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Operations and Management Activities Within the Transportation Planning Process

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Foreword

This paper was prepared by staff of the U.S. Department of Transportation's (U.S. DOT) John A. Volpe National Transportation Systems Center (Volpe Center) for the Federal Highway Administration's Office of Metropolitan Planning and Programs. Messrs. David W. Jackson and Allan J. DeBlasio of the Center's Economic Analysis Division are the authors. Mr. DeBlasio is the project leader and should be contacted concerning comments on this report at (617) 494-2032. Messrs. Douglas Laird and Brian Gardner of the Office of Metropolitan Planning and Programs provide overall direction of the project.

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Operations and Management Activities Within the Transportation Planning Process

Since 1997, research staff from the U.S. Department of Transportation's John A. Volpe National Transportation Systems Center (Volpe Center) have been working with the Federal Highway Administration's Office of Metropolitan Planning and Programs to assess how operations and management activities are incorporated into the metropolitan transportation planning process. The Volpe Center team has supplemented this work with a variety of related work that has been performed by team members and other Volpe Center staff.

This research began with a review of the degree to which intelligent transportation systems (ITS) solutions are included in planning documents. Afterward, successful strategies for mainstreaming ITS into the transportation planning process at ten metropolitan areas were examined. Current work is venturing beyond the ITS programs to discover the depth and breadth of the coverage of operations and management functions in the planning process.

As noted, this learning process has been multi-layered. Thankfully, we have seen that the more recent findings built on and reinforced previous findings, and have not contradicted them. This indicates a sound methodology and openness by those administrators, policy makers, planners, operators, and other field staff interviewed during this extensive work.

Findings from Previous Work

Some previous work did not specifically target the metropolitan planning process or metropolitan planning organizations (MPOs). This work started with an assessment of ITS deployment in seven metropolitan areas (Boston, Denver, Miami-Fort Lauderdale, Milwaukee, Phoenix, Pittsburgh, and St. Louis) and within the four metropolitan model deployment initiative sites (New York-New Jersey-Connecticut, Phoenix, San Antonio, and Seattle).

Staff also participated in other projects that added to the findings of this report. The first was a project within the ITS User Research Program. This project identified transportation investment decision-making at the state and local level and specific insight into ITS deployment opportunities and obstacles faced by state and local transportation managers. Staff assisted in site visits to 13 metropolitan areas. The findings of this project are included in the report, *Marketing ITS Infrastructure in the Public Interest*, which identified education, information, and outreach strategies that can be used to accelerate the deployment of ITS products and services.

The second was within the ITS Professional Capacity Building Program, which identified the training and education needs of transportation professionals in the ITS community. Staff assisted with interviews and course development.

Findings from these ITS assessment projects that have proven applicable to operations and management (O&M) initiatives fell into two categories – *motivation* and *interaction*. *Motivation* concentrated on why agencies deployed advanced technologies. *Interaction* revealed what relationships lead to successful ITS deployments.

Regarding motivation, there were a number of characteristics that effect an area's willingness to deploy advanced technologies. The specific characteristics range from high levels of congestion to agency administrators' openness to change. Transportation officials have primarily introduced advanced technologies to address a specific need or in response to a mandate. Officials from state departments of transportation appeared to have similar motivations to pursue technologies. Similar motivations were also apparent among other common agencies, with the exception of transit agencies and MPOs, which speaks to the independence and variations among these types of agencies. Likewise, representatives of transportation agencies within a metropolitan area are not always motivated by the same factors.

Regarding interaction, the Volpe Center team discovered that any established or increased interaction among metropolitan transportation officials increases the likelihood that the various system elements will be integrated. Regional planning efforts for specific purposes, such as an early deployment planning (EDP) study, have been instrumental in creating forums that foster agency interaction. Specific federal planning funds have also been effective in facilitating regional planning activities and increasing interaction. Staffs of the state departments of transportation and the MPOs generally have good relationships, but interaction from activity to activity is not consistent.

The level of involvement by each type of agency varies from metropolitan area to metropolitan area and is dependent on a few characteristics. Initially, differing agency priorities may hamper interaction among agencies. Transportation officials may have a false impression of other agencies' priorities. These false impressions may be overcome through involvement in regional transportation activities. The level of involvement by municipal transportation officials in these activities, however, is dependent on the lead agency, the structure of the program or project steering committee, and the area's geo-political structure.

Findings from Work Involving MPOs

Three Volpe Center projects assessed MPO practices and the related practices of the area operating agencies to gauge the ITS activities that were being included in the planning process and performed by the regional planning organizations. The first undertaking reviewed the level to which ITS solutions are included in congestion management system (CMS) plans and the extent to which regional architectures are

developed in EDP studies. This project included telephone interviews with authors of the 21 EDP reports and 16 CMS documents reviewed.

The second project was called *The Capability of ITS to Provide System Performance Data*, which reviewed the current state-of-the-art use of ITS data for transportation planning in metropolitan areas and the potential impact of ITS on transportation data collection and planning practices. This research included site visits to the Chicago, Detroit, Minneapolis-St. Paul, and San Antonio Metropolitan Areas.

The third research activity targeting MPOs was entitled *Incorporating ITS into the Planning Process*. This 1999 work included discussions with federal, state, transit, regional, and municipal staffs and policy makers at 10 metropolitan areas regarding efforts to mainstream ITS activities within the metropolitan transportation planning process. Site visits and documented reports were produced for Chicago, Dallas-Fort Worth, Los Angeles, and Miami Metropolitan Areas. Findings from these MPO and planning research projects that have proven applicable to operations and management initiatives fell under four subjects – interaction between planners and operators, committees, regional programs, and the role of the MPO.

The Volpe Center team found that much of the interaction between planners and operators often occur by happenstance, but there are some formal and informal structures that have been developed to alleviate this problem. Planners often lack knowledge of operations or engineering concepts and are rarely included during development of the system concept and design. Planners and operators agreed that planners could use education or training regarding these non-planning functions.

Committees, both within and outside the MPO structure, are instrumental in bringing representatives from different modes and jurisdictions together. These committees may consist entirely of elected officials, transportation officials, technical staff performing planning and operations functions, or a combination of these groups. The purpose of these committees range from educating members on various topics to its member organizations working together to solve transportation problems. It is very important to note that when these committees develop innovative solutions, elected officials or upper management must endorse the solutions, be it a change in operations or the incorporation of new technologies or procedures. Evidence of this endorsement should be noted in planning documents, such as the regional transportation plans, or other policy documents.

Like committees, regional programs improve communication and coordination across modes and jurisdictions. These programs can be either independent of the MPO or coordinated by the MPO. They can include the implementation of new technologies, incident management, traffic signal coordination projects, development of a regional ITS architecture, and sharing of construction information. A dedicated source of funding for these regional programs provides increased communications and coordination.

Transportation professionals within each area have differing opinions on the role of the MPO. The opinions are based on the geographic location of the area, the mode or jurisdiction, or the previous experience of working with the MPO. Some noted that because advanced technologies have not been routinely considered in most metropolitan planning processes, there is no clearly defined and established role for most MPOs. Others noted that the experience of MPO staff with advanced technologies is increasing. In the course of developing congestion management systems, MPO staff address traffic management issues through monitoring, controls, and traveler information systems.

Findings from the Current Review of Systems Operations and Management in the Planning Process

Since the fall of 1999, Volpe Center staff has been reviewing metropolitan transportation documents and interviewing planners, operators, and other transportation professionals from a number of metropolitan areas. This research has included the analysis of approximately 75 uniform planning work programs (UPWPs), transportation improvement programs (TIPs), regional transportation plans, and ITS strategic plans. The purpose of this research is to study how the transportation officials in each region has incorporated O&M functions into their transportation planning processes and what issues have arisen in merging these functions within the planning process.

The myriad of ITS programs and projects in metropolitan areas has caused transportation professionals to consider O&M more closely. Aside from traditional transit operation concerns, ride sharing programs, and motorist assistance patrols, ITS projects encompass an ever-increasing proportion of O&M concerns in many metropolitan areas. It is understood, however, that O&M issues are broader than just ITS concerns. This current work seeks to expand what was learned regarding O&M and ITS considerations to a wider range of O&M planning issues.

The Volpe Center team reviewed documents and conducted telephone interviews with transportation professionals from the Chicago, Columbus, Dallas-Fort Worth, Des Moines, Miami, Portland, and San Diego Metropolitan Areas and has developed preliminary findings. As the team interviews additional professionals and performs in-depth site visits, the involvement of MPOs in O&M activities will become more detailed. Successful strategies will be outlined and made available for transportation agencies in the other metropolitan areas to utilize.

The review of planning documents revealed that the quality and level of detail of UPWPs and TIPs vary from area to area. Although the current round of UPWPs do include as one of the seven planning factors, "*promoting efficient system management and operations,*" some plans do not provide sufficient information to assess the level of the MPO involvement in O&M activities or indicate how much analysis of actual O&M impacts has occurred. It appears that the MPO staffs are now grappling with what this factor actually means and how to satisfy it.

Likewise, modifications to TIP project selection criteria will probably be needed before most agencies will examine O&M impacts of projects. In some areas, however, the MPOs are already using long-range transportation plans to set policy requiring the examination of the full life-cycle costs of at least some of the major projects, if not all projects listed in the transportation plan. This includes the examination of O&M costs. If these policies are stated, then the TIP development process will follow with a more detailed review of O&M impacts on projects being prioritized and listed in the document.

In areas where there is a large MPO staff and a small number of public agencies, MPO staff appear to have time to understand the operations of member agencies. Unfortunately, there are many areas where the MPO staff are already overburdened by fulfilling current planning mandates. It is not clear if all of the MPO staffs can accommodate the added demand of reviewing O&M impacts from projects.

There are potential activities in which MPOs could be linked to O&M or have access to O&M data, but there are few areas where this is actually occurring. Surprisingly, even in areas where there is a strong culture of planning, there is still a disconnect between the operations and planning functions. There are a number of activities where MPO staffs are now directly or indirectly involved in operations and management within a metropolitan area:

- Data collection
- Information generation
- Database generation
- Model refinement
- Regional information center or data clearinghouse
- Geographic information systems (GIS) mapping
- Software and hardware computer training for operating agencies
- Web site management with inputs from member agencies
- Congestion management system analysis
- Transportation demand management (TDM) programs
- Transportation system management (TSM) programs
- TDM program coordinated with major construction
- Rideshare programs
- Intermodal management system or freight movement planning with ports and private sector
- Corridor studies
- Transit project evaluation
- Transit operations
- Project surveillance, monitoring, and performance measures or assessment
- Financial forecasting
- Financial plan for metropolitan transportation plan
- Technical assistance by MPO to determine financing mechanisms
- Signal timing assistance
- Roadway design (including road geometric) assistance
- 911 emergency telephone system development
- Management of motorist assistance programs
- Advanced traveler information system (ATIS) development and management
- ITS cost and needs plan
- National ITS Architecture consistency

- Coordination of multi-jurisdictional proposals, projects, and programs
- Coordination of operations working groups

Summary

There are already federal planning mandates dictating some level of involvement by MPO staffs with the operations and management aspects of TDM, TSM, and CMS programs. ITS initiatives have also been instrumental in showing the MPO as providing forums that can bring operating agencies together and create multi-jurisdictional projects. These experiences have enabled MPO staffs to become more involved with regional traffic signal efforts, incident management, and even traffic and transit information systems. Many MPOs are assuming roles as the regional database managers and are increasing their staff expertise in hardware and software systems. Nevertheless, we are far from the desired stance in which MPO boards and staffs can discuss O&M issues with the same knowledge and comfort that they have for capital projects.

Authors' Information

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Mr. David W. Jackson is also employed at the Volpe Center's Economic Analysis Division and is the principal investigator for the work being performed for the Federal Highway Administration's Office of Metropolitan Planning and Programs. He was also involved in course development for the Professional Capacity Building Program sponsored by the ITS Joint Program Office.