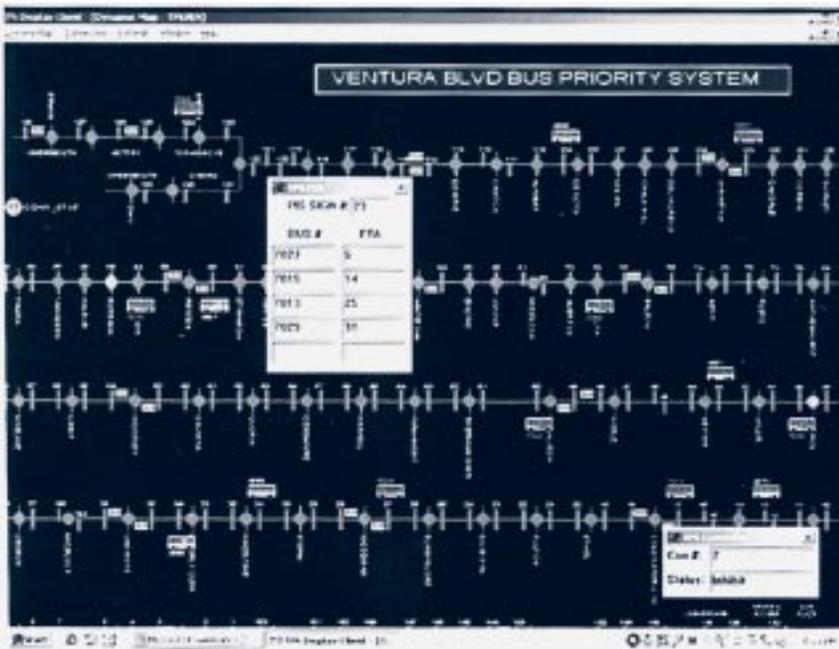# McTrans
Moving Technology

New ITS Software Available from LADOT

by Verej Janoyan, Senior Transportation Engineer, City of Los Angeles, Department of Transportation

During the past seven years, the City of Los Angeles Department of Transportation (LADOT) staff has developed several software packages for use in its Automated Traffic Surveillance and Control (ATSAC) Program. Four of these state-of-the-art traffic control software programs will be available soon for distribution through the McTrans Center. The primary motivation for the software distribution is to share LADOT's products with others so that they may take advantage of this technology.

Now AVAILABLE!
PASSER® V-03,
Version 1.0

McTrans New Software Features!

What McTrans is Working On

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continued from p.1

These products are: Adaptive Traffic Control System (ATCS)®7, Traffic Signal Control Program (TSCP)®7 for Model 2070 Controllers, Smart Transit Priority Manager (STPM)®7, and Transit Priority System (TPS)®7 software for local controllers.

Through funding grants from the Los Angeles County Metropolitan Transportation Authority (LACMTA), LADOT has developed these products to upgrade its central traffic control system comprised of 4,200 traffic signals and provide transit bus priority for several fleets operated by LACMTA. The software programs have been successfully implemented in the City of Los Angeles to alleviate traffic congestion, improve bus operations and reduce motorist delay. In response to a strong interest by public and private entities to obtain user licenses of these products, the Mayor and City Council of Los Angeles have authorized LADOT to enter into a software distribution agreement with the Federal Highway Administration (FHWA). Once signed, this cooperative agreement will provide licensing of the individual products to public agencies through **Mc*Trans***, an FHWA software distribution center. LADOT and McTrans, with FHWA facilitation, are currently working on the details to distribute and support these products.

These software programs are described below:

Traffic Signal Control Program (TSCP)7

The TSCP7 program is specifically designed to operate within Model 2070 controllers to provide traffic signal control. The program allows the Model 2070 controller to function as a two-through eight-phase, six-overlap, dual-ring traffic signal controller. The program can operate as a stand-alone actuated or non-actuated controller, or as part of an interconnected system to either an ATSAC type central control system with second-by-second control or a hard-wire or modem field master. The purpose of this program is to provide traffic control functions. The TSCP7 has the ability to accommodate transit priority for buses as well as light rail trains, including special phases for light rail signals.

Adaptive Traffic Control System (ATCS)7

The ATCS7 is a personal computer-based traffic signal control program which provides fully traffic responsive signal control based on real-time traffic conditions. ATCS7 architecture is based on the earlier Urban Traffic Control System (UTCS) which was developed by the FHWA. ATCS7 is capable of automatically and repeatedly adjusting traffic signal timing in response to current traffic demands versus operating in time-of-day mode. Detector data collected in the signal network is continuously analyzed, and the most appropriate signal timing for existing conditions is implemented within one signal cycle. Any long-term traffic pattern changes and short-term variations of traffic conditions can be automatically accommodated by this software. ATCS7 requires a central control system and infrastructure similar to that of the Los Angeles ATSAC System

Smart Transit Priority Manager (STPM)7

The STPM7 program is a personal-computer based central control program designed to operate in conjunction with Model 2070 traffic signal controllers and the TPS7 software to manage all transit priority functions. This program: (1) monitors and tracks buses, (2) requests priority at signalized intersections along transit routes, and (3) records all bus travel times through the system and provide passengers with bus arrival times at selected bus stops (via variable message signs). This program provides both a text-based and graphical-based user interface which allows the signal system operator and the transit operator to monitor and control their respective systems. The STPM7 requires a bus detection infrastructure and central control system similar to the Los Angeles ATSAC System.

Transit Priority System (TPS)7

TPS7 program is specifically designed to operate within Model 2070 controllers in conjunction with the Traffic Signal Control Program (TSCP)7 to provide transit priority functions in addition to traffic signal control. The program expands the Model 2070 controller=s capabilities to include specific priority for buses and emergency vehicles at signalized intersections. Stay tuned for additional information about the products, distribution process, and fee structure.

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TRAINING OPPORTUNITIES

Highway Capacity Analysis

Sept 17-18, 2003	**Denver, CO**
Oct 1-3, 2003	**Destin, FL**

Lectures on the applications prescribed in the 2000 Highway Capacity Manual (HCM2000)™ procedures including Signalized and Unsignalized Intersections; Multilane, Freeways, Weaving, Ramps and Freeway Facilities; and notes on Urban Streets, TwoLane and Transit.   (2.0 CEUs)

Day 1 / 8:00 - 5:00
Registration and Introductions
Introduction to Highway Capacity Manual (HCM2000)
Introduction to Highway Capacity Software (HCS2000)
Principles of Capacity Signalized Intersections

Day 2 / 8:00 - 5:00
Signalized Intersections(Continued)
Unsignalized Intersections
Notes on Urban Streets

Day 3 / 8:00 - 5:00
Basic Freeway Segments
Ramps and Ramp Junctions
Weaving Areas
Notes on TwoLane
Summary and Evaluation
Breaks provided with lunch on your own

OBJECTIVES
This Highway Capacity Analysis Seminar will provide lectures and software demonstrations on the application of several Highway Capacity Manual (HCM2000) procedures. The procedures to be covered represent those updated in the new version of the HCM including detailed information on HCM2000, published by TRB. Release 4 of the Highway Capacity Software (HCS2000) implements the procedures defined in the HCM2000 in a Windows 95/98/00/NT/XP interface. Each lecture will be followed with a software demonstration using the HCS module applying the HCM procedures. A comprehensive workbook will be provided with the course.

Now AVAILABLE! PASSER® V-03, Version 1.0

The Texas Transportation Institute (TTI) is pleased to announce the release of PASSER V for developing timings to coordinate signals along arterials. PASSER V provides a wide variety of simulation, analysis, and optimization technologies under a friendly graphic user interface.

PASSER V's user interface allows a user to simultaneously open up to five data files, each of which may contain data for multiple arterials or networks. Other key features of the program interface include: easy data entry using a combination of drawing functions and tabular forms, functions to define and analyze/optimize linear signal sub-systems, a graphic time-space diagram that provides for manual offset adjustments, and functions for printing hard copies of reports and/or saving results in formats that can be read by popular word processors and spreadsheets.

PASSER V uses HCM methodology for calculating timings for individual signals and for the analysis of isolated signals. It contains a new mesoscopic simulation model to assess the performance of linear signal systems. This model is similar to the step-based model in TRANSYT 7F. In addition, the program provides the several tools for the optimization and analysis of signal systems. These include PASSER II tool, PASSER III tool, a GA-Based tool, a Volume Analysis tool, and a Delay/Cycle Analysis tool. Brief descriptions of these tools are provided below.
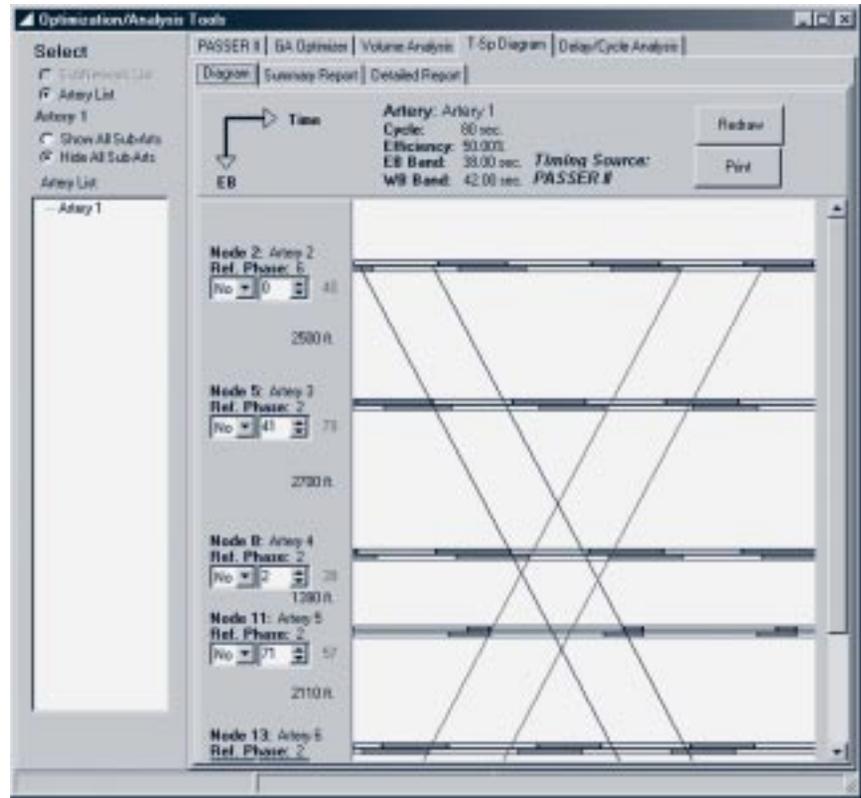
- The PASSER II tool uses an enhanced version of the interface minimization (progression optimization) algorithm used by the PASSER II program. This tool provides options to maximize one-way or two-way-volume-weighted progression. In addition, it provides an option for automatically tuning offsets to minimize delay without affecting progression. This process is known as bandwidth-constrained delay minimization.
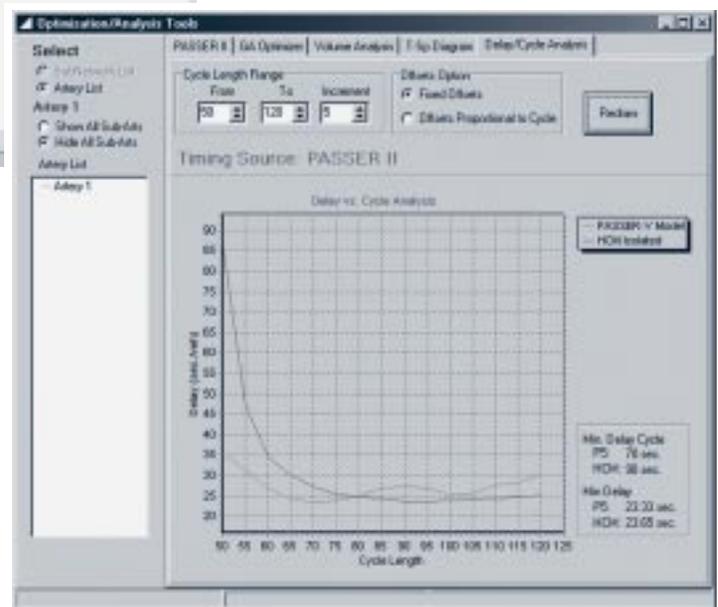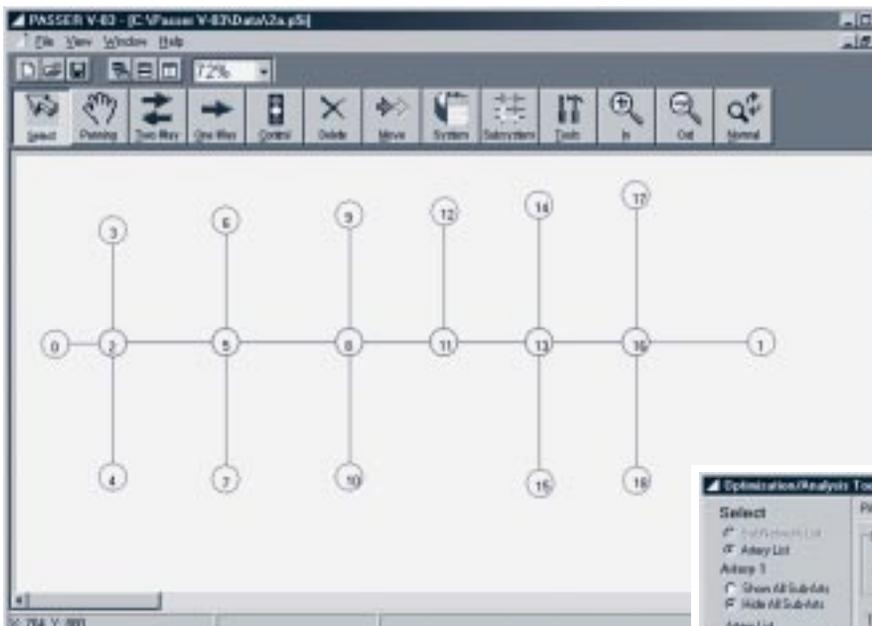
• The PASSER III tool is for optimizing the operation of diamond interchanges using a single traffic controller (Texas diamond operation). Similar to the PASSER III program, it optimizes timings to minimize delay.

• The GA-Based tool uses a genetic algorithm to develop timings for providing minimum delay or maximum progression. This tool can be used for coordinating diamond interchanges and adjacent signal on the arterial.

• The Volume Analysis tool analyzes green splits for a range of cycle lengths to identify potential bottleneck in the system.

• The Delay/Cycle Analysis tool provides a capability to analyze effects of changes in cycle length on the operation of a system of signals.

In summary, PASSER V is a powerful tool for use by traffic engineering professionals. For further information about the program, updates, and frequently asked questions, please see: http://ttiso ftware.tamu.edu. A demonstration version of the program is also available at this Web site.

PASSER V-03 (#P503) by Texas Transportation Institute is available from **Mc*Trans*** at LOS 1 for $600.

New Developments at Mc*Trans*

New Software Features!

McTrans has been hard at work developing significant upgrades to its top software packages, HCS2000 and TRANSYT-7F. With many new features, these two upgrades are scheduled for release in January 2004 (TRANSYT-7F) and mid-2004 (HCS2000). Below is a brief summary of some of the new features that are planned. Take a look…

HCS2000, Release 4.5

After many years of keeping up with changes to the Highway Capacity Manual (HCM) and moving through operating systems (from DOS to Windows 95 to XP), HCS2000 is going to get some features that will add to this already efficient and easy-to-use package.

Multiple Time Periods – Release 4.5 will be capable of analyzing multiple time periods in the Signals module, allowing for the passing of residual queues from one period to initial queues in the next. This will facilitate taking full advantage of the rationale behind the third term of the delay equation (d3) to quantify the building and dissipating of queues in oversaturated conditions.

Signal Warrant Analysis – HCS2000 will now be able to analyze the MUTCD signal warrants. This new module will provide a new screen for coding the additional data necessary to perform the warrant analysis to produce a report detailing which warrants are met and at what levels.

Importing Count Data – To facilitate the Multiple Period and Signal Warrant Analyses, importing of count data from external sources is planned. Using the XML structure, HCS2000 will offer importing capability for files produced by count board software for which an output file format is provided.

Batch Processing – Following on the efficiency provided by importing multiple period count data, batch processing can further automate the analysis of multiple time periods and even multiple intersections. A command-line will include input and output XML files arguments to allow the processing a multiple analyses in one run.

Freeway Facilities – The research-level spreadsheet used to develop HCM Chapter 22 and graciously provided by the developers (Nagui Rouphail and Brian Eads), will be replaced with an HCS2000-style module. Providing the same user-friendly interface as in other HCS2000 modules, the Freeway Facilities module will analyze multiple segments over multiple time periods, including oversaturated flow conditions.

Preset Phasing – A new feature planned for both HCS2000 and TRANSYT-7F, this will allow users an option of selecting from a list of preset phasing sequences. Choosing from leading lefts, directional leads, simple two-phase, full eight-phase overlaps, etc., this initial phasing design will circumvent the need for a significant amount of data coding for most applications.

Beta Testers Needed

The beta tests for both TRANSYT-7F and HCS2000 are planned for Fall 2003. Beta testers must be registered users of the current release to test either program. Testers who submit significant problem reports during the beta test period will be eligible to receive the upgrade at no charge.

To receive the free upgrade, testers would be expected to apply the beta version in a similar manner as they would apply the real release version on a real-world project, over an extended period of time. Problem reports would be submitted at least once every two weeks, to allow for timely software maintenance.

To apply, please access the form by following the link on the McTrans web site to Highway Capacity Software or TRANSYT-7F web pages (below).

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TRANSYT-7F, Release 10

Multi-Period Optimization – TRANSYT-7F is uniquely qualified for optimizing oversaturated conditions, and the software will offer additional modeling firepower in the form of multi-period optimization. This will allow the engineer to obtain timing plans explicitly designed to combat residual queues and residual delays, across multiple time periods with varying traffic volume demands.

"Profile View" Static Graphics – The new Profile View screen in release 10 will automate the concept of Spyglass originally introduced in release 9. This screen will allow the user to view various histograms and flow profiles for a graphical illustration of simulation results.

Time Space Diagram Screen – The Progression Diagram screen will allow the user to view a graphical representation of signal progression along the major street. The screen can be customized to display progression bands in the forward or reverse directions (or both), and the time distance scale can be customized to display any number of intersections on the screen at a time.

GUI for Multi-Period Simulation – The TRANSYT-7F graphical user interface will automatically display the input and output data associated with whatever time period is currently selected by the user. Record type editing will no longer be needed for multi-period analysis.

Bitmap Background Scaling & Origin –Scaling will allow the TRANSYT-7F Map View user to zoom or magnify the bitmap image by a certain percentage. Bitmap origin definition will allow the user to customize placement of the lower left hand corner of the bitmap.

CORSIM Intersection Delay & LOS – The CORSIM Processor will be enhanced to compute and report control delay and level of service (LOS) at each signalized intersection within the network.

Hardcopy Users Guide – Release 10 will have a complete and updated hardcopy users guide, unlike release 9, for which only the electronic help system was updated. Note that the electronic help system will be updated as well.

NEW products

FSPTRAK™

Dowling Associates, Inc. announces the release of FSPTRAK, a computer script for IBM PC compatible computers that enables the Pendragon Software, to facilitate the motorist service data collection of a Freeway Service Patrol (FSP) program. FSPTRAK allows users to efficiently:

- Collect the FSP data using Personal Digital Assistant handheld devices (PDA) and generate the electronic database automatically;
- Eliminate the paper survey form and the manually data entry process;
- Allow managers of FSP programs to inspect the quality of the data collection (i.e. hidden Timestamp function).

Additionally, FSPTRAK can be customized to fit the special interests of different FSP programs in all states.

FSPTRAK (#FSPTRAK) by Dowling Associates is available from **McTrans** at LOS 7 for $300.

EZplot

EZplot Traffic Collision Diagram makes it easy to plot traffic collision diagrams using ready-made templates for both highways and intersections. Highway templates are provided for 2 lane highways up to 8 lane freeways for both curve and tangent alignments. Intersection templates are provided for 25 different configurations including left turn channelization and two way left turn lanes. Collision data is obtained from traffic collision reports and is manually plotted by using the appropriate command buttons in the program. Weather conditions, lighting data, the type of object hit data and driver impairment information may also be input along with various types of pavement delineation and markings. 31 different collision symbols have been included. The highway and intersection templates may be easily modified as needed to fit differing geometric or striping configurations. The advantages to this program are its ease of use and minimal training to operate.

EZPLOT (#EZPLOT) by Robert Nunn is available from **McTrans** at LOS 6 for $150.

Traffic Tracker

Traffic Tracker is a software tool that enables you to easily collect and analyze time-based traffic flow data. The program allows you to design a data collection screen that is a graphical representation of the location where you are collecting data. During the data collection process, you press a number or letter key (called a trigger) on the keyboard each time a particular traffic event occurs. Each time you press a trigger key, the current time is recorded in a data file. The key that you pressed is also recorded in the data file, so that you can distinguish between separate events. Once you have collected data using Traffic Tracker, you can analyze the data in a variety of ways within the program, or you can export the data to a program like Excel or Access for further analysis.

Traffic Tracker consists of three components. You design data collection screens (called Environments) in the Environment Editor. You use these screens to collect data using the Data Collector. You then analyze the data using the Analysis Package.

Traffic Tracker is the direct descendant of a DOS-based program developed by NIATT in 1991 called Traffic Data Input Program (TDIP).

Traffic Tracker (#TTRAK) by NIATT, University of Idaho is available from **McTrans** at LOS 3 for $50.

Update Watch

Package	Version	Status	Target	Distribution
HCS2000	4.1d	Complete	Available	Patch Download
TRANSYT-7F	9.7	Complete	Available	Patch Download
TSIS	5.1	Complete	Available	Sent to Registered users
IDAS	2.2	Complete	Available	Sent to Registered users
PASSER™II-02	1.0	Complete	Available	Registered users may upgrade
PASSER™V-03	1.0	Complete	Available	see web site
TURBO	2.0	Complete	Available	Registered users may upgrade
TNM	2.1	Complete	Available	Registered users may upgrade

DID YOU KNOW?

HCS2000

After the HCM 2000 was published, the Highway Capacity Committee approved additional corrections and improvements to the two-way stop control (TWSC) unsignalized procedures. The amended procedures involved estimating the effects of flared right-turn approaches and upstream signals on the analysis. Version 4.1c of HCS2000 implements these HCM 2000 updates.

The default value for the extension of effective green (e), where vehicles tend to continue to enter the intersection at the beginning of the yellow, is 2 seconds. Users may consider a longer value under congested conditions or where much longer yellow plus all-red times are used.

Average field-measured values of cycle length and green time should be used in the analysis of actuated phasing. The Actuated Estimation feature in HCS2000 estimates these actuated phase lengths from the minimum and maximum green times and some detector information (based on HCM 2000 Chapter 16 Appendix B) when field data are not available.

CORSIM

Although this is not realistic and recommended for most areas, FRESIM is capable of being calibrated to simulate freeway capacities above 3000 vehicles per lane per hour. A sample input file (called "Max Capacity") is available on the McTrans web site, to demonstrate this technique.

The sample case CORSIM City (from TSIS 5.1) includes a toll booth with two separate facilities in parallel. One uses a yield sign and the other uses a stop sign, but they could also use pre-timed signals with different timing plans. There is also a freeway link that bypasses the toll booth, to represent prepay systems. Other users have simulated toll booths with a freeway feeding into a small NETSIM section that had several parallel links. Each link had a fixed-time signal with short cycle times that represented the delays associated with the booth operation. The freeway resumed on the other side of the NETSIM section.

Auxiliary lanes can be used to augment the number of through freeway (FRESIM) lanes. In the CORSIM City example case from TSIS 5.1, there is a section of freeway in that network that has 8 lanes. There needs to be an on-ramp to get the auxiliary lane started and an off-ramp where it terminates, which is why the sample case has both of those. However, there can be many "basic freeway segment" links in the middle, having 8 through lanes and no ramp connections. In addition to the CORSIM City example case that is distributed with TSIS 5.1, another sample input file (called "Full Aux") is available on the McTrans web site, to demonstrate this technique.

TRANSYT-7F

"Mid-block source volume" is a significant input parameter in TRANSYT-7F, because non-progressed flow is not assumed to be uniform flow. Instead, progressed feeding flows will be factored up or down by the traffic model to exactly match the downstream flow, in the absence of any coded mid-block source volume. This differs from "external links," at which all volume is assumed to be uniform flow.

TRANSYT-7F can report arterial performance statistics if route summary reports are requested within the input file, and if one or more progression routes have been defined within the input file. Some of the sample input and output files on the McTrans web site demonstrate this.

The optimization process takes into account the reduced traffic flows due to queue spillback, unless the chosen performance index (PI) is PROS-only. All other PI's (besides PROS-only) consider delay, or throughput, or both. When maximizing throughput, the timing plan that maximizes the (reduced) traffic flows is recommended as optimal. When minimizing delay, the timing plan that maximizes the (reduced) capacity of each movement is recommended as optimal, because lower capacities produce higher delay estimates.

Information Access

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Debbie Escalera Order Processing	242	Order & shipment status, Software registration & invoices
David Hale Technical Assistant	240	Traffic software technical assistance TRANSYT-7F, PASSER, CORSIM
Nebiyu Tiruneh Technical Assistant	238	Hydraulic software technical assistance HYDRAIN, HEC, HY-8, WSPRO

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You Can Now Reach McTrans Members for Equipment, Materials and Services

The McTrans Center at the University of Florida has been growing a very targeted membership in the transportation profession for over 15 years as THE source for traffic engineering, highway design and transportation planning software. Begun by the Federal Highway Administration (FHWA) in 1986 and self-supporting since 1988, McTrans has grown into a full-service software development, distribution and support center, recognized all over the world.

With recent advancements in ITS and other technologies, McTrans will begin assisting our membership by providing a mechanism to introduce related equipment, materials and services information. Transportation professionals who utilize analysis software are using other tools and beginning to implement a variety of installations, including:

_ Consulting Services	_ Traffic Count Boards	_ GPS/GIS Equipment/Systems
_ Signal Systems	_ Traffic Counting Tubes	_ Detector Amplifiers/Loops
_ Controller Cabinets	_ Video Surveillance	_ Sign Materials/Equipment
_ Signal Controllers	_ DMI Equipment	_ Marking Materials/Equipment
_ Signal Heads/Bulbs	_ Speed Radar Guns	_ Street Lighting Equipment
_ Signal Poles/Cables	_ VMS/CMS Equipment	_ Toll & Parking Systems

McTrans membership of over 25,000 includes professionals in:

Every State DOT → (Traffic Operations, Design, Planning and Administration)
Hundreds of Cities, Counties & MPOs →(Engineers, Technicians and Planners)
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We now offer an Equipment, Materials and Services insert to the quarterly newsletter.

Contact us about including your product or service to reach our members!

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Calendar

Training

Highway Capacity Analysis Software McTrans (1-800) 226-1013 ext. 229 Order Online from McTrans	Sept 17-19 Oct 1-3	Denver Co. Destin, FL
Designing Optimized Traffic Signals and Systems Using **TEAPAC, PASSER, TRANSYT and CORSIM** Strong Concepts and Louisiana State University (847) 564-0386	Oct 22-24	New Orleans, LA
Designing Optimized Traffic Signals and Systems Using **TEAPAC, PASSER, TRANSYT and CORSIM** Strong Concepts and University of Wisconsin (847) 564-0386	Dec 3-5	Philadelphia, PA
Designing Optimized Traffic Signals and Systems Using **TEAPAC, PASSER, TRANSYT and CORSIM** Strong Concepts and University of Wisconsin (847) 564-0386	Jan 26-28	Las Vegas, NV

Conferences

83rd Transportation Research Board Annual Meeting http://www4.trb.org/trb/annual.nsf	Jan 11-15	Washington, DC

NEED Training?

- **Highway Capacity Analysis (HCS2000)**
- **TRANSYT-7F Release 9**
- **CORSIM (TSIS 5.1) for Beginners**

Contact McTrans to set up a training course in your area, or read about currently scheduled training courses at:
http://mctrans.ce.ufl. edu/training/

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