

## SpaceX Starlink Satellite Broadband Communications for ITS Pilot

Providing broadband to rural ITS field equipment

Rural

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Project Title:  
SpaceX Starlink Satellite Broadband  
Communications for ITS Pilot

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### WHAT IS THE NEED?

Reliable high-bandwidth rural communications have been a significant challenge since early deployments of Intelligent Transportation Systems (ITS) at Caltrans. While there is an effort to install fiber-optic broadband services on select rural highways throughout the state, the effort will take years before it's useable, won't be installed on every rural state highway, and will be located in areas highly susceptible to damage from wildfire, floods and landslides. Reliable communications are critical to the perceived reliability of ITS Elements for the traveling public. ITS Elements cease to function as intended when communications systems fail. This poses a problem in rural areas where ITS Elements are deployed to mitigate the effects of non-reoccurring congestion due to snow, fire, floods, and other major incidents. Caltrans needs to find an alternative reliable high-bandwidth wireless communications option that is less susceptible to weather induced incidents.

### WHAT ARE WE DOING?

We are proposing to procure, install, operate, and evaluate four SpaceX Starlink satellite broadband communication services for various ITS Elements in District 2. Most rural Caltrans field sites selected have been impacted by the lack of available high-bandwidth communications options. These ITS field sites include infrastructure related to changeable message signs, video sites, and roadside weather information systems. This project will evaluate the procurement, construction, installation, integration, operation, and maintenance of four selected sites in rural regions of the state.

### WHAT IS OUR GOAL?

To provide a reliable, cost-effective broadband communications solutions to field sites located in remote rural areas of the State.



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## WHAT IS THE BENEFIT?

As heavy snow, wildfires, floods, and other major incidents continue to impact terrestrial infrastructure, having an alternative high bandwidth communications option in rural areas will be crucial. Satellite broadband satellite services link to fixed, low earth orbit satellites. Satellite services do not rely on terrestrial infrastructure, providing immunity to the incidents described above. With throughputs of up to 20 Gbps, satellite broadband offers enough bandwidth for the most bandwidth intensive TMS applications.

## WHAT IS THE PROGRESS TO DATE?

- The research team has contracted with Advanced Highway Maintenance and Construction Technology (AHMCT) to provide research on the SpaceX Starlink system. The contract is scheduled to be executed in Fall 2022.
- District 2 has selected three hub locations and 10 field locations. Based on Starlink availability, the project team will eventually select one hub location and four field locations.
- The research team created an "issues and features" document providing insight on various Starlink kits, equipment, and features, as well as documenting known issues with equipment.
- The research team made site visits to the selected hub site and two field sites to test Starlink equipment procured to date and to determine what additional mounting equipment would be necessary. The team's uplink / downlink test results were very promising at each site.

## IMAGES



Image 1: Image shows researcher determining best orientation for satellite dish while testing equipment at a field site – Image Source - Caltrans



Image 2: Image show researcher connecting satellite equipment to field site for testing – Image Source – Caltrans



Image 3: Field Testing - Image Source - Caltrans