STATEWIDE MULTIMODAL PLANNING: CURRENT PRACTICE AT STATE DOTS

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ABSTRACT

This paper summarizes the results of a national survey of state Departments of Transportation (DOTs) focusing on the extent to which they emphasize multimodal solutions in transportation planning. The results offer insights into the size, scope, and progress states have been making in the area of multimodal planning since passage of the Intermodal Surface Transportation Efficiency Act of 1991. The on-line survey instrument was distributed to all fifty state DOTs and a total of 35 responses were collected. It appears that some of the key challenges that limited the adoption of multimodal planning approaches in earlier decades are still considered challenges today and the current “snapshot” of multimodal planning suggests that most state transportation agencies still do not use evaluation criteria to compare multiple modal options. Not surprisingly, constraints and limitations on project eligibility because of funding source restrictions was identified as the major limitation to advances in multimodal planning and program development, followed by the need to follow agency standard operating procedures, and by an agency’s history and culture of highway dominated planning. However, changes are clearly taking place, and it is a positive sign that many state officials (20 out of 35) conclude that real progress has been made in furthering multimodal planning objectives over the past 10 years.
INTRODUCTION

This paper summarizes the results of a national survey of state Departments of Transportation (DOTs) focusing on the extent to which they emphasize multimodal solutions in planning for transportation services. Ever since the early 1960’s when the federal government first required a “balanced” approach to transportation planning (the so-called 3C planning process, where the third C referred to a comprehensive process covering all transportation modes), a good deal has been written about the need to transition from a predominantly highway planning and investment focus to what is often termed today a “mode neutral” approach. In particular, a number of writers have pointed to the way in which transportation agencies organize themselves as a major impediment to providing a true multimodal approach to transportation investment. This discussion has led to such terms as stovepipe or bunker planning in which investment plans are developed with limited coordination among the different modes of travel, whether or not such modes come under the responsibility of a single statewide DOT. At the federal level such concerns for a more integrated, multimodal approach to planning led to the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), with additional requirements to enhance the integration and coordination of the transportation system across and between different transportation modes. This focus was continued in the 1998 Transportation Equity Act for the 21st Century (TEA-21) and the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The survey results reported in this paper offer insights into the size, scope, and progress states have been making in the area of multimodal planning.

The survey was conducted as part of a larger project for the Georgia Department of Transportation (GDOT). The purpose of this project is to assess the need for a stronger multimodal approach in Georgia, to identify the constraints on, and opportunities for transitioning to a more balanced multimodal approach, and, if warranted, to suggest a strategy for moving the Georgia DOT in that direction.

Methodology

In support of the above objectives, data was obtained from a number of different sources:

1) A literature review focusing on state transportation agency governance structures, scope of responsibilities, and organizational strategies, as well as factors likely to influence future multimodal, including intermodal operations (e.g., legal authorizations, political limitations, funding constraints) (Sonnenberg and Meyer, 2011a).
2) An assessment of the multimodal transportation needs of Georgia, covering both passenger and freight movements, accomplished in two stages: first by reviewing the transportation needs, trends, and also the consequences of inaction identified in numerous transportation planning documents produced by GDOT and important stakeholder groups over the past decade; and through personal and telephone interviews with key stakeholders in both public agencies and the business community.

3) Case studies of selected state DOTs that were considered to have developed some successful aspects of multimodal planning as part of their investment decision making processes.

4) A nationwide online survey containing questions focused on critical multimodal planning issues. The survey consisted of 18 questions and was sent out to selected representatives of all 50 state DOTs.

This paper first presents insights from the literature review, followed by a description and discussion of the results of the state DOT survey.

LITERATURE REVIEW

Although many papers and policy statements recommend improved multimodal decision-making structures within DOTs and other agencies involved in regional transportation planning, the literature on how such agencies actually carry out multimodal planning duties within their organizations is quite sparse, with little empirical data reported since 2004. States that have attempted to create a more broadly multimodal approach to transportation decision making and investment have followed one of two broad approaches. The first is to create separate agencies having different modal mandates and then establish a coordinating mechanism among them. The second is to integrate all multimodal decision making and functional activities into one agency, the state DOT.

The first case is best illustrated by the transportation institutional structure in the state of Virginia, where separate agencies have been created with very focused mandates on some element of the state’s transportation system, e.g., the Virginia DOT, the Department of Rail and Public Transportation, the Department of Aviation, etc. The Secretariat, the overarching management structure, then has an Office of Intermodal Planning and Investment that coordinates the activities of these different agencies, primarily through a Transportation Board that includes, among others, the Secretary of Transportation, the Commissioner of VDOT, and the Director of Rail and Public Transportation. The benefit of such an arrangement is that each mode of transportation receives its share of attention in the decision making process, rather than being overshadowed by emphasis on one mode versus the other. The major challenge for such a structure is providing a strong and effective institutional mechanism that connects the different
agency investment decisions in the context of a single integrated multimodal transportation system.

The second case seems to be more common in the United States, in which all modes are included in one agency, the state DOT, and efforts are then made to ensure an integrated, multimodal perspective on planning and decision making within this agency’s structure. The most recent example of this is in Massachusetts where a reorganization in the transportation institutional structure resulted in different agencies being incorporated into one state DOT. A primary stated motivation of this reorganization was to provide a more effective approach to achieving a multimodal decision making structure (Fontaine and Miller, 2002; Miller, 2005). The advantage of this approach is that all of the necessary functions—planning, programming, design, construction, and operations—are under the management control of one agency head, thus providing the ability to direct agency activities as part of a more integrated and multimodal approach. The major disadvantage is that some modal efforts can become “overwhelmed” or “buried” by the activities of an agency that dedicates most of its resources to maintaining an effective highway network. This, in fact, has been a major criticism of many state DOTs around the country.


Many of the difficulties of transitioning to a more modally neutral approach to planning were documented in Transit Cooperative Research Report 14 (Crain and Associates, 1996). The focus here was on metropolitan area planning, but many of the findings are equally relevant to statewide planning. Some 41 interviews with representatives of transit agencies, metropolitan planning organizations, industry associations, and both federal and state DOTs identified three sets of institutional barriers to intermodal planning: 1. organizational barriers – notably modal separation, regulatory and legal restrictions, organizational culture and modal orientation; 2. inter-jurisdictional barriers - notably different views about authority and responsibility, reluctance to form partnerships, insufficient track record in forging relationships, pre-determined solutions overshadowing needs assessments, and poorly integrated land use and transportation policies; and 3. resource barriers - including significant funding shortfalls, insufficient information or staff resources, and inadequate tools for comparing mobility projects.

NCHRP Synthesis 286 contains a literature review, the results of a national survey of DOTs conducted in 1999, and five case studies. The report draws the following conclusions from the information gathered and analyzed:

- The (policy) decision to embrace multimodal planning has to come from the highest decision level and includes changing mindsets and organizations from modal facility
planning the movement of people and goods based on a customer/performance-based process.

- Successful multimodal planning is best undertaken with a state or regional vision umbrella, economic development policy, or sustainability considerations.
- The multimodal planning process should be appropriate for each state, but there is a minimum multimodal level that is appropriate for each.
- To increase effectiveness, multimodal planning should be institutionalized throughout the agency; consideration of multimodal aspects should not just be a planning task, but should be part of design, construction, maintenance, operations and modal divisions as well.
- The biggest challenges to effective multimodal planning – funding, organization and institutional challenges, and the lack of technical tools – can be overcome.
- The first step towards multimodal planning is starting the dialogue with stakeholders and customers of the transportation system.
- Data collection and technical processes should be appropriate to the multimodal planning scale.
- The focus of statewide multimodal planning activities has moved from meeting ISTEA requirements to the development of appropriate processes for a given state.
- States are struggling with how to provide a choice of modes, which has significant fiscal implications.

Only 13 percent of the respondents of the NCHRP survey (5 of 38 state DOTs) indicated that the DOT was solely responsible for the transportation system, which shows the importance of a cooperative institutional structure.

NCHRP Report 404 reported the results of a nation-wide survey among 90 planning officials that analyzed best practices in multimodal planning. Since most state DOTs were created to build, operate, and maintain highways, this report was interested in how state transportation agencies had institutionalized organizational changes to accommodate multimodal issues, if at all. The report first looked at key factors underlying DOT and MPO change and concluded that change agents played a significant role in promoting new transportation policies. These agents included “state legislatures and governors, state-appointed transportation commissions..., DOT leadership, large and well established regional planning organizations, and local and special interest groups.” The report found four common themes among DOTs that had successfully institutionalized multimodal planning:

- Many DOTs have attempted to address the special needs of large urban centers through structured partnerships with MPOs.
- The development of modal expertise and advocacy in the DOT appears to be an important early step in the creation of an effective multimodal planning and programming process.
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- In DOTs that are decentralizing planning and programming to the district or regional offices, changing the culture and processes of these offices is important.
- The flexibility of transportation program funding appears to be an important factor in promoting multimodal planning and programming.

Fontaine and Miller (2002) also conducted a survey among states to assess statewide multimodal planning practices. Their survey indicated that 10 states were considered to have strong statewide multimodal planning programs: Florida, Maine, Maryland, Michigan, Minnesota, New Jersey, North Carolina, Oregon, Washington, and Wisconsin.

In what appears to be the most recent effort, prior to this present study, to collect data on multimodal planning practices at state DOTS a study by Goeltz et al (2004) provided new evidence on the topic by carrying out interviews of planners and others in seven different states. They surveyed 325 individuals eliciting responses to questions addressing issues of funding adequacy, leadership support for intermodalism, effectiveness of the planning and implementation process, as well as asking for best intermodal project examples within each state. The authors conclude that all seven states surveyed made some significant strides towards adopting a multimodal planning approach, each altering their institutional structures to better incorporate a multimodal approach that is reflected in their agency organization charts. Based on the 2012 survey of state DOTs described in this present paper, this conclusion seems well founded. However, Goeltz et al also report that despite these efforts survey respondents rate these state DOTs from a “to a little degree” to (“to some degree”) in meeting intermodal planning objectives.

The survey results presented below address similar issues to these prior efforts, offering a more up-to-date assessment of progress in selected areas of multimodal planning at the statewide level over the past decade.
RESULTS

An online survey was distributed to all 50 state DOTs and a total of 35 responses were collected, providing information on mode responsibilities, planning practices, funding sources, and staffing levels. Initially the director of (multimodal) planning (or equivalent) was contacted twice, with non-response leading to up to two follow-up requests being made to other agency staff located under planning and where possible multi-modal planning offices. Figure 1 maps the state DOTs that responded to the on-line survey instrument.

FIGURE 1 Map of State DOTs Responding to Survey

Modal Responsibilities

The DOTs were first asked what modes of transportation other than highway the DOTs were responsible for, in what capacity and to identify the responsible department (see Figure 2). The survey results show that state DOTs are most involved in transit funding, airport funding, intercity bus funding, and pedestrian/bicycle funding, and least involved in waterways and railroads. The majority of the responsibility falls under a mode-specific bureau or division or under the planning department/office within the DOT. Pedestrian/bicycle issues are mainly the responsibility of planning departments (note: agencies were allowed to identify more than one organizational unit having some responsibility).
Agencies were then asked about their modal plans, the involvement of different modes in planning activities, about the evaluation criteria used to compare modes, and if any changes in multimodal planning were noticeable over the past 10 years.

The majority of state DOTs (23 respondents) reported developing both mode-specific plans and multimodal plans. Four respondents indicated that their agency only developed mode-specific plans and seven respondents answered multimodal plans only. When asked what efforts exist to integrate the various plans, most respondents mentioned that the plans were integrated into a statewide transportation plan. Some mentioned the collaboration with the MPOs in their state and a few specifically mentioned that their mode-specific offices and their multimodal planning office work together closely. Only a few states (four respondents) did not report integrating their plans or that they were working towards integration.

While the extent to which the DOTs conduct multimodal transportation planning that examines different modal strategies was considered moderate to moderate-to-great according to the majority of survey respondents (see Figure 3), when asked to what extent different modal options are compared to each other in the planning/programming process to determine the most cost-effective options, most respondents mentioned that the plans were integrated into a statewide transportation plan. Some mentioned the collaboration with the MPOs in their state and a few specifically mentioned that their mode-specific offices and their multimodal planning office work together closely. Only a few states (four respondents) did not report integrating their plans or that they were working towards integration.
effective investment for the state, most respondents indicated little to moderate effort (Figure 4). Moreover, nineteen respondents stated that in those cases where modal options were compared, no evaluation criteria were used to conduct such a comparison. Only seven respondents said that their agency had such evaluation criteria.

**FIGURE 3** To what extent does your agency conduct multimodal transportation planning that examines different modal strategies?

**FIGURE 4** To what extent are different modal options compared to one another in the planning process to determine the most cost effective investment for the state?
Although the above results suggest that the level of multimodal planning efforts seems mixed among the state DOTs, 20 respondents indicated that they had experienced a significant (‘moderate/great extent’ or ‘great extent’) increase in the incorporation of a more multimodal approach into their agency’s transportation planning and programming over the past 10 years (Figure 5).

**FIGURE 5** To what extent has your agency been incorporating a more multimodal approach into transportation planning over the past 10 years?

### Funding

Funding, or lack thereof, is a recurring topic within (multimodal) transportation planning and the survey therefore included several questions focusing on this issue. Specifically, agencies were asked about the flexibility of transportation revenue sources within their state, and if separate funding programs were available for non-highway modes.

The majority of the states do not have a transportation trust fund which can be used for any mode of transportation (22 respondents). For only 10 agencies, a transportation trust fund can be used for any transportation mode. Most states (25 out of 35 respondents) have separate funding programs (including state funding programs outside the agency) for non-highway modes (e.g. freight rail investment program, ports program, airport improvements). Figure 6 shows which of the modes are funded through different types of state funding for the states that reported having separate funding programs. Dedicated, mode-specific funds, general state funds and bond funding are reported to be the most popular funding types for non-highway modes. Rideshare, intercity bus and pedestrian/bicycle support also receive a significant share of their funding from motor fuel taxes and other motor vehicle taxes.
FIGURE 6 Which modes are funded with what type of state funds?

Funding is expected to have a direct impact on the extent to which a state incorporates modal strategies and modal comparisons in its multimodal planning activities. To show this relationship the results from the planning questions were combined with the results from the funding questions. Figures 7 and 8 show the differences in responses to perceived progress in multimodal planning and programming within a DOT and the availability of either flexible funding (Figure 7) and separate funding sources (Figure 8) for non-highway modes.

Only a slightly higher percentage of states that have a transportation trust fund that can be used for any mode of transportation responded with high scores of 4 or 5, compared to states without such a trust fund (60% vs. 50% of responses respectively). Given the limited number of DOTs that reported flexible funding sources it may be too early to draw any conclusions here. However, in states where respondents reported having a separate funding source for non-highway modes, the percentage of scores of 4 or 5 on the perceived progress of their DOT towards multimodal planning within the past decade was more than double the percentage of those reporting a 4 or 5 score among DOTs where such separate funding does not currently exist (i.e. at 16 out of 24 DOTs, or 67%, versus 3 out of 11 DOTs, or 27%; see Figure 8).
Q10. Does your state have a transportation trust fund whose funds can be used for any mode of transportation? (Answer = Yes or No)

Q9. In your opinion, over the past 10 years, to what extent has your agency been incorporating a more multimodal approach into transportation planning and programming? (Score = 1 to 5)

**FIGURE 7** Incorporating a more multimodal approach into transportation planning over the past 10 years against flexibility in use of state funding

Q11. Does your state have separate funding programs for non-highway modes? (Answer = Yes or No)

Q9. In your opinion, over the past 10 years, to what extent has your agency been incorporating a more multimodal approach into transportation planning and programming? (Score = 1 to 5)

**FIGURE 8** Incorporating a more multimodal approach into transportation planning over the past 10 years against separate funding programs for non-highway modes
Staffing

Like funding, and closely related to it, staffing is an important aspect of multimodal planning activities. The average number of full-time employees at the state DOTs included in the survey is about 4,200 (but ranging from 730-12,000). Figure 9 shows the average number of full-time employees devoted to planning issues per non-highway mode. Based on 35 different DOT responses the survey produced an average of 16.7 staff members per DOT summed over all non-highway modes, with an as expected emphasis on public transit planning. However, in states where a good deal of modal planning takes place outside the state DOT, these numbers underestimate the level of staffing for non-highway planning activities within a state.

Critical Issues and Success Factors

The final part of the survey asked the respondents to share their thoughts on critical issues that multimodal planning is facing and on the characteristics of a truly multimodal DOT. A summary of these responses is given below.

The respondents were asked to identify three of the most important reasons (from a list created by the authors) that can explain why multimodal planning has not been undertaken more fully within their agency. Figure 10 shows the results. Modal funding that focuses on mode-specific plans is considered the main reason, followed by agency standard operating procedures and agency history and culture.
In addition to the most important reasons, respondents were given the opportunity to further elaborate on the critical issues relating to statewide multimodal transportation planning and the characteristics of a truly multimodal DOT. Figure 11 and Figure 12 are based on the responses received, showing the number of times a specific issue was mentioned by a respondent.

As expected, the most popular response regarding critical issues relating to statewide multimodal transportation planning (Figure 11) was funding shortfalls and the need for greater flexibility in the use of existing funds, with mode specific funding silos a commonly perceived problem. Lack of a multi-modal culture, seen as a problem from the top of an organization down, was the second most popular category of response. Problems with moving freight multi-modally, with inter-modal connections, and with the need to deal multi-modally with land use/urban sprawl issues were the next most popular issues raised. The same issues with funding flexibility, the need for a modally neutral culture, and for leadership commitment to multi-modalism came up as characteristics of a truly multimodal DOT (Figure 12). Also seen as important are the need for better communication between mode specific experts and the departments they work in, as well as greater collaboration with non-DOT stakeholders and customers, including transportation service providers in the private sector. The next most popular responses pertained to the need for performance based/impact based plan selection and the need for better decision making tools and better across-modally trained staff.
FIGURE 11 Number of Mentions of the “Most Critical Issues” Relating to Statewide Multimodal Transportation Planning

FIGURE 12 Number of Mentions of the Characteristics Found Necessary For A State DOT to be Considered a Multimodal Agency
Taking the responses to the above questions (Figure 10, 11 and 12) together, and noting the similarity in issues identified in all three cases, the following themes summarize the major survey findings with respect to the critical issues facing, and the characteristics that need to be developed, in order to create a truly multi-modal state DOT:

- **Funding:** With the decreasing amount of funding that is available to most states, it is hard to justify infrastructure expansion if you cannot even take care of your existing infrastructure. Federal modal fragmentation and federal mandates are also seen as a burden to funding and multimodal planning. Flexible funding is needed to create a level playing field.

- **Culture:** a cultural change from an automobile and highway focus towards alternative modes of transportation is required within agencies as well as among the population.

- **Leadership:** strong leadership is needed at the top, including the Governor and DOT commissioner, as well as throughout the whole agency, that emphasizes the importance of multimodal planning.

- **Institutional issues:** fragmented ownership and operation of different modes cause competition among modes instead of agencies coordinating in order to work towards the same DOT goals to solve transportation challenges.

- **Communication:** communication with and engagement of all partners and stakeholders both within the agency and externally is of major importance.

- **Mode-neutral planning:** an agency should look at solving transportation issues without bias toward one mode or another. Policies and procedures are needed to allow for an unbiased systems analysis to choose the most effective solution, rather than to plan according to available funding.

- **Staff and Tools:** ongoing staff development and training are needed to shift the transportation paradigms more towards non-highway modes. In addition, data collection, analysis and decision making tools for multiple modes are important to analyze characteristics and impacts of multi-modal solutions and to determine objectively the most effective solution and the return on investment.

**CONCLUSIONS**

This project examined some of the key characteristics of multimodal transportation planning in state transportation agencies. The majority of state DOTs reported developing both mode-specific plans and multimodal plans. Although the current “snapshot” of multimodal planning suggests that most state transportation agencies still do not use evaluation criteria to compare multiple modal options, 20 states felt that multimodal approaches to planning and programming have increased over the past 10 years.
Not surprisingly, constraints and limitations on project eligibility because of funding sources were identified as the major limitations in advances in multimodal planning and program development. The majority of the states do not have a multimodal transportation trust fund, whereas only 10 agencies did. Most states have separate funding programs (including state funding programs outside the agency) for non-highway modes (e.g. freight rail investment program, ports program, airport improvements). Importantly, those states that had flexibility in funding multiple modes from the state’s trust fund were more likely to conduct multimodal planning.

The limitations to multimodal planning due to funding sources was followed by agency standard operating procedures and an agency’s history and culture as constraints on the adoption of a more multimodal planning approach. Public transit had the highest number of non-highway focused employees engaged in planning activities in a typical state transportation agency.

In summary, it appears that some of the key challenges that limited the adoption of multimodal planning approaches in earlier decades are still considered challenges today, e.g., modally-oriented funding categories. However, it is a positive sign that many state officials conclude that progress has been made in furthering multimodal planning objectives over the past 10 years.

REFERENCES


