metros

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in this issue

AMPO Travel Modeling and Air Quality Subcommittees Meet in St. Louis, Develop Recommendations for National Research

ASSOCIATION OF METROPOLITAN PLANNING ORGANIZATIONS

AMPO's Travel Modeling and Air Quality subcommittees met in March at the offices of the East-West Gateway Coordinating Council in St. Louis, Missouri. The Subcommittees, sponsored by FHWA, provide a forum for MPOs to share practices and identify solutions to the transportation planning challenges they face. The participants share technical knowledge to learn from each other and federal staff how to better address MPO requirements and improve transportation planning practices.

The Travel Modeling Subcommittee meeting focused on travel demand modeling for demonstrating air quality conformity, and the Air Quality Subcommittee picked up on many of the same issues, focusing on the emissions modeling side.

The general sentiment of the groups is that MPOs are doing well in these areas, but are aware of the benefits of sharing information. The Subcommittees recommend that the FHWA and EPA play a strong role in the national coordination of information sharing. That role would involve extending the standard "how to" educational courses currently in place to include a survey of MPOs and other practitioners, identifying their practices in these areas and reporting them back to the community in workshop or seminar form.

The meetings also identified several technical issues and practice areas that stand out as needing further research and information sharing:

ESTIMATING HIGHWAY SPEEDS / VMT BY TIME PERIOD

Estimating roadway speeds is crucial to developing realistic vehicle emission inventories. Collecting speed data by time of day, in order to reflect congestion, is especially important. Currently MPOs are addressing speeds in the conformity analysis in many different ways.

The Subcommittees recommend that a study be performed of current practices to determine methods used to address speeds in the conformity process and how they impact results.

MODELING TRUCK TRAVEL

There is limited data available for addressing truck travel in the transportation planning process. Travel models are based primarily on household behavior, but a significant amount of travel is not household related, including most truck travel. Modeling truck travel is especially important when modeling vehicle emissions since large trucks have significantly higher emissions than passenger vehicles.

It is expensive to conduct useful truck surveys because private companies are very heterogeneous. In addition, a large sample size and detailed surveys are required. Understanding and modeling truck travel may require a different approach than that used by the four-step process.

Many MPOs are addressing truck travel, but recognize that improvements are needed. The Subcommittees recommend that a study and assessment of truck travel modeling methods be performed, and the results be presented to the MPO community.

MOVING TO MICROSIMULATION/ TRANSIMS

Some MPOs are applying microsimulation modeling under pilot programs. There is no national program to move MPOs in the direction of microsimulation/TRANSIMS, and there is no direct federal funding source to do so. However, some MPOs believe microsimulation is becoming increasingly important. Existing models remained flawed in many ways, and it is becoming more expensive to enhance them.

An unanswered question is whether the outputs from microsimulation are better than those we get from existing models. MPOs that have applied microsimulation believe it provides a much more useful policy tool, with data that is more transparent and easier to explain.

The Subcommittees recommend that more outreach and education to MPOs about microsimulation/ TRANSIMS be provided nationally, including information on costs, data requirements, benefits, and results-to-date.

HPMS DATA

USDOT's Highway Performance Monitoring System (HPMS) program is used to assess the condition, performance, and usage of the nation's highways. Experience shows HPMS data is very difficult to apply in the air quality modeling process, and even many public agency partners misunderstand its application. Most MPOs work closely with the state DOTs to understand how they collect and adjust HPMS data so they can identify strengths and weaknesses. This provides a better level of comfort with the data, but doesn't eliminate the problems associated with using it.

The Subcommittees recommend that EPA and FHWA study methods to revamp HPMS data to make it more responsive to air quality planning needs.

MOBILE6 MODELING INPUTS

Several MPOs and their air quality agency partners are in the process of implementing MOBILE6, which requires several new input parameters, to update vehicle emission inventories and set emission budgets for conformity. Emission factors are highly sensitive to some of these inputs, so accuracy is very important.

The Subcommittees recommend that FHWA and EPA continue to identify methods for accurately collecting MOBILE6 input data that reflect local conditions in each metropolitan area. More importantly, information about how that data is applied across the country and the resulting findings is crucial.

MODEL UNCERTAINTIES

Those involved in the technical conformity process are aware of the uncertainties inherent in modeling transportation activity at a metropolitan level to develop an absolute emissions number. The Atlanta Regional Commission and their partners suggest, in Georgia's Unified Agenda for Reauthorization of TEA-21, that a study be performed to identify the cumulative errors and uncertainties throughout the modeling steps that produce a transportation emissions inventory. MPOs could use that information to build a buffer into the process of setting an emissions budget that would enable them to move forward with future transportation updates if data inputs change significantly.

continued on page 2

continued from page 1

CONFORMITY IN THE REALM OF TRANSPORTATION PLANNING

MPOs recognize the importance of conformity. Nevertheless, many MPOs spend such a significant amount of time and resources solving conformity problems that they have limited resources to focus on innovative planning. The conformity process and the litigious nature of the requirements lead to a continuous conformity exercise for some MPOs.

For example, the MPO in Kansas City, an ozone maintenance area, reports limited controversy when it comes to air quality. As a result, the MPO is able to devote resources to conduct long range planning exercises that benefit the metropolitan area in numerous ways. Currently, the MPO is conducting community visioning exercises with the public and elected officials to look at scenarios of how the metropolitan area is likely to grow in the future under different land use and growth strategies.

NEED FOR NATIONAL INFORMATION SHARING

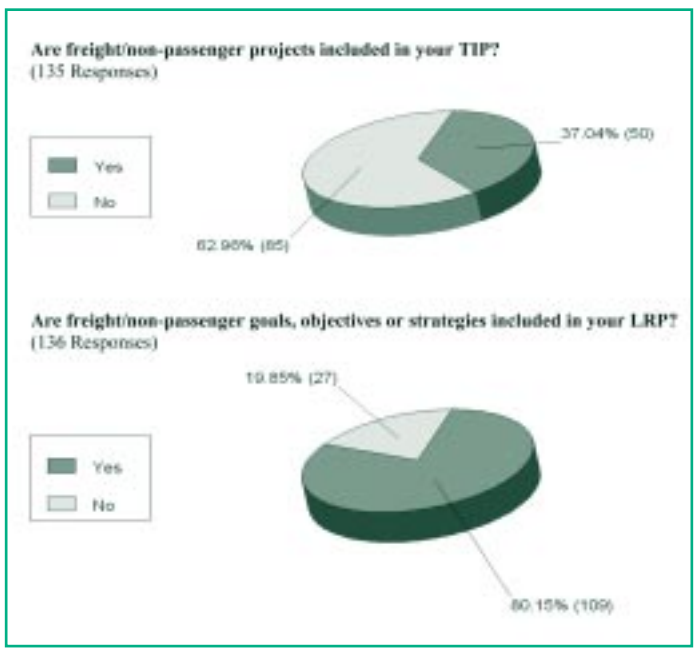
A national survey of practices in these areas will build capacity among MPOs to better address issues that arise when performing conformity analyses. This will be especially helpful for new nonattainment areas under the 8-hour ozone and PM2.5 standards.

AMPO Survey: MPOs Need MoreFreight Resources

The results of a March 2003 AMPO survey clearly show that although MPOs are adequately dealing with freight issues in their jurisdictions, across the board they are in need of data, funding and staff expertise in order to do truly effective freight planning. TEA-21 reauthorization must provide MPOs with the resources necessary to increase program capacity and ensure the safe and efficient movement of goods in and through metropolitan areas.

The AMPO survey was distributed to all 340 MPOs and received 136 responses (40%) from MPOs across the country, including organizations that employ one person to one with over one hundred and thirty employees. Included in the survey were questions about each MPO's staff, structure, budget, and planning as they concern freight.

The survey results clearly show that although freight is considered in most MPOs' planning process (80% include freight in their LRP), because of inadequate resources freight planning falls short when it comes to implementation (only 37% of MPOs include freight in their TIP, and only 16% have a priority list of freight projects). The most commonly needed resource – a need described by one MPO as "dire" - is data, cited by 80% of the respondents. Says Frank Baron of the Miami-Dade MPO, "Data is very difficult to come by. Surveys are considered either too intrusive - from either the 'interference with business' aspect or the 'big brother government wants more information from us' perspective - or delving into possible proprietary information." After data, MPOs need professional development and funding, each listed by 60% of respondents, and 34% of MPOs require more staff to deal with freight. These needs are illustrated by only 22% of surveyed MPOs having at least one staff person dedicated to freight and 60% of the responding MPOs spending under 5% of total staff time on freight, and half of the MPOs reporting freight projects as less than 2% of their overall program (in terms of both dollars and number of projects), while nationally freight accounts for 44% of all traffic .



Also problematic for MPOs is the lack of freight stakeholder involvement in the planning process. Although 65% coordinate with ports, private rail companies, or trucking companies on freight projects, only 18% have an institutionalized freight advisory committee, and freight interests have voting representation on only 18% of surveyed MPO policy boards. According to John Hummer of the North Jersey Transportation Planning Authority, although they make efforts to involve freight stakeholders, "[T]he freight community is not well coordinated and organized in presenting its needs to the MPO."

For MPOs to enhance their freight activities, the reauthorization of TEA-21 must provide them with substantially increased resources. To that end, AMPO advocates 1) increasing the FHWA PL and FTA 5303 planning takedowns to 2% of the overall programs, 2) allocating a certain portion of Surface Transportation (STP) funds and Congestion Management and Air Quality (CMAQ) funds directly to MPOs, 3) developing an "infostructure" to collect travel data (including freight), 4) expanding the eligibility of freight project funding, 5) providing incentives to attract private funding, and 6) refining TEA-21's National Corridors and Coordinated Border Infrastructure Programs.

Conformity and CMAQ

As has been the case since it was instituted in the Clean Air Act Amendments of 1990, the Conformity process is once again an issue of growing debate. At a mid-March hearing of the Senate Environment and Public Works Committee (EPW) members from numerous organizations, including AMPO, AASHTO and STAPPA/ALAPCO testified regarding the future of the Conformity process and Congestion and Air Quality Mitigation (CMAQ) funds. (STAPPA and ALAPCO are the two national associations representing air pollution control agencies. They cover 54 states and territories and over 165 major metropolitan areas across the U.S.)

AREAS OF GENERAL CONTENTION INCLUDED:

- **Shortening planning horizons for transportation plans from 20 to 10 years,**
- **Decreasing the frequency of conformity determinations on transportation plans from every three to every five years, and**
- **Increasing the grace period before an area found to be in violation of an air quality standard for the first time must demonstrate conformity**

During the hearing, comments were also made regarding the status and form of CMAQ funds. Some called for expanding the list of areas eligible to receive funding; increasing federal funding for the program; placing greater emphasis on projects that will result in direct, timely and sustained air quality benefits; and providing a more defined and consistent role, including concurrence, for state and local air agencies in the evaluation and selection of projects. Others argued for additional flexibility for use of CMAQ both for air-quality and congestion-relief projects.

New State Freight Profiles Released by USDOT to Assist State and Local Groups in Examining Freight Movements

U.S. Transportation Secretary Norman Y. Mineta announced on March 13 the release of State Freight Profiles. This collection of short reports provides a snapshot of freight flows, including maps, and expected forecasts of tonnages and traffic patterns for each state.

"America's freight network is a lifeline for our nation's manufacturers, farmers and businesses," Secretary Mineta said. "Understanding the nature of freight flows will help ensure our ability to remain competitive in the global marketplace and to continue to meet the economic and transportation challenges of the 21st century."

DOT estimates that by 2020 the U.S. transportation system will handle cargo valued at nearly $30 billion, nearly three times current levels. And overall volume, in tons, will see an increase of nearly 70 percent. DOT also expects international freight volumes to double in the next 20 years. All of this growth results in a major increase in freight volumes on state transportation infrastructure by 2020. With this comes the potential for growing inefficiencies and increased congestion on the national system.

State and local decision-makers can use State Freight Profiles (SFP) to examine which transportation corridors are experiencing, or will experience, large freight volumes. With this kind of insight, locales are better informed as to what steps to take such as utilizing congestion alleviation strategies or developing targeted multi-state or regional approaches.

Information in the SFPs was developed using the Freight Analysis Framework (FAF) databases. The FAF was developed in 2002 by DOT as a collaborative effort of the Department's Federal Highway Administration, the Federal Railroad Administration, the Federal Maritime Administration, the Bureau of Transportation Statistics, and the Secretary's Office of Intermodalism.

The FAF is a policy analysis tool which helps decision makers understand the geographic relationships between domestic and international trade flows and the nation's intermodal transportation system. The FAF examines four key transportation modes: highway, railroad, water, and air. To evaluate the effect of expected volumes on the transportation network, FAF includes economic forecasts for 2010 and 2020. It translates this economic data into transportation demand and then assigns that demand to the networks.

The state profiles are posted at http://www.ops.fhwa.dot.gov/freight/state_profiles.htm. Some of these images are online, and the rest will be posted soon. Additional information on the Freight Analysis Framework is available at the Office of Freight Management and Operations website, http://www.ops.fhwa.dot.gov/freight.

Strategic Thinking: 2003 AMPO Policy Conference

Transportation legislative updates and making things happen on Capitol Hill were the name of the game at this year's AMPO Policy Conference. Day one was marked by comments from this year's host jurisdiction representative, DC Councilman Phil Mendelson, along with Policy Committee Vice Chair Steve Heminger, Emil Frankel from the Office of the Secretary of Transportation and LOT (Local Officials for Transportation) representatives.

Day two of the conference turned from talk to action. AMPO members, escorted by staff, made their way to the Hill for meetings with Congressional representatives and staff. In addition, participants were treated to special briefings from the two Committees of interest regarding TEA 3: the House Transportation and Infrastructure Committee and the Senate Environment and Public Works Committee.

After two long days, the final session focused on big picture issues as we move forward to reauthorize TEA 21. Highlights included a discussion focusing on the Administration's proposals, moderated by AMPO President Mayor Ron Bates, which included Associate FHWA Administrator Cindy Burbank and FTA Administrator Jenna Dorn.

To round out the TEA 3 strategy emphasis and to gain a better understanding of various forces working to influence TEA 3, AMPO pulled together a panel including Kevin Luten with ACT, Sarah Campbell representing STPP and Elissa Margolin from the League of American Bicyclists.

The conference wrapped up with a short session of the Policy Committee to review the previous two and half day's activities.

Survey Reveals Attitudes

On March 12, survey results released upheld the belief that most Americans support the use of public funds for the expansion and improvement of public transportation. The results were revealed at a press conference before bi-partisan leadership of the U.S. House Transportation and Infrastructure Committee in Washington, DC. The study, conducted via telephone by Wirthlin Worldwide, was commissioned by the American Public Transportation Association (APTA) February 12-16 of this year. Wirthlin polled a random sample of 1,003 adults, 18 years of age and older, living in the continental United States.

KEY FINDINGS INCLUDE:

• Almost three-quarters (72 percent) of Americans support the use of public funds for the expansion and improvement of public transportation.

• 64 percent said that they would be more likely to support a candidate for Congress who is favorable to improving public transportation options.

• Traffic congestion is an important issue and most adults (56 percent) say that the need to reduce traffic congestion and the time it takes to get to work has become more important in the past five years.

• Most Americans, even those living in rural areas of the country, agree that their community needs more public transportation options.

• Regardless of geographic location, residents voice support for public transportation options and funding in their communities: urban (64 percent), suburban (59 percent), rural (51 percent), and small town (55 percent).

A summary of survey results is attached and can be found at http://www.apta.com/news/releases/wirthlin.htm.

Transportation Reauthorization Moves Forward

Since the last issue of Metros, two key congressional events occurred which improve the chances that a transportation reauthorization bill with be considered and passed by the Congress this year. Both of them have to do with putting the financing in place that would provide the funds needed to pay for the programs and projects envisioned in the bill.

The first event was agreement by Congress to allocate in the budget $273 billion for fiscal years 2004-2009 for transportation. The overall sum is further divided into $218 billion for highways, $49 billion for transit and the rest for safety. This amount is much higher than the amount sought by the Bush Administration, although somewhat lower than transportation supporters wanted. It was achieved only after intense lobbying by Congressional supporters of transportation projects, including AMPO.

The second was the statement by House Majority Leader Tom DeLay (R-TX) indicating he would accept indexing the gas tax as a way to raise transportation revenue. This is a complete reversal of a previous "no new taxes" pledge by the Majority Leader that also sets the stage for a new revenue source.

In the meantime, a draft of the Administration's proposed reauthorization legislation has been circulating in Washington and beyond. It includes the 1% takedown for MPO planning funds, ending the TIP as currently practiced, flatlining the CMAQ program, and is silent on suballocation of STP and CMAQ monies. Drafts of the House and Senate bills are still under wraps but are expected to come to light in early to mid-May.

And They're Off – House and Senate Begin Work on Budget Plans

Recently, both the House and the Senate began work on FY 2004 budget plans which will certainly play a role in TEA-21's renewal later this year. Transportation leaders have been consistently pushing Budget Committee members for increased funding levels above the current baseline of $31.6 billion for highways and $7.223 billion for transit programs.

In the House, Transportation and Infrastructure Chair Don Young (R-AK) and ranking minority member Jim Oberstar (D-MN) have pushed for increased funds for highway and transit such that, by the end of the renewal period, spending would top out at $75 billion. House transportation leaders are currently working for the increase and the additional user fees and revenues needed to support the move. As of mid-March, discussion continues. For a copy of the Transportation Committee's statement on its budget request, visit http://www.house.gov/transportation/.

In the Senate, members of the Environment and Public Works Committee (EPW) and the Banking, Housing and Urban Affairs Committee have taken the lead in advocating for an increased budget to support future surface transportation spending. Letters from both panels attracted a great deal of attention. To view the letters, see http://www.senate.gov/%7Ebanking/letters/2003/0311trns.htm

The budget resolutions are slated for action on the House and Senate floors next week.

Both the Budget Committee members and the Bush Administration have thus far opposed such increases.

BUDGET COMMITTEE RESOLUTIONS: WHAT'S THE DIFFERENCE?

As Congress continues to work toward agreement on a FY 2004 Budget, there remain a number of key areas with unresolved issues.

AREAS OF DISAGREEMENT

- The House resolution would mandate cuts of $470 billion by authorizers from mandatory spending programs over 10 years, including $6.1 billion from transportation programs. Harder-hitting were cuts from Ways and Means ($261 billion) and Energy and Commerce ($111 billion).
- The Senate bill would achieve its return to budget surpluses by allowing growth of less than 1 percent in discretionary spending in the later years of the 10-year plan.
- The Senate resolution includes a provision to overturn a ban on oil and gas drilling in the Alaska Arctic National Wildlife Refuge.
- The Senate resolution also includes a reserve fund which would allow increased spending for highways if new receipts become available.

AREAS OF AGREEMENT

Both the resolutions proposed by Senate Budget Committee Chairman Don Nickles (R-OK) and by House Budget Committee Chairman Jim Nussle (R-IA) would:

- Project federal spending for 10 years, achieving a budget surplus after several years of deficit spending;
- Accommodate the $1.57 trillion tax-cut proposed by President Bush in his budget plan;
- Call for tax-writing committees to develop "reconciliation" bills for the President's proposed $726 billion economic growth and stimulus plan.

Basics of the 4 Step Transportation Model

Over the past 10 years, Transportation Modeling has moved well beyond a tool just for investment decision-making. It has become a key component in efforts to improve, maintain and prevent backsliding in terms of regional air quality.

The 1990 Clean Air Act Amendments (CAAA) thrust metropolitan planners, most specifically the modelers, into the then new arena of air quality compliance. While the application of the transportation modeling process has expanded, its basic form has not.

Transportation Modeling (also known as Travel Demand Forecasting) estimates travel on the transportation system and gives a preview of travel on proposed facilities. Travel patterns are based on relationships developed from survey data between employment sites, housing, and transportation facilities. Forecasts assume that travel patterns will stay the same for a given period and can therefore demonstrate future travel flows.

WHAT MAKES UP THE MODEL?

Network

The network consists of an abstract of the travel system. The roadway is a simplified representation of streets that provide for general circulation within a given region. It is based on a system of nodes and links. Nodes are generally street intersection points, while links connect the nodes and represent streets and provide information on operating characteristics such as type and length of facility, number of lanes, etc. Also represented are gateways or cordon stations.

Socioeconomic Data

The amount and type of travel depend on the land use parameters input into the model. Traffic Analysis Zones (TAZ) are the analysis units of the model. Land use data are incorporated into TAZs, which range in size. Boundaries generally include the regional network area and natural or man-made dividers, such as canals and railroads, which naturally limit opportunities for trip crossings.

Land use is described in terms of type, intensity and location. This data is used in the trip generation process to estimate factors such as the number of trips that a household or employee will produce. Data is developed for a base year, say 2000, and for various forecasts. Household data includes population and is often broken down into various categories such as single-family households with two or more autos or multiple family households with no autos.

In simple terms, the four steps are the following (1) trip gen-

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Upcoming Events

JUNE 22-26, 2003
Air & Waste Management Association Conference, San Diego, CA
Contact 412.232.3444 ext. 3138,
www.awma.org

JULY 13-18, 2003
Joint Summer Meeting of the Ports, Waterways, Freight, International Trade, Planning, Economics, Finance, and Management Committees, Portland, OR

Part 1: 28th Annual Summer Ports, Waterways, and Freight & International Trade Conference Contact, Joedy Cambridge, **jcambridge@nas.edu**

Part 2: Joint Summer Meeting of the Planning, Economics, Finance, Freight, and Management Committees Contact, Kimberly Fisher, **kfisher@nas.edu**

eration, (2) trip distribution, (3) mode choice, and (4) trip assignment. Working on a regional basis, the models are complex computer programs that use equations to link large amounts of data. Each equation includes assumptions about how the transportation network operates. Incorporated in this theory are assumptions about travel demand and system capacity of both roads and transit.

Trip Generation

Trip generation takes socioeconomic data and, based on historical survey information, estimates the number of person trips produced and attracted within each Transportation Analysis Zone (TAZ). These trip productions and attractions are generally called "trip ends".

Trip Distribution

Trip distribution determines where a trip develops and where the trip will go. Trips are connected between TAZ-based data previously input into the model. Trip generation assumes a person is more likely to travel to a nearby zone with many amenities such as employment, shopping, etc. than to a further zone with few amenities.

Known as a "gravity model" this process derives its name and basic working premise from Newton's law of gravity, which states that:

the attractive force between two bodies is directly related to their size and inversely related to the distance between them.

Therefore, the number of trips between areas is directly related to the level of land development within each TAZ and inversely related to the distance (miles of travel) between the TAZs. Distance is expressed as miles of travel.

Mode Choice

Mode choice predicts how a trip will be taken. Will it be by foot, bike, automobile, mass transit, a ferry or some other means?

Characteristics of the tripmaker (income, gender, etc.), trip purpose (shop, work, etc.) and the mode (cost, time, etc.) all affect the mode choice decision process.

Trip Assignment

After applying vehicle occupancy rates and balancing the production and attraction trip matrix, the resulting "origin/destination" matrix is assigned to the network.

Model Output

Results of the "4-step process" are reports identifying traffic impacts on the overall system and each street segment measured by the relationship of facility capacity to facility volume. Information is available for the following whether as a table or as plotted data:

- vehicle miles of travel (VMT),
- vehicle hours of travel (VHT),
- number of trips,
- trip length,
- hours of delay,
- congested speeds,
- congested travel times,
- directional and non-directional daily and peak hour volumes,
- bandwidths and,
- volume/capacity ratios (V/C).