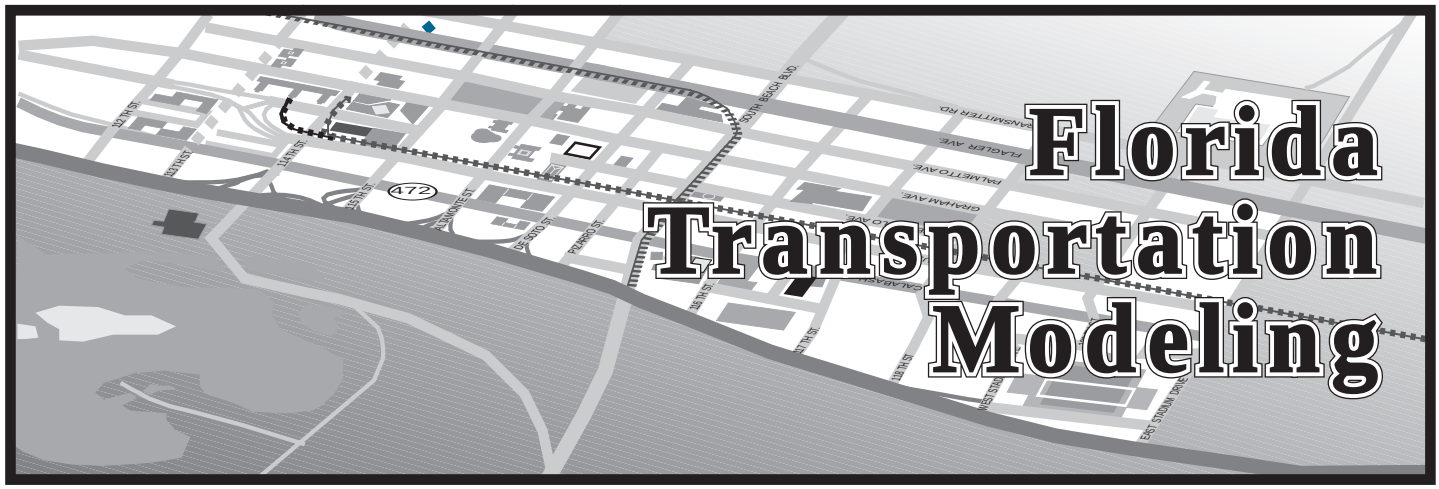


Volume 14

April 2000

STATEWIDE MODEL TASK FORCE MEETING TENTATIVELY SCHEDULED FOR JUNE 7 - 8 IN ORLANDO

FDOT District One rivals for largest model in the state

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

Under a general planning consultant contract with the Florida Department of Transportation - District One, Leftwich Consulting Engineers, Inc. (LCE) was tasked with developing an FSUTMS-based travel demand forecasting model for the Department that would provide additional capabilities in the preparation of traffic projections for FIHS facilities, Design Traffic/ ESAL reports, developments of regional impact (DRIs) and other regionally significant projects, and projects near or at county boundaries.

The resultant highway-only model has the following characteristics:

- All 12 Counties in the District (Charlotte, Collier, De Soto, Hardee, Highlands, Hendry, Glades, Lee, Manatee, Okeechobee, Polk, and Sarasota),
- 3,099 traffic analysis zones (TAZs),
- 35 external stations,
- Airport and truck trip purposes, and
- Revised external-internal (E-I) balancing procedure

Three complete datasets are available for the FIHS model. The validation (base) year is based on 1996 conditions. Year 2010 and 2020 datasets are also available. These are based on the currently adopted 2020 Long Range Transportation Plans, for the MPO models, and the Bureau of Economic and Business Research (BEBR) projections for rural counties.

The base year model network was developed by combining available networks from the Southwest Florida Regional Model, county models, and, where no models existed, from the Statewide model. The combined network was then rectified to state plane

In this issue

FSUTMS Users' Group Meeting Dates

Central *Kacia DuHart (407) 482-7883*
May 25, August 24, December 7

Southeast *Shi-Chiang Li (954) 777-4655*
April 14, June 8, September 14, November 30

Northeast *Imran Ghani (904)360-5682*
April 27, August 1, November 16

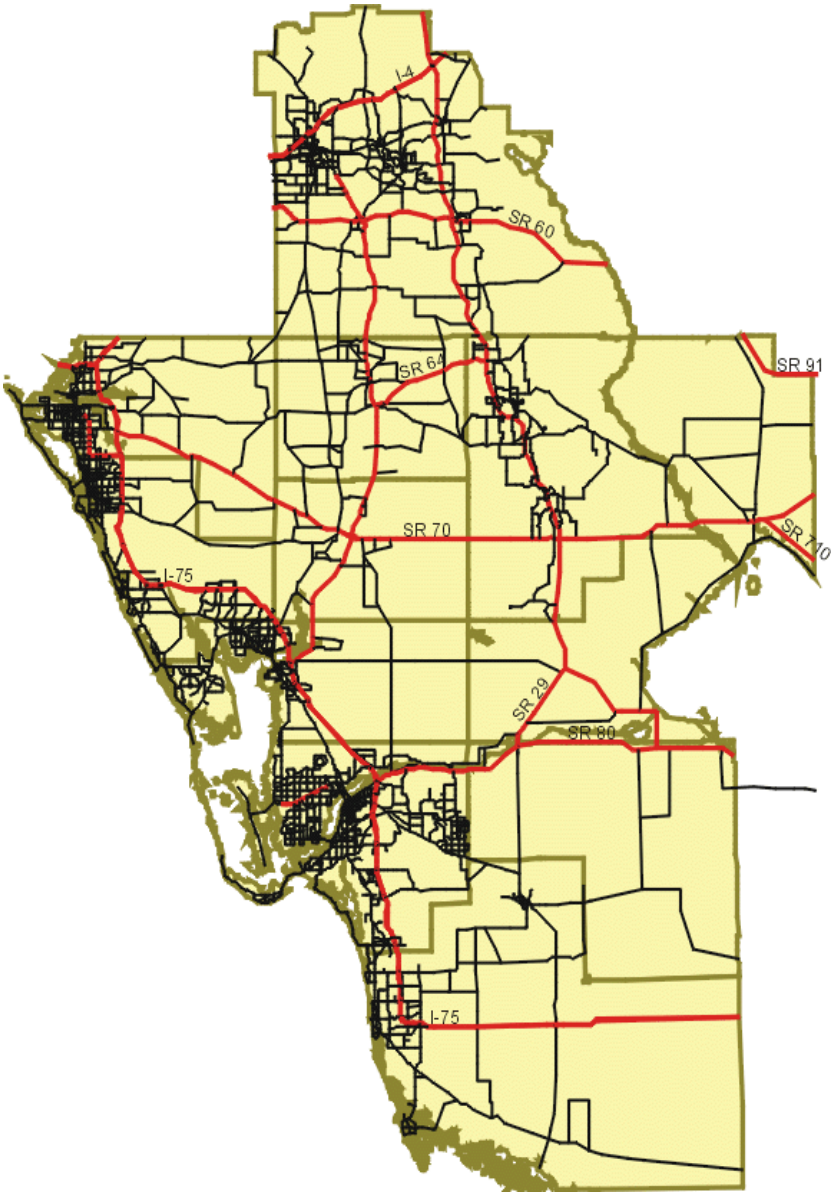
Tampa Bay *Danny Lamb (813) 975-6437*
June 1, August 24, October 19, December

FDOT District One rivals for largest model in the state *Cont'd*

coordinate system (NAD 1927 Florida west in meters) using a TIGER/line file and the Visual Planning Environment (VIPER) software. In addition two-digit area and facility types were used following the definitions recommended by the HNET sub-committee of the Model Task Force (MTF). Traffic count stations were added to the LINKS.yya file in the "zone" field. A traffic count database was then used to match station locations in the FIHS network to populate the "count" fields in the LINKS.yya. With this procedure, additional base year networks (e.g. 2000) can be developed with traffic count data in an efficient and cost-effective manner.

Socio-economic data was generated using available model ZDATA1 and ZDATA2 files for 1990, 2000, 2020, and 1996 (from the Florida Statistical Abstract). The "GEN" program was updated to accept up to 4,500 TAZs to accommodate the 3,000-plus zone system in the FIHS model.

The standard FSUTMS balancing procedure used for external-internal (E-I) trips was replaced with a new procedure developed by LCE. The FIHSEI program was included in the GEN module script file to balance Polk County E-I attractions independently from the rest of the counties and improve model-predicted travel patterns. An "airport" set of purposes was also added to the model using internal and external zone distances to airport TAZs output from the HPATH module. The "AIRPORT" program provides three additional airport-related purposes: residents (DUs), tourists (hotel/motel), and externals. The HPATH script file was also modified to generate the highway "skims" with the zone-to-zone distances for the area of influence for each airport available in urban areas (set to 30 miles for the Sarasota-Bradenton Airport and to 40 miles for the Southwest Florida Regional Airport).



The model validation effort produced results that were better than anticipated at the beginning of the model development. With an overall percent root mean square error (%RMSE) of 27.8 and VMT and VHT V/Cs of 1.02, the model surpasses most of the individual models it comprises.

The FIHS model runs under the FSUTMS menu system (version 5.3) "Highway-only" option. All input files, script files, and special programs are available on CD-ROM from FDOT. Several technical memoranda and reports were prepared documenting all aspects of the model development and performance of the model. In addition, a procedural guide is available that provides insight on the proper installation of the model on a personal computer. For additional information on the FIHS model, please contact the FDOT District One Project Manager, Mr. Jim Baxter at (800) 292-3368.

Turnpike District seeks to improve toll forecasting procedures

by Joey Gordon, Florida Department of Transportation, Turnpike District & William Olsen, URS Greiner Woodward Clyde

Toll modeling procedures currently available in FSUTMS use a traditional and simplistic method for conducting toll diversion analysis through a capacity-constrained equilibrium assignment of vehicle trips onto a highway network. Toll cost is converted to its travel time equivalent based on using a system-wide factor referred to as "CTOLL," reflecting an overall average value of travel (or "willingness to pay") for all travelers within a given metropolitan area or corridor. The value of "CTOLL" is either estimated reflecting an overall average household income for a study area or borrowed from other studies.

The Florida Department of Transportation , Turnpike District, sought advice from nationally renowned modeling experts on how to improve upon existing toll forecasting procedures. Experts' recommendations included the following key areas of improvement:

- Estimate demand for toll travel within a generalized nested logit structure at the mode choice modeling step rather than relying solely on highway assignment procedures;
- Update the traffic assignment modeling step to operate on composite impedance (generalized cost) rather than travel time alone;
- Use survey data to assist in developing appropriate mode choice models capable of estimating mode shares for transit, highway toll travel, highway non-toll travel, plus special use lane (HOV, HOT and Toll Only) applications;
- Make toll forecasting procedures sensitive to variations in household income, trip purpose, and time of day;
- Use the Orlando metropolitan area as the initial site for data collection and Turnpike model calibration;
- Implement improved toll forecasting analysis procedures within FSUTMS for systems analysis of potential Turnpike projects.

The current plan is to (a) collect stated and revealed preference surveys and other complementary data in the Spring; and (b) perform model calibration, validation, and implementation in the Fall of 2000.

Ask Harry…

This column is dedicated to providing information on new features and releases of FSUTMS along with user questions and answers that may be of general interest.

FSUTMS Version 5.40 is scheduled for shipment in April. The package will include ULAM99 and Viper 2.0, which now includes transit editing. Quality-assurance testing on Version 5.40 has been underway for several weeks with some minor problems detected and resolved.

Unlike past distributions, Version 5.40 will not include a new TRANPLAN Manual, so be sure to retain your current copy. Release notes will be provided – yes, you will have to spend a few minutes reading before successfully loading and running FSUTMS.V54.

Problem Solving

HEVAL, in the validation mode, produces screenline reports that compare assigned volumes to counted volumes. A user recently experienced unexpected results on a screenline that included only one link. The individual link was reporting: Volume = 11831, Count = 5485, V/C Ratio = 2.16 while the Totals line reported 6153, 5485, and 1.12 respectively. The user explained that his model included HOV lanes and preloaded truck volumes and asked for help in determining a solution. An examination of user-supplied data files revealed that the count had been coded in the ANODE-BNODE direction only, with the BNODE-ANODE direction being blank. If both counts had been missing, HEVAL would have reported "THIS LINK HAS NO COUNT". HEVAL correctly reported the volume-to-capacity ratio in the Totals line where it compared the assigned directional volumes to the available counts.

In response to this problem, HEVAL (Version 5.40) now reports missing directional counts on two-way links. Missing directional counts will not abort an HEVAL run.

Please Email your comments or questions to harry.gramling@dot.state.fl.us or call (850) 414-4928, SUNCOM 994-4928.

New statewide freight model to focus on intermodal connectivity

by Huiwei Shen and Terrence Corkery, FDOT Systems Planning Office,Tallahassee

Freight transportation plays a critical role in Florida's economic development. The Commodity Flow Survey (CFS) of 1993 measured $172 billion of goods shipments weighing 346 million tons handled in Florida, accounting for approximately three percent of the value and four percent of the weight of total U.S. freight shipments (excluding pipeline shipments). Even more noteworthy is the percentage of these freight movements that stay within Florida. The 1993 CFS shows that about 63 percent of the value and approximately 82 percent of the weight of total shipments originating in Florida were shipped to destinations within the state. This high level of intrastate freight movement calls for significant planning efforts at the statewide level to ensure smooth, efficient, and safe transportation of goods and services.

In recognition of the critical role played by freight transportation in a region's economy, recent legislation at the federal and state levels has explicitly called for the consideration of freight movements in transportation planning processes. Both the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) emphasized the importance of intermodal connectivity and freight transportation as major drivers of economic development. A similar thrust has also occurred at the state level. In September 1997, the Florida Senate Committee on Transportation made the following observation: *"because metropolitan areas have differing priorities, economic development, the movement of freight, and the connection between regional freight hubs (i.e., seaports, airports) are not always looked at from a regional or statewide perspective."* The committee recommended that economic development variables be incorporated into statewide planning models with explicit consideration of intermodal connectivity and freight movements.

In response to these federal and state legislative initiatives, the FDOT Systems Planning Office, in cooperation with the Freight Subcommittee of the Model Task Force, is spearheading a major effort to develop an Intermodal Statewide Highway Freight Model for Florida. The scope of services for this project includes ten tasks aimed at evaluating the current state-of-the-practice approaches and available databases, developing and testing new freight modeling methodologies, and coordinating and documenting activities completed as part of this project. The improved freight modeling processes developed under this study will be incorporated into FSUTMS.

The following is a brief summary of each task activity included in this project:

- **Task 1, Evaluation of Existing Freight Forecasting Models** will include an evaluation of freight models throughout Florida and the United States and an assessment of available techniques with an emphasis on statewide modeling efforts.
- **Task 2, Inventory of Existing Freight/Truck Surveys and Databases,** will be a comprehensive inventory of surveys and published databases on freight and truck movements available throughout Florida and the United States.
- **Task 3, Model Specification,** will identify policy decisions that need to be analyzed with the Intermodal Statewide Highway Freight Model. The MTF Freight Subcommittee and the Statewide Freight Stakeholders Task Force will direct this initiative.
- **Task 4, Data Needs Identification,** will ascertain all data needed for developing the Intermodal Statewide Highway Freight Model.
- **Task 5, Data Collection and Assembly,** will compile and analyze data in preparation for model development.
- **Task 6, Model Development,** will convert the model specifications and data collected during previous tasks into a working truck freight model.
- **Task 7, Model Validation and Refinement,** will test, evaluate, and refine the truck model until model estimates of truck activity match observed conditions.
- **Task 8, Model Integration and Implementation,** will fully integrate the truck/freight model into the FSUTMS model stream, with special programs and script files developed for this purpose.
- **Task 9, Study Coordination,** will ensure that for the duration of this study, all efforts will be coordinated with the Statewide Freight Stakeholders Task Force, the MTF Freight Subcommittee, MPOs, and FDOT staff.
- **Task 10, Documentation,** will provide technical memoranda summarizing the activities and findings of each task. Near the conclusion of the study, these "tech memos" will be compiled and incorporated into a final report and an executive summary.

The firm of Cambridge Systematics, Inc. (CSI) will lead the consultant team consortium for this study, to be completed by December 2000. For further information, please contact Huiwei Shen at (850) 488-4642.

Feds outline TRANSIMS schedule at TRB meeting

by Wade White, Gannett Fleming Engineers & Planners

At a recent status meeting for TRANSIMS at the Washington Hilton and Towers on January 13, 2000, Fred Ducca (FHWA), Robert Radics (FHWA Atlanta), Elizabeth Riklin (FTA Washington), and Kim Fisher (TTI) discussed the latest development concerning TRANSIMS. Following is the information that was garnered in bullet point format:

- TRANSIMS commercialization is due to begin in March 2000.
- The software is LINUX-based for now. It is built to run on multi-processor platforms such as the Sun Solaris, SGI Multi-Processor and the like.
- There is no land use forecasting component to TRANSIMS. The software doesn't address school buses, seasonal residents, or walk assignments. These and other travel markets will need to be identified by participating MPOs for inclusion in the model.
- The MPO solicitation, originally scheduled for December 1999, has been postponed until at least May/ June 2000.
- The ongoing Portland TRANSIMS case study is not scheduled to be complete until October 2000.
- There were 29 letters of intent from MPOs from the November request. There is no obligation to participate for those MPOs.
- MPOs must make "good faith effort" to convert to TRANSIMS. This will not be required to be in writing. Commitment will be evaluated by how high up in the policy-making process support is documented.
- FHWA/FTA is using the following goals and characteristics to select the maximum list of 5 MPOs for the Early Deployment Site:
  - diverse settings: geographic, transit, MPO size
  - wide range of policy issues
  - large group of experienced users to propagate
  - help in identifying data preparation methods
  - technically advanced staff to field-test software
- The MPO solicitation package will be advertised in the Federal Register. It will contain a much more detailed outline of what is required in the MPO proposals. Once it is advertised, respondents will have approximately 3 months to respond. All of the 29 sites that responded with a letter of intent will automatically be notified of the advertisement. It also will be posed on the TMIP website.
- Once the possible early deployment sites have been shortlisted, FHWA will work with the MPOs to identify the costs needed to support TRANSIMS in terms of data, hardware and staff.
- TTI will provide four types of training to support TRANSIMS:
  - policy level (1 day)
  - typical user level (3 day)
  - high-end user level (1 semester college course)
  - software developer level (5 day)
- TEA-21 funds available to MPOs will be determined after the commercialization consultant is selected. Dollars remaining from the TEA-21 authorization, after the commercialization costs have been subtracted, will be divided among the participating MPOs.
- The 20% local match can come from many local sources. It is unclear if staff time and previous data collection efforts will count towards the 20%. Once the 20% match is in place, other federal money such as $PL can be used to support the project.
- Unresolved Issues:
  - how to provide software: locally or Internet
  - level and type of support: what is funded by agency and what is provided without charge
  - how the above issues relate to funding and staffing implications

Florida Transportation Modeling is published under contract to the FDOT Systems Planning Office in Tallahassee. All information and materials contained in the newsletter are contributed by FSUTMS users and Model Task Force members. Please contact the editors to submit articles for future issues or to get on the mailing list.

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Transit Level of Service software available

By Jon M. Ausman, Transit Program Manager

The Public Transit Office, working with Kittelson and Associates, has developed a software package which measures the amount of transit service available to residents and job locations. The Transit Level of Service (TLOS) software uses both temporal and geographical/spatial factors to determine whether public transportation service is actually available or not.

The Main Issue

Actual transit service availability has been difficult to measure. Most measures make assumptions, which upon examination, overestimate the amount of availability. For example, many long-range transportation plans (LRTPs) presume public transportation is available to all persons and job locations within one-quarter air mile of a transit route. This estimation is based on two assumptions: one, everyone within one-quarter air mile has a walkable one-quarter mile route to a transit stop; and, two, bus schedules are convenient to users.

Both of these assertions are flawed. First, large portions of the population living within one-quarter air mile of a route must walk further than one-quarter mile, the industry standard, to actually get to the transit stop.

The second assertion that public transportation is available one hundred percent during the transit's span of service is also incorrect. Many transit agencies use hour headways for some, if not all, of their routes. A person walking at a speed of three miles per hour can walk a quarter of a mile in five minutes. If five minutes is a reasonable period of time to wait at the stop, then transit may be available to a job site or household for only ten (10) minutes of each hour of transit service. The ten minutes of service is based on walking five minutes and waiting five minutes.

If car ignitions had timers on them and they would only start on the hour and until ten minutes after (for example, from 7:00 AM to 7:10 AM), then we would not say we had auto availability from 7:11 to 7:59 AM because we could not start our car.

Many of the LRTPs prepared by Metropolitan Planning Organizations in Florida assert transit available to either 60-90% of the community's population or that geographical coverage runs at 60-90%. These same LRTPs then provide a detailed mode split analysis, which shows transit carrying less than one percent of the trips made.

Policy makers who see heavy coverage but few trips are unlikely to invest further in public transportation.

TLOS

The Transit Level of Service (TLOS) software is designed to be easily used by local communities. It allows local communities to set their own standards for how far people should walk (measured in minutes) and how long is a reasonable wait at a transit stop.

The software can be used in any community regardless of size. It requires the following data: bus stop locations; bus routes; bus schedule book (providing span of service, initial departure time and arrival times at different points along the route); TAZ population data; TAZ job data; and, walkable and air one-quarter mile segments from each bus stop.

Users of TLOS can choose temporal, geographic and bus route variables to determine the following: population and jobs served; minutes of service for people and job locations; percent population served; and, percent job location served.

The software will give an accurate read on whether bus service is available to residents or job opportunities (this software doesn't address the question of connectivity).

The report tables are designed to be easily understood by three target audiences: policy-makers (elected and administrative); transit agency route and service designers; and, MPO/FDOT model planners.

It is likely that the current numbers (population by air mile or pure geographical coverage) used to show transit availability will plummet in value after this software is used.

This system was tested on one transit system. In both the transit development plan and LRTP covering the system the statement was made that the transit system provided "nearly 100%" coverage even though the mode split was less than one percent.

TLOS determined that weekly transit availability and weekday span of service transit availability to both the residential population and job locations was less than one percent. This availability helps explain why the mode split is so low while coverage, on the surface, appears to be so great.

Copies of TLOS are available on the Public Transportation page of the FDOT web site. If you have any questions regarding the software, please call Jon M. Ausman at either (850) 414-4519 or Suncom 994-4519.

Updated schedule for year 2000 modeling workshops

The **Basic FSUTMS Workshop** is designed for transportation professionals with little or no experience in travel demand modeling. The workshop gives an overview of the transportation planning process, travel demand forecasting methodologies, and FSUTMS modules and file formats. Participants will learn to install and execute FSUTMS, interpret output files, create standard plots, and execute the Visual Planning Environment (VIPER) to edit highway networks. An overview on the GIS-TM (GIS for Transportation Modeling) software is also included.

Imran Ghani, FDOT District 2 Modeling Coordinator, will teach key features of the VIPER software on Wednesday, April 19, from 8:00 AM to 12:00 PM. The VIPER session will be open to the general modeling community.

The workshop will be held at the Hampton Inn on 1331 Prudential Drive, Jacksonville, Florida 32207. The workshop will begin at 1:00 PM on April 17, 2000 and end at 12:00 PM on April 21, 2000. A block of rooms has been reserved for $73 per night. Hotel telephone number is (904) 396-7770.

The Florida Transportation Modeling Applications Conference, sponsored by the Florida Model Task Force, FDOT Office of the State Transportation Planner, and the Systems Planning Office, will be held May 15-17, 2000, in Clearwater Beach, Florida. The conference announcement, call for papers, and registration form will be sent to you.

The Advanced FSUTMS Transit Modeling Workshop provides attendees with a working knowledge of the FSUTMS transit modeling structure and the latest transit modeling techniques. This workshop concentrates on advanced transit model structures and techniques such as the nested logit model, procedures to develop transit access, Time-of-Day modeling issues, and transit model calibration.

A Guest Modeler with extensive transit modeling experience is invited to help prepare and teach this workshop. In addition, Jim Fennessy, from Fennessy Associates, will conduct a lecture on the generalized nested logit model using a large urbanized area model.

The workshop will be held at the Adams Mark Hotel & Resort on 430 South Gulfview Boulevard, Clearwater Beach, Florida. The workshop will begin at 1:00 PM on June 12, 2000 and end at 12:00 PM on June 14, 2000. A block of rooms has been reserved for $86 per night. Hotel telephone number is (727) 443-5714.

There is no registration fee for these workshops. To assist us with preparations, all participants are required to register with the FDOT Systems Planning Office. Registration forms for these workshops can be downloaded from the FDOT web site (www.dot.state.fl.us/planning, under Systems Planning, System Traffic Models, and Training). Should you have any questions, please call Huiwei Shen at (850) 414-4911 or e-mail at huiwei.shen@dot. state.fl.us.

Florida's Traffic Monitoring Program meets future needs and challenges

by Harshad Desai, Florida Department of Transportation, Statistics Office

Florida has a solid Traffic Monitoring Program which is constantly being improved to meet increasing needs and future challenges. We estimate annual average daily traffic (AADT) on each and every state-maintained road by monitoring traffic (for a minimum of one day to 365 days) to meet various transportation needs. The Traffic Monitoring Program can be divided into two sub programs:

1. Telemetered Traffic Monitoring, and
2. Portable Traffic Monitoring

Based on more than 6,000 traffic monitoring locations, the estimated annual average daily traffic on approximately 12,000 miles of state highways can be done. Simply, for every two miles of roadway we have a traffic monitoring site. Out of these 6,000 locations more than 300 sites provided continuous traffic data which establishes traffic seasonal patterns, provides peak season conversion factors (PSCFs) and the model output conversion factors (MOCFs). The last two factors are specifically developed to support urban traffic modeling (FSUTMS).

FSUTMS traffic assignment volumes represent peak season weekday average daily traffic (PSWADT) projections for the roads represented in the modeled highway network. The peak season is the 13 consecutive weeks of the year with the highest traffic volume demand. PSWADT is acceptable for planning purposes, yet road design criteria require the 30th highest hour of traffic of the year, which is usually estimated from AADT. A MOCF is applied to the model-generated PSWADT to obtain AADT. The MOCF is unique to the model being used and must be obtained from FDOT's Systems Planning Office.

Weekly factors obtained from the continuous traffic count stations around the state are used to prepare annual updates of PSCFs. The PSCFs are used to convert a 24-hour count, representing the average weekday daily traffic, to PSWADT.

The Peak Season Factor Report includes the MOCF for each

Florida's Traffic Monitoring Program meets future needs and challenges *Cont'd*

traffic counter location. It identifies the 13-week peak season for each continuous count location and provides a multiplying factor (PSCF) for each week to convert a weekday 24-hour count to a PSWADT. It also provides a seasonal factor (SF) for each week to convert 24-hour weekday traffic counts to an AADT.

The SF for each week is derived by interpolating for the weeks between the two adjacent monthly seasonal factors (MSFs). The MSF is derived by dividing the AADT by the monthly average daily traffic (MADT). The highest weekday volume occurs when the SF for a week is the lowest. The peak season is the 13 consecutive weeks during which the highest weekday volumes occur. The 13 week highest week volume occurs when the sum of SF for those 13 weeks is the lowest. The average SF of the 13 weekly SFs during the peak season is called the MOCF. The MOCF should be used when a model output (PSWADT) needs to be converted to AADT.

For the past two years, Florida has been distributing the Florida Traffic Information CD-ROM. This CD-ROM contains a graphical interface to access traffic data collected for every traffic count site on the State Highway System. To view traffic characteristics, visually locate a traffic site using an interactive map of Florida. Each traffic count site selected instantly displays information about that particular site. For more detailed traffic characteristics, eight reports can either be printed or exported to a spreadsheet format. The eight reports and their contents include:

1. Annual Average Daily Traffic (AADT, K, D, and T data)
2. 200 Highest Hour (hourly counts for the highest 200 hours by direction, hour, D-factor, K-factor, D_{30}, and K_{30})
3. Annual Vehicle Classification (distribution of vehicles into15 categories)
4. Peak Season Factor Category (SF, PSCF, and MOCF)
5. Historical AADT (directional and total AADTs for as many years of data that has ever been collected for a site)
6. Hourly Continuous Count (traffic counts by month and direction)
7. Weekly Axle Factor Category (axle correction factors)
8. Volume Factor Category Summary (conversion factors displayed by categories)

This data is available from one of the most comprehensive traffic count programs in the country. We are hoping to provide all the information on the Internet in the near future. You can obtain a free copy of the CD-ROM by contacting Roberta Martin at 850-414-4728.

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