

# NASA Kennedy partners to help develop self-driving cars

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This aerial photo of the Shuttle Landing Facility runway at the Kennedy Space Center looks southwest. Longer and wider than most commercial runways, it is 15,000 feet long and 300 feet wide. It could be a test site for driverless cars under the Central Florida Automated Vehicle Partnership supported by NASA under a Space Act Agreement. Space Florida now operates and manages the SLF under a property agreement with NASA to allow a variety of commercial and government partners to use the three-mile long runway. Credit: NASA

Since its inception, NASA has been known as an agency that opens

doors to the future. While focusing on exploration beyond our home planet, agency experts also are working to improve life right here on Earth. NASA at the Kennedy Space Center in Florida recently joined a partnership created to help perfect self-driving cars.

Autonomous vehicles sound like science fiction. It has always been necessary to have someone to watch the road and operate the [vehicle](#), but scientists and engineers with many organizations now are working to develop vehicles capable of sensing and analyzing surroundings and navigating without a driver.

While such a vehicle has yet to hit the car lots, advances in technology soon may result in driverless vehicles using radar, lasers, the Global Positioning System and computer vision.

To be ready for such innovations, the U.S. Department of Transportation (DOT) late last year issued a notice soliciting proposals for a pilot program to designate automated vehicle proving grounds. Under the auspices of the office of Mayor Buddy Dyer of the City of Orlando, the Central Florida Automated Vehicle Partnership was formed to submit a multi-faceted proposal. Kennedy Space Center's capabilities for controlled testing of automated vehicles and associated technologies were included as a significant factor favoring the proposal's selection for award.

In January, the U.S. Department of Transportation's then-Secretary Anthony Foxx announced that DOT had selected the Central Florida partnership as one of 10 proving ground pilot sites around the country to encourage testing and communicating information about automated vehicle technologies. The partnership includes organizations from government, industry and academia.

"This group will openly share best practices for the safe conduct of

testing and operations as they are developed," Foxx said, "enabling the participants and the general public to learn at a faster rate and accelerating the pace of safe deployment."

According to Tom Engler, NASA's director of Center Planning and Development at Kennedy, this project is another example of Kennedy serving as a premier, multi-user spaceport.

"This project holds the potential to benefit NASA by promoting advanced technologies that may have agency mission-related applications," he said.

"We have a broad range of capabilities," said Amy Houts Gilfriche, a NASA Partnership Development manager in Center Planning and Development. "If we can contribute to developing new, cutting-edge technology of the future, we want to help."

Kennedy engineers already have been playing a crucial role in developing automated vehicles. The center's Swamp Works team recently tested instruments for a major heavy equipment manufacturer. Engineers analyzed how some of the sensors would respond when used on automated vehicles in [extreme environments](#).

These experiments allow researchers and manufacturers to understand how software and hardware will react in difficult conditions within a safe, controlled setting with minimal risk. According to Rob Mueller, a senior technologist with Kennedy's Exploration Research and Technology Programs, there are many situations where a sensor such as a camera, radar or other type of instrument could be compromised.



Electric cars are plugged in to charging stations at the Kennedy Space Center's Headquarters Building. Many of the autonomous vehicles that may be tested at the Florida spaceport will be electric and could use charging stations around the center. Credit: NASA

"Robots are only as good as the sensor inputs they receive," he said. "Just as a blind person would have trouble driving, so will a robot with impaired sensors."

Mueller explained, everyday occurrences could impair sensors on [self-driving cars](#) going into low-angle lighting at sunrise or sunset, glare from oncoming headlights, fog, dusty environments, heavy rain or electromagnetic interference from surrounding equipment.



"The Swamp Works lab specializes in prototyping, research and developing equipment in extreme environments," he said. "Lessons learned from terrestrial extreme environments also can be applied to robots operating on the surface of the moon, Mars or other bodies in the solar system."

NASA Transportation Officer Bruce Chesson pointed out that the space center has a unique transportation testing capability, professional staff, instrumentation, processes and technical expertise to test existing autonomous vehicles and develop new sensors.

"The reliability and safety of autonomous vehicles will be dramatically improved by developing advanced sensor systems," he said.

Chesson added that Kennedy has been working with groups in the Central Florida area promoting new transportation technology through the City of Orlando's Smart Cities Initiative application.

"We believe that Kennedy can offer many opportunities together with the other project partners to evaluate and demonstrate improved transportation technologies and modalities," he said. "This will result in Brevard, Orange and Volusia counties becoming an example to many other metropolitan areas in the United States."

In addition, Kennedy may provide a controlled testing facility, which offers a contained environment with a vast roadway network and secure access. Gilfriche explained that while the extent of Kennedy's role has not yet been determined, the center already has electric vehicle charging stations and could provide many different test sites for driving tests.

"We believe that this partnership may enhance the advancement of [autonomous vehicles](#) through proven space technology, safety and test procedures established by our center that likely mimic safety and

equipment that has been used to launch man into space and return," Chesson said.

Gilfriche noted that NASA playing a role in developing automated vehicles is another example of applying the agency's technology to everyday life.

"The safety implications of this [technology](#) are tremendous," she said.

"Some of the most significant factors to traffic crashes today are distracted and fatigued drivers. This is a unique opportunity to take that out of the equation and make our streets and highways safer."

Provided by NASA

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