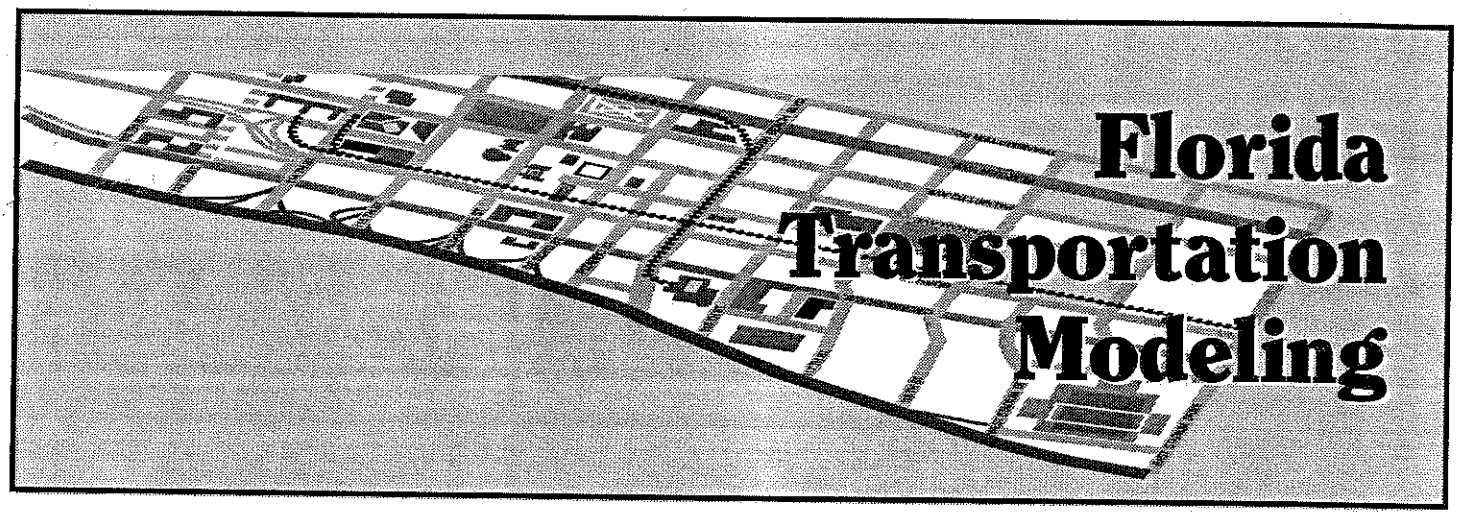

Volume 2 July 1996

Your Newsletter Needs Your Support By: Terry Corkery

In this, the second issue of *Florida Transportation Modeling*, I hope you will be able to see the slow but certain evolution of your newsletter. As many of you know, two local user groups, in southeast Florida and the Tampa Bay area, had been circulating their own newsletters to local modelers. FDOT Central Office recognized both of these publications as valuable information tools. To provide information statewide (not just within these two user groups) and to overcome duplication of effort by the two local newsletters, the FDOT Systems Planning Office decided to produce *Florida Transportation Modeling*.

We have with teamed up Mike Brown of Transportation Planning Services in Miami to help us produce *FTM*. Mike had been publishing the Southeast Florida User Group's newsletter for the past two years—*on his own time!* Recognizing that his good work could not go on indefinitely on a voluntary basis, we trapped him into continuing his newsletter work, this time serving the whole state, by putting him under contract. Mike Brown and I hope to continue making improvements to the content and format of this quarterly publication. We invite you to contact either of us with suggestions on making it better (see page 11 for addresses and phone numbers). The best way you can support *Florida Transportation Modeling* is to share your news and information with other modelers by contributing to a future issue. Next time you are working on a project you feel would be of interest to others in the modeling community, please take a few moments to draft a brief newsletter article.

"X32" is Coming Soon!

Extended DOS version of FSUTMS shows promise of eclipsing OS/2 and Certain RS/6000

By Terrence Corkery, AICP, FDOT Systems Planning Office

The FDOT Systems Planning Office in Tallahassee and its modeling software consultant, The Urban Analysis Group (UAG), are currently readying the next release of FSUTMS. Work on the new Version 5.1 is scheduled to be completed in July 1996. Version 5.1 will contain several minor technical updates to Version 5.0 for all platforms (DOS, OS/2, and RS/6000), but the big news is the DOS platform will be transformed into what will be called FSUTMS-X32. The new X32 DOS platform will potentially be the most significant performance improvement to Florida's standard model since the former mainframe-based program was converted to a microcomputer version in the early 1980's.

The "X32" nomenclature refers to extended 32-bit DOS processing. Extended DOS offers dramatic improvements over standard 16-bit DOS and 16-bit OS/2 compilers in terms of increasing computing speed and overcoming conventional memory limitations. The 16-bit DOS platform placed constraining limitations on array sizes, which rendered the platform unusable for models containing more than 12,000 links or 1,500 nodes.

Early results of X32 test versions have shown astounding reductions in total run times required to execute MPO travel models compared to 16-bit programs in OS/2 and DOS. X32 completes model runs in less than half the time needed for the old DOS programs. In many tests, running speeds have even surpassed most RS/6000 (UNIX-based) platforms, which has been the platform of choice for modelers running larger urban and regional models. In the past, agencies needing to run the larger models such as Miami, Orlando, and Tampa Bay on a limited budget have had to use the OS/2 platform to overcome DOS's limitations. However, OS/2 has never been a popular choice because processing speeds are actually slower than in DOS. The sample X32 run time comparisons listed in the table below will be welcome news to these OS/2-based modelers. By switching to X32, users can get run times comparable to an RS/6000 using hardware which typically costs $8,000 to $15,000 less.

Preliminary test results indicate that the larger the model, the better the relative time savings. The major run time improvements occur during trip distribution, mode choice, and highway assignment. Wade White of Gannett Fleming provided the run time comparisons for the Tampa Bay regional model. Bob Crawley of Frederic R. Harris tested the Polk County and Miami models using a Pentium-Pro with 200 MHz speed, a 5GB hard drive, and 16 MB of RAM.

In addition to providing higher speed and overcoming network size limitations, FSUTMS-X32 will offer greater convenience than the old DOS platform. The DOS requirement for 595K of unused conventional memory will be eliminated. Users will no longer be forced to remove memory-resident programs like printer drivers and network connections before running FSUTMS. Users are not even required to exit Windows: FSUTMS-X32 will run within a DOS window. However, in current test versions, Windows 3.11 seems to slow down X32 considerably.

The Network Information System (NIS) will not yet operate under Win95 or Windows NT. UAG is continuing work on how model processing occurs under Windows. An updated X32 release fully compatible with Win95 and Windows NT is expected to be completed by late summer.

The X32 DOS platform will require a minimum system consisting of a 386 with 640K of memory (RAM). However, a 486 or better with at least eight megabytes of RAM is recommended. Further, it is recommended that users purchasing new computers request at least 16 meg of RAM. It should be noted that DOS and Win95 contain two-gigabyte hard disk partition size limitations. Nearly all of Florida's models will run comfortably within a 2GB partition. However, to run very large models like the Southeast Regional Planning Model (SERPM), Windows NT is recommended to take full advantage of the four- or five-gigabyte hard drives common on the latest Pentiums and Pentium-Pros.

FSUTMS Version 5.1 Run Time Comparisons
(hours:minutes:seconds)

Tallahassee (557 TAZs)		Tampa Bay Region (1900 TAZs)	
Pentium-100 (NT)	0:02:51	Pentium-90 (OS/2)	12:11:00
Pentium-90 (DOS)	0:03:52	Pentium-90 (DOS)	3:32:00
RS/6000 Model 520	0:10:06	Pentium-90 (Win 3.11)	6:57:00
486-50 (DOS)	0:10:55	Power PC 830/603 (AIX 4.1.4)	2:46:00
		RS/6000 Model 355	4:06:00
Miami (1200 TAZs)		**Polk County (852 TAZs)**	
Pentium Pro-200 (DOS) -		Pentium-75 (DOS)	0:25:59*
Year 1990	0:51:35	Pentium Pro-200 (DOS)	0:25:59**
Year 2015	1:12:37		
		*Version 5.0 (16-bit) = 1:02:34	
		**Version 5.0 (16-bit) = 0:33:56	

Modifications in FSUTMS Version 5.1

Other than the big changes in how the DOS platform will operate, the July 1996 release of FSUTMS version 5.1 is only a minor update to Version 5.0. All three platforms (DOS/X32, OS/2, and RS/6000) will contain few modifications compared to the previous release:

- A problem involving turn penalties was corrected.
- The toll facilities model will now be applied during DISTRIB to determine AM network congested speeds for multi-path transit models.
- The Miami and Orlando models have been modified to run under FSUTMS rather than as stand-alone executables.
- The Miami, Orlando, and Tampa models will now appear as options on the PC-version of the FSUTMS menu.

As with previous releases of FSUTMS, the FDOT Systems Planning Office will notify all registered public sector users when Version 5.1 is available. Private sector users are required to obtain the program directly from the Urban Analysis Group.

When Is The Next Model Task Force Meeting?

To date, there has been no discussion about the next meeting date. The Model Task Force will probably hold its next meeting after everybody returns from summer vacations, most likely in September.

Tampa Bay FSUTMS Users Group

By: Bob Rutledge, Gannett Fleming, Tampa Office

The Tampa Bay FSUTMS Users Group, with FDOT District 7, sponsored a one-day training for the new Tampa Bay Regional Planning Model. The workshop was an applications training, intended to introduce FSUTMS users to the many upgrades that have been developed during the three-year development of the Tampa Bay Regional Transportation Analysis (RTA). The workshop was held at FDOT District 7, with approximately 80 people from the public and private sector attending. Transportation planners came from all over the state to learn about the new features.

Because of the limitation of DOS, the RTA model had to run under the UNIX (AIX) operating system. A major concern of the consultant community was the cost of acquiring a UNIX system. To alleviate these concerns, FDOT developed an extended-DOS version (X32) that not only runs the RTA model, but runs it faster than the UNIX! Both workshops included a "hands-on" training portion of the program that allowed testing of the various components of the model.

According to FDOT, the workshops were an overwhelming success. Participants commented on the usefulness of the information presented, the common-sense approach used to present this technical information, and how the "hands-on" portion of the workshop increased the participants' understanding of the modeling process.

Our executive committee is busy working on the next exciting meeting, so keep your eyes and ears open!

The location and date for the next meeting has not yet been determined.

TRAINING WORKSHOPS:

Help For The Modeling-Impaired

The Systems Planning Office has scheduled two FSUTMS Workshops for the remainder of 1996. There is no cost to attend the workshops but **pre-registration is mandatory**. The courses provide for a fixed number of attendees. Preference will be given to FDOT district and MPO personnel but after the pre-registration deadline, all unregistered seats will be open to alternates, including consultants. All workshops begin at 1:00 pm on the first day and end at 12:00 noon on the last day.

FSUTMS Transit Workshop

This three-day transit modeling workshop does not require completion of basic, intermediate, and advanced FSUTMS workshops but these courses are strongly advised. This workshop will be designed as a beginning-level to intermediate-level workshop for those with highway modeling experience but little experience in transit. The participants will learn transit modeling terminology, transit network building, transit path building, transit assignment, transit Network Information System, and transit evaluation.

The workshop will cover the mode split routine for single path transit, multi-path transit, and multi-path/multi-period transit, and High Occupancy Vehicles (HOV). The workshop will include an in-depth review of the control files, parameters, options, reports, and report interpretation.

Date: Aug. 5 (1 pm) - Aug. 8 (noon), 1996
Location: Treasure Island Inn
Address: 2025 South Atlantic Avenue
Daytona Bch Shores, FL 32118

Room Cost: $59.00 per night
Telephone: (904) 255-8371
Pre-registration deadline: **July 22, 1996**

Basic FSUTMS Workshop

This four-day basic-level workshop is designed to give the participants an understanding of the transportation planning process, the purpose of traffic demand forecasting, and the data and programming requirements. Participants will learn to install and execute FSUTMS, interpret the output results, create standard plots, and execute the Network Information System (NIS). The workshop will include an introductory discussion of the FSUTMS input, control, and output file formats.

Date: Sept. 23 (1 pm) - Sept. 27 (noon), 1996
Location: Treasure Island Inn
Address: 2025 South Atlantic Avenue
Daytona Bch Shores, FL 32118
Room Cost: $54.00 per night
Telephone: (904) 255-8371
Pre-registration deadline: **September 9, 1996**

Walt Steinvorth is heading up the training program and can provide more information and pre-registration forms: (904) 488-4642, SunCom 278-4642. Sandy Colson will be assisting in collecting the forms. Her number is (904) 488-4640, SunCom 278-4640.

Two-Digit Implementation Continues By: Walt Steinvorth

The Systems Planning Office and the Model Task Force have initiated a task work order entitled "HNET Two-Digit Area Type/Facility Type and Other Procedural Enhancements." All activities for this work will be performed by PBS&J with concurrence of Department staff and the Model Task Force. The purpose is to prepare revised processes and updated model parameters for the HNET, HASSIGN and HPLOT modules for FSUTMS. Standardized highway network building processes were originally developed in the early 1980s by the Department, and documented in a report entitled "Task A: Standard Highway Network Procedures Final Report."

FSUTMS/TRANPLAN programs were recently modified to accept two-digit codes for area type and facility type. In addition, the Highway Capacity Manual, a source for developing standardized model capacities, has gone through several revisions since 1981 resulting in the development of an FDOT LOS Manual. All these changes have resulted in the need for reevaluating processes and default parameter settings previously recommended for the HNET and HASSIGN modules.

The work order contains four major tasks. Task 1 develops new processes for coding and editing highway networks with the two-digit area type/facility type capability, and requirement for toll facilities modeling. Standardized two-digit area types and facility types will be recommended to the Model Task Force for endorsement. The consultant will test three urbanized areas for this study: Pensacola, Jacksonville, and a third to be announced.

Task 2 is to update default parameters used in the HNET and HASSIGN modules. The most significant of these reevaluations will be to prepare default speeds and capacities for the recommended two-digit area types and facility types based on the 1995 FDOT LOS Manual. Other parameters to be evaluated are the UROAD Factor and CONFAC.

Reevaluating highway plotting routines is the purpose of Task 3. The effort will concentrate on revising area type and facility type plots to achieve complete coverage of the two-digit coding scheme. Recommendations will be made to the Urban Analysis Group to enhance the new capability of developing plot windows to FSUTMS HPLOT control files via HNIS. (A separate task work order will be prepared for HNIS modifications.) A new standard HNIS User Profile (UPF) will be developed to maximize use of available colors for two-digit identification.

In Task 4 the Consultant will prepare a final report to describe the accomplishments of Tasks 1 through 3.

Walter Steinvorth of the Central Office will be handling day-to-day project management. Rob Schiffer is the Consultant Project Manager of PBS&J. Reports produced as part of this task order will go to the HNET Subcommittee for review and comment. HNET Subcommittee members are Wilson Fernandez - Metro-Dade Transit Agency, Craig Gavin - FDOT District Three, Dan MacMurphy - Greiner Engineering, and Arturo Perez - Leftwich Engineering. If you have any questions about this project, call Walt at 904-488-4642 or SunCom 278-4642.

ADVANCED USERS:
TECH NOTES

By Harry Gramling, FDOT Systems Planning Office

Using the UNBUILD program (Version 5.0 and newer) to unbuild network files (HNET.ayy and HRLDXY.ayy) that were created under Version 4.1 will produce corrupt output files unless the user makes the following change. PROFILE.MAS must be revised prior to running UNBUILD to indicate:

&TWODIGIT
NO

After running UNBUILD, reset &TWODIGIT to YES and then run the TWODIGIT program to make the "unbuilt" LINKS.yya file and all other input files compatible with Version 5.0.

FDOT Statewide Planning BBS

By: Don Draughon , Systems Planning Office

This system can be used by transportation planners to read about new FSUTMS developments, training courses, and new releases. Many people use this BBS to transfer data, ask questions, post announcements, and download shareware programs and utilities. The Department's five-year work program and Access Management regulations are also available for downloading. The board can be reached at (904) 921-4308 or SUNCOM 291-4308 (modem settings = MAX-8-N-1).

GIS News By: Mike Brown, TPS

The URISA (Urban and Regional Information Systems Association) has a new home page at http://www.urisa.org and includes information on the entire information technology industry with hotlinks to other GIS industry-related home pages.

The 1996 URISA Conference is scheduled for July 27-Aug. 1 1996 in Salt Lake City. For the first time URISA will team up with TRB to host the TRB Transportation Data Committees. For registration information contact URISA at:

900 Second St. NE, Suite 304
Washington D.C. 20002
Phone: (202) 289-1685
Fax : (202) 842-1850

FLORIDA SEMINARS ON TMIP METHODS ARE A RESOUNDING SUCCESS

by Bob McCullough, FDOT Systems Planning Office

Two seminars were held recently to share the latest developments in travel demand modeling with transportation planners and modelers in Florida. The seminars focused on the use of activity-based methods for travel forecasting as these methods lay at the foundation of new modeling tools being developed within the federal Travel Model Improvement Program (TMIP).

The intent of the seminars was to bring about an interchange of information between participants in the federal TMIP and transportation modelers in Florida. To this end, three speakers who are actively engaged in various TMIP activities were invited. The speakers were Prof. Ryuichi Kitamura from Kyoto University and University of California, Davis; Prof. Eric Pas from Duke University; and Mr. Keith Lawton from Portland Metro.

The federal sponsors of TMIP were impressed that Florida's modeling activities are moving in a direction similar to that of the TMIP. A high-level TMIP official from the Federal Transit Administration, Mr. Ron Fisher, served as the keynote speaker. Ron provided an overview of the TMIP and discussed some of the completed and ongoing activities including the development of TRANSIMS, the next generation of modeling tools being developed at the Los Alamos National Labs.

The seminars were held in Fort Lauderdale and Tampa on May 30 and 31, respectively. The respective districts and FSUTMS users groups in and around these areas were well represented at the seminars by Shi-Chiang Li and Bill Cross from District 4 and Danny Lamb from District 7. They discussed some of the ongoing modeling activities at the district planning offices. Local MPO perspectives and modeling challenges were presented by Frank Baron from Miami and Joe Zambito from Hillsborough County.

With over 120 transportation modelers present, the seminars were very well attended and saw several lively interactive discussions. Feedback received from the seminar attendees has been extremely positive. It is envisaged that these seminars (and perhaps more in the future) will help bring the TMIP to Florida while also ensuring that the TMIP is responsive to Florida's modeling needs. The sponsors of the federal TMIP have been informed of Florida's keen interest in participating as an interim operational capability (IOC) test site for TRANSIMS.

The seminars were jointly sponsored by the FDOT Systems Planning Office and Research Center and involved close coordination with district offices across the state. Special appreciation goes to Prof. Ram M. Pendyala with the Department of Civil and Environmental Engineering at the University of South Florida for serving as the seminar organizer. Ram, who is an active participant in several federal TMIP projects and review panels, is helping in the dissemination of information about the federal TMIP in the state. Ram has now collected all of the presentation material from the invited speakers and will arrange to have a copy of the material sent to all seminar registrants.

NEWS FROM NATIONAL TMIP SEMINAR ON ACTIVITY-BASED FORECASTING

by Ram M. Pendyala, Civil & Environmental Engineering, Univ of South Florida

The federal Travel Model Improvement Program recently sponsored an international conference on Activity-Based Methods for Travel Demand Forecasting. The conference was held in New Orleans during June 2-5 and immediately followed the two seminars (on the same theme) that were held in Florida. Prof. Peter Stopher with the Civil and Environmental Engineering Department at the Louisiana State University served as the Conference Chair.

The conference opened on the afternoon of June 2 with an introductory review session on activity-based methods for travel forecasting. A plenary session of invited presentations was held on the morning of June 3. The plenary session consisted of several presentations dealing with issues associated with activity-based modeling and discussing developments in activity-based modeling, analysis, data collection, and microsimulation.

The plenary session was followed by a series of three parallel workshops. The themes of the workshops were: Data Collection Methods, Activity-Based Models, and Microsimulation for Activity-Based Analysis. Each workshop had two chairs and was charged with identifying activity-based methods that are ready for use today, identifying activity-based methods that may be moved into practice within the next 2-5 years, defining barriers to the implementation of activity-based methods, and describing means by which the barriers may be overcome. The workshops met on the afternoon of June 3 and all day June 4 to develop their recommendations. Workshop chairs presented these recommendations at a closing session on the morning of June 5 before the conference adjourned. Prof. Eric Pas and I served as co-chairs of the Activity Modeling workshop and found the insights and experiences we gained from the Florida seminars very useful in fulfilling our roles.

The conference was well attended with about 100 people drawn from consulting firms, academia, local and state transportation agencies, federal agencies, and laboratories participating in the discussions. One of the most significant outcomes of the conference is that transportation planners at local and state transportation planning agencies need to see demonstrated proof of the viability, accuracy, precision, and usefulness of activity-based methodologies for travel demand forecasting. In this regard, several TMIP officials, including Ed Weiner and Ron Fisher from the USDOT, were very pleased with the Florida seminars that successfully conveyed the federal TMIP theme to state and local transportation planners (see related article). The conference recommended that the federal TMIP provide funds for conducting case studies where activity-based methods would be applied and demonstrated in a few urban areas.

Statewide Travel Forecasting Model

By Rob Schiffer, PBS&J/Tallahassee

In the late 1980s, FDOT/Central Office staff began development of a Statewide Travel Forecasting Model (STFM) to address the need for travel demand forecasts in areas not included in urban area FSUTMS models. The model was originally developed with a base year of 1988 and was subsequently updated to make use of 1990 Census data in rural areas. A special feature of the STFM is the ability to interpolate ZDATA to a specified year. Since the STFM uses ZDATA from all the Florida MPOs, this interpolation process is needed to ensure all the ZDATA sets are for the same analysis year. For example, if an MPO's base year ZDATA was for the year 1985 but the rest of Florida uses a 1990 base year, the STFM can interpolate a 1990 base year from linear growth trends through the MPO's planning horizon year. After years of model development work, efforts began in 1993 on a detailed validation effort for the STFM. As part of this effort, the STFM 1990 network was further refined, zone centroid connectors were adjusted, and appropriate model parameter settings were tested and validated. This effort was completed in August 1994.

In January 1995, work began on the current 2020 Update phase of the STFM. The key features of this effort include development of a complete future year database for the STFM, identification of LOS deficiencies on roadways outside MPO-modeled areas, preparation of 2020 alternative Needs Plan networks, and production of a User's Guide defining a methodology for preparing travel forecasts using the STFM.

Work began immediately on the development of three future year highway network datasets. A year 2000 existing-plus-committed (E+C) network was prepared through use of the FDOT Work Program along with FIHS information regarding existing laneages. We not only needed to account for the years 1996 through 2000 but also the years 1991 through 1995 in updating from the 1990 network. STFM networks for the 2010 FIHS Needs Plan and the 2020 FIHS Cost Feasible Plan were prepared using information provided by FDOT/Central Office FIHS staff. Future year FSUTMS socioeconomic datasets were requested through FDOT District Planning Offices for every MPO area in Florida. As we received new FSUTMS ZDATA files for future years (2015-2020), we also received the latest validated base year datasets (1990-1992) for each MPO. Rather than continuing with the older validation datasets, a decision was made to update the base year STFM to include newer 1990s-era ZDATA files. As new ZDATA files and TAZ maps were received, FSUTMS/STFM zone equivalencies were updated and supplemental validation runs were accomplished. In January 1996, were received the last of the updated FSUTMS datasets.

Work subsequently began on conducting future year model runs to identify any final validation adjustments. After some additional fine-tuning of the model validation, work began on the identification of LOS deficiencies in February 1996. LOS deficiencies were identified for non-MPO roadway segments using future traffic volumes from the STFM and the FDOT LOS Manual. On roadways determined to be deficient, traffic levels were verified using historic traffic count and population growth trend extrapolations and from the FIHS Decision Support System projections. Trend line graphs for the years 1994-2020 were prepared to compare forecasts from the different methodologies. Year 2000, 2010, and 2020 LOS deficiencies, along with borderline deficiencies, were then mapped for all State highway segments outside MPO areas.

Work has recently begun on the preparation of preliminary 2020 alternative Needs Plan networks. These networks will eventually be refined, mapped, coded, and evaluated. Discussions with FIHS staff could possibly lead to changes in the FIHS long range transportation plans. Any FDOT District Office interested in a presentation on the STFM and some of the preliminary 2020 findings should contact Walt Steinvorth, FDOT/Central Office Systems Planning, at (904)488-4642.

SERPM4 Validated!

By Bill Cross/Scott Seeburger/Shi-Chiang Li *AICP*, FDOT District 4 Planning Office

On June 21, the District 4 Planning Office announced the validation of the 1990 Southeast Regional Planning Model, Version 4. The model is regarded as the most sophisticated model in the FSUTMS family. The major new features of the model are:

- a time period modeling process for analyzing peak period traffic strategies
- indices of county employee control totals to normalize individual county employee estimates to a common base
- new 1990 census-based DUWEIGHT curves to reflect the trend of reduced household sizes
- two-digit facility type and area type highway network codes, developed through a cooperative effort
- a revised speed/capacity table consistent with the actual roadway operations and the Department's LOS tables
- a new HOV access coding scheme capable of testing HOV lane operation policies such as peak period directional enforcement and allowing SOV through-trips on carpool lanes
- a nested-logit mode choice model to overcome concerns regarding Independence of Irrelevant Alternatives
- facility-specific volume-density functions in highway assignments to differentiate the free-flow operation characteristics of freeways from the interrupted flow characteristics of arterials and collectors
- a new truck modeling process built into trip generation, distribution, and assignment modules

This version of the SERPM was validated by The Corradino Group. A technical review committee, consisting of the Metro-Dade, Broward, and Palm Beach County MPOs, Metro-Dade Transit Agency, FDOT Central Office, and FDOT Districts 6 and 8 Planning Offices, served as a peer review group to critique the

validation efforts. The model was validated on a RISC System 6000 computer. The Department is considering to port the model to the new X32 DOS platform in the next few months to expand its user base. The model is being used for the I-95/I-595 Master Plan project.

Southeast Florida FSUTMS Users Group Meetings

The tentative schedule for the upcoming Southeast Florida FSUTMS Users Group meetings and presentations is as follows:

- Friday, September 20, 1996
  Development of ZDATA2 Model
  by Rob Schiffer of Post Buckley

- Friday, October 18, 1996
  FSUTMS Nested Logit Mode Split Model,
  by Zeke Willis of URS

The meetings will be held at 2:00 P.M. in the District 4 Office at 3400 W. Commercial Boulevard, Ft. Lauderdale. For more information contact Shi-Chiang Li, *AICP* at (954) 777-4601.

Orlando Urban Area Model for 2020 Plan Converted to FSUTMS

by Arturo J. Perez, P.E.
Leftwich Consulting Engineers, Inc.

The Central Office, through the Statewide planning contract, retained the Urban Analysis Group (UAG) and Leftwich Consulting Engineers, Inc. (LCE) to convert the "Multi Model" for the Orlando Area to FSUTMS. The file naming conventions typically used in Florida (extension .YYA for input files and .AYY for the output files) were used in the conversion process. The model includes a full nested logit mode choice model (using a first-pass assignment to determine the highway congested speeds) and transit networks. As the conversion took place, the two-digit feature of FSUTMS version 5.0 was implemented. The model is available for DOS (X32), OS/2, and AIX/UNIX operating systems. Run time varies widely based on the operating system and the hardware used but a substantial reduction in the model run times was achieved by the conversion. On a Pentium-based 166 MHz machine (16 MB RAM) the base year 1990 model, run under the Extended-DOS version, takes 1 hour and 20 minutes to complete and requires about 300 MB of the disk space.

The 1990 and 2020 approved set of files are available from Dennis Hooker at the Orlando Urban Area MPO.

Miami Urban Area Transportation Study 2015 Model: DOS/X32 and OS/2 Versions Created

By Arturo J. Perez, P.E.
Leftwich Consulting Engineers, Inc.

FDOT District Six, through an ISTEA contract, requested from Leftwich Consulting Engineers, Inc. (LCE) and The Urban Analysis Group (UAG) to move the MUATS model available only on the RS/6000 platform to PCs. The AIX/UNIX version of the model was converted to the extended-DOS (X32) and OS/2 operating systems. In the process, a few files were renamed to follow the .YYA and .AYY naming convention used by FSUTMS for input and output file name extensions, respectively. The model has been tested against the AIX/UNIX version and the results are almost identical on both DOS/X32 and OS/2 versions. During the conversion process the two-digit feature (available with FSUTMS version 5.0) was incorporated. The 1990 (base year) validated model now runs in under 80 minutes on a Pentium 166 MHz machine with 16 MB RAM using FSUTMS-X32 under Windows 95 (MS-DOS-prompt window). The model requires approximately 350 MB of hard disk space to run.

The 1990 and 2015 (adopted plan) files are available from Phil Steinmiller at FDOT District Six in Miami.

MOBILE SOURCE EMISSIONS CONFORMITY

by Zakir H. Mir, Leftwich Consulting Engineers, Inc.

Metropolitan Planning Organizations (MPOs) routinely update their Long Range Transportation Plans (LRTPs). As part of these updates, the MPOs are required to demonstrate the air quality conformity for the mobile source emissions prior to the adoption of the LRTP. Often the LRTPs fail to meet the mobile source emissions standards, requiring the MPOs to go through a tedious process to achieve the conformity. A procedure that can be used to bring about the air quality conformity for the mobile source emissions for LRTP Updates is described below. This procedure involves achieving the mobile source emission reductions through minor modifications to the *VMTmix*, and application of other off-model adjustments. The procedure was used to bring about the NOx conformity for the Palm Beach County Cost Feasible Plan.

For the Palm Beach County Cost Feasible Plan, the NOx emission was required to be less than 53.75 tons per day to achieve conformity. Initial estimates of emission using the MOBILE5a

program measured the NOx emission as 58.01 tons per day. The initial estimate was made using the MOBILE5a default *VMTmix*. However the MOBILE5a documentation recommends that individual states and local jurisdictions develop and apply the localized estimates of *VMTmix* for use in the development of emission inventory. A detailed trend analysis was conducted using the vehicle registration information from the Department of Highway Safety and Motor Vehicles (DHSMV), re-arranged to match the MOBILE5a vehicle classification. Based on this trend analysis a new set of *VMTmix* was developed and applied in MOBILE5a. This modification to the *VMTmix* reduced the NOx emission to 53.85 tons per day.

Additional reduction was required to bring the Palm Beach County Cost Feasible Plan NOx emission to conformity. This was achieved by applying off-model adjustments to the NOx emission. Usage of off-model adjustment is often recommended since emission reductions due to various congestion mitigation programs implemented by the counties can not be modeled using the standard FSUTMS and MOBILE5a models. The off-model adjustments utilized for Palm Beach County included consideration for the implementation of a coordinated signal system, and usage of alternate fuels. An example to illustrate the procedure used to obtain the deductions due to the signal coordination is described below.

Palm Beach County used CMAQ funds to upgrade the traffic signals and to achieve the optimal progression, and reduce vehicle delay. It was estimated that the improved intersection saves about 7.85 seconds per vehicle. The Palm Beach County improved intersection system included 354 intersections carrying a daily volume of 12,200,839 vehicles. Therefore,

NOx idling emission factor from MOBILE5a = 3.768 gm/mi at 2.5 mph = 9.42 gm/hr.
Delay reduction = 12,200,839*7.85/3600 = 26,604.61 hours
NOx reduction = 26,604.61*9.42 = 250,615.42 gm of NOx = 0.28 tons of NOx

Using similar calculations, the reduction in NOx emission due to the usage of alternate fuel is estimated as 0.27 tons. With these off-model adjustments, air quality conformity was achieved for the Palm Beach County Cost Feasible Plan.

Review Of The Life Style Trip Generation Model

By: Mike Brown, TPS

FDOT Central Office Systems Planning contracted to develop special census tabulations for all the MPOs in the state. These tabulations which are aggregated by traffic zone are available upon request from Terry Corkery at Central Office. Four sets of tables are included in the tabulation: Table 1 based upon the existing FSUTMS trip generation model identifies the number of households by structure type, vehicles available, and household size. Table 2 is the proposed life style model developed by Reid Ewing at FIU/FAU Joint Center, and provides the number of households by presence of related children under the age of 18, vehicles available and number of workers in the household. Table 3 is based upon the Tampa Bay Regional Model and identifies the number of households by age of individuals, presence of related children under 18 and vehicles available. Table 4 is the Modified Tampa Bay Model and includes the number of households by presence of full-time workers, related children under 16, and vehicles available.

A preliminary evaluation of the life style modeling approach was undertaken by TPS at the direction of Shi-Chiang Li with FDOT District 4. Using the trip generation rates developed by Reid Ewing for Palm Beach County and the Treasure Coast, these special tabulations were used to develop trip production files for each of four tables for the Palm Beach and Treasure Coast study areas. Non-Home-Based trip productions and I-E trips were taken from the PRODS file generated by the standard trip generation model. The data was not factored or adjusted to include seasonal population nor was any modification made to the trip attractions, friction factors or control files. The highway-only assignments were developed for each of the four alternative approaches and those results are currently being reviewed by FDOT District 4 staff and the project's Technical Advisory Committee.

ZDATA2 Land Use Allocation Model Research Study

By: Mike Brown, TPS

Three major work efforts have been undertaken over the past three months regarding this project. First, Transportation Support Group has completed a report that documents the results of a survey designed to identify data sources and technical approaches most commonly used in developing base year and future year trip attraction data.

A second work effort by Post, Buckley, Shuh and Jernigan has focused on identifying the best sources of data to develop base year trip attraction (employment) data. This effort is currently involved in obtaining some commercially available databases and conducting a comparison of those data bases with ES202 and other commonly used data sources.

The third work effort undertaken by TPS has been a draft report which documents the various land allocation techniques and models available, the techniques used by the various urban areas in Florida to allocate future growth by traffic zone, and a preliminary list of models or techniques that should be considered for inclusion in the FSUTMS package.

The Tampa Bay Regional Transportation Analysis

By: Bob Rutledge, Gannett Fleming, Tampa

The Tampa Bay Regional Transportation Analysis (RTA) provides an on-going *process* for conducting transportation planning in a coordinated and consistent manner in the Tampa Bay area. The RTA represents a partnership among the Florida Department of Transportation, the District Seven MPOs (Hillsborough County, Pinellas County, Pasco County and Spring Hill/Hernando County), the local transit agencies (HARTline and PSTA) and the Tampa Bay Regional Planning Council. The primary aims of the RTA are as follows:

- Foster coordination and cooperation among area transportation planning processes and promote consistency among transportation plans;
- Provide a process for the analysis of regional transportation issues and for the evaluation of proposed regional transportation options;
- Provide a regional forum for the exchange of ideas and information and the resolution of conflicts.

One of the most important tasks for the RTA has been the development of a set of reliable planning tools tailored to the unique characteristics of the Tampa Bay area. During Phase I of the RTA, an extensive set of surveys was conducted to determine the specific travel characteristics, needs and desires of travelers in the Tampa Bay area. Also in Phase I, the basic structure was established for a set of regional planning models designed to address the specific needs of the Tampa Bay area. Phase IA included the refinement, calibration and validation of these models to an exacting set of standards for accuracy. The primary products of Phase I and IA of the RTA include:

- **A Regional Transportation Planning Database.** This is an extensive collection of information about Tampa Bay's travel characteristics, demographics, highway and transit networks and other travel-related factors. The database provided the information to calibrate and validate the Tampa Bay Regional Planning Model and to apply the model in testing alternatives. The common regional database ensures consistency of assumptions among the MPOs and other users of the model.
- **The Tampa Bay Regional Planning Model (TBRPM).** This is an FSUTMS-based set of transportation planning models designed to address the specific transportation needs and concerns of the Tampa Bay area. The TBRPM was designed to be:
  - *Regional in scope, but with sufficient detail and accuracy to be applicable at a local level.*
  - *Multi-modal* -- capable of evaluating the performance of both existing highway and transit modes as well as potential new transportation services, such as HOV lanes and guideway transit.
  - *Sensitive to the travel patterns of all travelers in the Tampa Bay area* including permanent residents, seasonal residents, tourists and other visitors, and those routine commuters from surrounding areas.
  - *Sensitive to the travel patterns and needs of trucks and goods movement within the area.*

To accomplish these aims, the model includes several unique features such as a refined trip generation model based on lifestyles, special treatment of routine external trips, distribution of trips based on both highway and transit system characteristics, a refined coding system for highway networks, and more detailed analysis of truck travel.

- **The Tampa Bay Regional Land Use Allocation Model.** This model is designed to reflect the close inter-relationship between transportation conditions and the distribution of future growth. The model is sensitive to changes in travel conditions and land use policies. The basic structure of the model was developed and refined in Phases I and IA. Final validation of the model will occur later (in Phase III), once additional data necessary for the validation is available.

MODEL TASK FORCE

March Meeting Recap

The Model Task Force met on March 11, 1996 at the Kissimmee Gateway Hilton Inn. Two of the Tri-chairs, Jeanette Berk and Joey Gordon, opened the meeting.

1. Status Of Standardization of Two-Digit Area Type/Facility Type

Rob Schiffer, Systems Planning's general consultant, gave a presentation on the status of standardizing two-digit area types and facility types. A preliminary evaluation of RCI and GIS databases for automation indicated that since the RCI database defines highway links different from FSUTMS and does not include county and municipal roads, it has only limited use in automating the two-digit highway network coding process. GIS databases have great potential in creating and editing FSUTMS networks.

Rob recommended the UROAD factor, currently set to 0.75 to be compatible with the UTPS approach, should be set to 1.00 to use the actual capacity values from the 1995 LOS Manual. Jim Fennessy agreed he would prefer to eliminate use of the 0.75 UROAD factor because it obscures the computation of volume/capacity ratios. It is more straightforward to use the actual LOS Manual capacities and then set this parameter to 1.00. He also added that zero is a valid capacity value with the latest release of FSUTMS. Rob also recommended a new default CONFAC parameter setting of 0.092 to equate with the default K-factor assumptions in the LOS Manual.

Rob recommended using generalized two-way peak hour LOS tables as default FSUTMS capacities and a default LOS standard for FSUTMS capacities of LOS E. This reflects current congestion patterns in Florida where drivers generally do not modify their commute trip patterns at LOS C or D. However, model validation testing has shown LOS D to be more appropriate in less congested rural areas. Rob recommended that FSUTMS default one-digit highway speeds be carried over to the two-digit HNET process. New speed categories could be added to reflect higher speeds on HOV lanes and rural freeways with 65 and 70 mph speed limits. Further stratifications of OBD (area type 4X) could be considered if it were determined that additional area types are needed. District Four is considering separate "beach" area types in the Southeast Regional Model.

2. Status Of FSUTMS Nested Logit Model

Terry Corkery, of Central Office Systems Planning, gave a presentation on the status of a standardized FSUTMS nested logit model. The usage of a nested logit model will avoid problems associated with the existing FSUTMS multinomial mode choice model and allow auto and transit modes to compete with each other more realistically. The Urban Analysis Group is under contract to the Systems Planning Office to revise the FSUTMS menu structure and incorporate the nested logit process into the existing model structure. URS Consultants is under contract to develop a series of nested logit model structures and calibrate the appropriate coefficients. The development of a series of standard nested logit models would enable theusers to redefine submodes and edit model coefficients within the FSUTMS menu structure.

3. TMIP Presentation: "Florida to Tie into Federal Travel Model Improvement Program"

Ram Pendyala of the University of South Florida College of Engineering presented the latest developments of the Federal Travel Model Improvement Program. The primary purpose of TMIP is to remedy acknowledged model deficiencies and provide new model structures which better address the requirements of ISTEA and the CAAA.

The Transportation Analysis and Simulation System (TRANSIMS) project is a major effort to develop new, integrated transportation and air quality forecasting procedures. TRANSIMS is a set of integrated analytical and simulation models and supporting databases. The TRANSIMS models deal with the travel of individuals at specific locations rather than zonal aggregations of households. Individual loads of freight will also be modeled.

These development efforts are still ongoing. Tests are being conducted currently in Dallas, Texas on mainframe computers. TRANSIMS models are scheduled for completion by 1999 or 2000. Software vendors are invited to review and assess the feasibility of converting this process into a user-friendly format. A functional, commercial software version of TRANSIMS should be available by 2005-2010. If you would like to be placed on the TMIP mailing list, contact Lynette Engelke, Texas Transportation Institute, 1600 East Lamar Boulevard, Suite 112, Arlington, Texas 76011, Phone: (817) 277-5503, FAX:(817) 277-5439, e-mail: l-engelke@tamu.edu .

4. Roundtable Discussion of Land Use Modeling

Jeanette Berk began by discussing the need for testing alternative land use scenarios in the 2020 Jacksonville (JUATS) Update. Land use models may also be used to educate the public and elected officials on the relationship between land use and transportation by visually displaying land use data.

Dennis Hooker, of the Orlando MPO, indicated that the 2020 Update of the Orlando Urban Area Transportation Study model was originally designed to combine the development of land use and transportation models. DRAM/EMPAL did produce acceptable estimates of household growth. But overall, the Orlando area has not been conducive to the use of land use models.
Orlando selected the DRAM/EMPAL models developed by S.H. Putman & Associates. It was found that the DRAM/EMPAL model projects reasonable growth for large urbanized areas with a traditional CBD area and outlying satellite developments. But most areas have not experienced phenomenal growth like Orlando and the model could not cope with the area's large employment growth. The lack of a linear set of socioeconomic data contributed to the inaccurate employment projections. The DRAM/EMPAL model costs $50,000 for the initial installation and calibration. There is an additional charge for ongoing technical support.

David Bredahl, of Gannett-Fleming, presented the status of Tampa Bay RTA land use model research efforts. This land use model is being developed by Resource Systems Group specifically to support lifestyle trip generation variables. One of the major changes is that households are grouped into three categories: retirees, workers with children, and workers without children. The available data to calibrate the model are 1990 and 1995 socioeconomic data. Land use projections are performed by sectors and traffic analysis districts. Factors used in determining land use growth rates are redevelopment areas/activities, future land use allocations, supply of developable land, highway and transit accessibility costs, and special considerations such as DRIs.

Rob Schiffer, of Post, Buckley, Schuh & Jernigan, talked about the current status of FDOT District Four's FSUTMS ZDATA2 project. The purpose of this project is to

improve the quality and reliability of trip attraction socioeconomic data used in the modeling process. A literature search and evaluation of existing land use models has been conducted. A survey was conducted to determine the most commonly used land use allocation models, data sources for base year and future year inputs, and local government needs regarding ZDATA2 projections. Detailed survey results will be presented at the next Model Task Force meeting.

Phase I efforts described above are almost complete. Phase II is designed to develop alternative base year ZDATA2 compilation processes and Phase III is designed to recommend future year ZDATA2 development processes. Phase IV activities include producing a ZDATA2 development manual and software. Phase V will include developing initial ZDATA2 files for each MPO in District Four.

James Hatchitt, of ARMASI, gave a presentation on a spatial database which contains information from property appraisers' offices. Records for each parcel include information such as land use codes, square footage of the building space, assessed value of the building, land value, etc. The program also allows users to query the database and create visual images and maps. All FDOT Districts have 1985 to 1993 data at the square mile (section) level. Cross-allocation tables could be developed to allocate data to TAZs.

5. Followup on the Enhanced Trip Generation Model Research Project

Reid Ewing, FAU/FIU Joint Center for Urban Policy, reported on progress of the trip generation research study. The contract for this study had been amended and extended. TMIP incremental improvements will also be addressed as part of this study. Existing survey datasets for Miami, Palm Beach, and Tampa Bay have been edited to remove erroneous and incomplete responses. The new contract also includes the development of standard travel characteristics study survey forms and methodologies.

The Jacksonville and Treasure Coast survey datasets were also recently used to assess the explanatory power of the standard FSUTMS GEN model versus a classic lifestyle model which uses the number of workers in the household, number of children, and number of vehicles to generate trip productions.

Bob McCullough indicated that his consultant has obtained special census tabulations for all Florida MPOs stratified by the standard GEN, Tampa Bay RTA, and classic lifestyle model variables. These tabulations will be provided to each FDOT district on compact disc.

6. Followup on the Transit Modeling Research Project

Ram Pendyala presented a report entitled "An Assessment of Transit Systems Modeling in the State of Florida." This project was designed to evaluate existing travel forecasting models, assess current practices, perform a comprehensive literature review, and recommend short term, medium term, and long term transit modeling enhancements. The study found out that for short range planning efforts, simple planning techniques are sufficient. However, consideration should be given to using FSUTMS-type processes for long range planning. The issues not fully addressed by the existing FSUTMS models are trip chaining, land use, time of day travel, demand/supply feedbacks, and performance measures to evaluate transit systems.

7. Identification of Future Research Activities

Rob Schiffer presented a list of future research projects: a statewide rural travel characteristics study, revisions to the FSUTMS external trip module, special generators, and GIS/FSUTMS integration. Jim Fennessy recommended the development of a peak-period assignment model in order to perform peak-hour analysis more effectively. Jeanette Berk indicated the need to incorporate bicycle and pedestrian modes into travel demand forecasting models.

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