Florida Keys Connecting Overseas to Advance Safe Travel
(Florida Keys COAST) Project, Monroe County – Contract No. E6M58

Frequently Asked Questions

1. What is the Florida Keys COAST Project?

The Florida Department of Transportation (FDOT) District 6 is creating a connected vehicle corridor along US 1 (Overseas Highway) in Monroe County, from Key Largo to the City of Key West. The Florida Keys COAST project limits on US 1 are from Mile Marker (MM) 0.0 in Key West to MM 112.5 near the Monroe/Miami-Dade County Line. US 1 is the sole highway connection between the mainland and much of the Florida Keys for residents, visitors, and businesses, and as such is a major evacuation route and an economic contributor. The Keys COAST project will implement advanced technology to promote safety and mobility for all road users of US 1 in Monroe County. The project scope includes deployment of Connected Vehicle (CV) applications, road-side units (RSUs), on-board units (OBUs), Automated Traffic Signal Performance Measures (ATSPM) software, and Intelligent Transportation Systems (ITS) equipment. These project features will establish connectivity between various modes (i.e., cars, trucks, buses, pedestrians, bicyclists, and emergency vehicles) and the roadway (i.e., traffic signals, mid-block pedestrian crossings, weigh-in-motion (WIM) screening station, drawbridge, and emergency signals along US 1 in Monroe County. The project will enhance FDOT District 6's real-time arterial management capabilities on US 1.

2. What are Connected Vehicles?

Connected vehicles (CV) use vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-everything (V2X) and infrastructure-to-vehicle (I2V) communication to exchange information between vehicles, drivers, the roadside traffic control devices, bicyclists and pedestrians. This capability to communicate enables exchange of real time information such as the position, speed, and direction of a vehicle, or the phase change at a traffic signal. The information is processed in real time to provide drivers with a greater situational awareness of prevailing conditions, such as congestion, incidents, pedestrian presence, and other hazards within the vehicle's path. The traffic information is presented to the drivers in the form of intuitive and clear alerts, advice, and warnings so that drivers can make better and safer decisions while driving. The exchange of real time information also creates the opportunity to proactively adjust traffic signal timing for servicing transit, emergency response or freight vehicles more efficiently.

3. What are Road-Side Units?

Road-Side Units (RSUs) are wireless communications devices (see Figure 1) that are mounted along a road or pedestrian facility. On the Keys COAST project, the RSUs will typically be mounted on the upright or the mast arms of existing traffic signals. The RSUs will be connected to and receive data from the traffic signal controllers and broadcast it to the On-Board Units (OBUs) within their communications zone. RSUs are also capable of receiving information from the vehicles via the OBUs, e.g., the vehicle's speed, position, direction and time. For this project, the information that can be exchanged includes Signal Phase and Timing (SPaT), Traveler Information Messages (TIM), Personal Safety Messages (PSM), Weigh-in-motion station open/close status, Drawbridge open/close status, transit/freight signal priority requests, emergency vehicle preemption requests, among others. A total of 51 RSUs are planned to be installed as a part of the Keys COAST project.

Figure 1: Road-Side Unit

4. What are On-Board Units?

On-Board Units (OBUs) are devices (see Figure 2) located in vehicles to collect data from the vehicle (e.g., location, direction and time) and/or provide an interface (see Figure 3) through which traveler information and warnings can be provided to the driver. OBUs broadcast as well as receive data to/from RSUs and other vehicles equipped with OBUs. On the Keys COAST project, the OBUs will be installed in the participating agency vehicles. The OBU shown in Figure 2 is 6.61 x 1.26 x 4.29 inches in size and is typically mounted under a vehicle seat or inside the center console, trunk or a glove box of a vehicle. A tablet (see Figure 3, which serves as the human machine interface) is planned to be mounted to the windshield to issue audible and/or visual warnings or alerts to the driver. The installations will be quality fit and finish. Furthermore, the installation of the OBU will be required to not interfere with the primary functions of the agency vehicles, and as such will be coordinated in advance through the project design process with each fleet type (e.g., transit, emergency response and law enforcement vehicles). To minimize impact to fleet operations, FDOT plans to implement a customized OBU installation plan developed in collaboration with each participating agency, e.g., staggered scheduling and installation at a site relatively convenient to the agency. A total of 250 OBUs are planned to be installed as a part of the Keys COAST project.

Figure 2: On-Board Unit

Figure 3: OBU Tablet

5. **Will the participating agency have discretion over which vehicles are used?**

   The participating agencies/entities will have complete discretion over identifying the vehicles to be selected for use on the Keys COAST project. FDOT will coordinate with each agency for finalizing the list of selected vehicles that will be equipped with OBUs for the Keys COAST project.

6. **Will the vehicles be monitored end to end of any trip?**

   The Keys COAST project does not call for "monitoring" of individual/specific vehicles. The OBU installed in the vehicle will communicate with an RSU when that vehicle is approaching and gets close to the RSU, i.e., comes in range of the RSU (approximately 900 feet). The data exchange between the RSU and the OBU ceases when the OBU-equipped vehicle moves out of range of the RSU. The RSUs will be installed on US 1 at or near existing traffic signals, FDOT weigh station in Plantation Key, and the Snake Creek Drawbridge. The information exchanged during this communication includes the position, speed, direction of the vehicle and time but does not contain any personally identifiable information (PII) or vehicle specific information. The Keys COAST project is not designed to track an individual vehicle's end to end trip.

7. **What is a Transit Signal Priority (TSP) System and how does it work?**

   A Transit Signal Priority (TSP) system uses communication between transit vehicles such as buses equipped with OBUs and the traffic signals. When buses are behind schedule, the TSP system can automatically request additional green time from a connected traffic signal so the bus can have priority to move through the light and get back on schedule. The Keys COAST project plans to include this feature, among other connected vehicle applications.

8. **What is a Freight Signal Priority (FSP) System and how does it work?**

   Freight (or Truck) Signal Priority (FSP) is a traffic signal modification that extends the green to allow an approaching truck equipped with an OBU to make it through an intersection without stopping. The main purpose for giving trucks extra green time is to increase safety by reducing the potential of running a red light and causing a collision. The secondary purpose is to reduce the delays and congestion that are caused by the longer time it takes trucks to accelerate from a stop. The Keys COAST project plans to include this feature, among other connected vehicle applications.

9. What is Emergency Vehicle Preemption?

Emergency vehicle preemption (EVP) provides a green light for emergency vehicles equipped with OBUs that are enroute to/from an incident scene. By providing a red light to other drivers that may cross the path of the emergency vehicle, EVP can help reduce collisions. EVP aims to improve other drivers' awareness of emergency vehicles as well as remind them to yield the right-of-way, increasing overall safety. It also reduces the travel time for the emergency vehicle to respond to life threatening situations. The Keys COAST project plans to include this feature, among other connected vehicle applications.

10. What are the safety benefits of connected vehicles?

According to USDOT, vehicle crashes claimed more than 37,000 lives in 2018. Connected vehicle technology has the potential to save lives, prevent injuries and reduce crashes. The National Highway Traffic Safety Administration (NHTSA) estimates that 94 percent of serious crashes are due to human error. Connected vehicle technology can mitigate 83 percent of non-impaired crashes through vehicle-to-vehicle communication.

11. Is the system secure, how will my privacy be protected?

FDOT has deployed a Security Credential Management System (SCMS) that will also be used on the Keys COAST project. The FDOT SCMS is compliant with the USDOT sponsored Crash Avoidance Metrics Partnership (CAMP) Proof of Concept SCMS. The FDOT SCMS is internet hosted and will provide certificate services to secure the messages being broadcast in the FDOT Connected and Automated Vehicle (CAV) ecosystem. The Keys COAST project devices that will send or receive messages (i.e., RSUs and OBUs) will be enrolled in the FDOT SCMS. Under this system, drivers cannot be cross-referenced with their vehicle data. The information exchanged during the communication with the vehicles does not contain any personally identifiable information (PII) or vehicle specific information.

12. What is FDOT's experience with Connected Vehicle projects?

There are 33 projects and initiatives around the state in various stages of planning, design, implementation and operations. Fifteen (15) of these are operational. FDOT is the lead entity or a stakeholder in the Florida projects and initiatives. Please refer to the statewide map below as of 9/30/21.