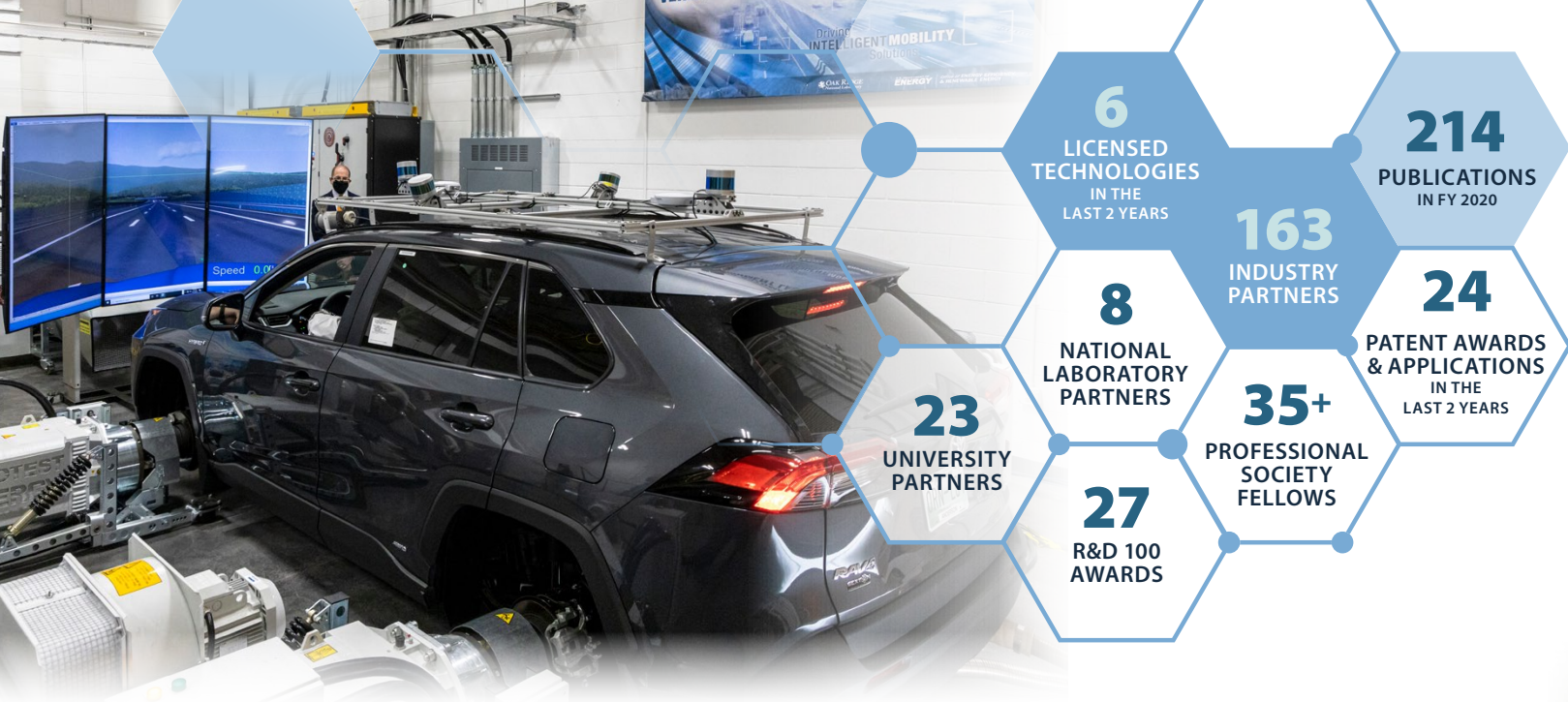


# National Transportation Research Center

Advancing Mobility  
Solutions



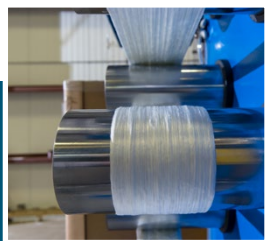




## Delivering Innovation

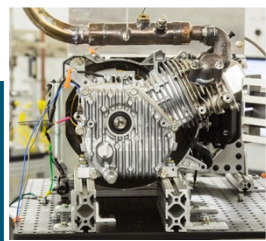
The National Transportation Research Center (NTRC), established in 2000, is the Department of Energy's only designated user facility focused on performing early-stage research and development for efficient, safe, secure, and clean, fully decarbonized transportation. Research focuses on advanced energy storage and electric drive systems (including fast wired and wireless charging); lightweight materials and multi-material structures for harsh environments; advanced combustion engines and alternative biofuels; data science, analysis, and vehicle cybersecurity; vehicle systems integration; and intelligent mobility systems.

The NTRC comprises a 65,000 sq. ft. facility that integrates a uniquely broad and comprehensive set of capabilities, from novel diagnostics to component and vehicle evaluation to data analytics and cybersecurity. The facility is dedicated to accelerating the pace of research and development for new materials in next-generation systems, providing decision-making tools for sustainable transportation systems, and creating economic opportunity by improving the energy efficiency and environmental impact of vehicles to support a robust transportation system for people and commerce. Across its energy science and technology user facilities, ORNL delivers breakthroughs from generation to distribution and storage to end use, accelerating America's transformation to a clean, efficient, flexible, and secure energy future.



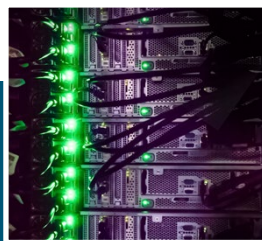
### Materials

Working with advanced composites and carbon fiber and the joining of dissimilar materials, focusing on developing lightweight and advanced materials for engines and powertrains.



### Neutrons

Using neutrons to investigate and understand the structure and properties of materials. Characterizing component performance and fluid dynamics while in operation.



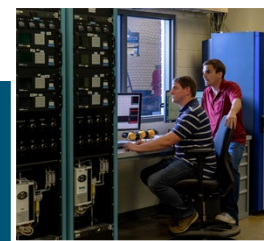
### Computational Science

Deploying artificial intelligence and supercomputing for combustion, materials, and batteries research. Developing evolutionary algorithms and optimizing neural networks.



### Advanced Manufacturing

Utilizing additive manufacturing to develop strong, lightweight materials, such as aluminum and carbon fiber, for more efficient transportation applications, reducing fuel consumption.



### Virtual/Physical Research

Integrating virtual and physical hardware for research, utilizing foundational science and complex integrated mobility systems, operating across multiple laboratory locations in simulated environments.



### Connected and Automated Vehicle Environment Laboratory

Innovative proving ground to evaluate intelligent mobility solutions using real-world hardware and data in virtual traffic conditions.

### Power Electronics and Electric Machinery

Development and evaluation of electric drive technologies, including wired and wireless charging, motors, inverters, and packaging.

### Vehicle Research Laboratory

Diagnostics for gaseous and particle speciation, fuels, engines, applied catalysis, and electrification technologies.

### Fuels, Engines, and Emissions Research

Unique tools and expertise for integrated research on combustion, fuels, and emissions controls.

### Vehicle Systems Integration Laboratory

Platform combining modeling and simulation with actual hardware components for advanced powertrain integration, prototyping, and evaluation.

### Battery Manufacturing Facility

Nation's largest open-access battery research facility, optimizing new materials and processes with scalable results.

### Vehicle Security Laboratory

Assessment of cyber vulnerabilities while vehicles are in operation, including onboard computer signal interrogation and interpretation.

## Working with ORNL

ORNL scientists at the NTRC work closely with industry to accelerate the adoption of new transportation capabilities. More than 160 industry partners have collaborated with the NTRC on technology advancement and commercialization. ORNL also actively participates in government-industry partnerships to accelerate the development of new technologies that improve the fuel efficiency, safety, and emissions of light-, medium-, and heavy-duty vehicles. These partnerships connect ORNL researchers with industry leaders and encourage a continuous dialogue about the technical needs of the industry and the most beneficial targets for research and development. The 21st Century Truck Partnership and U.S. DRIVE are the most prominent of these collaborative efforts. For more information on how to work with ORNL, visit [www.ornl.gov/partnerships](http://www.ornl.gov/partnerships).

### DOE's NTRC

The National Transportation Research Center is DOE's only designated user facility focused on innovations in transportation.





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