Western States
Rural Transportation
Consortium

MONTANA STATE UNIVERSITY
Western Transportation Institute

SYSTEMS ENGINEERING DEVELOPMENT AND INTEGRATION PROGRAM

Professional Capacity Building (PCB) for Communications

The Problem:

Rural transportation engineers design and implement ITS installations in some of the most remote locations in California. Rural ITS deployments are becoming increasingly complex and remain challenging to address in terms of communication. However, even though rural communications engineering is a mission critical skill, many engineers have relatively little experience with the myriad of technologies that could be applied. Because technologies are changing and becoming obsolete very quickly, transportation professionals find it challenging to stay abreast of the latest technologies available on the market. Transportation agencies are also faced with the challenges of finding and retaining qualified staff.

A variety of training options for communications are available commercially from academic institutions, trade organizations, and industry. However, opportunities to gain training particular to transportation communications is limited. There are even fewer options directly addressing professional capacity development for rural transportation communications.

Available training opportunities could provide valuable training and information to a transportation engineer looking to build professional capacity in telecommunications. However, because the available training is so diverse, it would be challenging to gain sufficient, up-to-date, and practical skills or professional capacity to adequately address the challenges of rural ITS communications faced by Caltrans.

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Professional Capacity Building (PCB) for Communications

The Solution:

The goal of this project is to develop a comprehensive curriculum and conduct training for Rural ITS communications in order to build the professional capacity of rural ITS engineers and maximize the benefits of a more efficient and better quality rural transportation information and communications system. The project has an educational focus and its primary objective is to have leading subject matter experts provide a hands-on, "nuts and bolts" learning experience for rural ITS engineers and technicians. Learning outcomes are centered on understanding the various communication technologies available and how to best select and implement these technologies, particularly in a rural environment.

Training for plant wireless communications, RF System Basics was conducted during Phase 1 of the project. In Phase 2, training was provided for IP Fundamentals as well as Plant Wired communications on the topic of Optical Fiber. A course in Telco Wireless Fundamentals and Usage was offered as part of Phase 3. Based on an ongoing needs assessment, further training will be facilitated in Phase 4 and subsequent phases.

The present curriculum consists of the following subject areas and topics:

Telco Wireless
- Cellular/PCS basics
- GSM data, 3G and beyond
- CDMA data, 3G and beyond
- LTE, 4G and Next Generations

Telco Wired
- Telco Wired Core
- POTS
- Analog Data Circuits
- ISDN
- xDSL
- DS1/T1
- Fractional DS1/T1
- Frame relay
- MPLS

Plant Wireless
- RF system basics
- 802.11 (WiFi) and related
- Microwave
- Short haul radio

Plant Wired
- Plant wiring basics
- Serial connectivity
- xDSL
- Optical fiber

IP Fundamentals
- Understanding IP networks
- Local area networks (LANs)
- Wide area networks (WANs)
- Network security
- Vendor specific equipment

For further information, please visit www.westernstates.org/Projects/PCB/, or contact:

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