

**PERFORMANCE MEASUREMENT
IN SMALL TEXAS
METROPOLITAN PLANNING ORGANIZATIONS**

A Thesis

by

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ABSTRACT

Performance measurement has grown in importance within transportation agencies due to decreased and stipulated funding and federal focus on system performance. A shift has occurred in how transportation planning and decision making historically took place including a rise in prominence of the Metropolitan Planning Organization (MPO). The public, state and local agencies, and other stakeholders are mutually served by the regional MPO to assure that transportation funding allocation and project selection meet the regional needs and coordinate the transportation planning process to provide a seamless transportation system. The recent Federal transportation funding program MAP-21 establishes performance measures for each MPO in coordination with the State department of transportation (DOT).

Small MPOs, those which serve populations of less than 200,000 people, differ vastly from larger MPOs in the amount of funds available and authority to allocate funds as well as the resources that are available to perform a performance measurement program. Small MPOs often lack the resources to identify and use performance measures, even though performance measurement at the MPO level has promoted efficient decision-making in large MPOs. This research strives to find by interviews and surveys of the small Texas MPOs if the use of certain performance measures in small MPOs can be financially upheld with limited resources and budget.

This thesis is timely in relation to the MAP-21 performance measurement requirements as it shows that performance measurement is, at this time, difficult to

impossible based on small Texas MPOs' very limited resources. Due to the estimated costs of basic performance measurement programs and the difficulty in quantifying the tangible benefits, the use of performance measurements in small Texas MPOs is unlikely. Small Texas MPOs listed potential performance measurement program benefits such as: project prioritization, funding allocation, and showing the public that professional planning is useful. It was found that any potential benefits of performance measurements are limited when dealing with small communities with fairly obvious transportation problems. The estimated cost of a basic performance measurement program in a small Texas MPO was determined to be around \$150,000 per year. This cost exceeded both their abilities to fund a performance measurement program and the perceived benefits of such an effort.

This research suggests the following performance measures are most likely to be beneficial when proven cost effective: V/C ratios, travel times, crash rates (safety) and VMT. These measures are often easily accessible and could be beneficial in the long-range planning of a local transportation system. However, fiscal and staffing limitations, along with realities of planning for a small community make the use of performance measures difficult. The results of this study can aid the Secretary of Transportation in understanding the limited technical capacities of small Texas MPOs in regards to performance measurement.

To my thesis-widow: Karina

Thanks for your never-ending love and support.

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1. INTRODUCTION

Metropolitan Planning Organizations (MPOs) coordinate transportation planning activities in metropolitan areas and evaluate their progress toward their strategic visions and goals through performance measurement. The question has been posed by more than one MPO: “which performance measures should we use within our organization?” Based on the Metropolitan Transportation Plans (MTPs) of different sized MPOs the state-of-practice can be determined. These plans may also be called regional transportation plans (RTPs) or long-range plans (LRPs), but are the same document. Since each MPO is federally required to create and keep up-to-date a current MTP, data was available to determine which performance measures help MPOs make decisions. Meyer explained “Performance measures are indicators of system performance that are related to the important issues or concerns of those making investment decisions” (Meyer, 2002). Thus it can be seen that depending on certain defining variables each MPO has different “important issues or concerns”. New York City faces different issues than Little Rock, Arkansas in regards to their transportation system and they accordingly should measure their performance in a different manner.

Performance measurement is used on a variety of differing levels for varying applications within different organizations including accountability to elected officials, evaluation criteria for project planning and selection, and internal progress measurement (Meyer, 2002). In this thesis the goal is to find performance measures that can be used

within an MPO as well as be reported to governing officials in helping to make decisions.

1.1 What is an MPO?

Urban areas with a population of more than 50,000 are federally required to have an MPO. MPOs can be crucial in bringing together the different stakeholders in the transportation planning process. The main functions of the MPO include establishing the setting for decision-making between government agencies, developing and updating short and long-range transportation plans, evaluating transportation alternatives, and pursuing public-involvement programs to engage the public and stakeholders in the transportation planning process (Meyer & Miller, 2001). Small MPOs are those which contain populations of fewer than 200,000. These MPOs are limited in the funding they receive as compared to the MPOs in areas with more than 200,000 people (ITS and ICF Consulting, 2005). The Association of Metropolitan Planning Organizations (AMPO) reported in 2004 that the average federal funding received by MPOs was over \$900K while the median response was just over \$300K showing the likely skew upward by the large MPOs that receive substantially more federal funding than average. This same study reported the average number of full-time employees at an MPO as 12.6, whereas the median was 5.5 showing a similar skew as with the funding (ITS and ICF Consulting, 2005). These larger MPOs are also designated transportation management areas (TMAs) which receive more federal funding. MPOs with air quality non-attainment status are also granted more funds, which is uncommon among small MPOs

(Handy & Brown, 2002). A review of the fiscal year (FY) 2012 Unified Planning Work Program (UPWP) of each of the 13 small Texas MPOs found an average of \$365K in federal funding per year. With the limited resources allotted to the small MPOs, many of these MPOs operate with one or two full-time staff members.

1.2 What is Performance Measurement?

Performance measurement is used to assess either quantitative or qualitative outcomes, and/or efficiency and was initially implemented in the private sector to evaluate measurable progress toward achieving stated objectives or goals (Shaw, 2003). The U.S. General Accounting Office (GAO) describes performance measures as “the ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals” which may address processes, outputs, or outcomes (GAO, 2011). Recognition has been given in recent years to the importance of implementing performance measurement in public agencies. Research has shown potential to improve decision-making, service delivery, program effectiveness, internal management, efficiency, and public accountability through performance management programs (OMB, 1993). Performance measurement became a requirement for most federal agencies with the creation of the Government Performance and Results Act of 1993. This act required each federal agency to develop a strategic plan which would include performance measurement aspects (OMB, 1993). Performance measurement has been used in many different settings including within a single organization, but within

the world of transportation long-range planning performance measurement programs are just beginning.

1.3 How is Performance Measurement Used in MPOs?

Since the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), performance measurement has been discussed and encouraged as an important part of long-range planning for transportation (Abbott, Cantalupo, & Dixon, 1998). In the transportation sector, declining revenues and increased demands on infrastructure have resulted in a shift towards performance measurement. Recent federal legislation and transportation reauthorization bills have also emphasized the importance of performance measurement. In discussing the changes of the federal reauthorization from ISTEA to SAFETEA-LU, the Planning Provisions Workshop prepared by the FHWA stated that “the [new] legislation provided... greater attention in certain areas critical to transportation agencies, such as connectivity, freight, asset management and performance measurement” (FHWA and Cambridge Systematics, 2006). The recent release of MAP-21 has shown that performance measurement is continuing to increase in importance as the new legislation mentions “performance measures” over 40 times and directs the USDOT to establish performance measures with state input (US Congress, 2012).

Performance measures can be used across all aspects of an agency to track system performance or trends, evaluate alternatives for project selection, and for internal and external communication. For an evaluation of performance measures in MPOs, costs

must be addressed (data collection and analysis) as well as the benefits (improved funding allocation). Abilene MPO in Texas is using congestion management performance measures to help prioritize their projects within the Transportation Improvement Program (TIP) but is looking to use performance measurement more in their long-range planning. The Capital Area MPO (CAMPO) in Austin, Texas is using performance measures to improve their public awareness and participation in the transportation planning process. CAMPO categorizes their performance measures into four categories: system effectiveness, economic impacts, environmental impacts and social equity.

An allied issue when discussing performance measurement is data – both in terms of the data requirements for desirable performance measures, and framing appropriate performance measures that make use of available data. The questions that then arise are: Who will keep track of the performance measures? Which performance measures should be tracked? Are performance measures justifiable for small MPOs?

1.4 Research Problem Statement

Performance measurement based planning has proven effective in general and specifically within large MPOs. Most small MPOs have not implemented performance measurement programs but the question remains: should they? This research examines the potential costs and benefits of a performance measurement system for a small MPO in an attempt to help them answer that question.

1.5 Research Objectives

This research will specifically address the following objectives:

- Identify likely performance measures for use by small MPOs.
- Determine the potential benefits that performance measurement based planning could offer to small MPOs.
- Determine the potential costs of implementing performance management based planning at a small MPO.
- Discuss cost effective performance measures, if any, for small MPOs.

1.6 Research Benefits

With the current fiscally constrained transportation planning system facing further federal funding cuts this research will be of great value to small MPOs as they seek to improve their efficiency in project prioritization and long-range planning. 52 percent of the nation's MPOs are "small" and could directly benefit from this research. The findings from this research will not only be applicable to Texas MPOs, but small MPOs across the country seeking guidance on performance measurement and the implementation of such programs.

1.7 Thesis Outline

Section 1, **Introduction**, provides a brief summary of MPOs and performance measures and the difficulty for small MPOs in implementing performance measurement

programs which prompted interest in this research. The problem statement, research objectives and research benefits are included as well as brief summary of the thesis.

Section 2, **Literature Review**, details supporting research from the field of transportation planning including an in depth look at the planning process within MPOs, a thorough review of performance measurements and their applications and how MPOs can use performance measurements.

Section 3, **State of the Practice: Literature and Data**, details nine case studies conducted on MPOs throughout the country of varying sizes, documenting their use of performance measurement based long-range transportation planning. Conclusions are also made from the case studies and documented in this section.

Section 4, **Research Methodology**, relates the structure followed in conducting this research and the assumptions made.

Section 5, **Benefits of Performance Measures for Small MPOs**, follows the established methodology of creating quantifiable benefits of performance measurement from small MPOs in Texas.

Section 6, **Costs of Performance Measures for Small MPOs**, outlines the data collected and conclusions and assumptions made in creating quantifiable costs for a simple performance measurement program for small MPOs in Texas.

Section 7, **Using Transit Performance Measures in Small MPOs**, explores the potential use of performance measures provided by the local transit agency as well as that benefit and cost.

Section 8, **Conclusions and Recommendations**, provides a summarized look at benefits and costs of performance measurement in small MPOs in Texas and offers recommendations to small MPOs throughout the country.

2. LITERATURE REVIEW

Although the use of performance measurement based planning is relatively new amongst small MPOs, large MPOs and other organizations have been using performance measures for many years. In this chapter the existing literature is reviewed, including a brief history and explanation of the MPO, its functions, an introduction to performance measurements as well as their application within MPOs. A state-of-the-practice review of performance measurement from various MPOs of varying sizes throughout the United States is also described.

2.1 The Planning Process in an MPO

The planning process is the process of creating goals and visions for the community, evaluating the existing system, forecasting growth and maintenance needs, and prioritizing improvement projects based on selected criteria. Common criteria might include cost-effectiveness, safety improvements, or benefits for people who do not own an automobile. The criteria are typically determined based on the goals and visions that were first developed by the MPO in conjunction with the public and elected officials. These criteria are also known as performance measures, which are encouraged by federal legislation, but little guidance is given as to what exactly to report. Specifically within small MPOs that tend to have limited funding, knowing which performance measures to implement and their benefits and costs would be valuable. Performance measures are typically accorded a weight based on the goals and visions; normally by a policy

committee composed of members from the MPO, local governmental jurisdictions, and the general public. The scores that result from the addition of the performance measures multiplied by their assigned weights is a numeric method of prioritizing projects based on established guidelines (Handy & Brown, 2002). Small MPOs may not have the political will to propose certain performance measures or their weights to policy makers without technical backing, such as the B/C ratio of performance measure implementation. Even with such backing small MPOs may lack political will to oppose the policy makers solely based on technical data.

MPOs are federally mandated to coordinate their metropolitan transportation planning with the state and with public transit providers. After projects have been prioritized as described above, in coordination with all interested parties and stakeholders, an MTP is approved by the MPO. The Transportation Improvement Plan (TIP) is then created by the MPO and approved also by the governor; this document outlines the projects that were selected in the MTP with the highest priority in the next two to three years (Ramani, 2009) (FHWA, 2007).

2.2 Performance Measurement

MTPs and TIPs would be solely based on qualitative decisions if performance measures were not used to quantitatively determine the benefits and costs of certain projects. This section outlines what performance measures are and why they are so important in the planning process.

Performance measures were first created within private sector organizations to evaluate progress toward strategic goals using measurable results. Performance measurement is defined as a qualitative or quantitative measure of outcomes, outputs and efficiency which originated as a management tool used by private-sector organizations to evaluate progress toward goals using measurable results or targets (Shaw, 2003).

Performance measures can translate data and statistics into easy to understand information. Performance measurement is a broad field with many applications, and scholars such as Glaser have significant work in adapting generic performance measures to fit an individual organization (Glaser, 1991). One of the most critical elements of performance measures is their ability to evaluate progress towards goals through quantifiable criteria. As mentioned in the introduction, the GAO describes performance measurement as “the ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals” which may address processes, outputs, or outcomes (GAO, 2011).

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) recognized performance measurement as an integral part of long-range planning and has been shown to improve agency accountability, increase the efficiency in which funds are allocated, and advocate change (Abbott, Cantalupo, & Dixon, 1998). The population within the jurisdiction of an MPO has been found to be a determining factor as to organization structure and which performance measures are most useful and desired. MPOs with larger populations are more inclined to be actively engaged in the use of performance measures in the planning process and typically have more funding

resources to allocate to transportation projects. Zia found, from a nation-wide survey of all 381 MPOs (with an 86% response rate) in 2009, that mandating certain performance measures from MPOs of all sizes, organization structure, and structures is not an adequate method of helping the MPO guide their decisions. Depending on certain variables including size and collaborative capacity MPOs benefit from different performance measures. Their survey responses revealed that “the complexity of our MPO structures does not permit a homogenous or uniform prioritization of performance measures to evaluate the performance of MPOs under ISTEA requirements” (Zia, Koliba, Campbell, Lee, Meek, & Colangelo, 2011). This research should be closely considered by the Secretary of Transportation and Congress in determining, under the Federal transportation funding act MAP-21, which performance measures will be required of different sized MPOs.

MAP-21 shows an increased emphasis on performance measurement and system efficiency for which states and individual MPOs will be held responsible. The legislation lists the following goals, which should drive the decisions on which performance measures will be used by each MPO:

- Safety
- Infrastructure condition
- Congestion reduction
- System reliability
- Freight movement and economic vitality
- Environmental sustainability

- Reduced project delivery delays

The declaration of policy in Section 150 of title 23 of MAP-21 clearly states:

“Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision making through performance-based planning and programming” (US Congress, 2012).

The legislation declares that within 18 months of the enactment of MAP-21 (October, 1 2012) the Secretary of Transportation along with State DOTs, MPOs and other stakeholders will determine which performance measures will be required of MPOs. Also of note is the responsibility of the Secretary of Transportation in submitting to Congress a report “evaluating the technical capacity of metropolitan planning organizations that operate within a metropolitan planning area of less than 200,000 and their ability to carry out the requirements [of MAP-21]” (US Congress, 2012). This research seeks to determine which, if any, performance measures can be maintained by small MPOs and at what cost. The results of this study can aid the Secretary of Transportation in understanding the technical capacities of small Texas MPOs in regards to performance measurements.

2.3 Performance Measure Development

This section describes a tested methodology for developing performance measures. A study conducted by the Texas Transportation Institute (Ramani, 2009) for the Texas Department of Transportation (TxDOT) created a succinct list of 13 performance measures based on the following five goals included in the TxDOT strategic plan:

- Reduce congestion
- Enhance safety
- Expand economic opportunity
- Improve air quality
- Increase value of transportation assets

The performance measures created by Ramani were formed to specifically target the sustainability of the existing and future transportation system within the State of Texas. This study showed how to develop performance measures, using set goals and then defining performance measures to quantify progress toward those established goals. Table 1 provides a list of the performance measures created in the study.

Table 1. Performance Indicators for Sustainability-Related Objectives

Goal	Objective	Performance Measure
Reduce congestion	Improve mobility on highways	Travel Time Index
	Improve reliability of highway travel	Buffer Index
Enhance safety	Reduce crash rates and crash risk	Annual severe crashes per mile
	Improve traffic incident detection and response	Percentage lane-miles under traffic monitoring/surveillance

Table 1. Continued

Goal	Objective	Performance Measure
Improve economic opportunity	Optimize land-use mix for development potential	Land-use balance
	Improve road-based freight movement	Truck throughput efficiency
Increase value of transportation assets	Maintain existing highway system quality	Average pavement condition score
	Reduce cost and impact of highway capacity expansion	Capacity addition within available right-of-way
	Leverage non-traditional funding sources for highways	Cost recovery from alternative sources
	Increase use of alternatives to SOV automobile travel	Proportion of non-SOV travel
Improve air quality	Reduce adverse human health impacts	Daily NOx, CO, and VOC emissions per mile of roadway
	Reduce greenhouse gas emissions	Daily CO2 emissions per mile of roadway
	Conform to emissions exposure standards	Attainment of ambient air quality standards

Source: Ramani (2009)

State DOTs are typically large organizations with complex structures, while MPOs are more limited in their scope and responsibilities. The State of Texas, for example, is home to 25 individual MPOs while only housing one State DOT. Of the 25 MPOs, according to the 2000 US Census, 13 of these MPOs are considered small MPOs, due to the fact that they are responsible for populations of less than 200,000 people in their metropolitan area. These small MPOs typically have full-time staffing of only 1-3 employees and limited funding. It should be noted that not all of the performance measures listed in Table 1 would be constructive or even potential measures for a small

MPO. Air quality is infrequently an eminent issue to small MPOs and improving air quality would most likely not be one of their top five goals. The methodology is still very much applicable as the performance measures would be created after establishing applicable goals within the small MPO.

MPOs can use performance measures to assess the performance of their transportation system and evaluate long-range alternatives against historic data. NCHRP Project 08-74 on the use of performance measures in State Departments of Transportation and Other Transportation Agencies categorized the general applications of performance measures within the transportation industry. Although not specifically focused on small MPOs, many of the ideas can also be applied (TTI, 2008):

- *Decision Support:*

Helps decision-making by determining the impacts of projects and their alternatives and recognizing the necessary mitigation measures

- *Management*

Assisting with program or project implementation

- *Communications*

Providing transparency of agency's actions to stakeholders

- *Evaluation*

Assessing progress of an agency towards its set targets, determining additional actions needed to achieve goal

- *Outcomes*

Evaluating the end results which may result from transportation or conditions affected by transportation

The Government Performance and Results Act of 1993 established a requirement for federal agencies to use performance measures after identifying goals for their efficiency. Additionally, in 1997 it was found that 36 DOTs were using performance measures in their highway, maintenance, safety, construction, transit and aviation divisions. Therefore, there is evidence that performance measures were being adopted throughout the country. Today all state DOTs use performance measures and have some sort of performance measurement program in place (Ramani, 2009).

The following section will describe specific uses of performance measures and their application within MPOs.

2.4 Performance Measurement in MPOs

In the use of performance measures to describe the success of the transportation system, research has shown that the input of the system user is extremely important. Publicized performance measures are what the public actually sees regarding the progress of an MPO towards a goal using their allocated funds. Public input on performance measures can turn around and help the public better understand movement toward goals and objectives (Pickrell & Neumann, 2001). Societal interest has been shown to peak when the public can easily comprehend what is being measured and how it directly concerns the user. Level of Service (LOS) ratings mean much less to the

general public than travel time, for example (Kassoff, 2001). The question then arises; are MPOs choosing their performance measures to serve the public? Studies have repeatedly shown that common performance measures are important to the system user, including: travel time, congestion, volume to capacity (V/C) ratios, traffic density or maneuverability, safety (number and severity of crashes), air quality attainment status, miles of sidewalks, transit service hours, vehicle miles traveled (VMT), and value of travel information (Hall, Wakefield, & Al-Kaisy, 2001). MPOs should choose performance measures that are right for both their planning process and the public they serve.

Since the enactment ISTEA in 1991, performance measurement has been discussed and encouraged as an important part of long-range planning for transportation (Abbott, Cantalupo, & Dixon, 1998). In the transportation sector, declining revenues and increased demands on infrastructure have resulted in a shift towards performance measurement (FHWA and Cambridge Systematics, 2006). Recent federal legislation and transportation reauthorization bills have also emphasized the importance of performance measurement (Johnston, 2008). The Texas Transportation Institute conducted a survey of MPOs which found the use of performance measures to be inconsistent between agencies. The results suggested that knowledge from among the MPOs could be gathered and shared to be mutually beneficial in regards to performance measurement use (Ramani, 2009). This is particularly true of small MPOs where the use of and types of performance measures vary widely. This suggests that studying and surveying small MPOs in Texas for information on performance measurement programs could

potentially benefit other small MPOs throughout the country when applied to their specific area. Performance measures can be used across all aspects of an agency to track system performance or trends, evaluate alternatives for project selection, and for internal and external communication. An allied issue when discussing performance measurement is data: data required for the selected performance measures, framing appropriate performance measures that make use of available data and the cost of data collection and analysis. Additionally, in very small communities the transportation issues may be quite obvious, or politically controlled, making the use of performance measurements in project selection unnecessary or redundant. All of these issues combine to make it unclear if performance measurement benefits exceed their cost in small communities.

2.5 Benefits of Performance Measurement

The benefits of performance measurement are at times extremely difficult to quantify. In many instances the benefits of a certain performance measure is found by a comparison to other benefits and their quantifiable societal profits. Along with benefits always comes the complimentary issue of cost.

Quantitative benefits include those that can be assigned a numerical value such as “amount of increased federal funding due to the use of performance measures”. In reality this is just a transfer of funds due to the fact that money must be spent in order to merit the increased funding, but could be beneficial if the money is better spent in the city with the performance measures. This could be the case if funding were eventually tied to performance measures like federally funding is allocated from the Federal Transit

Administration (FTA). A qualitative benefit would be “improved long-range planning” to which it is very difficult to assign a numerical value without knowing the maximum of “improvement” a process such as planning can attain.

However, various studies across the United States have attempted to detail the benefits of using performance measures in long-range transportation planning. Miller found that incorporating performance measures into the planning process that helps select projects for construction that will have the largest impact (Miller, Garber, & Kamatu, 2010). MAP-21 mentions that performance measures will “provide a means to the most efficient investment of Federal transportation funds”, thus suggesting that project prioritization is benefited from performance measurement (US Congress, 2012).

Other benefits are difficult to grasp, but can be logically discovered. For example, assume one project is selected over another due to the use of performance measurement. Then, a thorough analysis proves that more congestion will be mitigated due to its selection. That travel time will be faster and that average travel speeds are higher, then the societal benefits of performance measurement could be extreme when calculating travel time savings, maintenance costs, wasted fuel costs, and air quality mitigation projects. The implementation of certain projects including traffic demand management (TDM) and intelligent transportation systems (ITS) for example could make a large difference if implemented and performance measures and model analysis can help determine where projects should be implemented (De John, Miller, Winslow, Grenier, & Cano, 2002).

The Environmental Protection Agency (EPA) clearly defined one benefit of performance measures in long range planning in the following excerpt from page six of their document “Guide to Sustainable Transportation Performance Measures” (EPA, 2011):

“Once a region has reached consensus on project priorities and adopted a long-range plan, performance measures can be used to compare the plan against current conditions or a future business-as-usual scenario. The results can help communicate the benefits of the plan to the public.”

These benefits are difficult to quantify because they literally compare the benefits of one future project to another future project, or group of projects and all the implications and consequences of those selected projects.

A growing concern among the public is the issue of environmental justice in the transportation system. Performance measures can be used to help assure that income levels and demographic groups are treated similarly and that all of the public benefits from additional transportation projects. Historically, where performance measures such as environmental justice were not recorded or maintained, transportation projects were built where it was most economically feasible, where land was cheap, although social impacts may have been great. Research has shown that one of the greatest positive impacts on environmental justice is the use of performance measures. To begin, an MPO must carefully craft goals and define environmental justice for its area, as even the Federal Highway Administration (FHWA) seems to have conflicting regulations and

definitions on the subject as shown here from Duthie's research (Duthie, Cervenka, & Waller, 2007):

“The guidance from FHWA on the distribution of funding and its impacts is conflicting. A memorandum issued in January 2000 states that one of the three basic principles of EJ is to “assure low-income and minority groups receive proportionate share of benefits” (Burbank and Adams, 2000). However, the current FHWA policy, as stated on its website (FHWA, 2002), is that beyond the requirement to mitigate disparate impacts, “there is no presumed distribution of resources to sustain compliance with the environmental justice provisions.”

Although many studies have been conducted and reports written in regards to performance measurement, no literature could be found that quantified the benefits of a performance measurement program, likely due to the difficulty in the quantification of benefits.

2.6 Costs of Performance Measurement

Literature documenting the cost of performance measurement programs is extremely limited, especially in the case of small MPOs. This is partially due to the fact that very few small MPOs have performance measurement programs in place. Further research should be pursued in documenting the cost of performance measurement programs that have been put in place, detailing the cost per individual performance measure compared to implementing an entire program. Performance measurement on the State DOT scale may be most accessible for study and review, and an in depth review of

each of the country's 200 small MPOs could be conducted to identify performance measurement programs that have been implemented to document the cost of implementation and maintenance of their programs.

Research by Miller found that the implementation of safety-related performance measures would require 20-40 hours depending on the size of the performance measurement program. That cost is a one-time investment while the acquisition of data can vary more, from 10-60 hours based on the type of data and staff experience with the desired data. Once data is collected it must be analyzed which could range from a few hours for a rough evaluation or could involve full-time commitment from staff to perform a detailed analysis (Miller, Garber, & Kamatu, 2010). This research briefly examined the cost of performance measurement and suggested that the analysis of the required data could employ a full-time staff member.

No literature could be found that quantified the costs of any performance measurement program for long-range transportation planning. Therefore, it was clear that attempting to obtain or estimate the costs and benefits of performance measures for small MPOs would require more than examination of the literature, it would require a survey of small MPOs.

3. STATE OF THE PRACTICE: LITERATURE AND DATA

MPOs of different sizes and organizational structure function distinctly from one another. A brief review of nine MPOs outside the state of Texas revealed the following data. It should be remembered that the results here presented are from a very limited sample of MPOs and organizations seeking to use these results as guidance should do so solely as a planning tool to aid in the process of choosing performance measures for long range planning.

3.1 Review of Nine MPOs

This state-of-practice review will be divided by small, medium and large MPOs. For this thesis small MPOs have populations less than 200,000, medium MPOs have populations between 200,000 and 1,500,000 and large MPOs have populations greater than 1,500,000. These threshold values were chosen based on literature and by examining the populations of all MPOs. The NCHRP Project 08-36, Task 49 defined the threshold of 200,000 to separate small MPOs from the others due to the fact that “ISTEA gave MPOs direct programming authority over metropolitan Surface Transportation Program (STP) funds” because the urbanized areas it then termed a “transportation management area” (TMA) (ITS and ICF Consulting, 2005). This same designation at the 200,000 population threshold is maintained within MAP-21 (US Congress, 2012). The ITS and ICF Consulting report listed medium MPOs as ranging in population from 200,000 to 1,000,000, but used a large MPO population of 4,000,000 for its funding

source analysis. A threshold was chosen of 1,500,000 between medium and large MPOs to limit the “large MPO” to an average population closer to 4,000,000 as noted in NCHRP Project 08-36 (ITS and ICT Consulting, 2005).

Nine MPOs were selected and divided into the three tiers by population. The large MPOs include: New York Metropolitan Council (NYMTC), Southern California Association of Governments (SCAG), and Chicago Metropolitan Agency for Planning (CMAP) all of which house populations of over 1.5 million residents. Medium sized MPOs include: Wasatch Front Regional Council (WFRC) in Utah, Metroplan in Arkansas, and Metropolitan Area Planning Agency (MAPA) in Nebraska which all have populations for between 200 thousand and 1.5 million. The small MPOs include: Collier County Metropolitan Planning Organization in Florida, Ouachita Council of Governments (OCOg) in Louisiana, and Casper Area Metropolitan Planning Organization in Wyoming which have populations under 200 thousand.

These nine MPOs were chosen to geographically represent the United States, from east to west and north to south with varying sized MPOs including both urban and rural areas. With such a limited sample of MPOs from the group of 384 in existence, these nine organizations may not be representative of large, medium and small MPOs. Although the spread of the population sizes for the sample MPOs vary from one of the smallest at 63,000 (Casper) to the largest 18.6 million (Los Angeles) the seven MPOs in-between those two extremes are not evenly distributed but were arbitrarily chosen based on population size and geographical location.

Each of the aforementioned MPOs has a current MTP available online for public viewing/use and can be found at the following URLs:

- NYMTC – nymtc.org/rtp/default.aspx?location=documents
- SCAG – www.scag.ca.gov/rtp2008/index.htm
- CMAP – www.cmap.illinois.gov/2030-regional-transportation-plan
- WFRC –
www.wfrc.org/cms/index.php?option=com_content&view=article&id=92&Itemid=78
- Metroplan – www.metroplan.org/index.php?fuseaction=p0007.&mod=44
- MAPA – www.mapacog.org/long-range-transportation-planning
- Collier County MPO – www.colliercountympo.com/documents.asp?area=docs
- OCOG – www.northdelta.org/documents.html
- Casper Area MPO -
www.casperwy.gov/Transportation/TransportationPlanningMPO/LongRangeTransportationPlan/tabid/487/Default.aspx

The MTP for each MPO was used to determine to what level performance measures are being currently used in each MPO. Within the MTP performance measures are typically reported in tables, figures, or lists. A qualitative comparison will be done with the results from the MTPs to find how different sized MPOs value and use different performance measures.

3.1.1 Large MPOs (Population over 1.5 million)

The first group of MPOs analyzed was the large MPOs with populations over 1.5 million persons. Only 30 such MPOs exist at this point and obviously all are located at very large population centers with high population densities. Many of these MPOs were some of the very first created in history (circa 1962), but surprisingly there are some large MPOs which were organized as late as 1992 (FHWA, 2000). Table 2 includes details of the three MPOs sampled in this study of large MPOs.

Table 2. Large MPO Details

Organization	Population	Area (sq. miles)
Southern California Association of Governments	16,516,000	38,649
New York Metropolitan Council	12,068,000	2,726
The Chicago Metropolitan Agency for Planning	8,150,000	4,096

Source: US Department of Transportation, Federal Highway Administration (2000)

The MPO covering a large portion of southern California (SCAG) has the largest geographical land coverage as well as the largest population base in the United States. SCAG made the decision to combine some large MPOs and create an incredibly large organization to help better coordinate planning throughout the region. Both SCAG and CMAP included extensive performance measurement programs in their MTPs, while NYMTC had very limited mentioning of explicit performance measures. As mentioned previously, not every MPO has made the decision to base their planning methods on performance measures due to the fact that they are not required to do so. Some agencies

have seen the great benefits of a performance based planning model, one example is SCAG.

“It is impossible to solve our regional transportation problems unless we are able to identify and measure them effectively” (SCAG, 2008). Since 1998, SCAG has been developing performance based plans for their MTPs. SCAG was the first MPO to rely extensively on performance measures to identify future regional investments. The 2008 MTP (which describes that long range plan until 2035) is the fourth of such plans that has been implemented by SCAG and the list of useful performance measures is constantly being improved in specificity and depth. One important factor in SCAG is their requirement that performance measures be used to develop their MTP, not just to make investment decisions once the plan is in place, nor to simply prioritize projects already in the plan. SCAG believes that “performance measures quantify the outcomes that are important to individuals, businesses, and the region. They quantify regional goals and provide a way to evaluate progress over time”. SCAG also states:

“Performance measurements help clarify the link between transportation decisions and eventual outcomes, thereby improving the discussion of planning options and communication with the public. This also helps determine which improvements provide the best opportunities for maximizing the system’s performance within the defined constraints” (SCAG, 2008).

From the statements found within the SCAG MTP, it is clear that this large MPO is a proponent of using performance measures to help in their planning process and make informed funding allocations.

The MPO in the Chicago area, CMAP, is also focused on performance measures, with lists of performance measures in their MTP including, but not limited to, VMT, transit frequency, highway congestion, freight flows, highway lane miles, trip length, person-miles traveled, access to transit and work commute times. CMAP uses performance measures to detail the progress and proposed benefits of certain infrastructure decisions. Different sections in their MTP specifically target maintenance, transportation system efficiency, economic development, social equity, public health and congestion management with defined performance measures and goals (CMAP, 2008). Surprisingly NYMTC described very few performance measures explicitly in their MTP. The congestion mitigation process (CMP) in the NYMTC includes performance measures including: VMT, VHT, freight volume, and crash rates, which are typical of even small performance measurement programs (NYMTC, 2010). Air quality attainment status is typically critical in large MPOs including the NYMTC, which includes emissions and air quality measures in their MTP.

Large MPOs face many of the problems that the small and medium MPOs face, but on a much larger scale, which introduces completely different and more complex issues. These three large MPOs that were studied were found to have much more focus on regional planning and impact than the small and medium MPOs. Large MPOs tend to cover a larger geographical area and thus regional connectivity, transportation options, and safety are more of a concern. Specifically in NYMTC safety and security were big issues dealt with in the MTP. Each of the large MPOs included microscopic performance measures on individual roadways as well as regional performance measures such as

emissions and accessibility to amenities and employment. Again, the NYMTC had a limited number of explicit performance measures, but to achieve the goals of enhancing the regional environment, improving the regional economy, improving regional quality of life, and providing convenient, flexible transportation accessibility, some performance measures must be used within the organization (NYMTC, 2010). For example, SCAG, in their MTP development process, examined performance measures to find any disproportional negative impacts to certain income groups of proposed plans and state that “performance measures provide a way to quantitatively assess the impact of a plan” (SCAG, 2008). This process applied by SCAG shows that performance measures can be used on a regional level to provide equity geographically and socio-demographically.

Each of the large MPOs dealt specifically and in detail with their transit system, which in the cases of New York and Chicago is robust. SCAG is seeking to increase the influence of transit within their MPO. Also within the large MPOs a growing concern on reliability is voiced in the MTPs. As more and more people seek employment in densely populated urban centers, residences tend to sprawl from the city center thus requiring commuting to the place of employment. Where commutes are necessary and chosen by workers, reliability becomes a very important factor in regards to travel time and delay.

In keeping with the regional view side of large MPOs and their MTPs, sustainability of their transportation system is also a concern. SCAG defined a sustainable transportation system as follows:

“A transportation system is sustainable if it maintains its overall performance over time with the same costs for its users. Sustainability, therefore, reflects how our decisions today affect future generations” (SCAG, 2008).

Large MPOs are very intimately concerned about the regional issues and some MPOs such as SCAG and CMAP consider that an effective method of dealing with these large issues is through identifying transportation problems and measuring them.

Although regional issues fill most of the space in the MTP, microscopic performance measures are still used throughout the planning process to provide value to regional connectivity and economic growth. The backbone of these large performance measurement programs can still be found in measures such as: VMT, V/C ratios, travel times and crash rates.

3.1.2 Medium MPOs (Population 200,000 to 1.5 million)

The MPOs studied in this section have a large range of population, from 200,000 to 1.5 million people. Medium sized MPOs account for 40 percent of the nations' MPOs. Table 3 includes some characteristics of the three MPOs that were reviewed in the medium MPO category.

Table 3. Medium MPO Details

Organization	Population	Area (sq. miles)
Wasatch Front Regional Council	1,328,000	1,777
Metropolitan Area Planning Agency	659,000	772
Metroplan	543,000	1,603

Source: US Department of Transportation, Federal Highway Administration (2000)

A review of these MTPs from Utah, Nebraska, and Arkansas it was found that the WFRC, with a population more than double the other two MPOs, has a very robust performance measurement program in comparison with the other two. Performance measures such as crash rates, VMT, V/C ratios, and travel time or delay (microscopic transportation measures) are considered as they are in the large MPOs (in this sample). Performance measures that these medium MPOs record also include, aside from the microscopic measures: air quality status, travel time index, transportation alternatives, emergency response time, annual average daily truck traffic (AADTT), population density, and vehicle occupancy rate. Metroplan included a statement in their MTP which sums up many of the ideas presented in the medium MPOs:

“The Metropolitan Transportation Plan will contribute to a more livable and efficient environment in central Arkansas. This plan should significantly change how we are presently allowing our transportation systems and our communities to develop by defining an intermodal transportation system that:

- Maximizes the mobility of people and goods;
- Minimizes transportation related fuel consumption and air pollutions; and,
- Establishes a strong link between the provision of transportation facilities and how we use our land” (Metroplan, 2010).

From the statement one can sense the feeling of this medium MPO that is striving to “significantly change” the transportation system as well as existing development patterns.

Goals and visions developed by federal transportation legislations are being used by the medium MPOs to create system goals such as: maximizing accessibility and mobility, increasing safety and security, considering the environment and urban form, and keeping costs reasonable and sustainable (MAPA, 2010). As was mentioned, WFRC has an extensive use of performance measures that is clearly visible in their MTP while the other two MPOs are more implicit. Metroplan has very few performance measures listed or discussed in their MTP but their goals and visions implicitly require the use of performance measures to determine progress towards the desired goals.

As population density increases so does the applicability and potential success of public transportation. The medium MPOs show an increased concern in performance measurement usage in regards to transit usage including: transit ridership, running time,

on-time performance, mode split percentage, gallons of fuel consumed by transit, and service hours for transit vehicles. Both WFRC and MAPA included the use of performance measures in determining prioritization of proposed projects, while Metroplan did not include prioritization in their MTP.

WFRC covers a large metropolitan area of over a million people and the MTP details a much more involved performance measurement plan than the other medium MPOs studied in this section. A more comprehensive review of MPOs throughout the United States may find that there are some MPOs of the same size which have a strong performance measurement program while others do not, but within the scope of this research, it seems that WFRC acts much more like a large MPO, whose defining characteristics were described in the previous section. WFRC does not seem to be trying to significantly change their transportation system, but multi-modally expand their existing system.

Benefits and costs are used in the medium MPOs to prioritize programs and budgets, but in one case only cost-effectiveness is mentioned, which is sometimes interchangeable with B/C ratios. Transit service implementation is mentioned in each of the MTPs upon the condition of cost-effectiveness.

3.1.3 Small MPOs (Population Less than 200,000)

Small MPOs range in population from 20,000 to 200,000. There is an obvious difference between a population center of 20,000 (smallest MPO by population) and 200,000. This group of small MPOs contains the majority of MPOs throughout the country (nearly 52%). Although not federally mandated until a population of 50,000 is reached, some areas have seen the benefits of regional transportation planning and created MPOs with a far smaller population, such as the Kittery Area Comprehensive Transportation System (KACTS) MPO in southern Maine (population: 20,686 and area: 36 sq. miles). A more detailed study could delve into the differences within just this group of MPOs with smaller population tiers. The three MPOs that were examined within this group are listed in Table 4.

Table 4. Small MPO Details

Organization	Population	Area (sq. miles)
Collier County MPO	200,000	2,117
Ouachita Council of Governments	126,000	182
Casper Area MPO	63,000	200

Source: US Department of Transportation, Federal Highway Administration (2000)

From the data in Table 4 one could conclude that coverage area is not a limiting factor in the “size” of an MPO. Typically the small MPOs cover a small area due to the federal requirement that areas with a population density that exceeds 1,000 people per square mile must be included in the metropolitan area. Most small MPOs choose not to extend their jurisdictional borders beyond that which is required of them. Collier County

MPO is an exception to the trend and contains over 280 square miles of water and a lot of sparsely populated land due to the decision to use the county boundary as the MPO boundary. A review of the Collier County MTP shows that the focus of long range planning is for a much smaller land area near the population centers.

The results of the survey of these three MPOs and their MTPs were generally focused on the micro-scale. Performance measures that were listed within the MTPs included vehicular volume, transit service hours, population within ¼ mile of transit (route coverage percentage), number of park and ride facilities, and number of crashes. Collier County MPO had a well-developed list of performance measures that are proposed in their 2035 MTP which included some more macroscopic measures such as connectivity, emergency response time, energy consumption, and planned evacuation routes. There were large differences between Casper and Ouachita from Collier County, reiterating the potential need for further analysis of differing tiers within the 200,000 population boundary.

Goals and visions were developed in these three small MPOs with public participation and guidance from federal legislation. It was the aim of all three of the MPOs to have their goals and objectives align with regional and state wide goals. MTPs were created with the help of transportation engineering firms that are nationwide and have experience with all sizes of MPOs. Congestion and travel times are mentioned within these MTPs but little attention is given to them due to the small population increases that are forecasted. In this sample, small MPOs seldom have an issue with congestion or travel time since VMT is low in comparison to the capacity that is

available. Thus raises the question: are performance measures worthwhile for small MPOs? The benefits of performance measurement are more apparent when dramatic increases in population and congestion are expected or significant congestion has occurred, but in the case of the small MPO are the benefits substantial and at what cost are they achieved? This thesis will seek to answer those questions.

Performance measures were used in all three cases to prioritize project selection and allocate funding. In the Ouachita MTP every quantitative performance measure taken from travel demand models, was given equal weight (i.e., increase in traffic volume, increase in V/C, speed improvement, VHT, VMT) and combined with publicly weighted qualitative measures created by the MPO and community response (i.e., improved quality of life, reduced congestion, improved safety, support economic goals, conserve energy, protect environment). The equal weights of the quantitative performance measures and the unequal and more heavily weighted qualitative performance measures show that the quantitative measures were less important than the opinions and desires of their local citizens in this small MPO.

In the two smaller MPOs, benefit/cost ratios were not used to prioritize projects, at least not explicitly in the MTPs. B/C ratios were used in educational campaigns to help citizens see the benefits of alternate transportation modes, as opposed to just the use of the automobile. Collier County MPO does use B/C ratios with some of their performance measures to prioritize their projects.

3.2 State-of-Practice: Conclusions

Further research could delve into past MTPs and the performance measurement results from past plans. The question is often posed; “Does transportation planning actually help?” If it does help, one should be able to trace the success of certain metropolitan areas to their past planning activities. MTPs are a federal requirement from metropolitan areas, but are there some MPOs that take the task more seriously or are the plans just completed to meet the requirements? This small sample encouraged additional research with the small Texas MPOs where individual MPOs could be specifically targeted, interviewed and studies based on their size.

The following sections will detail state-of-practice for MPOs of each tier population size based on the analysis of the small sample of MPOs. These sections will summarize the findings of this brief study, by MPO size, and investigate the need for quantifying benefits and costs and calculating B/C ratios in helping small MPOs receive the benefits of performance measurement programs at reasonable costs if possible.

3.2.1 Large MPO Performance Measures

With more than 1.5 million people in one urban center the issues of sustainability and resiliency come in to play. Large MPOs seem to be trying to regain control of their expanding transportation system. While growth is important at this stage, so is the need for smart growth and carefully coordinated land use planning. Part of a sustainable transportation system is an efficient performance measurement system supported by efficient data collection. Large MPOs normally face many regional issues including the need to meet air quality attainment with the US EPA. As performance measurement needs to be spread throughout a larger geographical area, regional measures need to be implemented. It should be noted that the performance measures recommended for the small and medium MPOs should also be employed in the large MPOs as well as the following performance measures:

- Distribution of investment (environmental justice)
- Distribution of travel time savings
- Accessibility to employment
- Travel time reliability
- Transit reliability
- Transit frequency
- Accessibility of transit
- Number of TODs and mixed-use developments
- Vehicle occupancy

As large MPOs implement and support performance measurement programs they will more effectively be able to quantify the benefits that improvements bring on a regional scale. SCAG is an excellent example of how to successfully implement such a strategic plan. Large MPOs should invest in permanent data collection hardware to effectively measure the outcomes of project implementation with real-time data.

3.2.2 Medium MPO Performance Measures

For MPOs that vary in population coverage between 200,000 and 1.5 million people the sample suggested that MPOs of this size desire change to their existing transportation system. The regional benefits and issues start to become a larger concern. Public transportation systems need to expand largely at this scale as the population spreads out from the city center. Performance measurement at this level is critical as plans tend to suggest change and improvement which needs to be quantitatively measured to ensure appropriate planning and execution of the plan. All of the performance measures used by small MPOs should be employed by medium MPOs as well as the following recommended performance measures:

- Crash rates
- Mode split
- Transit ridership
- Transit vehicle hours
- Air quality measurements
- Emergency response time

- Connectivity
- Trip length
- Noise

Data collection is essential for medium MPOs as well as other sizes to quantify the benefits of implemented plans. Medium MPOs can implement more intelligent transportation systems (ITS) in their data collection program due to increase budgets and expanded programs. Performance measurement programs can help medium MPOs measure their impacts on the environment and the benefit distribution to include disadvantaged communities and populations.

3.2.3 Small MPO Performance Measures

Small MPOs tend to have small growth rates, thus the improvements needed within a 20 or 30 year timeframe are often very minimal. Even though improvement of the existing transportation system may not be necessary to meet air quality standards or to maintain an acceptable level of service, performance measures could be used to maintain the existing system. Microscopic performance measures may be most beneficial for small MPOs where individual arterial performance is one of the major issues. Based on the review of the nine MTPs discussed in this brief state-of-practice review, the following performance measures were mentioned by small MPOs, which have populations less than 200,000 people:

- Vehicle miles traveled (VMT)
- Vehicle hours traveled (VHT)

- Annual average daily traffic (AADT)
- Volume to capacity ratios (V/C)
- Average speeds
- Percent in reduction of number/severity of crashes
- Meeting attendance (for a public participation measure)

However, simply noting performance measures in their MTP does not necessarily mean those performance measures are used in decision making. This was evident in the small Texas MPOs interviewed for this research (see Section 5.2).

Small MPOs may be able to implement a performance measurement plan based on low cost data collection methods. Obviously inductance loops, video surveillance, and permanent count stations on every major arterial may not be cost effective with low traffic volumes, with little variation over time, but traffic counts and travel time surveys can be effective low-cost alternatives to ITS that may be more cost effective in larger MPOs.

Small MPOs will likely be financially overwhelmed by the cost to conduct performance measurement programs on the scale of large MPOs as funding is most likely not adequate and the existing transportation systems do not necessitate fully automated real-time data collection for effective performance measurement. A focus on a smaller list of performance measures like the one here presented may help small MPOs create and maintain a performance measurement program with their limited staff and funds in an effective manner.

3.2.4 Use of Benefit/Cost Ratios

Benefit/cost (B/C) comparisons can be used in conjunction with PMs to prioritize projects, budget allocations and select programs. Some MPOs are employing this method currently and seeing measurable implications from doing so. Performance measurement is a very sound method of measuring benefits, which are at times difficult to quantify, while costs are more readily quantified. Whether the MPO is large, medium or small, explicitly using B/C ratios can allow the public to more easily understand what is happening with their tax dollars and can allow the efficient use of performance measures within the MPO and encourage development of future MTPs.

4. RESEARCH METHODOLOGY

With an understanding of MPOs and performance measures as discussed in chapter 3, the specific methodology for this thesis is presented. In an effort to grow the sample size of small MPOs from the previous MTP study and acquire more data and input from each MPO, data was collected from each of the small MPOs in Texas. This included examining their MTPs as well as phone interviews and email surveys. Subsequent sections will detail the benefits and the costs of implementing a performance management program in a small MPO based on the data collected from these small Texas MPOs.

4.1 Data Sources

The State of Texas has 25 MPOs ranging in size from a population of 80,000 to over 6 million. Of those 25 MPOs, 13 are considered small MPOs (listed hereafter), serving populations of less than 200,000 persons. First, the MTP of each MPO was examined and studied to determine the explicit use of performance measures in their long-range transportation planning. Those initial results are included in Table 5. For the reader's reference, the MTP for each of the 13 small Texas MPOs listed are available online and can be found at the URLs listed in Table 5.

Some MPOs explicitly mention the performance measures in their MTP while others only make reference to measuring performance and progress. The majority of the small MPOs in Texas listed: vehicular volumes, LOS and number of crashes as

performance measures that are recorded and tracked, suggesting that these may be the most logical and cost effective performance measures for small MPOs to maintain.

Table 5. Performance Measure Results from MTP Review

MPO Name/ Region	Documents Available	Details of Performance Measures/Programs
Abilene MPO	2035 MTP	RTP mentions goals are to increase safety, decrease emissions, be consistent with state goals, integrate modes, and preserve existing transportation system. If the MPO does not use performance measures, it could potentially benefit from implementing them to quantify these goals and achievements.
http://abilenempowerg/documents/AbileneMetropolitanTransportationPlan2010-2035v100112adoptedJanuary122010.pdf		
Amarillo MPO	2035 MTP	-LOS is the only explicitly mentioned performance measure -ADT also (used to find LOS). -The State’s Safety Improvement Index is also mentioned
http://amarillompo.com/pdf/2010/MTP10-35rev3.pdf		
Brownsville MPO	2035 MTP	-Traffic Flow data -Crash data -Cost/benefit index -Texas Congestion Index
http://cameroncountyrma.org/docs/tigerII/D_Other_Information/2010-2035BrownsvilleMPOMTP.pdf		
BCS MPO/ Bryan – College Station	2035 MTP	-LOS -Travel Times -Traffic Volumes -Crash Data -Criteria for highway project prioritization (crashes, severity, connectivity analysis, LOS)
http://bcsmo.org/index.php/download_file/view/11/		
HSBMPO/ Harlingen – San Benito	2030 MTP	MTP mentions many times the need to measure performance, and that they do, but no specific performance measures are discussed except LOS
http://hsbmmpowerg/Documents/2010-2035%20Final%20Approved%20on%2012-9-2010%20(2).pdf		

Table 5. Continued

MPO Name/ Region	Documents Available	Details of Performance Measures/Programs
Laredo	Texas urban Mobility Plan (Laredo-Webb County) 2035 MTP	<ul style="list-style-type: none"> -Texas Congestion Index -Crash Data -LOS -Mobility Index -Border Delays -Empty freight mileage -MTP mentions awaiting implementation of more performance measures as directed by USDOT -Not many performance measures outlined, but they are referenced many times.
http://www.ci.laredo.tx.us/city-planning/Departments/MPO/index.html		
Longview MPO	2035 MTP	<ul style="list-style-type: none"> -Traffic volume -Freight volumes -Congestion -Crash data -Air Quality
http://mpo.longviewtexas.gov/metropolitan-transportation-plan-2035		
SAMPO/ San Angelo	2035 MTP	-Congestion Index
http://sanangelompo.org/plans/pdfs/mtp/MTP_2010-2035_4.pdf		
Sherman – Denison MPO	2035 MTP	<ul style="list-style-type: none"> -Various management systems exist in the document that may use performance measures, but no performance measures are explicitly listed. The management systems are: Pavement, Bridge, Safety, Public Transportation, Congestion and Intermodal Transportation Facilities.
http://www.sdmpo.org/Publications/MTP/2035%20MTP%20approved%20111809%20admin%20chg%20100610_1.pdf		
Texarkana MPO	2035 MTP	<ul style="list-style-type: none"> -LOS -AADT -Bridge condition -Travel Time -Miles of Trails, sidewalks and bike lanes -Number of crosswalks, bike & pedestrian friendly intersections -Percent of parks accessible by bikes and pedestrians -Percent of schools accessible by bike or pedestrians -Linear feet of connectivity gaps filled
http://www.texarkanampo.org/documents/Tuts/Total%20Document.pdf		

Table 5. Continued

MPO Name/ Region	Documents Available	Details of Performance Measures/Programs
Tyler MPO	2035 MTP	-LOS -Travel demand model outputs (volumes) -Crash rates -Environmental impact -Air quality measures
http://www.cityoftyler.org/Portals/0/docs/departments/metroplanning/MPO/Documents/Metropolitan%20Transportation%20Plan/Adopted%20Tyler%20Area%20MTP%202035.pdf		
Victoria MPO	2035 MTP	-V/C ratios -LOS -VHT -Average Speeds -Delay -Crash data Performance measures seem to be used, but not much explicitly mentioned
http://www.victoriampo.org/documents/VictoriaAreaMTP2035_000.pdf		
WFMPO/ Wichita Falls	2035 MTP	-LOS -Vehicle Hours of Delay -Speed -V/C ratios -VMT -Volumes -Transit Trips -Lane miles -Connectivity Index -Travel time
http://www.wfmpo.com/images/stories/MTP/Final__1-19-10_All.pdf		

The literature and the MTPs of the small Texas MPOs did not provide enough information to clearly identify the potential costs and benefits of performance measures to small MPOs. Therefore after examining these MTPs, each small MPO was contacted and surveyed to better understand the use, or potential use, of performance measures in their organization.

The following chapter will explore the potential benefits of performance measurement within small MPOs. An introduction to benefits is given and responses from interviews with the individual small MPOs are used to determine perceived benefits.

5. BENEFITS OF PERFORMANCE MEASURES FOR SMALL MPOS

Currently, there are no federal requirements for MPOs to meet system-wide performance measures but state and local officials are examining ways to develop their own internal and external measures. Initiative taken by states and localities demonstrate the positive impact (benefits) that performance measures can have on improving the overall transportation system performance (Cambridge-Systematics, 2000). MPO officials (mostly of large MPOs) who have been successful at incorporating performance measures into the transportation planning process have found (FHWA, 2010):

- Greater accountability about how funds are spent
- Improved transparency to encourage public involvement and understanding
- An assessment of “system” performance rather than individual projects
- A refocusing of decision-making on outcomes
- Increased attention to cost-effectiveness

5.1 Introduction to Benefits

This section describes the benefits of performance measurement specifically within small MPOs (those with populations smaller than 200,000). The data analyzed was gathered from phone interviews to the MPO directors of the 11 of the 13 small MPOs in the State of Texas. Two of the small Texas MPOs chose not to participate in the research. The focus of the questions centered on their use of performance measures

and the costs and benefits of using, or potentially using, performance measures in their planning process.

In an attempt to quantify benefits of performance measurement in small MPOs interviews were held with, and surveys received from, the following Texas MPOs, ranging in population from 80,000 to 196,000:

- Abilene MPO
- Amarillo MPO
- Brownsville MPO
- Bryan-College Station MPO
- Harlingen-San Benito MPO
- Laredo Urban Transportation Study
- Longview MPO
- San Angelo MPO
- Sherman-Denison MPO
- Texarkana MPO
- Tyler Area MPO
- Victoria MPO
- Wichita Falls MPO

The surveys were conducted by phone interviews during June 2011 and followed the script attached in Appendix A. While the survey covered a large understanding of the use of performance measures in MPOs, questions 3, 4, 6 and 8 and the overall impression during the conversation led to some-what tangible benefits of performance measurement from the perspective of the MPO directors or MPO Planning managers. Following are the four survey questions related to performance measurement benefits:

- Why was a performance measurement program begun in your agency? (*Discuss whether it was due to an external mandate or internal initiative*)
- What is performance measurement used for in your organization? (*Elicit broad program detail*)

- Do performance measures have an impact on funding allocations/decision making?
- Can you describe your agency’s overall experience with performance measures? Do agency staff members find it useful or helpful?

The answer to these questions will be discussed in section 5.2 along with the qualitative responses given by the MPO representatives.

5.2 Benefits of Performance Measurements Based on MPOs Survey Responses

The interview responses from the Texas MPOs (included in Appendix B) revealed the qualitative and quantitative benefits that they perceive from the use of performance measures in their long-range planning. The following is a list taken from the responses of MPO directors and MPO planning managers throughout Texas in regards to the benefits, or potential benefits, of performance measures:

- Help prioritize projects/scenario selection
- Get more “bang for your buck”
- Help balance the budget
- Show the public how the transportation system is performing
- Show the public how the transportation system’s performance can improve
- Determining funding allocations
- Quantify benefits in before-after studies
- Quantify benefits of proposed projects
- Determine if desired results are being attained from projects

- To hold the MPO and governmental agencies accountable
- Show the public that professional planning is useful
- Help the MPO staff “do a better job of planning”

It should be noted that one small Texas MPO mentioned their use of transit based performance measures. Transit agencies are required by the Federal Transit Administration (FTA) to collect and report certain performance measures annually. These performance measures deal directly with transit service. Some MPOs have responsibility and oversight over their local transit agencies, but in most cases that is not so.

The small Texas MPO that is using performance measures collected and recorded by their local transit provider is doing so to hold them responsible for service in their area based on the following measures: transit ridership, transit demand, population in neighborhood of high transit need, demographics of the urbanized area, transit revenue hours and transit service hours. It could be possible to incorporate these performance measures at a very low cost although almost no benefit can be quantified due to the small percentage of transit use in most small communities. Although the data was secured by the MPO at no additional cost the benefits for long range planning are quite limited.

Affixing a qualitative measure to each performance measure or performance measurement program is extremely difficult as future costs of built and un-built projects and impacts would need to be taken into account. None of the MPOs ventured to quantify the benefits but suggested that the benefits were mostly qualitative with

eventual quantitative results. Although there was a range of reactions to the interview questions on benefits of performance measures, the majority of the MPOs seemed to understand the benefits of measuring the performance of their transportation system as well as the performance of their individual MPOs. Also with that majority was the perception that on the scale of the small MPO the benefits did not outweigh the costs that would be associated with such a program. Table 6 shows the range of reactions for the 11 small Texas MPOs that responded to the survey in relation to the implementation of performance measurement programs in their MPO.

Table 6. Range of Reactions to Performance Measurement Programs

Reaction to Performance Measurement Programs	Number of Small Texas MPOs
Currently using performance measures and excited for the future benefits	2
Interested in pursuing performance measurement but there is no funding	3
Will implement if directed but not proactive	3
Too busy to worry about the “next great idea”	3

The data in Table 6 show the varied reactions to performance measurement use in small Texas MPOs from those who are currently using performance measures to those who are not convinced that performance measures will help their MPO or make any difference in their long-range transportation planning. The majority of small Texas MPOs considered time and funding restrictions to be too great to implement a performance measurement program on their own.

It should be noted, as can be seen in Table 5, that many of the small Texas MPOs listed performance measures in their MTP. The State of Practice review for small MPOs (Section 3.1.3) found that all three of the small MPOs outside Texas were “using” performance measures, but the review was limited to the published MTPs. Phone interviews with the small Texas MPOs showed that although performance measures were listed in the MTP, in most cases, they were not being used on a regular basis for long-range transportation planning or for any purpose. This suggests that although the MTPs of the three MPOs outside Texas, that were reviewed, mentioned the use of performance measures, the only method of verifying their use and the extent thereof is from direct interviews or surveys. It should not be assumed that because performance measures are listed in the MTP of an MPO that they are being used and providing benefits to transportation planning activities.

The following section will explore the costs of performance measures for small MPOs both from literature as well as from the survey responses of the small Texas MPOs.

6. COSTS OF PERFORMANCE MEASURES FOR SMALL MPOS

After having reviewed the benefits of performance measures, the next step was to review and attempt to quantify the costs of implementing a performance measurement program.

6.1 Introduction to Costs

This section describes the costs of implementing a performance measurement program specifically within small MPOs. That data analyzed was gathered from email surveys sent to the 13 MPO directors of the small MPOs in Texas. Seven of the MPOs responded to the survey and of those, four responses included actual quantified estimations of the cost to implement a basic performance measurement program. The follow-up survey questions are included in Appendix C and were designed to solicit cost estimates for a program with the following performance measures:

- V/C Ratios (related to LOS)
- Travel Times
- Crash Rates (Safety)
- VMT

Literature was also reviewed in an effort to find average costs for performance measurement programs or any relevant data. The findings are reported in the subsequent sections.

6.2 Costs of Performance Measurements Based on MPO Survey Responses

The costs of a performance measurement program vary between organization and structure as reported by the small Texas MPOs. Without the implementation of such a program in a small MPO the costs are difficult to quantify. This section will discuss the responses of the small Texas MPOs in regards to the cost of performance measures.

The survey responses from the Texas MPOs (attached in Appendix D) revealed estimated quantitative costs for the implementation of a basic performance measurement program. Four of the surveyed MPO directors responded with quantified costs. Three responses identified the need of additional staff to handle the task of program maintenance and data collection and analysis. Anywhere from one to two part-time employees all the way to two or three full-time employees was estimated to be required to implement and maintain a performance measurement program with four performance measures: V/C ratios, travel times, crash rates, and VMT.

The MPOs estimated that a budget in the range of \$100,000 - \$200,000 would be needed to hire staff, implement a program, collect data and analyze the data required for a performance measurement program. One MPO suggested that more time and money would be spent justifying the expenses of a performance measurement program than would be needed for the actual program.

The aggregate conclusion from the MPO responses was that the costs of a performance measurement program were far beyond the scope of the existing MPO structure and budget. One MPO stated that “one half my budget and double my current personnel” would be required for implementation and operation of such a program. With

difficult financial times at hand, MPOs found it difficult to comprehend having more money to spend than what is already allocated for their required tasks. It was also interesting that the MPOs noted the need for more personnel to complete a performance measurement program. This could suggest, as was the sentiment of many of the MPOs, that the tasks they already have assigned completely fill the time of the few staff members that comprise a small MPO.

The responses from the small Texas MPOs add to the argument that the other three small MPOs reviewed in this research may not have been using performance measures. MPOs share the same funding source, and thus the costs of maintaining a performance measurement program must be burdensome to any small MPO, not just those within the State of Texas.

The potential benefits proposed by the small Texas MPOs seem to be exceeded by the costs required to create and maintain a performance measurement program. The limited staffing and funding in small MPOs restrict some MPOs who are desirous of seeing the benefits of performance measures in their organization. Also of note is the sentiment from some small Texas MPOs that small MPOs lack impetus to measure performance because so much depends on the policy board decisions and state MPO allocations, causing the implementation of a performance measurement program practically untenable.

7. CONCLUSIONS AND RECOMMENDATIONS

Performance measures have been proven effective in many industries and even within large MPOs across the country. This research has sought to describe the benefits and costs of performance measurement specifically to the small MPO based on survey responses from 11 of the 13 small Texas MPOs. The conclusion was made that currently performance measurement costs most likely outweigh the benefits. More research could be conducted into assigning numerical values to the benefits here ascribed for ease in creating benefit/cost ratios to determine when the implementation of a performance measurement program could be cost effective within a small MPO. Additional research could potentially also quantify the costs of implementing certain performance measures for differing sizes and complexities of performance measurement programs. The main difficulty is that small Texas MPOs lack the funding and the staffing resources and thus have little means wherewith to create such measurement programs. Another monumental obstacle to surpass is gaining the political will and technical data to support implementation of performance measures. In many of the small Texas communities, the MPO has little political power to select projects based on technical performance and in most cases technical support is not required since the few transportation improvements needed are obvious. With the assistance of research and guidance small MPOs can better understand when the value of performance measurement is applicable in their long-range planning as well as the associated costs.

Application of the MAP-21 requirements that all MPOs maintain performance measures should be carefully and sensitively applied with the many small MPOs throughout the country. The legislation permits differing measures be kept in urban and rural which based on this research is recommended to also be extended to small MPOs.

7.1 Conclusions Summary

Performance measurement is at this time mostly infeasible for small Texas MPOs. MAP-21 requirements for small MPOs should be considered carefully or additional funding may be required to facilitate performance measurement programs in small MPOs. Due to the estimated costs of even basic performance measurement programs and the difficulty in quantifying the tangible benefits, the use of performance measurements in small Texas MPOs is unlikely. Small Texas MPOs listed performance measurement program benefits such as: project prioritization, funding allocation, and showing the public that professional planning is useful while estimating the cost of a basic performance measurement program around \$150,000 per year. The average operating budget of a small Texas MPO is around \$350,000 per year. The results of this study can aid the Secretary of Transportation in understanding the technical capacities of small Texas MPOs in regards to performance measurement.

7.2 Recommendations

The allocation of Federal transportation funding, while requiring performance measures be tracked and reported from each MPO under MAP-21, should consider

different sized MPOs, specifically those MPOs with populations under 200,000 people, to have different technical capabilities in regards to performance measurement management.

Based on the research conducted in this study the following performance measures are suggested as those which are most likely to be beneficial when the associated costs can be managed:

- V/C Ratios
- Travel Times
- Crash Rates (Safety)
- VMT

Most of these measures come directly from the travel demand model which is typically maintained at the MPO level and the data is often easily accessible.

Additional research on a larger scale of small MPOs across the country could reveal which performance measures are currently being used on a cost effective basis. A thorough study of the small and medium MPOs throughout the country could aid in defining at what population threshold which performance measures can become cost effective based on the benefits they provide.

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APPENDIX A

INTERVIEW GUIDE

Following is a sample over-the-phone introduction to the project as well as the list of questions asked to the MPO staff member.

Introduction

The purpose of this interview is to document current transportation agency performance measurement efforts in areas of strategic management, long range planning and programming, project development and design, construction, and operations and maintenance.

In this research project, we want to cover a range of Texas MPOs to develop an understanding of how they use performance measurement for transportation-related agency activities. In the case of agencies not currently implementing performance measures, we would like to develop an understanding of the potential needs and use performance measures.

Would you be willing to participate in an interview regarding your agency's implementation of performance measurement? The interview will take no longer than one hour. Your participation will be confidential and research records will be stored

securely. Your name and job title will not be included in any publication resulting from this study.

Interview Questions:

1. In your organization do you use performance measurement in any aspect of your transportation planning and related activities?

(if YES continue through question 11, if NO skip to question 12)

2. When did your agency start using performance measures? *(Elicit details about program history)*

3. Why was a performance measurement program begun in your agency? *(Discuss whether it was due to an external mandate or internal initiative)*

4. What is performance measurement used for in your organization? *(Elicit broad program detail)*

5. Does your agency use performance measures to define progress toward strategic goals?

6. Do performance measures have an impact on funding allocations/decision making?

7. Do you have documentation of performance measures that are publicly-available or other documentation that can be shared with the researchers?

8. Can you describe your agency's overall experience with performance measures? Do agency staff members find it useful or helpful?
9. What resources do you think would be helpful in improving your agency's current performance measurement program?
10. What data sources are currently being used to quantify your performance measures? Do you find data availability to be a constraint in the performance measurement process?
11. Are there any others within the agency that you suggest we talk to regarding performance measures and your agency's use of them?

(End of survey if Question 1 was answered as "Yes")

(Following questions are if Question 1 was answered as "No")

12. Is your agency currently considering implementing a performance measurement program, or has it ever been considered in the past? *(If yes – elicit details of which specific areas they were considered or are being considered, and the future outlook for the use of performance measures)*
13. Is there any specific deterrent to the use of performance measures in your agency that could explain why no performance measurement program exists to date?

14. Are there particular resources and data that would potentially be helpful in the process of implementing a performance measurement program in the future?

15. Are there any others within the agency that you suggest we talk to regarding performance measures and your agency's thoughts/experiences with them?

APPENDIX B

MPO SURVEY RESPONSES

The following pages are the responses of the individual MPOs in Texas that were surveyed. The answers correspond to the questions in Appendix A. The MPO names have not been included for anonymity of the MPO staff.

MPO 1

1. Yes, current – not really in the MTP, in the TIP – yes (congestion management)
 - a. Future – more, crash locations, analysis
2. Limited use
3. Motivation = funding, getting more for their dollars, to make sure their plans are implementing good projects. Externally motivated, but also internally (need some “facts” and data to get funding in their area) mixture of external and internal motivations.
4. Not used in the past.
5. Not towards goals, implementation in the future – tied to budget.

6. Yes, not yet, but in the future yes! PMs show where you want to spend your funding, PMs really help to get the most bang for your buck.
7. Not at this point.
8. Yearly review of PMs and budget, staff doesn't really understand the benefits of PMs. The training opportunities for PMs in Transportation are not normally attended by all staff members and it's hard to transfer that knowledge, more trainings would help.
9. There are not any good guidelines for PMs in transportation out there, a list of general PMs would be useful (easy in a city, hard on an MPO level, needs to make sense to citizens and apply to 30 year planning horizons) more training from TTI, FHWA, or TXDOT, a list of 30 PMs that pertain to transportation would be nice – which could then be chosen from to best suit the area.
10. Search on the internet, state DOTs, other MPOs – for developing PMs, definitely need more data, in house: need more data collection, very difficult for a small MPOs, need more sources outside – on PMs.

Comments:

This MPO has not used performance measures up to this point. Small MPOs have a lot to do with the 2 or 3 staff members that they have and collecting and tracking data is very difficult with the limited staff. The most useful resource for implementing PM programs would be a list of PMs in transportation.

MPO 2

1. No
12. Will use more PMs in the future. Modeling, traffic counts (just in town data collection).
13. No specific deterrents, they're not sure they can really implement PMs though. Only the City is urbanized. The MPO works with the TxDOT district and City very closely and haven't seen need for PMs individually as an MPO thus far. It is difficult getting representatives together from the cities, counties, and TxDOT.
14. A best practices handbook/guidebook of how to use PMs from other MPOs, HUD and FHA resources need to be available.

Comments:

Guidance would be helpful in the event that a performance measurement program was mandated and training would help foster understanding and knowledge of the benefits of using performance measurement.

MPO 3

1. Yes
2. Since before 1994, the travel demand model, used for alternative analysis
3. TxDOT said that you really need to be doing this (developing a model), we developed the socio-economic data, and coded the network

4. Mostly just for alternative analysis
5. No
6. PMs definitely help
7. Land-use planning measures are used, travel-time measures are being developed,
No list, but website lists:
 - a. Vehicle Hours of Delay
 - b. Speed
 - c. V/C
 - d. VMT
 - e. Volumes of Auto Trips
 - f. Transit Trips
 - g. Mode Share
 - h. Lane miles
 - i. Connectivity Indices
 - j. Travel time
8. Yes they understand, it's a guideline to reach our goals, PMs help unify the staff
9. Staff size needs to increase, talk to MPOs, Communication with other agencies
will help foster growth, connection, training and mandates
10. TxDOT hasn't given a lot of help, travel-time data (hiring a consultant),
congestion management study, Data collection done on a project level

Comments:

The use of PMs has been limited, but they do use them for project selection in the MTP. Few PMs are included in the MTP, and they are not used to measure progress toward strategic goals. The MPO feels that guidance and more resources on improving PM programs will be helpful. A large concern for the future is having to do more work without increasing their funding to allow for more staff members.

MPO 4

1. No.
12. The use of PMs is in the plans; the technical advisory committee is currently discussing the implementation of a performance measurement program. PMs are very important to the policy committee; the MPO needs to determine which PMs are going to work for their area.
13. They didn't know the availability of data, knowledge base needed to be expanded, (Motivation – from policy committee perspective: decreased budget, more fiscally constrained, better bang for your buck with each project with PMs, MPO perspective – public stewards or tax money, need to do the right thing and really represent the public well).

14. All training has been aimed at the MPO, fine tuning – small MPOs (under a TMA) gather together and brainstorm, limited staff and resources can't take too big a bite of the pie and be able to deliver, what has worked for other small – medium MPOs? Training for policy level folks for transportation in MPOs (high level training for the technical aspects of PMs in transportation would be very helpful).

Comments:

This MPO is excited to apply performance measurement in their MPO. They have been reaching out looking for guidance in how to apply the large scale programs that they see around the country to their small MPO. They feel that a guidebook on best practices for small to medium MPOs would be very helpful. They are reading papers, going to trainings, searching for ways to understand better performance measurement and how to apply it.

MPO 5

1. Yes in transit, not anywhere else.
2. Very recently, since 2009 in the MTP.
3. To see if results were being attained, to be able to look back and see what is happening, the board wasn't very happy with the transit provider, so the MPO

used PMs to show the board the performance. Allows the MPO to hold the transit provider accountable (PMs for the MTP could hold the MPO accountable to the public).

4. Internally developed. The board asked a lot of questions about certain projects and the MPO brought up the idea of using PMs and setting goals.
5. Yes, they set the goals and keep track of progress with the PMs.
6. Yes, what the MPO noticed is that new transit routes are being developed, local funding and contributions are coming in and the MPO answers their contributions with PMs, outreach to the public. Ridership reports and aiming to increase ridership will let the MPO make decisions about adding new transit routes.
7. In the MTP – goals and objectives (in the MTP)
 - a. increased patronage of existing services
 - b. increase in the potential demand for transit
 - c. total population in neighborhoods of high transit need
 - d. demographics of the urbanized area
 - e. population growth in areas that are distant from the center cities
 - f. location of commercial development
 - g. congestion at the industrial complexes, medical center and TSTC campus
 - h. increased awareness and interest in transit as a recruitment tool;

- i. regional growth.

These goals are listed in the MTP:

Goal 1: Provide for Safe Travel

Objective: Reduce potential for traffic accidents and provide for increased travel safety.

Goal 2: Reduce Travel Time and Congestion

Objective: Reduce traffic congestion and travel time in and around the urbanized area.

Goal 3: Enhance Aesthetics of the Transportation System

Objective: Integrate the transportation system with the aesthetic qualities of the landscape and historic sites.

Goal 4: Encourage International Trade

Objective: Incorporate economic and development considerations to increase accessibility and mobility of people, freight, and international trade.

Goal 5: Coordinate with Land Development Needs

Objective: Provide accessibility to existing and anticipated patterns of development throughout the MPO area while preserving resources.

Goal 6: Incorporate Intermodalism

Objective: Integrate the various modes of transportation, particularly roadways (private auto, trucking, and public transit), railroad, bikeway, airports, pedestrian and seaport.

Goal 7: Develop a Transit Transportation System

Objective: Continue to monitor the Assessment of Public Transportation Needs and Transit Plan and the newly developed Express system for future expansion.

Goal 8: Emphasize the Preservation of the Existing Transportation System

Objective: Use applicable monitoring systems to monitor and evaluate the conditions of the transportation system.

Goal 9: Implement a policy requiring a minimum acquisition of 75% of the necessary right-of-way before a project can be included in the Transportation Improvement Program

Objective: Ensure the feasibility of project implementation and distribution of allocated construction funds in an efficient manner.

8. The MPO is in the introductory phase of PMs, learning the best practices, start incorporating more PMs in construction and mobility projects, how can we measure public participation with PMs?
9. Primarily – training (good information out there but it is very basic, not a lot of technicality, how to develop criteria or measures?) training or workshops that are technical with how they are measuring PMs – hands on.
10. Reporting from the transit agency, revenue hours, ridership increases, service hours, for the first time they're putting together a travel demand model – access

to Texas Work Force Data (didn't have access before), how do we incorporate PMs into part of the project selection criteria?

Comments:

This MPO is using the performance measures from the transit provider very effectively. They're excited to learn how to use more performance measures in their transportation planning, they also spend time looking at other MPOs and their PM programs, and have been attending FHWA trainings.

MPO 6

1. No, not formally, the MPO uses PMs for the alternative analysis, but not really in long range planning.
12. No, the board hasn't come up with anything specifically, so the MPO hasn't thought of anything long term; no set goals with PMs.
13. For the most part there isn't a deterrent but the MPO hasn't explored PMs, hasn't explored the topic deeply, and hasn't heard a lot about it. There are a lot of other things going around and the MPO doesn't have time to explore every new idea. Nobody on the policy board really has PMs on the radar. The MPO is curious to the cost/benefit of implementing a PM program.
14. The travel demand model is helping get data. A template of the program will be very helpful in implementing a PM program. The MPO doesn't want to have to

invent a system if they had to implement a PM program. A 10 step guide to Performance Measurement would be helpful, needs to be very user friendly.

Comments:

This MPO doesn't really see the benefit of PMs and they don't really understand them. More training and guidance would be helpful, but again their staff is limited and they don't feel that there is time to devote in exploring new techniques to planning. The MPO feels that unless their policy board asks them to use PMs in long range planning that they won't initiate the program. The MPO does use PMs on an alternative analysis scale for project selection, but no specific plan is set in place, mostly the travel demand model is used to create PMs for project comparison.

MPO 7

1. No, PMs are used, but only organizationally, not with transportation planning, yet.
12. Yes, the next fiscal year brings a desire to implement PM usage in transportation planning. Research and grant opportunities for ped/bike improvements, public involvement, increase website usage, and interagency communication/interaction are all PM elements that have been discussed.
13. PMs haven't really been understood, until very recently the MPO was under the jurisdiction of the City, so many decisions were policy driven, but with the

standalone agency, more PMs will be used. PMs considered include minimizing bike/ped fatalities, reducing crashes, adding bike lanes, trails and sidewalks.

14. Financial resources would be most helpful, local funds will require public support. Texas MPOs are used as resources; they have similar issues to deal with. Safe Routes is used for training, National HWY Institute webinars, Pedestrian and Bike information center, and the Center for Urban Transportation Research University of South Florida are all used as resources.

Comments:

This MPO is excited about the PMs that are being used internally to show the City that the MPO is valuable, but PMs are not used in transportation planning. It seems as if they understand PMs on a high level, but are looking to improve their understanding and hope to implement a PM program next year. They seek out training and guidance from other Texas MPOs and find them very helpful.

MPO 8

1. Yes.
2. In FY 2001, the MPO started collecting traffic count data and set in place the ability to do travel-time studies (2-3 year basis).
3. Internally motivated at the staff level the PMs were collected, with approval from the board. More detailed data was important for project consideration, and so that project prioritization could be made. Implementing PMs was an effort in showing the public that the MPO was useful – helping the community with economic development – the MPO shares its PMs.
4. Project prioritization.
5. No active goals.
6. Yes, PMs have had an influence – very heavily weighted toward economic development and safety (in the policy board).
7. No, traffic counts and travel time studies, making attempts at getting crash data.
8. The MPO has been working with PMs for a while and see the benefits, but haven't really made up their minds on whether or not to develop a substantial PM program. The MPO thinks that PMs will help them do a better job of planning the transportation for the community.

9. Resources used include: USDOT training materials, planning for operations guidebook, desk reference, Collaborative Advantage 2007, TRB performance measures to improve transportation systems, NTSC Performance Measurement Initiative, PMs to improve transportation planning process (TRB circular 2005), primer on safety PM for transportation planning process, NCHRP 446, 618, and looking at larger MPOs' documents and plans.
10. Crash data is hard to get because of the bi-state area (where are the records?), a travel demand model doesn't exist, Highway department is not able to provide demographic information (not available from the State).

Comments:

This MPO is really back and forth on PMs, they want to implement them more, but don't really know how to with the limited staff and resources that they have. They're pretty much sitting back and waiting for the reauthorization bill to go through before they make any big moves. They do see the benefits of PMs and try to use some.

MPO 9

1. Not currently.
12. The MPO is now actively considering implementing PMs for Public Transit – ridership, travel time; sidewalks – livability.
13. No, the MPO just hasn't thought about implementing a PM program until now.

14. Common PMs, geared towards smaller MPOs would be particularly helpful.

Comments:

This MPO is excited to implement PMs but don't have any experience with doing so besides traffic counts, V/C ratios, and crash data. They think that straight, to-the-point guidance would be helpful and specifically a list of PMs that can be quickly implemented and easily maintained (with limited staff and resources).

MPO 10

1. No.

12. No; every August they catalog the MTP projects and look and see which move into the TIP, Tech Advisory committee give a prioritized project list, then they give this to the policy board.

13. Everybody on the policy board and technical committee knows how the projects will affect the congestion and safety, etc. the decisions are made with very little analysis, mostly policy driven.

14. Something that proves that performance measurement is actually helpful.

Comments:

They don't see the importance of PMs; they don't think they help (do they really help?). They just think that getting things done is most important. They say that the only way that PMs will be used is if they are required to use them federally or by the policy board.

MPO 11

1. No, and training hasn't really solidified understanding of performance measurements.
2. We'd like to, but the project ranking system is really what we're using, just using LOS from TxDOT (their data).
3. Limited amount of data available, funding.
4. Funding, best practices manual from other MPOs in the area. A special focus on smaller MPOs and how performance measures can work there with limited data (need to use performance measures for accountability to the public).

Comments:

This MPO is excited to use PMs but don't really know how. A best practices document they think will be very helpful in putting together a program although they mentioned that a particular focus on small MPOs will be helpful since funding is particularly limited and data sources are limited as well.

APPENDIX C

MPO FOLLOW-UP SURVEY

This is the follow-up survey introduction as well as the list of questions emailed to the MPO staff member.

Email Survey Intro:

This is a follow-up survey regarding the phone interview you may have had with Devin Moore – TTI employee and Texas A&M Graduate Student June or July 2011. This survey is to further understand the costs of performance measures.

The survey is composed of 4 short answer questions and should take no longer than ten minutes to complete. Your participation is voluntary but extremely helpful in this research.

Survey Questions:

1. If you were to implement a performance measurement program, which measures would you implement? Which measures are most useful for your agency?

2. If you were to implement the following performance measures:
 - V/C Ratios

 - Travel Times

- Crash Rates (Safety)
- VMT

What data would you need? How much time do you estimate would be needed or at what cost could you obtain the data?

3. What would you estimate the cost of implementing a performance measurement program in your MPO to be? Employee requirements, consultant requirements, data collection, analysis?
4. Which functions could your MPO staff sacrifice to implement a performance measurement program if any? How much time does the current function require?

APPENDIX D

MPO FOLLOW-UP SURVEY RESPONSES

The following pages are the responses of the individual MPOs in Texas that were sent the follow-up survey. The answers correspond to the questions in Appendix C. The MPO names have not been included for anonymity of the MPO staff.

MPO F1

1. not sure
2. More funding than we presently have
3. 1-2 new staff/ 120-140 k
4. we don't perform these measures/lack of funding

MPO F2

1. It is a very difficult thing to measure "performance" within a small MPO because so much depends of the MPO Board decisions and the MPO allocation by the State
2. all of it
3. As a small MPO with very limited funds, it might be very hard to measure at a proportionally smaller cost. Unlike some state which allocate a more adequate

fixed amount to its MPOs before population distribution, TX allocates just 50,000 + pop hardly enough for the 4 or so staff it would take to adequately address all of these concerns and be able to systematically measure performance .

4. What would we cut, let's see... public meeting, talking with member staff about planning...I don't have any idea what we would cut. We do not have enough time to do everything we want to do now. How much time... see question 3

MPO F3

1. Sustainability
2. Census, Travel Demand Modeling
3. Unsure
4. Unsure

MPO F4

1. Projects let, under construction, and completed during fiscal or calendar year.
2. State and local data. Utilizing one Full Time Employee, probably 120 to 160 hours. I would not pay for the data. It should be readily available from state and local sources to synthesize.
3. One-half my budget. Double my current personnel. I would spend more time justifying what we do than actually doing it.
4. None. We're stretched too thin as it is now. With MAP-21 moving through Congress and all the budget cuts, I'm not sure I'll even get my full funding allocation for FY 2012.

MPO F5

1. I think the APER (Annual Performance Evaluation Report) is an existing performance measurement tool that serves MPO's well.
2. We currently derive V/C ratios and crash rates. We use locally created studies (funded by the MPO) for travel times. I don't know how we'd capture VMT other than through surveys.
3. It seems that every consultant contract we have runs 100-150K.
4. Without any sacrifice, we use V/C ratios and safety data. I'd need 100-150 every five years for each of the travel survey or VMT survey.

MPO F6

1. Undecided
2. VMT
3. Don't know
4. No response

MPO F7

1. Measures: travel time, number of crashes, VMT, pavement & bridge performance rating. Most useful: travel time
2. V/C Ratios: current (1-2 yrs old) traffic volumes on major collectors and up. Averaged 160 in-house traffic volumes counts/yr over 5 yrs ~ 320 hrs/yr and 1520 miles of travel/yr. Then add analysis time for each facility. Travel Times:

studies updated every 2 to 2.5 yrs take ~ 1 month or 160 man hours using GPS based data collection system, one employee, and only making one run in a.m. and p.m. peaks per corridor plus mileage costs. Crash Rates: most recent 3 yrs. of crash records by date, location, crash type (rt. angle, head-on, rear end, etc.), # of people involved, # of injuries by type & severity. Crash records from state dot's and local agencies are "free", time involved varies depending on number of counts requested and availability of agency staff. Unfortunately the data available from the state may not have sufficient detail so would have to factor in MPO staff time to review all the local records and input to database. Recent experience reviewing 102 crash records for 3 mile urban corridor took ~ 30 hrs to review. This resulted in ~ 40 records that were applicable to the study and we estimate another 40 hrs to develop database and input information. Also need to consider time and cost to maintain data once it is collected. This can be very time consuming if/when the need to change/update methodologies/software arises.

3. Conservative minimum of \$50,000 to implement a PM program for entire study area, in addition to our current efforts related to data collection/analysis. Would need 1 to 2 additional part time employees. Using part-time employees avoids costs of benefits. Probably really need a full time employee dedicated to the task. At current and future estimated funding levels our MPO could not afford to use consultant services for these efforts.
4. There are no current functions we could eliminate. Every MPO is unique in regards to staffing/technical abilities so the following only applies to our MPO.

We already have an in-house traffic counting program and conduct travel time studies on a regular basis (at an annual cost of ~ \$50,000 including personnel, equipment, and travel) so these functions are already in place for implementing a PM program. If we were to reorganize our program to implement a true PM program I would go with a part time office assistant for secretarial duties (including handling the claim process), assistance with document development and public involvement activities. One or two part time employees for data collection. A full time engineer/planner for data analysis and assistance on document development. A director to manage the program, perform data analysis, conduct document development, public involvement and coordination with member agencies and the general public.