



Western States  
Rural Transportation  
Consortium



## SYSTEMS ENGINEERING DEVELOPMENT AND INTEGRATION PROGRAM

### Professional Capacity Building (PCB) for Communications, Phase 4

#### Project Description:

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. Even though rural communications engineering is a mission-critical skill, many engineers have relatively little experience with the myriad of technologies that can 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 commercially available from academic institutions, trade organizations, and industry. However, training opportunities particular to transportation communications is limited, with even fewer options directly addressing professional capacity development for rural transportation communications.

The goals of this project are to develop a comprehensive curriculum and to conduct training for Rural ITS communications. This will build the professional capacity of rural ITS engineers and maximize the benefits of a more efficient and higher 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 practitioners.



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## Professional Capacity Building (PCB) for Communications, Phase 4



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

#### Telco Wireless

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

#### Telco Wired

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

#### Plant Wireless

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

#### Plant Wired

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

#### IP Fundamentals

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



### Previous Coursework:

**Radio Frequency (RF) System Design**, October 4-7, 2010 — key elements needed for designing RF communications systems.

**Mastering Fiber Optic Network Design and Installation**, September 24-28, 2012 – design of fiber optic networks, and installation, maintenance, and testing of installed networks.

**Hands-On Ethernet and TCP/IP Fundamentals**, September 23-27, 2013 – systems engineering approach to Ethernet and IP Networking with training in IP networking basics, LANs, and WANs.

**Telecom Wireless Fundamentals**, March 9-13, 2015 – design principles and practical application techniques for leased wireless communications systems.

### Phase 4 Training Opportunities:

**TCP/IP Fundamentals**, Fall 2017, Fall 2018 – updated repeat of training offered previously; pre-requisite course.

**Telecom Wireless Fundamentals**, Spring 2018, Spring 2019 – updated repeat of training offered previously.

**Small Data Center Design as Related to TMCs**, Fall 2018 - New course! Entirely new subject area.

**Intermediate TCP/IP Fundamentals**, Spring 2019 – New course! Including machine to machine networks and enhanced coverage of network security.

For further information, please visit [www.westernstates.org/Projects/PCB/](http://www.westernstates.org/Projects/PCB/), or contact:

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