9-1-2001

Best Practices in Developing Regional Transportation Plans, MTI Report 01-10

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San Jose State University

Norman Y. Mineta
International Institute for
Surface Transportation Policy Studies
Created by Congress in 1991

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Mineta Transportation Institute
San José State University
San Jose, CA 95192-0219

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a publication of the
Mineta Transportation Institute
College of Business
San José State University
San Jose, CA 95192-0219

Created by Congress in 1991

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA/CA/OR-2001-27		

4. Title and Subtitle	5. Report Date
Best Practices in Developing Regional Transportation Plans	September 2001
	6. Performing Organization Code

7. Authors	8. Performing Organization Report No.
Donald N. Rothblatt, Steven B. Colman	01-10

9. Performing Organization Name and Address	10. Work Unit No.
Norman Y. Mineta International Institute for Surface Transportation Policy Studies College of Business, San José State University San Jose, CA 95192-0219	11. Contract or Grant No. 65W136

12. Sponsoring Agency Name and Address		13. Type of Report and Period Covered
California Department of Transportation Sacramento, CA 95819	U.S. Department of Transportation Research and Special Programs Administration 400 7th Street, SW Washington, DC 20590-0001	Final Report 14. Sponsoring Agency Code

15. Supplementary Notes

This research project was financially sponsored by the U.S Department of Transportation's Research and Special Programs Administration and by the California Department of Transportation (Caltrans).

16. Abstract

AltAlthough Regional Transportation Plans (RTPs) have been prepared for many decades, there has been little effort to comprehensively compare and evaluate the different features of these documents. Most Metropolitan Planning Organizations (MPO) typically do this on an ad hoc basis, thus resulting in duplication of efforts. Furthermore, there is a need to evaluate how the many changes in federal transportation policy during the 1990s have affected the planning of major new transportation facilities.

The purpose of this study is to compare Metropolitan Planning Organization (MPO) Regional Transportation Plans (RTP) and planning processes in California with selected regions. Seventeen MPOs were included to provide a balance of geographical location, growth rate, transit orientation, size, density and air quality conformity status.

RECOMMENDATIONS

This report makes numerous recommendations about public participation in the RTP; the frequency of updates; scoring criteria for projects; the use of planning data in the RTP; coordination with ports and airports; and the evolving role of MPOs as it relates to preparation of the RTP. These are documented in the report, based on written and oral surveys conducted by the research team.

17. Key Words	18. Distribution Statement
Advocacy groups; Metropolitan Planning Organizations; Regional Transportation Planning; Traffic congestion.	No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	143	$15.00

Form DOT F 1700.7 (8-72)

Library of Congress Catalog Card No. 2001095475

To order this publication, please contact the following:

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ACKNOWLEDGMENTS

The research team acknowledges with gratitude the assistance received from the directors and the staffs of all the metropolitan planning organizations that participated in the study.

Thanks also to graduate students Eugene Maeda, Sheung-Kuen Kwan, Kelly Vasquez and Pin-Yuen Wang for their assistance in preparing this report for publication. We also wish to thank the staff of the Mineta Transportation Institute for their assistance in bringing this report to print. In particular, thanks to Research Director Trixie Johnson, Research and Publications Assistant Sonya Cardenas, Graphic Artists Ben Corrales, Shun Nelson and Cedric Howard, and Editorial Associates Catherine Frazier and Irene Rush.

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EXECUTIVE SUMMARY

The purpose of this study is to compare Metropolitan Planning Organization (MPO) Regional Transportation Plans (RTP) and planning processes in California with selected regions. A total of 17 MPOs were included to provide a balance of geographic location, growth rate, transit orientation, size, density, and air quality conformity status. The MPOs' planning processes and documentation were compared in terms of the past history and current progress in regional transportation planning, approaches toward addressing the transportation impacts of land-use decisions, methods and degree of citizen involvement in the process, the project evaluation process used, and the databases available in each MPO to support evaluation. MPO directors (or their designees) were asked to provide self-assessments of their planning processes, including how or if MPOs affect transportation outcomes in a region.

The methodology includes a comprehensive literature review supplemented with telephone interviews of individuals involved in metropolitan transportation planning. The product is this report, which, it is hoped, will be useful to all those involved in regional transportation.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the 1998 Transportation Equity Act for the 21st Century (TEA-21) have resulted in major improvements in the quality of regional transportation planning. In most cases, the size of the MPOs (in terms of geographic boundaries) appears to be about right, and modest efforts are being made to broaden the representation of stakeholders in the RTP process. For example, many MPOs now include representatives of freight and nonmotorized advocacy groups.

Some of the conclusions that emerge from the study that indicate areas in which improvement could take place are as follows:

Public participation needs to be improved so that it is meaningful and broad-based. This is an issue that most MPOs are aware of, and many are working to improve. New ways need to be found to involve the general public, not just the organized stakeholders. The RTP public process is often dominated by more narrowly focused advocacy groups, such as business or environmental groups, or modal advocates who do not always represent the majority opinion of the pubic at large.

Coordination with state DOTs appears to be seriously lacking in most of the plans. We speculate that this may be due to differences in missions between the MPOs and state Departments of Transportation (DOTs). Closer coordination between the two agencies should help the regional planning process.

Better multimodal evaluation and scoring criteria for projects are needed. The development of this process is still evolving, and additional research would be valuable in this area to assist MPOs. In many cases, the present processes still rely heavily on subjective scores provided by the evaluator, and may not always relate well to the performance measures and standards used elsewhere by the MPO.

More participation in the land use and development process can be made than is presently occurring with the MPOs, even though only Portland has direct land use powers. Although nearly every agency interviewed had no direct land use powers, MPOs do hold an indirect power over land development. They are able to target investments toward areas where new development is desirable, delay or withhold investments in areas where new growth is undesirable. However, few agencies seem to explicitly recognize this power in their decision making.

There is a potential for the RTP to be updated less frequently than it is now (every three years) and still be a good planning document. RTPs must be updated in air quality nonattainment areas at least every three years, and some MPOs voluntarily update their documents more frequently. The update process can be expensive; therefore, it is worth examining ways to make the process more efficient.

RTPs should not be sanitized. There is a tendency in many RTPs to gloss over areas where significant disagreement on approach and priorities are concerned. Although it is desirable to keep RTP documents as short as possible, we think the documents would be improved by recognizing and paraphrasing issues related to proponents and opponents of particular polices or projects.

MPOs need to make the transition to a system management and operations focus, which is somewhat different from their traditional role as allocators of resources and investment managers. They will continue to be investment managers, but they also need to become proficient in monitoring the system and identifying performance measures and feedback, and adept at

developing and implementing low-cost projects to improve overall performance of the transportation system.

Ranges of inputs should be considered for major inputs to the RTP process. Most RTPs indicate that they used single "most likely" numbers for key inputs to their planning process. Using ranges of values for these key inputs would allow development of contingency plans that would make the RTP a much more flexible document, and might allow for it to be updated less often (see above comment on the update requirement, as well).

MPOs should work to improve coordination with ports and airports. These agencies had the lowest levels of cooperation with the MPOs. MPOs should focus on more closely involving them in the RTP process.

The quality of planning data in certain areas needs to be improved to make the RTP a more useful and reliable document. In particular, the specific planning data most in need of improvement included data on use of nonmotorized modes, long-term structural shifts in lifestyle and travel behavior, and the availability and price of energy. Several studies at the federal level are going on now to improve this data, at least on a national scale. The Bureau of Transportation Statistics (BTS), created by ISTEA, has made notable progress in developing data at the national level.

INTRODUCTION AND LITERATURE REVIEW

PURPOSE OF STUDY

One of the important features of the ISTEA legislation was the requirement that metropolitan planning organizations (MPOs) enhance their transportation plans, coordinating their efforts with the state's responsibilities under the Clean Air Act Amendments of 1990. MPOs must undertake a continuous planning process and develop a Transportation Improvement Program (TIP) to be reviewed by the U.S. DOT. TEA-21 collapsed the state and metropolitan planning factors to just seven, although the original ISTEA factors constitute a good framework for evaluating and comparing the RTPs:

1. Preservation of existing transportation facilities and, where practical, ways to meet transportation needs by using existing transportation facilities more efficiently.
2. The consistency of transportation planning with applicable federal, state, and local energy conservation programs, goals, and objectives.
3. The need to relieve congestion and prevent congestion from occurring.
4. The likely effect of transportation policy decisions on land use and development and the consistency of transportation plans and programs with the provisions of all applicable short- and long-term land use and development plans.
5. The programming of expenditure on transportation enhancement activities.
6. The effects of all transportation projects to be undertaken within the metropolitan area.
7. International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation areas, monuments and historic sites, and military installations.
8. The need for connectivity of roads within the metropolitan area with roads outside the metropolitan area.
9. The transportation needs identified through use of the management systems.
10. Preservation of rights-of-way for construction of future transportation projects, including identification of unused rights-of-way that may be needed for future transportation corridors and identification of those corridors for which action is most needed to prevent destruction or loss.

11. Methods to enhance the efficient movement of freight.
12. The use of life cycle costs in the design and engineering of bridges, tunnels, or pavement.
13. The overall social, economic, energy, and environmental effects of transportation decisions.
14. Methods to expand and enhance transit services and to increase the use of such services.
15. Capital investments that would result in increased security in transit systems.

Other criteria that were used in this study to evaluate the RTPs include:

- Has the plan been updated in a timely manner?
- Does the plan make the most efficient use of existing transportation facilities to relieve vehicular congestion and maximize the mobility of people and goods?
- Does the plan include appropriate proposed transportation enhancement activities?
- Does the plan include appropriate coordination with Clean Air Act agencies?
- Was there appropriate participation by interested parties?
- How, and to whom, was the transportation plan distributed (draft or final)?
- Does the TIP show the priority of projects?
- Is there a supporting financial plan that demonstrates how the RTP and TIP can be implemented; indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan; and recommends any innovative financing techniques to finance needed projects and programs, including value capture, tolls, and congestion pricing?

The purpose of this study is to compare Metropolitan Planning Organization (MPO) Regional Transportation Plans (RTP) and planning processes in California with selected regions. A total of 17 MPOs were included to provide a balance of geographic location, growth rate, transit orientation, size, density, and air quality attainment status. The MPOs' planning process and documentation were compared in terms of the history and current progress in

regional transportation planning, approaches toward addressing the transportation impacts of land use decisions, methods and degree of citizen involvement in the process, the project evaluation process used, and the databases available in each MPO to support evaluation. Ultimately, we attempted to determine how and if MPOs affect transportation outcomes in a region.

The methodology includes a comprehensive literature review supplemented with telephone interviews of individuals involved in metropolitan transportation planning. MPO directors (or their designees) were asked to rate the quality of the RTP process and procedures. The reader should keep in mind that these are self-evaluations, and therefore subject to a number of potential biases and interpersonal comparisons. The reader should be cautioned that the conclusions reached here may be different from those an outside peer-review panel might reach. The product is this report, which, it is hoped, will be useful to all those involved in regional transportation planning.

LITERATURE REVIEW AND ANNOTATED BIBLIOGRAPHY

The first task in our study was a review of the literature on metropolitan transportation planning. The University of California's MELVYL system was used to obtain a list of books and articles with the words "metropolitan transportation planning," which yielded fewer than 38 useful items. Furthermore, many of the items found are more than 15 years old and, therefore, of less relevance. What follows is a review and summary of the relevant literature that was selected from that available, and an annotated bibliography of some of the more important literature available.

Considering the importance of the regional transportation planning process, we were surprised at the sparseness of relevant literature. Most of the literature tends to fall into categories: either guidelines and requirements (for example, Caltrans 1999; U.S. DOT 1995); or critiques written of the plans or processes as implemented (see Lewis 1999; Innes 2001; Lewis and Sprague 1997). In the former case, most of the material tends to read like a "how to do it" handbook, whereas the critiques often have been put out by specific advocacy groups unhappy with the current process and seeking changes that would be favorable to the authoring group. Relatively neutral and forward-looking studies tend to be rare.

A third approach was taken by the U.S. Department of Transportation in the mid-1990s, in which multidisciplinary peer review teams made multiday site

visits to the agencies and wrote extensive reports evaluating various aspects of the transportation planning process. Several of these have been cited under U.S. DOT in the bibliography. These reviews had the advantage over many studies (including ours) of being able to interview many different parties involved in the planning process.

The literature in general metropolitan processes is much richer, and the interested reader may wish to review the bibliography for titles that were reviewed for this study.

California Department of Transportation, *Final Draft Regional Transportation Plan Guidelines,* September 9, 1999.

This recent report provides background on the regional transportation plan (RTP), including its history, purpose, legal requirements, components, and procedural issues. At the time of writing, it was expected that the final version would be adopted in early 2000. Chapter headings cover regional planning, the policy element, the action elements (analysis and conclusion), the financial element, environmental considerations, and supplemental information and appendices. These guidelines are intended for application in California, which has a somewhat different structure and process for RTP preparation than exists in other states.

The report is available on the Internet at www.dot.ca.gov/hq/tpp/Offices/ORIP/rtp.htm*;* Adobe Acrobat is required to view it.

California Department of Transportation, *Regional Transportation Plan Guidelines,* effective January 1995.

This is the current version "in force" of the above document. It is shorter and lacks the extensive appendices in the proposed revision of the document.

Paul G. Lewis and Mary Sprague, *Federal Transportation Policy and the Role of Metropolitan Planning Organizations in California,* April 1997.

In September 1997, the law governing federal transportation policy and funding—the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)—expired. ISTEA was a significant source of revenue for California and represented a large component of the discretionary transportation funding available to metropolitan areas. As Congress was writing a new transportation law, there was considerable debate surrounding changes in ISTEA. The intent

of this report is to help inform that debate. The report makes three main contributions:

- It provides a brief overview of postwar transportation policy at the federal and state levels, focusing in particular on the evolution of metropolitan planning organizations (MPOs). MPOs have played a major role in urban transportation planning since the early 1960s, and they gained significant decision making powers under ISTEA.
- It examines California's implementation of ISTEA, recent transportation-funding decisions of MPOs throughout the state, and the effect of intergovernmental relations on transportation planning in California.
- It considers how rewriting the federal law may affect transportation in California. For example, ISTEA favors a metropolitan approach, which often involves coordination across multiple counties. At least one of the proposals under consideration for replacing ISTEA calls for a reduction in the federal presence and a greater devolution of responsibility to the states. The authors express concern that such an approach could undermine the regional aspect of transportation planning in California and significantly increase the fiscal challenges faced by mass transit systems.

Although this report focuses specifically on transportation policy, its findings also illuminate a central issue in the devolution of government responsibility—namely, that incentives and outcomes may vary considerably, depending on the level of government making the decisions.

Professor Sherman Lewis, "Report on MTC Planning," June 23, 1999.

This is a critique of the planning process of the Metropolitan Transportation Commission of the San Francisco Bay Area (MTC), written in the form of a long letter, by a former director of the Bay Area Rapid Transit System (BART) and chair of the Sierra Club of California. The comments were made as part of the U.S. DOT's recertification review of MTC as the MPO for the San Francisco Bay Area. The author contends that:

- MTC's planning process is largely driven by the needs of its major constituent agencies (cities and counties), along with Caltrans and BART.
- The agency lacks a "regional vision" compared to "better" MPOs, such as in Portland.
- Planning decisions are biased by political considerations.

- Land use implications of new highway capacity (and attendant growth and air quality impacts) are not being adequately studied.
- MTC's project scoring criteria (for ranking projects for funding) has shortcomings, including "forced choices that do not fit some projects, no consideration of fatalities, features that do not advance the purported goal, and lack of clarity about how many 'points' to enter."
- Lack of meaningful alternatives in the RTP process.
- Lack of responsiveness to public participation.

Joseph S. DeSalvo, ed., *Perspectives on Regional Transportation Planning*. Lexington, MA.: Lexington Books, 1973.

Although dated, this book provides considerable information on the early problems of creating metropolitan planning organizations, especially from a federal perspective. The chapters were based on papers developed from conference proceedings and dealt with basic issues such as:

- How large a region represents the optimal size for defining MPO boundaries?
- How should multistate metropolitan areas be handled?
- What is the economic rationale (costs and benefits) for regional transportation planning?

Several authors note that a key rationale for transportation planning is that it can improve social welfare by achieving a more efficient resource allocation.

Several of the chapters in this book are referenced below:

Karl A. Fox argues that the most promising regions for transportation planning appear to be centered on about 24 major metropolitan areas, which he refers to as national metropolitan regions (NMRs). He argues essentially for what today might be called "Super-MPOs" that encompass several metropolitan areas, usually with one city acting as the NMR "capital." It appears to some extent that the Consolidated Metropolitan Statistical Areas (CMSAs) used by the Census Bureau since the 1990s embody some of these concepts. The NMR would be responsible for providing improved linkages between metropolitan centers within the NMR, especially air transportation and intercity rail, and with other NMRs. Within the NMR, the individual functional economic areas

(Fox's term) would be responsible for the planning of travel facilities between homes, workplaces, and shopping and service facilities.

Ralph Gakenheimer, in his chapter, "Regional Transportation Planning Experience in the United States: A Critical Review of Selected Cases," argues that there is a trade-off between administrative coherence and functionality. He suggests that highly coherent groupings, such as states, offer much better means of implementation, more responsiveness to client users, and better opportunities for intersectoral collaboration. Functional regions (corridors and metropolitan areas), he asserts, provide greater leverage for developing analytical solutions and may be the only means of solving important problems, but they suffer unfortunate implementation disadvantages. He recommends that all the planning that can be done at the state level should be left there.

Another controversial point he advances is that it is probably better for a regional agency to be very functional or very coherent administratively, rather than to occupy a compromise position between the two criteria. Gakenheimer suggests the possibility of creating short-term, well-funded special agencies that would be charged to solve specific regional problems and then be dissolved—in essence, a "task force" concept with a specific mission that might span several years. He cites the Northeast Corridor Project—then active in making dramatic improvements to the intercity passenger rail system—as an example of this sort of organization at the multistate, corridor-level project.

Judith Innes and Judith Gruber, "Bay Area Transportation Decision Making in the Wake of ISTEA: Planning Styles in Conflict at the Metropolitan Transportation Commission," April 2001.

From 1995 until 1999, the authors closely followed the activities of the Bay Area Partnership formed by MTC as a collaborative forum for addressing transportation planning issues in the San Francisco Bay Area. Some of their observations and comments on the work of the Partnership were that:

- In transportation, no one is in charge—no agency or player feels empowered to try to solve the transportation problems about which the public cares most, such as congestion, use of transit, and ready access to activities and services needed by the public around a region.
- Unlike many collaborative policy making processes the authors have observed, Partnership members did not develop much understanding of each other's interest and their own interdependencies.

- Members all pushed for their parochial interests even more strongly at the end of the process than at the beginning.
- Lack of transparency in the decision making process is contributing to the external critiques MTC is facing.

The authors recommend a number of actions that they feel will improve transportation planning in the region, such as greater reliance on performance measures, moving away from project-based transportation planning, reducing the use of formula-based funding allocations, and implementation of innovative collaborative processes that reward innovation and the inclusion of stakeholders.

ORGANIZATION OF REPORT

The remainder of this report is divided into three major areas: a description of the study approach and methodology concerning plan documentation and questionnaire development; a discussion of the survey results and analysis with regard to the regional transportation plan; and the institutional roles and relationships of the MPOs with their external environments. The section on institutional issues deals with agency roles, who pays for the MPO, control of the MPO, and citizen involvement. The technical issues section deals with five key aspects of the state planning process and how they have been approached differently by the 17 MPOs included in this study. Finally, we conclude with a summary of what has been learned, including some characteristics that appear to be shared by successful MPOs. We believe that these recommendations could be useful to the California Department of Transportation, to lawmakers considering revisions to the ISTEA legislation, and to MPOs outside California that may be considering revisions to their statewide transportation planning process.

STUDY APPROACH AND METHODOLOGY: PLAN DOCUMENTATION AND QUESTIONNAIRE DEVELOPMENT

REVIEW PROCESS OF TRANSPORTATION PLAN DOCUMENTS

We began our study with Phase I (Winter 2000) by conducting preliminary interviews of the staff of the four largest California Metropolitan Planning Organizations (MPOs) and those of a selected sample of 13 other state MPOs designated for regional planning under ISTEA and TEA-21. To provide a balance of geographic location, size, and other factors, the 17 states included in our study represented each region of the country: Northeast—Massachusetts; Southeast—Florida and Georgia; Midwest—Illinois, Minnesota, and Wisconsin; Southwest—Arizona and Texas; and West— California, Oregon, Nevada, and Washington. We also arranged to receive the most recent Regional Transportation Plan (RTP) for each MPO.

Our choice of which RTPs to include was admittedly subjective, but was based on the following criteria:

- We wanted to include the large MPOs in California—Los Angeles, San Francisco, San Diego, and Sacramento—as a basis for comparison with the other MPOs. This was four of the 17 agencies selected.
- Because California is experiencing considerable growth pressure, we wanted to include MPOs that were facing significant growth pressure now and in the future. Nine of our selected MPOs met this criterion: Tucson, Phoenix, Miami, Atlanta, Las Vegas, Portland, Houston, Dallas, and Seattle.
- We wanted agencies that were also facing transportation and air quality problems, as are many MPOs in California. At least five MPOs outside California are in significant nonconformity with the Clean Air Act Amendments of 1990. We hypothesized that this would make their planning processes richer and more complex, with a greater variety of stakeholders in the outcomes.
- We wanted agencies that (subjectively) have reputations for innovative planning, such as Portland, Oregon, and the Twin Cities in Minnesota.
- We wanted geographic dispersion of agencies among various national regions; therefore, the Pacific Northwest, the Southwest and Sunbelt,

Florida, the Midwest, and the Northeast are all represented by at least one MPO.

Our preliminary review of the 17 RTPs[1] and examination of reports of other related studies of state planning, such as the California Statewide CMP/Air Quality Coordination study, provided us with an informative overview about the nature of ISTEA/TEA-21 regional planning and related issues. Based on this preliminary review, we decided that the best contribution our study could make to understanding the ISTEA/TEA-21 regional program would be to focus on the following major aspects of RTPs:

- How well have metropolitan transportation organizations managed the transition to multifunctional agencies?
- How have the stakeholders been involved in the development of the regional transportation plan?
- What degree of cooperation has there been with local, regional, and state agencies?
- How are environmental factors considered, especially air quality?
- What level of agreement is there on goals and priorities with various community interests?
- What kind of performance measures have been developed in order to make cross-modal comparisons of projects?
- What kind of programs have MPOs developed to assess the impacts of land use decision making on transportation facilities and performance?
- What resources have been made available for the regional transportation planning process?
- What are the institutional characteristics of MPOs?
- What is the relative success in improving the quality of transportation?

Accordingly, we developed an information matrix that described each MPO with respect to these aspects. First, we attempted to complete our matrix from a detailed review of each MPO regional plan. This process was helpful in that it familiarized our study team with the activities of each MPO, but did not provide all the information we needed for our matrix. For example, few

[1] Only partial information was obtained from four of the MPOs.

regional plans provided information about the composition of MPOs, their advisory committees, and annual budgets.

The next phases of our study involved generating a questionnaire that would help us to complete our information matrix and help us develop and test several hypotheses concerned with the relative success of MPOs. Tables 1 through 8 (which are presented in Appendix D) show a final version of our information matrix.

INITIAL HYPOTHESES AND ASSUMPTIONS

In Phase II (Winter-Spring 2000), we not only determined the data needed to complete our information matrix, but also identified the output measures of success related to the regional planning process and the factors or input variable that might influence these outcomes. The measures of success we used were based on MPO staff judgments with respect to the following factors:

- Overall effectiveness of the MPO organization to meet objectives.
- Improved coordination between local governments, transportation and land use activities, and transportation and air quality activities.
- Degree of cooperation between the MPO and other significant regional transportation-related agencies.
- Reduction of traffic congestion.
- Effectiveness of the MPO planning process in improving transport mobility and air quality.

Based on previous research (Glickfeld and Levine, 1992; Wachs, et al. 1993; Donaghy and Schintler 1994), we determined the factors or input variables likely to influence the desired outputs to be of two kinds. First, there are contextual variables that have important influences on the outputs but are essentially given for each region and cannot be easily changed. Because of their importance, these variables needed to be accounted for, or controlled, through such techniques as multiple regression or partial correlation analysis (see Appendix B), which tries to determine the influence of each variable while holding the others constant. Examples of contextual variables for each region are per capita income, education (percent college graduates, age 25+ of the 1990 population), total population, population density, number of local governments, and, to a somewhat lesser extent, population change and state highway miles per capita.

The other factors influencing the desired outputs are the characteristics of the participating MPOs, which can be changed through conscious public policy. These characteristics, or policy variables, include the number of MPO functions, extent of citizen participation, extent of group participation, percent budget for operation and maintenance planning budget, MPO budget per capita, time used to complete the RTP, and number of MPO governing board members.

Like any serious research study, this work began with a set of expectations and hypotheses by the investigators, formed from prior research on and experience with the MPOs and by attending MPO meetings. The expectations are important because they governed the nature and orientation of the questions asked in the MPO survey. Some of these expectations were verified by the MPO interviews; others were disproved or only partially supported. Among the basic expectations were:

- Generally, we expected that the contextual variables that would suggest intensity of development and growth, such as population, population change, and density, would be indicators of congestion and have a negative impact on our output variables; and that measures of socioeconomic status, such as income and education, would be related to successful transport policies and be positively associated with our outcome measures.
- With regard to our policy variables, we expected that the desired outcomes would be greater as the MPOs were more focused, more inclusive (in terms of broad consensus building processes), and had more resources available. Thus, we expected a negative association between number of MPO functions and outputs, and positive relationships between indicators of the extent participation and abundance of resources (financial and physical) with desired results as expressed by indicators of MPO effectiveness.

Some additional specific expectations were that:

- MPOs would attempt to simplify the process to the greatest degree possible in order to minimize costs and maximize the impact of available staff resources.
- States would prefer to use an agency or institution existing prior to 1998 as the planning agency, rather than creating a new agency.

DEVELOPMENT OF SURVEY INSTRUMENT

Questions concerning each output variable or measure of success were devised and put into the form of a questionnaire schedule. As Appendix A indicates, questions related to these measures of success were designed to yield an ordinal score in accordance with semantic differential scales (where 1 equals "poor," and 10 equals "excellent").

Generally, questions involving the input variables were devised employing scales similar to those used for the output measures of success. Questions concerning missing data for our information matrix and questions of an exploratory and open-ended nature also were included in the questionnaire.

During Phase III of our study (Spring 2000), the questionnaire was constructed, pretested, and revised. The pretest involved interviewing several MPO senior staff as well as the staff of air quality districts and regional transportation agencies. Their feedback was very helpful for improving the final questionnaire. In Phase IV (Spring-Summer 2000), the structured questionnaire was administered by telephone to all the MPO Transportation Planning Directors or their designees. Generally, this individual had the title of senior transportation planner or supervising transportation planner. Each interview required about one hour to complete.

RESULTS OF SURVEY INSTRUMENT

After the data were collected, scores from questions concerning each variable were entered on computer files for tabular, graphic, and statistical analysis in Phase V (Fall 2000). First, simple correlation coefficients were computed in order to make a preliminary examination of the relationships between variables. This procedure also acted as a technique for screening input variables with marginal influences on dependent variables. Other statistical techniques, such as t-tests and analyses of variance, were used to test differences between mean scores of subgroups of the MPOs (for example, high-density vs. low-density metropolitan areas). Partial correlation coefficients were employed primarily to test for expected relationships between input and output variables in the entire sample (see Appendix B for computational details). In some cases, multiple regression analysis was used to test the combined impact of the input variables expected to influence each output variable.

Because of the exploratory nature of this study, only tentative expectations of the relationships among the variables examined were used; thus, two-tailed t-tests of significance seemed most appropriate. Of course, it is recognized in the social and other applied sciences that it is desirable to obtain at least a 95 percent probability of no error due to chance ($p<0.05$) before granting any theoretical importance to the relationships uncovered. However, in order to call the attention of the reader to potentially important areas for future research, results are reported with a somewhat lower 90 percent probability of no error due to chance ($p<0.10$).

The questionnaire is shown in Appendix A and the survey results are presented in verbal and numeric form in Tables 1 through 8 (Appendix D).

REVIEW OF REGIONAL TRANSPORTATION PLAN DOCUMENTS

OBSERVATIONS

All the RTP documents collected were read by the research team. Some of the key observations from this review were as follows:

- The update interval (generally every two to three years) seems to be about right, but few (if any) agencies produce an annual report on the status of plan implementation.
- Lack of state Department of Transportation (SDOT) coordination seems to be an important issue. More effort needs to be expended on coordinating state and regional plans, at both the state and MPO agencies. Many agencies seem to have gone part of the way in including a state DOT representative on their governing board (NCTCOG includes two), but does the RTP merely mimic what is in the state highway plan? Should the state plan be an amalgam of the regional plans, plus highway planning for rural counties?
- There are important data needs that the U.S. DOT could focus on. Some, such as the need for travel data on nonmotorized modes, are already being addressed. Others, such as long-term lifestyle changes and impacts of technology on passenger and goods movement, have not been well studied.
- There is little use of ranges for important input assumptions, such as population or employment, or energy costs. Although they would increase the costs of plan preparation, they would help make the plan a more useful, long-lived document that avoids the problem that has traditionally plagued long-range planning: that of extrapolating near-term trends too far into the future. Two different approaches to the RTP document might be to:

    a. Prepare the RTP less often, but use ranges to plan for a wider range of contingencies; or

    b. Update the plan as often, or more often than now, making changes each time.

Lack of land use authority is nearly universal among MPOs. Portland was the only MPO we found that had limited land use authority. Although highly controversial, some additional power to regulate land use would assist MPOs in doing their jobs. California congestion management agencies have punitive

powers over cities that approve land uses that cause traffic levels to exceed service standards today but have been reluctant to use such powers in the decade that they have had them. How such powers would be implemented by an MPO is beyond the scope of this study, but might include review and consultation over large-scale projects and the ability to veto or modify large projects that create significant negative impacts on the regional transportation system.

This chapter explores the relationship of the 15 ISTEA factors as they relate to the RTP documents. The original 15 metropolitan planning factors, which were later condensed to seven factors in TEA-21, are discussed individually below, along with comments relative to our review, mentions of agencies showing best practices in considering the factor, and, in some cases, recommendations. The 15 planning factors are shown in *italics*.

1. *Preservation of existing transportation facilities and, where practical, ways to meet transportation needs by using existing transportation facilities more efficiently.* This factor appears to be largely met in the documents reviewed in this study. Most documents reveal the evolving emphasis, at both the federal and state level, of management and operations of the transportation system. This generally is well reflected in the documents reviewed, especially considering that the MPOs are not operating agencies themselves, but only have power over funding and investment decisions. Many of the MPOs are spending upwards of 75 percent of their total transportation budgets on operations and maintenance of their transportation systems. Regions with significant transit networks (for example, Chicago and San Francisco) tend to spend larger percentages of their funds on O&M because transit tends to be more a more labor-intensive mode than the highway mode.[2] We did not find any of the RTPs to be exceptional in addressing this planning factor, although San Francisco appears to have been conscientious in developing as accurate cost estimates as possible.

   We recommend that the U.S. DOT, in cooperation with the Association of Metropolitan Planning Organizations (AMPO) and the MPOs, work toward developing a uniform system of classifying and aggregating operating and maintenance cost accounts, similar to the way the Federal Transit Administration (FTA) has done under its Section 15 reporting

[2] This also occurs because only public-sector costs are included. For example, the cost of replacement of privately owned motor vehicles is not included on the highway ledger, but the cost of replacing worn-out buses and rail cars is considered on the transit side.

requirements for transit O&M costs. This will allow for more meaningful and fairer comparisons between regions.

2. *The consistency of transportation planning with applicable federal, state, and local energy conservation programs, goals, and objectives.* This objective appears to be minimally satisfied. Most agencies, until recently, have not paid much attention to energy conservation with the plentiful supplies and low real prices of the 1990s dictating much of the attention given to this factor. Tucson (PAG), Phoenix, and San Diego have done a better than average job in addressing this factor.
3. *The need to relieve congestion and prevent congestion from occurring.* Most RTPs focus on this as one of, if not the, primary issues for the region. This fits in with their historic role as transportation investment managers for the region. Several MPOs addressed this factor through using data, analysis, and conclusions generated from their congestion management system (CMS). MPOs were originally required (by ISTEA in 1991) to have a CMS approved by U.S. DOT, but Congress has since changed the law to make this an optional task. However, many states and MPOs have continued to recognize the value of the CMS by continuing to maintain it. In California, congestion management programs to some degree act as a surrogate for a CMS. San Francisco and San Diego stand out as examples of a comprehensive approach to addressing this factor.
4. *The likely effect of transportation policy decisions on land use and development, and the consistency of transportation plans and programs with the provisions of all applicable short- and long-term land use and development plans.* Most plans address this to some degree, but without direct land use powers to approve or deny development, most MPOs can address this factor only in a general way. Some RTPs have considered whether projections of future land uses and demographics are compatible with the existing or projected future availability of transportation capacity. One problem that growing MPOs face is the "spillover" effect into agent counties that are not part of the MPO, and thus do not participate in many of the convening opportunities provided by the MPO. Some MPOs (for example, Dallas) deal with this issue by including many surrounding rural counties in their MPO. In San Francisco, however, the nine-county Bay Area is surrounded by 10 mostly rural counties whose development may be significantly impacted by MTC's growth over the next 20 years. Portland (Oregon) Metro stands out as an agency with more land use powers than most.

5. *The programming of expenditures on transportation enhancement activities.* This is generally considered as part of the funding portions of the plans. This program funds many smaller projects, such as bicycle and pedestrian facilities, preservation of historic and archaeological resources, and amenities and environmental improvements. In some cases (for example, Arizona) enhancement projects are selected at the state level. We recommend that all enhancement projects be selected at the MPO or lower level.
6. *The effects of all transportation projects to be undertaken within the metropolitan area.* This is essentially a cumulative impact analysis that is usually handled through the transportation system-modeling task. Generally, it has been well handled, with the possible exception of the feedbacks on the land uses and economic activity levels in the region (see comment on 4 above). This planning factor also overlaps heavily with planning factor 13 below.
7. *International border crossings and access to ports, airports, intermodal transportation facilities, major freight distribution routes, national parks, recreation areas, monuments and historic sites, and military installations.* These have been covered to varying degrees in the documents. The importance of this factor clearly depends on the location of the metropolitan area, and not solely on its location near international borders. For example, Dallas is at the intersection of several key trunk interstates and rail lines, and so is impacted by trade to and from Mexico. This factor overlaps with planning factors 11 (freight routes), 13 (recreational routes), and 14 (transit). See also the recommendations section related to improving coordination with ports and airports in the RTP process. Seattle has developed a metropolitan freight transportation system.
8. *The need for connectivity of roads within the metropolitan areas with roads outside the metropolitan area.* Portland's MPO has developed a set of street connectivity standards that might be helpful to other regions (Chapter 6 of their RTP).
9. *The transportation needs identified through use of the management systems.* These management systems included congestion, bridges, intermodal, public transportation, transportation demand management, intelligent transportation systems, and safety. The management systems have been deleted as a requirement of TEA-21, but are now optional and continue to be used in many states and metropolitan areas. RTPs addressed these issues with varying levels of detail; overall, the greatest emphasis

seems to have been put on the ITS management system since considerable TEA-21 funds have been targeted at ITS implementations.

10. *Preservation of rights-of-way for construction of future transportation projects, including identification of unused rights-of-way that may be needed for future transportation corridors and identification of those corridors for which action is most needed to prevent destruction or loss.* Right-of-way preservation has become more difficult in the past 30 years, for two reasons:

    a. Ample highway budgets in the 1950s and 1960s allowed for significant property acquisitions well in advance of need. Such funds are no longer available.

    b. In California, significant right-of-way acquisition for a transportation corridor is not permitted under the state's environmental laws until an environmental impact report for the project has been adopted.

    Both of these factors significantly retard the ability of MPOs to acquire right of way in advance of need. However, it is easier to preserve an existing corridor (such as railroad lines or Caltrans undeveloped property) than it is to purchase a new right of way for future needs, even when such purchases can demonstrably reduce the costs of project implementation in the future. The Minneapolis-St. Paul MPO is an example of an agency applying best practices in this area (RTP policy 14).

11. *Methods to enhance the efficient movement of freight.* This is a shortcoming of most of the plans. This factor also overlaps with the development of an intermodal management system. Boston, Chicago, and San Diego have done a good job of addressing this issue, and San Francisco has created an ongoing (not time-limited) freight advisory council.

12. *The use of life cycle costs in the design and engineering of bridges, tunnels, or pavement.* Few RTPs gave much attention to this issue, perhaps because it represents a detailed engineering level of evaluation, and because many MPOs and SDOTs have been considering this factor (perhaps with incomplete data) for many years. No MPO stood out as "best," but Phoenix was an example of an MPO that paid better than average attention to this factor. This factor was dropped in 1997 when the 15 planning factors were condensed to seven.

13. *The overall social, economic, energy, and environmental effects of transportation decisions.* This is an extremely complex factor, which

addresses several different issues. Therefore, in most RTPs, the results are only summarized. The California MPOs tend to consider this factor in some detail in their state-mandated EIRs. Portland is a good example of an agency providing summary information in their RTP document. Several other agencies went to the trouble of analyzing the costs imposed on, and benefits received by, different income groups in their region because of transportation investment decisions.

14. *Methods to expand and enhance transit services and to increase the use of such services.* The Atlanta and San Francisco RTPs devote considerable attention to this factor, as one might guess in two regions where transit plays a major role in travel, especially commuter trips. Most RTPs talked about expansion of existing rail and bus services, with much less emphasis on developing nontraditional or innovative services, or increasing ridership on the existing system.

15. *Capital investments that would result in increased security in transit systems.* This factor is probably appropriately deleted as a requirement for inclusion in RTPs in the future (as it was in TEA-21). This factor is often handled by individual transit operators, and is often a consideration in their short-range transit plans (SRTPs). Transit security as a major issue also varies widely between areas (sometimes even within a single MPO region), so probably is more appropriately handled at the transit operator, or municipal, level. We could cite no “best practices” for this factor, although the Twin Cities probably considered it better than most in their RTP.

INTERVIEW SURVEY RESULTS AND ANALYSIS

PREVIOUS PLANS AND ACTIVITIES

Our survey included 17 respondent MPOs,[3] with a mean time since formation of 27 years; that is, most of the MPOs had been formed in the early 1970s, which reflected the beginning of federal grants supporting regional transportation planning agencies (RTPAs).[4] In certain respects, it is difficult to find a precise "age" for the agencies, since many of them had predecessor agencies. Atlanta dates its MPO back to the 1940s. In the San Francisco Bay Area, the Bay Area Transportation Study Commission (BATSC) was created in the 1960s to prepare studies and plans, but was only statutorily designated as the MPO in 1970. In Seattle, the Puget Sound Regional Council identified itself as being only eight years old, although the Puget Sound Council of Governments preceded it for several decades.

MPO ROLES AND RESPONSIBILITIES

Most surveyed MPOs had a large number of constituent cities, with a mean of 69 cities. There was considerable range in this value, from just five cities in the Tucson and Las Vegas MPOs to 184 in southern California. The most populous city in the MPO, which was not necessarily the central city, also varied widely in population. One of our initial hypotheses was that the size of the most populous city in the MPO might play an important role in the decision making process and might have a strong influence over the level of consensus on projects and intergovernmental relations. The percent of MPO population in the most populous city ranged from a low of 10 percent in the Boston MPO to 60 percent in Houston, with a mean value of 30 percent.

PLANNING ISSUES AND THE REGIONAL TRANSPORTATION PLAN DOCUMENT

Air Quality: Particularly since the passage of the Clean Air Act Amendments of 1990 (CAAA), MPOs have played a key role in analyzing the impacts of mobile sources on air quality and demonstrating conformance to the federal

[3] Only partial information was obtained from four of the MPOs.

[4] We use RTPA in its generic sense; in California, the California Transportation Commission makes a specific designation of an RTPA, with specific powers granted to it. We use "California RTPA" to designate those agencies.

National Ambient Air Quality Standards (NAAQS). Areas that fail to show reasonable progress in attaining these goals can have a significant portion of their federal highway funds withheld and must show that new transportation projects will not worsen the air quality in the area.

Because most of the MPOs we studied were large (mean population of 4.24 million in 1997), it is not surprising that approximately half were not in conformance with the federal ambient air quality standards for at least one of the three key tailpipe pollutants: carbon monoxide (CO), ozone, or particulate matter (PM_{10}). It should be noted that air quality basins, which are usually a function of topography and population density, are not always coterminous with MPO boundaries, which more often are drawn using municipal or county boundary lines. However, the MPO is often the most important player in demonstrating conformance to the NAAQS with respect to transportation.

INTERAGENCY COOPERATION

Cooperation scores were evaluated qualitatively using a simple semantic differential scale, with 1 indicating no cooperation and 10 indicating extremely good cooperation. Clearly, there are limitations to this kind of question: the responses are subjective and are influenced by interpersonal differences between respondents; respondents may give biased answers in order to support their own agency; and the data collected are mainly ordinal. These issues have been well documented in the literature.[5] Rankings (ordinal data) are still valuable; in fact, there is some controversy over whether such data can be used as interval-level data, which provides a broader range of valid statistical techniques for analysis. Nevertheless, this seemed to be the best available tool to document the levels of interagency cooperation, and clearly a rating scale (like the Likert scale) provides more information from the respondent than a simple ranking would.

Respondents generally provided scores in a fairly narrow band, between 6.8 and 7.6. Counties were given the highest score for their cooperation in the RTP process, with a mean of 7.6. This could be because counties already have regional or subregional authority to varying degrees; because they are geographically closer in scale to MPOs; and perhaps because in most regions they are a more distant unit of government than cities, so they may not have had as great a stake in the outcomes, especially land use.

[5] See Nie (1975) and Fink (1995).

Airport authorities were found to have the lowest degree of cooperation with the MPO. Although respondents were not asked to provide a causal explanation, we posit at least two reasons why this might occur. The first is that airports are often run as autonomous agencies, with full vertical integration of all responsibilities, from long-range planning to daily operation to providing for financing of capital improvements. They are often enterprise agencies, highly respondent to their clients (airlines) and expected to break even (and sometimes create a surplus) at the end of the year. Capital funding for improvements is often obtained through indebtedness rather than reliance on federal funding sources.[6]

The second reason is that airports often focus on relatively short-term time horizons compared to the typical RTP's 20-year forecast. Long-range air passenger and cargo forecasts have been highly volatile (and inaccurate) in the past, and the response by airport planners and managers is often to plan only two to five years in the future (about long enough to complete a major capital project). Airports like to be nimble in responding to the needs of their client constituencies, which means that they often do not like being bound to lengthy planning studies and plans that are difficult to amend. There is anecdotal evidence that some airports consider these studies irrelevant, although ground access is clearly an issue at many of the larger airports. These inherent conflicts between the MPO and the airport's mission may provide relatively few incentives for cooperation in the RTP process.

High scores of MPO cooperation were found among local governments (7.3), air quality districts (7.0), cities (7.5), transit operators (7.3), the U.S. DOT (7.9), and marine ports[7] (7.0).

DATA SUFFICIENCY AND ANALYTICAL TOOLS

Respondent scores on the availability and quality of planning data (Table 5, Appendix D) varied more than the responses to other questions. On a 10-point scale, respondents were asked to rate the quality of planning data they had available for the RTP, from 1 (poor or non-existent) to 10 (excellent).

[6] It is not unusual for an airport to have the legal authority to issue tax-exempt revenue bonds without voter approval.

[7] Six of the 13 MPOs who provided complete responses to our survey questionnaire did not have marine ports, because of their inland location.

MPOs seemed most satisfied with the three traditional types of data needed for long-range transportation planning: land use and demographic information (7.5), vehicular traffic projections (7.4), and air quality (7.6). We expected to find that the three California MPOs in our sample (San Francisco, Los Angeles, San Diego) would be more satisfied with their air quality data than other areas, because of the state's longstanding concern for mobile-source air emissions. This was not borne out by the responses; it could also be a result of the effective standards and level of analysis being higher in California. This would mean the benchmark for comparison might be higher.[8]

Agencies seemed somewhat less, but still, satisfied with the quality of transit projections (6.6) than the other data. Transit ridership forecasts involve more assumptions and more complicated modeling and are usually subject to more official (and unofficial) scrutiny than are highway travel projections.

With respect to several other data items, MPOs were much less satisfied with the quality of data available to them for the RTP. These areas included forecasts of the long-term impacts of lifestyles and structural changes (4.8), nonmotorized modes of travel (4.7), the long-term impacts of new technology on travel demand (4.5), freight and goods movement (5.5), and safety/accident data (5.9). All these factors have become increasingly important in the last 10 years, first with the passage of ISTEA (1991) and then TEA-21. Impacts of technology and lifestyle changes are particularly important for assessing long-term changes in travel demand. Planners in the 1960s and 1970s sometimes missed important trends, such as increased labor force participation by women and increasing migration to Sunbelt cities that had important impacts on both the volume and character of travel demand.[9] Information technology is also just beginning to have a major impact on both household and workplace location. "Call centers" may be located thousands of miles from where a business's customers are located and allow some workers to be relatively free of the location constraints that traditionally have bound them to their work location.

[8] This is evidenced by the active and important role that environmental groups play in most California areas, and by the legal precedents set (in federal court) by *Sierra Club et. al. vs. Metropolitan Transportation Commission,* 1989. Case No. C89 2044 TEH.

[9] For example, working women often make different types of trips than their male counterparts. They often retain primary child care and shopping responsibilities in a household. All other things being equal, this may require more frequent but shorter trips and may make it relatively more difficult for them to form carpools or use transit.

There has been some discussion of whether the planning time horizon (typically, 20 years) for the RTP is too long or short. Twenty years has typically been a compromise position, based on the length of time it often takes to deliver a major transportation project (from system planning to construction completion). FHWA typically has required that traffic projections be made for a period of at least 20 years from the projected opening day of the facility. A few areas (notably Portland Metro) have attempted to make projections for a 40-year period, but past efforts in this regard have met with little success.[10] Historically, such very long-term projections have been used to justify large and costly projects that could not otherwise be rationalized within a 20-year time horizon. We found it interesting, then, that there was universal agreement among our sample that the 20-year timeframe was "about right."

We were also interested in whether agencies were using ranges of forecasts (such as low, high, most probable) as input assumptions to their RTP. The obvious use of ranges would be total population and jobs in an area, or possibly prices (for example, for gasoline, parking, or fares). Only five of our respondents said they used such ranges in their RTP, and only one was in California. MPOs were more likely to examine alternatives based on the impact of funding assumptions (Does a transportation sales tax pass or not? Are federal transit operating subsidies eliminated?) than other types of socioeconomic variables. It may be that using varying assumptions increases the generalized cost[11] of the plan without a commensurate increase in the utility of the plan.

RESOURCE REQUIREMENTS FOR THE RTP

The complexity of the RTP process (of which the final document is only a part) means that it is neither a simple nor an inexpensive process. The mean time needed to complete the RTP was 2.5 years, ranging from a low of one year to as much as four years. Schedule requirements were dependent on whether the RTP was merely being updated or undergoing a major rewrite. RTPs must be updated every three years. Most MPOs indicated that their most recent RTP

[10] For example, in the late 1950s, the Army Corps of Engineers attempted to make population and economic projections for the San Francisco Bay Area between 1960 and 2020. The results were wildly off the mark, and often erred in inconsistent ways. Unable to foresee the impacts of silicon technology, they underpredicted growth in the South Bay and overpredicted it in the North Bay.

[11] We use "generalized costs" to include not only the financial costs, but also opportunity costs and intangible costs such as level of opposition or disharmony created in the process.

was an update; the only ones that had prepared a major revision or an entirely new RTP were SCAG, ARC, NCTCOG, and Portland Metro.

Respondents were also asked, "Considering the federal requirements for the RTP, do you feel that too many, or too few, resources are expended on the development of the RTP?" Responses were based on a semantic differential scale: much less, somewhat less, about right, somewhat more, and much more. Seven of the ten MPOs responded that the resources being spent now were "about right." Two MPOs thought somewhat more resources should have been applied, and one indicated a desire for somewhat less.

AGREEMENT ON PROJECT PRIORITIES

Respondents were asked, "What level of agreement was reached on the final project priorities shown in the RTP or TIP?" A rating of 1 indicated no agreement at all; a rating of 10 indicated total agreement. This question elicited an average response of 7.2, ranging from a 5 to 10. Agreement seemed to be more difficult when there was a larger number of governments (per 1,000 population).

SIMPLE LINEAR CORRELATIONS

Beyond simple descriptive statistics, we also wanted to look at simple correlations[12] between contextual variables and outcomes. Resulting values range from 1 (perfect linear correlation) to –1 (perfect inverse linear correlation), with 0 indicating no correlation (random correlation). Contextual variables included land area, population, income, governmental structure, and other similar items. The outcome variables included level of cooperation, the quality of planning data and the quality of outreach, the level of final agreement reached, and other similar "outcomes" of the RTP process. Complete details are shown in Table 9, Appendix D.

Surprisingly, neither 1997 population nor absolute population change were closely correlated with any of the outcome variables. However, population growth rate was moderately but negatively correlated with several important variables, such as the degree of cooperation with air quality districts (-0.67) and several "level of agreement" variables:

[12] Sometimes called Pearson correlations. A basic description of the statistical techniques used in this study is provided in Appendix D.

- Local governments (-0.76)
- Environmental groups (-0.75)
- Business community (-0.65).

An obvious, albeit speculative, explanation for this is that higher population growth rates may put additional strains on the transportation system and may create more opportunities for conflict in balancing transportation, air quality, economic development, and other types of goals. Higher average population density in an MPO, in contrast, produced almost the opposite result, with MPOs reporting greater levels of agreement and cooperation with local government and environmental and pro-business groups. This may be due to an underlying relationship between population growth rates and density; the lowest-density metropolitan areas are generally growing faster than higher-density areas.

Educational attainment was measured by the Census Bureau's estimate of the percent of the population over 25 years of age who had graduated from college. There were positive correlations here with level-of-agreement variables with local governments (0.87), environmental groups (0.64), business groups (0.84), and highway agencies (0.62).

Per capita income had a mixed relationship to the other variables. It was negatively correlated with agreement on project priorities (-0.65) and quality of the outreach process (-0.66), but positively correlated with level of agreement with business groups (0.79) and transit operators (0.60).

Several variables had no significant correlation with other outcome variables. They included the following:

- Number of governments in the MPO;
- Number of lane-miles of highway;
- Number of highway lane-miles per capita;
- Year the MPO was formed;
- Number of governing board members;
- Current number of agency functions;
- Time needed to complete plan;
- Quality of planning data on nonmotorized modes

- Quality of safety/accident data
- Quality of data on other "management systems;"[13] and
- Percentage of funding budgeted for operations and maintenance.

As noted earlier, we initially expected that the percent of MPO population in the most populous city would be correlated with several outcome variables. This turned out to be untrue; the only variable it correlated with was degree of cooperation with counties. Even then, it was a fairly weak positive correlation (0.60) that may have little practical significance.

Most MPOs have several advisory committees that allow citizen representatives greater opportunity to participate in the MPO process and may help diffuse opposition to particular projects. The number of advisory committees did seem to play a positive but modest role in increasing the level of agreement with local governments (0.65) and environmental groups (0.63).

Several of the "quality of data available" questions appeared to be closely related to outcome variables. The quality of land use/demographic data was correlated with the degree of cooperation with the U.S. DOT, but not with other outcomes. The quality of traffic projections seemed to be the most influential variable, with significant correlations with the degree of cooperation with all other agencies except counties and transit operators. Developing credible traffic (and transit) forecasts requires broad agreement on input assumptions and devotion of considerable MPO resources to the travel demand forecasting function. Another interesting result was that the quality of transit projections was not correlated with the degree of cooperation of transit operators (r of just 0.20) or the level of agreement of environmental advocacy groups (r=0.10).

Other conclusions from the simple linear correlations include:

- Quality of data on lifestyle/structural change data was correlated with the quality of the outreach process (0.83), state DOT cooperation (0.68), and success in improving the quality of transportation (0.73).
- Better economic projections were related to the degree of cooperation with cities (0.62), state DOTs (0.68), and the quality of the outreach process (0.79).

[13] As initially required under ISTEA but later made optional.

- Better demographic projections were correlated with the degree of cooperation with transit operators (0.61) and marine ports (0.91).
- Quality of data on the impacts of technology was correlated with several outcomes, including the cooperation with local governments (0.62), cooperation with air quality agencies (0.79), cities (0.72), California congestion management agencies (0.90), and airports (0.68).
- Quality of freight/goods movement data was correlated with only one variable: the degree of cooperation with marine ports (0.83).
- Better air quality data resulted in several positive results: better cooperation with local governments (0.77), with cities (0.76), with state DOTs (0.68), and marine ports (0.81). It also was correlated positively with the quality of the outreach process (0.71).

Not unexpectedly, the greater the relative importance of adding highway capacity in the future, the less the degree of cooperation there seemed to be with transit operators (-0.84). An unexpected result was that greater emphasis on added road capacity also was correlated with reduced cooperation with street and highway agencies (0.69).

Cooperation with counties seemed improved with the number of official public meetings held (0.77) and the relative amount of time used for developing the vision statement (0.79), but these two inputs were not correlated with other variables.

NON-PARAMETRIC CORRELATIONS

Non-parametric correlations between variables were analyzed in order to confirm some of the correlations found with the simple (Pearson's) correlations. The method chosen, Kendall's Tau, is described in Appendix C and does not require that the underlying measurement units be interval in nature; ordinal (ranked) data are acceptable. This section highlights some of the results from analysis of the non-parametric correlation analysis.

Few variables were correlated with 1997 population.
This was a somewhat surprising conclusion, since it was expected that several variables, such as time needed to complete the transportation plan (-0.168), agreement on project priorities (-0.462), and quality of data (ranging from -0.032 to -0.396) might be correlated with the population of the area. The general expectation was that the time needed to complete the plan would be

greater, the agreement on project priorities lower, and the quality of data greater in more populous areas. The only statistically significant correlation was the quality of the outreach process: It appeared to be inversely correlated with the population of the area at the 95 percent confidence level ($p<.05$).

Quality of the outreach process and agreement on project priorities.
There was a modest correlation here (0.574, which is significant at the 95 percent level, $p<.05$) between the quality of the outreach process, and agreement on project priorities. Although again not demonstrating a cause-and-effect relationship, it appears that greater investment in the public and stakeholder outreach process may have a beneficial effect on the agreement on project priorities.

Reported quality of planning data seems to have little role in manufacturing consensus.
Generally, the level of correlation was low between the quality of different data used in the transportation planning process and the environmental and business groups' level of agreement. Surprisingly, there was a moderately high (0.59, significant at the 95 percent level, $p<.05$) correlation between environmental and business groups' level of agreement on the RTP. This could also be indicative of the survey respondent's intrapersonal rating system as well, that is, a tendency for an individual respondent to offer responses that were all very high or all very low because of his/her own biases.

INSTITUTIONAL ROLES AND ANALYSIS

This chapter deals with some of the institutional issues of preparing the regional transportation plan, including the processes involved and resources required. Among the questions we attempt to answer in this section include:

- The historical context of how MPOs were created.
- Who pays for regional transportation planning and what resources are required?
- Who controls the MPO?
- What citizen and stakeholder involvement is there in the RTP?
- How does the MPO relate to the state Department of Transportation (SDOT) long-range transportation plan?

THE EVOLVING ROLE OF THE METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION: HISTORY AND PRESENT

The designation of metropolitan planning organizations (MPOs) was first required by the 1973 Federal Aid Highway Act.[14] MPOs were the result of a combination of the nation's energy crisis, increasing traffic congestion, and strong concern for air quality and the environment. MPOs were identified and designated in areas with a population of over 50,000 people. The MPOs would comprise elected officers and participating local government officials. The initial goals and objectives of the MPOs were to develop a regional consensus on the most cost-effective approaches for solving transportation problems. This included the balancing of roads and mass transit and addressing environmental, economic, and community concerns. This led to the downsizing of highway plans and increasing the emphasis on short-range, operationally oriented improvements. Such plans prompted the development of regional transportation plans (RTP), transportation systems management (TSM) programs, transportation demand management (TDM) programs, short-range three- to five-year transportation improvement programs (TIP), and many similar programs.

[14]Much of this section was adapted from Solof (undated).

Prior to that, considerable history led to the requirement for the designation and requirements for metropolitan planning, evolving from a series of historical events and earlier legislation. The United States traditionally has had a multitude of political jurisdictions (states, counties, cities, and special-purpose districts). Regional economies commonly transcend local government boundaries and sometimes state lines. The federal government has recognized the diverse nature of these regional economies by identifying more than 300 metropolitan areas with populations over 50,000 people. According to the U.S. Census Bureau, each metropolitan area consists of "a core area containing a large population nucleus, together with adjacent communities having a high degree of economic and social integration with that core." The federal government also recognizes that the integrity and vitality of these areas are dependent on the large-scale circulation of goods and people over regional transportation networks. However, the fragmented political authority in most metropolitan areas makes it difficult to address regional transportation impacts and needs.

To help address the impacts of regional urban growth and changing economies, the federal government enacted a series of laws beginning in the late 1930's. President Roosevelt implemented his New Deal conservation programs, which promoted regional planning. The Public Works Administration helped state and local governments develop the planning capabilities needed for large-scale infrastructure projects. One such program was the Tennessee Valley Authority (TVA). The TVA addressed not only water resource issues, but also energy, agricultural improvement, housing, and economic development. Planning was to be in accordance with national standards as a condition for the receipt of federal infrastructure aid. This requirement also set the pattern for future inter-governmental relations. The federal government used financial aid as leverage for promoting national goals and for local governments to cooperate outside their political boundaries.

During the later years of World War II, government and industry leaders began to make plans for the postwar period. This included preparation in 1944 of the Interregional Highways Report (National Interregional Highways Committee 1944), which became the blueprint for the Interstate Highway System. In 1956, legislation was signed to fund the Interstate System through a federal gasoline tax; in 1959, President Eisenhower created the Advisory Commission on Intergovernmental Relations (ACIR) to explore new government structures and policies to address suburban growth problems and improve coordination of the increasing number of federally aided projects and programs. Legislation in the 1960's followed to help carry out many of the ACIR recommendations for

replacing regional commissions with stronger, more permanent metropolitan-based organizations.

The 1962 Federal-Aid Highways Act required that metro areas follow the "3C" process of providing a "continuing, comprehensive, and coordinated" planning of transportation facilities in order to be eligible for federal grants. The Ten Basic Elements of the 3C Planning Process[15] were the forerunners of the planning factors included in both ISTEA and TEA-21:

1. Economic factors affecting development;
2. Population;
3. Land use;
4. Transportation facilities, including those for mass transportation;
5. Travel patterns;
6. Terminal and transfer facilities;
7. Traffic control features;
8. Zoning ordinances, subdivision regulations, building codes, etc.;
9. Financial resources; and
10. Social and community-value factors, such as preservation of open space, parks and recreational facilities; preservation of historical sites and buildings; environmental amenities; and aesthetics.

This act also required that states spend a minimum of 1.5 percent (later increased to 2 percent) of the federal funds for planning and research. This memorandum and its future addendums covered all aspects of organizing and carrying out the 3C planning process with technical assistance from the U.S. Bureau of Public Roads (BPR), predecessor to the Federal Highway Administration (FHWA).

Until the enactment of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), there was still controversy regarding the lines of authority between the state, counties, local governments, and the MPOs. MPOs appeared to be more of an advisory committee and a means of meeting federal requirements rather than a facilitator of urban growth management. ISTEA-

[15] Weiner, Edward, *Urban Transportation Planning in the U.S.—A Historial Overview.* Washington D.C.: U.S. Department of Transportation, November 1992.

mandated MPOs share responsibility for implementing the Clean Air Act and its amendments. In doing so, this empowered the MPO to manage a broad band of urban growth issues such as environmental conservation, growth management, improvement of educational institutions, welfare reform, health care access, and public safety.

The duties of the MPOs were reinforced again in 1997 by passage of TEA-21 and ISTEA. TEA-21 used seven "planning factors" for both MPOs and statewide transportation planning. Planning factors for the MPOs were the following:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety and security of the transportation system for motorized and nonmotorized users.
- Increase the accessibility and mobility options available to people and freight.
- Protect and enhance the environment, promote energy conservation, and improve quality of life.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.

These pieces of legislation provided additional authority, funding, and objectives for the MPOs. ISTEA's earlier features included 15 planning factors with more specific consideration of transit and other non-auto modes, consideration of land use impacts/relationships for the first time, and greater public participation in transportation planning decisions.

WHO PAYS FOR REGIONAL TRANSPORTATION PLANNING?

Each MPO uses its own discretion to determine the resources it applies to development of the RTP. The RTP is one of the more important activities that an MPO undertakes, but it is by no means the only one—in fact, many MPOs (as noted earlier) have broader planning responsibilities than just transportation. The RTP does have the advantage of being eligible for PL funds, which are a percentage of certain federal grants provided under TEA-21

for the specific purpose of transportation planning, although not necessarily for the RTP. This results in a variety of approaches to developing and maintaining the RTP.

In our survey, the time needed to prepare an RTP ranged from one to four years, with a mean of 2.5 years, and a modal value of three years. The total schedule time, of course, does not directly indicate the resources invested, although it may act as a proxy for the resources required and for the opportunity for input from a wide range of constituent groups. On the other hand, too long a time schedule could be indicative of difficulty resolving disagreement or obtaining consensus on important issues. There was a modest difference—about 14 months additional time—depending on whether an agency was updating its RTP or preparing an entirely new plan. Again, note that this does not indicate the level of activity during the time period, only the agency's self-reported time to complete the plan. Since RTPs must, by law, be updated at least every three years, it is not surprising that most agencies were able to complete the process in slightly less than that amount of time, on average.

Respondents were also asked, "What was the cost (in dollars or equivalent person-months of effort), required to complete the RTP?" There were five nonresponses to this question; the responses ranged from about $500,000 for a simple update and staff costs only to $15 million. The latter plan was a completely new plan in one of the most complex urban areas of the country. Costs on the order of $3 to $5 million were not uncommon, even among medium-sized MPOs. As expected, updates tended to be less costly. Clearly, the MPO process is expensive, and appropriate value must be extracted for the agency to recoup its return on investment.

The question of whether more or fewer resources should be devoted to the RTP is discussed in Chapter 3 of this report. Most agencies answering this question indicated that they felt the resources being devoted to the RTP were "about right."

WHO CONTROLS THE MPO?

As befits their disparate origins, MPOs have adopted a variety of approaches to structuring their governing boards and their voting mechanisms. Most agencies reported relatively inclusive boards, often including large transportation agencies (airports, ports), the state or federal departments of transportation, or other important agencies in their jurisdiction (for example,

the Department of Defense). Some included multi-tiered boards. They range in size from relatively compact boards (14 members) such as MTC, which represent counties and groups of cities, to large councils like SCAG or Dallas, which include 70 or more members. Larger boards usually have an executive board and/or several subcommittees to address specific issues.

Most boards include all the local governments in an area. Areas with many local governments (usually the largest MPOs) use a two-tier system, in which all agencies are represented but a smaller body is selected to make executive decisions. Although some areas include many cities, most areas included only a relatively small number of counties (the largest number being in the Dallas-Fort Worth area—16), and some areas include only a single large county (for example, Las Vegas, San Diego, Miami-Dade), which means that the variety of views represented by cities is generally greater than the differences between counties.

Transit operators participate in the MPOs in different ways. In Tucson, transit operations are run by the MPO. In most areas, they participate on committees of the MPO. Only two cities in our sample, Tucson and Houston, included more than half of the MPO's population. At the other extreme were Atlanta, Boston, and San Francisco/San Jose, where the largest city had only 13%, 10%, and 13% of the metro area's population.

The appointment of MPO board members varies significantly between areas; the common procedures include appointment by:

- The mayors of cities, or largest cities, in the MPO;
- The state's governor;
- City Councils;
- A larger group (such as a general assembly); or
- County boards of supervisors.

In most cases, the boards are made up of elected officials, who are assumed to have greater legitimacy than strictly appointive members might otherwise have.

CITIZEN AND STAKEHOLDER INVOLVEMENT IN THE REGIONAL TRANSPORTATION PLANNING PROCESS

One of the difficulties with long-range transportation planning—and long-range planning in general—has been the difficulty in gaining appropriate and timely input from citizens and stakeholders into the process. Most people are motivated to respond when change is well defined and proximate in both time and space; RTPs often represent the exact opposite. RTPs deal with diffuse policy issues as much as well-defined projects; the projects are often spread over thousands of square miles and in many cases will not occur for 10 or 20 years (if at all). Planners often are frustrated when citizens' involvement coalesces around a project as it nears the construction phase, even though opportunities for their input had been provided at many points previously in the planning process. One of the questions we wanted to ask, therefore, was how MPOs were able to motivate citizen involvement in the process in a timely and appropriate manner.

Some of the key questions asked in this portion of the questionnaire were:

- How were interested parties notified of their ability to be involved in the RTP process?
- How many noticed public meetings were held?
- Were these held in different parts of the region?
- What methods were used for outreach?
- What was your rating of the overall quality of the RTP public outreach process?
- Did you use outside help for this purpose?
- Did the process result in any changes to the RTP?
- Did you use the Internet for disseminating information? If not, why not?

Table 7 (Appendix D) provides a matrix summary of the answers to these questions, along with the narrative below.

Most agencies used fairly traditional outreach processes, such as newsletters, mailings, and newspaper advertisements. Several used their agency Web page (discussed below), a few used radio, and at least two used television. There did not appear to be a correlation between the manner of meeting notification and the self-rated quality of the outreach process.

Nearly every MPO held meetings in different locations in their region; sometimes these were based on one meeting per county, in every major city, or other criteria. The number of official meetings held ranged from about six to as many as 68 in the Seattle area. In some cases, workshop presentations were held as well as public meetings in which comments from the public were taken.

Outreach to groups historically underrepresented in the regional transportation planning process typically took the form of ads in community or minority newspapers, involvement in community fairs, and mailings. Advisory committees also were used frequently, as discussed elsewhere in this report. These groups included not only minority groups and low-income neighborhoods, but also groups such as trucking firms and taxicab operators.[16] Dallas, for example, used a mailing list generated from a local trucking association to notify truck operators of the preparation of the RTP. San Francisco's MTC included a freight advisory council as part of its continuing transportation planning process.

Generally, most agencies seemed pleased with the quality of their outreach process, with eight agencies giving themselves a "7" or higher rating. Two agencies gave themselves a "5" or less on this scale.

A little more than half the respondents (seven agencies) used an outreach consultant for at least some of the public outreach process. Overall, the MPOs that used outreach consultants for at least some tasks seemed significantly more satisfied with the quality of their outreach process than did those that did not. The mean score for agencies using consultants was 8.0, whereas the mean score for those not using consultants was 5.8. Although use of an outreach consultant did not always guarantee better results in this portion of the RTP, it did seem to improve scores overall.

Every agency contacted provided meeting notices via the Internet, which by now has become a rather routine source of communication. Nearly all included a summary of the RTP on their Web site; and more than half (eight agencies) provided the full document (either in HTML or as a downloadable document) on their Web site. Agencies that made minimal use of the Internet indicated that cost, the large files involved for full documents (and consequent

[16] Trucking firms typically have been represented in the state transportation planning process, particularly in the realms of freeway plans and financing, but have not always been actively sought out at the regional level.

difficulty in downloading), and shortness of time were factors in not using it as a communication medium.

RELATIONSHIP TO THE STATE TRANSPORTATION PLAN AND STATE DOT

In theory, the state and metropolitan transportation plans should be closely coordinated because state agencies fund many of the transportation projects of regional importance in a metropolitan area and are usually responsible for much of the development, design, and operation of high-performance highways within the metro region. Our key conclusions in this area were that:

- This appeared to be a sensitive question. Three agencies declined to answer it. However, there did not appear to be a correlation between whether an agency answered this question and the rated degree of cooperation with the state's DOT.
- There did not seem to be a high level of satisfaction with the results of the coordination process. Many MPOs responded by saying, in variations of these terms, "the state as the responsibility for coordinating the RTPs."
- In Oregon, there is a more formal process in which the state must find the RTP consistent with the Oregon Transportation Plan.
- Las Vegas indicated that the Nevada Transportation Plan is included in their RTP.

Generally, this seems to be an issue that MPOs could better address in the future. Part of the problem may be caused because states have been required to prepare multimodal transportation plans only since the passage of ISTEA in 1991. Prior to that time, many agencies (including Caltrans) had only adopted highway plans that, in many cases, were no more than lists of projects and maps of general route alignments for highways—more like a present-day TIP than a true transportation plan. It may take some time, including several update cycles of the state and MPO plans, for the two to be better coordinated with each other.

WHAT INGREDIENTS MAKE FOR A SUCCESSFUL REGIONAL TRANSPORTATION PLAN?

In attempting to determine the ingredients that make for a successful MPO, we first identified the output measures of success related to the goals of the ISTEA

and TEA-21 regional planning program, as well as the factors that might influence these desired outcomes. Then, we collected the relevant information by interviewing the staff and examining every RTP in our study and gathering related demographic data from the U.S. Census and highway statistics from the Federal Highway Administration (FHWA). After appropriate analysis, we have reported our findings on the MPO characteristics most associated with the desired outcomes.

1. Size of Service Area

   The area served by transportation agencies in our study ranged from 3,154 square miles in the Miami area to 33,966 square miles in the Southern California Association of Governments, with a mean value of 10,310.

   In keeping with our expectations, we found mostly negative relationships between size of service area and cooperation with local government, air quality districts, and the U.S. DOT (all $p < 0.10$). As Table 10 (Appendix D) shows, virtually all the significant relationships with area size were negative in nature. Similar to the effects of the number of governments in the service area, the larger service areas had the most difficulty in building a consensus about balancing regional and local interests regarding transportation goals and objectives with respect to local government ($p < 0.005$), environmental groups and street highway agencies (both $p < 0.05$), and the business community ($p < 0.01$).

2. Total Population

   As shown in Table 1 (Appendix D), the 1997 population varied greatly among MPOs—from a low of 666,700 in the Tucson area to a high of 14,532,000 in the Southern California Association of Governments. The mean MPO 1997 population was 4,241,000.

   In accordance with our expectations, Table 11 (Appendix D) shows that population size varied negatively with degree of cooperation with cities and transit operators (both $p < 0.10$) and quality of outreach process ($p < 0.05$). There also were negative relationships between population size and agreement of goals/objectives with local government ($p < 0.10$) and street highway agencies.

   These findings are corroborated by those of other studies that show, for example, that the most populous communities in California are most likely

to be impacted by development and to enact growth management measures (Glickfeld and Levine 1992).

3. Population Change

We expected increasing population change to reflect more development pressure and traffic congestion and thus have negative influences on our desired indicators of program outcomes.

As Table 12 (Appendix D) shows, the only significant positive relationships between 1990-97 percent population changes were cooperation with transit operators ($p < 0.50$) and agreement on project priorities ($p < 0.10$). Virtually all other significant relationships with percent population change were negative, as expected, in measures of effectiveness as degree of cooperation with air quality districts ($p < 0.005$), congestion management agencies ($p < 0.05$), and airport operators ($p < 0.10$); and agreement on goals and priorities with local government and environmental groups (both $p < 0.005$) and the business community ($p < 0.05$). Similar results were found when examining the impact of absolute population change.

Although these findings clearly support our expectations concerning the negative transportation influences from rapid population growth on metropolitan transportation planning, our data did indicate a growing willingness of MPOs to cope with the transportation implications of growth through greater cooperation with transit, state, and federal transportation agencies. Such adaptive positive adjustments could be essential for MPOs to obtain the necessary cooperation and additional resources needed to cope with rapid growth.

4. Population Density

Gross population density, which is a measure of intensity of development, or degree of urbanization, varies greatly among our study areas from a low of 32 persons per square miles in the Reno area to a high of 1,247 in the very urban Chicago region, with a mean value of 572. As Table 1 (Appendix D) shows, only five of the original 17 MPOs in our sample (San Francisco, Miami, Chicago, Boston, and Milwaukee) had an overall residential density greater than 750 persons per square mile, which is

below the U.S. Census criteria of 1,000 for defining the boundaries of urban areas.

Our expectations about the influence of population density were supported by the significant ($p < 0.10$) positive partial correlations with degree of cooperation with air quality districts and transit operators (see Table 13, Appendix D). Although there were some negative relationships, such as the quality of the outreach process, there were many other positive linkages to density on the agreement of goals and objectives with local government, environmental groups, and street and highway agencies (all $p < 0.05$) and the business community ($p < 0.005$).

5. Education

As Table 1 shows, educational attainment also varied substantially among our study regions. In terms of the percentage of college graduates age 25 plus of the 1990 population, the level ranged from 13.8 percent in Las Vegas to 30.9 percent in the San Francisco Bay Area, with a 22.7 percent average.

In keeping with our expectations, education levels had positive relationships with desired outcomes. As Table 14 (Appendix D) indicates, the percentage of college graduates age 25 or over in the 1994 population had positive correlations with agreement on goals and objectives with local governments ($p < 0.05$), environmental groups ($p < 0.10$), and business community and street and highway agencies (both $p < 0.005$). Although there were some negative partial correlations with educational attainment, such as the degree of cooperation with transit operators and state DOTs, there were several significant positive relationships with other forms of cooperation with air quality districts, cities, counties, and congestion management agencies (all $p < 0.05$).

These generally positive findings were corroborated by the Glickfeld and Levine (1992) study of California growth management and the Rothblatt and Colman study (1995) of the California congestion management policy, which found that jurisdictions that had a higher proportion of college-educated persons tended to enact more growth management measures and be more supportive of congestion management programs. These results may be due to the high public regard for collective areawide improvement, often generated in better-educated communities.

6. Per Capita Income

   The level of affluence also varies among the MPOs in our sample. Table 1 shows that 1994 mean per capita income varied from a low of $8,575 in the Tucson Area to a high of $28,322 in the San Francisco Bay Area, with a mean of $23,125. Thus, the potential resources available for dealing with community problems in more affluent areas could be a positive factor in the field of transportation.

   As with level of education, Table 15, Appendix D, shows that increases in per capita income yielded only positive relationships with agreement on goals and objectives with local government ($p < 0.10$), environmental groups and street and highway agencies (both $p < 0.05$), the business community, and transit operators ($p < 0.10$).

   Contrary to our expectations, Table 15 shows that increases in per capita income yielded only negative relationships with degree of cooperation with air quality districts and cities ($p < 0.05$) and marine ports ($p < 0.10$). Similar to the Pearson correlations cited earlier, there were significant negative linkages of per capita income and agreement on priorities ($p < 0.01$) and quality of outreach process ($p < 0.05$). While other studies have shown that socioeconomic characteristics, such as income, were not good predictors for the voter passage of growth management ordinances (Knaap, 1987; Baldassare, 1990), our research yields some strong negative associations of income with indicators of policy effectiveness. Perhaps other factors such as greater scrutiny and higher expectations of governmental activities by more affluent suburban environments may be at work.

7. Number of Local Governments Involved in the MPO Service Area

   Given the great diversity of the MPOs, it is not surprising that the number of local governments involved in the MPO service area ranged from 5 in the Reno area to 260 in the Chicago region. The mean is 85.

   In contradiction to our expectations, we found significant positive relationships between the number of local governments involved in the MPO service area and the effectiveness indicators of the degree of cooperation with air quality districts, counties, and airport operators (all $p < 0.10$); and agreement of goals with local government ($p < 0.05$) and environmental groups ($p < 0.10$). However, other output variables, such as agreement on priorities ($p < 0.05$) and quality of outreach process and

success in improving the quality of transportation (both $p < 0.10$) were negatively related to the number of governments. These findings, shown on Table 16 (Appendix D) suggest that, unlike less formal citizen participation, extensive formal local government involvement may not always foster an increase in cooperation with regional planning activities and mobility improvements.

When we tried to normalize our data with regard to population and examine the impact of the number of local governments per capita, we found stronger positive across-the-board results than those found with absolute number of governments, with only one significant ($p < 0.05$) negative correlation with respect to agreement with goals and objectives of transit operators (see Table 17, Appendix D). This finding suggests that counties with many local governments with small and relatively homogeneous populations may receive only modest participation and support for MPO activities because these governments receive little in ISTEA/TEA-21 funding. Again, increased funding and resources were among the most often cited recommendation to improve the regional transportation planning process.

8. Highway Miles Per Capita

Our expectations for positive relationships between the amount of non-state highway miles per capita and effectiveness indicators were modestly borne out. As Table 18 (Appendix D) reveals, the correlations were mixed and few were statistically significant. When we extended our examination to study the influence of the amount of nonstate highway miles with respect to the square root of land area, we obtained similar results.

As Table 18 indicates, the major positive relationships with increased highway supply were a higher degree of cooperation with air districts ($p < 0.10$) and the major supplier of regional highway capacity, the state DOT ($p < 0.05$). The only significant negative linkage with increased highway miles per capita was with the agreement of goals/priorities with the competing transportation suppliers and transit operators ($p < 0. 05$).

These findings indicate that the relative supply of existing highway resources are generally of equal utility among the metropolitan areas, and that when significant differences in the supply of state highway facilities are provided, they probably represent a late and inadequate response to already over-congested traffic situations.

9. Year MPO Formed

   The age of the MPO (that is, years since its formation) varied from 10 years for the Tucson area to 53 years for the Atlanta Regional Commission,[17] with an average of 27 years.

   We expected that the older and more established MPOs would have the time, experience, and institutional relationships to generate higher levels of output measures of effectiveness than their younger peers would. As Table 19 (Appendix D) shows, our study observed mixed results, with the MPO age having expected positive relationships with the degree of cooperation with counties ($p < 0.05$) and state DOTs ($p < 0.10$), and unexpected negative influences on agreement of goals and priorities with the business community ($p < 0.10$) and transit operators ($p < 0.005$).

   Perhaps these results reflect a possible increase of MPO influence in articulating and setting goals and priorities under ISTEA/TEA-21 planning processes, which may have come into conflict with those held by some of the major regional interest groups.[18]

10. Number of MPO Governing Board Members

    Given the great diversity of MPOs in our study, it is not surprising that the number of MPO governing board members ranges from 6 in Las Vegas to 152 in the Dallas area. The mean is 57.

    In accordance with our expectations, we found significant positive relationships between the number of board members involved in MPOs and the effectiveness indicators of success of the degree of MPO cooperation with several agencies, such as cities ($p < 0.05$), counties ($p < 0.01$), state DOTs ($p < 0.01$), U.S. DOT ($p < 0.05$), airport operators ($p < 0.01$), and marine ports ($p < 0.10$). The larger boards also had greater success in the public involvement process ($p < 0.05$) and in achieving agreement with the goals and objectives with the business community ($p < 0.10$).

[17] ARC had a predecessor agency founded in 1948.

[18] Including its predecessor agencies.

These findings, shown on Table 20 (Appendix D) suggest that, like less formal citizen participation, expanded formal government representation fosters increased MPO cooperation with local, regional, and federal transportation-related agencies, and with improved citizen participation as well.

11. Largest City Size

The largest city size, as a percentage of the metropolitan area population, ranged from 10 percent in the Boston area to 60 percent for the Houston-Galveston Area Council. The mean value was 29.5 percent.

Our expectations were that the larger and more influential the largest (usually central) city, the easier it would be to generate cooperation on transportation issues. As Table 21, Appendix D, indicates, our expectations were largely supported: there were primarily positive relationships between central city size and cooperation with local government ($p < 0.10$), degree of cooperation with cities ($p < 0.10$), and counties U.S. DOT, and airport operators (all $p < 0.05$). Only one relatively weak ($p < 0.10$) negative linkage was found, regarding agreement of goals and priorities with street and highway agencies.

Thus, it could be that the closer an urban institutional arrangement comes to a unitary metropolitan governance system, the more likely it would be for an MPO to build a consensus on the future development of the region.[19]

12. Number of MPO Functions

As Table 22 (Appendix D) reveals, we found that (contrary to our expectations) the more functional responsibilities the MPOs have, the higher the output scores were in terms of partial correlations of agreement project priorities ($p < 0.05$) and success in improving the quality of transportation ($p < 0.05$). As discussed earlier, there was no simple correlation that occurred when increasing the number of functional MPO responsibilities with any output variable. These relationships held regardless of the number and nature of the MPO functions.

Interestingly, when MPO staff were asked what they would do to improve the structure and function of their organization, two of the most frequent

[19] This position is forcefully argued for by David Rusk, the former mayor of Albuquerque, in his book *Cities Without Suburbs*, 1993.

suggestions were to have more focus on MPO functions and have more coordination with other regional agencies. Apparently, there seems to be a desire for both a clearly defined, focused MPO function at the state leveland a comprehensive integrative function at the regional level. This suggests that MPOs should not have too many different responsibilities so as to swamp their staff, but enough functional integration to provide regional and statewide breadth of vision. In the end, however, the number of MPO functions will be determined by state government.

13. Degree of Citizen Participation

As pointed out earlier, in keeping with our expectations, as the degree of citizen participation (as measured by the number and type of advisory committees) increased, there was an observed increase in the desired output scores for the degree of cooperation with congestion management agencies and on project priorities (both $p < 0.05$); and with agreement of goals and priorities with local government ($p < 0.05$) and transit operators ($p < 0.10$). As Table 23 (Appendix D) indicates, we found an expected positive relation between the breadth of citizen participation and the success in improving the overall quality of transportation.

However, other studies of California transportation planning (Rothblatt and Colman 1995) suggest the existence of a trade-off between the extent of local citizen participation and the ability to form a regional planning consensus. That is, extensive citizen participation may actually be a potential obstacle to regional planning if conducted excessively or improperly. That is, beyond a certain point, the decision making costs of time, effort, and direct outlays for local participation may begin to outweigh the incremental benefits of additional regional consensus formation. Perhaps some optimal point can be reached that balances the costs of participation with the benefits of regional consensus.

Thus, while citizen participation appears to function well at the state level, additional attention is needed by the related regional institutions to bridge what appears to be a gap between the legitimate democratic drive for increasing local citizen participation and the growing need for large-scale regional and statewide planning activities for expanding metropolitan areas. Similar conclusions were arrived at in studies of planning and growth management activities in California and elsewhere (Beatley et al. 1994: Pincetl 1994). While the approaches may vary in each region, more progress seems to be needed here.

14. Time Used to Complete Regional Transportation Plan

As pointed out earlier, the time to complete the regional transportation plan varied from 12 to 48 months, with a mean of 30 months. Our partial correlation analysis largely supported our expectations, as the length of time used to complete regional transportation plans had significant positive relationships with improved cooperation between MPOs and cities and the U.S. DOT (both $p < 0.10$) and congestion management agencies ($p < 0.05$). As Table 24, Appendix D, shows, we also found positive relationships between planning time and effectiveness of MPOs to improve agreement on project priorities ($p < 0.01$), and with goals and objectives with local government ($p < 0.10$). Only two relatively weak ($p < 0.10$) linkages were found—between planning time and agreement with environmental groups and transit operators.

Thus, it appears that time was well spent in improving the quality of regional plans and MPO relations with other transportation-related agencies. However, we did not find any direct relationship between time and success of public involvement, as was the case in the number of governing board members. This suggests that while increased community representation can yield improved public involvement, extended planning time alone does not guarantee success in citizen participation. Perhaps an optimal process is also at work at the metropolitan level between the representational costs of planning time and the benefits of public participation, as well as qualitative aspects of the participation process.

15. Quality of Planning Data Used

We expected that the quality of planning data used would have a positive influence on the indicators of MPO effectiveness because more reliable and accepted projections would probably make it easier for an MPO to generate a consensus about transportation policy.

In general, our partial correlation analysis strongly supported our expectations, as the significant relationships of the quality of various data types were overwhelmingly positive. For example, Tables 25 to 27, Appendix D, show that the quality of data concerned primarily with future physical and technical environments—such as traffic projections, impacts of technology, and air quality—had a strong positive influence on the cooperation with local government (mostly $p < 0.001$) and with many

prominent agencies ($p < 0.05$), and positive linkages with agreement on priorities and quality of transportation (mostly $p < 0.05$). At the same time, Tables 28 and 29, Appendix D, indicate that the quality of data reflecting socioeconomic scenarios, such as lifestyle and structural changes and economic projections, were also positively related to cooperation with local government and several stakeholders (mostly $p < 0.05$), as well as positively associated with the quality of the outreach process ($p < 0.01$) and overall success in improving the quality of transportation ($p < 0.05$).

It appears that a variety of high-quality data, which present useful and comprehensive information and projections about metropolitan physical, social, and economic conditions, can make significant contributions to the quality of the regional transportation planning process. Of course, there is always the challenge for MPOs to make such information relevant and understandable to the various transportation stakeholders and broader metropolitan community. Again, community participation and educational programs would seem important to meet this challenge.

16. Percent Budget for Operations/Maintenance

The percentage of budget for operations and maintenance varied from 20 percent for the San Diego Association of Governments to 81 percent in the San Francisco Bay Area. The mean value was 43 percent.

Since spending a higher percentage of budget for operations of existing facilities would leave fewer resources available for new improvements, we expected that an increase of this variable would have a negative impact. As Table 30 (Appendix D) shows, contrary to our expectations, we found only a few positive relationships, such as with agreement on project priorities ($p < 0.05$), agreement on goals and objectives with local government ($p < 0.005$), and success in improving the quality of transportation ($p < 0.05$).

Although not overwhelming, these results suggest that there may be more support to maintain existing transportation facilities and services at an acceptable level rather than to add new services, possibly at the expense of the existing system.

17. Importance of Adding Capacity

Since we believed that expanding the capacity of the metropolitan transportation system would be widely supported, we expected positive

relations between the importance of adding capacity and desirable indicators of effectiveness.

As Table 31 (Appendix D) indicates, the reverse was primarily the case. With the exception of one positive relationship with degree of cooperation with congestion management agencies ($p < 0.10$), all other significant influences were negative in nature: degree of cooperation with cities ($p < 0.10$); agreement on goals and objectives with local government ($p < 0.01$); and the business community and street/highway agencies (both $p < 0.05$); and overall success in improving the quality of transportation ($p < 0.10$).

With the exception of congestion management agencies, which tend to be very proactive transportation improvement entities, it appears that most regional constituencies, both public and private, prefer public investment to be made primarily in shoring up existing transportation facilities and services. This corroborates our earlier findings concerning the negative impact of percent of budget for operations and maintenance.

These results also suggest that an extensive program of community participation and education would probably be essential to inform the constituencies of the existing transportation facilities about the benefits of investment in new transportation services, in order to generate support for such services.

18. Number of Official Meetings

The number of official meetings varied from 6 for the MPOs in the Houston-Galveston, MTC, and Dallas-Fort Worth areas to 32 in the Portland, Oregon area. The mean value was 19.

As with other variables concerned with public participation, we expected that an increasing number of official meetings would have a positive impact on desirable output variables. As Table 32 (Appendix D) shows, our results were mixed. We found negative linkages between number of meetings and the degree of cooperation with counties ($p < 0.05$) and the U.S. DOT ($p < 0.10$), and only one positive relationship with agreement on goals and objectives with transit operators.

Perhaps similar to our earlier discussion concerning citizen participation, an extensive number of official meetings may become an obstacle to

successful metropolitan planning if conducted excessively or improperly. Perhaps some desirable balance could be reached that weighs the benefits of regional consensus-building against the costs of meetings.

19. Time Used for Vision Statement

Time used for generating a vision statement (as a percentage of the time used for regional plan preparation) ranged from virtually zero in the San Francisco Bay Area to as much as 50 percent in the Seattle region. The average value was 19.5 percent.

Unlike time for overall plan completion, which showed strong positive linkages to many output variables, time for creating a vision statement displayed only a modest mixed influence. As Table 33 (Appendix D) indicates, time preparing for a vision statement was negatively related only to cooperation with counties ($p < 0.10$) and positively associated with marine ports ($p < 0.05$).

It may be that MPOs that need to use a greater amount of planning time for determining a vision statement have more difficulty in consensus building and creating agreements on goals and cooperative behavior with most of the metropolitan stakeholders.

OBSERVATIONS AND RECOMMENDATIONS

METROPOLITAN TRANSPORTATION PLANNING IN PROSPECT

ISTEA and TEA-21 have resulted in major improvements in the quality of regional transportation planning. In most cases, the size of the MPOs (in terms of geographic boundaries) appears to be about right, and modest efforts are being made to broaden the representation of stakeholders in the RTP process. For example, many MPOs now include representatives of freight and nonmotorized advocacy groups.

Transportation planning seldom changes dramatically, but it does change direction. A framework developed by Professor Michael D. Meyer is shown here, with our modifications.

Probable Evolution of the Metropolitan Transportation Planning Between 1980 and 2020

	From 1980 to 2000	***From 2000 to 2020***
Emphasis Areas	Methods and data in support of capital programming	Improved information on a wide-ranging set of impacts for a variety of capital, operational, pricing, lifestyle, and land use decisions
Efficiency	Highway networks and corresponding level of service (speed and travel time)	Multimodal system operation and broader performance measurement (accessibility and mobility)
Perspective	How to get from point ‘A’ to ‘B’	Broader context of transportation role in community, and the global, national, state, and regional economic markets
Focus	Vehicle, passenger, or person movements	Broader viewpoint, including goods movement and productivity changes, as well as land use impacts

Probable Evolution of the Metropolitan Transportation Planning Between 1980 and 2020 (Cont.)

	From 1980 to 2000	*From 2000 to 2020*
Technology	Vehicle and system technology viewed as a given	Innovative technologies used to influence system operation and substitute for travel
Land Use	Acceptance of land use patterns as a given and not part of the solution set	Use of growth management and "smart growth" tools in connection with transportation policies as a major strategy
Environmental Impacts	Seen as a project-level mitigation issue	Linkage between transportation decisions and a broader systems and sustainability framework
Plan Evaluation and Equity	Often defined by modal choices made by policymakers; political boundaries; and aggregate user benefits and costs	Equitable distribution of benefits and costs within the concept of community; equity considerations
Approach	What can the MPO do to "solve" the transportation problem?	What can all of us do together (for example, partnerships) to improve transportation?
Public Participation	Narrowly defined interest/advocacy groups with specific objectives	More broadly defined groups with wider objectives; use of public opinion surveys and focused educational efforts

OBSERVATIONS

- Generally, we found strong negative relationships between the size of the service area and numerous measures of the MPO effectiveness. Similar to the number of governments in the service area, larger areas had the most difficulty in building a consensus about balancing the regional and local interests with regard to transportation goals and objectives.

- Both total population and population change rate had negative impacts on several measures of desired MPO outcomes, such as MPO agreement on goals and priorities with other agencies. Although these findings support our expectations concerning the negative transportation influences from rapid population growth on metropolitan transportation planning, our data did indicate a growing willingness of MPOs to cope with the transportation implications of growth through greater cooperation with transit, state, and federal transportation agencies.
- Our expectations about the influence of population density (a measure of intensity of development) were supported by the significant positive partial correlations with the degree of cooperation with air quality districts and transit operators. There were many other positive linkages to density on the agreement of goals and objectives with local government, environmental groups, street and highway agencies, and the business community.
- Although higher per capita income did little to generate desired MPO outcomes, there were significant correlations between the educational level of the constituents of the respondent agency and the number of MPO effectiveness measures used. That is, MPOs representing regions with higher educational levels tended to have greater agreement on goals and objectives with local governments, environmental groups, and the business community than agencies from areas with lower levels of college graduates. These results may be due to the high public regard for collective area-wide improvement, often generated in better-educated communities.
- The major positive relationships with increased highway miles per capita supplied were a higher degree of cooperation with air districts and the major supplier of regional highways, the state DOT. The only significant negative linkage with increased highway miles per capita was with the agreement of goals and priorities with the competing transportation suppliers and transit operators. These findings indicate that the relative supply of existing highway resources are generally of equal utility among the metropolitan areas, and that when significant differences in the supply of state highway facilities are provided, they probably represent a late and inadequate response to already overcongested traffic situations.
- We expected that the older and more established MPOs would have the time, experience, and institutional relationships to generate higher levels of output measures of effectiveness than their younger peers would. Our study generated mixed results, with the MPO age having expected positive relationships with the degree of cooperation with counties and state DOTs; and unexpected negative influences on agreement of goals and priorities

with the business community and transit operators. Perhaps these results reflect a possible increase of MPO influence in articulating and setting goals and priorities under ISTEA/TEA-21 planning processes, which may have come into conflict with those held by some of the major regional interest groups.

- In accordance with our expectations, we found significant positive relationships between the number of board members involved in MPOs and the effectiveness indicators of success of the degree of MPO cooperation with several agencies, such as cities, counties, state DOTs, the U.S. DOT, airport operators, and marine ports. The larger boards also had greater success in the public involvement process and in achieving agreement on goals and objectives with the business community. These findings suggest that, like less formal citizen participation, expanded formal government representation fosters increased MPO cooperation with local, regional, and federal transportation-related agencies, and with improved citizen participation as well.
- Our expectations were that the bigger and more influential the largest (usually central) city, the easier it would be to generate cooperation on transportation issues. Our expectations were largely supported, as there were primarily positive relationships between central city size and cooperation with local government degree of cooperation with cities and counties, the U.S. DOT, and airport operators. It could be that the closer an urban institutional arrangement comes to a unitary metropolitan governance system, the more likely it would be for an MPO to build a consensus on the future development of the region.
- We found that (contrary to our expectations) the more functional responsibilities the MPOs generally have, the higher the output scores were in terms of partial correlations of agreement project priorities and success in improving the quality of transportation. There was no simple correlation that occurred when increasing the number of functional MPO responsibilities with any output variable. These relationships held, regardless of the number and nature of the MPO functions.
- In keeping with our expectations, as the degree of citizen participation (as measured by the number and type of advisory committees) increased, there was an observed increase in the desired output scores for the degree of cooperation with congestion management agencies and on project priorities, and with agreement on goals and priorities with local government and transit operators. We found an expected positive relation

between the breadth of citizen participation and the success in improving the overall quality of transportation.

However, other studies of California transportation planning (Rothblatt and Colman 1995) suggest the likelihood of a trade-off between the extent of local citizen participation and the ability to form a regional planning consensus. That is, extensive citizen participation may actually be a potential obstacle to regional planning if conducted excessively or improperly. Perhaps some optimal point can be reached that balances the costs of participation with the benefits of regional consensus.

- The length of time used to complete regional transportation plans had significant positive relationships with desired outcomes, such as improved cooperation between MPOs and cities and the U.S. DOT and congestion management agencies. We also found positive relationships between planning time and effectiveness of MPOs to improve agreement on project priorities and with goals and objectives with local government.

  It appears that in general, time was well spent in improving the quality of regional plans and MPO relations with other transportation-related agencies. However, we did not find any direct relationship between time and success of public involvement, as was the case in the number of governing board members. This suggests that while increased community representation can yield improved public involvement, extended planning time alone does not guarantee success in citizen participation. Perhaps an optimal process is also at work at the metropolitan level between the representational costs of planning time and the benefits of public participation, as well as qualitative aspects of the participation process.

- We expected that quality of planning data used would have a positive influence on the indicators of MPO effectiveness because more reliable and accepted projections probably would make it easier for an MPO to generate a consensus about transportation policy. In general, our partial correlation analysis strongly supported our expectations, as the significant relationships of the quality of various data types were overwhelmingly positive.

  It appears that a variety of high-quality data, which presents useful and comprehensive information and projections about metropolitan physical, social, and economic conditions, can make significant contributions to the quality of the regional transportation planning process. Of course, there is always the challenge for MPOs to make such information relevant and understandable to the various transportation stakeholders and broader

metropolitan community. Community participation and educational programs would seem important to meet this challenge.

- Because higher percentage budgets for operations of existing facilities would leave fewer resources available for new improvements, we expected that an increase of this variable would have a negative impact. However, we found only a few positive relationships, such as with agreement on project priorities, agreement on goals and objectives with local government, and success in improving the quality of transportation. Although not overwhelming, these results suggest that there may be more support to maintain existing transportation facilities and services at an acceptable level, rather than to add new services possibly at the expense of the existing system.
- Because we believed that expanding the capacity of the metropolitan transportation system would be supported widely, we expected positive relations between the importance of adding capacity and desirable indicators of effectiveness. The reverse was primarily the case, as most significant influences were negative in nature.

  With the exception of congestion management agencies, which tend to be very proactive transportation improvement entities, most regional constituencies prefer public investment to be made primarily in shoring up existing transportation facilities and services. This corroborates our earlier findings concerning the negative impact of the percent of budget for operations and maintenance. These results also suggest that an extensive community participation and educational process probably would be essential to inform the constituencies of the existing transportation facilities about the benefits of investment in new transportation services, in order to generate support for such services.

- As with other variables concerned with public participation, we expected that an increasing number of official meetings would have a positive impact on desirable output variables. Our results were mixed. We found negative linkages between number of meetings and the degree of cooperation with counties and the U.S. DOT, and only one positive relationship with agreement on goals and objectives with transit operators.

  Perhaps similar to our earlier discussion concerning citizen participation, extensive numbers of official meetings may actually become an obstacle to successful metropolitan planning if conducted excessively or improperly. Perhaps some desirable balance could be reached that weighs the benefits of regional consensus building against the costs of meetings.

- Unlike time for overall plan completion, which showed strong positive linkages to many output variables, time for creating a vision statement displayed only a modest mixed influence. Time preparing a vision statement was negatively related only to cooperation with counties and positively associated with marine ports. It may be that MPOs that need to consume a greater amount of planning time for determining a vision statement have more difficulty in consensus building and creating agreements on goals and cooperative behavior with most of the metropolitan stakeholders.

RECOMMENDATIONS

We make the following recommendations based on our study. These are not criticisms, but are areas that could use strengthening and improvement in the current process. Many MPOs are already aware that these are "weak links" in the RTP process.

Public participation needs to be improved so that it is meaningful and broad-based. This is an issue that most MPOs are already aware of and many are working to improve. The San Francisco MTC, for example, has recently been holding a series of public meetings solely to ask the public how to improve the public participation process. New ways need to be found to involve the general public, not just the organized stakeholders. The RTP public participation process is often dominated by more narrowly focused advocacy groups—business or environmental groups, or modal advocates—who do not always represent the majority opinion of the public at large.

Coordination with state DOTs appears to be seriously lacking in most of the RTPs. We speculate that this may be due to differences in missions between the MPOs and state DOTs. Closer coordination between the two agencies can only help the regional planning processes. Some agencies, such as the San Diego Association of Governments (SANDAG), have long "borrowed" employees from one agency to work in the other on temporary assignment, to improve the understanding between the two agencies.

Better multimodal evaluation and scoring criteria for projects are needed. Most MPOs are still grappling with a multimodal evaluation process required since ISTEA. This process is still evolving, and additional research would be valuable in this area to assist MPOs. In many cases, the present processes still rely heavily on subjective scores provided by the evaluator and may not always relate well to the performance measures and standards used elsewhere by the

MPO. The problem becomes particularly acute when the MPO allows the applicant agency (local government, transit district, etc.) to fill out the evaluation form itself.

More participation in the land use and development process can be made than is presently occurring with the MPOs, even though only Portland has direct land use powers. Although nearly every agency interviewed had no direct land use powers, MPOs hold an indirect power over land development. They are able to target investments toward areas where new development is desirable, and delay or withhold investments in areas where new growth is undesirable. Yet few agencies seem to explicitly recognize this power in their decision making. This may be politically difficult to do, but it is one way MPOs could influence urban form and promote smart growth principles. There are few good models of how regional, consensual land use decisions could be implemented. This is a complex issue, which may have to be considered together with basic questions of government finance, since so many land use decisions are now dependent on the net revenue (tax receipts minus cost of public services) that accrue to a local government.

There is a potential for the RTP to be updated less frequently than it is now (three years) and still be a good planning document. RTPs must be updated in air quality nonattainment areas at least every three years, and some MPOs voluntarily update their documents more frequently. The update process can be expensive; therefore, it is worth examining ways to make the process more efficient.

One way might be to allow the MPOs to produce an annual report, something like a "Status of the Implementation of the 2000 RTP during 2002," that would report on how well the agency has done in meeting the goals, objectives, policies, and performance measures stated in the RTP. This would be much more than the TIP, which is really more a list of projects in tabular format with status of implementation, but relatively little on the achievement of policy objectives of the plan. The RTP document then might be updated less often—perhaps every four or five years. The annual report could include opportunities for public participation, and it would fit well with the MPOs' evolving role toward system management and operation.

RTPs should not be sanitized. Many RTPs tend to gloss over areas where there is significant disagreement on the approach and priorities of projects. Although it is desirable to keep the RTP documents as short as possible, we think the documents would be improved by recognizing and paraphrasing

issues related to proponents and opponents of particular policies or projects. At the same time, controversy over a project should not be allowed to impede its selection. Major improvements are bound to generate opposition; and the selection of only noncontroversial projects will leave the MPO with only a catalog of small projects that no group feels motivated enough to oppose.

MPOs need to make the transition to a systems management and operations focus, which is somewhat different from their traditional role as allocators of resources and investment managers. With increasingly limited funds for new investments in new transportation capacity, MPOs need to evolve into a new role of systems management. They will continue to be investment managers, but they also need to become proficient in monitoring the system and identifying performance measures and feedback, and adept at developing and implementing low-cost projects to improve overall performance of the transportation system.

Ranges of inputs should be considered for major inputs to the RTP process. Most RTPs indicated that they used "most likely" numbers for key inputs to their planning process. These key inputs include things like population, jobs, income levels, tax revenues, gasoline prices, auto ownership, and so on. Using ranges of values for these key inputs would allow development of contingency plans that would make the RTP a much more flexible document and might allow for it to be updated less often (see above comment on the update requirement, as well).

MPOs should work to improve coordination with ports and airports. These agencies had the lowest levels of cooperation with the MPOs. MPOs should focus on more closely involving them in the RTP process. Better understanding of each other's role, more frequent communication (informal and formal), and perhaps the use of neutral facilitators could help this process.

The quality of planning data in certain areas needs to be improved to make the RTP a more useful and reliable document. In particular, these include data on the use of nonmotorized modes, long-term structural shifts in lifestyle and travel behavior, and the availability and price of energy. Several studies at the federal level are going on at the present time to improve this data, at least on a national scale. The Bureau of Transportation Statistics (BTS), created by ISTEA, has made notable progress in developing data at the national level.

ABBREVIATIONS AND ACRONYMS

ACIR	Advisory Commission on Intergovernmental Relations
AMPO	Association of Metropolitan Planning Organizations
ARC	Atlanta Regional Council
BART	Bay Area Rapid Transit System
BATSC	Bay Area Transportation Study Commission
BPR	Bureau of Public Roads
BTS	Bureau of Transportation Statistics
CAAA	Clean Air Act Amendments
CALTRANS	California Department of Transportation
CMP	Congestion Management Program
CMS	congestion management system
CMSA	Consolidated Metropolitan Statistical Area
CTC	California Transportation Commission
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
IISTPS	International Institute for Surface Transportation Policy Studies (the Mineta Transportation Institute)
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
MELVYL	University of California library catalog (on-line)
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission of the San Francisco Bay Area
NAAQS	National Ambient Air Quality Standards

NCTCOG	North Central Texas Council of Governments (Dallas-Ft. Worth)
NHS	National Highway System
NMR	National Metropolitan Region
PSRC	Puget Sound Regional Council (Seattle-Tacoma)
RSTP	Regional Surface Transportation Program
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SANDAG	San Diego Association of Governments
SCAG	Southern California Association of Governments
SDOT	state Department of Transportation
SDS	semantic differential scales
SRTP	short-range transit plan
STIP	State Transportation Improvement Program (California)
TDM	transportation demand management
TEA-21	Transportation Equity Act for the 21st Century (1998)
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIP	Transportation Improvement Program
TSM	Transportation Systems Management
USDOT	United States Department of Transportation

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TEAM MEMBERS

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Christopher Ferrell, an Associate Transportation Planner at Dowling Associates, Inc., began his career in 1995 as a planner for the Metropolitan Transportation Commission (MTC) working on Intelligent Transportation System (ITS) applications for traffic management. He has experience in ITS planning, deployment, operational integration, project management, and evaluation. Since 1998, Chris has been enrolled as a Ph.D. student in City Planning at the University of California, Berkeley. His studies focus on the relationships between transportation and land use. His research experience includes the evaluation of transit facilities, transportation policy analysis, the study of sustainable transportation systems, and the analysis of institutional

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PRE-PUBLICATION PEER REVIEW

San José State University, of the California State University system, and the MTI Board of Trustees have agreed upon a peer review process required for all research published by MTI. The purpose of the review process is to ensure that the results presented are based upon a professionally acceptable research protocol.

APPENDIX A: QUESTIONNAIRE FOR RTP STUDY

Good morning (afternoon). My name is _____ and I'm a graduate student at San Jose State University. I am assisting with a U.S. Department of Transportation-funded research study that compares Regional Transportation Plans and processes. Your agency was one of those that generously offered to provide us with a plan. I wonder if I could take about 15 to 20 minutes of your time to ask for some clarifications, and additional information not in the plan? We will be happy to mail participating agencies a copy of the results when they are available.

Important Note to Surveyor: Please record name of person you spoke with, and a phone number (if the individual has a 'direct line'):

Contact Name_____

Phone (_____) _____

If the individual is reluctant to respond at present, ask, "Is there a better time that I could call you back?" Try to get a specific time in date within the next 5 working days. If he/she is still reluctant, ask, "Is there someone else at your agency who could help me answer some questions about your RTP?"

BACKGROUND QUESTIONS

1. Name of Agency or MPO: (do not ask this question unless you are unsure)
2. When created in its present form (year):
3. How many public agencies are there in your jurisdiction? (*Surveyor: check document first to see if this information is available*.)

   Cities:_____

   Counties (or combined city/county) _____

   Transit Operators_____ (exclude social service or specialized operators)

   Federal agencies (examples: DOT, DOD, EPA):_____

   Other (please describe): (example: special districts)_____

4. Are all of these agencies represented on your governing board? (*Surveyor: there may be a multi-layered governing board; please ask them to provide information on it*).
5. (Ask only if there are one or more transit operators in Question 3): How do the transit operators participate? Are they represented on your Board of Directors?
6. What % of population (approximately) does the largest constituent agency (city?) represent of the total MPO population?
7. Are there other functions of your agency? (Examples: council of governments, air quality, council on aging, freeway incident patrols, California congestion management agency). Please list:

Council of governments	Transit district/operator
Metropolitan planning organization	Airport authority/operator
Freeway service patrol	Marine port operator/authority
Air district/air pollution control	Water or wastewater, water quality
Local tax authority (sales, property, etc.)	Country transportation commission*
Regional transportation planning agency*	Other: specify

* Probably applies to California only.

8. Who is on the agency's governing board? Who appointed them? (e.g., are they/must they be elected officials?) (*Ask for the group or agency represented, NOT the name of the individual.*)
9. What rules are used to determine a majority decision of the Board? (*Check all that apply*):

   [ ] Simple majority (50%)

   [ ] Super majority (>50% required to carry measure, such as 2/3)

   [ ] Weighted votes (some members have more votes than others); describe the weighting, if applicable:

[ ] Veto power by one or more constituent agencies

10. Do you consider this RTP an update of an earlier RTP, or a major modification or an entirely new RTP?
11. What Advisory Committees did you use in the development of the RTP? (check all that apply)

    [ ] Technical

    [ ] Business/ economic development interests

    [ ] Environmental

    [ ] Minority/social equity

    [ ] Modal advocates (e.g., bicycle committee)

    [ ] Freight/goods movement/trucking

    [ ] Other (please specify)

12. How are the advisory committee members selected?
13. In your personal opinion, should your MPO include more agencies, and/or geographic area? Or less? (*Surveyor: if answer is "more" or "less," ask why they think this.*)

    Check appropriate responses.

	No. of Agencies in Your MPO	**Geographic Area**
About right now	[ ]	[ ]
More	[ ]	[ ]
Less	[ ]	[ ]

    Please explain any more/less answers. Are there shortcomings of the existing situation? Difficulty in making decisions?

14. What is your region's **current** air quality attainment status?

Federal:

State (if applicable):

INTERAGENCY COOPERATION

15. On a scale of 1 (poor) to 10 (excellent), what is the degree of cooperation between local governments and the MPO?_____

16. On a scale of 1 (poor) to 10 (excellent), what is the degree of cooperation with other significant agencies in your region?

    a. Air quality district (if separate agency) _____

    b. Cities _____

    c. Counties _____

    d. Transit operators _____

    e. State Department of Transportation _____

    f. U.S. Department of Transportation _____

    g. California only: Congestion Management Agencies _____

    h. Airport owner/operators _____

    i. Water/marine ports (if applicable) _____

    j. Council of Governments (COG) _____

17. What level of cooperation was achieved with adjacent MPOs or regional transportation planning agencies in contiguous counties (outside your metropolitan area)? How were they involved in the process? Are there conflicts with any of these agencies?

18. How do you achieve consistency with the plans of adjacent agencies outside your MPO/region?

19. How does your metropolitan/regional plan relate to your state's transportation plan?

RESOURCE REQUIREMENTS

20. What schedule amount of time (months) did it take your MPO to complete your RTP, from start to finish?

21. What was the cost (in dollars), or equivalent person-months of effort, required to complete the RTP?
22. If your MPO's total operating budget had to remain unchanged, would you allocate:

    [ ] Much less money to the development of the RTP in the future

    [ ] Somewhat less money to the RTP

    [ ] About the same amount as your agency spent last time

    [ ] Somewhat more money on the RTP

    [ ] Much more money on the RTP

OPINIONS

23. Were there specific problems or weak areas in the previous RTP, particularly if those were remedied in the current version?
24. What do you think the best aspect of your RTP (or process) is?
25. Which aspect/component would you have improved, if you had the time/ resources?
26. Is the 3-year requirement for RTP update: too frequent, about right, not frequent enough?
27. What suggestions do you have to improve the RTP process?
28. Are there unresolved regional issues affecting your agency or RTP? If so, please list a few key issues:
29. What level of agreement reached on the final project priorities shown in the RTP and TIP? (1 = none at all; 10 = complete/total agreement): _____
30. Do you believe the current number of federal ground transportation funding categories under TEA-21 are:

    [ ] About right

    [ ] Too few—(should be more categories say, targeted at specific types of problems)

[ ] Too many—(should be fewer categories say, to provide more flexibility)

PLANNING DATA

31. In your opinion what was the quality of planning data you had to work with was? (1 = poor or non-existent; 10 = excellent)

_____Land use and household demographic data and forecasts

_____Traffic projections for highways

_____Transit projections

_____Life-style or underlying structural changes (but not technology—see below)

_____Economic/ industrial projections

_____Demographic projections (income, aging, etc.)

_____Non-motorized modes (bike, ped)

_____Impacts of technology (e.g., telecommuting)

_____Freight/goods movement

_____Safety/accident information

_____Air quality data

_____Other management systems (e.g., bridges, intermodal, etc.)

Comments:

32. What planning data would you like to have refined or improved, if resources were available?
33. Is there a multi-modal scoring criteria used for projects? (**Yes/No**)

Is it something you could send to us (*if it's written down, say in a memo*).

34. Were there changes made to your land use or demographic projections based on the congestion implications from your travel forecasting process? *In other words, were land use inputs taken as exogenous, or were they influenced by the results of the travel forecasting and financial capability of your region?*
35. Do you believe a traditional 20-year time horizon for the RTP is:

    [ ] About right

    [ ] Too short

    [ ] Too long

    (If too short or long, ask "How long would be a better horizon?")

36. Do you use ranges of values for controversial assumptions? Examples could be population, jobs, income, gasoline prices, etc.

FINANCIAL ELEMENT

37. What proportion of revenues over the RTP horizon (20 years?) are dedicated to operations and maintenance of the existing system? (N/A= not analyzed)
38. In your RTP, **how important** is the addition of new capacity in the future, as opposed to maintaining the existing system? (1 = all emphasis on Operations & Maintenance; 10 = all emphasis on capacity enhancing).
39. Besides the financially constrained plan required by federal law, do you also develop a financially unconstrained (or less constrained) set of projects?
40. Can you briefly explain to me how your "transportation needs" were determined?

PUBLIC INVOLVEMENT PROGRAM

41. How were interested parties notified of their ability to be involved in the RTP process?
42. How many noticed public meetings were held?
43. Were these held in different parts of the region?

44. What other methods were used for outreach, particularly to groups that have been historically under-represented in the transportation planning process? These groups could include not just low-income or minority groups, but also freight transporters, taxi operators, etc. (*Please describe who and how*)
45. Overall, how would you rate the quality of your RTP's public outreach process? (1 = poor to 10 = excellent)
46. Did your agency hire a consultant to assist in the public involvement process?

    No.

    If Yes: What did they do? What % of the overall outreach effort (rough person-hours) was handled by the consultant (to nearest 10%):

47. Did you make any changes to the plan (or the process) as a direct result of public input?

POLICIES

48. About what % of the total RTP planning effort went into development of a vision statement, and the goals, objectives, and policies?
49. To what extent do they (planning goals/objectives/vision) have broad agreement amongst: (10 = complete agreement; 1 = highly controversial)

    Local governments?_____

    Environmental groups?_____

    Business community?_____

    Street and highway agencies?_____

    Transit operators?_____

50. How does your RTP deal with the land use/transportation connection? I.e., does it consider jobs/housing balance at the regional or subregional scale?
51. Does your agency have **any** land use powers? If yes, describe:

52. On a scale of 1 (poor) to 10 (excellent), overall, how successful has the current MPO policy and planning process been in improving the quality of transportation in your metropolitan area?

USE OF INTERNET

53. Did you put any of the following information up about your RTP on the Internet?

    [ ] Meeting announcements or notice of availability

    [ ] RTP Summary

    [ ] RTP Full document

    [ ] Public opinion surveys/comments

54. If your MPO did *not* make use of the Internet for any of these purposes, what were the reasons? (*Typical answers might be cost, short of time, Internet users not representative of the general population.*)

Thank you for your time and assistance. Would you like to be mailed a copy of our study when it becomes available?

[ ] YES [ ] NO

APPENDIX B: DESCRIPTION OF SIMPLE AND PARTIAL CORRELATIONS

A correlation coefficient is a number showing the degree to which two variables are related. Correlation coefficients range from –1.0 to +1.0. The two extreme values imply perfect linear correlation between the variables. Zero implies no linear correlation between the two variables. Two variables may have a very small correlation coefficient (in absolute value), but still be related in a non-linear fashion. A negative coefficient implies that when one of the variables is high, the other is low (and vice versa). It is important to note that correlation does not imply causation; causation must be supported by theory, the researcher's intuition, or evidence.

SIMPLE CORRELATION COEFFICIENTS

There are several ways to calculate correlation coefficients. For simple correlations between two variables ("bivariate correlation"), the Pearson product-moment correlation (sometimes called Pearson's r) is used here. It is the most frequently used coefficient, calculated using the following formula:

$$\sum(x-\bar{x})(y-\bar{y}) / \sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}$$

The data must be measured on an interval or ratio scale for Pearson's r to be meanigful (also see Appendix C).

PARTIAL CORRELATION COEFFICIENTS[20]

Partial correlation is similar in concept to simple correlation, but shows that relationship between two variables after the researcher statistically subtracts or removes (controls for or holds constant) the linear effect of one or more controlling variables. Conceptually, at least, partial correlation is analogous to cross-tabulation with control variables. In cross-tabulation, the control is accomplished by examining the joint frequency distribution of two variables

[20] This text has been adapted from Nie, 1975.

between two (or more) categories of one or more control variables. An example might be the relationship between educational level and income, controlling for the effects of age; or the relationship between population density and trip generation, controlling for the effects of income and household size. With cross-tabulation, the control is literal; that is, one simultaneously locates each observation according to the values it takes on three or more variables. This is one of the major problems with analyzing cross-tabs, for each additional category of each variable in the relationship exerts a tremendous drain on the average cell frequencies. Thus, it takes a very large sample to execute even simple controls.

In partial correlation, on the other hand, the control is statistical rather than literal and is based on the simplifying assumptions of linear relationships among the variables used as controls. In essence, partial correlation enables the researcher to remove the effect of the control variable from the relationship between the independent and dependent variables without physically manipulating the raw data. In partial correlation, the effect of the control variables are assumed to be linear throughout their range, and it is this linear assumption that makes partial correlation possible.

The basic formula for the computation of partial correlation coefficient is:

$$r_{xy,k} = \frac{r_{xy} - (r_{xk})(r_{yk})}{\sqrt{1 - r_{xk}^2} * \sqrt{1 - r_{yk}^2}}$$

where 'r' is the simple correlation coefficient (described above), 'k' is the control variable, and 'x' and 'y' are the independent and dependent variables. The extension of this formula to more than one control variable is made by replacing the simple correlation coefficients (known as "zero-order partials") on the right side of the equation with the nth order partial coefficient. In this way, the formula is used to recursively define and compute each higher-order partial from the previous one.

Partial correlation can be used in a wide variety of ways to aid in understanding and clarifying relationships between three (or more) variables. When properly employed, partial correlation becomes an excellent technique for uncovering spurious relationships and locating intervening variables, and can even be used to help the researcher make certain types of causal inferences. A spurious correlation is defined in a relationship between two variables, A

and B for example, in which A's correlation with B is solely the result of the fact that A varies along with some other variable, C for example, which is indeed the true predictor of B. In this case, when the effects of C are controlled for (that is, held constant), B no longer varies with A.

Key drawbacks are the assumption of linearity in the variables (at least in the range over which observations are made), and the requirement that the variables measured be measured on interval or ratio scales. In the present case, the assumption needs to be made that the semantic differential scale (1 to 10) represents an interval, in other words, that the property of the distances between the scores (ratings) are defined in terms of fixed and equal units. Interval-level measurement allows study of differences between things but not their proportion magnitude.

APPENDIX C: DESCRIPTION OF THE KENDALL'S TAU STATISTIC

Kendall's Tau is a descriptive non-parametric statistic of the correlation between two variables. It is particularly useful when the underlying measurement is ordinal, rather than interval, or where the data have some of the characteristics of ordinal data.

A strict interpretation of Pearson's correlation or partial correlations require that the data analyzed be interval or rational in nature. In many of the questions asked in our survey, a semantic differential scale is used, in which the respondent was asked to strongly agree (score of 10) or strongly disagree (score of 1) with a particular statement posed by the interviewer. Ten discrete answers are then available to the respondent. Ideally, we would like the difference in intensity of response to be the same between a response of '7' and '8' as it is between '1' and '2'. Unfortunately, this is not always the case.

There has been debate in the literature about whether semantic differential scales (SDS) meet the requirements for analysis with Pearson-like correlation statistics. Some SDS's questions come closer to fulfilling this requirement than others; for example, if a respondent were asked to subjectively rate "What percent of your goals were fulfilled in the previous year?" this would probably be closer to a true interval scale. In reality, what the SDS used in our questionnaire does is to measure the intensity of feeling or attitude, which is more difficult to ascertain.

Kendall's Tau obviates this problem by using ranked correlations, rather than interval linear correlations. That is, the ratings from the responses are converted to ranks, where the number of ranks is the same as the number of valid observations for both variables. A simple example shows this clearly, for n=5:

ORIGINAL RATING	RANKING ASSIGNED
9	1.0
7	2.5
7	2.5
5	4.0
3	5.0

It shows that the rating '9' was assigned a rank of 1, the two 7's were each given an equal rank (because of the 'tie'), and so on. It is then the correlation between the ranks that is compared with Kendall's Tau, rather than the correlation between ratings. We selected Kendall's Tau rather than Spearman's test of rank correlation because it is reputed to do a better job with tie scores, and it was anticipated that with ratings often clustered in particular ranges (for example, between 6 and 9), that tie ratings would occur relatively frequently.

The downside of Kendall's Tau, as with any non-parametric test, is that it tends to be weaker than its kindred parametric tests—that is, it may tend to understate the degree of correlation between two variables, and therefore cause the researcher to miss out on some important relationship. However, by confirming many of our observations with the Kendall Tau test, we believe that it will strengthen the robustness of some of the results. As with any correlation statistic, however, the correlation neither implies the directionality nor the practical significance of the correlation.

APPENDIX D: LIST OF TABLES

APPENDIX D: SUMMARY TABLES

TABLE 1 GENERAL INFORMATION

Metropolitan Planning Organization	Metropolitan Area	Land Area (Sq. Miles) (1)	1990 Population (2)	1997 Population(3)	Population Change (4)	% of Pop. Change(5)	'97 Population Density (6)
Pima Association of Governments	Tucson, AZ	9,187.0	666,957	780,150	113,193	17.0%	84.9
Maricopa Association of Governments	Phoenix, AZ	14,574.0	2,238,498	2,839,539	601,041	26.9%	194.8
Sacramento Area Council of Governments	Sacramento, CA	5,094.0	1,481,220	1,655,866	174,646	11.8%	325.1
Metropolitan Transportation Commission	San Francisco,CA	7,368.6	6,277,525	6,700,753	423,228	6.7%	909.4
San Diego Association of Governments	San Diego, CA	4,204.5	2,498,016	2,722,650	224,634	9.0%	647.6
Southern California Association of Governments	Los Angeles, CA	33,966.0	14,531,529	15,608,886	1,077,357	7.4%	459.5
Miami Urbanized Area Metropolitan Planning Organization	Miami, FL	3,153.6	3,192,725	3,515,358	322,633	10.1%	1114.7
Atlanta Regional Commission	Atlanta, GA	6,126.2	2,959,500	3,627,184	667,684	22.6%	592.1
Chicago Area Transportation Study	Chicago, IL	6,930.5	8,239,820	8,642,175	402,355	4.9%	1247.0
Metropolitan Area Planning Council	Boston, MA	6,450.0	5,685,763	5,827,654	141,891	2.5%	903.5
Metropolitan Council of the Twin Cities Area	Twin Cities, MN	6,064.4	2,538,776	2,792,137	253,361	10.0%	460.4
Regional Transportation Commission of Clark County, Nevada	Las Vegas, NV	39,370.3	852,646	1,262,099	409,453	48.0%	32.1
Metro	Portland, OR	6,953.8	1,793,476	2,112,802	319,326	17.8%	303.8
Houston-Galveston Area Council	Houston, TX	7,706.7	3,731,029	4,320,041	589,012	15.8%	560.6
North Central Texas Council of Governments	Arlington, TX	9,104.7	4,037,282	4,683,013	645,731	16.0%	514.4
Puget Sound Regional Council	Seattle, WA	7,223.5	2,970,300	3,367,872	397,572	13.4%	466.2
Southeastern Wisconsin Regional	Milwaukee, WI	1,793.1	1,607,183	1,636,572	29,389	1.8%	912.7

TABLE 1 GENERAL INFORMATION

Metropolitan Planning Organization	Metropolitan Area	% Pop 25+ College Grad (7)	'94 Per Capita Income (8)	Number of Govt's in Area* (9)	Number of Govt's / Mil Pop. (10)	'97 Hwy Lane Miles (11)	Hwy Miles / 1000 Pop. (12)
Pima Association of Governments	Tucson, AZ	23.3%	$18,575	5	6.41	175	0.224
Maricopa Association of Governments	Phoenix, AZ	22.1%	20,999	24	8.45	870	0.306
Sacramento Area Council of Governments	Sacramento, CA	23.4%	20,811	16	9.66	680	0.411
Metropolitan Transportation Commission	San Francisco,CA	30.9%	28,322	101	15.07	3,440	0.513
San Diego Association of Governments	San Diego, CA	25.3%	21,626	18	6.61	1,790	0.657
Southern California Association of Governments	Los Angeles, CA	22.0%	21,542	184	11.79	5,240	0.336
Miami Urbanized Area Metropolitan Planning Organization	Miami, FL	18.8%	21,918	30	8.53	710	0.202
Atlanta Regional Commission	Atlanta, GA	26.8%	23,633	64	17.64	2,220	0.612
Chicago Area Transportation Study	Chicago, IL	23.5%	25,257	260	30.09	2,625	0.304
Metropolitan Area Planning Council	Boston, MA	30.7%	26,093	101	17.33	1,310	0.225
Metropolitan Council of the Twin Cities Area	Twin Cities, MN	27.1%	25,231	205	73.42	1,530	0.548
Regional Transportation Commission of Clark County, Nevada	Las Vegas, NV	13.8%	22,338	5	3.96	375	0.297
Metro	Portland, OR	23.6%	22,172	24	11.36	690	0.327
Houston-Galveston Area Council	Houston, TX	24.2%	22,651	106	24.54	2,415	0.559
North Central Texas Council of Governments	Arlington, TX	25.8%	23,449	163	34.81	3,095	0.661
Puget Sound Regional Council	Seattle, WA	27.1%	24,785	68	20.19	1,565	0.465
Southeastern Wisconsin Regional Planning Commission	Milwaukee, WI	20.8%	23,729	74	45.22	610	0.373

* number of incorporated cities and towns served in metropolitan area

Sources:

Population and income estimates - *1997-1998 State and Metropolitan Area Data Book*, U.S Department of Commerce, Economic and Statistics Administration, Bureau of the Census, and U.S. Census Bureau Website: http://factfinder.census.gov ;

Number of governments from MPO website ;

Highway Lane Miles - *The 1999 Annual Mobility Report* , Texas Transportation Institute.

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Year Formed (13)	Public Agencies Within the Jurisdiction (14)					Governing Board Members (15)
		Cities	Counties	Transit Op.	Fed. Agencies	Other	
Pima Association of Governments (Tucson)	1990	5	1	11	4	5	All Agencies in 6 Political Subdivisions
Maricopa Association of Governments (Phoenix)	1967	24	1	0	1	3	N
Metropolitan Transportation Commission (San Francisco/San Jose/Oakland)	1970	101	9	8	1	6 public ports 5 commercial airport	14 appointed by local elected officials 2 appointed from more populous counties 1 appointed from less populous counties 1 ABAG member
San Diego Association of Governments	1966	18	1	2	1	N	All agencies have board rep.
Southern California Association of Governments (Los Angeles)	1965	184	6	9	N	N	70-member Reg'l Council from 63 Dist and 7 County reps.
Miami Urbanizated Area Metropolitan Planning Organization	1977	30	1	2	N	N	Not all agencies have board rep
Atlanta Regional Commission	1947	64	10	2	7	N	Not all agencies have board rep
Metropolitan Area Planning Council (Boston)	1975	101	0	150	All	0	7 Communities represent 101 Cities & Town
Regional Transportation Commission of Clark County, Nevada (Las Vegas)	1981	5	1	N	N	N	All agencies Nevada Dept. of Transportation
Metro (Portland, OR)	1979	24	3	2	2	N	All agencies are represented on governing board

N = Data Not Available

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Year Formed (13)	Public Agencies Within the Jurisdiction (14)					Governing Board Members (15)
		Cities	Counties	Transit Op.	Fed. Agencies	Other	
Houston-Galveston Area Council	1966	106	13	3	N	19 school dist 11 soil & con-servation dist	All have board rep feds have 2 non voting members
North Central Texas Council of Governments	1974	163	16	2	N	26	Not all agencies have board rep
Puget Sound Regional Council	1992	68	4	7	3	Port of Seattle Port of Everett Port of Tacoma WSTC, WSF	Most of Agencies

N = Data Not Available

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Participation of Transit Operators (16)	Largest City (% of Total Pop) (17)	Current Agency's Functions (18)
Pima Association of Governments	Primary transit agencies operated by MPO	Tucson 57%	TD, WQ, MPO
Maricopa Association of Governments	Represented by technical committee	Phoenix 40%	AD, WQ, CMA, GM, MPO
Metropolitan Transportation Commission	Represented on Board of Directors Participate in the Bay Area Partnership	San Jose 13%	MPO, RTPA, FSP
San Diego Association of Governments	Participate in committees	San Diego 43	Congestion & Waste Mgmt Toll Auth, COG, Crim. Just. Research, Growth Mgmt, MPO
Southern California Association of Governments	Participate in committees	Los Angeles 25%	COG, MPO, WAT
Miami Urbanizated Area Metropolitan Planning Organization	Transit operators participate on committees	Miami 18%	MPO, develop TP, update TIP, faciliatate public involvement, coord. TPC
Atlanta Regional Commission	Represented on Committees	Atlanta 13%	COG, MPO, WAT
Metropolitan Area Planning Council	Represented by MBTA & MBTA advisory board. Involved in updating plan & public transit capital project	Boston 10%	Land Use/ Planning, MPO
Regional Transportation Commission of Clark County, Nevada	ATC's representatives meet with MPO for route changing/ proposal. All transit decision go thru RTC board	Las Vegas 35%	MPO, RTOA,TD
Metro	The major transit agency is a member of Metros transportation policy advisory committee	Portland 33%	MPO,TAX,WAT TRANS

N = Data Not Available

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Participation of Transit Operators (16)	Largest City (% of Total Pop) (17)	Current Agency's Functions (18)	Members Selection (19)
Houston-Galveston Area Council	N	Houston 60%	COG, MPO	Appointed by board
North Central Texas Council of Governments	On Regional transportation council	Dallas 25%	COG, MPO, RTPA Police Training	Mostly elected officials
Puget Sound Regional Council	Transportation Operators Committee make recommendations for Transp. Policy Board, Growth Mangement Policy Board, & Executive Board	Seattle 17%	COG, MPO, RTPA Growth Manag.	Executive Board Members - Appointed by General Assembly Constituents

N = Data Not Available

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Decision Making (20)	New/ Updated RTP (21)	Advisory Committees (22)	Advisory Committee Members Select. (23)	Current Air Quality Status (24)		
					PM10	CO	O3
Pima Association of Governments	N	Update	Modal Advocates, Technical, CMS, Citizens	N	Non-Attained	Attained Limited	Attained
Maricopa Association of Governments	Simple Majority Population	Update	Technical, Minority, Modal Advocates	Appointed by represented jurisdictions	Non-Attained	Non-Attained	Non-Attained
Metropolitan Transportation Commission	Simple Majority	Update	Technical, Business, Environment, Minoirty, Modal, Freight, Disabled, Labor	Appointed by represented Jurisdiction	Attained Moderate	Non-Attained	Attained
San Diego Association of Governments	Simple Majority	Update	Mixed Policy, Technical, Citizen Advisory	N	Attained	Attained	Serious
Southern California Association of Governments	Simple Majority	Entirely new	Business, Environmental, Minority, Modal, Freight	Appointed by regional Council	Has seven Federally designated non-attainment areas.		
Miami Urbanizated Area Metropolitan Planning Organization	Simple Majoirty	Update	Environemental, Modal Freight cmte being developed	N	Attained	Attained	Attained
Atlanta Regional Commission	Simple Majority	Entirely new	Technical, Business, Environmental Minority, Modal, Freight	N	Attained	Attained	Attained
Metropolitan Area Planning Council	Simple Majority Super Majority	Update	NIL	N	Non-Attained	Non-Attained	Non-Attained
Regional Transportation Commission of Clark County, Nevada	Simple Majority	Update	Tehnical, Minority/ Social Equity	Exe. Advisory comm. sent by city's land use/ planning dept. or DPW	Non-Attained	Non-Attained	Non-
Metro	Simple Majority	Entirely new	Technical, Business, Environmental, Minority, Modal Advocates, Freight, Youth, Disabled	By Metro Council	Conformity established for existing RTP and MTIP		

N = Data Not Available

TABLE 2 AGENCY BACKGROUND

Metropolitan Planning Organization	Decision Making (20)	New/ Updated RTP (21)	Advisory Committees (22)	Advisory Committee Members Selection (23)	Current Air Quality Status (24)		
					PM10	CO	O3
Houston-Galveston Area Council	Simple Majority	Update	Technical, Business, Env Modal, Freight	N	Has until 2007 to attain the ozone standard		
North Central Texas Council of Governments	Simple Majority	Major Revision	Technical, Freight	based on tech. expertise	Attained	Attained	Non-Attained
Puget Sound Regional Council	Simple Majority Weighted Votes Population	Update	Technical, Modal Advocates, Freight/goods movement/ Trucking, Transportation Policy Board, Growth Management Policy Board, Regional Staff Committee, Regional Technical Forum, Regional Evaluation Committee Transp. Enhancements Committee, Regional Transp. Pricing Task Force, Transp. Demand Manag. Roundtable Action Committee, Transp. Operators Committee	Appointed by Member Jursidictions & Agencies	Non-Attained	Maintain	Maintain

N = Data Not Available

Notes:

COG Council of Government
MPO Metropolitan Planning Organization
FSP Freeway Service Patrol
AD Air District/Air Pollution Control
LTA Local Tax Authority
RTPA Regional Transportation Planning Agency*
TD Transit District
AU Airport Authority
MAP Marin Port Operator
WW Water or Wastewater, Water quality
CTC County Transportation Commission*
O Other: specify

* Probably applies to California only

TABLE 3 INTERAGENCY COOPERATION

Metropolitan Planning Organization	Cooperation with Local Gov't (25)	Degree of Coopertion with Significant Agencies (26)								
		Air Quality Dist. (26a)	Cities (26b)	Counties (26c)	Transit Operators (26d)	State DOT (26e)	U.S. DOT (26f)	Congestion Mgmt Agency (26g)	Airport Operators (26h)	Marine Ports (26i)
Pima Association of Governments	9	8	9	9	7	8	N	8	7	N
Maricopa Association of Governments	8	6	8	8	9	7	10	N	8	N
Metropolitan Transportation Commission	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
San Diego Association of Governments	N	N	N	N	N	N	N	N	N	N
Southern California Association of Governments	7	9	8	8	6	9	8	8	8	8
Miami Urbanizated Area Metropolitan	8	8	8	7	9	8	8	7	8	8
Atlanta Regional Commission	7	7	7	7	7	8	7	N	5	N
Metropolitan Area Planning Council	3	6	3	N	5	3	6	6	4	4
Regional Transportation Commission of Clark County Nevada	5	5	6	7	9	7	7	5	4	N
Metro	9	7	9	8	6	7	9	N	7	7

N = Data Not Available

TABLE 3 INTERAGENCY COOPERATION

Metropolitan Planning Organization	Cooperation with Adjacent MPOs (27)	Method of Consistency with Adjacent MPOs (28)	How does transportation plan relate to the State's Transportation Plan? (29)
Pima Association of Governments	N	Not necessary	State's plan attempted to coordinate w/ MPO plans, but no good results
Maricopa Association of Governments	7 (Scale of 1-10) The only adjacent MPO is 100 miles away	Not necessary	No. State does not have transportation plan.
Metropolitan Transportation Commission	8	Mostly involved with them on state level issues and corridor studies.	No. State does not have
San Diego Association of Governments	N	N	N
Southern California Association of Governments	good level of cooperation have scheduled mtgs at the elected and mgmt levels	review their plans to make sure issues than need to be coordinated are	careful review of state plan, they have to be consistent
Miami Urbanizated Area Metropolitan	N	recently formed an organization of three counties to achieve consistency	N
Atlanta Regional Commission	N	N	N
Metropolitan Area Planning Council	Through direct contact. Generally, state will resolve any conflicts exist.	State highway department incorporate RTP to state's transp. plan for consistency	State planning agencies combine all MPO plans. MPO has no separate process.
Regional Transportation Commission of Clark County Nevada	Adjacent MPO not involved in planning process because of geographic constraints	Through meeting process	State transportation plan is included in the RTP.
Metro	Cooperation relatively hight. Adjacent MPO on technical and policy committees.	Regular coordination and cross representation on advisory committees.	RTP must be approved and found to be consistent w/ state plan

N = Data Not Available

TABLE 3 INTERAGENCY COOPERATION

Metropolitan Planning Organization	Cooperation with Adjacent MPOs (27)	Method of Consistency with Adjacent MPOs (28)	How does transportation plan relate to the State's Transportation Plan? (29)
Houston-Galveston Area Council	Cooperate when they need to The necessity is not there right now	The outlying counties are rural with no significant development. Roads maintained by county.	TIP is subset of the statewide TIP. Well integrated.
North Central Texas Council of Governments	Minimal	Adjacent counties are very rural.	Not very much
Puget Sound Regional Council	Adjacent RTP organizations become Associate PSRC members for coordination.	State's Blue Ribbon Comm. provides forum for coordinated planning & discussion.	MTP is a component of Washington State Transp. Plan that coordinated all State's RTPO plans

N = Data Not Available

TABLE 4 RESOURCE REQUIREMENTS

Metropolitan Planning Organization	Time Needed to Complete Trans Plan (30)	Cost to Complete Trans Plan (31)	Budget Priority Shift (32)	Deficiencies in Previous RTP Remedied (33)	Best Aspect of Planning Process (34)
Pima Association of Governments	24 Months	$1 million	Somewhat less money	Published document not included project listing, only in map forms. Weak public info on proj. listing	Good public discussion/ participation process. Graphically attractive
Maricopa Association of Governments	4 Years	N	No Comment	No Major Problems. Minor problem: Not integrated well enough	Freeway component
Metropolitan Transportation Commission	1 year	$0.5 million for staffs only	Somewhat more money	Highway & roadway oriented	Comprehensive listing of projects that every one has & their commitment to it.
San Diego Association of Governments	N	N	N	Current RTP not consistent w/ local general plans. Will fix in next plan.	Did a better job getting info to public. Ran ads, radio time and special event announcements.
Southern California Association of Governments	3 years	$15 million 25% of MPO resources	about the same	Previously less emphasis on the implementation plan.	It is an open process. Try to get lots of input at outset.
Miami Urbanizated Area Metropolitan	3 years	$1 million paid to consultant	about the same	Land use update does not coincide w/ long range plan data	Inclusion of all parties remotely involved. Have over 20 members on technical steering committee.
Atlanta Regional Commission	4 years	N	about the same	Current RTP has stronger commitment to transit and land use changes.	Local jurisdictions commitment to alternative forms of transportation over the next 25 years.
Metropolitan Area Planning Council	1-1/2 yrs	N	N	Looked at project investments in terms of corridors.	It is easy for the public to see where transportation dollars are going.
Regional Transportation Commission of Clark County Nevada	14 Months	Not Sure	about the same	No Specific	Transit Component
Metro	4 yrs typical update usually 1 yr	$3 million over 5 yrs	about the same	Not adequately multi-modal nor intermodal. No detailed land use vision.	Developed w/ extensive outreach. Controversial elements developed on a consensus basis w/ local gov't

N = Data Not Available

TABLE 4 RESOURCE REQUIREMENTS

Metropolitan Planning Organization	Time Needed to Complete Trans Plan (30)	Cost to Complete Trans Plan (31)	Budget Priority Shift (32)	Deficiencies in Previous RTP Remedied (33)	Best Aspect of Planning Process (34)
Houston-Galveston Area Council	1 year	current draft cost $1.2 million	about the same	land use, bike and pedestrian issues	Region wide cooperation on the development of the plan.
North Central Texas Council of Governments	2 yrs	42 person months	somewhat more money	Didn't have as much time as would be desireable.	Sustainable development First time development
Puget Sound Regional Council	30-36 months	$4.3 million	about the same	Public involvement, financial shortfall, implementation strategies	Land-use & pricing policies modeling, land use strategies

N = Data Not Available

TABLE 4 RESOURCE REQUIREMENTS

Metropolitan Planning Organization	What Aspect Would You Like to Improve (35)	Suitability of Update Req. (36)	Suggestions for Improving Planning Process (37)	Unresolved Regional Issues (38)	Agreement on Project Priorities (39)	Suitability of Funding Categories (40)
Pima Association of Governments	More details on project listing	Too frequent Should be 5 years.	No	Revenue Forecast	Not Sure	about right
Maricopa Association of Governments	Street Component	About right	RTP updated too frequent (every year). No new info. can be in-corporated into plan during update	Growth control mangmt., transit election for LRT assumptions , CMA Q fund	10	about right
Metropolitan Transportation Commission	N	About right	N	Air qual conformity projects may only be 20% funded	N	about right
San Diego Association of Governments	Work w/ cmte earlier, public outreach earlier	About right	Start public involvement earlier. People want to know performance measures.	Main airport does not meet long term need	7 - 8 fairly high	about right
Southern California Association of Governments	Get info to task forces for dec. making	Too frequent	Start public outreach earlier	None	8	about right
Miami Urbanizated Area Metropolitan	Would like to display projects using GIS	About right	Improved timing of plan dev. w/ census data. Improve timing of land use and plan up updates.	Unable to get trans $. Trans tax failed three times in 11 yrs	8	too few
Atlanta Regional Commission	Public involvement process.	About right	Want to make changes in the project selection process and the financial constraint process.	Financial constraint Land use	8	about right
Metropolitan Area Planning Council	Should include more public process	Too frequent Shoud be 3 years.	Improve forecasting & modeling with better requirements	Who get to make the decisions: Local or State	3	too many
Regional Transportation Commission of Clark County Nevada	All areas on TIP Reduce time on proj. election process	About right	No	No specific	8	about right
Metro	Transportation demand model	Too Frequent	No	12 "refinement" corridors that need to be addressed	9	about right

N = Data Not Available

TABLE 4 RESOURCE REQUIREMENTS

Metropolitan Planning Organization	What Aspect Would You Like to Improve (35)	Suitability of Update Req. (36)	Suggestions for Improving Planning Process (37)	Unresolved Regional Issues (38)	Agreement on Project Priorities (39)	Suitability of Funding Categories (40)
Houston-Galveston Area Council	Public involvement process	downtime allows you to look at goals	N	Environmental groups are less supportive	7	too many
North Central Texas Council of Governments	More time on sustainable	Keep longer - too short	Monitor and maintain plan you have. Do new development forecasts.	Financial short fall.	5	about right
Puget Sound Regional Council	Financial issues	Too frequent	More reality based planning process, with more time to deal with the issues at hand	Financial issues.	6	about right

N = Data Not Available

TABLE 5 PLANNING DATA

Metropolitan Planning Organization	Quality of Planning Data Used (41)							
	Land use/ Household Demog (41a)	Traffic Projections (41b)	Transit Projections (41c)	Lifestyle/ Structural Changes (41d)	Econ Projections (41e)	Demo Projections (41f)	NonMotorized Modes (41g)	Impacts of Technology (41h)
Pima Association of Governments	5	7	5	5	N/A	5	5	7
Maricopa Association of Governments	8	8	6	3	5	8	2	4
Metropolitan Transportation Commission	9	9	9	9	9	9	9	9
San Diego Association of Governments	9	8	6	N	7	9	6	5
Southern California Association of Governments	8	8	5	N	7	7	5	8
Miami Urbanizated Area Metropolitan	9	8	8	N	8	9	4	N
Atlanta Regional Commission	7	7	7	7	9	9	2	2
Metropolitan Area Planning Council	5	5	6	1	2	4	5	1
Regional Transportation Commission of Clark County Nevada	7	5	6	5	7	7	5	3

N = Data Not Available

TABLE 5 PLANNING DATA

Metropolitan Planning Organization	Quality of Planning Data Used (41)							
	Land use/ Household Demog (41a)	Traffic Projections (41b)	Transit Projections (41c)	Lifestyle/ Structural Changes (41d)	Econ Projections (41e)	Demo Projections (41f)	NonMotorized Modes (41g)	Impacts of Technology (41h)
Metro	10	9	9	8	8	7	6	7
Houston-Galveston Area Council	6 - 7	8	8	4	5	N	5	4
North Central Texas Council of Governments	9	9	9	7	8	8	5	5
Puget Sound Regional Council	6	7	4	3	6	8	6	4

Mean score

N = Data Not Available

TABLE 5 PLANNING DATA

Metropolitan Planning Organization	Quality of Planning Data Used				Which Data Needs to be Improved (42)	Multi-Modal Project Scoring Criteria? (43)	Changes to land use plan based on congestion implications (44)	Suitability of 20 Year Plan (45)	Ranges of Values (46)
	Freight/ Goods Mvmnt (41i)	Safety/ Accident Info (41j)	Air Qual (41k)	Other Mgmt Syst (41l)					
Pima Association of Governments	7	7	8		Employment & growth forecasting	Yes	Not sure	About right	Yes
Maricopa Association of Governments	2	7	8	5	Pop. by social econ. & by age, business act. non-motorized mode	Yes. Based on CM, AQ, Pop., & transit goals	No	About right	No
Metropolitan Transportation Commission	9	9	9	9	arterial and non motor	N	N	About right	don't know
San Diego Association of Governments	6	7	7		alternative modes	Yes	Trans info did feed into initial look	About right	No
Southern California Association of Governments	6	6	7		goods movement	have a performance eval system	No	About right	Yes, ex: revenue forecast
Miami Urbanizated Area Metropolitan	6	6	9		Freight movement	Yes	Yes, within the last ten years	About right	No
Atlanta Regional Commission	2	5	9	5	non motor modes and land use	N	N	About right	
Metropolitan Area Planning Council	2	6	4	7	Survey/ interview on public opinion	No	Yes	About right	No
Regional Transportation Commission of Clark County Nevada	7	5	7	8	Econ. forecast, esp. in Las Vages area	Yes	Yes. Subcomittee decided changes	About right	Yes

N = Data Not Available

TABLE 5 PLANNING DATA

Metropolitan Planning Organization	Quality of Planning Data Used				Which Data Needs to be Improved (42)	Multi-Modal Project Scoring Criteria? (43)	Changes to land use plan based on congestion implications (44)	Suitability of 20 Year Plan (45)	Ranges of Values (46)
	Freight/ Goods Mvmnt (41i)	Safety/ Accident Info (41j)	Air Qual (41k)	Other Mgmt Syst (41l)					
Metro	8	7	9	8	Bike/Ped; Real time travel data	Not for RTP but have one for MTIP	RTP recommended land use changes	About right	No
Houston-Galveston Area Council	7	4	7	N	land use	Yes, for screening	No	About right	Yes
North Central Texas Council of Governments	6	6	9	5	Safety and Freight	In RTP	Yes. Changes based on forecasts not documented in RTP	About right	N
Puget Sound Regional Council	7	5	7	N	land use, small area pop./ employ./housing est., mode choice	Yes. The RSRC TIP criteria	No	About right	No

N = Data Not Available

TABLE 6 FINANCIAL ELEMENT

Metropolitan Planning Organization	% Budget for Operations/ Maintenance (47)	Importance of Adding Capacity (48)	Is there a Financially Unconstrained Plan (49)	Determination of Transportation Needs (50)
Pima Association of Governments	70%	7	No	Public outreach, congestion model involved political & business leaders, public comments from web page, open house, mass media
Maricopa Association of Governments	N/A	9	No	Thru CM program, public opinion, transit study, City's feedback, freeway program, traffic projection & availiable data
Metropolitan Transportation Commission	81%	5	Yes	Start w/ and idea from public or gov't entity, the project is defined and usually sponsored by gov't entity, then goes up for review
San Diego Association of Governments	20%	5	Yes	Some projects are rolled over from the previous RTP Some projects are identified in corridor studies
Southern California Association of Governments	30%	9	Yes	Growth forecasting. Target investments that will relieve congestion. Transportation Models
Miami Urbanizated Area Metropolitan	o & m money not in plan	N/A	Yes	Obtain projections from local planning departments and put the info in travel demand models
Atlanta Regional Commission	43% ($2.9 billion)	5	N	Through a needs assesment report and through consultation with the Transportation Coordinating Cmte
Metropolitan Area Planning Council	30%	7	Yes	MPO decided what priorities are. Some based on accident data and congestion data
Regional Transportation Commission of Clark County Nevada	Not sure	6	Yes	Transportation Needs addressed thru public involvement. e.g. public meetings at various location & workshops
Metro	80%	5	Yes	Developed LOS that factors land use, alternative modes and off peak performance; worked with local gov't & public
Houston-Galveston Area Council	40%	5	Yes, an appendix in the RTP	Cooperative effort with needs identified by local gov't, transit operators and MPO
North Central Texas Council of Governments	35 - 40%	5	Yes	N
Puget Sound Regional Council	80% ($2 billion)	N/A	Yes	Survey sent out by PSRC, State Highway System Plan, Ferry System Plan

N = Data Not Available

TABLE 7 PUBLIC INVOLVEMENT

Metropolitan Planning Organization	Manner of Meeting Notification (51)	Number of Official Meetings (52)	Meeting Locations (53)	Other Methods for Outreach (54)	Quality of Outreach Process (55)	Outreach Consultant (56)	Changes from Public Comment (57)
Pima Association of Governments	Newsletter, TV, radio, direct mailings	N	Different parts of the region	Newsletter, TV, radio, direct mailings	9	Yes	N
Maricopa Association of Governments	Meeting notice, agenda on web, outreach person	9	West, Central, & East parts of the region	Public hearing on freeway program, annual transit meeting	6	No	No
Metropolitan Transportation Commission	targeted mailings	N	Held at different locations	N	N	No, MTC has public info staff	Yes
San Diego Association of Governments	brochures; news ads; radio; web	N	No, staff was avail for presentations	ads in minoirty newspapers	8	Yes, did 60% of outreach	Yes
Southern California Association of Governments	Notice to all constituents to participate	N	MPO office few at diff locations	N	7	Yes, did 40% of outreach	Yes, input is taken seriously. All comments are documented
Miami Urbanizated Area Metropolitan	web; news ads; MPO newsletter	10	different locations	Include in mailings as they learn of them	9	Yes, did 50% of outreach	Yes
Atlanta Regional Commission	N	12	Mtgs held in each County	RTP has section on how it will meet low income & minority need	7	No	Yes
Metropolitan Area Planning Council	Mailing, contact list, newspaper	15 (3 series)	All around the region	Meeting notice in community newspapers, mailing.	4	No	No
Regional Transportation Commission of Clark County Nevada	Mailing notice, ads, Monthly T.V show, listing	15	Different parts of the region	Ads/news on different language newspapers/ TV shows, comm. fair	8	Yes, use Media Consultant	Yes
Metro	mailings; news ads; web	20 work-shops; 12 hearings	different locations	CAC set up to include under-represented	10	Yes	Yes, more than half of RTP projects from outreach process.
Houston-Galveston Area Council	newspaper ads; website; mail outs	around 6	different locations	N	5	No	Not yet, although it will happen

N = Data Not Available

TABLE 7 PUBLIC INVOLVEMENT

Metropolitan Planning Organization	Manner of Meeting Notification (51)	# of Official Meetings (52)	Meeting Locations (53)	Other Methods for Outreach (54)	Quality of Outreach Process (55)	Outreach Consultant (56)	Changes from Public Comment (57)
North Central Texas Council of Governments	aggressive mail list; news ads	6	different locations	ATA member list; minority newspapers	N	No	Some
Puget Sound Regional Council	Mailings, ads on local papers & mag. presentation, web	68	All Jurisdictions	Mailings, monthly newsletter, web	5	Yes	Yes, make changes based on public requests from review process

N = Data Not Available

TABLE 8 POLICIES AND USE OF INTERNET

Metropolitan Planning Organization	Time used for Vision Statement (58)	Level of Agreement on Goals/Objectives/Vision (59)					Land Use/ Transportation Connection (60)
		Local Gov't (59a)	Env. Groups (59b)	Business Community (59c)	Street and Hwy Agencies (59d)	Transit Operators (59e)	
Pima Association of Governments	N	8	N	N	8	7	Constrained growth allowed in plans, predicted demographic data factored into the plan
Maricopa Association of Governments	5%	5	5	5	5	5	Demographic model to incorporate regional plans to land use at proj. level
Metropolitan Transportation Commission	Same goals as 1994 plan	10	7.5	10	9	9	MTC puts dollars into Trans for Livable Communities
San Diego Association of Governments	15 - 20 %	9	6	7	8	8	Adopt a specific land use forecast which is the basis for the RTP
Southern California Association of Governments	5%	7	6	6	6	5	land use policies not directly addressed in RTP
Miami Urbanizated Area Metropolitan	5%	N	7	N	N	N	N
Atlanta Regional Commission	20%	10	5	8	10	10%	RTP contains a description of Livable Centers Initiative
Metropolitan Area Planning Council	Less than 1%	9	9	9	9	9	Transportation model does not deal with land use.
Regional Transportation Commission of Clark County Nevada	20%	3	4	5	7	8	Use forecasting model to relate land use & transportation connection
Metro	25%	9	7	8	7	9	Through 2040 growth concept that was dev prior to RTP
Houston-Galveston Area Council	goals did not significantly change	8	8	8	8	8	Look at demographic forecasts

N = Data Not Available

TABLE 8 POLICIES AND USE OF INTERNET

Metropolitan Planning Organization	Time used for Vision Statement (58)	Level of Agreement on Goals/Objectives/Vision (59)					Land Use/ Transportation Connection (60)
		Local Gov't (59a)	Env. Groups (59b)	Business Community (59c)	Street and Hwy Agencies (59d)	Transit Operators (59e)	
North Central Texas Council of Governments	15%	8	6	8	N	8	Sustainable dev Land use mentioned in plan
Puget Sound Regional Council	50%	10	8	7	10	10	Land use are supported by a multi-modal regional transportation system

Mean score

N = Data Not Available

TABLE 8 POLICIES AND USE OF INTERNET

Metropolitan Planning Organization	Land use Powers (61)	Success in improving the Quality of Transportation (62)	Information on the Internet (63)
Pima Association of Governments	No	N	Meeting notices, RTP summary, public opinion
Maricopa Association of Governments	No	7	Meeting notices, RTP summary, public opinion
Metropolitan Transportation Commission	No	7	Mtg notices
San Diego Association of Governments	No	8	RTP summary and full document mtg notices
Southern California Association of Governments	No	7	RTP summary and full document mtg notices
Miami Urbanizated Area Metropolitan	No	5	RTP summary and full document mtg notices
Atlanta Regional Commission	No	8	RTP summary and full document mtg notices
Metropolitan Area Planning Council	No	4	Meeting notices, RTP summary, RTP full document, public op.
Regional Transportation Commission of Clark County Nevada	No	7	Meeting notices, RTP summary, RTP full document, public op.
Metro	Yes	10	Mtg notices: RTP summary and full public comments
Houston-Galveston Area Council	No	6	Mtg notices; RTP summary and full document

N = Data Not Available

TABLE 8 POLICIES AND USE OF INTERNET

Metropolitan Planning Organization	Land use Powers (61)	Success in improving the Quality of Transportation (62)	Information on the Internet (63)
North Central Texas Council of Governments	No	N	Mtg notices RTP summary
Puget Sound Regional Council	N/A	7	Meeting notices RTP summary

N = Data Not Available

TABLE 9 CORRELATIONS STATISTICS BETWEEN SELECTED SURVEY QUESTIONS

		Cooperation with Local Gov't (25)	Degree of Coopertion with Significant Agencies (26)								
			Air Quality Dist. (26a)	Cities (26b)	Counties (26c)	Transit Operators (26d)	State DOT (26e)	U.S. DOT (26f)	Congestion Mgmt Agency (26g)	Airport Operators (26h)	Marine Ports (26i)
1997 Population (3)		-0.116	0.570	-0.042	0.118	-0.350	0.223	-0.013	0.414	0.264	0.172
Population Change (4)		0.183	0.298	0.256	0.032	0.032	0.535	0.327	0.277	0.316	0.545
% of Pop. Change (5)		-0.064	**-0.670***	0.014	-0.155	0.495	0.113	0.078	-0.632	-0.386	0.403
1997 Population Density (6)		-0.114	0.373	-0.227	-0.099	-0.047	-0.097	-0.204	0.208	0.166	-0.081
% of Pop. 25+ College Grad (7)		-0.047	0.267	-0.178	0.086	-0.493	-0.604	-0.165	0.478	0.076	-0.457
1994 Per Capita Income (8)		-0.344	-0.011	-0.408	-0.255	-0.111	-0.339	-0.401	0.012	-0.121	-0.242
Number of Govt's in Area (9)		0.006	0.431	-0.054	0.148	-0.387	0.174	0.031	0.405	0.240	0.074
Number of Govt's per Mil Pop. (10)		0.182	0.061	0.000	-0.004	-0.243	0.003	0.056	0.295	0.149	-0.154
1997 Hwy Lane Miles (11)		0.122	0.587	0.144	0.163	-0.224	0.411	0.119	0.550	0.362	0.415
Hwy Miles per 1000 Pop. (12)		0.341	0.092	0.245	-0.019	0.056	0.341	0.159	0.457	0.179	0.492
Year Formed (13)		0.085	0.091	0.006	0.227	0.044	0.375	0.253	0.257	0.025	0.287
Governing Board Members (15)		0.441	0.257	0.371	0.224	0.062	0.408	0.495	0.418	0.513	0.375
Largest City (% of Total Pop.) (17)		0.521	-0.086	0.527	**0.602***	0.292	0.398	0.591	0.070	0.338	0.349
Current Agency's Functions (18)		0.302	0.016	0.338	-0.382	0.363	0.081	0.385	0.137	0.305	0.351
Advisory Committees (22)		-0.114	0.254	0.056	-0.442	-0.396	-0.470	-0.435	0.809	0.156	-0.589
Time Needed to Complete Trans Plan (30)		0.147	0.059	0.201	-0.297	-0.167	0.019	0.193	0.282	0.054	0.049
Quality of Planning Data Used (41)	Land use/ Household Demog (41a)	0.498	0.258	0.489	0.108	0.242	0.458	**0.693***	0.315	0.418	0.626
	Traffic Projections (41b)	**0.848****	**0.605***	**0.804****	0.406	0.145	**0.615***	**0.755****	**0.881***	**0.812****	**0.866***
	Transit Projections (41c)	0.518	0.113	0.339	0.418	0.203	**0.376**	0.572	0.202	0.271	0.328
	Lifestyle/Structural Changes (41d)	0.591	0.557	0.592	0.305	0.155	**0.680***	0.385	0.618	0.266	0.718
	Econ. Projections (41e)	0.552	0.475	**0.617***	-0.007	0.280	**0.676***	0.249	0.504	0.232	**0.724***
	Demo. Projections (41f)	0.452	0.231	0.478	-0.386	**0.609***	0.547	0.382	0.295	0.466	**0.914***
	NonMotorized Modes (41g)	0.087	0.357	0.133	0.122	-0.094	0.008	-0.081	0.481	0.233	0.268
	Impacts of Technology (41h)	**0.617***	**0.791****	**0.719***	0.477	0.052	0.591	0.493	**0.897***	**0.678***	0.806
	Freight/Goods Movement (41i)	0.451	0.406	0.556	0.151	0.200	0.368	0.162	0.471	0.428	**0.829***
	Safety/Accident (41j)	0.253	0.432	0.243	0.369	0.004	0.088	0.369	0.775	0.273	0.159
	Air Quality (41k)	**0.765****	0.372	**0.762****	0.168	0.416	**0.683***	0.557	0.541	0.442	**0.806***
	Other Management System (41l)	-0.122	0.202	0.007	0.263	0.045	-0.061	-0.196	0.693	0.022	0.982
% Budget for Operations/Maintenance (47)		0.328	0.149	0.433	-0.228	0.321	-0.012	0.066	0.673	0.288	0.346
Importance of Adding Capacity (48)		-0.277	0.075	-0.151	0.039	-0.092	-0.150	0.067	0.122	0.084	-0.200
Number of Official Meetings (52)		-0.224	0.141	-0.042	**-0.773***	-0.308	-0.469	-0.483	-0.866	-0.021	-0.017
Time used for Vision Statement (58)		0.051	-0.104	0.185	**-0.788***	-0.025	-0.169	-0.350	-0.632	-0.034	0.179

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

TABLE 9 CORRELATIONS STATISTICS BETWEEN SELECTED SURVEY QUESTIONS

		Agreement on Project Priorities (39)	Quality of Outreach Process (55)	Level of agreement on goals/objectives/vision (59)					Success in Improving the Quality of Trans. (62)
				Local Gov't (59a)	Env. Groups (59b)	Business Community (59c)	Street and Hwy Agencies (59d)	Transit Operators (59e)	
1997 Population (3)		0.083	-0.270	0.084	0.147	0.055	-0.187	-0.387	-0.184
Population Change (4)		0.205	-0.182	-0.209	-0.386	-0.328	-0.353	-0.436	0.163
% of Pop. Change (5)		0.290	0.230	**-0.756****	**-0.754****	**-0.648***	-0.318	-0.096	0.288
1997 Population Density (6)		-0.042	-0.229	**0.683***	**0.613***	**0.849****	0.547	0.425	-0.544
% of Pop. 25+ College Grad (7)		-0.474	-0.537	**0.872****	**0.636***	**0.838****	**0.623***	0.458	-0.087
1994 Per Capita Income (8)		**-0.652***	**-0.663***	0.462	0.554	**0.786****	0.567	**0.595***	-0.273
Number of Govt's in Area (9)		-0.496	-0.535	0.219	0.294	0.331	0.069	-0.127	-0.294
Number of Govt's per Mil Pop. (10)		**-0.849****	**-0.695***	0.383	0.374	0.501	0.556	0.326	-0.222
1997 Hwy Lane Miles (11)		-0.165	-0.306	0.240	0.077	0.236	0.000	-0.206	0.008
Hwy Miles per 1000 Pop. (12)		-0.561	-0.199	0.409	-0.105	0.323	0.443	0.357	0.408
Year Formed (13)		0.272	-0.149	0.103	-0.340	0.108	-0.023	-0.720	0.130
Governing Board Members (15)		-0.531	-0.434	-0.019	0.139	-0.006	-0.109	-0.197	-0.010
Largest City (% of Total Pop.) (17)		0.168	0.217	-0.411	-0.199	-0.411	-0.446	-0.445	0.229
Current Agency's Functions (18)		0.213	0.436	-0.055	-0.331	-0.420	-0.348	-0.221	0.311
Advisory Committees (22)		0.179	-0.312	**0.653***	**0.632***	0.430	0.594	0.561	0.299
Time Needed to Complete Trans Plan (30)		0.556	0.339	0.122	-0.324	-0.324	-0.248	-0.143	0.517
Quality of Planning Data Used (41)	Land use/ Household Demog (41a)	0.231	0.590	0.038	-0.295	0.032	-0.372	-0.100	0.591
	Traffic Projections (41b)	-0.071	0.398	0.331	0.054	0.258	-0.216	-0.159	0.484
	Transit Projections (41c)	-0.056	0.369	0.181	0.094	0.583	0.018	0.256	0.185
	Lifestyle/Structural Changes (41d)	-0.054	**0.831***	0.258	-0.282	0.360	0.089	0.247	**0.730***
	Econ. Projections (41e)	-0.118	**0.792****	0.191	-0.444	0.107	0.110	0.181	**0.603***
	Demo. Projections (41f)	-0.146	0.245	0.165	-0.380	-0.036	0.090	0.142	0.391
	NonMotorized Modes (41g)	-0.464	0.122	0.349	0.466	0.519	0.267	0.300	0.098
	Impacts of Technology (41h)	0.082	0.626	0.148	0.040	0.158	-0.276	-0.317	0.460
	Freight/Goods Movement (41i)	-0.384	0.488	0.077	0.173	0.190	0.043	0.137	0.320
	Safety/Accident (41j)	0.441	0.503	0.225	0.045	0.308	-0.173	-0.165	0.235
	Air Quality (41k)	0.091	**0.707***	0.126	-0.386	0.077	-0.068	0.038	0.569
	Other Management System (41l)	0.244	0.442	0.052	0.364	0.316	0.130	0.340	0.062
% Budget for Operations/Maintenance (47)		0.090	0.337	0.446	0.285	0.356	0.224	0.384	0.395
Importance of Adding Capacity (48)		0.524	-0.254	-0.469	-0.168	-0.584	**-0.686***	**-0.844****	-0.326
Number of Official Meetings (52)		-0.214	-0.096	0.418	0.331	-0.013	0.424	0.507	0.298
Time used for Vision Statement (58)		-0.440	-0.009	0.353	0.098	0.042	0.533	0.620	0.471

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

TABLE 10

RELATIONSHIPS BETWEEN LAND AREA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.4790[b]
Degree of Cooperation with:	
Air Quality Districts	-0.4761[b]
Cities	-0.4728
Counties	-0.2645
Transit Operators	-0.2936
State DOT	0.0412
US DOT	-0.6230[b]
Congestion Management Agency	-0.4243
Airport Operator	-0.1284
Marine Ports	-0.4562
Agreement on Project Priorities	0.2505
Quality of Outreach Process	-0.2456
Agreement on Goals/Objectives with:	
Local Government	-0.8896[e]
Environmental Groups	-0.6323[c]
Business Community	-0.8080[d]
Street/ Highway Agencies	-0.6847[c]
Transit Operators	-0.1178
Success in Improving the Quality of Transportation	-0.1826

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 11

RELATIONSHIPS BETWEEN POPULATION AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.4103
Degree of Cooperation with:	
Air Quality Districts	-0.6198[c]
Cities	-0.0459
Counties	0.2008
Transit Operators	-0.5814[c]
State DOT	0.2293
US DOT	-0.0952
Congestion Management Agency	0.4518
Airport Operator	0.2530
Marine Ports	0.0757
Agreement on Project Priorities	0.4932[b]
Quality of Outreach Process	0.6357[c]
Agreement on Goals/Objectives with:	
Local Government	-0.5599[b]
Environmental Groups	-0.3335
Business Community	-0.3485
Street/ Highway Agencies	-0.8155[d]
Transit Operators	0.4932
Success in Improving the Quality of Transportation	-0.4183

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 12

RELATIONSHIPS BETWEEN POPULATION CHANGE AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.1986
Degree of Cooperation with:	
Air Quality Districts	-0.8432[e]
Cities	-0.2258
Counties	-0.2073
Transit Operators	0.6225[c]
State DOT	0.4228
US DOT	0.3261
Congestion Management Agency	-0.9648[c]
Airport Operator	-0.5378[b]
Marine Ports	0.7197
Agreement on Project Priorities	0.5094[b]
Quality of Outreach Process	0.2518
Agreement on Goals/Objectives with:	
Local Government	-0.8134[e]
Environmental Groups	-0.7978[e]
Business Community	-0.6519[c]
Street/ Highway Agencies	-0.4756
Transit Operators	-0.4074
Success in Improving the Quality of Transportation	0.3642

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 13

RELATIONSHIPS BETWEEN POPULATION DENSITY AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.2502
Degree of Cooperation with:	
Air Quality Districts	0.5247[b]
Cities	-0.3371
Counties	-0.3432
Transit Operators	0.5581[b]
State DOT	0.2972
US DOT	-0.2902
Congestion Management Agency	0.4474
Airport Operator	-0.3366
Marine Ports	-0.6509
Agreement on Project Priorities	-0.7332[c]
Quality of Outreach Process	-0.6647[c]
Agreement on Goals/Objectives with:	
Local Government	0.6558[c]
Environmental Groups	0.6464[c]
Business Community	0.8583[e]
Street/ Highway Agencies	0.6663[c]
Transit Operators	-0.4276
Success in Improving the Quality of Transportation	-0.5930[b]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 14

RELATIONSHIPS BETWEEN PERCENT COLLEGE GRADUATES + 1990 POPULATION AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.4109
Degree of Cooperation with:	
Air Quality Districts	0.7147[c]
Cities	0.6515[c]
Counties	-0.3081
Transit Operators	0.6051[c]
State DOT	-0.6531[c]
US DOT	-0.5351
Congestion Management Agency	0.6101[c]
Airport Operator	-0.7019[c]
Marine Ports	-0.8203[b]
Agreement on Project Priorities	-0.3009
Quality of Outreach Process	-0.4452
Agreement on Goals/Objectives with:	
Local Government	0.6827[c]
Environmental Groups	0.5244[b]
Business Community	0.8211[e]
Street/ Highway Agencies	0.7794[e]
Transit Operators	0.4456
Success in Improving the Quality of Transportation	0.3742

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 15

RELATIONSHIPS BETWEEN PER CAPITA INCOME AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.3245
Degree of Cooperation with:	
Air Quality Districts	0.7745[c]
Cities	-0.6339[c]
Counties	0.6187[b]
Transit Operators	0.1878
State DOT	-0.5720[b]
US DOT	-0.6130[b]
Congestion Management Agency	0.9598[c]
Airport Operator	-0.5170
Marine Ports	-0.8365[b]
Agreement on Project Priorities	-0.8128[d]
Quality of Outreach Process	-0.6614[c]
Agreement on Goals/Objectives with:	
Local Government	0.5685[b]
Environmental Groups	0.6499[c]
Business Community	0.8254[e]
Street/ Highway Agencies	0.8226[c]
Transit Operators	0.4711[b]
Success in Improving the Quality of Transportation	0.2935

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 16

RELATIONSHIPS BETWEEN NUMBER OF GOVERNMENTS AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.4258
Degree of Cooperation with:	
Air Quality Districts	0.5479[b]
Cities	0.2452
Counties	0.5105[b]
Transit Operators	-0.4817[b]
State DOT	0.5937[c]
US DOT	0.2407
Congestion Management Agency	0.4278
Airport Operator	0.5163[b]
Marine Ports	0.2977
Agreement on Project Priorities	-0.6711[c]
Quality of Outreach Process	-0.5555[b]
Agreement on Goals/Objectives with:	
Local Government	0.7148[c]
Environmental Groups	0.5040[b]
Business Community	0.4365
Street/ Highway Agencies	-0.5115[b]
Transit Operators	0.4634
Success in Improving the Quality of Transportation	-0.6363[b]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 17

RELATIONSHIPS BETWEEN NUMBER OF GOVERNMENTS PER CAPITA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.1041
Degree of Cooperation with:	
Air Quality Districts	0.6120[b]
Cities	0.2993
Counties	0.2582
Transit Operators	-0.2849
State DOT	0.6890[c]
US DOT	0.0532
Congestion Management Agency	0.5019
Airport Operator	0.5092[b]
Marine Ports	0.8611[c]
Agreement on Project Priorities	0.5138[b]
Quality of Outreach Process	-0.4768
Agreement on Goals/Objectives with:	
Local Government	0.4477
Environmental Groups	-0.2527
Business Community	-0.2428
Street/ Highway Agencies	0.1662
Transit Operators	-0.6076[c]
Success in Improving the Quality of Transportation	0.6008[b]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 18

RELATIONSHIPS BETWEEN HIGHWAY MILES PER CAPITA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.1255
Degree of Cooperation with:	
Air Quality Districts	0.5611[b]
Cities	0.3117
Counties	0.2601
Transit Operators	-0.2827
State DOT	0.6261[c]
US DOT	-0.1455
Congestion Management Agency	0.5525
Airport Operator	0.2290
Marine Ports	0.5450
Agreement on Project Priorities	0.2662
Quality of Outreach Process	-0.2131
Agreement on Goals/Objectives with:	
Local Government	0.4241
Environmental Groups	-0.3797
Business Community	0.2079
Street/ Highway Agencies	0.3308
Transit Operators	-0.6761[c]
Success in Improving the Quality of Transportation	0.3263

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 19

RELATIONSHIPS BETWEEN MPO AGE AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.1827
Degree of Cooperation with:	
Air Quality Districts	0.0956
Cities	0.1313
Counties	0.5336[b]
Transit Operators	0.2223
State DOT	0.6202[c]
US DOT	0.4256
Congestion Management Agency	0.4341
Airport Operator	0.0818
Marine Ports	0.2551
Agreement on Project Priorities	0.4046
Quality of Outreach Process	-0.1891
Agreement on Goals/Objectives with:	
Local Government	0.1034
Environmental Groups	-0.3931
Business Community	-0.5422[b]
Street/ Highway Agencies	-0.1424
Transit Operators	-0.8215[e]
Success in Improving the Quality of Transportation	0.2133

[a] two-tailed t-test yields $p>0.100$ unless otherwise noted
[b] t-test yields $p<0.100$
[c] t-test yields $p<0.050$
[d] t-test yields $p<0.010$
[e] t-test yields $p<0.005$
Source: Compiled by authors

TABLE 20

RELATIONSHIPS BETWEEN NUMBER OF GOVERNING BOARD MEMBERS AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.5366[b]
Degree of Cooperation with:	
Air Quality Districts	0.3243
Cities	0.6911[c]
Counties	0.8205[d]
Transit Operators	0.2988
State DOT	0.7819[d]
US DOT	0.6652[c]
Congestion Management Agency	0.5623
Airport Operator	0.7690[d]
Marine Ports	0.8318[b]
Agreement on Project Priorities	0.2863
Quality of Outreach Process	0.6651[c]
Agreement on Goals/Objectives with:	
Local Government	0.2822
Environmental Groups	0.2806
Business Community	0.5013[b]
Street/ Highway Agencies	0.1713
Transit Operators	0.3818
Success in Improving the Quality of Transportation	0.2156

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 21

RELATIONSHIPS BETWEEN PERCENT CENTRAL CITY SIZE AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.5355[b]
Degree of Cooperation with:	
Air Quality Districts	0.4638
Cities	0.6068[b]
Counties	0.7596[c]
Transit Operators	0.1040
State DOT	0.4313
US DOT	0.6305[c]
Congestion Management Agency	0.8249
Airport Operator	0.6613[c]
Marine Ports	0.1035
Agreement on Project Priorities	0.4502
Quality of Outreach Process	-0.4677
Agreement on Goals/Objectives with:	
Local Government	-0.4372
Environmental Groups	-0.2430
Business Community	-0.3585
Street/ Highway Agencies	-0.4787[b]
Transit Operators	0.4189
Success in Improving the Quality of Transportation	0.2819

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 22

RELATIONSHIPS BETWEEN NUMBER OF MPO FUNCTIONS AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.1862
Degree of Cooperation with:	
Air Quality Districts	0.0199
Cities	0.1792
Counties	0.0546
Transit Operators	-0.3775
State DOT	-0.1464
US DOT	0.3581
Congestion Management Agency	0.4598
Airport Operator	0.1434
Marine Ports	-0.3873
Agreement on Project Priorities	0.6779[c]
Quality of Outreach Process	0.1584
Agreement on Goals/Objectives with:	
Local Government	-0.3109
Environmental Groups	-0.4444
Business Community	-0.4457
Street/ Highway Agencies	-0.3486
Transit Operators	-0.2613
Success in Improving the Quality of Transportation	0.6411[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 23

RELATIONSHIPS BETWEEN NUMBER OF MPO ADVISORY COMMITTEES AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.2897
Degree of Cooperation with:	
Air Quality Districts	0.3159
Cities	0.5975[b]
Counties	-0.6055[b]
Transit Operators	0.0581
State DOT	-0.0690
US DOT	0.1821
Congestion Management Agency	0.9460[c]
Airport Operator	0.3926
Marine Ports	0.3868
Agreement on Project Priorities	0.6367[c]
Quality of Outreach Process	0.2913
Agreement on Goals/Objectives with:	
Local Government	0.6410[c]
Environmental Groups	0.3909
Business Community	0.2405
Street/ Highway Agencies	0.4553
Transit Operators	0.4798[b]
Success in Improving the Quality of Transportation	0.6461[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 24

RELATIONSHIPS BETWEEN TIME TO COMPLETE RTP AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.2884
Degree of Cooperation with:	
Air Quality Districts	0.4457
Cities	0.6134[b]
Counties	0.2471
Transit Operators	-0.2873
State DOT	0.2385
US DOT	0.6163[b]
Congestion Management Agency	0.9470[c]
Airport Operator	0.4374
Marine Ports	0.4889
Agreement on Project Priorities	0.8248[d]
Quality of Outreach Process	0.4141
Agreement on Goals/Objectives with:	
Local Government	0.5199[b]
Environmental Groups	-0.5904[b]
Business Community	-0.4464
Street/ Highway Agencies	0.3421
Transit Operators	-0.5306[b]
Success in Improving the Quality of Transportation	0.6791[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 25

RELATIONSHIPS BETWEEN QUALITY OF TRAFFIC PROJECTION DATA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.9186[e]
Degree of Cooperation with:	
Air Quality Districts	0.5580[b]
Cities	0.8992[e]
Counties	0.6539[c]
Transit Operators	0.1917
State DOT	0.6761[c]
US DOT	0.8479[e]
Congestion Management Agency	0.9111[b]
Airport Operator	0.8004[e]
Marine Ports	0.8735[c]
Agreement on Project Priorities	0.5680[b]
Quality of Outreach Process	0.4850
Agreement on Goals/Objectives with:	
Local Government	0.7065[c]
Environmental Groups	0.3211
Business Community	0.7160[c]
Street/ Highway Agencies	0.1469
Transit Operators	0.0605
Success in Improving the Quality of Transportation	0.6262[b]

[a] two-tailed t-test yields p>0.100 unless otherwise noted
[b] t-test yields p<0.100
[c] t-test yields p<0.050
[d] t-test yields p<0.010
[e] t-test yields p<0.005
Source: Compiled by authors

TABLE 26

RELATIONSHIPS BETWEEN QUALITY OF IMPACT OF TECHNOLOGY DATA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.6610[c]
Degree of Cooperation with:	
Air Quality Districts	0.8495[d]
Cities	0.7737[d]
Counties	0.5180
Transit Operators	-0.8460e
State DOT	0.6225[c]
US DOT	0.5789
Congestion Management Agency	0.9964[c]
Airport Operator	0.6297[c]
Marine Ports	0.8159
Agreement on Project Priorities	0.6918[c]
Quality of Outreach Process	0.7787[d]
Agreement on Goals/Objectives with:	
Local Government	0.6564[c]
Environmental Groups	0.5038
Business Community	0.5052
Street/ Highway Agencies	0.2805
Transit Operators	0.3418
Success in Improving the Quality of Transportation	0.7984[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 27

RELATIONSHIPS BETWEEN QUALITY OF AIR QUALITY DATA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.8808[e]
Degree of Cooperation with:	
Air Quality Districts	0.5980[b]
Cities	0.8636[e]
Counties	0.6116[b]
Transit Operators	0.4305
State DOT	0.7255[c]
US DOT	0.6411[c]
Congestion Management Agency	0.6744
Airport Operator	0.4789
Marine Ports	0.9267[c]
Agreement on Project Priorities	0.6247[c]
Quality of Outreach Process	0.7560[d]
Agreement on Goals/Objectives with:	
Local Government	0.6294[b]
Environmental Groups	-0.4689
Business Community	0.3912
Street/ Highway Agencies	0.6085[b]
Transit Operators	-0.4466
Success in Improving the Quality of Transportation	0.6765[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 28

RELATIONSHIPS BETWEEN QUALITY OF LIFESTYLE CHANGE DATA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.7395[c]
Degree of Cooperation with:	
Air Quality Districts	0. 6411[b]
Cities	0.7396[c]
Counties	0.7801[c]
Transit Operators	0.0158
State DOT	0.8044[c]
US DOT	0.4592
Congestion Management Agency	0.0058
Airport Operator	0.0960
Marine Ports	0.9981[c]
Agreement on Project Priorities	0.5830
Quality of Outreach Process	0.9867[e]
Agreement on Goals/Objectives with:	
Local Government	0.7968[c]
Environmental Groups	0.4653
Business Community	0.6575[b]
Street/ Highway Agencies	0.5127
Transit Operators	0.3186
Success in Improving the Quality of Transportation	0.9109[d]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 29

RELATIONSHIPS BETWEEN QUALITY OF ECONOMIC PROJECTION DATA AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.7194[c]
Degree of Cooperation with:	
Air Quality Districts	0.7525[c]
Cities	0.7927[d]
Counties	0.6371[c]
Transit Operators	0.6384
State DOT	0.8108[d]
US DOT	0.3780
Congestion Management Agency	0.5478
Airport Operator	0.2208
Marine Ports	0.8581[c]
Agreement on Project Priorities	0.5916[b]
Quality of Outreach Process	0.9091[e]
Agreement on Goals/Objectives with:	
Local Government	0.6125[b]
Environmental Groups	-0.5813[b]
Business Community	0.2520
Street/ Highway Agencies	0.7405[c]
Transit Operators	0.4192
Success in Improving the Quality of Transportation	0.6782[c]

[a] two-tailed t-test yields $p>0.100$ unless otherwise noted
[b] t-test yields $p<0.100$
[c] t-test yields $p<0.050$
[d] t-test yields $p<0.010$
[e] t-test yields $p<0.005$
Source: Compiled by authors

TABLE 30

ELATIONSHIPS BETWEEN PERCENT BUDGET FOR OPERATIONS/MAINTENANCE AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	0.4730
Degree of Cooperation with:	
Air Quality Districts	-0.5663
Cities	0.5248
Counties	-0.6234
Transit Operators	0.3567
State DOT	-0.4507
US DOT	-0.4091
Congestion Management Agency	0.4295
Airport Operator	0.3860
Marine Ports	0.6502
Agreement on Project Priorities	0.8603[c]
Quality of Outreach Process	0.5638
Agreement on Goals/Objectives with:	
Local Government	0.9052[e]
Environmental Groups	0.5024
Business Community	0.3991
Street/ Highway Agencies	0.5604
Transit Operators	0.5536
Success in Improving the Quality of Transportation	0.8521[c]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 31

RELATIONSHIPS BETWEEN IMPORTANCE OF ADDING CAPACITY AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.5082
Degree of Cooperation with:	
Air Quality Districts	0.2833
Cities	-0.6134[b]
Counties	-0.2436
Transit Operators	-0.2023
State DOT	-0.5270
US DOT	0.2030
Congestion Management Agency	0.9724[b]
Airport Operator	0.2743
Marine Ports	0.9383
Agreement on Project Priorities	0.3534
Quality of Outreach Process	-0.5178
Agreement on Goals/Objectives with:	
Local Government	-0.8232[d]
Environmental Groups	-0.2763
Business Community	-0.7823[c]
Street/ Highway Agencies	-0.7521[c]
Transit Operators	-0.2365
Success in Improving the Quality of Transportation	-0.6290[b]

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 32

RELATIONSHIPS BETWEEN NUMBER OF OFFICIAL MEETINGS AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.2517
Degree of Cooperation with:	
Air Quality Districts	0.2278
Cities	02152
Counties	-0.8026[c]
Transit Operators	-0.4109
State DOT	-0.5251
US DOT	-0.6167[b]
Congestion Management Agency	0.1018
Airport Operator	0.1766
Marine Ports	0.5180
Agreement on Project Priorities	0.4179
Quality of Outreach Process	0.2123
Agreement on Goals/Objectives with:	
Local Government	0.5704
Environmental Groups	0.4654
Business Community	0.4534
Street/ Highway Agencies	0.6253
Transit Operators	0.6138[b]
Success in Improving the Quality of Transportation	0.5221

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors

TABLE 33

RELATIONSHIPS BETWEEN TIME USED FOR VISION STATEMENT AND INDICATORS OF MPO EFFECTIVENESS

Effectiveness Indicator	Partial Correlation Coefficient[a] (n=13)
Cooperation with Local Government	-0.0684
Degree of Cooperation with:	
Air Quality Districts	0.1584
Cities	0.3226
Counties	-0.9000[d]
Transit Operators	0.3135
State DOT	-0.4761
US DOT	-0.4810
Congestion Management Agency	0.0794
Airport Operator	0.4239
Marine Ports	0.9407[c]
Agreement on Project Priorities	0.2828
Quality of Outreach Process	-0.4316
Agreement on Goals/Objectives with:	
Local Government	0.4197
Environmental Groups	0.4284
Business Community	-0.5840
Street/ Highway Agencies	0.5041
Transit Operators	0.5815
Success in Improving the Quality of Transportation	0.2239

[a]two-tailed t-test yields p>0.100 unless otherwise noted
[b]t-test yields p<0.100
[c]t-test yields p<0.050
[d]t-test yields p<0.010
[e]t-test yields p<0.005
Source: Compiled by authors