



The Travel Model *Improvement* Program

Fiscal Year 2006 Annual Report

October 31, 2007

Travel Model Improvement Program

FHWA

Helping Agencies Improve Their Planning Analysis Techniques



EXECUTIVE SUMMARY

This report covers activities of the Travel Model Improvement Program (TMIP) and other modeling activities of interest to the travel model community during fiscal year 2006. Both TMIP activities and non-TMIP activities are presented so that the reader of this report is informed about TMIP activities as well as other activities of interest. This annual report also presents a look ahead at future TMIP directions and presents a summary of past TMIP funding.

TMIP has three goals. Under the first goal, *to help planning agencies build their institutional capacity to develop and deliver travel related information to support transportation and planning decisions*, TMIP continued to work with our traditional partners such as the National Association of Regional Councils (NARC) and the Association of Metropolitan Planning Organizations (AMPO), while also adding new partnerships with Argonne National Labs and continuing work with academic partners Rutgers and New Jersey Institute of Technology (NJIT). TMIP sponsored three peer reviews, provided two course offerings and six seminars; continued the Website, E-Mail List and Clearinghouse and produced one issue of the TMIP Newsletter *TMIP Connection*.

For the second goal, *to develop and improve analytical methods that respond to the needs of planning and environmental decision making processes*, the Research Needs (for the forecasting profession) Assessment was completed with a paper entitled: “Current and Emerging Urban Transportation Planning Issues and Urban Travel Demand Research Needs.” Also, TRANSIMS applications, development and case studies have grown since the release of TRANSIMS under an open source license.

There are a number of both TMIP and non-TMIP initiatives under the third goal, *develop mechanisms to ensure the quality of technical analysis used to support decision-making and to meet local, state, and federal program requirements*:

- ♦ TMIP
 - the National Academy of Sciences study “Determination of the State of the Practice in Metropolitan Area Travel Forecasting” continues;
 - Technical support to EPA for the development of the new emissions model, MOVES will continue on an ongoing basis;
- ♦ FHWA non-TMIP
 - The Federal Highway Administration (FHWA) continued to use the Certification Checklist of Travel Forecasting Methods in conducting certification reviews, and
 - The FHWA Resource Center provided quantitative analysis technical support to a variety of projects nationwide. (For more information on FHWA Resource Center activities, please visit them at: <http://www.fhwa.dot.gov/resourcecenter/>)

INTRODUCTION

Fiscal Year 2006 (FY 2006) was the 13th year for the TMIP. This fourth annual report describes the TMIP program and strategic plan goals and objectives, describes the actions taken to support those goals, both by the TMIP team and others, and attempts to assess our impact on the modeling community. Non-TMIP projects will be identified as such, so the reader may also learn of other initiatives of interest to modelers.

TMIP follows its mission by acting on three strategic goals and their commensurate objectives. The TMIP mission is that:

TMIP will . . .

Do What?

Support and empower planning agencies.

How?

Through leadership, innovation and support of planning analysis improvements.

Why?

To provide better information to support transportation and planning decisions.

FUNDING AND SUPPORT

The TMIP activities discussed here are supported by a variety of sources. The FHWA Associate Administrator for Planning, Environment and Realty provides TMIP staff support and, through the Surface Transportation Environment and Planning Cooperative Research Program (STEP), provides the primary source of funding for TMIP activities. Separate funding for TRANSIMS is provided by specific funding allocations in SAFETEA-LU. For more information on funding see Appendix A.

PERFORMANCE BY GOAL

Each goal is addressed individually below, together with the actions and activities that are designed to meet that goal.

Goal One “To help planning agencies build their institutional capacity to develop and deliver travel related information to support transportation and planning decisions.”

In order to achieve this goal, TMIP employs a variety of outreach and training actions. In accordance with our strategic plan we:

- ◆ Provide information to transportation decision-makers, non-technical professionals, and other stakeholders on the value, role, useful applications, and limitations of travel forecasting;
- ◆ Develop and cultivate collaborative partnerships with other organizations concerned with improving travel analysis techniques;
- ◆ Promote organizational structures which support quality travel analysis activities;
- ◆ Identify and communicate the state of the practice in technical analysis and data collection and associated resource requirements;
- ◆ Deliver and communicate technical products and services to travel model users; and
- ◆ Promote planning technical analysis as a profession.

A variety of mechanisms are employed to provide and disseminate information including working with organizational partners to plan and present at conferences, promoting and providing peer reviews, offering training, maintaining a website, email list and modeling information clearinghouse, producing and distributing newsletters and supporting peer exchanges.

Activities with Organizational Partners

TMIP funds in FY 2006 were used to work with and support national partners as well as some specific agency and academic partnerships. TMIP sponsored, showed and/or presented papers and moderated discussions at seven national conferences in FY 2006. The seven conferences represent a broad spectrum of our client base including technical planners, researchers and decision makers at all agency levels. The conferences were:

- ◆ October 2005, Association of Metropolitan Planning Organizations (AMPO) Annual conference in Denver, Colorado;
- ◆ October 2005 Association of Collegiate Schools of Planning (ACSP) Annual Conference in Kansas City, Missouri
 - TMIP facilitated a roundtable discussion on the subject of travel model education
- ◆ January 2006, Transportation Research Board (TRB) Annual Conference in Washington, DC;
- ◆ April 2006, American Planning Association (APA) annual Conference in San Antonio, Texas;
- ◆ May 2006, TRB 2006 1st Bi-annual Innovations in Travel Modeling in Austin, TX;
- ◆ June 2006, National Association of Regional Councils (NARC) Annual Conference in San Antonio, Texas; and,
- ◆ September 2006, TRB 10th National Conference on Transportation Planning for Small and Medium Communities, in Nashville, Tennessee.

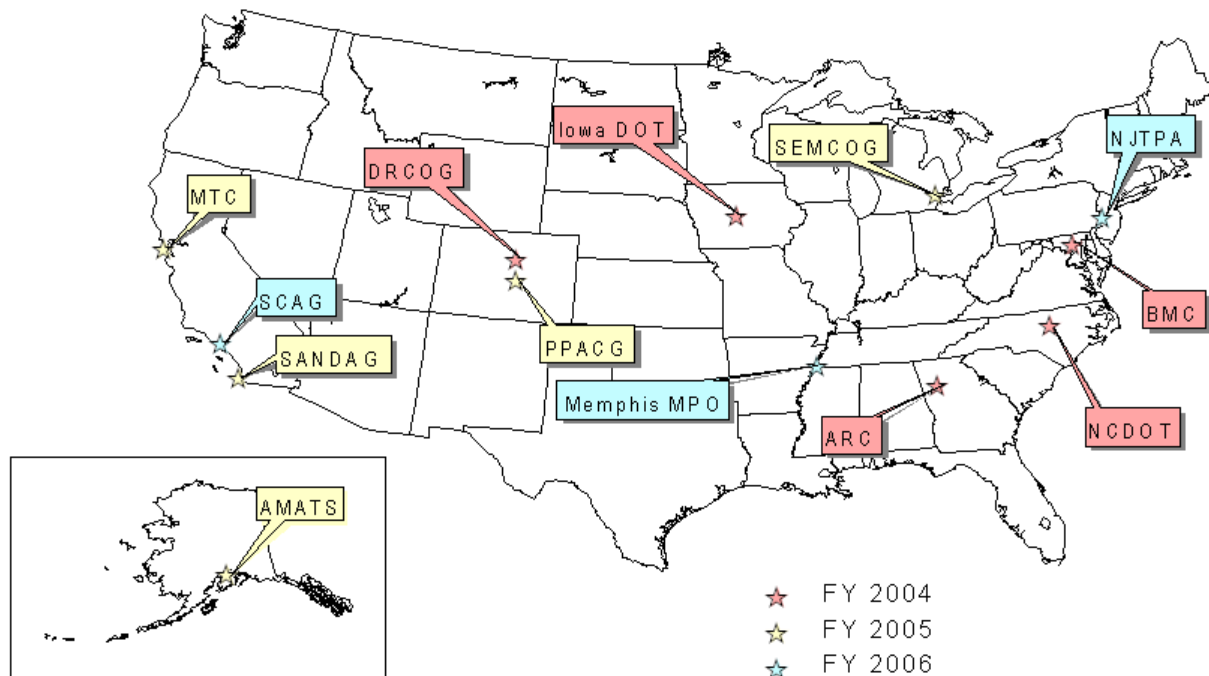
Peer Reviews

The TMIP peer review program provides the modeling community with a method to gain insight and experience in modeling issues. Furthermore, the practice of producing and posting a written report for each peer review, presenting the peer review program and results at conferences and publishing an annual synthesis of peer review issues and recommendations for corrective action by the individual panels improves the state of the practice of travel demand forecasting. TMIP continued the Peer Review Program for a third year in FY06. Three peer reviews were held during FY 2006, of the three, two were follow ups, where the requesting agencies sought review of implementation of previously made recommendations. One agency used the peer review panel to assess the current travel demand model and have them recommend both near-term and long-term model enhancements. The Peer Reviews were held at the following locations (the links are to documentation of the reviews and recommendations):

- ◆ Memphis Area Metropolitan Planning Organization, Memphis, TN (2nd meeting)
 - http://tmip.fhwa.dot.gov/services/peer_review_program/documents/memphis/report_2/
- ◆ North Jersey Transportation Planning Authority, Newark, New Jersey, and
 - http://tmip.fhwa.dot.gov/services/peer_review_program/documents/njtpa/
- ◆ Southern California Association of Governments, Los Angeles, California (3rd meeting)
 - http://tmip.fhwa.dot.gov/services/peer_review_program/documents/scag/report3/

All TMIP peer review reports can be found at:

http://tmip.fhwa.dot.gov/services/peer_review_program/status.stm.

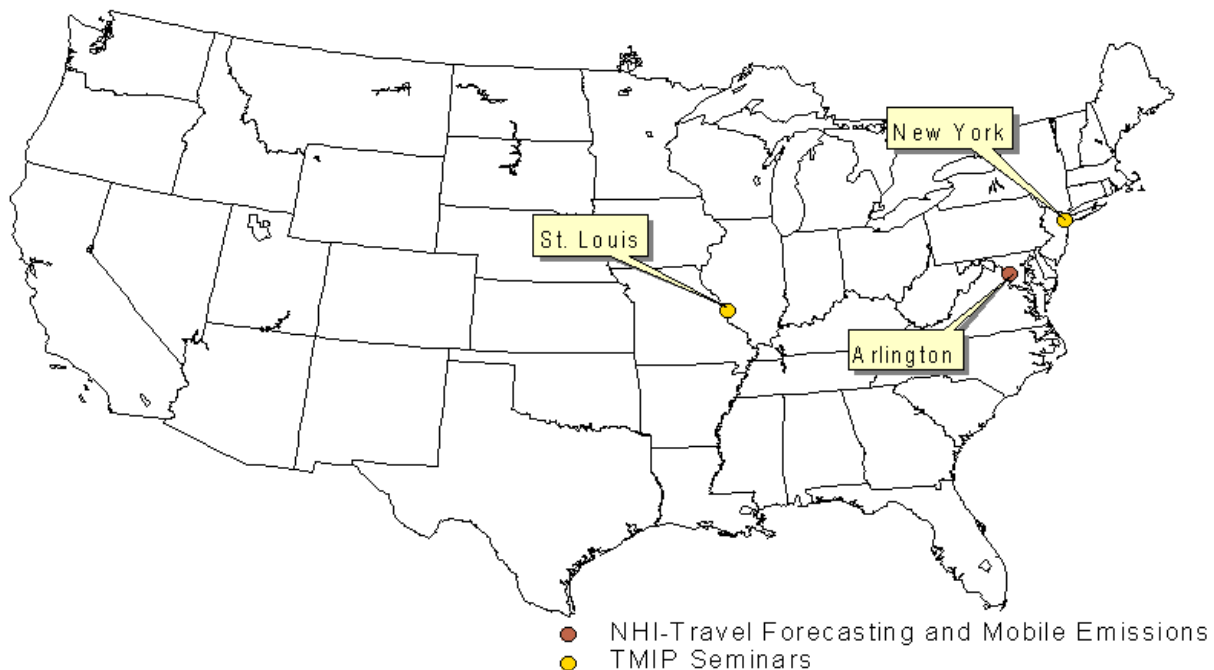


TMIP Peer Review Locations for Fiscal Years 2004-2006.

Training

During FY 2006 TMIP continued its tradition of hosting National Highway Institute (NHI) courses relevant to travel forecasting and offering one-day TMIP seminars in advanced modeling topics. In FY 2006 TMIP sponsored, hosted or offered:

- ◆ Introduction to Travel Demand Forecasting (4.5 day NHI course) one time at
 - Arlington, Virginia
- ◆ Estimating Regional Mobile Source Emissions (3.5 day NHI course) once at
 - Arlington, Virginia
- ◆ Activity and Tour-Based Modeling (TMIP Seminar),
- ◆ Forecasting Land-Use Activities (TMIP Seminar), and
- ◆ Travel Model Validation, Calibration and Reasonableness Checking (TMIP Seminar) at both
 - St. Louis, Missouri, and
 - New York, New York



TMIP Training Locations for Fiscal Year 2006.

Planners and modelers at all levels of expertise, across multiple agency levels and also from the private sector attend TMIP training. In FY 2006, 166 practitioners attended eight TMIP courses and seminars. This represents an approximately 45 percent decrease in overall attendance, and 40 decrease in offerings. Attendance and offerings declined from FY 2005 to FY 2006.

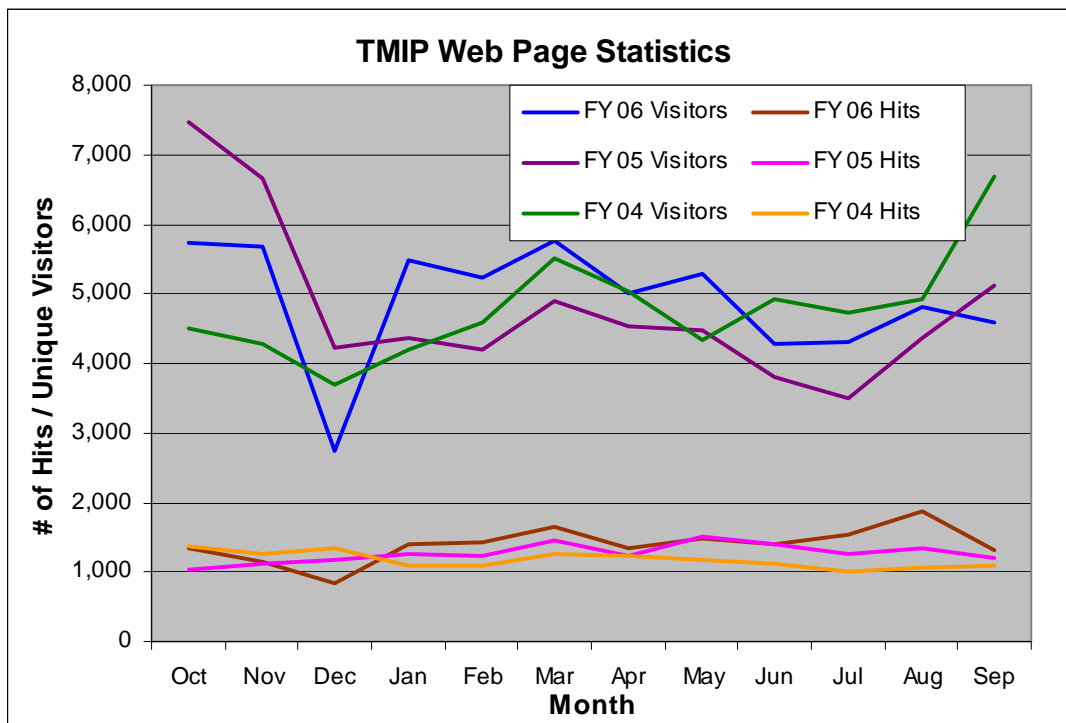
Course or Seminar	Presentations			Attendance		
	FY 06	FY 05	FY 04	FY 06	FY 05	FY 04
Introduction to Travel Demand Forecasting Course	1	2	6	13	48	121
Estimating Regional Mobile Source Emissions Course	1	2	3	11	33	51
Activity and Tour-Based Modeling Seminar	2	3	4	32	67	103
Forecasting Land-use Activities Seminar	2	3	3	60	82	71
Travel Model Validation, Calibration and Reasonableness Checking Seminar	2	3	3	50	75	73
TOTAL	8	13	19	166	305	419
AVERAGE				19	23	22

Website, Email List and Clearinghouse

Website

The TMIP website is our face to the community. The homepage consists of updated calendar items, recent additions to the website and news, and navigation to services, courses and conferences, TRANSIMS information, links, contacts, clearinghouse and travel model discussions (which houses the TMIP Listserv email list).

In FY 2006 there were between 4200 and 5800 visitors to the website each month (representing approximately 500 more visitors per month over past years performance). Visits to the homepage tracked slightly higher than previous years, averaging about 1500 hits per month, with a spike to nearly 2000 in August 2006.

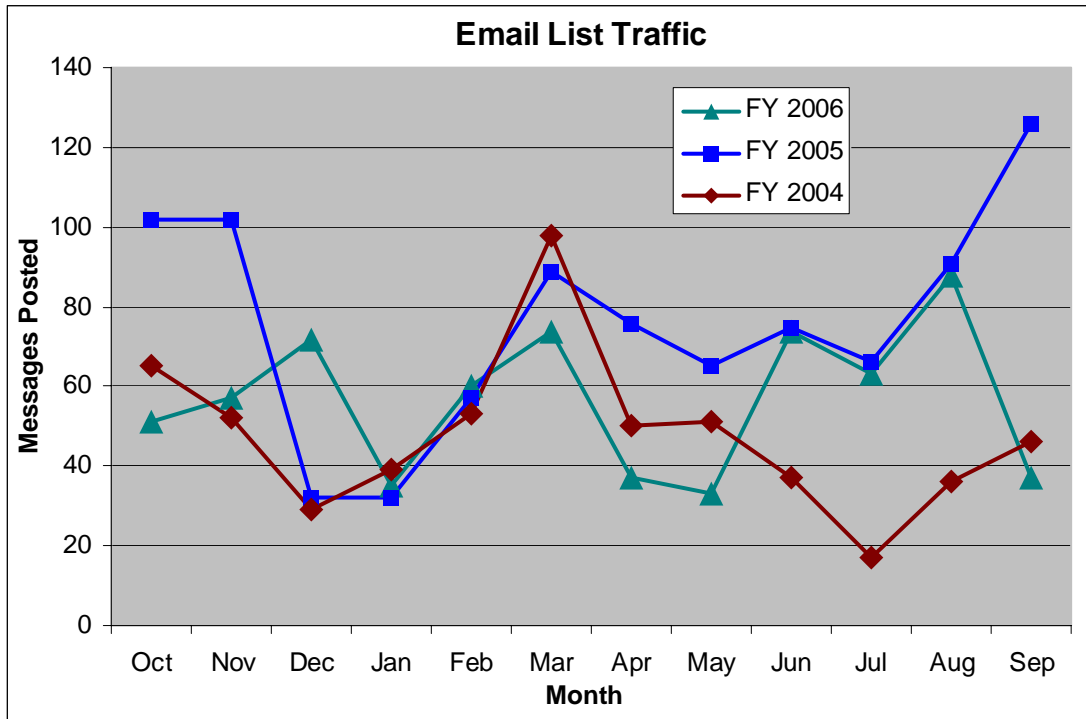


TMIP-L, the TMIP email list

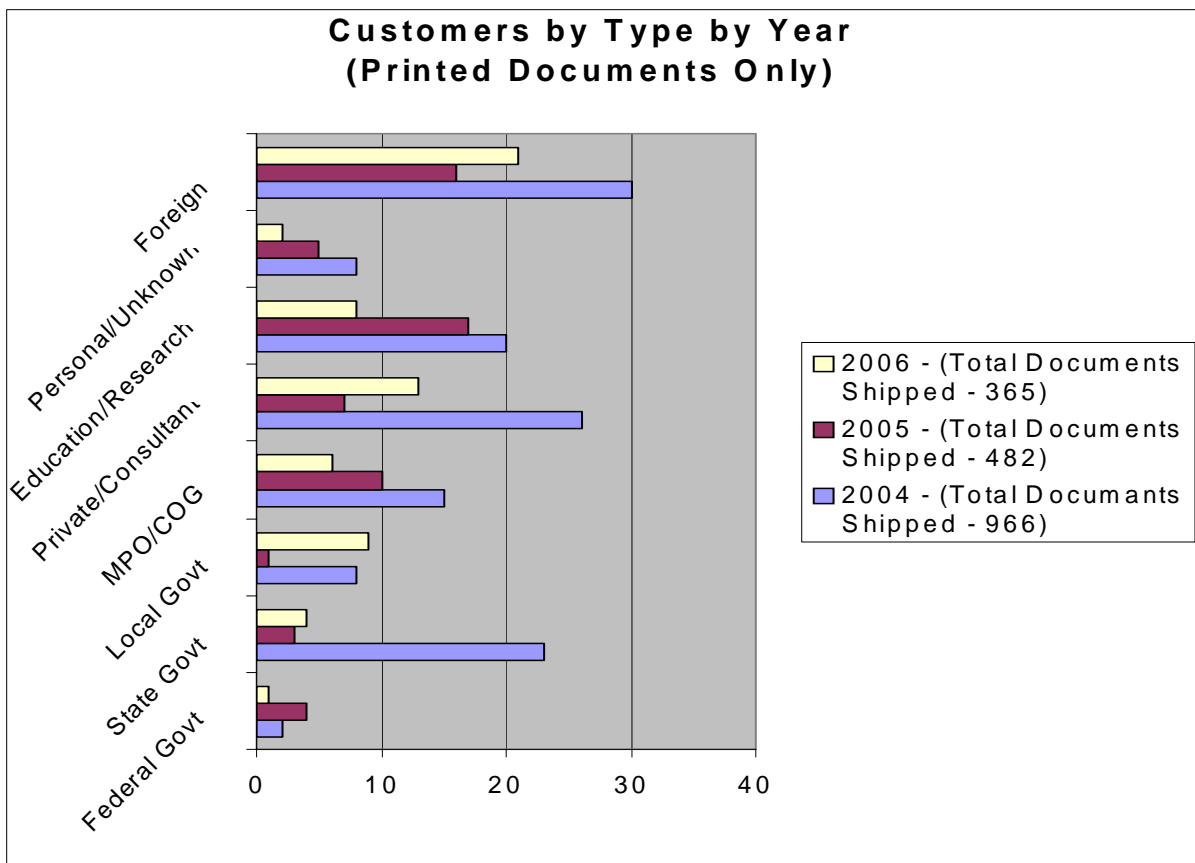
The TMIP email list is the scene of technical discussions, information exchange, job postings and course advertisements of interest to the travel model community. It currently boasts approximately 800 members, up from 700 at the same time in FY05, and sees between 33 and 88 postings and replies per month. The TMIP email list is hosted and archived by Texas Transportation Institute and is the source of the Hot Topics column in the *TMIP Connection* newsletter (discussed below).

Clearinghouse

The TMIP clearinghouse experienced very moderate growth in FY 2006 chiefly due to the diminished research budget. There are 331 documents and resources available in the TMIP



clearinghouse (up from 326 in FY05). The Clearinghouse also experienced a decline in shipped materials, as we move more to downloadable, web-accessible mechanisms.



The table below shows the ten most requested documents, and how they ranked in previous years.

FY06 Top Clearinghouse Documents Shipped		Number Shipped	Rank FY05	Rank FY04
1.	Travel Demand Forecasting Self Instructional CD-ROM	81	1	1
2.	Model Validation and Reasonableness Checking Manual	16	7	3
3.	Integrated Transportation and Land Use Forecasting: Sensitivity Tests of Alternative Model Systems Configuration	15	2	5
4.	Creating Synthetic Baseline Populations	14	10	15
5.	Third Oregon Symposium on Integrating Land Use and Transport Models (CD)	13	3	23
6.	Time-of-Day Modeling Procedures, State-of-the-Art, State-of-the-Practice	12	NA	NA
6.	Land Use Forecasting Case Studies: A Synthesis and Summary	12	NA	NA
8.	Data Collection and Modeling Requirements for Assessing Transportation Impacts of Micro-Scale Design	10	8	7
8.	Travel Survey Manual Appendices	10	13	26
10.	Computational Study of Routing Algorithms for Realistic Transportation Networks, A	11	11	26

Web Working Group

FY 2005 saw the development of a volunteer working group to review and recommend content for the TMIP Clearinghouse.

This group of 21 volunteers reviews content in their subject Clearinghouse categories and identifies documents to be updated or archived, links that needed to be updated or deleted, and suggests additional documentation and/or links.

In 2006, in recognition of the volunteer work the subject advisors contribute, their names were added to each subject page. Their names are placed at the top of the screen immediately below the subject category title on that category's document listing.

All subject advisors were contacted via email in July 2006 for new references to activity based modeling section. Some advisors returned responses either notifying of a change in position with recommended replacement or their recommendations for literature to be added.

TMIP Connection Newsletter

TMIP produced one regular issue of *TMIP Connection* in FY 2006. Newsletter topics covered:

- ◆ a project undertaken at the University of Pennsylvania at Philadelphia to research and document moving next generation models into practice,

- ♦ elasticity of VMT to fuel prices,
- ♦ the TMIP roundtable at ACSP Annual conference,
- ♦ a TRANSIMS update,
- ♦ the departure of Michael Culp from the TMIP team, and
- ♦ determining the state of the practice of travel demand forecasting.

The newsletter was mailed to approximately 1250 people in FY 2006. Additionally, the web link to the newsletter is distributed electronically through the TMIP email list and FHWA planners, and notification is sent to our partners for mention in their newsletters.

Goal Two: “To develop and improve analytical methods that respond to the needs of planning and environmental decision making processes”

Research Needs Assessment

TMIP conducted a needs assessment of urban travel forecasting method research through an assessment of documented practitioner needs, need prioritization, and a selective review of recent and current research. The result is a paper entitled: “Current and Emerging Urban Transportation Planning Issues and Urban Travel Demand Model Research Needs.”

TELUS

The TELUS deployment continues. In December 2004, the first customized web-based application of TELUS was implemented at Alabama DOT for use by all 13 MPOs in the state for TIP development. In June 2005, TELUS was deployed at the Miami Valley Regional Planning Commission in Dayton, OH. The application, which enables public participation through comment web pages, received a commendation during the agency’s federal review. In September 2006, a customized application of the software was implemented at the Houston Galveston Area Council.

TRANSIMS (funded separately)

TRANSIMS is an integrated set of tools developed to conduct regional transportation system analyses. TRANSIMS ***is made available under an open source license*** with the goal of establishing it as an ongoing public resource available to the transportation community. For more information on TRANSIMS visit <http://tmip.fhwa.dot.gov/transims/> and <http://transims-opensource.org/>

In 2006, TMIP began a working partnership with Argonne National Laboratory (ANL) on TRANSIMS technology in Chicago:

- ♦ FHWA provided technical assistance on TRANSIMS applications
- ♦ ANL staff provided technical assistance on computing technology and software development expertise

In Central New Jersey work with New Jersey Institute of Technology (NJIT) and Rutgers continued:

- ◆ FHWA staff provided technical assistance on TRANSIMS technology and applications
- ◆ Rutgers staff made significant contributions with the population synthesizer and activity generator

TRANSIMS research efforts in 2006 focused on development and applications. Developing and testing templates for microsimulation studies occurred at:

- ◆ Portland, Oregon:
 - Completed work on trip-based application of the router and microsimulator.
 - Demonstrated initial capability for microsimulating highway tours.
 - Shared findings on difficulties with microsimulating transit tours based on aggregate choice models.
 - Began development of TRANSIMS 4.0.
- ◆ New Orleans: Awarded in 2006, use TRANSIMS to evaluate multimodal evacuation plans for the New Orleans area.
- ◆ Buffalo: Started in 2006, use TRANSIMS to simulate cross-border truck flows in conjunction with background auto traffic.
- ◆ Burlington: Awarded in 2006 use TRANSIMS to estimate the impacts of bottleneck removal and TSM improvements for a small urban area.
- ◆ Chicago: Scoped in 2006, use TRANSIMS as the model to estimate the movement of people, POV, and transit vehicles in an evacuation of the downtown loop in response to a chemical plume released from the Sears Tower.
- ◆ Central New Jersey: Use TRANSIMS to evaluate morning congestion and non-motorized transport issues in Central New Jersey.

NHTS Transferability Project (non-TMIP)

NHTS Transferability is a GIS-based tool that enables users to download trip statistics for selected Census Tracts and Transportation Analysis Zones (TAZ). The objective of the NHTS Transferability Project is to provide estimates of trip generation rates and VMT for areas which have not had the resources to conduct a regional household travel survey within the last 10 to 15 years, and to combine small area demographic data from Census 2000 and other data sources to improve the estimates. The project refers to the transferability of the 2001 NHTS results to the regional or local level. The Transferability methodology provides estimates of regional or local travel, including vehicle trips (VT), vehicle miles of travel (VMT), person trips (PT), and person miles of travel (PMT) by trip purpose. Outputs are in Excel spreadsheet and ESRI shape file formats. <http://nhts.ornl.gov/tools.shtml>

Goal Three: “To develop mechanisms to ensure the quality of technical analysis used to support decision-making and to meet local, state, and federal program requirements”

NAS Study

In FY 05, the Federal Highway Administration, Office of the Secretary of Transportation and the Federal Transit Administration commissioned the TRB/National Academy of Sciences to study the current state of the practice for metropolitan area travel forecasting. Along with determining the state of the practice, the study is to identify actions needed to ensure that appropriate technical processes are being used for travel forecasting applications. The committee, chaired by Martin Wachs, formerly at UC Berkeley, now of Rand Corporation, met several times in 2006. Committee members represent MPOs, state transportation agencies, consultants, and academia. The committee roster is at http://trb.org/directory/comm_detail.asp?c=B0090

To provide current technical information, the committee commissioned a consulting firm, BMI-SG, a VHB Company, to conduct a web-based survey of all MPOs on their travel forecasting models and procedures. Sixty percent of those MPOs surveyed responded, including 84 percent of MPOs with one million or more population. An April 2006 draft report of the survey results is at <http://www.trb.org/publications/reports/BMI-SG-Sept2005-Draft.pdf>

The TRB/National Academy of Sciences anticipates completing work in 2007, and making a final report available at that time.

Technical Support for MOVES Development

TMIP continues to provide technical support for the input of transportation models into MOVES, EPA’s replacement for the Mobile model series. The purpose of the support is to ensure a smooth interface between the transportation models and the emissions models. The contractor for this effort is AECOM.

Certification Checklist for Travel Forecasting Methods (non-TMIP)

FHWA has been using the checklist for the last three years in conducting certification reviews. The checklist has proven very helpful to this process. By using the checklist, reviewers are able to assess the initial ‘health’ of the travel models without getting involved in lengthy and detailed technical analyses. MPO staffs have commented that the checklist provides support and justification for budget requests for improvements to travel models. The checklist does not substitute for an in depth analysis of a model or a peer review. However, the checklist does provide an initial diagnostic to determine whether a detailed model review is required. To access the checklist go to: <http://www.fhwa.dot.gov/planning/certcheck.htm>

FHWA Resource Center Project Level Technical Assistance (non-TMIP)

The FHWA Resource Center Planning Team has provided technical assistance and input on project level forecasts for NEPA and local project studies. Illustrative projects include major

interchange projects, major capacity expansions in urban interstate corridors, and local roadway widenings to support major traffic generators. Specific technical issues have included: (i) sufficiency of model validation efforts; (ii) adequacy of adopted analytical approach for capturing economic and secondary/cumulative impacts of capacity-enhancing projects; and (iii) review of model outputs for reasonability.

The Planning Team has provided technical assistance -- in consultation with the FHWA division offices -- for project analyses conducted in the following states:

- ◆ Utah (2006 - ongoing)
- ◆ New Hampshire (2006)
- ◆ Michigan (2006-ongoing)

Training (non-TMIP)

The Resource Center Planning Team has responded to technical assistance requests from state DOTs through the delivery of specialized workshops on travel forecasting. Training issues have included topics ranging from introductory workshops on travel models to statewide modeling practices and 'off-model' sketch planning applications.

The Resource Center Planning Team has supported technical assistance/training sessions to the following state DOTs (in consultation with FHWA divisions):

- ◆ Connecticut DOT (2006)
- ◆ Virginia DOT (2006)
- ◆ Georgia DOT (2006)

SUMMARY AND FUTURE DIRECTIONS

2006 was a transition and planning year for the TMIP program. In 2006 TMIP began to rely on funding from the STEP program and the TRANSIMS funding provided by SAFETELU. Mike Culp, who had managed the TMIP Outreach program since 1999, took another position within FHWA. That TMIP position had not been filled by the end of FY2006. Finally, TMIP awaited the results of the NAS report. This report is expected to have a major impact on TMIP and the direction travel modeling takes in the United States.

Appendix A: TMIP Funding

Enactment of TEA-21 in 1998 drastically changed the funding of FHWA's R&T programs' severely curtailing TMIP activities the first few years of the Act. This trend continued throughout both fiscal year 2004 and fiscal year 2005 due to continuing resolutions in lieu of reauthorization. The continuing resolutions did not include additional funding for TRANSIMS during 2004 and 2005. SAFETEA-LU was passed towards the end of fiscal year 2005.

In FY06, Surface Transportation Environment and Planning Cooperative Research Program (STEP) provided the primary source of funding for TMIP activities. Separate funding for TRANSIMS was provided by specific funding allocations in SAFETEA-LU.

