too distant future the widespread use of such technology for urban growth pattern modeling, environmental assessment along transportation corridors, and area-wide traffic volume counts.

Coordinated Data Collection and Use

Because the effectiveness of planning and, thus hopefully of decision making, depends so strongly on the existence of a good data base, designing a data collection and management plan for an urban area becomes an important task in transportation planning. Indeed, I would argue, just as our predecessors did in 1958, that you really cannot make good decisions without the facts. Therefore, I would recommend that just as the transportation improvement program (TIP) outlines the projects, agency responsibilities, funding sources, and timing of the key projects in a region, so too should there be a data improvement program (DIP). This program would provide a schedule of data collection activities over a specified period, identify likely unmet data needs, establish priorities among these needs, determine the level of resources to be devoted to each of these needs, and estimate the cost of the data collection efforts on an annual basis. Of great importance in this exercise would be the required interagency and intergovernmental coordination that would be required for such a program to be successfully implemented.

Before ending, I would like to add a personal note. I have been a participant and observer of transportation planning over the past 18 years. I have held positions where I was the producer of information for decision makers and also held positions where I was the end user of information produced by the planning process. I have participated in several expert review panels for transit investment where billions of dollars worth of public funds were going to be spent on systems or facilities for which the data base and planning tools were totally inadequate to answer some of the most basic questions. I have participated in debates over system performance monitoring (primarily for air quality purposes) where the level of precision and accuracy of data collection demanded by some far out-stretched even the best capabilities in the country. I worry that many of our public policies and subsequent policy requirements have gone far beyond the data base and technical modeling capabilities that exist in our profession. There is little doubt in my mind that we are about to play a catch-up game, due in part to many years of neglect and limited resources. However, I hope that our profession, and this conference, goes beyond simply looking at what is necessary to support the decisions of today. Because if we do, my fear is that once we finally have in place the data base and analysis methods that are needed for today, the decision-making environment will have changed again. In all of our discussions, the importance of data and of the analytical we need to provide some strategic perspective on capability it supports. Will they be useful 10 years from now? 20 years from now? 50 years from now? I know the answers to these questions are not easily forthcoming. However, by simply asking them, we might be able to put in place a data base that truly can support the decision-making process of the 21st century.

PANEL ON ENVIRONMENTAL ISSUES AND IMPLICATIONS FOR DATA COLLECTION PROCEDURES

Gary Hawthorn, Gary Hawthorn Associates, Ltd., moderator

OPENING COMMENTS

Gary Hawthorn

The Clean Air Act Amendment (CAAA), in advance of ISTEA, first spotlighted concerns about the adequacy of existing analytical tools and data needed to carry out the clean air requirements.

A NARC conference in November 1991 focused on these concerns, emphasizing data problems as major obstacles to improved emission estimates--in particular: no data, data of uncertain quality/precision, bad data, and the expense/time to collect new data.

In an eye-opening/overwhelming exercise, a workshop at that NARC conference demonstrated the wide range of data needed to determine accurately the emission reductions resulting from employer trip reduction programs. (The CAAA specifies only that required employer programs achieve a 25% increase in AVO above the area-wide average--which, if achieved, reveals little about the emission reductions from such programs.)

Compatibility and cultural gaps exist between transportation and air quality professionals and their data/models. Accuracy needs are also significantly different.

Sometimes the data in hand may not represent the truth. Employer trip reduction plans, submitted in response to Regulation XV, may feature preferential parking as a major incentive for carpoolers. But a site

visit to the parking lot may reveal that the preferential space is only 15 feet closer to the plant entrance--not really much of a mode-switching incentive.

TRANSPORTATION DATA IMPLICATIONS OF THE CLEAN AIR ACT OF 1990

John H. Suhrbier, Cambridge Systematics, Inc. and
Greig Harvey, Deakin, Harvey, Skabordonis, Inc.

NOTE: Attachment 1 is a longer version of Suhrbier's conference presentation and represents the main resource paper for this session. During the Conference Suhrbier presented overheads (Attachment 2) on:

- CAAA Transportation Analytical Requirements (emissions inventory, VMT projections, measures of effectiveness, employer trip reduction programs, emissions from VMT/vehicle trip growth, VMT/congestion, monitoring etc.).
- Conformity (required consistency between SIP mobile source emissions estimates and emissions from transportation plans/TIPs) .
- Section 108(f) Transportation Control Measures.
- Key Vehicle Emission Variables (emphasizing trips/trip end emissions rather than trip length and vehicle operating characteristics).
- CO Speed/Emission relationships (showing higher emissions at speeds above 45 mph).
- CAAA/ISTEA/Development Issues Requiring Enhanced Modeling.
- "States" of Transportation Practice (Need to move from state-of-the-practice to best practice to state-of-the-art, with continuing research advances pushing the state-of-the-art).
- Next Generation of Travel Demand Forecasting (wider range of policy sensitivity, feedback loops in modeling steps, GIS integration, forecasts based on disaggregate households/marketing surveys vs. zonal approach, more customizing of models and post-processing techniques, trip-based emissions vs. link/traffic volume-based).

In addition to the overheads, Suhrbier emphasized that: (1) the CAAA creates very significant analytical requirements that state DOTs and MPOs are not now well prepared to meet, (2) while not all of the CAAA and EPA objectives will be met, data/modeling improvements must occur--partially because of threatened/actual litigation, and (3) many ISTEA objectives/provisions reinforce the data/analytical demands of the CAAA.

Greig Harvey made the following points:

DATA NEEDS

- Demographics—smaller/variable zone systems, GIS-based, wider range of data (e.g., employment categories, housing/rental prices, crime rates).
- Networks—greater detail (down to arterials because emissions are estimated for the entire network), consistent with zone system scale, GIS-based, reflect economies of scale).
- Facility Performance—need improved speed/flow relationships, validation data.
- Conventional Home Interview Data—needed for model development/refinement, detailed spatial emissions analyses (in San Diego, such data revealed orders of magnitude differences in emissions projections).
- License plate surveys/cordon counts—for off-model flows.
- Longitudinal surveys/panels—to evaluate response to TCMs and land use dynamics.

SAMPLING OF CAAA/ISTEA ANALYSIS NEEDS

- Better information on real world conditions of the transportation system (actual flows/speeds by time of day) and precursors of travel (demographic/socioeconomic data).
- Accurate modeling/forecasting of the genesis of vehicle trips, including: trip generation by related land use, trip distribution, mode choice, and time of day.
- Accurate modeling of network travel flows.
- Improved understanding of travel patterns/traveler response to changes in service, price, and land use.