OVERVIEW
The Los Angeles County Metropolitan Transportation Authority (Metro) has developed a comprehensive program in the areas of signal operation and maintenance to upgrade the skills of local traffic engineers and signal maintenance personnel.

To date, Metro has invested in Traffic System Management (TSM) programs throughout the region using Call-For-Projects funding. The training is supported by the Signal Support Group, and is considered Metro's congestion relief program.

INSTRUCTORS

Fred Minagar, M.S., R.C.E., P.E.
President of Minagar & Associates, Inc., is a recognized national authority in the areas of Intelligent Transportation Systems (ITS), traffic engineering and transportation planning. Fred has over 24 years of real world practice and teaching experience. He has engineered, managed and administered over 100 ITS and 250 traffic engineering projects in 15 states across the United States. Mr. Minagar has served as a City Traffic Engineer for 4 cities in Southern California. His project, Traffic Signal Synchronization of 121 City, County and Caltrans locations won the PTI's 2003 Award of the Best Transportation Technology Solutions in the United States, as well as, the ITS-CA's 2002 Award of Excellence for Best California Return on Investment Project. Fred has conducted numerous ITS and traffic engineering workshops for FHWA, ITE National, Caltrans, Metro, various DOTs, cities and Governments of China & South Korea. For over 11 years, he has been re-appointed/re-elected as Traffic & Transportation and Planning Commissioner/Chairman for the City of Laguna Niguel. Mr. Minagar has been awarded the United States Congressional Order of Merit 2003 & 2006, as well as, the 2002 National Leadership Award.

Joe Provenza
As President of PRO VEN Inc., and former Associate Electrical Transportation Engineer with Caltrans, Joe has 42 years of Traffic Signal field operations experience. Mr. Provenza has a State of California Teaching Credential.

Anthony Provenza
Anthony Provenza is presently employed by the City of Palmdale as the Senior Traffic Signal Electrician. He has 24 years of experience working with Traffic Signals and Highway lighting for Palmdale, Caltrans and L.A. County. Anthony has an A.B.A. in Public Sector Management, an A.S. in Engineering and a State of California Teaching Credential.

Kang Hu, P.E.
A Senior Transportation Engineer in charge of the Advanced Transportation Management Systems (ATMS) Division of the Los Angeles Department of Transportation (LADOT). Kang Hu has more than 20 years of experience in advanced traffic management systems including extensive hands-on knowledge in the adaptive traffic signal control and transit priority systems. He also assisted the World Bank in the implementation and evaluation of adaptive traffic signal control systems in Asia.

Bill J. Shao, P.E., T.E.
Bill Shao is a Transportation Engineer with the Los Angeles Department of Transportation (LADOT). Mr. Shao was formerly the Section Engineer of LADOT Signal Systems and Research Section, and the Automated Traffic Surveillance and Control (ATSAC) Center, had oversight for daily operation citywide. He is experienced in complex signal phasing and signal timing designs for Types 2070 and 170 controllers, and has previously served as the city’s expert witness in signal operations.

Chun K. Wong, P.E.
Chun Wong is a registered Transportation Engineer who has extensive experience working with advanced technology. He is the principal engineer who developed state-of-the-art Transit Priority System software algorithm for the new Metro Rapid Bus service in the Los Angeles County area. Mr. Wong is also responsible for the development of the Real-Time Passenger Information System. Currently, Mr. Wong heads the Transit Priority System (TPS) Research and Development section of the Los Angeles Department of Transportation.

COURSES

NEMA TRAFFIC SIGNAL CONTROLLERS AND VIDEO DETECTION/ 1.5 DAYS
This workshop focuses on ECONOLITE ASC/2 TRAFFIC SIGNAL CONTROLLER UNIT and TS2 Cabinet, including timing, basic set-up, and functions. There will be an overview of NEMA TS2 with emphasis on Cabinet Layout, Load Switches, Detectors, BIU, MMU, and Cabinet Troubleshooting. Considerations for proper design, installation and maintenance of Video Detection for Traffic Signal Systems will be presented.

TRAFFIC SIGNAL SYSTEMS EFFECTIVENESS AND HOMELAND SECURITY / 1 DAY (Updated)
This introductory workshop provides an overview of the role of traffic & transportation professionals as effective homeland security specialists. It focuses on: Emergency Response & Recovery, Continuity of Operation as well as Disaster Planning, Prevention and Preparedness with emphasis on traffic signal systems. Invited guest(s) will present the homeland security issues facing cities, counties, state DOTs and federal agencies.

TRAFFIC SIGNAL TIMING PARTS I & II/ TWO SEPARATE 2 DAYS (Updated)
This two, two-day workshops provides beginning, intermediate to advance level training covering the principles and applications of Synchro 6.0 & Synchro Studio 7.0 computer software. Participants will utilize Synchro program at the workshop to perform capacity analysis for signalized intersections and to develop optimum signal timing plans that reduce delays and stops for isolated and networked intersections during the
workshop. Prior experience with Synchro is not required for part I; however, prior general knowledge of traffic engineering & Synchro is preferred for part II.

**CCTV AND VIDEO DETECTION / 2 DAYS (Updated)**
This two-day workshop covers the principles and applications of the state-of-the-art freeway and arterial surveillance and control systems. Special attention will be devoted to Closed Circuit Television (CCTV) technology. Three Case Studies from Northern California, Southern California, and Washington, D.C. will be explored in great length. Nationwide lessons learned from the FHWA’s perspective will be presented. Electrical, Civil and Transportation Engineers are invited to attend this workshop.

**SYSTEMS COMMUNICATIONS / 2 DAYS (Updated)**
The workshop covers the following: ITS, communications technology evaluation criteria, National ITS Architecture, USDOT-FHWA’s Lessons Learned, Communications Media Systems (Wire Line and Wireless) and Highway Communications Systems. Special attention will be devoted to Fiber Optic communication. A number of Case Studies from California as well as other states will be covered.

**BUS PRIORITY, QUICNET 4.0 & CTNET SYSTEMS / 2 DAYS (Updated)**
The workshop introduces the concepts and operations of bus/transit priority as well as emergency pre-emption systems on the first day, the latest QuicNet signal controller system and the latest State of California Caltrans CtNet traffic signal controller system on the second day.

**BI-TRANS 233 / 1.5 DAYS**
In this workshop, the BiTrans 233 Version 2.0 software program for the Type 170 controller is presented, including: Configuration technique, Basic Timing Intervals and options, Coordination techniques, Input and Output manipulation, and Specific functions. Prior training in Traffic Signal basic timing and intervals are required.

**BI-TRANS 200 CA, LACO 1 R & CALTRANS C-8 / 2 DAYS**
This workshop focuses on the presentation of 3 popular Traffic Signal programs used in Type 170 applications: Bi-Trans 200CA, LACO 1 R and Caltrans C8. The basic timing functions and intervals are also presented, as well as the coordination features and the special features available in each program.

**TYPE 170 HARDWARE & LOOP DETECTORS WITH TROUBLESHOOTING / 2 DAYS**
In this workshop, the Model 332 Cabinet and its available components are presented along with Cabinet configurations, Cabinet layout and components available, Cabinet writing, Type 170 History, Cabinet troubleshooting, Monitor Unit programming, Cabinet Specifications, Detector Theory and application, and Model 170 Specifications and configurations.

**COMPUTERIZED TRAFFIC SIGNAL CONTROL SYSTEM / 2 DAYS**
This workshop presents current technologies and control strategies available for computerized traffic signal control systems. The workshop covers the technical subjects of system architecture, concept of operations, functional requirements, TMC layout, adaptive functions and system integration of advanced traffic control systems. Special applications of electronic reversible lanes and smart corridor management will also be discussed. Further, this workshop will provide in-depth review of commercially available systems including KITS, QuickNet 4, I2TMS, MIST, TranSuite and ATCS.

**ADVANCED TRAFFIC SIGNAL OPERATIONS / 2 DAYS**
This two-day course focuses on Advanced Signal Operations topics. It will discuss the principles of Traffic Signal Phasing Design for complex intersections, Signal Controller Capabilities and Hardware Configuration, Advanced Volume-Density Operations, and Railroad/Emergency Vehicle Preemptions. This course will also introduce two types of Signal System Coordination- Traffic Responsive Operations and Advanced Traffic Adaptive Systems. The course will enable participants to learn advanced functions at both the Local Controller Level and the System Level.

**LADOT's TRANSIT PRIORITY SYSTEM (TPS) DESIGN AND IMPLEMENTATION / 2 DAYS (Updated)**
This two-day course is designed to prepare traffic engineers and signal technicians in the design and implementation of the Los Angeles Department of Transportation’s loop-transponder based Transit Priority Systems (TPS). This course will cover practical knowledge of TPS intersection geometric design, signal design, bus stop treatments, 2070 timing charts, and Passenger Information System. To further compliment the learning, this course will also offer hands-on exercises in various TPS subsystems such as detection system, communication, and, 2070 controller configurations.

**TRAFFIC SIGNAL OPERATIONS AND HIGHWAY CAPACITY ANALYSIS / 2 DAYS (Updated)**
This two-day workshop will discuss signal operational theory, analyses, and applications of Highway Capacity Manual (HCM 2000) for signalized intersections. Topics include signal phasing, signal controller parameters, background traffic flow theory, and fundamental principles of highway capacity analysis for signalized intersections. Release 5 of the Highway Capacity Software (HCS+) from the University of Florida’s McTrans Center will be utilized in analyzing real-world signalized intersections.

**INTRODUCTION TO THE 2070 TRAFFIC SIGNAL CONTROLLER / 2 DAYS**
This Workshop introduces the advance signal timing parameters and features available in the L.A. City and Caltrans software programs for the Type 2070 Signal Controller in a 332 cabinet, as well as an introduction of ITS cabinet. Caltrans specifications and cabinet configurations will be presented.

**BI TRAN 2033 PROGRAM FOR 2070 SIGNAL CONTROLLER / 2 DAYS**
This workshop presents the features available in the Bi Tran 2033 Program designed to work with the 2070 Controller Unit. It will include configuration, basic functions, timing intervals and options, as well as Coordination techniques, Input and Output manipulation, and special functions. Introduction to the 2070 Workshop is suggested prior to attending this workshop.

**REGISTRATION**
To expedite your request, please complete the enclosed registration form included in this brochure. Fax the completed form to Dianne Sirisut at 213-922-5259. Registration will be confirmed on a first-come-first-served basis. There will be a registration fee for the textbook(s) due on the first day of class, make checks payable to Metro. If you have any other questions, please contact Dianne Sirisut at 213-922-5257 or e-mail: signalsystems@metro.net.