



First U.S. NEVI charging station opened in December 2023



Deployment of connected and automated trucking technology on revenue-generating routes

2023 ANNUAL REPORT



NAAMCE opened in September 2023 at Springfield Beckley Municipal Airport



DriveOhio

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Letter from the Director

Dear Friends,

The global transportation landscape is amid a technological revolution. Smart mobility technologies are expected to improve safety, make our transportation systems more efficient, resilient, accessible, and equitable, and generate significant economic opportunity. Through the innovation and efforts of the Ohio Department of Transportation (ODOT), DriveOhio, sister agencies, and cross-sector collaborators, Ohio has solidified its position as a nationally-recognized leader in the smart mobility space.

Key investments and initiatives in Ohio, such as the new National Advanced Air Mobility Center of Excellence (NAAMCE) in Springfield and the testing and deployment of automated vehicles on rural roadways, play a critical role in attracting industry and serving Ohio's residents and visitors.

ODOT and DriveOhio are excited to continue advancing smart mobility technology innovation, testing, deployment, and scale-up for the benefit of all Ohioans. This Annual Report provides an overview of DriveOhio's 2023 project portfolio as well as projects planned for 2024—highlighting just what we are doing to usher in this next generation mobility ecosystem.

Respectfully yours,



Jack Marchbanks, Ph.D., Director
Ohio Department of Transportation



DriveOhio

Each of the six DriveOhio focus areas – Advanced Air Mobility (AAM), The Ohio Uncrewed Aircraft Systems (UAS) Center, Connected Vehicles (CV), Automated Vehicles (AV), Electric Vehicles (EV), and Workforce – has its own dedicated section on the following pages. Within each section, there is a brief overview of the workstream followed by:

- **Key Initiatives:** A summary of the strategic actions and projects related to the specific focus area.
- **Statistics:** A compilation of relevant metrics that highlight activity within that focus area.
- **Project Highlights:** A spotlight on the two to three most significant or notable projects for FY 2024.



INTRODUCTION

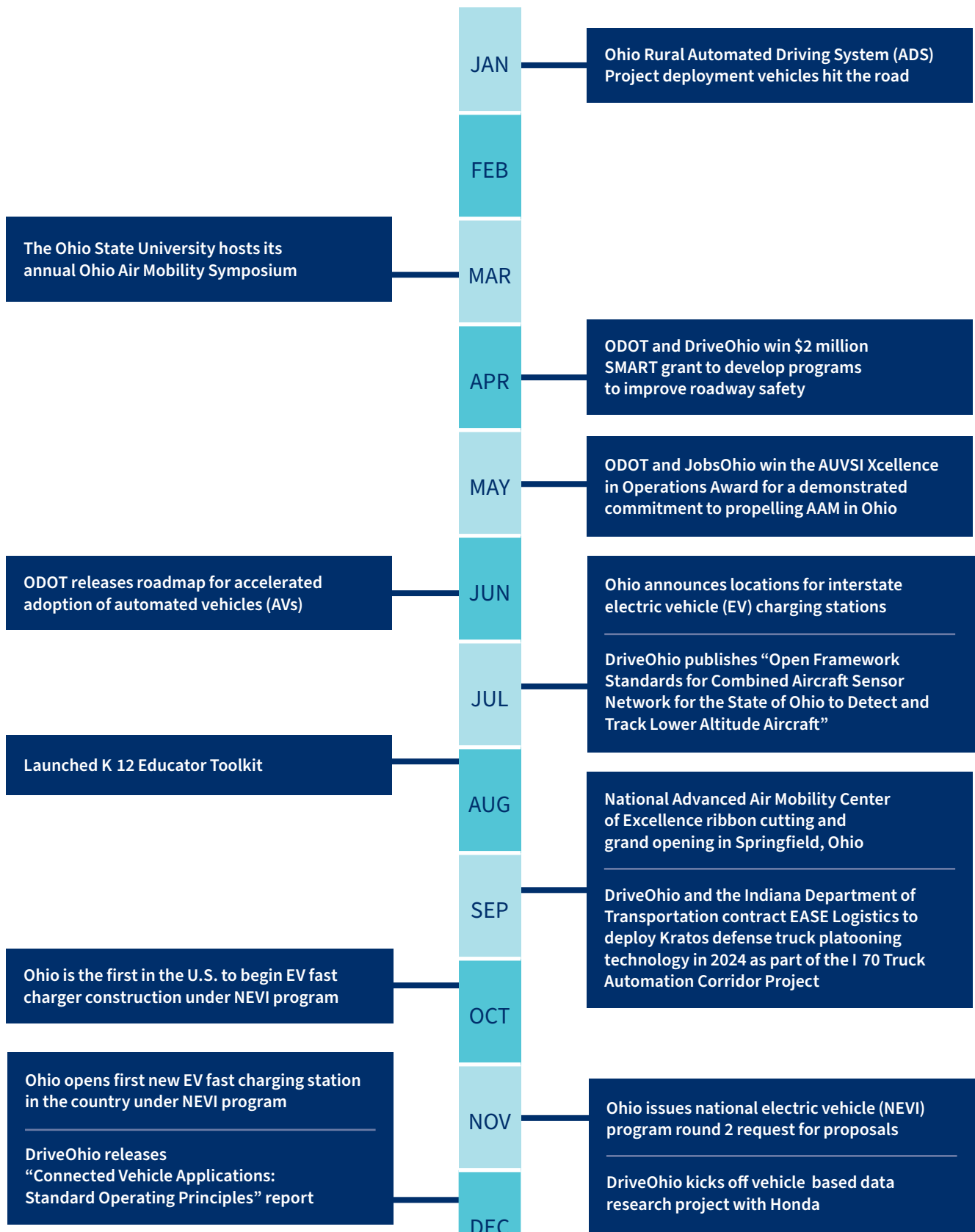
DriveOhio, an initiative of the Ohio Department of Transportation (ODOT), was created in 2018 through an executive order and re-authorized by Ohio Governor Mike DeWine in 2019 as the statewide center for the advancement of smart mobility. In alignment with ODOT's mission, each year DriveOhio plans and implements a diverse portfolio of projects and initiatives that help make the state's transportation system safe, accessible, well-maintained and position it for the future. This Annual Report provides an overview of DriveOhio's key accomplishments and project portfolio from 2023 by workstream, and lays out key initiatives planned for 2024.



DriveOhio



2023 HIGHLIGHTS





DriveOhio





Advanced AIR MOBILITY

Advanced Air Mobility (AAM) represents a revolutionary leap in transportation, with its integration of cutting-edge technologies to create a seamless, efficient, and versatile mobility network. AAM has the potential to provide rapid and reliable transport of people and goods as well as connect underserved areas and places in a more efficient method than surface transportation or existing aviation can accomplish.

As the birthplace of aviation, Ohio is leading the nation in developing and utilizing AAM. By embracing AAM, Ohio aims to build on its historical achievements, by fostering continued innovation and leadership in aviation. DriveOhio's AAM initiatives outlined in this section reflect Ohio's commitment to advancing cutting-edge transportation solutions that benefit all Ohioans.

KEY INITIATIVES

National Advanced Mobility Center of Excellence (NAAMCE)

Opened in November 2023, this state-of-the-art facility at the Springfield-Beckley Municipal Airport enables collaboration across the AAM sector. Additional information is provided in the **Project Highlights** section of this report.

Joby Aviation Announcement

In a landmark announcement, Joby Aviation unveiled its plans to establish a cutting-edge electric air taxi manufacturing facility at the Dayton International Airport. More information can be found in **Project Highlights**.

SkyVision

This ongoing air traffic control system project at the Springfield-Beckley Airport is a collaboration between the Air Force Research Laboratory (AFRL) and the State of Ohio that safely, accurately, and effectively allows uncrewed aircraft to detect and avoid other aircraft while in flight.

Ohio Air National Guard MQ-9 Deployment Planning

DriveOhio and the Ohio UAS Center support project planning for the upcoming 178th Wing deployment of MQ-9 Reaper drones at the Springfield-Beckley Municipal Airport.

Planning for Remotely Deployed Drone Operations (Drone in a Box)

This project involves deploying automated drone systems that can independently launch, perform tasks, and return to a secure base for recharging and data offloading. Initial research and planning was completed to deploy a system in support of the Brent Spence Bridge Corridor project to remotely operate a drone for construction monitoring and incident management.

Tethered Drone Operations

The Ohio UAS Center recently received State Transportation Innovation Council (STIC) funding to purchase a Fotokite tethered UAV (drone) to explore use cases for Traffic Incident Management and Traffic/Work Zone Monitoring.

AAM Multistate Collaborative

DriveOhio participated in this collaborative dedicated to identifying and harmonizing AAM-related governance, regulatory mechanisms, and infrastructure to ensure safety and continuity of operations. This effort is led by the Virginia Innovation Partnership Corporation (VIPCC) and JobsOhio.

NASA National Campaign and Annexes

The Ohio UAS Center has worked on six Space Act Agreements with NASA to share information about Advanced Air Mobility community integration, system-wide safety, autonomous cargo operations, public good use cases, communication systems, and technology research and demonstrations.

Thought Leadership and Speaking Engagements

- Sinclair Community College AAM Maintenance Curriculum Development
- JobsOhio Regional Discussions
- Ohio Transportation Engineering Conference (OTEC)-Planning for AAM and Community Integration
- OSU 3rd Annual Ohio Air Mobility Symposium
- XCELLENCE in Operations Award from the Association for Uncrewed Vehicle Systems International (AUVSI) for Propelling AAM in Ohio
- National Advanced Air Mobility Industry Forum

STATISTICS

#1 supplier state to Boeing and Airbus

#7 in the U.S. for aerospace/defense jobs

#2 state for aerospace attractiveness

3rd largest concentration of aerospace engineering and operations technologists and technicians

7 universities conducting UAS research

550+ aerospace and aviation firms in Ohio

PROJECT HIGHLIGHTS

National Advanced Air Mobility Center of Excellence (NAAMCE) Opening

The NAAMCE officially opened its doors in September 2023 at the Springfield-Beckley Municipal Airport. This state-of-the-art facility, spread over 30,000 square feet of hangar, administrative, and laboratory space, is designed to encourage collaboration among key players in the AAM sector. The Air Force Research Laboratory (AFRL), the Ohio Uncrewed Aircraft Systems (UAS) Center, NASA, industry leaders, and academic institutions converge at NAAMCE to drive innovation in AAM, particularly in the development of electric vertical take-off and landing (eVTOL) aircraft.

The establishment of the center, funded by a \$9 million investment from the Department of Defense, JobsOhio, and the City of Springfield, bolsters Ohio's place at the forefront of AAM research and development. Its proximity to Wright-Patterson Air Force Base and the AFRL further solidifies the state's commitment to becoming a national hub for AAM activities.





Joby Aviation Announcement [🔗](#)

In a landmark announcement, Joby Aviation unveiled its plans to establish a cutting-edge electric air taxi manufacturing facility at the Dayton International Airport. This move, projected to create 2,000 new jobs in the Miami Valley, marks a major advancement in Ohio’s leadership and commitment to the field of AAM. The facility will be dedicated to the production of Joby’s eVTOL air taxis, which are set to transform urban transportation.

Ohio’s rich aviation heritage, dating back to the Wright Brothers, was a key factor in attracting Joby Aviation. The state’s consistent support for aviation innovation, strategic location, and strong aerospace ecosystem made it the perfect choice for Joby’s expansion. The presence of key institutions including the Wright-Patterson Air Force Base, the AFRL, and the NAAMCE further enhanced Ohio’s appeal.

Joby’s decision to invest at least \$477.5 million in a 140-acre site at the Dayton International Airport demonstrates the company’s faith in Ohio’s potential to become a worldwide hub for eVTOL manufacturing. The facility, set to begin operations in 2025, will produce up to 500 aircraft annually, significantly contributing to the state’s economic growth. The project is anticipated to generate over \$140 million in new payroll and could create 15,000 additional jobs statewide by 2045.

PROJECT STATUS **UPDATE**

NAAMCE Grand Opening

✓
COMPLETE



Advanced Air Mobility Framework

✓
COMPLETE



Advanced Air Mobility Economic Impact Study

✓
COMPLETE



Uncrewed Traffic Management Research Project

✓
COMPLETE



*Ohio*TM DriveOhio





Ohio

UAS CENTER

The Ohio UAS Center, established in 2013 and now operating under DriveOhio, serves as the state's central hub for all activities related to uncrewed aircraft and advanced aviation technologies. It plays a central role in ODOT's AAM and UAS operations, managing and executing a wide array of uncrewed aircraft missions.

The Ohio UAS Center is a catalyst for innovation, actively involved in advanced research and initiatives that aim to unlock the potential of lower-altitude airspace. Its work is focused on the seamless integration of uncrewed and autonomous aircraft technologies into the National Airspace System. This paves the way for a future where advanced aviation technologies enhance safety, efficiency, and accessibility in Ohio's skies.

In addition to its role within ODOT, the UAS Center lends its expertise to local and state agencies by offering support in flight operations and program development. These efforts promote collaboration and resource sharing, contributing to the wider adoption and integration of UAS technology across the state.

KEY INITIATIVES

Uncrewed Aircraft System Traffic Management (UTM) Research Project

In partnership with OSU and others along the 33 Smart Mobility Corridor, the UAS Center is developing a low-altitude air traffic management system.

Open Framework Standards for Combined Aircraft Sensor Network to Detect and Track Lower Altitude Aircraft

Through a research partnership with CAL Analytics as part of the UTM Research Project, the report outlines the development of a low-altitude airspace surveillance service (LAASS), focusing on integrating various sensor technologies to enhance uncrewed aircraft systems (UAS) operations. It includes a cost-benefit analysis, legal framework, and functional requirements to support the implementation and scalability of this surveillance system.

Ground-Based Robotics Assistance Research

This research project, in partnership with the University of Cincinnati, explores the use of ground-based robotic assistants to support uncrewed aircraft operations for ODOT. It aims to develop operational concepts, evaluate existing technologies, and create an implementation guide for integrating these robotic assistants into ODOT's workflows.

Underwater Evaluation of Uncrewed Surface Vessels (USV)

The Ohio UAS Center will evaluate the use of an USV for underwater inspection of bridge piers compared to using divers for such inspections.

Solar Eclipse Traffic Monitoring Planning

ODOT planned drone deployments at major highways and interchanges and high-traffic areas to enhance traffic control and incident management during this major event with an influx of out-of-state tourists.

Planning for Beyond-Visual-Line-of-Sight (BVLOS)

ODOT completed planning and submitted an application to the FAA to waive the 'Visual Line of Sight' requirement along a section of U.S. 33 for traffic monitoring and incident management. More information can be found in **Project Highlights**.

Ohio Environmental Protection Agency (EPA) Multipurpose Flights

The Ohio UAS Center continued to conduct inspection and data collection flights, including hazardous material recovery efforts.

Ohio Department of Natural Resources (ODNR) Orphan Well Project

The Ohio UAS Center continued to use magnetometer-equipped drones to locate over 250,000 previously unknown abandoned wells with metal casings from the late 1800's to mid-1900's, which can be thousands of feet underground.

Radiation-Detecting Drone Exercises

The Ohio UAS Center continued its partnership with ODH to provide a state-of-the-art radiation detection system, DroneRAD, that will keep responders safe from dangerous levels of radiation and other potential hazards by providing real-time, mapped radiation readings and situational awareness with a live video feed. A drone equipped with radiation detectors was tested at the EM's Portsmouth Site to enhance emergency response capabilities.

Ohio Emergency Management Association (OEMA) and Army National Guard National Disaster Assessment and Exercises – Storm and Tornado Response

The Ohio UAS Center continued to provide situational awareness and damage assessment to the OEMA and the Ohio National Guard during tornadoes, and participated in Vigilant Guard exercises with the national guard, military, and multiple Ohio agencies to test and improve readiness for emergencies, terrorist events, and natural disasters. It also continued to work with the Ohio National Guard on milestone box integration of streaming videos in the military's Domestic All-Hazards Response Team (DART) system for flight operations.

Flights to Support ODOT

Conducted operations across all 12 Districts to improve the safety, efficiency, and management of Ohio's transportation infrastructure. More information can be found in **Project Highlights**.

Industry Demonstrations and Speaking Engagements

- OSU Drone Rodeo Demonstration
- Ohio State Fair
- 11 Springfield-Beckley Airport UAS Facility tours
- Visited or hosted 9 high schools and colleges
- Guest Speaker on the Clemson Drone Podcast

STATISTICS

***Received first** of its kind FAA BVLOS approval for operations of the 20 pound Censys Sentaero aircraft*

***Second** in the U.S. approved for drone operations over people and traffic without a parachute*

*Conducted **2,197** UAS flights*

*Completed **438** construction monitoring flights*

*Participated in **71** outreach events*

PROJECT HIGHLIGHTS

Flights to support ODOT

The Ohio UAS Center plays an important role in supporting ODOT and DriveOhio through a broad range of uncrewed aircraft operations. These operations aim to improve the safety, efficiency, and management of Ohio's transportation infrastructure. The UAS Center has conducted 2,197 flights across a variety of project types which are providing valuable data and insights. These flights include training sessions, construction monitoring, bridge inspections, and surveying/mapping. The Ohio UAS Center also undertakes specialized tasks such as magnetometry, radiation detection, environmental assessments, and emergency management efforts—highlighting its versatility and technological expertise. These flights took place across multiple districts. District 8 (Cincinnati area) witnessed the highest activity with 410 flights, followed by District 2 (Toledo area) with 190 flights and District 7 (Dayton area) with 164 flights. Central Office (Columbus) operations also significantly benefited with 162 flights.

The Ohio UAS Center has extended its support to other state agencies such as the Ohio Department of Health, the Ohio Department of Natural Resources, and the Ohio Department of Rehabilitation & Correction—demonstrating its broad utility and collaborative approach, and the importance of building robust UAS capacity statewide and across agencies.





Beyond Visual Line of Sight (BVLOS) Test Flights



The Ohio UAS Center recently completed planning activities, including a risk assessment, that eventually led to approval from the FAA for BVLOS operations. This approval allows ODOT to operate a large 20-pound Censys Sentaero drone over a four-mile stretch of the U.S. 33 corridor northwest of Columbus. The primary goal of this initiative is to improve traffic monitoring and incident management. The drone is equipped with advanced systems that can detect and avoid other aircraft. To maximize safety, these onboard systems are supplemented by visual observers on the ground. Notably, this is the first drone of its size to be approved for this type of operation, and it's the second in the U.S. to be approved for operations over people and traffic without requiring a parachute.

The BVLOS waiver is a crucial step towards integrating new UAS technologies into ODOT's operations. The FAA's four-year approval for BVLOS operations will help facilitate integration of live drone footage into ODOT's Traffic Management Center, providing greater situational awareness for ground crews. This capability is particularly important for areas without stationary traffic cameras, ensuring comprehensive coverage and faster response times. Additionally, the drones can be equipped with sensors to detect hazardous materials, providing essential safety data to emergency responders. This trial will lay the groundwork for potentially expanding BVLOS operations statewide, particularly benefiting rural and hard-to-reach areas in emergency response efforts and traffic monitoring.

PROJECT STATUS **UPDATE**

Exploring the Use of Ground-Based Robotic Assistance
in Uncrewed Operations of State departments of transportation (DOTs)


ONGOING



Support ODOT Flights


ONGOING



DriveOhio





Connected VEHICLES

DriveOhio is at the forefront of advancing connected vehicle (CV) technology, leading innovative initiatives that are shaping Ohio's transportation future and serving as a template for replication nationwide. The release of the nation's first statewide systems engineering guidebook for CV and automated vehicle (AV) deployments highlight DriveOhio's commitment to streamlining project planning and implementation processes. Projects such as Ohio's SMARTCenter testing facility and Connected Marysville project exemplify real-world testing and deployment of CV technologies.

DriveOhio's CV efforts center on fostering collaboration between public and private sector partners; ensuring consistency and interoperability by working in conjunction with industry leaders to further research and development initiatives; and expediting CV technology deployment statewide. We pave the way for a safer, more efficient transportation future.

KEY INITIATIVES

CV Pooled Fund Study (CVPFS) Vehicle-Based Data Project

DriveOhio's 2023 efforts included: development of MAP Guidance Revision 2 and the Model CV Data Architecture Report; completing Connected Infrastructure Message Monitoring Systems (CIMMS) Phase 1; and completing the Phase 1 of the Connected Intersection Project.

Connected Marysville-Dublin CV Technology Testing

DriveOhio is testing CVs and connected infrastructure on signalized intersections, including red light violation, pedestrian ahead, curve speed, and lane closure warning applications; notifying traffic managers of slowdowns or backups; and providing safety lessons that will benefit other communities across Ohio and the nation.

OmniAir Mcity Plugfest Field and Safety Application Testing

DriveOhio participated in this collaborative testing event, testing OBUs from five different manufacturers on a DriveOhio vehicle.

Connected Roundabouts

DriveOhio installed the first public roadway connected roundabout in the U.S. in Dublin, Ohio, operations of which will continue into FY2025, generating robust data.

33 Smart Mobility Corridor

DriveOhio installed two additional Vehicle-to-everything (V2X) roadside units (RSUs) on U.S. 33 to enhance ongoing data collection and analysis efforts.

V2X Standard Operating Principles (SOPs)

To proactively define a consistent approach to CV messaging, DriveOhio has engaged with other infrastructure owners and automotive industry stakeholders to develop SOPs that further the state of practice with wide-reaching impacts. More information can be found in **Project Highlights**.

Event Streaming Platform (ESP)

The ESP (ODOT's data system) processes high volumes of real-time data streams from various sources, which can then be combined with existing datasets with the intention of providing quicker insights to aid decision making. In 2023, DriveOhio completed its ESP ingestion and discovery modules and began consumption module development. More information can be found in **Project Highlights**.

OmniAir Consortium Leadership

DriveOhio is represented on OmniAir's Board of Directors and is the lead for both the Plugfest Technical Planning Sub-Working Group (Plugfest group) and the Connected Infrastructure Sub-Working Group (RSU group).

Smart Belt Coalition

In 2023, DriveOhio took the reins of this multi-state collaboration between transportation agencies and educational institutions focused on connected and automated vehicle technology and will continue to lead through June 2025.

Accelerating V2X Cohort

DriveOhio participates in this USDOT ITS JPO monthly forum for V2X deployers to share experiences, best practices, and documentation.

Quarterly Law Enforcement Newsletter

DriveOhio provides regular updates to keep law enforcement officers throughout the state aware of the latest AV/CV project updates and events.

Vehicle-Based Data Pilot Project

DriveOhio awarded over \$700,000 to Honda and partners for a two-year project to develop a road condition management system using vehicle-generated data from ADAS-equipped vehicles to identify and report hazardous road conditions.

Thought Leadership and Speaking Engagements

DriveOhio is a member of or participant in the following:

- Intelligent Transportation Society Midwest (ITS Midwest) Board
- SAE Connected Transportation Interoperability (CTI) Committee
- Mid America Association of State Transportation Officials (MAASTO) – CAV Committee

DriveOhio presented on CV Applications and CV SOPs at various industry events including:

- OTEC
- ITS Midwest Conference and Expo
- MAASTO CAV and EV Conference
- OmniAir Future of Transportation Technology Panel

STATISTICS

***35-mile smart mobility corridor** equipped with a 432-strand fiber optic network*

*Developed Standard Operating Principles for **three CV applications***

***DriveOhio** received a **\$2 million USDOT SMART** grant to develop its data streaming infrastructure*

***Over 100 roadside units** provide real-time information to enhance driver safety and support decision-making on the road*

***Over 100,000 miles** of real-world driving data for testing and validation*

PROJECT HIGHLIGHTS

V2X Standards



DriveOhio is leading an initiative to establish standard operating procedures (SOP) for key CV applications, such as curve speed warning, lane closure warning, and reduced speed zone warning. These SOPs aim to streamline deployment efforts and ensure consistency in CV messaging, providing a unified approach amidst diverse industry-led deployments. By collaborating with infrastructure owners and automotive industry stakeholders, DriveOhio aims to proactively define standardized messaging protocols to reduce uncertainties and foster confidence in nationwide adoption of V2X applications, enhancing roadway safety and efficiency across Ohio and beyond.



Event Streaming Platform (ESP)

DriveOhio, in collaboration with ODOT's Division of Information Technology, has received a \$2 million USDOT SMART grant to pioneer two innovative programs within its ESP designed to use real-time data streams and advanced analytics to enhance roadway safety across Ohio.

The first program, Crash Prediction and Proactive Mitigation, uses both real-time and historical data to identify scenarios likely to result in crashes and provide proactive recommendations to mitigate these risks. The second program, Incident Detection and Response Initiation, aims to shorten emergency response times by integrating airbag deployment alerts directly from vehicle manufacturers into the ESP—facilitating quick interventions, particularly in rural areas. Through these applications, DriveOhio aims to leverage data-driven insights and technological innovations to create safer transportation environments, ultimately minimizing the impact of crashes on Ohio's roadways.



PROJECT STATUS **UPDATE**

Vehicle-Based Data Pilot Project


ONGOING



ESP Safety Applications


ONGOING



Connected Marysville-Dublin


ONGOING





DriveOhio





Automated VEHICLES

Automated vehicles (AVs) are revolutionizing the transportation sector with technology that enables them to perceive their surroundings and make decisions independently. This includes advanced driver-assist systems (ADAS), such as adaptive cruise control, automatic parking, and collision avoidance, as well as fully autonomous vehicles that can perform all driving functions without human intervention. The primary goal of AV technology is to significantly improve roadway safety by minimizing human error. AVs also hold the potential to help address driver shortages, improve mobility for those who cannot drive for themselves, and enhance transportation system wide efficiency for passengers and freight.

Ohio is a pioneer in AV technology and one of the first states to allow controlled research and testing on its roads and is leading the exploration of the benefits, impacts, and challenges of AV technology. DriveOhio's initiatives cover a broad range of applications, including interstate freight operations, passenger transport in both rural and urban settings, and dedicated AVs for package delivery. These efforts continue generating valuable insights and lessons, establishing Ohio as a leader in the integration and advancement of AV technology.

KEY INITIATIVES

AV Pooled Fund Study

ODOT/DriveOhio leads collaborative efforts with other state agencies and infrastructure owners to advance adoption of AV technology. In 2023, DriveOhio worked on the Roadmap for Infrastructure Owner's Vehicle-Based Data Pilot Project. Additional information is provided in the **Project Highlights** section of this report.

Ohio Rural Automated Driving Systems (ADS) Project

As the most comprehensive ADS testing effort on rural roads, this data-focused project featured passenger vehicle and truck platooning deployments in rural Appalachian Ohio, as well as closed track testing. Project data analysis was done with the Youngstown State University Data Mine. Additional information is provided in the **Project Highlights** section of this report.

I-70 Truck Automation Corridor Project

DriveOhio and the Indiana DOT (INDOT) will deploy automated trucks along a 166-mile stretch of Interstate 70 between Columbus and Indianapolis, starting in 2024. In 2023, the team began development of an Automation Readiness Road Audit Tool (ARRAT) and Guidebook that, when completed, can be used by infrastructure owners in Ohio and nationwide to help assess AV readiness and identify potential infrastructure improvements needed to support AV adoption. DriveOhio and INDOT shared project updates and insights at both 2023 OTEC and the Purdue Road School.

ODOT Student Transportation Advancement Research (STAR) Program

DriveOhio conducted connected and automated vehicle education (CAVe)-in-a-box hands-on learning experiences, with support from the University of Cincinnati Infrastructure Institute (UCII). It also supported the Exploring the Use of Ground-Based Robotic Assistance in Uncrewed Operations of State DOTs project.

AccelerateAV Infrastructure Owner Industry Forum

This dynamic online platform is designed to foster collaboration among AV stakeholders from both the public and private sectors. Additional information is provided in the **Project Highlights** section of this report.

ITS America Standing Committee on Automated Vehicles

DriveOhio leads this committee, which advocates for policies and regulatory frameworks that facilitate the safe testing, deployment, and integration of highly automated AVs into the transportation system.

Youngstown AV Shuttle

DriveOhio provided technical, legislative, and procurement support for the Youngstown SMART2 Network project.

FHWA Road Features for Automated Driving Systems Project

DriveOhio was a member of the technical review team for a federal project to identify roadway assets and asset qualities that could impact AV operation.

Partners for Automated Vehicle Education (PAVE) Advisory Council and Scholarship Essay Contest

DriveOhio is a participant on PAVE's Public Sector Advisory Council and was a sponsor of the 2022-2023 essay contest encouraging young people to contemplate a future with automated vehicles and write about what this technology could mean for their communities.

National Cooperative Highway Research Program (NHCPR)

DriveOhio is participating in Project 20-24 (147) - Identifying Best Practices for Automated Driving Systems and Other Emerging Technologies and Project 23-02 - Recent Experiences in Advancing and Deploying of Automated Vehicle Technologies.

Quarterly Law Enforcement Newsletter

DriveOhio provides regular updates to keep law enforcement officers throughout the state aware of the latest AV/CV project updates and events.

STATISTICS

*The **Ohio Rural ADS Project** deployed three passenger vehicles with AutonomouStuff technology for testing on rural roads*

*The **Ohio Rural ADS Project** represents **32 counties** in Ohio's rural Appalachian region. It is the most comprehensive testing effort yet to be conducted on rural roads in the U.S.*

*DriveOhio logged **14,000 miles** in automated mode for the **Ohio Rural ADS project***

***Two 53-foot tractor-trailers** were used for truck platooning tests*

*During the **Ohio Rural ADS Project**, automated passenger vehicles made **331 trips** along pre-determined routes*

PROJECT HIGHLIGHTS

Rural ADS



The Ohio Rural ADS project is leading the way in integrating automated vehicles on rural roadways in central and southeast Ohio. The project, funded in part by a \$7.5 million grant from the USDOT, spans 32 counties in Ohio's rural Appalachian region and represents the most comprehensive testing effort on rural roads in the U.S., aiming to demonstrate how connected and automated vehicles can improve safety and mobility in rural settings. In addition to boosting the economic well-being of rural communities, this project also advances transportation technology, reinforcing Ohio's leadership in transportation innovation and safety.

This initiative involves two major deployments aimed at collecting data to inform future technology needs: passenger vehicles and truck platooning.

Passenger Vehicle Data Collection

The first deployment involves three passenger vehicles equipped with AutonomouStuff technology, operating on divided highways and rural two-lane roads in Athens and Vinton counties. These vehicles are tested under various operational and environmental conditions, including limited visibility and work zones. During the year-long deployment, a professional driver is always present to monitor the automated system, ensuring safety and readiness to take control if necessary. This deployment emphasizes the importance of high-definition mapping, which provides precise information about the surrounding environment to the automated systems, enhancing their ability to navigate complex rural road conditions.

Truck Platooning in Revenue Service Operations

The second deployment focuses on truck platooning, utilizing two 53-foot tractor-trailers equipped with Bosch wireless vehicle-to-vehicle (V2V) communication technology that enables them to travel closely together at highway speeds. The lead truck controls the speed, braking, and acceleration, while the follower truck precisely matches these movements, ensuring coordinated travel and improved safety.

Initially deployed on the 35-mile U.S. 33 Smart Mobility Corridor, these trucks were later incorporated into a private fleet's daily operations. Equipped with radar systems to detect other vehicles and respond to their movements, these platooning trucks aim to improve safety and efficiency on Ohio's roads.

The implementation of this technology follows extensive testing and training. Host fleet EASE Logistics drivers have completed a combined 400 hours of training at the Transportation Research Center (TRC) to prepare for these operations. The platooning mode engages under defined conditions, considering weather, road conditions, and traffic. This technology has undergone thorough testing by Bosch and TRC before its deployment. The data generated from this project will be shared with the Federal Motor Carrier Safety Administration and the USDOT, aiding in the development of national policies for the integration of automated driving systems. This project positions Ohio as a frontrunner in smart mobility innovation while simultaneously improving the operational efficiency of freight transport.

AV Pooled Fund Study



The AV Pooled Fund Study, led by ODOT, is a collaboration of state DOTs that aims to advance transportation safety and mobility using AVs. The fund's strategic roadmap outlines program recommendations divided into seven pillars: physical and digital infrastructure readiness; operations; interstate freight and multi-modal harmonization; partnerships; workforce; communications and engagement; and policy. These pillars focus on integrating AV technologies into traffic operations and maintenance, promoting interstate freight travel, and preparing the workforce for increasing AV-related job demand. By pooling resources and expertise, this collaborative effort accelerates the development and implementation of AV technologies, ensuring safety, efficiency, and accessibility on public roads.

Accelerate AV Forum



The Accelerate AV Forum is a dynamic online platform designed to foster collaboration among AV stakeholders from both the public and private sectors. This forum provides a space for sharing ideas, networking, and discussing the challenges and opportunities associated with AV technology. Supported by the AV Pooled Fund Study, the forum brings together state DOTs to align industry needs with the capabilities of state agencies. This collective approach ensures that AV developments are informed by a diverse range of perspectives, facilitating a more cohesive and effective integration of AV technologies into the transportation system.



PROJECT STATUS **UPDATE**

Ohio Rural ADS Project

 **ONGOING**



I-70 Truck Automation Corridor Project

 **ONGOING**



Automated Vehicle Pooled Fund Study

 **ONGOING**





DriveOhio





Electric VEHICLES

Electric vehicle (EV) technology is widely available, with more EV models hitting the market each year. DriveOhio is making the EV infrastructure investments needed to enable EV travel. Establishing a convenient network of EV charging stations throughout the state is a critical component of this work, through both the National Electric Vehicle Infrastructure (NEVI) program and state and local initiatives. The state's EV successes are a direct product of DriveOhio's strong partnerships with public and private stakeholders, which enable EV travel as well as, drive innovation and economic growth.

KEY INITIATIVES

EV Grant Process Guide



DriveOhio published a comprehensive guide for local and regional partners navigating the EV grant process, detailing essential steps for successful grant pursuits.

What to Consider When Deploying EV Chargers Guide



DriveOhio created a detailed guide for deploying EV infrastructure for local and regional partners covering key considerations for project planning, procurement and on-going operations and maintenance.

Rest Area Charging Study

Under current federal regulations, EV chargers at Ohio's Interstate rest areas must be fully subsidized, however this document reviews existing amenities, grid capacity, traffic patterns, and communication infrastructure to prioritize EV charging installation should such regulations change in the future or should the state choose to install (and locally fund) charging infrastructure for emergency purposes.

EV Infrastructure Partner Directory



DriveOhio created an online directory to support individuals and organizations seeking partners for an EV infrastructure project in the state.

Ohio University, University of Toledo and Go Sustainable Energy Research

DriveOhio is working with their research partners to find optimal locations in Ohio to install EV chargers, specifically in underserved and rural areas, focusing on utilizing off-grid alternative energy sources (e.g., solar, wind, hydropower) where possible to reduce the impact on the electric grid.

Alternative Fuel Vehicle (AFV) Dashboard



DriveOhio incorporated charging and additional vehicle functionality into Ohio's AFV dashboard, including extending the baseline to capture pre-pandemic trends in registration data and adding the ability for users to track NEVI deployments and find other chargers near them. More information can be found in **Project Highlights**.

State Term Contract

DriveOhio worked closely with the Ohio Department of Administrative Services to add EVs to the state term contract, allowing state agencies and local entities to procure EVs from pre-approved suppliers based on negotiated terms and pricing.

NEVI Plan Implementation



• Round 1 Procurement

DriveOhio announced contingent awards for Round 1 NEVI deployments in July 2023, with final awards issued for 23 sites in late 2023 into early 2024. Ohio was the first state in the U.S. to contract, break ground and open a competitively awarded NEVI-funded charging station.

• Round 2 Procurement

DriveOhio released the Round 2 NEVI RFP in November 2023, incorporating lessons learned from Round 1, with awards anticipated in 2024.

• 2023 Ohio EV Infrastructure Deployment Plan and Outreach

The 2023 plan update detailing program activities over the past year, including updates on extensive stakeholder and public outreach, contracting, and deployment was published and approved by FHWA in September 2023.

• NEVI Reporting Tools

DriveOhio participated in the Joint Office of Energy and Transportation's EV Charging Analytics and Reporting Tool (EV-ChART) Pilot Group to test the functionality of the platform for reporting progress on NEVI-funded charging stations. Additionally, DriveOhio is developing a publicly facing annual report dashboard on the NEVI Program progress and station utilization.

More information can be found in **Project Highlights**.

ODOT purchased its first Battery Electric Vehicles (BEVs)

ODOT has purchased both Chevy Bolt and a Ford F-150 Lightning to add to their fleet. While the Bolt will be used for more general purposes, ODOT will be testing the use of the Lightning for all-weather use and its impact on battery life.

Thought Leadership and Speaking Engagements

- ITS America Conference & Expo
- MAASTO Annual Meeting 2023 - NEVI in Action in Ohio
- 2023 Ohio Energy Conference - Electric Vehicles: Case Studies in Ohio Innovation
- Association of Metropolitan Planning Organizations Annual Conference - Deploying Technology for a Climate Resilient Future
- Ohio Township Association Federal Day
- Clean Fuels Ohio Virtual Panel
- 2023 Aim Hire Workforce and Education Conference
- MORPC's Summit of Sustainability
- IR/WA Chapter 13 Law Day Seminar
- Ohio Civil Rights Symposium
- International Delegation presentation – France (September 2023) and Germany (December 2023)

STATISTICS

***6** in-person and **6** virtual public meetings held as part of a robust NEVI outreach program*

***1,867 miles** of Alternative Fuel Corridors (AFCs)*

23** NEVI charging sites awarded along interstates in **2023

22** additional NEVI charging sites to be added in **2024

***\$140M** in federal funding for EV infrastructure*

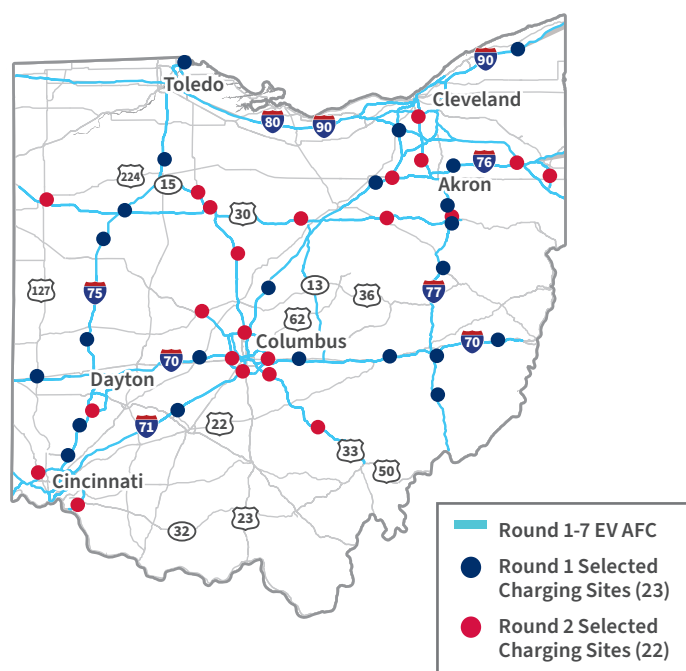
PROJECT HIGHLIGHTS

NEVI Highlights



DriveOhio is leading the nation in EV infrastructure deployment under the NEVI Program. Ohio is allocated \$140 million in NEVI funds during the five year program to create an EV charging network across the state. To start, these funds must be used to deploy direct current fast chargers equipped with 150-kilowatt ports accessible 24 hours a day, seven days a week for fast and convenient charging every 50 miles along AFCs.

In July 2023, \$16.6 million in NEVI funds were awarded to private companies for the installation and operation of EV charging stations in Ohio. The state celebrated a milestone by breaking ground on the nation's first EV charging station under the NEVI program at the Pilot Travel Center along Interstate 70. With construction underway on fast charging stations along interstates in 2023, funding was awarded for an additional 23 new stations along Ohio state and U.S. routes in 2024. Ohio is focused on ensuring equitable access to EV infrastructure and enhancing services for EV drivers.



Outreach Efforts

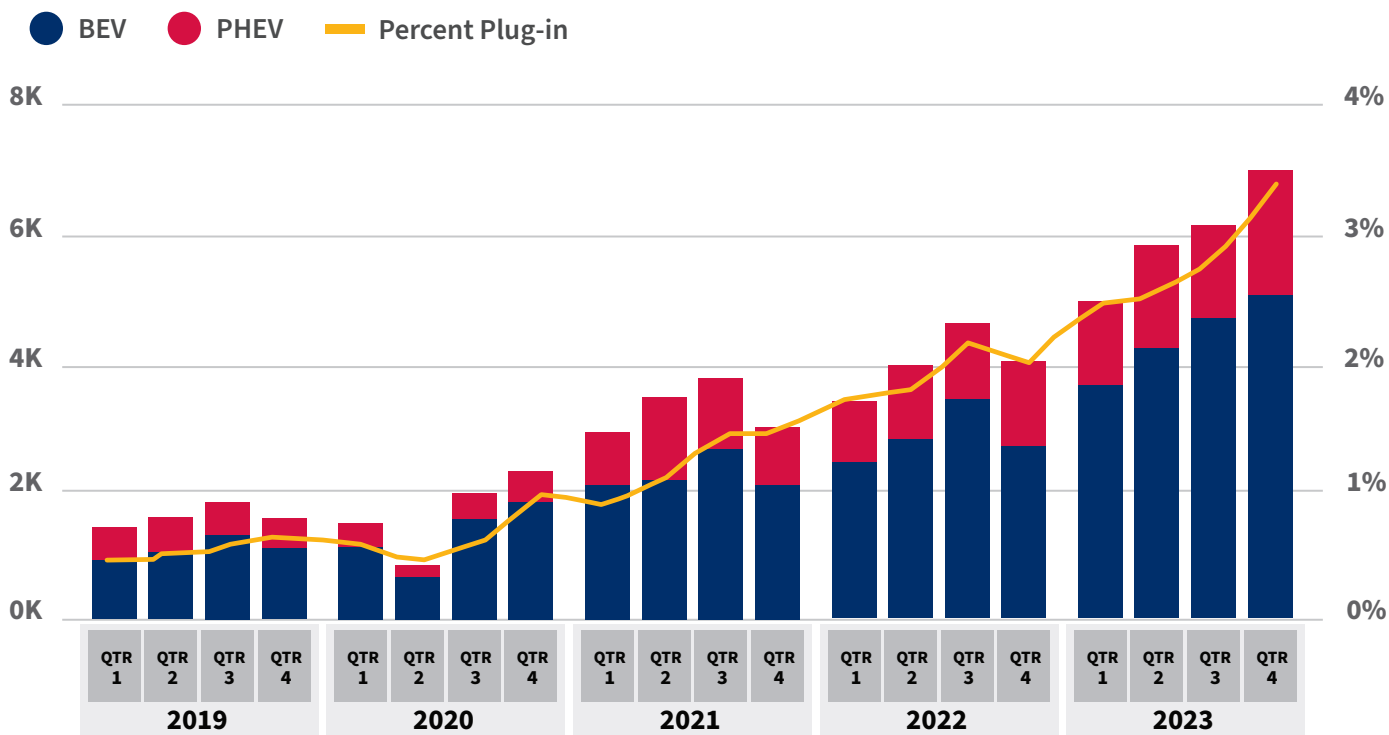
DriveOhio, in partnership with regional stakeholders, has organized a series of webinars and public engagement activities as part of its NEVI plan updates. These outreach efforts aim to inform the public about program developments and gather feedback on potential charging locations. In 2023, thirteen public meetings were held, including an equity workshop in December. Engaging in early conversations allows DriveOhio and other stakeholders to address issues and develop solutions with the community, ensuring widespread benefits. The feedback gathered from these sessions has been invaluable in shaping future outreach strategies, specifying the 'Who, What, Where, and Helpers' necessary for success. DriveOhio has also held webinars for interested NEVI vendors and numerous media engagements to further extend its reach. Additionally, DriveOhio has actively contributed to ten conferences, showcasing its EV initiatives and sharing insights.

Alternative Fuel Vehicle (AFV) Registration Dashboard



DriveOhio collaborated with the Ohio Bureau of Motor Vehicles (BMV) to create the AFV Registration Dashboard. This dashboard monitors and analyzes the latest trends in AFVs across Ohio—helping users better understand the types of AFVs being sold, where the vehicles are registered, and the type of fueling infrastructure needed to support them. The AFV adoption rate has steadily increased from 0.80% in January 2019 to 3.4% in December 2023. During that period, October 2023 has the highest new AFV registrations of 2,582, which represents a 98.16% increase from AFV registrations in October 2022.

New Passenger Car EV Registrations



PROJECT STATUS UPDATE

Ohio NEVI Deployment Plan

ONGOING



Ohio NEVI Round 1 Charging Site Construction (23 Locations)

ONGOING





DriveOhio





WORKFORCE

In the rapidly evolving landscape of mobility technology, DriveOhio recognizes the critical role of a skilled workforce in shaping the future of transportation. As initiatives ranging from AVs to AAM are explored, the focus remains on nurturing talent across all educational levels, from Pre-K to higher education, and empowering existing professionals through upskilling efforts. The comprehensive approach to workforce development includes three key areas:

- **Engagement Across All Educational Levels:** DriveOhio actively engages with students from Pre-K to Ph.D., sparking their interest and awareness in smart mobility careers through problem-based learning initiatives. By partnering with educators and community partners, a talent pipeline is built by introducing students to the vast opportunities within the smart mobility industry.
- **Preparation for Career Readiness:** Understanding the value of practical experience, DriveOhio collaborates with career-tech and higher education institutions to provide work-based learning opportunities. By connecting academia and industry, students are equipped with the practical skills and knowledge necessary to excel in the world of smart mobility.
- **Upskilling the Existing Workforce:** DriveOhio is committed to supporting current professionals and individuals re-entering the workforce through upskilling initiatives that lead to industry-recognized credentials. By providing opportunities for continuous learning and professional development, it is ensured that the existing workforce remains equipped to adopt emerging technologies and contribute meaningfully to the smart mobility sector.

KEY INITIATIVES

Smart Mobility Ambassador Program



This DriveOhio program recruits early-career and youth volunteers to engage students of all ages in conversations about next-generation emerging career opportunities across Ohio and provide hands-on STEM and smart mobility learning experiences.

Ohio Vertiport Innovation Challenge



Student teams at the high school and higher education levels work with industry mentors and government mentors to develop proposals that pinpoint solutions to a particular AAM transportation challenge through aviation infrastructure.

STEM and Higher Education Classroom Visits and Projects

In 2023, DriveOhio made 25 visits to STEM and higher education classrooms throughout the state to engage students with smart mobility activities and spread awareness of career opportunities.

Visits to UAS Center and NAAMCE

DriveOhio facilitates educational visits to these state-of-the-art AAM facilities, providing hands-on learning experiences and first-person exposure to AAM technologies.

Ohio's Auto and Advanced Mobility Workforce Strategy



DriveOhio worked with the Governor's Office of Workforce Transformation (OWT) to develop this strategic plan, providing technical expertise and insights from its various workforce initiatives, and plays a critical role in its implementation. More information can be found in **Project Highlights**.

Addition of K-12 DriveOhio Educator Toolkit



This toolkit features a variety of resources educators can leverage to facilitate STEM education and increase awareness of and preparedness for the smart mobility jobs of the future. Resources include course materials and curriculum, grants and funding, career connections and professional development. More information can be found in **Project Highlights**.

Career Connections Webinar Series



DriveOhio hosted two webinars in their on-going series that connects Ohio's cutting-edge employers with students and educators. Attendees were able to explore career pathways for drone pilots and automated vehicles, ask questions, and become informed about smart mobility and affiliated technology.



STATISTICS

*Federal grants totaling over **\$70K awarded** to educators interested in implementing smart mobility activities into classrooms and after-school programs*

***Ohio Vertiport Innovation Challenge** with participation from over 15 universities, high schools, colleges, and airports across Ohio*

*The **DriveOhio Educator Toolkit** has been downloaded by over **340 educators** who work with over **50,000 students** statewide*

46 DriveOhio events and school visits

***485 Educator registrations** for DriveOhio webinars*

PROJECT HIGHLIGHTS

DriveOhio Educator Toolkit



DriveOhio is dedicated to advancing STEM education and career outreach programs. This commitment is reflected in the DriveOhio Educator Toolkit, a comprehensive resource designed to empower educators, students, and industry partners alike. The toolkit, which is a key resource for preparing Ohio's talent for the future of smart mobility, includes four main elements: curriculum, professional development, career and networking opportunities, and grants and funding.

The curriculum provides a variety of hands-on content and activities, allowing students to interact with the latest transportation technology. This includes everything from electric vehicles to delivery drones. These resources equip educators with the necessary tools to create engaging learning experiences that encourage critical thinking and problem-solving skills among students of all ages.

DriveOhio offers free online courses for educators to launch DriveOhio ambassador programs, covering smart mobility fundamentals, student recruitment strategies, and training methodologies. The webinar series connects students and educators with industry leaders, offering insights into smart mobility career pathways, emerging technologies, and internship opportunities. This helps to cultivate a talent ecosystem, ensuring that Ohio's workforce remains at the forefront of transportation innovation.

Recognizing the importance of access to resources, DriveOhio offers grants and funding opportunities to educators, enabling them to enrich classroom experiences and incorporate smart mobility activities.





Auto and Advanced Mobility Workforce Strategy



Ohio's strategy for developing its auto and advanced mobility workforce, developed by the Governor's Office of Workforce Transformation (OWT), is centered around four interconnected components: 1) collaborative statewide partnerships with regional implementation; 2) industry desirability and career awareness; 3) broad recruiting efforts for a diverse and robust workforce; and 4) scalable education and training. Working with the Governor's OWT, DriveOhio plays a key role in workforce strategy development and implementation for all things smart mobility.

This strategy's first component establishes a collaborative foundation through a statewide partnership with regional implementation, ensuring effective utilization of time, resources, and funding. The second component emphasizes driving industry desirability and career awareness, leveraging Ohio's strong manufacturing heritage to redefine and enhance the appeal of auto and advanced mobility careers. The third component expands the talent pool by broadening recruitment efforts beyond reskilling incumbent workers, ensuring a diverse and robust workforce capable of supporting its advanced mobility ambitions. The fourth component focuses on scaling education and training to meet industry demand, building upon Ohio's extensive educational network, including magnet high schools, career and technical education programs, and multidisciplinary undergraduate and graduate degrees. This comprehensive, collaborative effort is essential to develop a leading workforce in auto and advanced mobility, contributing to the state's economic prosperity and positioning it as a leader in this transformative industry.

PROJECT STATUS **UPDATE**

DriveOhio Educator Toolkit

 **ONGOING**



Statewide Innovation Challenges

 **ONGOING**



DriveOhio





LOOKING AHEAD

As we look ahead to 2024, DriveOhio remains committed to revolutionizing mobility across the state. DriveOhio's ongoing and planned initiatives leverage technologies and innovative solutions that benefit all Ohioans. Through strategic partnerships, engaging in comprehensive research, building on previous efforts, and implementing innovative demonstration projects, DriveOhio is dedicated to driving forward the state's smart mobility agenda. This section provides an overview of the key initiatives DriveOhio will undertake in 2024.

Advanced Air Mobility

MQ-9 Reaper Integration

The MQ-9 Reaper drone will conduct operations at Springfield-Beckley Air National Guard Base supported by the ground-based detect and avoid SkyVision system

Medical Cargo Use Case

DriveOhio will explore the use of drones for medical cargo delivery. This initiative aims to improve the transportation of medical supplies and equipment.

Drone in a Box Deployment

This project involves deploying automated drone systems that can independently launch, perform tasks, and return to a secure base for recharging and data offloading.

Tethered Drones

Tethered drone systems will be deployed to provide stable and continuous aerial coverage for various applications.

Joby Aviation Hiring and Workforce Preparation

DriveOhio will help prepare a skilled workforce to fill many of the 2,000 jobs anticipated to support Joby Aviation's new facility in Dayton, Ohio. This initiative includes development of training programs and education partnerships that ensure a ready workforce for Joby Aviation as well as the broader AAM industry.

FAA Approval for Beyond Visual Line of Sight

DriveOhio has received FAA approval to fly a large drone over a section of U.S. 33 to test its capability for traffic and incident management. This project will evaluate the effectiveness of drones in providing real-time data and enhancing situational awareness for traffic monitoring and emergency response.

4th Annual Ohio Air Mobility Symposium

The upcoming 4th Annual Ohio Air Mobility Symposium will bring together experts, policymakers, and industry leaders to discuss the future of air mobility. This event will focus on shaping policy, infrastructure planning, and exploring technological advancements in the AAM sector.

AAM Multistate Collaborative

Hosted at NAAMCE, this event will bring together representatives from 18 states to engage in collaborative discussions to facilitate an exchange of ideas and identify paths forward for advancing AAM initiatives across participating states.



Ohio UAS Center

UAS Use Case Library

DriveOhio will establish a comprehensive UAS use case library, accessible via a request form to support broader adoption.

Infrastructure

DriveOhio will support infrastructure development for testing small UAS (sUAS).

ODOT Personnel Training

The Ohio UAS Center runs a drone deployment program to train ODOT employees in various divisions. This training will ensure that staff are well-versed in the latest UAS technologies and operational protocols.

Robotic Assistance

DriveOhio will introduce robotic assistants for tasks that require ground-level intervention in support of uncrewed aircraft operations.

Expanded Testing by Outside Companies

DriveOhio will facilitate expanded testing opportunities for external companies, allowing them to trial their UAS technologies within the state's infrastructure.

Drone Data Integration

Video data captured by drones will be integrated into ODOT's existing video processing systems to enhance performance.

Continued Interagency Support

DriveOhio will continue to collaborate with other state agencies, including the ODH, ODNR, and Ohio EPA, to build expertise and capacity statewide.

Connected Vehicles

ESP - SMART Grant Programs

DriveOhio will continue to build out safety applications for the ESP, leveraging the SMART grant program awards.

V2X Standards Testing

DriveOhio will conduct V2X standards testing in collaboration with OmniAir.

Work Zone Technology Assessment

DriveOhio will assess work zone technology effectiveness, identify areas of improvement, and leverage lessons learned for Smart Belt Coalition and other efforts.

Connected Marysville-Dublin Project

DriveOhio will complete testing of CV technology and begin data analysis to determine effectiveness of safety messages.

OSU Intersection Safety Challenge

OSU will host an intersection safety challenge to develop and test innovative solutions for improving safety at intersections, supported by DriveOhio.

Vehicle-Based Data Pilot Project

DriveOhio will continue working with Honda and partners to develop a road condition management system using vehicle-generated data from ADAS-equipped vehicles to identify hazardous road conditions and evaluate its benefits for long-term use.



Automated Vehicles

I 70 Truck Automation Corridor

DriveOhio, in partnership with INDOT and the TRC, will deploy partially automated trucks along a 166 mile stretch of I 70. The project will begin testing in revenue service truck platooning in the summer of 2024 and continue development of the project's AV Roadway Readiness Audit Tool and guidebook.

Closing out the Ohio Rural ADS Project

DriveOhio will complete the Ohio Rural ADS project, including final reporting.

Predictive Modeling for AV Data Analysis

DriveOhio will implement predictive modeling techniques to analyze data from AV operations.

Rural GPS Research

Research will focus on enhancing GPS accuracy and reliability for both air and ground vehicles in rural areas.

Rural Mobility Hubs

DriveOhio will develop and test rural mobility hub concepts that integrate multiple modes of transportation.

AV Pooled Fund Study - Local Agency Support

A pooled fund project will be launched to support local governments in implementing AV technologies.

Registration Form for AV Testing and Interactions

DriveOhio will introduce an AV registration form to streamline the process for companies testing and interacting with AV technologies in Ohio.

Electric Vehicles

Alternative Fuel Corridor Buildout

DriveOhio will continue developing electric vehicle charging infrastructure along designated AFCs as part of the NEVI program.

Ongoing Local Community Engagement

DriveOhio will focus on engaging with local communities to promote equitable access to EV infrastructure.

EV Charging Station Utilization Reporting

This program will involve detailed reporting on the utilization of EV charging stations to monitor performance and identify areas for improvement.

AFV Registration Dashboard Enhancement

Ohio's AFV Registration Dashboard will be re-factored to include adoption rates, charging infrastructure comparison, and NEVI charging station status.

Fleet Electrification

DriveOhio will support the electrification of vehicle fleets across the state.

NEVI Round 1 Site Operations

The first round of EV charging sites will become operational.

NEVI Round 2 Site Construction

The second round of EV charging sites will begin construction.

Expansion Beyond AFCs

Beyond the designated AFCs, DriveOhio will explore opportunities to expand EV charging infrastructure in other strategic locations.

Alternative Fuel Research

DriveOhio will support Ohio University's research relating to costs for various alternative fuel options in different regions of the state.



Workforce

Higher Education Toolkit

DriveOhio will develop a Higher Education Toolkit, providing resources to both students and educators. The toolkit will be designed to integrate smart mobility and advanced transportation technologies into the learning process.

K 12 Toolkit Update

An updated version of the K 12 Toolkit will offer expanded curriculum and professional development opportunities.

High School Internship Career Fair

Central Ohio STEM Industry Council will host high school internship career fair at ODOT in February 2024.

NEVI Workforce Initiative

DriveOhio will launch the NEVI Workforce Initiative to train workers for jobs related to the installation and maintenance of EV charging infrastructure.

Statewide Auto and Advanced Mobility Workforce Strategy

DriveOhio will continue its efforts to support the Governor's OWT Statewide Auto and Advanced Mobility Workforce Strategy.

STAR Program

ODOT will continue developing its STAR grant style program and engage students at Ohio based colleges to test out new ideas, such as environmental strategies, advanced navigation technologies, and smart infrastructure designs.

STEM "Charging Stations"

DriveOhio is preparing to design, deploy, and scale a collaborative network of STEM Charging Stations across Ohio to accelerate informal STEM learning. These Charging Stations will feature QR codes at existing project sites offering augmented reality and interactive platforms.



DriveOhio

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