NADS Overview

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National Advanced Driving Simulator (NADS)

- A driving safety research center within the University of Iowa
- Established in 2001 with funding from US Dept. of Transportation and State of Iowa
- Self sustained through contract-based research for government and industry
- Available for use by any sponsor (government, industry, military, international)

OUR SPONSORS:

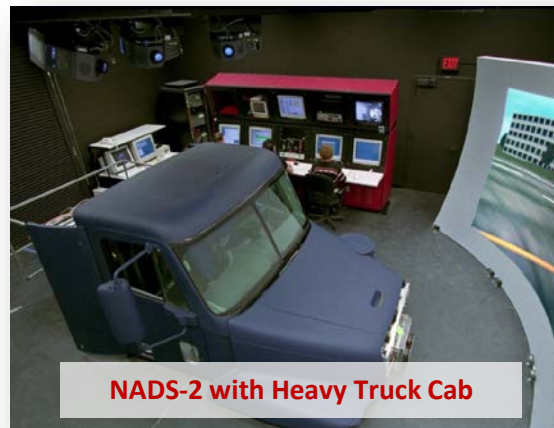# We Conduct Research and Provide Simulation Services

- Research/assess new vehicle technology with local human subject population

- Provide data to regulatory agencies and industry

- R&D partnerships with institutions around the world

NADS-1 Dome in Bay

NADS Instrumented Vehicle

NADS-2 with Heavy Truck Cab

NADS miniSim™

THE NATIONAL ADVANCED DRIVING SIMULATOR

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NADS-1

- Large envelope motion base
- 13-degree of freedom motion base
- 360 degree of visuals
- Swappable vehicle cabs
- Validated vehicle dynamics
- Large library of scenarios and driving environments

NADS-2 High Resolution Visuals Simulator

- No motion
- Supports different types of vehicle cabs
- Vision testing setup includes:
  - 0.5 arc-min pixel spacing to support 20/20 acuity
  - Glare source with brightness controlled to oncoming vehicle distance
  - Real-time eye-tracking and head-tracking instruments
  - Night-time virtual environment
  - Multiple equivalent scenarios

THE NATIONAL ADVANCED DRIVING SIMULATOR
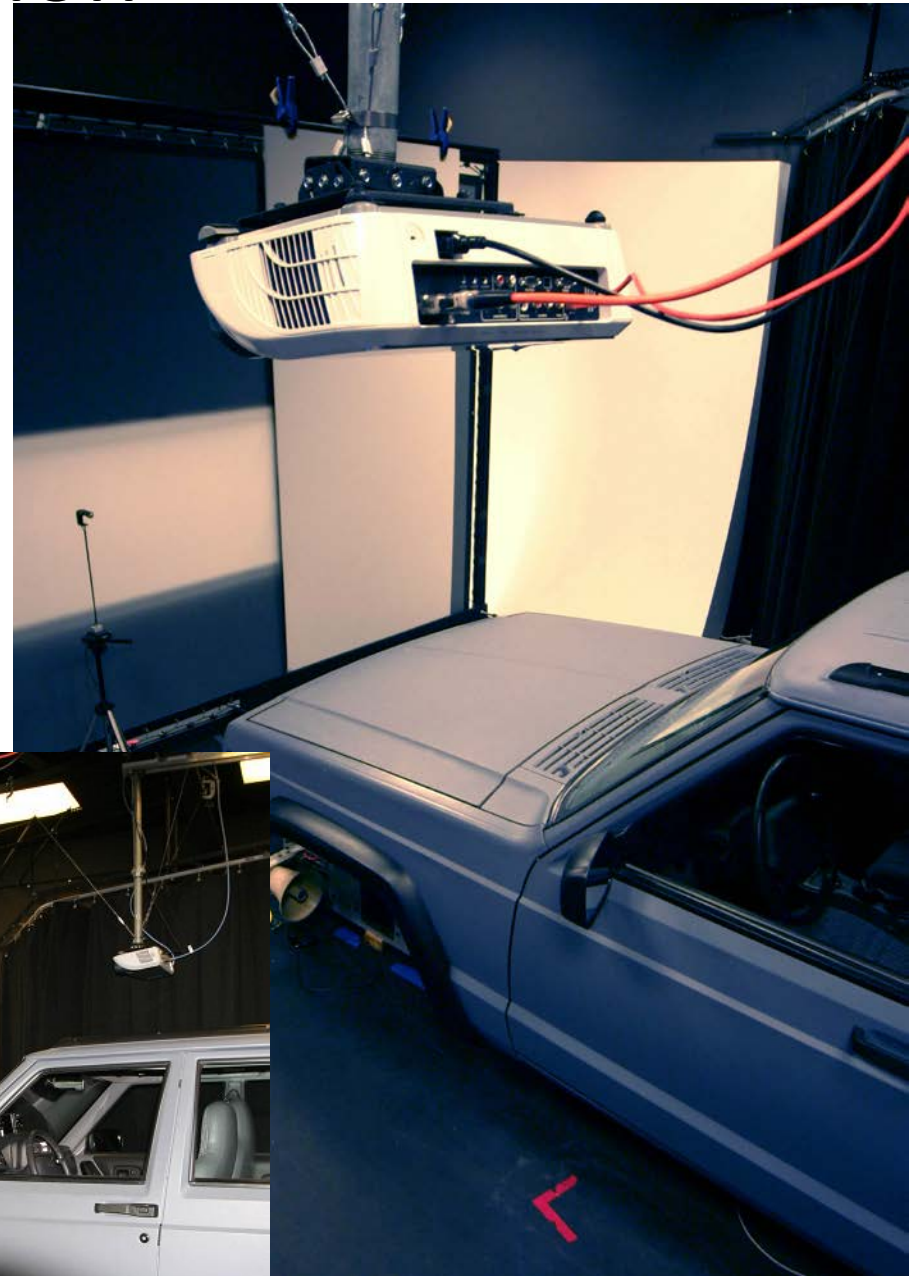
NADS miniSim™

- Portable, small footprint
- Off-the shelf parts. Single PC.
- Cost Effective, Reliable
- Multiple configurations
  - Quarter Cab
  - Simplified Cab
  - Desktop
- Tool for collaboration across institutions/industry/agencies
- Compatible with NADS-1, NADS-2 simulators
- Customized version for vision testing

Dual-Purpose Instrumented Vehicle

- Modern 2012 Toyota Camry with navigation

- Instrumented sensors and CAN bus integration

- Repositionable video cameras for cab and roadway views

- Can link to part-task simulator

THE NATIONAL ADVANCED DRIVING SIMULATOR

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Springfield

- Environments
  - Urban
  - Residential
  - rural highway
  - interstate

- 285 total sq. miles
- 230 miles of roadway
- 178 intersections
- 143 traffic signals
- 10 different road configurations
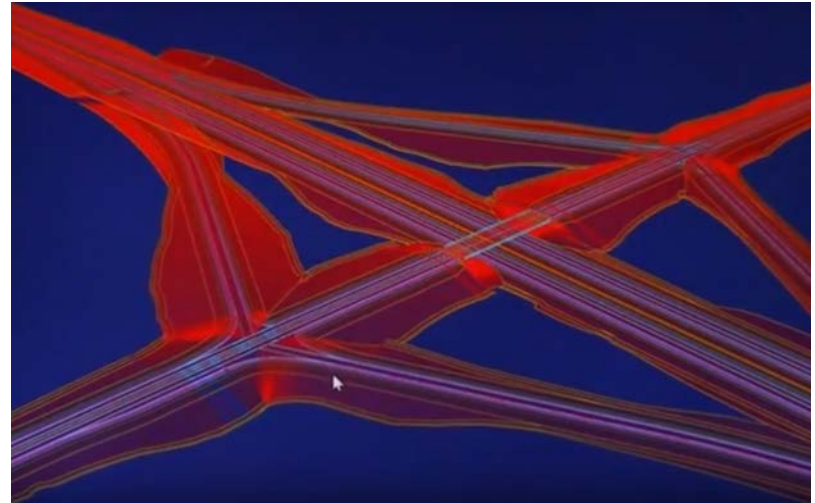- Controllable time-of-day and weather conditions
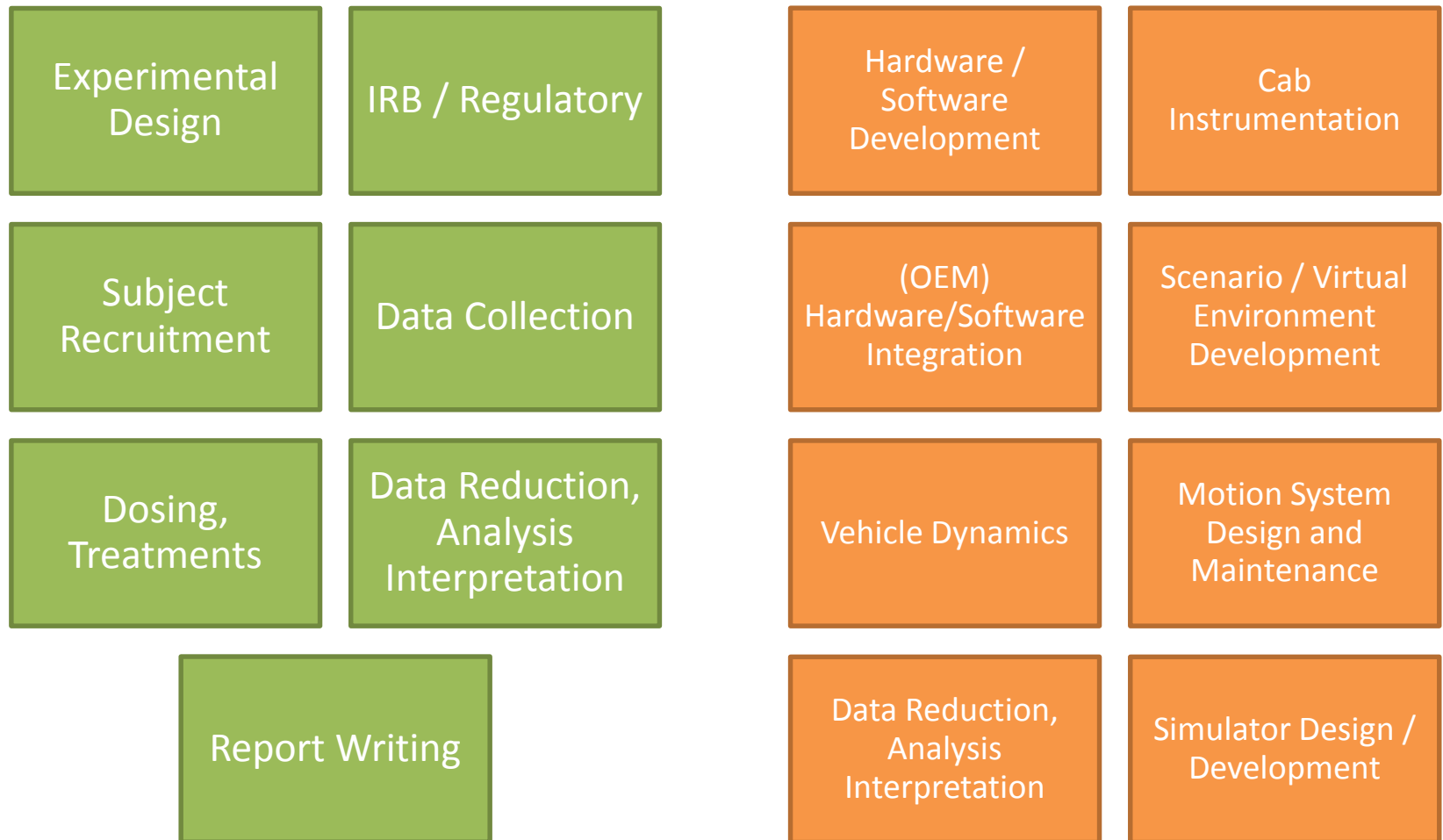
Road Data Visualization

Quickly building simulated driving environments to duplicate real world roads
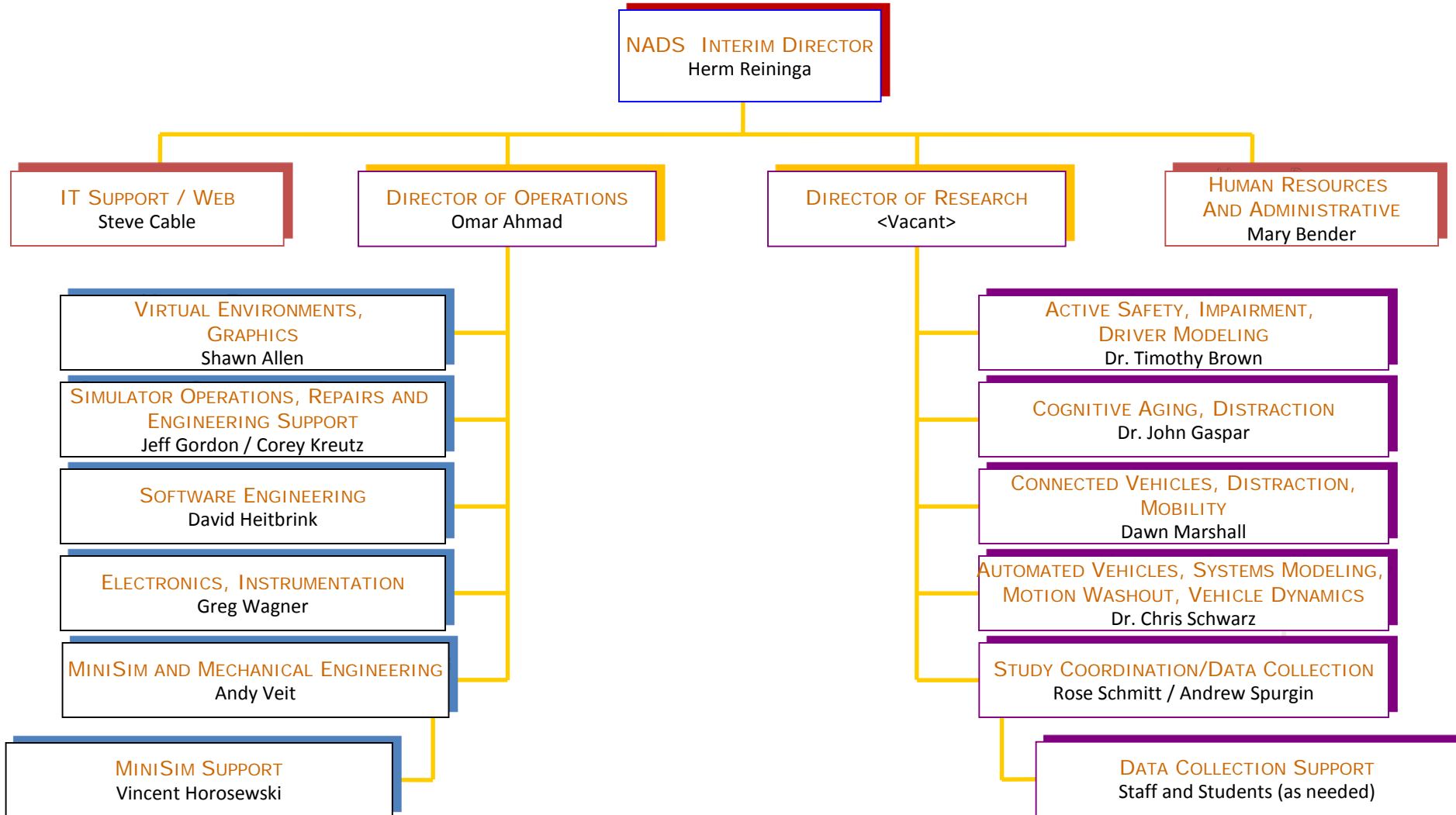
Data sources:
- Aerial imagery
- MicroStation design files
- SHRP-2 naturalistic driving data
- GPS (future)
- OpenStreetMap (future)

Research Study Capabilities

Experimental Design	IRB / Regulatory
Subject Recruitment	Data Collection
Dosing, Treatments	Data Reduction, Analysis Interpretation
Report Writing	

Hardware / Software Development	Cab Instrumentation
(OEM) Hardware/Software Integration	Scenario / Virtual Environment Development
Vehicle Dynamics	Motion System Design and Maintenance
Data Reduction, Analysis Interpretation	Simulator Design / Development

The National Advanced Driving Simulator

The University of Iowa

We Have a Broad Range of Simulation Expertise

Research Topics

IMPAIRED DRIVERS

Distracted

Drowsy

Alcohol Impaired

Cannabis Impaired

Driver State Detection

Mitigation strategies

VEHICLE SAFETY

Connected Vehicles

Automated Vehicles

Crash Avoidance
     Systems

Lane Departure

Electronic Stability
     Control

Crash Warning
     Interface Metrics

AT RISK DRIVERS

Older Drivers

Teen Drivers

Autism

Young Tractor Drivers

Motorcycle Conspicuity

Sleep disorders

Neurological conditions

Law Enforcement
officers

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