



## TRAFFIC SIGNAL DESIGN: MULTIMODAL APPLICATIONS (TE-41)

### COURSE OUTLINE

#### Day One

1. 8:00 - 8:15 AM Introductions and Course Outlines (BJS)
2. 8:15 - 10:00 AM Module 1: Overview of Multi-Modal Signal Design Topics (BJS)
  - a) Traffic signals serve more than just the traffic mode- “Complete Street” environment.
  - b) Examples of multi-modal signals
  - c) Consideration of context (street classifications, land use, and special districts)
  - d) Applicable design references
  - e) *Interactive Engagement Exercise: Ask trainees to compare and contrast examples of signal design plan that illustrate the before/after difference in multi-modal context.*
3. 10:00 PM - 12:00 NN Module 2 – Complex Signal Phasings, Controllers, and Cabinets (BJS)
  - a) Examples of complex signal phasing
  - b) Controller considerations: firmware / software
  - c) Cabinet configurations: (input and output files)
  - d) Relationship among phasing, controller firmware features, and cabinet configurations
  - e) *Interactive Engagement Exercise: Give trainees complicated signal phasing diagram to determine appropriate firmware features, conflict monitor breakout, and cabinet input/output files.*
4. 12:00 NN - 1:00 PM Lunch (on your own)
5. 1:00 PM - 3:00 PM Module 3: Signal Design for Pedestrians (JJP)
  - a) Locations of Crossings and Ramps
  - b) Types of Crossing Control
  - c) *Signal Phasing Considerations*
  - d) Detection and Signal Indications
  - e) *Interactive Engagement Exercise: Given pedestrian desire line, students to design crossings, ramps, signal heads and ped push buttons.*



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**COURSE OUTLINE** (page 2)

6. 3:00 PM - 5:00 PM Module 4: Signal Design for Cyclists (JJP)
- a) Description of Class I/II/III/IV Bikeways
  - b) Types of detection
  - c) Signal Phasing considerations
  - d) Bicycle signal heads and phasing
  - e) *Interactive Engagement Exercise: Given bike lane and cycletrack location, students to design, signal heads and detection.*

**DAY TWO**

7. 8:00 AM - 10:00 AM Module 5: Emergency Vehicles and Bus Rapid Transit (BRT) (BJS)
- (a) Emergency Vehicle Detection
  - (b) Emergency Vehicle Preemption and Design Elements
  - (c) BRT - Context and Detection Considerations
  - (d) BRT – Transit Signal Priority and Design Elements
  - (e) Preemption versus Priority
  - (f) *Interactive Engagement Exercise: Give trainees hypothetical intersections and ask them to determine the appropriate selection of designs for emergency vehicles and rapid transit.*
8. 10:00 AM - 12:00 NN Module 6 – Heavy Rail and Light Rail Transit (LRT) (BJS)
- (a) Standards: CA MUTCD, CPUC General Orders, and AREMA
  - (b) Railroad Preemption and Design Elements (Heavy and Light)
  - (c) Limited Service Operations versus Flashing Red Operations
  - (d) LRT Priority Design Elements
  - (e) *Interactive Engagement Exercise: Give trainees a sample of highway-rail grade crossing and ask them to design a signal preemption sequence with limited service.*
9. 12:00 NN - 1:00 PM Lunch (on your own)



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**COURSE OUTLINE** (page 3)

10. 1:00 PM - 3:00 PM Module 7 – Next Generation Traffic Control (JJP)
  - (a) Signal Coordination: Time-of-Day, Responsive, Adaptive - Overview, System Selection, Design Considerations
  - (b) Signal Control: Central Control Systems
  - (c) Signal Communications Systems
  - (d) Connected Vehicles-Pilot Program Examples
  - (e) *Interactive Engagement Exercise: Ask students to get into groups and think about the pros and cons of next-gen systems*
  
11. 3:00 - 4:45 PM Module 8 – Bringing It All Together (JJP)
  - (a) *Interactive Engagement Exercise: Give students an example of signalized intersection that includes cars, bike lane, peds, Class IV bikeways, and BRT, and have them select appropriate mast arms, signal poles, and pole foundations.*
  
12. 4:45 - 5:00 PM Wrap-Up, Course Evaluation, and Certificates (BJS)