McTrans™
Moving Technology
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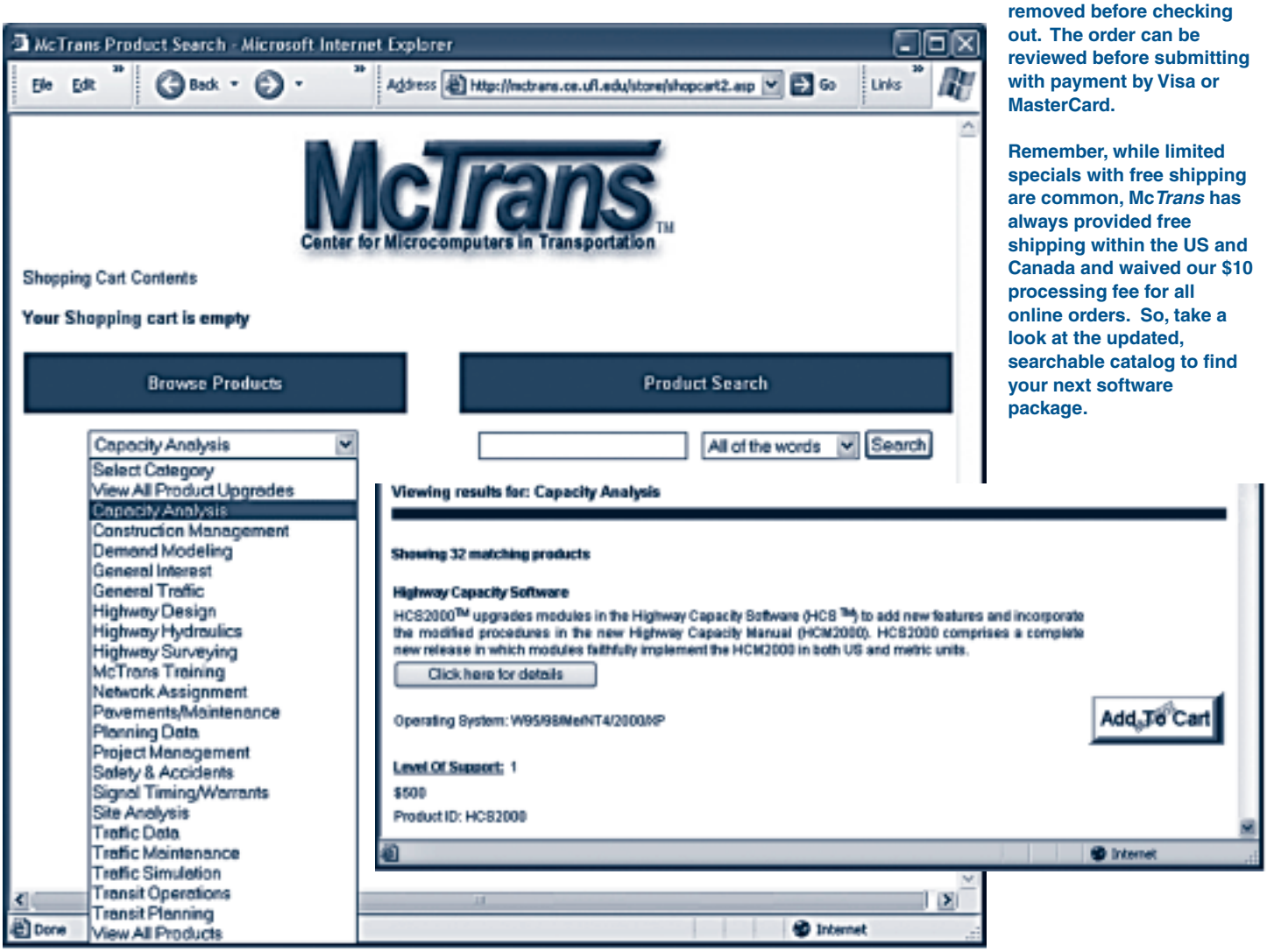
NEW CATALOG AND SHOPPING SYSTEM IMPLEMENTED!

McTrans has just completed a new, updated catalog and activated an improved online ordering system with an easy-to-use shopping cart!

The new catalog includes current information on all products in a structure that is searchable by category or keyword. Each entry includes a short descriptions with support and pricing information in the resulting list, and a more complete detailed description a click away. This new system will allow us to maintain our product listings and descriptions virtually in real time.

The shopping cart function presents an "Add to Cart" button with each product listed following a search. When the button is clicked, the product is added to the order, complete with product number and price. More products can be searched and added, quantities can be changed and items can be removed before checking out. The order can be reviewed before submitting with payment by Visa or MasterCard.

Remember, while limited specials with free shipping are common, McTrans has always provided free shipping within the US and Canada and waived our $10 processing fee for all online orders. So, take a look at the updated, searchable catalog to find your next software package.



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THE YEAR 2000 HIGHWAY CAPACITY MANUAL

by Wayne Kittelson and Erik Ruehr

INTRODUCTION

The Transportation Research Board (TRB) released a new edition of the Highway Capacity Manual1 in late 2000. Dubbed HCM2000, this document consists of 1,100 pages and 31 chapters organized into five separate parts, and is the culmination of a concentrated multiagency effort [including TRB, the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA)] over the past 15 years to meet the changing analytical needs and to provide the evaluation tools required by today's transportation professional.

Significant changes are made to most chapters, which also include specific procedures for evaluating oversaturated conditions. Entirely new analysis procedures are described for freeway systems and two-lane highways. Guidance is also given in the evaluation of interchanges and in the applicability and use of computerized simulation models. Whereas previous editions of the Highway Capacity Manual focused on the analysis of individual points or road segments, HCM2000 goes beyond this to the evaluation of entire facilities, corridors and even area-wide transportation systems.

Two distinct versions of HCM2000 are available—one is entirely metric and the other is presented in U.S. customary units. Regardless of the version selected, a CD-ROM accompanying each copy contains audio and visual elements as well as search aids to enhance the readability and understanding of the presented material.

OVERVIEW

HCM2000 is organized into five parts that combine into a logical method of presenting the information. This is intended to make it easier for the ever-widening range of professionals who look to the Highway Capacity Manual as a resource to find the information they need without reading the entire document. The five parts of HCM2000 include:

- Part I: Overview (Chapters 1–6). This part introduces the reader to basic capacity and level-of-service (LOS) concepts. It describes the various types of applications, and includes broad-level decision-making tools and guidelines. It also includes a glossary of terms that are used throughout the remainder of the document.
- Part II: Concepts (Chapters 7–14). This part includes a discussion of basic capacity parameters for each facility type and recommends default values that might be appropriately used in the absence of field data, as well as example service volume tables for general planning applications
- Part III: Applications (Chapters 15–27). This part contains the step-by-step procedures recommended for use in evaluating each of the different facility types, including both uninterrupted and interrupted flow facilities. Most of the procedures have been updated and some present entirely new analytical procedures.
- Part IV: Corridor & Areawide Analyses (Chapters 28–30). This part includes entirely new material and presents methods for aggregating the results of analyses conducted under Part III into facility, corridor and/or areawide assessments. A number of key performance measures are estimated, the values of which are summarized in a "report card" type of format.
- Part V: Simulation & Other Models (Chapter 31). This final part also includes material that is entirely new to suggest appropriate applications of simulation models, provide some numerical examples and include an extensive reference list.

CHANGES

Within the context of this new format, HCM2000 presents updated and/or entirely new analysis procedures for specific facility types. The following paragraphs present a brief summary of the major changes contained in HCM2000.

Basic Freeway Segments

New reduced truck equivalency factors are provided for trucks and buses on rolling and mountainous terrain, and also for specific upgrade analyses. In addition, some slight changes have been made to the LOS thresholds and freeflow speed curves to allow for analysis in both metric and U.S. customary units.

Freeway Weaving

The method includes speed equations recalibrated for analysis in metric and U.S. customary units. It uses a revised heavy vehicle factor that is consistent with the basic freeway segments analysis procedure. It also redefines the capacity of a weaving section to be dependent on a series of conditions.

Ramps and Ramp Junctions
The changes include the use of the revised heavy vehicle factor for consistency with the analysis of basic freeway segments. A simplified procedure is now provided for determining whether a specific ramp junction is operating within the influence area of adjacent ramps. The characteristics and conditions associated with breakdown operation are clarified. The method has also been enhanced so that it now predicts speeds across all lanes of the freeway

Freeway Facilities

This entirely new procedure contains procedures allowing the user to estimate the quality of service being provided on a directional freeway section consisting of a mixture of basic freeway segments, weaving areas and ramps. The procedure is quite versatile in that it allows for the analysis of multiple contiguous freeway sections over multiple time periods. It also goes beyond the previously described procedures for analysis of the individual segments by allowing for the analysis of oversaturated as well as undersaturated conditions.

Multilane Highways

Consistent with the previously described procedures for uninterrupted flow facilities, the multilane highway analysis procedure includes the use of the revised heavy vehicle factors. Some minor changes were made in the LOS thresholds and free-flow speed curves to allow for analysis in both metric and U.S. customary units.

Two-Lane Highways

This procedure is entirely new in HCM2000 and allows for analysis of both two-way segments and also directional segments; directional segment analyses can be conducted under general level or rolling terrain conditions, specific upgrades, or specific downgrades. Special procedures are included to analyze passing lanes, climbing lanes on specific upgrades and truck crawl regions on long, steep downgrades. Two separate classes of two-lane highways are considered and are separately analyzed. The base capacity for a two-lane highway has been revised from 2,800 pc/h to 3,200 pc/h.

Signalized Intersections

The signalized intersection analysis procedure in HCM2000 remains largely unchanged, but it does include some corrections, clarifications and minor adjustments. A new methodology is included to allow calculation of saturation flow rate adjustment factors accounting for the effects of pedestrians, bicycles and protected/permissive left turns from shared lanes. Users can now calculate the maximum back of queue as an additional intersection performance measure.

Unsignalized Intersections

The unsignalized intersection analysis procedure also remains essentially unchanged. A number of typographical and calculation errors have been corrected, notably for analyses which involve: impedance calculations for T-intersections; upstream signalized intersections; and/or flared approaches.

Urban Streets

Previously named "Urban/Suburban Arterials," this chapter includes only minor updates and typographical corrections.

Transit

HCM2000 incorporates the new analysis methodologies developed under a TCRP-funded project that resulted in a separate document entitled Transit Capacity and Quality of Service Manual. The capacity and LOS estimation procedures focus on bus operations on surface streets.

Pedestrians

HCM2000 updates and expands upon the pedestrian characteristics data and provides a new analysis procedure for paths shared by both pedestrians and bicyclists. Finally, LOS is redefined so that it is now based primarily on the estimated pedestrian delay.

Bicycles

An entirely new methodology is provided in HCM2000 for the analysis of bicycle facilities. Exclusive and shared bicycle paths are separately analyzed, with the bicycle path LOS analysis based on the number of passing and meeting events.

Interchange Ramp Terminals

A new chapter has been included in HCM2000 to address interchange ramp terminals, which represent a special situation of closely spaced intersections that has not received attention in past editions. While no comprehensive methodology is included for the analysis of interchange ramp terminals, the chapter does introduce and discuss the basic concepts of queuing and platooning at interchanges, signal timing considerations at diamond interchanges, the effects of a downstream queue on the saturation flow rate at a signalized intersection and the added delay that results from operating closely spaced signalized intersections.

CORRECTIONS AND UPDATES

Corrections and updates to HCM2000 will be handled differently than with previous versions of the Highway Capacity Manual. A web site has been set up that will be the official source of information for all clarifications, corrections and updates to HCM2000. The Web site address is http://gulliver.trb.org/wb/wbpx.dll/~hcm. Users of HCM2000 are encouraged to refer to this web site for updated information and to register to receive communications regarding the HCM2000l.

SUMMARY

The first edition of the Highway Capacity Manual was released in 1950; it was 150 pages in length and was the result of a collaborative effort between TRB and the Bureau of Public Roads (the predecessor to FHWA). Now, 50 years later, HCM2000 benefits from the intervening research, technological advances and personal insights of countless professionals from around the world.

Note: Special thanks to the authors, Wayne Kittelson and Erik Ruehr, and to the Institute of Transportation Engineers (ITE) for allowing this reprint of their ITE Journal article.

DYNASMART-P

A State-of-the-Art in Dynamic Traffic Assignment for Traffic Operations Planning

by Dr. Henry C. Lieu
Federal Highway Administration

DYNASMART-P is one of the two state-of-the-art dynamic traffic operations planning tools developed under the Federal Highway Administration's (FHWA) Dynamic Traffic Assignment (DTA) research project. DYNASMART-P supports transportation network planning and traffic operations decisions in the ITS and non-ITS environments through the use of simulation-based dynamic traffic assignment. This tool combines (1) dynamic network assignment (or demand) models, used primarily in conjunction with demand forecasting procedures for planning applications, and (2) traffic simulation (or supply) models, used primarily for traffic operational studies.

DYNASMART-P provides the capability to model the evolution of traffic flows in a traffic network, which result from the decisions of individual travelers seeking for the best paths en-route over a given planning horizon. It overcomes many of the known limitations of static tools used in current practice. These limitations pertain to the types of alternative measures that may be represented and evaluated, and the policy questions that planning agencies are increasingly asked to address.

DYNASMART-P requires input data commonly used by the traditional traffic assignment and simulation models representing networks and traffic flows. The input data vary with the network being analyzed and the level of detail required by the user. Complexity of the network could range from a linear freeway network to an integrated network with High-Occupancy Vehicle (HOV) lanes, High-Occupancy Toll (HOT) lanes, ramp metering, transit services, possibly incidents and signal controlled intersections on surface streets.

DYNASMART-P produces voluminous outputs to assist users in performing detailed traffic analysis. The output report contains a wide range of Measures of Effectiveness (MoEs), which are commonly used by traffic engineers for analyses, such as volumes, speeds, travel times, delays, etc. DYNASMART-P also produces a vehicle trajectory file, which is very useful for research purpose. In addition, DYNASMART-P provides the user with the means to view simulation results and other characteristics through various graphics formats, both static and animated.

With rich built-in features, DYNASMART-P can be used to evaluate complex strategic and operational network planning decisions and to produce more realistic traffic assignment results for planning analyses. The potential applications include:

- Assessing impacts of ITS and non-ITS technologies on the transportation network, such as dynamic message sings, ATIS-equipped vehicles, etc.
- Supporting decision-making for work zone planning and traffic management.
- Evaluation of HOV lanes and HOT lanes.
- Evaluation of different congestion pricing schemes.
- Planning for special events and emergency situations.
- Traffic assignment analyses in traditional planning activities.

DYNASMART-P is currently running on Windows NT 4.0 (service pack 5) or higher. A minimum of 300 MB of the hard drive space and the minimum of 512 MB of RAM memory are needed to run the model, depending the size of the network and analysis time period.

DYNASMART-P has been tested with the field data currently being used by the Knoxville Metropolitan Planning Commission. FHWA is currently conducting a beta test to ensure that the software matches user needs. Upon completion of the beta test, FHWA will refine DYNASMART-P and release it to the public. Anyone interested is welcome to participate in the beta testing. Please contact Henry C. Lieu at Henry.Lieu@fhwa.dot.gov for more information about DYNASMART-P and participation in the beta testing.

SpecWizard is a software tool that can help you write specifications for your NTCIP standards-based ITS equipment. SpecWizard takes your answers to a series of key questions about your ITS deployment and produces a text file that you can edit and incorporate into a specification for NTCIP-based equipment.

NTCIP stands for the National Transportation Communications for ITS Protocol. You can purchase ITS equipment that is based on NTCIP communication standards. NTCIP standards are open standards—ITS equipment based on these standards offer greater levels of interoperability and interchangeability than equipment not based on NTCIP standards. NTCIP standards safeguard you from being locked into proprietary technology.

What ITS applications can I use SpecWizard for?SpecWizard currently addresses deployments for:

- Dynamic Message Signs
- Environmental Sensor Stations
- Signal Controllers
- SpecWizard may be expanded based on demand

How does SpecWizard work?

- SpecWizard is an easy-to-use software program with a familiar interface.
- SpecWizard interviews you about the type of ITS device you want to deploy. The software asks you a series of questions about the features you want for the device, your plans for maintenance and support, and other issues specific to the device.
- SpecWizard incorporates your answers into a text file that you can include in your specification. Your answers to SpecWizard's questions help SpecWizard reduce the ambiguity in your procurement specification.
- SpecWizard also features a bandwidth analysis tool. You describe your communications system performance and polling desires and SpecWizard combines these with the NTCIP requirements and alerts you to any expected performance problems.
- Free updates to SpecWizard will be available when the new version of the DMS standard is released in 2003.

SpecWizard, Version 2.0 (#SPWZD) by FHWA is available at LOS 8 for $190.

ACCUSIM II offers TSIS users a complete post-processing and validation solution. Post-processing provides commonly used Measures of Effectiveness (MOE's), and validation checks the simulation results for statistical significance against real world observed data. ACCUSIM II is unique in its ability to analyze multiple runs, and present results for isolated and cumulative time periods.

Post-Processing

Building on the powerful ACCUSIM analysis engine, ACCUSIM II now offers post-processing of FRESIM and NETSIM data such as:

- Volumes served,
- Travel times,
- Queues (NETSIM only),
- LOS (HCM '94 & '00) and delay,
- Fuel consumption,
- Emissions,
- Speeds, and
- Fuel Consumption.

One of the key features is intersection LOS calculation, where ACCUSIM aggregates approach links for a node and displays the resulting intersection delay and LOS (spillback onto other links can also be accounted for). The links are color-coded based on the LOS of each approach, with green for LOS C or better, yellow for LOS D or E, and red for LOS F. Clicking on a node launches a detail screen showing the delay by movement and approach. HCM 2000 and 1994 equivalent results are available.

Frequently used network MOE's are listed on the toolbar for convenient access. Users can view the MOE's for just NETSIM, just FRESIM, or the total network. The MOE's include:

- Vehicle Miles
- Vehicle Hours of Delay
- Average Speed (MPH)
- Total Gallons Used
- Average MPG

Summary reports can be previewed and then printed for:

- Intersection MOE's (for all intersections, signalized and sign controlled intersections, just signalized intersections, or user specified intersections),
- Network MOE's as described earlier, and
- Travel path summary information.

ACCUSIM II (#ACCUSIM2) by DKR Software is available at LOS 1 for $500.

Quadstone Paramics V4.0

Paramics is an advanced suite of software tools for microscopic traffic simulation developed by Quadstone Limited.

The Paramics V4 software is the next stage in the evolution of the Quadstone Paramics microscopic traffic simulation system. V4 is built from the core of V3 however there are many structural changes not to mention a 100% new user interface.

Paramics is widely regarded as the most powerful microscopic traffic simulation software available in today's marketplace. However, it has also be considered the most comprehensive and therefore sometimes difficult for new users to adapt to. This yields an imbalance between the power provided by the system and the ease of use or ability to harness that power.

To address this imbalance, the core aim of the V4 development can be summarized in three words, Usability, Integration, and Productivity:

- Usability: Easy to use, simple to learn, natural and intuitive for new users;
- Integration: Make the software range work together for the benefit of the user, avoid repetition, get the maximum value for money out of the model and input/output data; and
- Productivity: Work faster, work smarter, spend less time building models and more time using/analyzing them.

The Quadstone Paramics V4 range includes:

- Modeller: The core simulation tool;
- Processor: The batch assignment tool;
- Analyser: The post simulation data analyser tool;
- Programmer: The API interface;
- Monitor: The pollution modelling interface; and
- Estimator: New to V4, the OD estimation tool.

Paramics Project Suite (#PARACPS) Version 4.0 by Quadstone Limited is available at LOS 7 for $13,310. The Development Suite (#PARACDS) Version 4.0 is available at LOS 7 for $25,410. Contact **McTrans** for special multiple copy and academic discounts.

iTREC™ Analyzer

iTREC easily allows you to analyze and report travel time information. iTREC consists of two programs; a data recorder program and an analyzer program, each sold separately. The iTREC data recorder is used to collect data and the iTREC analyzer is used to analyze and report travel time studies.

The iTREC analyzer software calculates average speed, distance traveled, stopped delay, and the number of stops. The analyzer software can be used to evaluate changes along roadways such as:

- Travel times along different routes
- Delays associated with construction
- Improvements due to signal timing changes

Integrated within iTREC analyzer software is a Geographic Information System (GIS) that is used for selecting all or portions of data runs; third-party GIS software is not required. iTREC simplifies all stages of time travel studies through a user-friendly interface allowing anyone to easily generate valuable reports in a graphical format.

iTREC Analyzer (#ITRECANL) by iTRANS is available at LOS 7 from **McTrans** for $1275.

iTREC™ Data Recorder

To quickly and easily collect travel time information, iTRANS Consulting Inc. has developed a software package called iTREC. iTREC actually consists of two programs; a data recorder program and an analyzer program, each sold separately. The iTREC data recorder is used to collect data and use the iTREC analyzer is used to analyze and report travel time studies.

The iTREC data recorder program integrates Global Positioning System (GPS) hardware with most any Microsoft Windows, based PC laptop computer. Using the iTREC data recorder with a GPS receiver has the following advantages over traditional travel time methods:

- Reduction in staff requirements, no passenger is needed during vehicle data collection for recording information
- Fewer errors, since data collection is automated eliminating missed checkpoints or incorrectly logged data
- Your own existing GPS hardware (NMEA compliant) can be used or purchase a unit from iTRANS.

iTREC Data Recorder (#ITRECDAT) by iTRANS is available at LOS 7 **McTrans** for $410.

DeckCheck

Sandia Analytics announces DeckCheck™ and updates its Bridge Information System Sandia Analytics (formerly KwikSoft Development) is announcing the release of DeckCheck, a permit vehicle analysis program.

DeckCheck evaluates permit vehicles against a bridge's allowable stress. Choose a bridge from a subset of data taken from the National Bridge Inventory database. Select route and milepost range; input the permit vehicle data, span lengths and fixity, and the program compares the allowable stresses with that of the permit vehicle.

Analyze a single bridge or perform a route analysis. DeckCheck comes pre-loaded with statewide data for use by city, county or state bridge engineers and support staff. Trucking and permitting professionals will also find DeckCheck a useful tool in planning routes for commercial permit vehicles.

DeckCheck can be up and running in minutes. It is unique in that it is user-friendly and requires very minimal training or knowledge of bridge mechanics. It is ideal for use by support staff under the supervision of a bridge engineer. DeckCheck (#DECKCHEK) by Sandia Analytics is available at LOS 7 from **McTrans** for only $995.

SABIS

The Sandia Analytics Bridge Information System™ (SABIS) is the ideal complement to DeckCheck. Pre-loaded with statewide information from the National Bridge Inventory, SABIS provides quick access to bridge data for a wide range of uses.

Locate a structure by bridge number, county, route and milepost or feature intersected. the location is displayed as an on-screen map with information on structural and load aratings, ADTs, sufficiency, year built, scour rating, ownership, maintenance, historical significance, and much more. Maps can be displayed in many modes, such as within political boundaries, road networks, relief, shaded elevation or satellite images.

Like DeckCheck, SABIS is also easy-to-use by support staff, which frees up supervisors and engineers for other duties. SABIS (#SABIS) by Sandia Analytics is now available at LOS 7 through **McTrans** for only $895.

PRETRANSYT/TEAPAC and PRENETSIM/TEAPAC

Strong Concepts' preprocessors, PRETRANSYT and PRENETSIM, for the TRANSYT-7F and CORSIM traffic models have been vastly enhanced to include many advanced modeling capabilities which are available in these time-tested, government-sponsored models. These enhanced capabilities add to the already unprecedented features provided by PRETRANSYT and PRENETSIM for efficient and reliable execution of traffic system modeling, optimization and animation projects. They include:

- sign-controlled movements
- startup lost time and end gain time by movement
- storage capacities by movement
- alternative upstream-downstream assignment method (TRANSYT)
- dual-optional lane usage
- link curvature (CORSIM)
- free flow lanes
- number of lanes
- right-turn-on-red
- heavy vehicle percentages

Other enhancements include:

- increased limits on allowed map coordinate values to accommodate larger scale coordinate systems
- ability to read all of these model parameters directly from SIGNAL2000 for true HCM-based intersection capacity analysis and optimization
- compatible changes made in PREPASSR for PASSER-II
- better simulation time period management (CORSIM)
- option to enter executable file name in setup CFG file
- better permitted left turn modeling (TRANSYT)
- fine-tuning of the new Version 5 TEAPAC interface

PRETRANSYT and PRENETSIM both have the unique TEAPAC Visual Mode which provides an intuitive, Windows graphical user interface, as well as a Command Mode for power users. This is the same WinTEAPAC2000 interface found in all other TEAPAC programs. This interface includes a fully-indexed, on-screen user guide and context-sensitive help and error diagnostics. PRETRANSYT and PRENETSIM also incorporate the new TEAPAC Version 5 interface with its Tabular View to increase efficiency for intermediate users and certain data-intensive tasks. The 12-intersection versions of PRETRANSYT/TEAPAC Ver 2.71 (#TPCPTR.1) and PRENETSIM/TEAPAC Ver 1.31 (#TPCPNT.1) from Strong Concepts are available from McTrans for $495. The Usage Level 2 versions (#TPCPTR.2) and #TPCPNT.2) which handle up to 100 intersections with subsystem management are available for $695. Educational versions are available for half-price and demonstration versions are available free as downloads from the Strong Concepts and McTrans web pages. Free and reduced-price updates are available for registered licensees of earlier versions of PRETRANSYT and PRENETSIM directly from Strong Concepts.

EnTraDa

Environmental Traffic Data Program, an intelligent post processor for speed, has gotten smarter. Supplementary model, Akcelik/Davidson Model has been added for computation of Speed and VHT. Built-in peak hour spread technique for overflow traffic volume. Auto validation prevents error in data entry. And much more…

Update Watch

Package	Version	Status	Target	Distribution
HCS2000	4.1c	Complete	Available	Patch Download
HCS	4.1d	Testing	Feb 2003	Patch Download
TRANSYT-7F	9.6	Complete	Available	Patch Download
TRANSYT-7F	9.7	Testing	Jan 2003	Patch Download
IDAS	2.2	Complete	Available	Sent to Registered users
PASSER™II-02	1.0	Complete	Available	Registered users may upgrade
TURBO	2.0	Complete	Available	Registered users may upgrade
TNM	2.0	Complete	Available	Registered users may upgrade

WARRANTS/TEAPAC MUTCD 2000 Warrant Analysis The WARRANTS2000/TEAPAC program (#TPCWAR.1) now performs multi-way stop warrant analyses in addition to its signal warrant analyses, both according to the procedures dictated by the MUTCD 2000 (Millennium Edition). In addition, an option has been added for user-selection of the so-called 56% rule for the Combination of Warrants used in a 2000 Signal Warrant Analysis. WARRANTS2000 continues to provide an option to perform a signal warrant analysis using the previous MUTCD (1988). WARRANTS2000 performs its multi-way stop and signal warrant analyses using all the volume-oriented warrants of the MUTCD 2000, including warrants 1A, 1B, 1C, 2, 3A, 3B and 7 for signals. A unique algorithm searches every possible 60-minute period of a 15-minute count for hours that meet the warrants, ranking the identified hours by minor street volume. Input data can be imported directly from various electronic traffic counters such as Jamar and TimeMark or entered/edited manually. The 2000 warrant analysis enhancements are also built into the Usage Level 2 version of TURNS/TEAPAC (#TPCTRN.2).

Usage Level 2 of WARRANTS (#TPCWAR.2) also provides advanced tabulation and peak hour analysis features. Peak 15-minute or 60-minute volume data can be sent directly to other TEAPAC programs like SIGNAL2000 for optimized HCM level of service calculations, SITE for background traffic in impact studies, and PREPASSR, PRETRANSYT and PRENETSIM for signal timing and modeling studies. Use of the TED and TUTOR programs in the TEAPAC system allow complete automation of all of these calculations for unparalleled efficiency, accuracy and speed.

WARRANTS has a unique Visual Mode which provides an intuitive, Windows graphical user interface, as well as a Command Mode for power users. This is the same WinTEAPAC2000 interface found in all other TEAPAC programs. This interface includes a fully-indexed, on-screen user guide and context-sensitive help and error diagnostics. WARRANTS also incorporates the new TEAPAC Version 5 interface with its Tabular View to increase efficiency for intermediate users and certain data-intensive tasks.

The Warrant Analysis version of WARRANTS/TEAPAC Ver 2.01 from Strong Concepts (#TPCWAR.1) is available from McTrans for $395. The Usage Level 2 version (#TPCWAR.2) which adds advanced tabulation and peak hour analysis features is available for $595. Educational versions are available for half-price and demonstration versions are available free as downloads from the Strong Concepts and **McTrans** web pages. Free and reduced-price updates are available for registered licensees of earlier versions of WARRANTS and TURNS directly from Strong Concepts.

FLEXSYT-II- is an event-based, microscopic simulation tool for traffic management studies. It is the successor of FLEXSYT-I-, developed in the seventies and eighties by Frans Middelham. On a stochastic base vehicles move through the network, interacting with each other and the network (e.g., stop-lines and detectors). It has a no build-in traffic control philosophy, but uses a special traffic control language, called FLEXCOL-76, which is based on the rules of Boolean algebra and the clear differentiation between the 'change of state of an element' (event) and the 'state of an element' (condition). The control part also has a special structure. This structure contains a general part (the control philosophy) and a problem dedicated part, both to be specified by the user.

The network has to be specified in detail and can contain features such as stops for public transport, secondary conflicts, priority intersections and routes. In the simulation eight vehicle types can be present. These types are person cars, small trucks, large trucks, busses, trams, bicycles, pedestrians and carpool vehicles. All these vehicle types have their own characteristics and traffic behaviour. Output can consist of an event by event trace of the controller and tables containing an output on controller information, delays, travel times, network indicators and environmental aspects (fuel consumption and emission of toxic gasses).

With FLEXSYT-II it is possible to research the structure of the network, such as the lay-out of intersections, length and number of lanes, effects of bus lanes, etc. However, due to its own traffic control programming language, it can also be used to study all kinds of traffic control strategies, such as the fixed-time control strategy, vehicle-actuated control strategies, traffic-depended control strategies and even fuzzy control. Furthermore, it can be and is applied to study traffic management measures, such as roundabouts, arterials, toll-plazas, ramp metering, main-line metering, HOV lanes, tidal flow lanes, etc.

In the past years a new user interface has been developed, called FLASH (FLEXSYT Application Shell). With FLASH it is possible to specify networks graphically and to visualize the output.

FLEXSYT-II is currently located in the New Products section. It should be an updated

product. At the end of the description, please add the following:

FLEXSYT-II Ver. 3.0 and FLASH 2.1 (#FLEXSYT) by AVV Transport Research Centre is available at LOS 7 for $2,250.

DID YOU KNOW?

HCS

In Patch 'c' of HCS2000™, the Unsignal module contains corrections to the flared approach and upstream signal methodologies, reflecting recent updates to the Highway Capacity Manual (HCM). The flared approach and upstream signal methodologies are only applicable to two-way stop control (TWSC) analyses.

In the Signals module, the planning analysis methodology is sometimes used to estimate or evaluate an appropriate phasing sequence for future conditions. The Signals planning module allows the user to specify a left-turn protection of "permitted", "protected", "compound", "not opposed", or "synthesized", on each of the four approaches. The "compound" option can be used to evaluate protected-permitted phasing. The "not opposed" option is typically used to evaluate T-intersections, or split phasing. If the user chooses "synthesized", the HCM procedures are then used to estimate an appropriate left-turn protection and phasing sequence, based on the traffic volume data that was coded.

In Patch 'c' of HCS2000, the Signals module contains a new Formatted Report called the "Detailed Report." This report is analogous to the detailed report from HCS-2, in which all input data needed (in most cases) to re-create an analysis are presented.

TRANSYT-7F

Genetic algorithm optimization runs can locate the optimum solution more quickly when "unimportant" signal settings are omitted from the optimization process. By ignoring (i.e., holding constant) the signal settings that are likely to have a negligible effect on results, the program is able to examine more combinations of the signal settings that have a more significant effect on results.

For example, when traffic networks are significantly undersaturated, such as having 20 or fewer seconds of delay per vehicle, optimization of offsets and phasing sequence tends to have a negligible effect on results. Similarly, offsets and phasing sequence are likely to have little impact within severely oversaturated networks, in which there are very few opportunities for progression. Finally, offsets and phasing sequence are likely to have little impact at isolated intersections with no nearby upstream signal. In cases such as this, genetic algorithm optimization runs can locate the optimum solution more quickly when offsets and phasing sequence are omitted from the process, and only the cycle length and splits are optimized.

For a second example, when traffic networks are near capacity and have numerous progression opportunities, optimization of offsets and phasing sequence tends to allow significant improvements in flow and performance. In cases such as this, genetic algorithm optimization runs can locate the optimum solution more quickly when cycle length and splits are omitted from the process, and only offsets and phasing sequence are optimized. For this type of optimization, it is necessary to specify the appropriate cycle length in advance, and the software can use the initial timing model to estimate new splits for every candidate phasing sequence.

TSIS-CORSIM

CORSIM reports spillback on a link when the back bumper of the last vehicle in any lane on the link is within the intersection at the upstream end of the link, traveling less than 3 feet/second, with a leader who is traveling less than 5 feet/second. The width of the intersection at the upstream end of the link is determined by counting the number of lanes on the cross links at that point and multiplying that number by 12. Opposing left turn pockets are assumed to be facing each other, so they are only counted on one of the links.

CORSIM utilizes three unique random number seeds (record type 2 entries 4, 17, and 18) to control traffic decisions and operations within NETSIM and FRESIM. Entry 4 is used to randomize vehicle headways when vehicles enter either NETSIM or FRESIM. This entry has no effect on results when the uniform distribution is used, but does effect results when the normal or Erlang distributions are used. NETSIM uses entry 17 for some traffic decisions, and to assign driver types plus vehicle types. The driver types are used by CORSIM to simulate varying levels of aggressiveness and decision-making, whereas the vehicle types are used to simulate varying levels of performance between passenger cars and heavy vehicles. FRESIM uses entry 18 for all traffic decisions, and to assign driver types plus vehicle types. NETSIM uses entry 18 for some traffic decisions, and to determine pedestrian activities.

Certain input parameters can be used to calibrate traffic performance at unsignalized intersections in CORSIM. These parameters include the start-up lost time (record type 11) for calibrating follow-up time, acceptable gaps in near-side cross-street traffic (record type 142), and acceptable gaps in far-side cross street (record type 143).