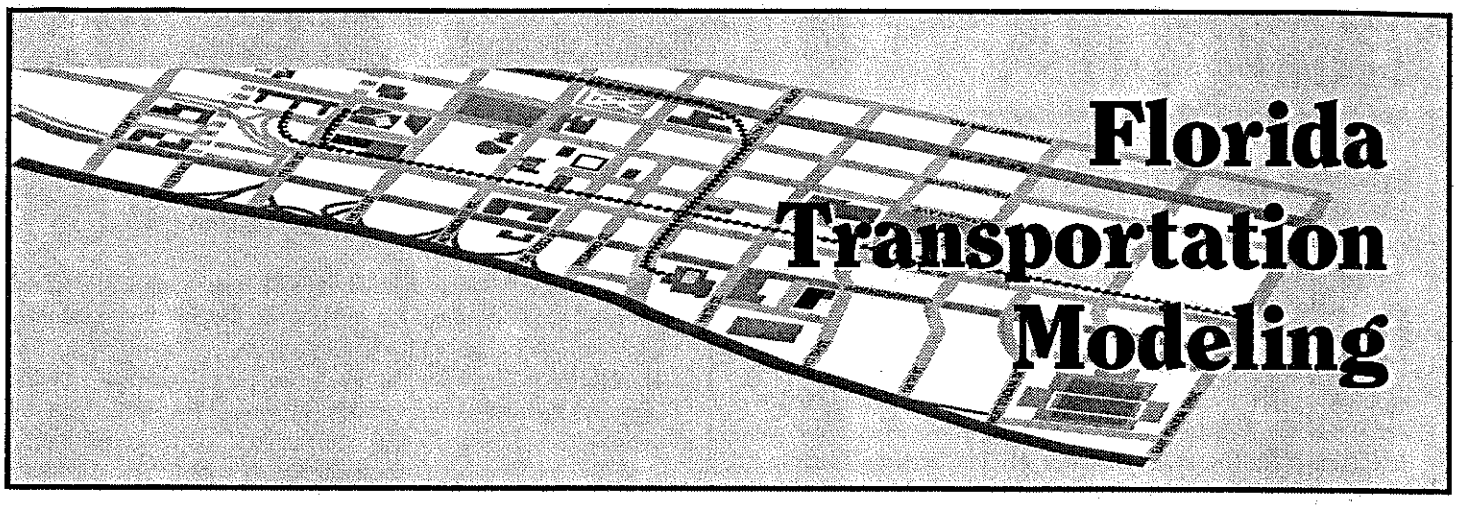

Volume 3 November 1996

In This Issue...

TMIP: Miami is possible TRANSIMS interim test-site

by Bob McCullough, FDOT Systems Planning Office

Florida's model improvement efforts received a big boost when the federal Travel Model Improvement Program (TMIP) initiated disussions with FDOT to have Miami serve as a possible field test-site for several interim products of TRANSIMS, the next generation of travel demand forecasting models being developed by the Los Alamos National Laboratories (LANL). The field tests would focus on three interim products that are being packaged and made available in the near future to selected states and MPOs. The first product is the Baseline Population Synthesizer that generates synthetic households and persons using census data. The synthesizer is intended to simulate the population characteristics of an area for regional travel demand forecasting. The second product is the Micro-Network Editor that facilitates the coding and representation of multimodal networks at a very fine level of detail. The third product is the Multicriterion Traffic Assignment algorithm that accounts for a multitude of factors underlying route choice behavior of travelers.

The consideration of Miami as a test-site for the TRANSIMS interim products is a culmination of several FDOT-sponsored statewide initiatives conducted during the past six months that have helped generate considerable local and state interest in TMIP's new generation of travel modeling methods including activity-based analysis, microsimulation, and TRANSIMS. In May of this year, the FDOT conducted seminars in Fort Lauderdale and Tampa focusing on the activity-based analysis component of TMIP. (Mr. Ron Fisher, a key TMIP official with the Federal Transit Administration served as the Keynote Luncheon Speaker at the Tampa seminar.) These seminars brought a wealth of information about the national TMIP to the state. The presentations by Prof. Ryuichi Kitamura, Prof. Eric Pas, Mr. Keith Lawton, and Mr. Ron Fisher at the seminars helped planners within the state develop an appreciation for and understanding of modeling methods being considered by TMIP. At the same time, the seminars helped the federal TMIP recognize Florida's commitment to model improvement.

Another FDOT-sponsored initiative now underway provides for conducting comprehensive activity surveys in Miami and one other urban area in Florida, to be determined later. Data collection is scheduled for early 1997 and it is anticipated that the data would be used for field-testing the TRANSIMS products in Miami (see related article on page 4). The Miami metropolitan area provides an ideal urban setting for testing products that are likely to compose the next generation of travel modeling tools. The challenges associated with modeling Miami's diverse demographic, socio-economic, and cultural populace along with its unique intermodal transportation system, far-reaching suburban development, high-density downtown, and waterfront attractions make it an excellent case-study site for TRANSIMS products. The FDOT Central Office intends to continue its TMIP and TRANSIMS information-sharing activities to keep local planners fully informed of developments at the national level.

TECH NOTES

by Harry Gramling, FDOT Systems Planning Office

Over 50 copies of FSUTMS-X32 have been distributed. To date, only three help calls directly related to X32 have been received. The only problem to surface involves the multipath-multiperiod mode choice program, MODEMPMP.EXE. This file, as distributed with the X32 release, has a bug (the problem does not apply to the OS/2 and AIX platforms). The program will stop during mode choice with an "internal write error." The problem has been resolved through an updated MODEMPMP.EXE file. The new file, named MODEMPMP.X32, is available on the Systems Planning Bulletin Board at (904) 921-4308 or Suncom 291-4308. (The user must rename the extension to -.EXE.) Instructions for downloading the file are listed below. The corrected program will also be included on an update diskette to be provided when another problem involving selected link runs is resolved. UAG is currently working on this problem.

Another trouble spot is executing HNIS under WIN95. If you are using X32 within a Windows-95 operating system, please see Don Draughon's related article at right.

The Systems Planning Office has requested an enhancement to plot routines that will permit annotation of project (such as DRI) and total traffic on the same plot.

At least one user has encountered a problem that is not obvious to the casual user. Terminal times are assigned based on the area type of the centroid connector. If a "non-standard" area type other than 10, 20, ...50 is assigned to a centroid connecter, the PROFILE.MAS must be updated to include a terminal time for the new area type. Otherwise, trips beginning and ending in that zone will not have an associated terminal time (the program will assume zero). Thus, changing a CBD area type from 10 to 11, for example, would reduce CBD zone trip lengths by five minutes, which can alter distribution patterns. Systems Planning has requested to UAG that a fatal edit check be added to eliminate this problem.

If you have encountered any problems associated with X32, please call Harry Gramling at (904)922-0439 or Suncom 292-0439. Private-sector users may obtain FSUTMS versions 5.0 and 5.1 from the Urban Analysis Group. Call Cindy Nemanic at (510) 838-1363 for more information.

To download MODEMPMP.X32 from the Systems Planning BBS: Dial (904) 921-4308 on your modem and log on to the system.

Go To File System
Change Area
4 - Recent Uploads
Download a File
filename = modempmp.x32
try ZMODEM for the protocol choice

FSUTMS-X32/Windows 95 users:

Here's how to fix the *NIS* display problem

by Don Draughon, FDOT Systems Planning Office

The recently released FSUTMS-X32 has a problem when running the Windows 95 version of the HNIS (Highway Network Information System) program. The problem has something to do with the image size and resolution of the program, resulting in a "windowed" image that is too small to work with and cannot be made full screen. UAG is working to solve this problem, but in the meantime, Arturo Perez (Leftwich Consulting Engineers) has come up with a solution that involves using the DOS version of HNIS instead of the WIN95 version. Outlined below are steps which may be used to create an icon in Windows 95 to run FSUTMS and HNIS full-screen:

1) If during installation you chose the Windows 95 version of HNIS.EXE it will be necessary to copy the DOS version (HNIS.EXE) from installation diskette #7 into the \FSUTMS.X32 directory.
2) Click on the START button at the lower left corner of your Windows 95 screen and choose Programs, then choose Windows Explorer.
3) Double-click on the Windows folder in C: to open it.
4) Now look for the MS-DOS icon with the word, "command" next to it.
5) Using the right mouse button, click and drag this icon to the Desktop and choose "Create a Shortcut."
6) Now you must modify this copy of the MS-DOS Prompt by right-clicking on it and choosing Properties.
7) Next choose the Program tab and change the Working: directory path from C:\WINDOWS to C:\DATA\FTOWN or whatever the subdirectory is where you normally start FSUTMS (this step is optional). NOTE: You must have an AUTOEXEC.BAT file with a path statement containing \FSUTMS.X32 to run it from a data directory.
8) Now choose Advanced... and place a check in the "Prevent MS-DOS-based programs from detecting Windows" statement and remove the check in "Suggest MS-DOS mode as necessary," click on OK.
9) Now choose the Screen tab and make certain that Full-screen is selected under Usage, click OK and close all windows.

You now have a copy of the MS-DOS Prompt icon located at the top of the Start menu that will enable you to run the DOS version of HNIS full-screen in Windows 95. You can change the name of this icon to FSUTMS if you like, and you can change the icon itself.

We have found that in Windows 95 there are many ways of performing the same functions. If you have a tip that will help others, please bring it to our attention and we will include it in future issues.

Model Task Force establishes GIS Subcommittee

by Joey Gordon, Model Task Force Tri-chair

As Geographic Information Systems packages gain popularity, it has become more important than ever to guide the implementation of GIS/FSUTMS interfaces. A memorandum was sent out on September 17, 1996, activating the GIS Subcommittee of the Model Task Force. The memo was sent to the following potential participants who had earlier volunteered their interest: Dennis Hooker (Orlando MPO), Shi-Chiang Li (FDOT District 4), Arturo Perez (Leftwich Consulting Engineering), Ike Ubaka (FDOT Public Transportation Office, Tallahassee), Wayne Zhao (FDOT District 2), and Kangming Xu (Post, Buckley, Schuh and Jernigan).

The purpose of this group is to review and evaluate activities ongoing at the statewide level relating to GIS integration with FSUTMS. The subcommittee will also work toward standardizing links between FSUTMS and other planning packages such as the Level of Service software, Decision Support System, and Roadway Characteristics Inventory using GIS. Glenn Ahlert (Lee County MPO) has agreed to serve as GIS Technical Subcommittee Coordinator and Joey Gordon will serve as the tri-chair contact person. Vidya Mysore will serve as the primary contact from the Systems Planning Office staff. Both Joey and Vidya participate on FDOT's GIS Functional Team, so they will be channeling information between the two groups.

For further information, call Joey Gordon of the Turnpike District Planning Office at (904) 922-2520 or Vidya Mysore at (904) 922-0444.

GIS for Transportation: Guiding our future directions

by Vidya Mysore, Systems Planning Office

The Systems Planning Office is developing strategies to use Geographic Information Systems for Transportation (GIS-T) to support a model development and application process. As a first step, we have worked with the Model Task Force to activate the GIS subcommittee to investigate the following tasks:

Task 1: Interfacing transportation models and GIS:

(a) Short Term Plan, focusing on immediate needs. These include writing programs to bring model output data into known GIS platforms for map query and display.

(b) Long Term Plan, implementing staged GIS interfaces into the four-step modeling process. Key agenda items will include the following:

- conflation (an overlaying procedure) of the model network with the non-model street network
- augmenting GIS techniques in a model calibration and validation process
- outlining the GIS interface needs of future FSUTMS versions, including the database-capable (DBC) version.

Task 2: Supporting the GIS Functional Team (GFT, discussed below) role and directions. The subcommittee needs to abide by the standard procedures and policies set by the GFT and work with them to implement the state-level pilot studies and other model application needs.

Task 3: Standardizing the interface between FSUTMS and other FDOT planning packages, such as Level of Service software, the Roadway Characteristics Inventory (RCI), and the Decision Support System (DSS), using GIS technologies.

GIS Functional Team (GFT)

In February 1994, FDOT formed the GFT along with a GIS Executive Steering Committee. The role of the GFT is to review, plan, develop and analyze the various components that meet the technical, organizational, and operational requirements of a comprehensive GIS-T infrastructure for FDOT.

Since then, GFT has worked hard to gain a consensus on a range of core GIS implementation issues. In their first phase, the GFT has produced six major task reports:

- A GIS-T User Requirements Analysis
- Base map recommendations to support FDOT GIS-T efforts
- Alternative configuration comparison and analysis and infrastructure recommendations (i.e., computing delivery architecture for GIS-T)
- GIS-T hardware and software recommendations
- GIS Organizational Needs
- A GIS-T Implementation Plan

Listed below are the major recommendations and other highlights of these task reports.

Base Map Recommendations:

- Adopt a 1:24,000 standard scale for all base maps.
- Adopt UTM Zone 17 and NAD 83 as standards for base map projection and datum.
- Adopt county boundaries and FDOT district boundaries as units of map partition.
- Establish metadata standards (documentation attached to the

graphics, text and other attributes of the geographical database).

Software Recommendations:

- Standardize on the use of only two GIS platforms: ARC/INFO (ESRI) and MGE (Intergraph).
- In general, ARC/INFO will be used for planning, programming, and environmental activities and MGE for design, construction, and maintenance.

Hardware and Operating System Recommendations:

- Use Windows-NT as the PC-based operating system for both servers and clients (workstations).
- For UNIX, use AIX and DEC Alpha.
- Adopt TCP/IP as the network communication protocol (used for transmitting electronic data).

Pilot Project Recommendations:
Six 'foundational' projects were identified by the GFT as essential pilots:

- Street Network Data Collection: Gathering, maintenance, clean-up, and standardization of Street Network Files.
- Base Map Cartographic Set: Produce approximately 30 maps to exemplify the use of GIS.
- Mainframe-Client Server Replication: Provides tools for seamless data replications.
- Work Program Application.
- Permit Routing Application.
- Safety Office Application.

All of the above pilot studies are in progress and are expected to be complete in 1997. The above recommendations are not intended to hinder local GIS activities. It is the intent, however, to reduce overlapping efforts, reduce the development of GIS-T applications on multiple GIS software platforms, enhance communication and coordination of GIS activities, and enhance the transfer of technology, lessons learned, etc.

The GFT activities are in agreement with the results of a GIS survey of all twenty-five Florida MPOs conducted by Bob Kamm (Brevard MPO) in March 1996. The survey indicated the need for FDOT to bring about several actions at the MPO level relating to modeling and GIS:

- Establish a standard link between FSUTMS and GIS (both for network and socio-economic databases).
- Develop a transportation network layer or coverage. This includes technical aspects, and management issues on staffing, construction, maintenance, and integration coordination.
- Produce status reports on FDOT's GIS activities. This includes information about the GIS-T applications, physical roadway and traffic characteristics information such as bridge, pavement, and RCI data.
- Provide management-oriented training on the principles of GIS, ArcView, and other add-on GIS packages.

At present, the Systems Planning Office staff is actively involved with the Street Network Pilot Study. Street network standardization is very crucial and is an immediate need before the modeling and GIS technologies can merge together. We are also investigating several packages which address modeling and GIS interfaces.

Systems Planning is working closely with the GIS Functional Team and the Model Task Force in implementing modeling issues in GIS-T development. If you would like to know more about GIS implementation, please contact Vidya Mysore at (904) 922-0444 or (SC) 292-0444.

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Related topic also in this issue of FTM: Converting FSUTMS Highway Networks to ARC/INFO, page 10.

Activity-based travel data collection underway

by Ram M. Pendyala, Civil & Env. Engrg., University of South Florida

The Research Center of the Florida Department of Transportation recently awarded a contract to the University of South Florida to conduct comprehensive activity-based travel surveys in two urban areas of Florida with a view to boost model improvement efforts in the state. The specific model improvement targeted in this project involves the development of an integrated transit demand and supply model that can assist transit planners in identifying optimal or near-optimal transit service configurations that meet various levels of transit demand.

Activity-based travel surveys provide rich information regarding people's travel behavior, activity engagement patterns, trip chaining needs, activity and trip scheduling, and short non-motorized trips. In addition, activity-based surveys provide a mechanism for modeling travel demand as a derived demand, i.e., derived from the need to pursue activities that are distributed in time and space.

Several metropolitan areas around the country including Portland, San Francisco, Boston, Raleigh-Durham, and Dallas-Ft. Worth have completed or are currently conducting activity-based surveys. Many of these efforts are motivated by the fact that modeling methods currently under development within the purview of the federal Travel Model Improvement Program (TMIP) are based on the principles of activity-based analysis and would greatly benefit from the availability of such data.

The research project calls for activity data collection to occur in one large and one small urban area (population less

than 200,000) in the state. Miami has been chosen as the large urban area while a final decision has not yet been made with regard to the small urban area. At this time, statements of interest are being sought from small urban areas that may wish to participate in the survey effort. Survey design is scheduled for October and November of this year, while survey administration and data collection are scheduled for March 1997.

In addition to serving the specific model improvement task included in this project (i.e., the development of an integrated transit demand and supply model), the activity-based data collected in this project will be able to support a host of model developments in the future. Examples of such model developments include the analysis of trip chaining, departure time choice (time-of-day modeling), destination choice, value of time, and human activity engagement as the underlying force driving travel demand.

Recently, the federal TMIP has initiated discussions with the State of Florida to have Miami serve as a field test-site for interim products that become available through the ongoing TRANSIMS project (see related article on page 1). The activity-based travel data to be collected as part of this research project will be used for undertaking the TRANSIMS field tests.

Regular updates on the progress of this project will be published in this newsletter. Meanwhile, questions and comments may be directed to me at (813) 974-1084 or to Mr. Ike Ubaka with the Public Transit Office of FDOT who is serving as the Project Manager at (904) 488-7392.

FDOT presents DRI traffic analysis training

by Terrence Corkery, AICP, Systems Planning Office

This year, the Development of Regional Impact (DRI) review process has been making a strong comeback, surprisingly at the urging of the development community. Developers have begun to realize that development approvals administered by the Florida Department of Community Affairs (DCA) and the state's regional planning councils (RPCs) provide a consistent, fairly predictable review process throughout the state.

These recent events reverse a trend of the last few years when the DRI review process declined in importance, being phased out and replaced by local government comprehensive plans and concurrency management systems.

Local government treatment of large-scale developments varied significantly from city to city, creating an unpredictable development climate, which sometimes presented difficulties in obtaining financing for development projects. Local government-controlled reviews in anti-growth cities and counties often resulted in longer delays and higher development costs than the DRI review process would have caused.

Training Workshops Developed

With the renewed emphasis on DRIs, the Systems Planning Office has been making preparations to offer training, troubleshooting, and other technical assistance to the districts, MPOs, DCA, and the RPCs. In September 1996, we conducted four training sessions for DCA's technical review staff on using FSUTMS for analyzing traffic impacts of DRIs and comprehensive plan amendments.

The DCA Resource Planning and Management Division is charged with the responsibility of reviewing local government planning studies on behalf of the State of Florida. These planning studies include comprehensive plan amendment proposals and Development of Regional Impact (DRI) applications, both of which contain complex transportation impact analyses.

Dale Eacker, of DCA's Bureau of State Planning, contacted FDOT requesting training on how to review these transportation planning studies. He felt that DCA's review staff of roughly 60 land use planners could benefit from some instruction in the fundamentals of transportation modeling and in interpreting model outputs to determine future traffic impacts of proposed developments.

In response to DCA's request, the Systems Planning Office Modeling Section developed customized training workshops covering three areas:

- a general FSUTMS overview
- analyzing comprehensive plan amendments
- analyzing Developments of Regional Impact

The workshops combined a presentation similar to the style of the FSUTMS training workshops with a discussion of other procedures performed outside the modeling arena. Thus, the training covered how to review model inputs and outputs, but also addressed internal capture, pass-by trips, and determination of significance and adversity.

Results

These training workshops were well received by DCA staff. We are making arrangements with DCA to conduct the workshops a second time to accommodate those people who were unable to attend. This training, although customized for DCA's needs, will serve as a foundation to develop other workshops for FDOT districts and MPOs.

We are coordinating our efforts with another project the Systems Planning Office is working on, the Site Impact Analysis Procedures task work order. This task work order under the FIHS General Planning Consultant contract consists of developing a handbook on transportation impact analysis procedures and providing training workshops to FDOT district staff responsible for reviewing DRIs and comprehensive plan amendments.

Integrating FSUTMS with EVAC:

South Sarasota County Hurricane Evacuation Study

by Bill Lloyd, AICP, Wilbur Smith Associates

The EVAC model was designed to forecast heavy outbound travel demand under emergency evacuation conditions. FSUTMS data files and network files were modified and used as inputs to the EVAC program for the South Sarasota Evacuation and Traffic Circulation Alternative Corridor Study. This article describes the EVAC model and methodogy used to estimate existing and future network performance under hurricane evacuation conditions.

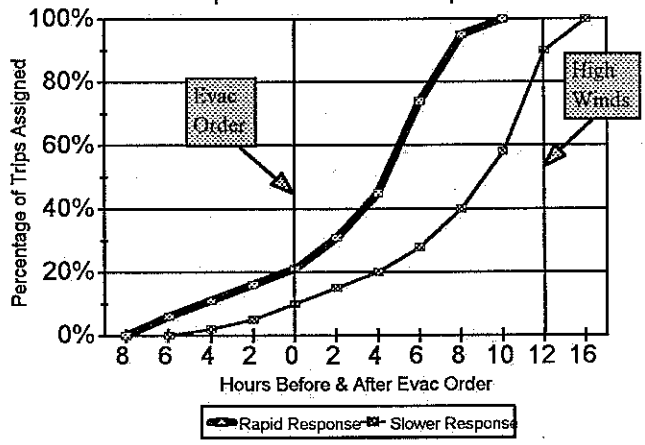
Response Distribution

During an evacuation event people choose to depart at different times during the evacuation period. Some residents in potentially hazardous areas may leave even before an evacuation order is issued. Others may wait for some period of time after an evacuation order to confirm that a storm will actually threaten their area. The Federal Emergency Management Agency (FEMA) monitors behavior during storm evacuations and surveys area residents, after evacuations, to determine response patterns. Departure distribution curves (percentage of residents departing by periods preceding and following an evacuation order) are developed from these data. The EVAC model permits designation of the departure distribution pattern of area residents. Two different distributions were specified for geographical sub-areas within the study area (see Figure 1). A rapid response distribution was used for beach areas with limited access and greater vulnerability to high winds and storm surges. A slower response distribution was used for inland areas with less exposure. Departure distributions may also be used to assign trips departing the area at different times to different evacuation routes to simulate the effects of street or bridge closures due to flooding.

Evacuation Trip Development

Population or dwelling unit data can be used to estimate the number of evacuation trips that will enter the network during the evacuation scenario. Traffic analysis zone (TAZ) data developed for the Sarasota/Manatee County 2020 Long Range Transportation Plan Update were used for this purpose. In this analysis it was assumed that a majority of households would evacuate as a unit in a single vehicle, and a small percentage would evacuate additional vehicles. Approximately 10% of all evacuating trips are predicted to be made by households evacuating additional vehicles. A value of 1.1 vehicles per occupied dwelling unit, including hotel and motel units, was used to predict total evacuation trips per TAZ . Consideration was also given to the impact of evacuating populations passing through the study area on their way to safety (external-external trips). These populations primarily included residents in the western half of Charlotte County.

Figure 1
Departure Distribution Comparison



Background Traffic

During evacuation events all roadway traffic is not necessarily related to trips actually evacuating the area. Particularly early in the evacuation period, trips are occurring that are part of area residents' nomal travel patterns or are related to pre-evacuation activities. This background traffic uses some roadway capacity which might otherwise be available to evacuating vehicles. This proportion may be varied over different periods within the total evacuation period. For this analysis background traffic was assumed to decrease as the evacuation moves forward.

Evacuation Periods/Subperiods

The total evacuation period was divided into a series of shorter periods and subperiods. These are used to specify when variables change during the simulation process (departure percentages, capacity adjustments for background traffic, and path definition) and in the summarization of model evaluation measures. More and shorter periods/subperiods can improve the accuracy of model results and increase the level of detail used in representing evacuation assumptions. However, these benefits are accompanied by increased model computing run times.

Capacity Simulation

The evacuation simulation process takes into consideration two measures of road capacity: holding capacity and processing capacity. Holding capacity refers to the number of vehicles that may be physically present on the roadway at any point in time. If the demand of vehicles wanting to enter the link is greater that its ability to process and/or store vehicles, queues will build through the road system. Holding capacity for each link as calculated in this analysis is roadway segment length divided by average vehicle length (assumed to be 18 feet per vehicle), times the

number of lanes operating in the evacuation direction.

Process capacity used in simulation is similar to the standard definition of road capacity. It defines the number of vehicles that can pass a point on the road over a given amount of time and is a function of the road's cross section (number of lanes), intersection characteristics, and degree of access control. For this analysis, processing capacity was derived from the standard FSUTMS speed/capacity table. In simulating evacuation vehicle flows over time, a link's processing capacity cannot be exceeded.

Evacuation Network Extraction
The south county evacuation network was extracted from the current Sarasota-Manatee Long Range Transportation Plan FSUTMS network in Anode-Bnode format. Required link characteristics (i.e., length, speed, and capacity) were converted from FSUTMS HNET.AYY files into EVAC format.

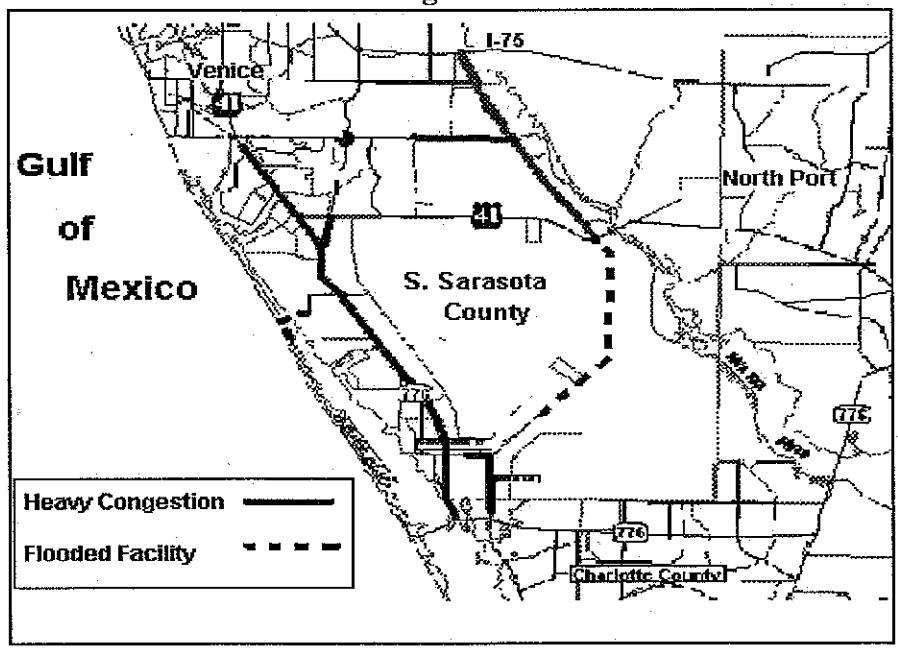
Aggregation of Study Area Centroids Into Sectors
TAZs were aggregated into geographic sub-areas associated with different departure distributions. This is accomplished in EVAC by cross-referencing evacuating zones with distribution sectors. All zones within a given sector are assumed to use the same departure distribution. EVAC produces tables reporting trip percentages by sector and evacuation route, which aid in the trip distribution process.

Evacuation Paths
Up to four evacuation routes may be specified for each TAZ. The routes are defined by identifying the series of road links evacuees would use to travel from their home to designated points of safety. The routes may be used to travel to shelters or inland areas. Route designation may also be used to reflect changes in routes available over the evacuation period, associated with road or bridge closures due to flooding.

Alternative Routing Plans
The evacuation simulation process is applied to test the performance of a candidate evacuation plan. The Sarasota County emergency evacuation routing plan was used as the base routing scenario to determine the location, degree and duration of evacuation delays. Routing path adjustments were then employed in subsequent runs ensure the plan makes optimum use of road capacity (i.e., avoiding overloading on some routes while leaving others under-utilized), until reasonable results were achieved.

Evacuation Scenarios
Three storm/evacuation scenarios were analyzed to illustrate a range of potential events. For example, one scenario involves heavy rains preceding a fast moving storm traveling east from the Gulf of Mexico directly towards the study area. A rapid response distribution is applied to the barrier islands and coastal zones loading roughly 25% of evacuating trips onto the network by hour zero when the evacuation order is issued. However, the majority of the population resides within the slower response distribution zones which have loaded only 10% of their total trips by the evacuation order. Six hours into the evacuation scenario the Manasota Beach bridge succumbs to the rising storm surge. The northern and southern segments of River Road as well as Dearborn Street also close due to flooding caused by heavy rains. By this time roughly 30% of the population has entered the roadway network and 28% has left the study area. Nine hours into this scenario the intersection of Center Road and Jacaranda Boulevard close, in addition to the last segment of River Road north of U.S. 41. Approximately 55% of the population has entered the network with 41% having succeeded in leaving the study area. Twelve hours into the evacuation, hurricane-force winds begin to batter the study area. At this time, all of River Road, Venice Avenue east of Jacaranda Boulevard, and Jacaranda south of U.S. 41 are added to the list of closed facilities.

Figure 2



Evaluation
EVAC includes extensive reporting abilities that the user can modify depending upon need. For this analysis, data relating the location of vehicle congestion were reported, and converted into a GIS-compatible format. Finally, the files were loaded into a GIS program and associated with the FSUTMS network to illustrate congested corridors (see Figure 2).

HNET study proposes enhancements

by Rob Schiffer, PBS&J/Tallahassee

This is an update to an article in the July issue of *Florida Transportation Modeling* entitled, "Two-Digit Implementation Continues". The previous article explained the purpose of this research effort, funded by FDOT/Central Office and sponsored by the Model Task Force, aimed at implementing two digit area type (AT) and facility type (FT) methodologies for network coding and model validation. In this issue we present an update to this ongoing effort.

In order to test alternative methodologies, network coding of two-digit area types and facility types was completed for three urbanized areas. Jacksonville, Pensacola, and Indian River County were selected as test sites for large, medium and small urban areas, respectively. Upon completion of initial network coding, color-coded plots were provided to FDOT and/or MPO staff responsible for each of these areas for review and comment. New HPLOT script (control) files were developed to produce detailed plots of each area type and facility type category.

Initial coding methodologies were based largely on previous efforts in the Tampa Bay area. (Recently, the SERPM IV model validation incorporated some of these same two-digit categories while combining others.) New two-digit AT/FT categories were added where necessary for consistency of speeds and capacities. Newly prepared capacities, based on the 1995 LOS Manual and distributed at the March 1996 FSUTMS Special Update Workshop, were used as a starting point for validation testing. Initial free flow speeds were based largely on Model Update Task C recommendations, with some added assumptions for new AT/FT categories.

Model runs 1-6 were identical in each of the three urban areas tested. Run #1 used the previously validated SPDCAP file (to the greatest extent feasible) with the newly recoded two-digit network to ensure maximum compatibility of network coding efforts. We decided a run #1B would be necessary in each area to erase any previously developed speed/capacity adjustment factors, and provide a better comparison with subsequent runs. Runs 2 through 6 were designed to evaluate alternate LOS levels for capacity determination, and different settings for CONFAC and UROADF.

Since that time, we have embarked on a series of model runs, mostly aimed at refining model speeds and network coding of area types and facility types. Copies of validation run summaries are continually provided to all members of the Model Task Force HNET Subcommittee. Each model run summary provides a description of the modifications made for each run, as well as summary statistics on the performance of the trip distribution and highway assignment modules.

Working with Districts 2, 3, and 4, we have completed 21 runs for Pensacola, 18 runs for Jacksonville, and 16 runs for Indian River County. It was found that a hybrid of LOS C/D capacities worked best in Pensacola and Jacksonville. No UROAD factors are recommended for use in either of these areas. The LOS Manual essentially does the same adjustment as a UROADF when using an LOS standard lower than E. The ratio between C/D and E differs by type of facility; thereby accomplishing a variable UROADF. Since Indian River County has limited roadway congestion, we had to use LOS E capacities with a UROAD factor of 0.75 in order to get the model to iterate. A CONFAC of .10 seemed to work better in each area than the .092 value (which is based on the K-factor used in the LOS Manual).

We have also prepared a series of new standard UPF files for use in HNIS. We have been developing a number of recommendations for additional AT/FT categories, recommended input speeds and capacities, and additional FSUTMS features to enhance the ability to use two-digit coding methodologies. We will also be coding future year network improvements to complete our validation testing. A presentation will be made at the next Model Task Force meeting to discuss the findings of this research effort.

FSUTMS ZDATA2 development process

by Rob Schiffer, PBS&J/Tallahassee

This is an update to an article in the July issue of *Florida Transportation Modeling* entitled "ZDATA2 Land Use Allocation Study". Previous articles explained the purpose of this research effort, funded by FDOT/District 4, aimed at evaluating, recommending, and developing alternate procedures for producing base year and future year FSUTMS ZDATA2 files. In this issue we present an update on this ongoing effort.

Evaluations have been completed on three alternate base year ZDATA2 processes. The first process is based on use of government employment reporting for ZDATA2 development. This process involves geocoding employer I.D. numbers from a Florida Department of Labor and Employment Security (ES-202) database to TAZs. Geocoded employer ID numbers are subsequently provided to the FDOT Office of Policy Planning for automated aggregation of employment by TAZ and SIC category into ZDATA2 files (using programs developed by FDOT). ES-202 data treats the number of employees by individual corporation as "confidential." Therefore, employment is only available at an aggregate TAZ level. This makes data validation more difficult.

The second base year process involves use of proprietary employment data from Contacts Influential (or other sources such as Dun & Bradstreet). These data are also geocoded to TAZs, and, with the assistance of GIS and database software, aggregated by TAZ and SIC category into a ZDATA2 format. While there is a cost attached to

proprietary employment data, actual employment figures are available for each employer, unlike ES-202. Contacts Influential, it was found, is less expensive than Dun & Bradstreet data and is easier to validate because employers are listed by local business name rather than corporate name. It should be noted that, for dates prior to September 1996, Contacts Influential provides only an employment range rather than an actual employment estimate (also there is an extra fee for employment estimates beyond a range).

The third base year process involves use of land coverage data to produce estimates of employment. Two sources of property appraisers' data, ARMASI and MetroScan, were evaluated for this third process. Unfortunately, the only geo-referencing system for ARMASI data at present is the township/range/section system. Square mile sections are generally incompatible with TAZ boundaries, and as such, assumptions have to be made regarding the percent of each section within a given TAZ (or vice versa). MetroScan data, primarily geared towards the real estate industry, is not yet integrated with GIS technology. In order to estimate employment from land use data, gross assumptions must be made regarding floor area ratios and vacancy percentages. As property appraisers' offices continue to integrate GIS into their databases, use of such data in the future for trip attraction estimating may become more feasible.

At present, we are working closely with Broward County and Palm Beach County MPO staffs to prepare base year ZDATA2 estimates for their forthcoming model validation efforts. A combination of Contacts Influential and ES-202 data are being used in this effort. Similar work on Martin, St. Lucie, and Indian River Counties will proceed at a later date.

Mike Brown, of Transportation Planning Services, is presently evaluating three alternative future land use models as part of this same study. The Broward Employment Allocation Model, Simplified Land Allocation Model (SLAM), and Highway Land Use Forecasting Model II (HLFMII) will be tested. Recommendations will later be made regrading the applicability of each model for use in MPO areas of the District.

To evaluate these models, actual data from the Indian River and Broward County will be used to develop land use forecasts. Current information on vacant land and historical data on development approvals has recently been provided by both counties. This data will be used to develop 1985-1990 1985-1995 land use forecasts that will be compared with actual development patterns in the two counties.

The ZDATA2 Study Advisory Committee has requested that the study team research various techniques to incorporate concurrency restrictions into the land use allocation process. They have also requested that modeling approaches designed to identify redevelopment opportunities also be explored for use with the recommended land use model.

Trip distribution model tested in Southwest Dade

by Marie-Elsie Dowell, Parsons Brinckerhoff-Miami

The trip distribution module of FSUTMS was put to the test during evaluation of a proposed freeway in southwest Dade County. The freeway would extend the existing SR 874 from its current terminus at the Homestead Extension of Florida's Turnpike (HEFT) to SW 137th Avenue, just south of SW 160th Street.

Using FSUTMS (Dade County Model) turned out to be the best tool to forecast traffic in an ever-changing area where tremendous growth is projected within the next few years.

Methodology: The 2020 socio-economic data set developed by the Dade County MPO was used to develop future travel demand in the area with and without the proposed roadway. The multimodal model developed by KPMG/ Peat Marwick using FSUTMS as a base was used as a platform. This model builds on the FSUTMS model system and is analogous to the multi-purpose/ multi-period model developed previously in Miami for the Dade County Transitional Analysis. The model also incorporates multimodal highway capabilities and HOV modeling.

Model Results: Various alternatives were modeled in order to define the most appropriate roadway network that would best serve the area. The Southwest Dade area is growing at a tremendous pace. Comparison of aerial photos taken in 1989 and 1993 show that Hurricane Andrew only slowed down the growth in the area temporarily. Residential, commercial, and support facilities seem to appear overnight and along with them the roadways needed to serve the new facilities. The 2020 demographic data shows an average density of approximately 4,000 units per square mile in the area.

The proposed extension would consist of a six lane freeway running in a northeast-southwest direction. The travel patterns from the model between alternatives showed that the proposed roadway would attract traffic from both north-south arterials and east-west arterials already existing in the area. These arterials mainly serve as major connections between the local collector-distributor roads and the freeways such as the HEFT, SR 874 and SR 826.

Model Performance: The model results were compared against the responses obtained through an origin-destination survey performed in the area. The survey results show that people in the area currently using the major north-south and east-west arterials would indeed use the proposed roadway.

In addition, the different travel paths in and out of the area were surveyed and measured (distance, posted speed, etc.). Travel times were calculated based on the resulting levels of service on the different roadways serving the area. The

destination point in all cases was taken as the interchange between SR 874 and the HEFT (Homestead Extension of the Florida Turnpike). The survey results showed a savings of approximately four to eight minutes when the proposed freeway is in place.

In conclusion, the origin-destination survey results and the actual data collected in the field match the trip distribution and assignment results obtained from the model.

Life Style Model Review

by Mike Brown, TPS Miami

A technical memorandum was developed by TPS for FDOT District 4 which provided a preliminary review of the life style trip generation model. Trip generation rates developed by Dr. Reid Ewing using household survey data were applied in conjunction with Special Census Tabulations developed for FDOT Central Office. An edit check of the Special Census data was undertaken as part of this review.

The changes in home-based-work trip productions for each county in the study area were imported into GIS. Maps were created showing the areas with increased or decreased trip productions as compared to the standard GEN model. GIS maps showing the concentration of persons over 65 and households with two or more workers were then used to help evaluate the model.

There was a definite decrease in home-based-work trips in areas with a large number of persons over 65. As an example of the results of the sub-area evaluation, a TAZ in Broward County which is almost exclusively made up of the upscale retirement community of Century Village with a population of 15,000 was shown to be producing over 3,500 home-based-work trips according to the existing GEN model. With the life style model only 350 home-based-work trips originate from that zone.

The county-wide total of home-based-work trips was compared with the total home-based-work trips identified in the Census Transportation Planning Package Journey-to-Work data. The life style model was usually closer to the CTPP than the GEN model. The life style model produced lower total home-based-work trips for all counties in the study except for Dade County which showed more home-based-work trips. This appears to be due to larger multi-generation families with more workers per household in Dade.

Development Of Future Year Life Style Data: Projecting life style model variables is fairly easy. The current proportion of households within each category can be applied to the projected number of dwelling units to compute the future life style numbers. This may seem to be a crude approach, but it is no different than the way most counties currently project vacancy rates, seasonal residents or auto ownership for use with the existing model.

Conclusions And Recommendations: The life style model does provide significant improvements over the existing model in predicting home-based-work trips. Improved reliablity of HBW trips is critcial for those MPOs which are looking to expand into time-of-day modeling for multi-modal planning and peak period congestion management.

Converting FSUTMS Highway Networks to ARC/INFO

by Wade White, Gannett Fleming, Inc., Tampa

As personal computing capabilities increase, transportation planners are being asked for more sophisticated analyses and presentations. The visual link between travel forecasts and other geographic features can help planners convey the impact of transportation network alternatives to decision makers. To this end, the practice of travel demand forecasting is beginning to rely upon the display capabilities of GIS as a tool to present networks as they relate to other geographic features.

The following program is a handy tool to help convert FSUTMS LINKS files into an ARC/INFO-compatible format. By using the output of this program with the ARC function GENERATE, FSUTMS users can display highway networks in ARC/INFO (and subsequently ARCVIEW) for comparison with other GIS data sources (i.e. TIGER files, raster imagery, etc.). This tool is currently being used to help rectify coding differences between TIGER data and the 1995 base highway network under development as part of the Tampa Bay Regional Planning Model.

```
C PROGRAM HWY2GIS.FOR PROGRAM TO CONVERT LINKS INPUT
C TO ARC INFO "GENERATE" FORMAT  7/10/96 ww
      IMPLICIT INTEGER*4 (A-Z)
      REAL*4 AX,AY,BX,BY,X(15000),Y(15000),XX,YY
      CHARACTER*30 infile1,infile2,infile3,outfile1
      CHARACTER*6 param
      CHARACTER*1 alt,centroid
      CHARACTER*2 year
      LOGICAL*4 exists
      WRITE (*,25)
   25 FORMAT (/,' Enter Alternative YEAR (2 NUMBERS) > ',$)
      READ (*,30) year
   30 FORMAT(A2)
      WRITE (*,45)
   45 FORMAT (/,' Enter Alternative ID (1 CHARACTER) > ',$)
      READ (*,50) alt
   50 FORMAT (A1)
      WRITE (*,55)
   55 FORMAT (/,' Would you like to include Centroids (y/n)
> ',$)
      READ (*,60) centroid
   60 FORMAT (A1)
      WRITE (*,61)
    61 FORMAT (/,' How Much Would you like to shift the X
coords > ',$)
      READ (*,62) XSHIFT
   62 FORMAT (I7)
      WRITE (*,63)
    63 FORMAT (/,' How Much Would you like to shift the Y
coords > ',$)
      READ (*,64) YSHIFT
```

```
   64 FORMAT (I7)
      infile1  = 'LINKS.'//year//alt
      infile2  = 'XY.'//year//alt
      infile3  = 'PROFILE.MAS'
      outfile1 = 'arc-hwy.'//alt//year
      INQUIRE (FILE=outfile1,EXIST=exists)
      IF (exists) THEN
      OPEN (60,FILE=outfile1,STATUS='OLD',FORM='FORMATTED')
      CLOSE (60,STATUS='DELETE')
      END IF
C OPEN UP ALL THE FILES
      OPEN (50,FILE=infile1,STATUS='OLD',FORM='FORMATTED')
      OPEN (51,FILE=infile2,STATUS='OLD',FORM='FORMATTED')
      OPEN (52,FILE=infile3,STATUS='OLD',FORM='FORMATTED')
      OPEN (60,FILE=outfile1,STATUS='NEW',FORM='FORMATTED')
c READ &ZONESA FROM PROFILE.MAS
   70 READ(52,75,END=85)param
   75 FORMAT(1X,A6)
      IF (param.eq.'ZONESA') THEN
        READ(52,*)ZONESA
      END IF
      IF (param.eq.'UNITS') THEN
        READ(52,*)UNITS
      END IF
      GOTO 70
   85 IF(ZONESA.LE.0) GOTO 1500
C READ COORDINATES INTO MEMORY
   90 READ (51,92,END=93) NODE,XX,YY
   92 FORMAT (1X,I5,2(1X,F8.2))
      X(NODE)=((XX*100)+XSHIFT)*(5280/UNITS)
      Y(NODE)=((YY*100)+YSHIFT)*(5280/UNITS)
      GOTO 90
   93 CLOSE(51,STATUS='KEEP')
C  SET  UP  BIG  LOOPS  FOR  COORDINATES  READING  AND  LINK
ASSIGNMENT
   95 READ (50,105,END=990) A,B
  105 FORMAT (2X,2I5)
      IF(centroid.eq.'n'.or.centroid.eq.'N') THEN
          IF(A.LE.ZONESA.OR.B.LE.ZONESA) GOTO 95
      END IF
  175 Z=Z+1
  200 AX=X(A)
      AY=Y(A)
      BX=X(B)
      BY=Y(B)
      WRITE (60,255) Z,AX,AY,BX,BY
  255 FORMAT (I10,2(/,2F18.0),/,'END')
      IF (MOD(Z,1000).EQ.0) WRITE (*,275) Z
  275 FORMAT (2X,'RECORD PROCESSED = ',I5)
      GOTO 95
  990 WRITE (*,1005) Z
 1005 FORMAT (/,3X,' TOTAL RECORDS PROCESSED =',I5,
     */,3X,'NORMAL END HWY2GIS.FOR VERSION 1.1',//)
      WRITE (60,1007)
 1007 FORMAT ('END')
      CLOSE (50,STATUS='KEEP')
      CLOSE (51,STATUS='KEEP')
      CLOSE (60,STATUS='KEEP')
      GOTO 2000
 1020 WRITE (*,1025) Z,A,B
 1025 FORMAT (/,3X,'ABNORMAL READ, MISMATCH ON NODE FILE',//
     *2X,'RECORD=',I5,/
     *2X,'ANODE=',I5,/
     *2X,'BNODE=',I5,/)
      GOTO 2000
 1500 WRITE (*,1505)
 1505  FORMAT (//,'   ERROR  PROFILE.MAS  BAD  OR  MISSING
ZONESA',
     */,'  ABORTING----------',/)
      GOTO 2000
 2000 STOP
      END
```

News from the FSUTMS User Groups

TAMPA BAY FSUTMS USERS GROUP

by Robert A. Rutledge, AICP, Senior Transportation Planner Sylla, Inc.

The Tampa Bay FSUTMS Users Group held their quarterly meeting at the offices of FDOT District Seven. Bob McCullough and Terry Corkery from the Central Office detailed all the latest improvements in FSUTMS Version 5.1 and the Extended DOS platform (X32). The Extended DOS platform was of particular interest to the members, and Bob and Terry were kept hopping answering questions.

Sharon Philips, with Post, Buckley, Schuh and Jernigan gave a very informative presentation on the 40th Street Corridor Study here in Tampa. An old tool in traffic calming is being utilized with much success in other areas, and Tampa, being no stranger to controversy, is ready to employ it here. Roundabouts are back! Sharon presented a very convincing argument for use of this tool, and how it has benefited other areas with similar traffic circulation problems.

Danny Lamb, with FDOT District Seven, updated the group on the status of the Regional Transportation Analysis (RTA). The RTA is in its fourth phase. This phase of the project will revisit socio-economic data, and different variables used in the trip generation model.

Members on the Move: (or shameless plugs!) Bob Rutledge has joined SYLLA, Inc., as a Senior Transportation Planner in the Tampa Office. Bob is responsible for developing a Transportation Planning section for the firm. So if you need a good DBE, give him a call.

George Deakin has joined Kimley-Horn's Tampa office, and will be responsible for traffic engineering in the Central Florida area.

Our next scheduled FSUTMS Users Group meeting will be held in December. It will be the changing of the guard (officers) dinner/dance party. We will deep you informed of the time and location!

SOUTHEAST FLORIDA FSUTMS USERS GROUP

As this newsletter was going to press, the Southeast Florida Users Group was

set to meet on November 8. Walter H. Keller, Inc. had been scheduled to present results from their Broward Travel Characteristics Study. The next meeting date has not yet been established. Those with questions or comments about the South Florida Users Group should contact Shi-Chiang Li of District Four at (954) 777-4601.

District One to establish users group

Bob Crawley, formerly of the Polk County Transportation Planning Organization, recently joined FDOT as District One's modeling coordinator. One of Bob's first major tasks for District One will be to form a Southwest Florida FSUTMS users group. He is in the process of contacting modelers in the district and is hoping to set up a first meeting sometime in January. Please address any questions or suggestions about the users group or District One modeling in general to Bob Crawley at 941-519-2397 (SunCom 557-2397).

Next Model Task Force meeting

No meeting date has been set for the next Model Task Force meeting. The group will meet in January or February when a key research study has been completed and is ready for review. This study, the HNET two-digit area-type and facility-type implementation, is nearing completion (see HNET article on page 8). Other studies to be discussed at the next Model Task Force meeting include life style trip generation models (page 10) and ZDATA2 development (page 8).

Notices will be sent out when a meeting date is established.

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