificial intelligence enablement, construction, manufacturing

Very Active Industry Development

These and others can bring R&D investment to Wisconsin

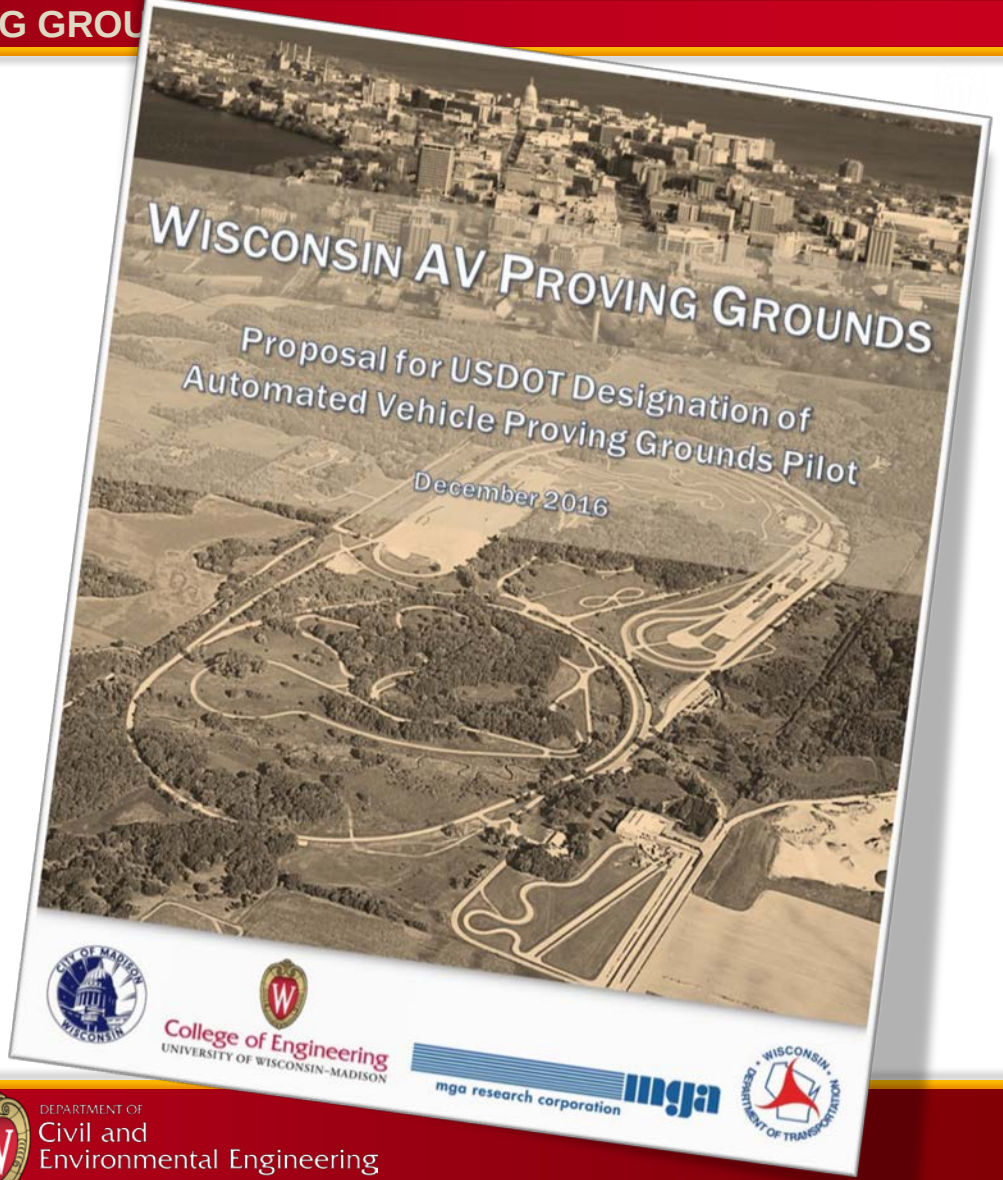
Federal AV Policy



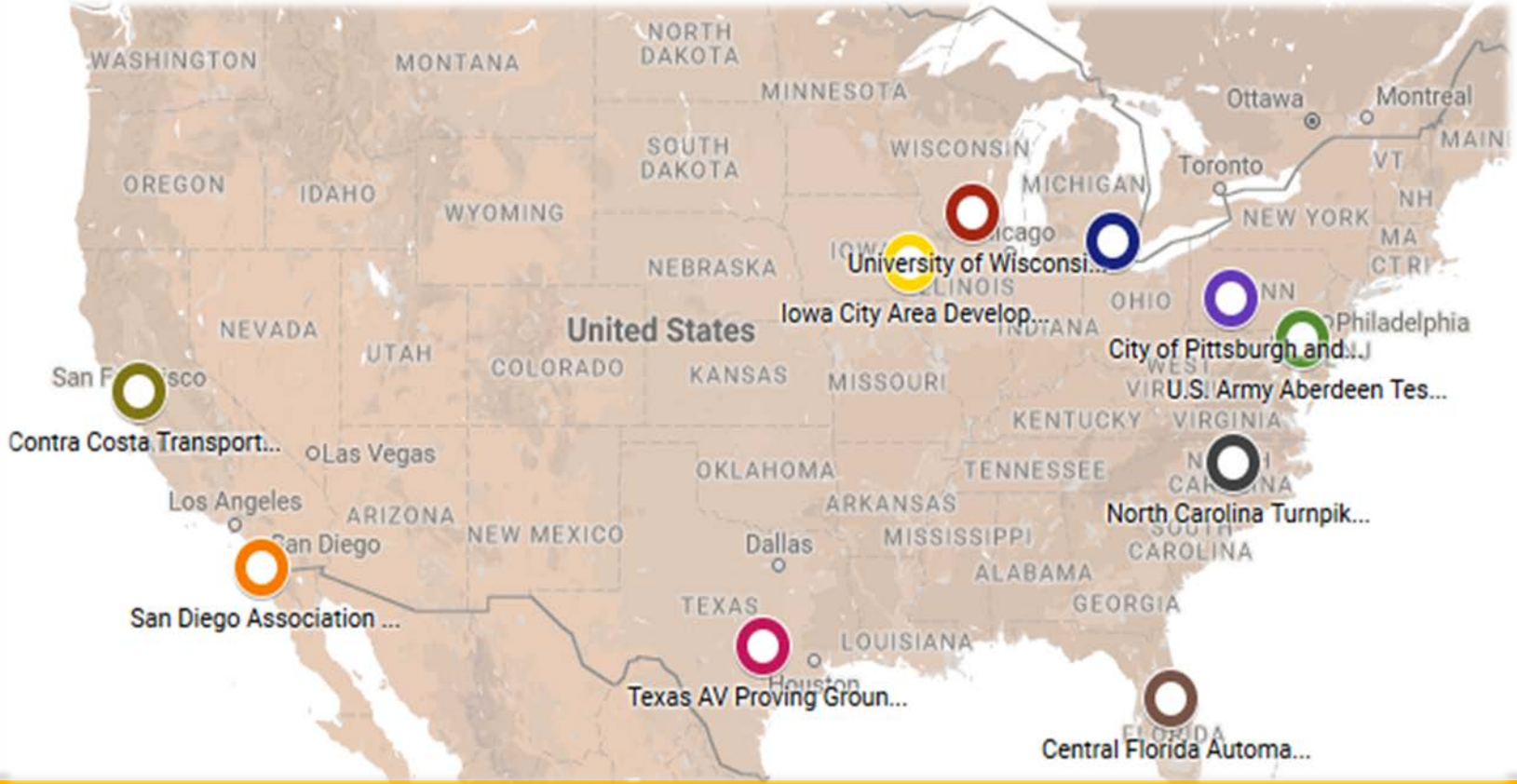
- Released September 20, 2016
- Guidelines, not regulations
- Proposes a 15-point safety assessment
- Model State Policy

USDOT Solicitation

- December 2016
- Peer network
- No funding



Designated AV Proving Grounds



Wisconsin Facilities

MGA Research Facility - Burlington, WI

Early Stage | Closed Track | Low Speed
Safety | Durability | Transit

Road America - Elkhart Lake, WI

Early Stage | Closed Track | High Speed
Mobility | Long Distance | Freight

UW-Madison / Epic Campus

Mid-Stage | Limited-Use Facility | Low Speed
Safety | Durability | Transit

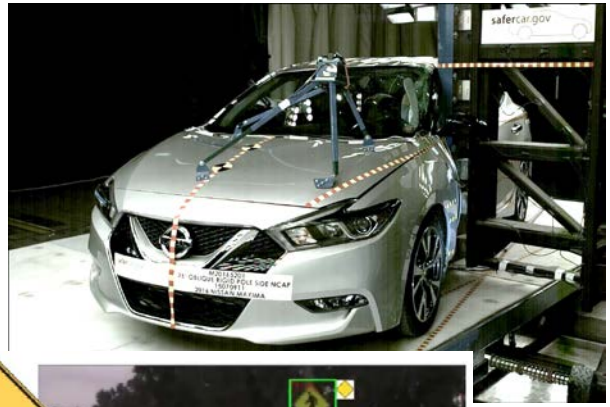
City of Madison

Mid/Late-Stage | Public Roads | Low Speed
Safety | Mobility | Durability | Transit

Wisconsin DOT (W-Highway)

Late-Stage | Public Roads | High Speed
Mobility | Long Distance | Freight

Wisconsin Facilities



MGA Research, Burlington

400 acres, private and secure, numerous testing capabilities

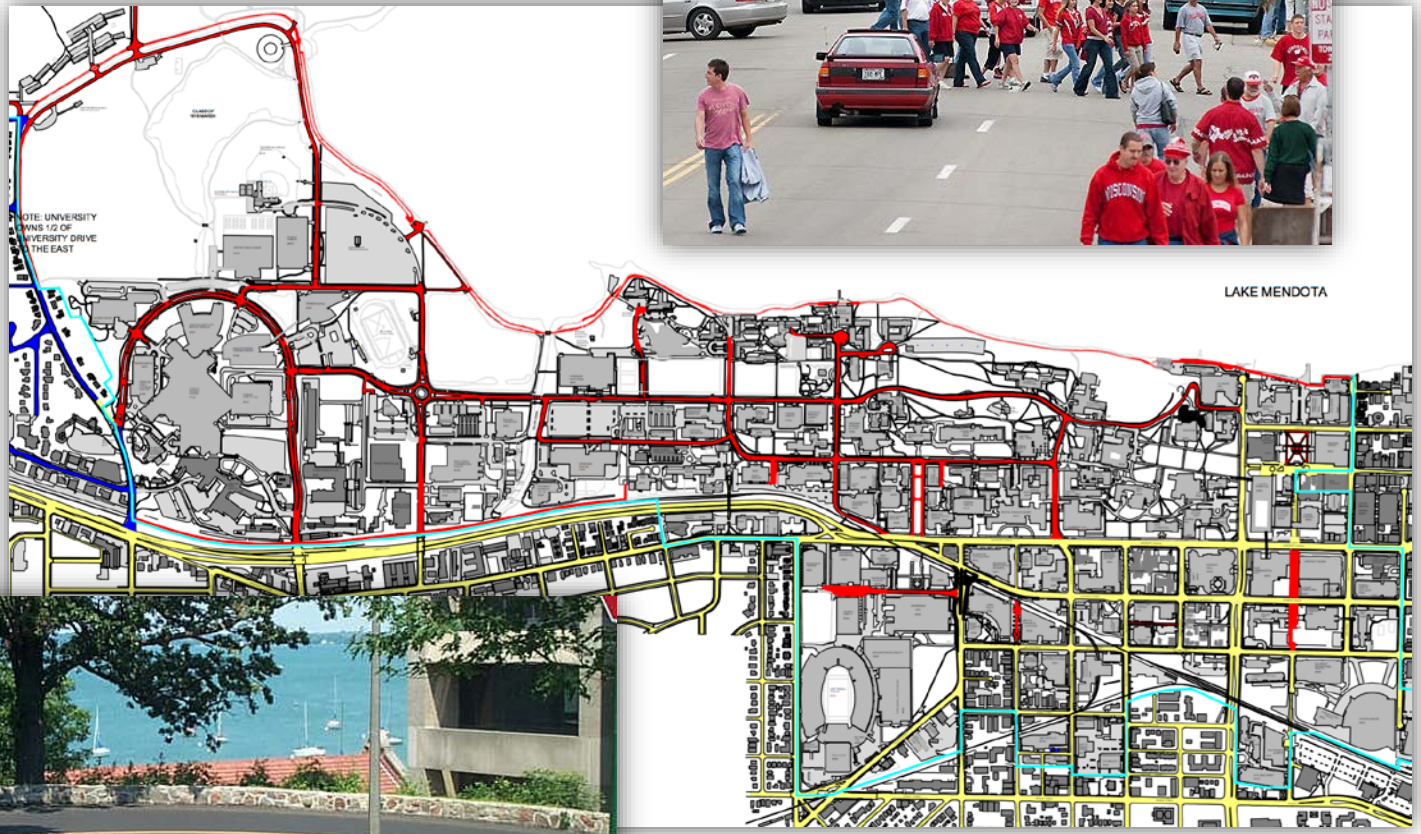
Wisconsin Facilities

Road America, Elkhart Lake

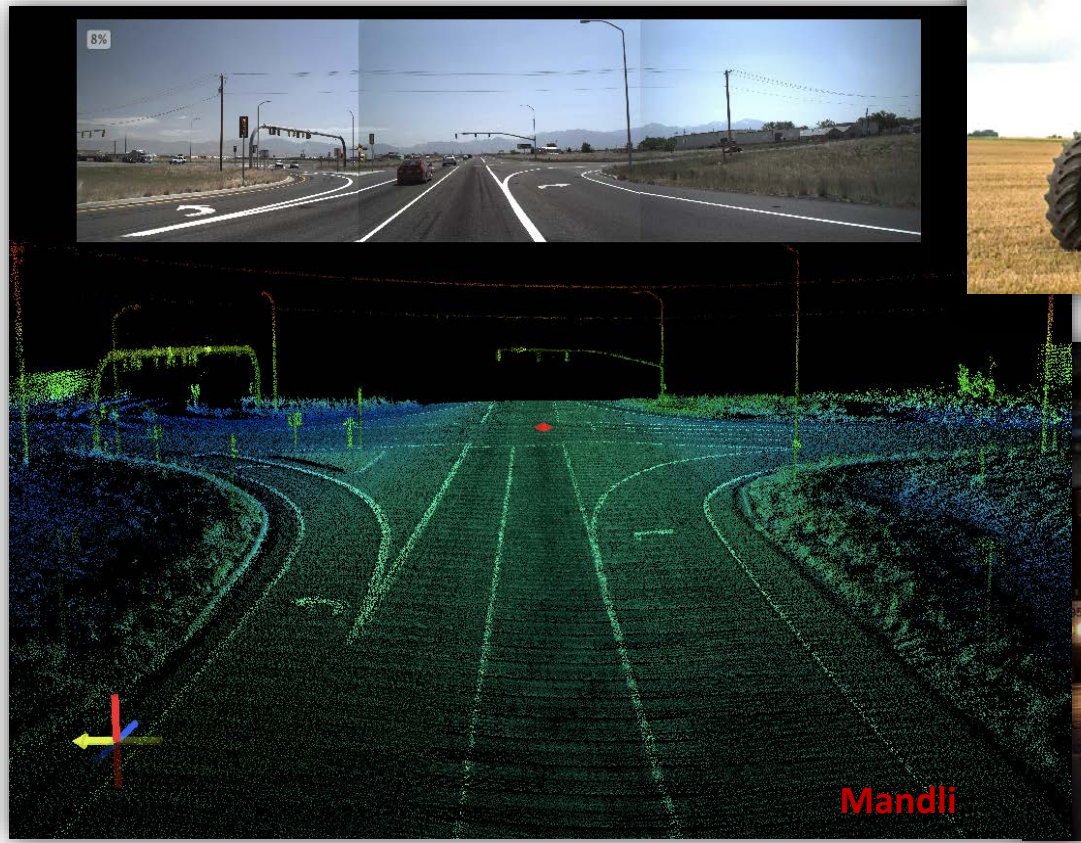
- Road track: 4.05-mile length, 30-foot width
- 1-mile combo paved-dirt track
- 12+ miles off-road
- 10+ miles access roads
- Major race events

Wisconsin Facilities

UW-Madison Campus and City of Madison



Opportunities



Our Capabilities

Data and sensing—including LIDAR, GPS, cameras, communications, and other sensors.

Vehicle operations—including speed, acceleration and deceleration, performance on grades and curves, and electric vehicle range and charging time.

Inclement weather operations—including snow, ice, fog, and high winds.

Interaction with surroundings—including pedestrians, bicycles, mopeds, cars, and traffic control devices.

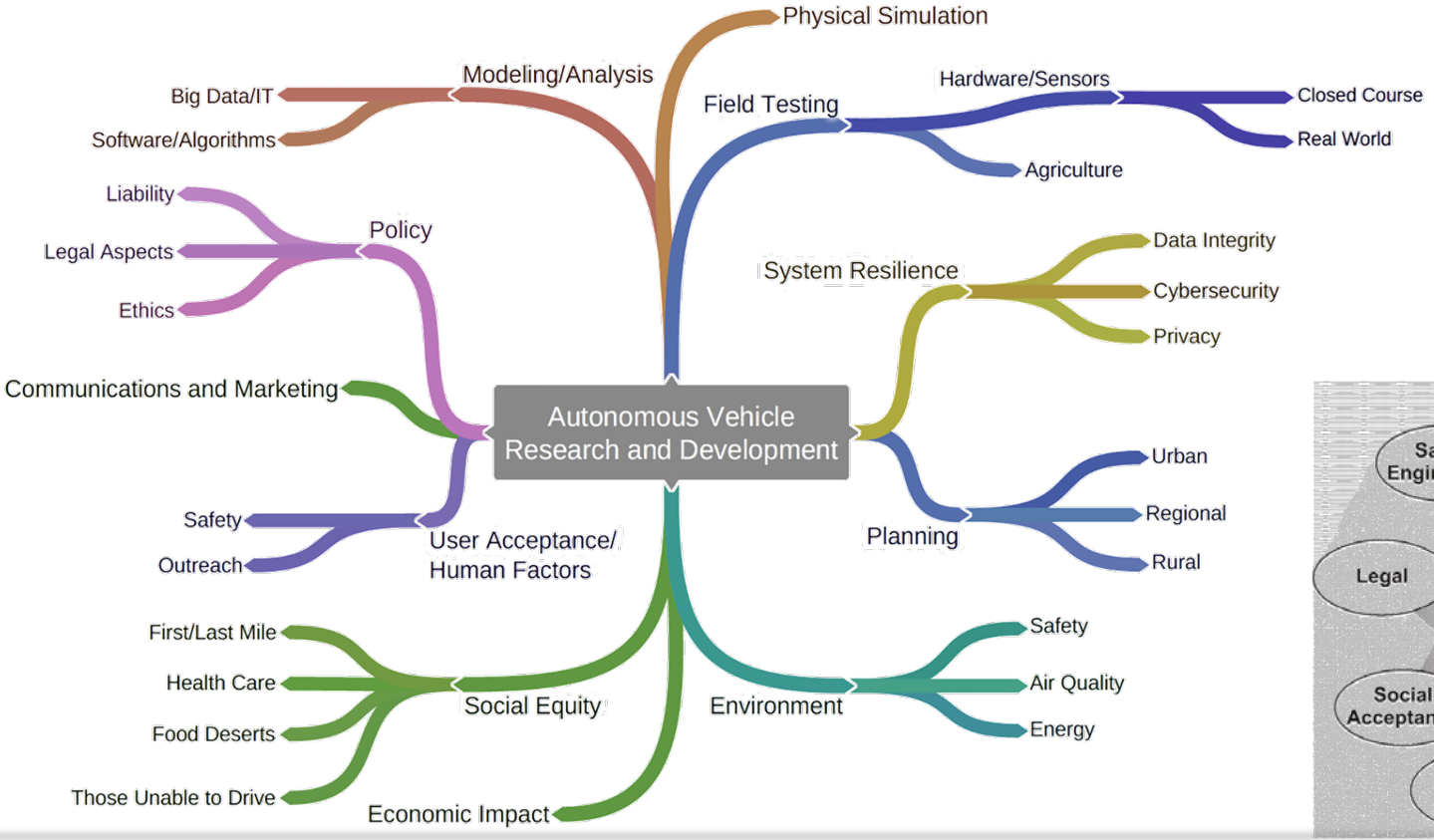
User acceptance—Passenger comfort, public perception, safety, and ethics.

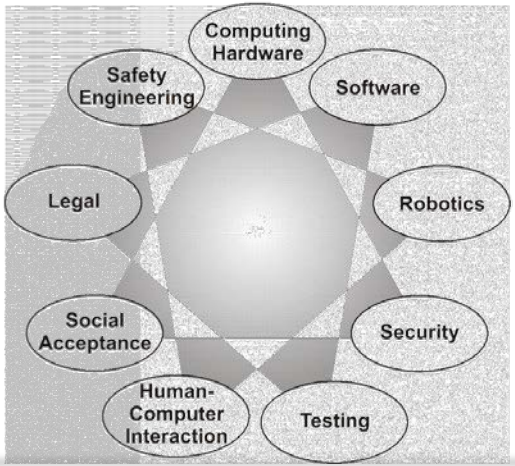
System resilience—Advancing standards, safety protocols, and security.

Human-machine interfaces—such as sensors, communications, and responses.

Shared mobility—Automated vehicle microtransit developments, enhancements, and testing.

Breadth and Complexity





(An) AV Timeline

2015
- driver assistance common
- some partial automation available to consumers

2020
- limited / conditional AVs widely available to consumers

2025
- autonomous shared mobility fleets

2030
- high automation required in all new vehicles

2035
- human operation is the exception in many places

2040
- transition to driverless largely complete
- fleet turnover continues…

- Any estimate is debatable
- We are only beginning a long transition period

Thank You

Peter Rafferty, PE, PTOE, AICP

Researcher – Department of Civil and Environmental Engineering
TSM&O Program Manager – Wisconsin TOPS Lab

608-890-1218
prafferty@wisc.edu

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Environmental Engineering
UNIVERSITY OF WISCONSIN–MADISON