Rural

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Project Title:
Communication Technologies for Rural Intelligent Transportation Systems (ITS) Professionals

Task Number: 1749

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Professional Capacity Building for Communication Systems Phase V: Intelligent Transportation Systems (ITS)

Develop appropriate courses to be taught by subject matter experts which update the students' skills for new and constant evolving technologies in ITS.

WHAT IS THE NEED?

The transportation industry faces challenges in finding qualified workers, retaining experienced staff, and adapting to new technologies. The demand for America's transportation system is growing as the population increases, resulting in a need for a more efficient and effective system. Rapidly changing technologies, such as Intelligent Transportation Systems (ITS), require employees to have new and dynamic skill sets. Implementing ITS in rural areas has become more complex due to the greater number and variety of field devices being utilized. Rural ITS engineers and technicians must be knowledgeable about different communication technology options and how to select the most appropriate ones to design, implement, and maintain reliable and robust communication systems in rural and remote areas.

To address the lack of professional capacity in rural ITS communication systems, this project will enhance the professional capacity of rural ITS engineers and technicians, providing them with the knowledge and skills to design, implement, and maintain reliable and robust communication systems in rural and remote areas. Improved traveler information communication from the field to the Transportation Management Center (TMC) can help improve safer travel decisions, road maintenance efficiency, and emergency response times.

WHAT ARE WE DOING?

A panel of members from the California Department of Transportation (Caltrans) rural area districts and headquarters

was formed in phase I of this project. The panel members identify and decide the skill areas that need to be updated or improved so that the contractor develops the appropriate courses to be taught by subject matter experts. These courses update the students' skills for new and constantly evolving ITS technologies.

WHAT IS OUR GOAL?

The outcome and end-product of this research will be the delivery of courses to Caltrans rural engineers and technicians to train them in the skills they lack, which are necessary to design and maintain robust communication networks for rural ITS field equipment. This project will build the professional capacity of rural ITS engineers and technicians through an applied, hands-on educational experience that brings together the latest/most recent information into a comprehensive, one-stop shop for rural ITS communications.

WHAT IS THE BENEFIT?

Improving transportation communication systems in rural areas can lead to safer travel decisions, improved road maintenance efficiency, and better emergency response times. To achieve these benefits, ITS engineers need to be knowledgeable about different communication technology options and how to select the most appropriate ones for each application. This project will help ITS engineers and technicians build their professional capacity, allowing them to design, implement, and maintain reliable and robust communication systems in rural and remote areas.

WHAT IS THE PROGRESS TO DATE?

- The research team has contracted with the Western Transportation Institute (WTI) at Montana State University to update the PCB gap analysis, develop/deliver/evaluate new training content, and facilitate Caltrans meetings concerning PCB training.

- The research team contracted with Pearson Technologies, Inc., to provide two five-day training sessions on the design of fiber optic networks and installing, maintaining, and testing installed networks. These courses were held in October/November 2021. 24 District staff members participated in the training in Rancho Cordova and Fontana.
- DRISI partnered with D12 Maintenance and provided two five-day training sessions from Pearson Technologies, Inc. on the design of fiber optic networks and installing, maintaining, and testing installed networks. One session was held on May 6-10, 2022, in D12, and the other on October 17-21, 2022, in D3. A total of 24 students attended.
- New training content developed by WTI and Caltrans - RF / Microwave Fundamentals training from Aviat Networks. This was a five-day, hands-on experience on October 24, 2022, at the District 3 TMC. 12 students attended.
- The research team contracted with CellStream to provide three five-day training sessions on hands-on TCP/IP and Ethernet fundamentals. The three training dates were scheduled throughout 2023 and 48 students attended this training.
- The research team contracted with Pearson Technologies, Inc. to provide two five-day training sessions on the maintenance and troubleshooting of fiber optic networks, designed specifically for Caltrans maintenance electricians. Sessions were held in July 2023 and 24 Maintenance Electricians attended this training.
- An update about this project phase was prepared and posted on the PCB project pages on the Western States Rural Transportation Consortium website (http://westernstates.org/Projects/PCB/Default.html)
- The project team met in October 2023 and indicated they would like another round of TCP Fundamentals, Advanced Networking, and a new class on Wireshark. Traffic Operations will pursue funding for this training. The team will follow this under Task 1763 - Professional

Capacity Building for Communication Systems
Phase VI: Statewide Implementation and
Deployment.

IMAGES

Image 1: Hands-On Fiber Optic Training – Fusion
Splicing

Image 2: Hands-On Fiber Optic Training – Fusion
Splicing

Image 3: Hands-On Fiber Optic Training – Cable
Preparation