

TSIS 4.3 to be released this summer

by Brad Mears, Sr. Software Engineer, ITT Industries, Inc., Systems Division

Early this summer, FHWA will release TSIS 4.3 for distribution. The latest release of TSIS (the Traffic Software Integrated System) includes changes to CORSIM that make it much more realistic.

TSIS (rhymes with "pieces") is a software package that includes the CORSIM microscopic traffic simulation and a suite of supporting tools. Originally developed for FHWA use, CORSIM provides the engineer with a microscopic simulation that can model surface streets and freeways in over-saturated conditions. Among its many features are ramp-meters, parking zones, bus operation, actuated signal control and incidents.

Along with CORSIM, TSIS includes a graphical animation tool called TRAFVU and utility programs for the CORSIM user. In addition to acting as the launching pad for CORSIM and

TRAFVU, TSIS allows the user to install his or her own set of tools. These can then be launched from the same toolbar as CORSIM or TRAFVU.

New Features

This release of TSIS features significant improvements in vehicle movement logic. Specifically, lane-changing and car-following logic under congested conditions on short links has been enhanced considerably. The way vehicles behave as they approach a yield sign and cross the intersection has been adjusted to model real-world performance more accurately. Enhancements have been also made in Spillback modeling and MOE calculation. In addition, the ability of CORSIM to model larger networks has been expanded.

Earlier versions of CORSIM used a feature called "micro-nodes" to make intersection behavior more accurate.

This option could only be used at a limited number of intersections and was processing-intensive. The systemic improvements to vehicle behavior in TSIS 4.3 have made micro-nodes not only unnecessary but counter-productive. For that reason, the micro-node logic has been disabled. This change should make it easier to use CORSIM and make system-wide results more accurate.

The ramp-metering feature has been revised to make it more flexible and easier to use. Metering based on occupancy and modeling two vehicles per meter green are newly incorporated capabilities. Originally developed to support an FHWA research effort, the enhanced ramp-metering feature is now available for the practicing engineer using CORSIM. **▶page two**

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Y2K



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Transportation Research Center

TSIS 4.3 Will Provide Enhanced, Real-World Modeling

Just like Hollywood movie studios, TSIS is now showing previews! In a future version of TSIS, CORSIM will model HOV lanes. In TSIS 4.3, we are showing off some of the early work on this feature. If you are interested in modeling HOV lanes with CORSIM, this is your chance. Take a look at the preview and give us your comments.

Improvements have been made in TRAFVU to display smoother, more realistic vehicle turning trajectories at intersections. As vehicles turn from one link to another, they follow a smooth-curve trajectory. This enhancement removes the "lane jumping" that previous versions displayed.

Previous versions of TSIS were all released on floppy disk. With each version, the number of disks grew. Starting with version 4.3, TSIS will be distributed on CD-ROM. Besides making installation easier, this allows us to include more sample files and documentation.

On-line Resources

To provide a single, comprehensive resource for TSIS users, FHWA operates a website dedicated to TSIS. The site, www.fhwa-tsis.com, has recently been redesigned to make it easier to find topics of interest. It now includes a user discussion group, a downloads area and information on receiving technical support.

The user discussion group is a web-based forum where users can exchange questions, answers, tips and hints. Anyone interested in TSIS is encouraged to submit a message. Participants include people completely new to TSIS as well as CORSIM "power-users".

The downloads area on the website is where to look for sample TRF files and companion software. For example, one of the things you will find is the CORSIM Run-Time Extension Supplement. This software allows advanced users with programming skill to interface their own code to CORSIM. This package is a spin-off from research conducted for FHWA. Since the RTE package is unsupported, McTrans can't provide technical support or answer any questions about it.

Technical Support

Despite our hard work and good intentions, there are times when TSIS users have problems and need technical support. There has been some confusion concerning this issue and this is probably a good chance to remind everyone how this works.

When you purchase TSIS through McTrans, you should always send a support request through the McTrans technical support group. They have been trained to handle most problems and can provide quick turn-around to your common problems. If they are unable to resolve the problem, they will forward it to FHWA and the FHWA contractor that maintains TSIS & CORSIM.

Future Plans

On the horizon for TSIS is version 5.0, which delivers some exciting new capabilities for the end-user. From the moment you start it up, TSIS 5.0 shows an entirely new face. The user interface has been redesigned to make it easier to manage multiple projects and multiple test cases within projects. To manage projects and test cases, the user manipulates a tree structure similar to the one found in the Windows Explorer program. This view allows you to collect test cases, results from multiple runs and animation files all in one place.

With the new interface is the long-awaited TSIS graphical editor for creating CORSIM input files. Using a graphical, map-like display, the user can create and edit TRF files interactively.

TSIS 5.0 also addresses one of the problems that frequent users have struggled with in previous versions – how to perform multiple runs and collect results from those runs. As with any stochastic simulation, CORSIM should be run multiple times and the results analyzed statistically. In earlier versions, there was no practical way for the user to do this. TSIS 5.0 introduces a script language where the user can create custom scripts that can automate any action the user can perform manually.

Y2K

Traffic Signal Devices and Systems on the State Highway System Status Report as of March 5, 1999

by Lap Hoang, P.E., Deputy State Traffic Operations Engineer, Florida Department of Transportation

The Florida Department of Transportation (FDOT) Traffic Engineering Office has a program in effect to insure that all traffic signal devices and traffic signal systems will be Year 2000 compliant before the turn of the century on January 1, 2000.

All controllers are hardwired to prevent conflicting traffic movements, therefore in a worse case the signals will provide safe movement for vehicles. If there were to be a failure of a master controller or computer, the signals would either provide a fixed timing pattern, or flashing mode of operation.

A letter was sent to the 26 manufacturers of traffic control devices having equipment on FDOT's Approved Product List (APL) on February 12, 1998. The letter requested them to provide us written confirmation on year 2000 compliance of their devices by June 30, 1998. Also, by the same date, those manufacturers having closed loop systems in operation in Florida were asked to certify that their systems were Y2K compliant.

On April 23, 1998, a second notice was sent to the 16 manufacturers who had not responded.

Twenty-three of the 26 (88%) manufacturers contacted have responded. Seventeen of the 23 who responded certified they are fully Y2K compliant. The remaining six have some items that are not Y2K compliant. All these problems can be fixed by replacing firmware, software, or by following programming instructions, all of which are available from the manufacturer. These fixes, along with specific instructions for obtaining fixes, will be sent to District Traffic Operations Engineers (DTOE's). They will be asked to provide this information to local agencies in their districts and to request locals to

apply the fixes to all applicable equipment in the field and in their inventory.

A third notice was sent by certified mail to the three manufacturers who have not responded. This notice advised them that their equipment is under a Notice of Corrective Action. We did not receive a written reply, and their equipment was suspended effective January 19, 1999, by Notice of Suspension, thus making it ineligible for bid, sale, or use on any state project for the 30 day suspension period. No response was received by February 19, 1999. Their certification will be revoked by letter for a minimum of one year. This equipment is being researched in our files to determine if it is date sensitive. If found to be so, the DTOE's will be notified to alert the locals.

We are determining the critical information on micro-computers in the field which are running closed loop traffic signal systems. Information on checking these computers for Y2K compliance will be distributed to the DTOE's so they can give it to the locals who will be asked to apply the fixes. If the computers can not be fixed, they will be scheduled to be replaced.

In addition, all District Traffic Operations Engineers were asked to determine Year 2000 compliance of Urban Traffic Control Systems in their districts. These systems are in various stages of inspection and correction.

To reach all city and county traffic engineering operations, the FDOT Traffic Engineering Office placed an article in the Florida Section, Institute of Transportation Engineers, FLITE publication in February 1998. We asked that they review their operations for Year 2000 compliancy.

Announcements

WORKSHOP

Models in Support of
ATMS(Advanced
Traffic
Management
Systems)

May 16-19, 1999

FAA Center for Management
Development, Palm Coast,
FL

Cost: \$500

Includes registration, room, meals,
socials and workshop proceedings
Co-sponsored by the Federal
Highway Administration and the Uni-
versity of Florida Transportation Re-
search Center (McTrans)**Philosophy** To bring together the
nation's foremost experts to discuss
and advance the state-of-knowledge
in traffic modeling software; its sup-
port of, and integration with ATMS.**Purpose** Assess and critique the
current status of traffic software sys-
tems; provide feedback to sponsors
and developers, particularly to the
federal Highway Administration
(FHWA), concerning the systems
they are developing.**Focus** Traffic simulation, signal opti-
mization, and routing and dynamic
assignment. The workshop will
include presentations on the state of
the art and breakout workshops onsubjects such as simulation, fixed-
time and real-time traffic-responsive
control, traffic assignment, support
systems and deployment.**Attendance is by Invitation** and is
limited to about 70 preinvited and 30
additional participants representing
model developers, users,
researchers, integrators and
sponsoring agencies. To apply for an
invitation, please send a letter
including a brief summary of how
you can contribute to and/or gain
from, participation in this specialized
workshop. If you wish to speak on
new or topical material, please send
a summary.**A very limited number of
scholarships may be available for
public-sector users.**To apply for an invitation or for more
information, write immediately:ATMS Modeling Workshop
McTrans Center
University of Florida
PO Box 116585
Gainesville, FL 32611-6585
Fax: (352) 392-3224

S
presented by

E
McTrans

M
co-sponsored

I
by the Central

N
Transportation

A
Planning Staff

R
(CTPS) Boston, MA

Highway Capacity Analysis

Boston, MA

including procedures in the

1997 Update to the Highway Capacity Manual

with software demonstrations using the

Highway Capacity Software (Release 3 for Windows 95/NT)

May 12-14, 1999

Course Agenda

(May 12) 9:00-5:00

Registration and Introductions

Introduction to the Highway Capacity Manual (HCM)

Principals of Capacity (Lecture)

Basic Freeway Segments (Lecture & HCS Demo)

Multilane Highways (Lecture & HCS Demo)

(May 13) 9:00-5:00

Weaving Areas (Lecture & HCS Demo)

Ramps and Ramp Junctions (Lecture & HCS Demo)

Unsignalized Intersections (Lecture & HCS Demo)

Signalized Intersections (Lecture)

(May 14) 9:00-12:00

Signalized Intersections (Lecture & HCS Demo)

Arterial Streets (Lecture & HCS Demo)

Summary and Evaluation (Lecture & HCS)

Objectives This Highway Capacity
Analysis Seminar will provide lectures
and software demonstrations on the ap-
plication of several Highway Capacity
Manual (HCM) procedures. The
procedures to be covered represent
those updated in the current version of
the HCM including Chapters 3, 4, 5, 7, 9,
10 and 11, with detailed information on
the 1997 Update to the HCM, scheduled
to be published by TRB in July, 1998.
Release 3 of the Highway Capacity Soft-
ware (HCS-3), implements the
procedures defined in the HCM in a Win-
dows 95/NT interface. Each lecture will
be followed by a demonstration using
the HCS module applying the HCM pro-
cedures. A comprehensive workbook
will be provided with the course.

new products

DELAYE Enhanced 1.2

DELAYE Enhanced is a Windows (3.1 and higher) program by Martin Knopp that allows engineers and planners to quickly estimate freeway incident congestion based on an old Lotus macro by Juan Morales. Through an easy to use interface, an engineer simply enters basic traffic flow and incident information and is provided an estimate within seconds on various user impacts. Outputs include total delay, time to normal flow, maximum queue size and length, maximum delay per vehicle, average delay per vehicle, excess fuel loss, idle emissions (CO, HC, and Nox), and financial loss (value of time & fuel loss). Output can be English or metric and is also plotted graphically. Calculation factors such as value of time, price of fuel, or emissions are adjustable by the engineer, and the input data can be saved for future use. The tool has been used to estimate user costs for crashes, incident management programs, maintenance operations, and construction lane rental scenarios.

DELAYE (#DELAYE) by Martin Knopp is available at LOS 6 for \$50.

Engineering Geometry Assistant

Use EGA to solve the day-to-day geometric problems that engineers regularly encounter. Speed and ease-of-use are optimized, with no obscure COGO commands or dozens of tool icons to remember. Sketch a design graphically, then key-in the exact values you want. EGA lets you automate solutions to geometric problems in the same manner that spreadsheets handle your design calculations. In EGA, elements remember how they were created. Locate a point at the intersection of two lines, and it will adjust if either line changes. Elements can even annotate themselves. And since items retain their construction methods, you can copy and past entire design segments, like ramps or even bridges, into a new design, re-connecting their relationships to new alignments.

Exchange data with other Windows applications. Paste a traverse into Microsoft Word, along with a scaled, annotated drawing. Export your design to AutoCAD and MicroStation. Prepare a preliminary engineering layout, then copy/paste it into PowerPoint. You can create a scaled design over a scanned aerial photograph, complete with stationing and curve data. Draw an alignment and watch stationing and curve data adjust as the mouse moves. Document your design with smart labels that automatically annotate your design, including area and perimeter for closed paths. Create parallels and trim them. Change units whenever you want. EGA comes with a 120-page User's Guide, 25-page Quick Start, and complete On-line Help. Minor updates are free via Internet. Purchasing an EGA license includes the next major release of the software too.

Engineering Geometry Assistant (#EGA) by Visual Communication Technologies, Inc. is available at LOS 7 for \$350.

HYTB

HYTB is a new document that consists of HEC-14 & HEC-15. It does not include any software. HY-TB software will no longer be sold. The HEC-12 document was replaced by HY22 and is sold under that title.

HYTB (#HYTB.D) by FHWA is available for \$20.

SIGNAL97/TEAPAC

SIGNAL97/TEAPAC (#TPCS97.1) is a new program that implements the capacity analysis techniques of the 1997 update to the Highway Capacity Manual for signalized intersections (Chapter 9). Like its popular predecessors, SIGNAL94 and SIGNAL85, SIGNAL97 adds an optimization option in Level 2 of the program (#TPCS97.2) that produces the best possible capacity analysis for the given conditions, including optimized signal timings and optimized signal phasing. This optimization option allows the operations method of the capacity analysis to be used quickly and effectively for all aspects of signal analyses, including signal timing, planning studies, impact analysis and geometric design. SIGNAL97 is a faithful implementation of the Chapter 9 procedures which was used by the TRB Highway Capacity Signals Subcommittee to assist in the generation of the example problems in the updated Manual. SIGNAL97 produces all of the new worksheets of the 97HCM update including the new oversaturated delay techniques,

as well as other important computations such as queue length and service flow rates. SIGNAL97 uses data files which are both upwards and downwards compatible with SIGNAL94, and like SIGNAL94, is integrated with the other TEAPAC programs such as SITE (impact studies), TURNS (turn count analysis), WARRANTS (MUTCD warrant analysis), PREPASSR (pre/post-processor for PASSER-II), PRETRANSYT (pre/post-processor for TRANSYT-7F) and PRENETSIM (pre/post-processor for CORSIM). Using these programs, a comprehensive traffic study can be completed using a single database of information shared among all of the TEAPAC programs. Both inputs to and results from SIGNAL97 can be used by these other TEAPAC programs, and SIGNAL97's optimized results can be exported to HCS. All of these programs are available from **McTrans**.

SIGNAL97 is now available for several Windows platforms and for DOS. The Windows versions have all of the features noted above (found in the DOS version), plus the unique TEAPAC Visual Mode which provides an intuitive, graphical user interface as a true Windows program. Windows versions also provide a complete and fully-indexed on-line user guide and context-sensitive help. Data files are full interchangeable with the DOS version of SIGNAL97, as well as all the other TEAPAC programs, either Windows or DOS. The .W95 versions will run on any of the Windows 95, Windows 98 or Windows NT platforms; the .WIN versions will run on the Windows 3.x platform. All platforms are licensed together and delivered on a single CD-ROM.

The Optimization version of SIGNAL97/TEAPAC Ver 1.00 from Strong Concepts is available from **McTrans** for \$595 (#TPCS97.2.W95, #TPCS97.2.WIN and #TPCS97.2). The Capacity-Analysis-Only version of SIGNAL97/TEAPAC is available at LOS 7 for \$295 (#TPCS97.1.W95, #TPCS97.1.WIN and #TPCS97.1). These products include a complete Tutorial/Reference Manual. SIGNAL97 is also available as part of the TEAPAC Traffic Engineering Package (#TPC*.1), the TEAPAC Signal Timing Analysis Package (#TPC*.2) and the TEAPAC Site Impact Analysis Package (#TPC*.3) in place of the SIGNAL94 program. Educational and demonstration versions are available. Registered licensees of SIGNAL94/TEAPAC may upgrade to SIGNAL97 directly from Strong Concepts.

SIMS

The Sign Inventory Management System can help governmental entities effectively maintain traffic signs. SIMS is a sound, comprehensive sign management system which contains the following components: Inventory Condition Assessment Repair Decisions Priority Analysis Initiate Repair Action Record Actions Parts Management Agencies that fulfill these purposes will have an effective sign maintenance program and will record information pertinent to tort liability concerns. Motorists rely on traffic signs to regulate, warn, and guide themselves and others. Courts have consistently held governmental entities responsible for adequate placement and maintenance of traffic signs. Governmental entities can delegate only the task of traffic sign maintenance to its highway department. The entity is ultimately responsible for adequate traffic signs. SIMS (#SIMS) by the University of New Hampshire is available at LOS 2 for \$75.

Updated Products

Advanced General Network Editor, Version 6.0

The 32-bit major upgrade of the General Network Editor was released in early November by AJH Associates for Windows 95, 98, and NT 4. Version 6.0 has been ported to Delphi 3 and has undergone a significant expansion of capabilities. More than 30 major enhancements have been added, including the ability to: Have shape points on links; underlay up to 10 JPEG and Windows metafile images, which can be placed behind networks (networks can be drawn on the images), edited and saved; create different "views" of the same network; simultaneously open several networks; better control of variable node sizes and link widths; produce nodes and links with Update, eliminating the need for the TOPO utility; plot the network to a file in WMF or EMF metafile formats for importing into other software and for preparing background images for other networks. Other improvements streamline the use of dialog boxes and Calculate, and improve efficiency for the user, especially in combination with the Quick Response System II. A revised reference manual, expanded on-screen Help, and extensive use of Hint boxes add to the improved software package. Advanced GNE, version 6.0 (#GNE.WIN) by AJH Associates is available at LOS 7 for \$245.

ITRAF Version 2.7

ITRAF is an object-oriented graphical user interface for the PC Windows environment that was designed at Oak Ridge National Laboratory to simplify the TRAF (CORSIM and CORFLO) models input data process. Based on a link-node concept, ITRAF allows the user to graphically construct the network and input most of the required data by clicking buttons or dragging icons. ITRAF Version 2.7 includes all fixes to the problems reported by the users and provides full support to the CORSIM and CORFLO models which are currently available. That is, networks for the NETSIM, FRESIM, NETFLO LEVEL I, NETFLO LEVEL II, and FREFLO simulation models, as well as traffic assignment can be created and edited using ITRAF. The user can graphically input or modify all the information related to the geometry of the simulated network including surface streets, freeway links, on-ramp and off-ramp links, intersections, bus stations, and bus routes. Operational and demand information such as traffic control settings, ramp control metering, traffic volumes, turn percentages, parking activities, surface street and freeway incidents is also entered graphically. Because of its object-oriented basis, ITRAF creates these data structures as the network is being developed, assigning CORSIM and CORFLO default values to parameters and making guesses based on the topology of the network (such as the destination of the turning movements, for example). This reduces the effort in developing the database in two ways. First, the user no longer needs to deal with cumbersome data structures (e.g., 80-column data records), which are now created "behind the scenes" as he/she provides the geometric and traffic operational data graphically. And secondly, because ITRAF will anticipate in many instances the user's actions, thus reducing the number of steps to enter the data. ITRAF also provides extensive error checking, as well as other features (e.g., zoom, pan, scale and align options, network and dialog box printing, and special edit features such as copy, modify, and check) which contribute further in simplifying the data input effort. ITRAF 2.7 (#ITRAF) by FHWA is available at LOS 2 for \$75.

RSMS

The Road Surface Management System (RSMS) is an effective tool for road surface management. There are many benefits that can be derived from correctly using a rational, systematic method to manage the maintenance of your municipality's road surfaces with RSMS. Since most local agencies do not have adequate funding to support all the required maintenance and rehabilitation each year, prioritization of each candidate project is essential to ensure that the available funds are spent wisely. RSMS can be customized for each municipality. Each Town or City has a level of comfort with certain repair strategies. Flexibility built into the program allows big or small communities to build RSMS to fit their own needs. Annual budgets can be developed logically, with a minimum amount of guesswork. Agencies can review information contained within pavement management reports, such as condition, costs, and needs of the network to determine consequences of their decisions. After the condition survey has been completed and all data entered into the computer, RSMS can numerically generate the overall condition of the network. This will served as a baseline to determine if the overall condition is improving from one year to the next. RSMS generates simple, customized reports that are easy to read and that can be reviewed by non-technical personnel with a minimal amount of interpretation. The reports include all the input data such as inventory and distress survey results, as well as projected repairs and budget reports. RSMS (#RSMS) by University of New Hampshire is available at LOS 2 for \$75.

SIDRA 5.2

SIDRA 5.2 is the latest upgrade version of SIDRA for Windows, which has been designed to run under Microsoft Windows 3.1, 95, 98 and NT. A summary of the new features of SIDRA 5.2 is given below.

- Sensitivity analysis by parameter scaling for optimization, evaluation and geometric design purposes (with performance graphs similar to variable flow scale graphs). Parameters that can be varied: maximum green time for actuated signals, roundabout island and inscribed diameter, lane width and lane utilization ratio, follow-up headway for gap-acceptance analysis.
- HCM 97 Level Of Service definitions based on control delay (now more compatible with the general SIDRA method).
- HCM 97 roundabout capacity and level of service results based on the HCM 97 method for single-lane roundabouts.
- Alternative capacity models for roundabouts (old Australian NAAS-RA, German linear and gap-acceptance models).
- New HCM 97 gap-acceptance parameters for two-way stop sign control for general use.
- New HCM 97 delay equations for signalized intersections and two-way stop-sign control, and new HCM 97 capacity equation for two-way stop-sign control.
- Enhancements to SIDRA configuration utility.
- New text output tables and other output enhancements introduced, and various bugs fixed.
- Fully revised User Guide.

SIDRA 5.2 (#SIDRA) by Australian Road Research Board is available at LOS 6 for \$850.

The following products have been deleted:

EzSignals	Viggen Corp.
EzTransyt Plus 7.0	Viggen Corp.
EzVipass	Viggen Corp.
Evipass	Viggen Corp.
Corflo Cyberbook	Viggen Corp.
HISAFE	FHWA
PTRACK	FHWA

Update Watch

Package	Version	Status	Target	Distribution
HCS-3	3.1a	Complete	Available	Patch file download
TRANSYT-7F	8.1	Complete	Available	Registered users may upgrade
TRANSYT-7F	Win	Under development	Spring	Automatic to registered users
TSIS	4.3	Under development	Spring	Automatic to registered users

Calendar

Conferences**ITS America 9th Annual Meeting**

ITS America
Sandra Fitzgerald (202) 484-2902

Apr 19-22 Washington, D.C.

ITE 69th Annual Meeting

Institute of Transportation Engineers
(202) 554-8050

Aug 1-4 Las Vegas, Nevada

Training**Microcomputer Applications in Signal Timing (TEAPAC, PASSER, TRANSYT and CORSIM)**

Strong Concepts and Northwestern University Traffic Institute (847) 491-5040

May 3-6 Evanston, IL

Highway Capacity Analysis Seminar

McTrans Center, University of Florida (352) 392-0378

May 12-14 Boston, MA

ATMS Modeling Workshop

McTrans Center, University of Florida (352) 392-0378

May 16-19 Palm Coast, FL

Timing Traffic Signals Using TEAPAC, PASSER, TRANSYT, and CORSIM

University of Nebraska (402) 472-2175

June 22-24 St. Louis, MO

Travel Forecasting: Quick Response Application

AJH Associates
(414) 963-8686 Website: www.execpc.com/~ajh

June 14-18 Milwaukee, WI

Traffic Noise Fundamentals

Bowlby & Associates
(615) 661-5838

June 6-7 Nashville, TN

FHWA Traffic Noise Model 1.0

Bowlby & Associates
(615) 661-5838

June 8-11 Nashville, TN