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**AN ASSESSMENT OF CRITERIA USED FOR TRANSIT FRIENDLY
DECISION-MAKING**

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SWUTC/05/167322-1

Sponsored by
Southwest Region University Transportation Center

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ABSTRACT

A great deal of attention is being focused on creating more livable communities, as well as implementing smart growth, transit-oriented and generally more sustainable communities. As a result, planners are focusing more attention on multimodal transportation solutions. Regional goals mention the critical nature of planning and implementing environmentally sensitive systems that allow residents a choice in travel mode. A preliminary review of the decision-making criteria used by many local governments, however, shows project selection criteria largely reflective of measures that tend to favor highway-oriented benefits, such as increasing travel speeds. In addition, goals supporting increased non-motorized travel options, increased transit and more environmental sensitivity projects are often less measurable and more related to the nebulous “quality of life” factors. When benefits, such as air quality are measurable, the advantages may be localized and seem insignificant on a regional basis.

This research examines transportation decision-making to determine whether criteria have been broadened to include a more balanced view of transportation, allowing pedestrian and transit options to be assessed based on their full benefits. The study reviews criteria with a focus on identifying non-highway criteria among six selected Metropolitan Planning Organizations (MPOs).

EXECUTIVE SUMMARY

Transportation projects are measured across a series of criteria intended to reflect community goals and values. The criteria usually include elements related to environmental variables and social values. A closer look shows that these variables are sometimes subjective, as well as value-based. Even though the intention is to provide a more balanced, sustainable and inclusive transportation system, the nature of the planning process inherently provides more importance to variables that are measurable and may be more favorable to highway-oriented solutions. Measurements such as reduction of congestion and improvements in travel time may result in a highway solution for a corridor, rather than a transit option. Project selection may be based largely on time or congestion reduction when the full societal costs have not been included.

The challenge of encouraging people to transfer from one mode of transportation, especially private vehicles to public transportation, is rather difficult, considering the convenience offered by private automobiles. While transit poses its abilities to mitigate some of an urban area's traffic congestion, it also might inflict undesirable results if it was not well planned or well coordinated. Therefore, a well-balanced view of transportation and strategic planning that encourages mixed-use modes and facilities are desirable as part of the planning process. Failure to do so leads to a poorly balanced transportation system with negative impacts on the economy and residents' health and well being. In addition, urban sprawl results with scattered activity centers and low-density neighborhoods, making bus trips to-and-from those destinations costly and inefficient. Consequently, these outcomes inevitably add to the difficulties already experienced by transit operation.

Decision-makers, MPOs, and other transportation professionals have discussed measures to reduce the congestion problem in America's urban or metropolitan areas. The primary outcome of these discussions is the creation of livable communities, as well as implementation of smart growth practices. These initiatives encourage better planning with focus on the future sustainability.

The study team identified criteria among six of the nation's metropolitan planning organizations (MPOs) with a focus on identifying non-highway criteria. MPOs studied include NCTCOG (Dallas area), H-GAC (Houston area), ARC (Atlanta area), MTC (San Francisco Bay area), DRCOG (Denver area), and Metro (Portland area). All communities reflect a similar method of project selection with a slight distinction. This pattern is influenced by TEA-21 planning requirements.

A review of criteria from the MPOs showed commonalities and dissimilarities. The MPOs exhibited common responsibilities, although their project types and prioritization strategies are different. All the MPOs defined their goals in their long range plans and established related criteria to support those goals in their transportation improvement document.

The MPOs also vary in a number of ways. Their priorities differed based on the importance of the projects in the communities they service. Some regions place high importance on measures that help reduce traffic congestion, maintain air and water quality, and improve quality of life through transit projects; others place less emphasis on transit and other strategies that encourage more occupants per vehicle.

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PROJECT PROBLEM STATEMENT

A great deal of attention is being focused on creating more livable communities, as well as implementing smart growth, transit-oriented and generally more sustainable communities. Since the advent of Intermodal Surface Transportation Efficiency Act (ISTEA), planners are focusing greater attention on the multi-modal components of regional transportation systems. ISTEA, and its successor Transportation Equity Act of the-21st Century (TEA-21), provided local governments the flexibility to spend previously allocated highway funds on either transit or highways, or as the local government deemed best. During the same time period, a number of governments and organizations began encouraging applications of smart growth principles, which wisely coordinate several disciplinary areas, including transportation. Regional goals mention the critical nature of planning and implementing environmentally sensitive systems that allow residents a choice in travel mode. A review of the decision-making criteria used by many local governments, however, shows project selection criteria largely reflective of measures that tend to favor highway-oriented benefits, such as increasing travel speeds. In addition, goals supporting increased non-motorized travel options, increased transit, and more environmentally sensitivity projects are often less measurable and more related to the nebulous “quality of life” factors. When benefits, such as air quality are measurable, the advantages may be localized and seem insignificant on a regional basis. Moreover, measurements showing that regional transportation goals have been met and what actually determines a sustainable or otherwise more livable community are difficult to find. When such measurements are located, they vary vastly by community. Therefore, while citizens and elected officials strive for greater environmental sensitivity and increased coordination between transportation and land use, traditional highway-oriented decision-making tools may be in use to identify transportation projects.

This research examines transportation decision-making to determine whether criteria have been broadened to include a more balanced view of transportation, allowing pedestrian and transit options to be assessed based on their full benefits. The study reviews criteria with a focus on identifying non-highway criteria among six selected Metropolitan Planning Organizations (MPOs). The term “transit-friendly” is used in this document to indicate criteria that discourage utilization of the single-occupant vehicle and encourage utilization of transit, bicycles or pedestrian ways.

BACKGROUND

Transportation projects are measured across a series of criteria intended to reflect community goals and values. The criteria usually include elements related to environmental variables and social values. However, a closer look shows that these variables are often subjective rather than value-based. Thus, even though the intention is to provide a more balanced, sustainable, more inclusive view of the transportation response, the nature of the planning process inherently provides more importance to variables that are measurable and more favorable to highway-oriented solutions. Measurements such as reduction of congestion and improvements in travel time may, in fact, result in a highway solution for a corridor, rather than a transit option. In such case, the project selection may be based largely on that travel time or congestion reduction element when the full societal costs have not been included. In other cases, transportation decisions are based in some components of benefits and costs. Benefit-cost methodology was made popular by the Army Corps of Engineers in analyzing various construction options. The procedure is based in Pareto Optimal Theory which advocates that everyone is better off because the project has been implemented (Mishan, 1974). The benefits defined for a project are assessed a dollar value, and this value is divided by project costs in order to produce a ratio. If the ratio is “one” or greater, the project benefits are determined to exceed costs and can be considered viable. If the ratio is less than one, then the project is determined not viable.

Over the years, planners and communities moved from pure benefit-cost evaluations to a modified cost and benefit analysis, often called cost-effectiveness allowing incorporation of more social and environmental considerations in the process of decision-making (Meyer and Miller, 1984; Gray and Hoel, 1992). The Federal Transit Administration (FTA) has used a similar method which provides a dollar value for operating cost, new transit riders and time savings over other alternatives. The three variables comprise the benefits, which are divided by project cost. This has allowed decision-makers to expand the rigid valuation of benefits to more easily accommodate broader community goals.

Over roughly the last 15 years, the number of community advocates who encourage livable communities, smart growth and similar concepts has increased. Important to these advocates is greater consideration of the interaction between land use and transportation decisions. Of interest is the way cost-effectiveness or other decision-making measures have evolved since the increased focus on livable and more sustainable communities. A survey of the type of measures and their applications would add valuable information to planners and decision-makers, contemplating the range of transportation options and their potential implications.

OBJECTIVES OF STUDY

In all communities, the cost-effectiveness may be influenced by political variables. Still, the planner is charged with producing the best technical answers. This research will analyze the transportation criteria for selected metropolitan planning organizations (MPOs) across the nation. A cross section will be selected to represent communities that may be similar to communities in Region VI. The objectives of the study are as follows:

- Identify communities nationally known to be proactive in encouraging non-motorized alternatives that may have developed measurable criteria to determine viable transportation projects over the last 5 to 10 years.
- Compile a list of measurable criteria that reflects livable communities' concepts and goals to reduce dependence on the automobile, and that incorporate benefits from transit and non-motorized transportation options.
- Identify those non-highway criteria that are common among all the criteria used in the various communities.
- Examine those common criteria and determine their impact in encouraging livable communities.

METHODOLOGY

An examination of several MPOs will be included in the study. The criteria used by each MPO will be described and delineated with designation of criteria encouraging transit or non-motorized travel options. Also, comparisons will be made between these criteria and similar data drawn from more traditional projects' decision-making criteria. Consideration will be given to variations in size, culture and "transit-maturity" in the analysis.

The study team used the case study approach as the method for assessing the data. This method allowed researchers to gain insight and interpret observations from the locations identified, even though each region may exhibit characteristics unique to its location. Furthermore, the case study method facilitates findings of a descriptive, qualitative, and quantitative nature (Yin, 1994).

The analysis began with a literature review of the transportation decision making process. The next step involved the selection of MPOs and the identification of criteria used by each in selecting transportation related projects. Once the identification of the criteria was complete, the researchers determined the commonalties. The final step included the identification of common criteria and the discussion of how each contributes to the overall goal of livable communities.

LITERATURE REVIEW

Before cost-effectiveness analysis, in the first half of the 20th century, the United States' transportation problems were left out of the political arena and simply regarded as technical engineering problems. During the 1960's, problems emerged between mode proponents and politicians when politicians began adopting transportation as an issue for them to guide their thinking in a more direct way. A good example of this is shown in this excerpt.

Public opinion began to change around 1960. Both local and national politicians responded to this, and pro-transit measures gained increasing support....The first interstate links built were rural, but by 1960 highway construction was having a severe impact on cities. In the 1960s, the federal-aid highway program displaced an annual average of 32,395 families and individuals, plus 3199 businesses....Grassroots opposition to the superhighways grew into the "Highway Revolt" (Black, 1995, pp. 42-43).

The challenge of encouraging people to transfer from one mode of transportation, especially private vehicles to public transportation, is rather difficult, considering the convenience offered by private automobiles. While transit poses its abilities to mitigate some of an urban area's traffic congestion, it also might inflict undesirable results if it was not well planned or well coordinated. Therefore, a well-balanced view of transportation and strategic planning that encourages mixed-use modes and facilities are necessary as part of the planning process. Failure to do so leads to a poorly balanced transportation system with negative impacts on the economy and residents' health and well being. In addition, urban sprawl results with scattered activity centers and very low-density neighborhoods, therefore, making bus trips to-and-from those destinations costly and inefficient. Consequently, these outcomes inevitably add to the difficulties already experienced by transit operation.

Decision-makers, MPOs, and other transportation professionals have discussed measures to reduce the congestion problem in America's urban or metropolitan areas. The primary outcome of these discussions is the creation of livable communities, as well as implementation of smart growth. These two initiatives encourage better planning with focus on the future sustainability and reasonable changes to the infrastructure as stated by Fielding (1999).

Transit planners should analyze the benefits and costs, leaving the choice of solution to management, which must take into consideration political, financial, administrative issues beyond the sphere of planning (p. 153).

To the advocates of transit, a combination of a well-planned transit system and appropriate land-use management seem to be a solution to the challenge of sustainability and congestion. It is reasonable that if transit is frequently used, the number of private cars on the highways will decrease.

Relationship Between Transit and Livable Communities

Description of smart growth, sustainability and livable communities include coordinated uses of land and well-conceived supporting transportation. Specifically focusing on the benefits of transit in “Transit-Oriented Development (TOD)”, where the tenets of smart, sustainable community are strategically linked with good transit as a nucleus. Transit is influenced by population density and “modal compliments” (feeder bus service) for its efficient functionality. Density is the compactness or concentration of development. TOD is an example of concentrated development. Numerous studies support the relationship between density and vehicle trip length. In 1995, Nelson/Nygaard, conducted a study in Portland, Oregon with emphasis on variations in transit demand. Their outcomes concluded that the most significant variables for determining transit demand were the overall housing density per acre and the overall employment density per acre. These two variables, alone, predict 93 percent of the variance in transit demand among different parts of the region. Work by Harvey (1990), Holtzclaw (1990), and others suggest that a doubling of residential densities (persons per residential acre) correlates with a decrease of 20 percent to 30 percent in vehicle mile traveled (VMT) per capita. Holtzclaw concludes that 1 mile of transit travel in denser urban environments replaces 4 to 8 miles of automobile travel in low-density suburbs for a similar set of activities.

Additionally, several examples representing large and small communities confirm the relationship between transit and livable community plans, for instance:

- The Corpus Christi Regional Transit Authority (CCRTA) conducted research on the improvement of sidewalks, lighting and landscaping around the transfer centers in Corpus Christi, Texas. The result of this project was a four percent to six percent increase in ridership on the routes served by transit centers.
- Another station improvement project was undertaken in Chicago where transit ridership, growth and community revitalization were anticipated (Sweeney, 2001). Access improvements like those made at Chicago stations have been demonstrated to increase transit system utilization by as much as six percent. The rehabilitation of this station has been no exception, increasing overall ridership on the Green Line and adding to the community’s livability.
- In Louisville, a six percent citywide increase in ridership is a result of improved transit connections combined with the on-site employment training programs.

In each of these communities, appropriate transit projects were effectively integrated into communities as a result of decision-making by local government about the solution that best met their needs. In addition, MPOs often lead their communities in identifying cost-effective remedies. The ISTEA and TEA-21 delineate guidelines for the planning process to be carried out by the MPOs in the area of transportation planning.

Metropolitan Planning Organizations (MPOs)

MPOs are organizational entities established by law to provide a forum for cooperative transportation decision making for the metropolitan area containing a population of 50,000 people or more. The goals of the MPOs include supporting economic growth initiatives, implementing multimodal transportation systems in a

manner that efficiently maximizes mobility of people and goods with minimal energy consumption, and reducing air and water pollution and negative social impacts. A major focus of the MPOs is to create livable communities for the public that encourage multi-modal transit systems. Livable communities in the United States vary according to local goals, as noted by Vukan (1999). He writes that livability is generally understood to encompass those elements of home, neighborhood, and metropolitan area that contribute to safety, economic opportunities and welfare. In addition, health, convenience, mobility, and recreation are considered important conditions. Lewis and Williams (1999) add that livable neighborhoods are affected by political and physical factors. In general, livability includes multi-unit housing, mixed land use and green space.

Although livability cannot be defined precisely or measured quantitatively, it is recognized as a very important concept, and consideration in the societies of developed countries for the twenty-first century. Most livable communities encourage multi-modal transit systems for an entire region.

In order to pursue livability and compatible transportation, MPOs receive federal funding to carry out their planning responsibilities. Since these entities are designated to receive federal funds, they distribute funds to other organizations and have influence in the disbursement of government funds and the rate at which funds are dispersed within their region. The MPOs work very closely with states, counties and cities when coordinating regional transportation planning.

The MPOs are currently operating under the guidelines of the TEA-21, signed into law by President Bill Clinton on June 9, 1998. Prior to TEA-21, ISTEA served as the major authorizing legislation for surface transportation from 1991 to 1997. TEA-21 is the largest infrastructure-funding bill ever, representing a real milestone and a major victory for the federal transit program in terms of funding levels and policy provision (www.apta.com/govt/legis/tea21).

The underlying philosophy of ISTEA is essentially unchanged, only the approach has been simplified with the advent of TEA-21. This legislation combines the continuation and improvement of its predecessor's programs with new initiatives to meet the challenges of improving safety as traffic continues to increase at record levels. In addition to previous responsibilities, TEA-21 focuses on protecting and enhancing communities and the natural environment, while providing transportation and encouraging smart economic growth and competitiveness at home as well as internationally through efficient and flexible transportation. In addition to all these unparalleled achievements attained by this legislation, TEA-21 offers significant features that include:

- Federal funds for surface transportation is assured and guaranteed. The transit funding guarantee is a selected, fixed amount.
- Safety will be encouraged at all costs through safety programs and new incentive programs with great potential for savings to life and property. More funds will be awarded to other government agencies, especially to police forces in an effort to enforce safety to all motorists, transit users, and pedestrians.
- Continuation of the proven and effective program structure established for highways and transit under the landmark ISTEA legislation.

- Women and minority-owned business and small firms in highway and transit contracting are encouraged.
- Funding research and its' application to maximize the performance of the transportation system with special emphasis placed on deployment of Intelligent Transportation Systems (ITS) to help improve operations and management of transportation systems and vehicle safety (FHWA, July 14, 1998).

TEA-21 concentrates on the role and responsibilities of the MPOs in the United States metropolitan areas. In fulfilling their transportation planning responsibilities, the MPOs cooperate with a number of agencies, including the Federal Highway Administration (FHWA), FTA, local communities and counties. These organizations receive input and recommendations from their Transportation Technical Committees (TTC).

The following displays the four general steps of a MPO transportation planning process:

1. System planning - long-range planning for the entire urban area. It involves examining alternative systems, evaluating cost-effectiveness, and identifying priority corridor of improvement.
2. Alternative analysis - detailed comparison of several alternatives and a null alternative. It results in the best-preferred alternative.
3. Preliminary engineering - determines the technical feasibility establishes specific alignments, and makes detailed cost estimates.
4. Final design - prepares final plans and specifications to be used by contractors (Garber and Neal, 1988).

This process is critical because through it the worthiness of a project is determined. Consequently, feasible projects are moved into the implementation phase.

Decision-Making Process

The decision-making process begins with a brainstorming stage, where a variety of ideas, designs, locations, and system configurations are all considered for the solution of a problem.

Decision-makers must set goals and objectives, and identify the criteria by which they will measure alternatives and projects before the brainstorming stage starts. Some of the immediate goals and objectives of these top officials include 1) making decisions that support structures to last for decades and 2) selecting alternatives that comply with state and federal transportation planning regulations-in an attempt to leverage funds.

Nevertheless, this process is difficult because the decision-makers involved have to deal with numerous factors that could influence their decisions, either positively or negatively. Political factions and lobbyists usually influence the decisions made by these officials to favor their own interests. For instance, residents of a high-income neighborhood, who might believe that transit is associated with crime, might oppose an addition of a new route in their area. Additionally, there are other significant factors that

could alter the decisions made. Some of these considerations include federal planning requirements, cost-benefit analysis, social impacts, and financial constraints. All these considerations are critical elements that lead to sound decision-making. To facilitate the decision-makers' duty, analysts are charged with presenting them with summarized and readily understandable information. Keys in the process of decision-making are those elements that influence elected officials.

The strong historical bias in the planning process toward cars leads to separate rather than integrated land uses. Only a multimodal system, consisting of private vehicles and public transit is capable of meeting the needs of high-density areas. Many people argue that increasing car dependence is not sustainable due to a lack of diverse densities and efficient activity centers. Further, regardless of the degree of car ownership, there will always be a significant segment of the population who cannot use a private car.

Depending on the complexity and demands of the decision-making process, better decisions are usually made after a thorough, public-involved study has been conducted.

Cost-Effectiveness and Cost Efficiency

Engineers and planners routinely apply the concept of cost efficiency and cost effectiveness as decision component of transportation planning. Efficiency is the relationship between the resources used (labor, capital, and fuel) and the service (miles and hours) produced; effectiveness is the deployment of service to accomplish goals (increasing passenger trips to produce more revenues or to reduce traffic congestion) (Fielding, 1987). Assessing cost effectiveness and efficiency areas is a critical element of evaluation. These methods of evaluation were largely made popular in the military context, where goal attainment frequently cannot be quantified, but where the relationship between cost and effectiveness, for example, of alternative weapons can be ranked.

The concept of efficiency is concerned with obtaining one's "money's worth" from an alternative (Thomas and Schofer, 1967). The benefits should be greater than the cost to consider the project viable. This cost comparison approach is based on the axiom that more informed and, hence, better decisions will result if the decision-makers are presented with the maximum amount of information about the subject (Papacostas and Prevedouros 1993). While these methods provide successful results, in many cases, inevitable disadvantages are attached. One detriment of these approaches is they lead to decision-makers putting more emphasis on the efficiency of the system, thus ignoring less measurable goals such as social consequences.

Another principal criticism of the cost-effectiveness procedure is it presents too much information that cannot be readily assimilated and integrated in a decision process (Stopher and Meyburg, 1976). In addition, this method requires decision-makers to express cost and benefit in monetary value. Many of cost and benefits associated with a project cannot be satisfactorily expressed in monetary value. The disadvantage of this concept is that many of the important factors associated with the project purpose are omitted during the evaluation leading to a narrow set of consequences being considered.

It is clear that determining cost effectiveness and efficiency of alternatives is a difficult task because it involves a high volume of information. It is also apparent, from

past experience, that decisions made by this type of analysis alone are not generally the best, when viewed in the context of a whole set of criteria. Recently, there has been a tremendous involvement of the public in decision-making through surveys, meetings and other input methods. Citizens and environmental groups are active and even militant in expressing their views (Black, 1995). Citizens' perspectives cannot be easily translated into a variable for cost and analysis. For this reason, the cost benefit ratio is only one of many considerations leading to a project's selection.

Criteria and Measures of Evaluation

The strategic planning process begins with a clear statement of goals and objectives accompanied by a defined set of criteria. A community's goals and objectives must adhere to TEA-21's seven broad areas to be considered in the planning process:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety and security of the transportation system for the motorized and non-motorized users;
- Increase accessibility and mobility options available to people, as well as for freight;
- Protect and enhance the environment, promote energy conservation, and improve quality of life;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system (FHWA, 2002)

All six selected MPOs have identified a number of criteria, which they use to identify the most feasible alternatives when selecting projects. Criteria are standards on which judgments are based when selecting between alternatives. The criteria should match or support the MPOs' ultimate goals and objectives. Consequently, measures of effectiveness (MOEs) are applied to evaluate whether the chosen alternative achieves its objectives. MOEs are the standards against which alternatives are measured and serve as a major link between the technical analysis and the goals and/or objectives of decision-makers. According to Abrams and DiRenzo (1979) in order to be of use in the evaluation process, MOEs should display six major characteristics. They must be:

1. *Relevant to objectives*- each MOE must be clearly related to the objective.
2. *Measurable*- availability of enough data and analysis techniques are highly critical in the decision-making, therefore, they should be readily available. Also, the cost for gathering and analyzing these data should be equivalent to the value of information produced.
3. *Sensitive*- *reflect the values and concerns of the adjacent community and other stakeholders.*
4. *Unbiased*- measures should be applicable to a wide range of alternatives and not favor one mode over another.
5. *Manageable*- excess measures of information should rid a small amount of measures is easily manageable.

6. *Understandable*- measures and any information presented must be understandable to the decision-makers.

The table below shows an example of the relationship between goals, objectives, criteria, and MOEs. Goals are general statements about what an agency should accomplish and objectives translate goals into specific aims that are to be accomplished within a designated time period (Fielding, 1987).

Table 1

| | |
|------------|---|
| Goal: | Improve transit accessibility for senior citizens |
| Objective: | Minimize travel time (should be measurable) |
| Criteria: | Travel time (compared to what?) |
| MOE: | Response time for dial-a-ride transit |

Cost-benefit ratio is actually used by a number of MPOs as a determining criterion. This criterion has a major influence in the decision-making process because projects are implemented based on their investment ability of producing more value than financial value spent. Overall, the benefit should be greater than the cost.

CASE STUDIES

The study team selected six MPOs across the nation with a focus on identifying criteria used for transportation decision making. A focus was on criteria that seem to encourage more utilization of higher occupancy vehicles or non-motorized travel. Data were collected on population, employment and the MPOs project selection methods. MPOs studied include NCTCOG (Dallas area), H-GAC (Houston area), ARC (Atlanta area), MTC (San Francisco Bay area), DRCOG (Denver area), and Metro (Portland area). All communities reflect a similar method of project selection with a slight distinction. This pattern is influenced by TEA-21 planning requirements. It should be noted that the goals, criteria and measure discussed in the narrative and displayed in the tables reflect elements clearly observable in printed material for each MPO.

Synopsis of North Central Texas Council of Governments: Dallas/ Fort Worth Area

Background

The following analysis focuses on North Central Texas Council of Governments' (NCTCOG) Metropolitan Transportation Plan. NCTCOG is a voluntary association of local governments established in 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG serves a 16-county region of North Central Texas, which is centered on the two urban centers of Dallas and Fort Worth. The counties found therein include Collin, Dallas, Denton, Ellis, Erath, Hood, Hunt, Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, Tarrant, Johnson, and Wise. According to the data collected by the Census Bureau in 2000, the total combined population of this area is 5,309,277 (NCTCOG, February 2000).

NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions.

A project selection procedure is applied in the short range Transportation Improvement Program, which determines the feasibility of the individual projects. The goals, criteria and project selection criteria that favor transit projects over highway will be identified from the entire anthology of goals and criteria. The direction for long-range transportation plans is set in the 2025 Mobility Plan. This plan is a comprehensive, multimodal blueprint for transportation systems and services aimed at meeting the mobility needs of Dallas-Fort Worth (DFW) Metropolitan Area. The plan establishes regional goals and transportation priorities over the 25 year horizon (NCTCOG, February 2000).

Goals

Key goals address transportation, quality of life, and financial parameters as follows:

Table 2
Mobility 2025 goals

| |
|---|
| <p>Under the category of transportation, the following are addressed:</p> <ul style="list-style-type: none"> • Accommodate Expected Demographic Growth • Reduce Traffic Congestion • Provide Multimodal Options • Improve Travel Efficiency |
| <p>The quality of life goal has three areas:</p> <ul style="list-style-type: none"> • Provide for Continued Economic Development • Provide Increased Transportation Accessibility • Reduce Environmental and Community Impacts |
| <p>The financial goal include two key ideas:</p> <ul style="list-style-type: none"> • Pursue Stable, Long-term Revenue Options • Reduce Transportation System Costs |

Criteria

NCTCOG’s criteria are developed according to several funding categories. For purpose of this analysis, Congestion Mitigation Air Quality (CMAQ) and Surface Transportation Program-Metropolitan Mobility (STP-MM) will be examined. CMAQ is analyzed because of its emphasis on reducing congestion and improving air quality. STP-MM is included because it represents the local communities’ opportunity to allocate funds to transit or highways. Both of these funding categories may be used for highways or transit at the discretion of the local decision-makers. The specific criteria related to the goals leading to project selection are listed under NCTCOG’s Transportation Improvement Program (TIP). The NCTCOG assessment of criteria is based on a point system with a total.

Criteria for Congestion Mitigation/Air Quality (CMAQ) and STP-MM

Projects are awarded points on a scale of 0 to 20 per criteria for a maximum of 100 points total. In the case of CMAQ, the points are distributed evenly across five criteria; while STP-MM points vary across five criteria. STP-MM and CMAQ share four common criteria. CMAQ includes a congestion management variable, while STP-MM separates cost-effectiveness into two parts-current and future.

As an example, the point system is shown in Table 3 for Congestion Mitigation and Air Quality eligible projects. The NCTCOG website has the point distribution for the Surface Transportation Program—Metropolitan Mobility category.

Table 3
NCTCOG's Evaluation Components and Scores (CMAQ)

| Criteria | Points |
|--|--------|
| Cost Effectiveness | 20 |
| Air Quality/Energy Conservation | 20 |
| Local Cost Participation | 20 |
| Intermodal/Multimodal/Social Mobility | 20 |
| Congestion Management System Strategy/Transportation Control Measure | 20 |
| Total | 100 |

Source: NCTCOG, www.nctcog.dst.tx.us/trans/tip/appendix%20k.pdf

The following description is given of each criterion according to NCTCOG.

Cost-Effectiveness is based on annual travel time benefits and the total dollar cost of making the proposed improvement. The whole idea is to use available resources as effective and as thrifty as possible so that the output is greater than the input. Current and future cost-effectiveness of a project depends on the type of measure to be undertaken. For instance, in terms of capacity and system improvement (roadway widening and intersection improvement) the travel timesaving method of evaluation is used.

Air Quality and Energy Conservation are analyzed based on the change in emissions resulting from the implementation of a project. A project can reduce emissions by improving speed of traffic flow on the roadway or by removing vehicle miles of travel from the traffic stream.

The Local Cost Participation is not included in transit-friendly since it refers to the percent of the local match and offers no advantage to transit.

Congestion Management Plan and Transportation Control Measures was used in evaluating projects for the Congestion Mitigation Air Quality Improvement Program only. Projects designed specifically to improve air quality were given maximum scores.

Intermodal/Multimodal Projects/Social Mobility evaluate whether the project encourages multiple-occupant vehicle travel and facilitates intermodal connections. Also, projects that promote transit use, car and vanpooling, elderly and disabled transportation services, received the maximum number of points; while projects such as road widening promote single-occupant vehicle travel were scored unfavorably.

The criteria for STP-MM and CMAQ were viewed to determine which variables provided an advantage to a transit or other non-motorized project compared to highway. The determination required an obvious advantage.

It was also important to link the criteria with MPO stated goals. Some of the criteria can be directly matched with the written goals; others are somewhat hard to recognize because they are embedded conceptually across criteria section. The goals, criteria and measures that are friendly to transit have some criteria in common with those for CMAQ funding. In addition, points are provided for including non single occupancy vehicle travel options and for reducing congestion.

In specific, the measures are Pedestrian/Bicycle, Bus/HOV lanes, Commuter Rail/Light Rail and Travel Demand Management. Measures are directly related to goals. For example, the measures to *Improve Travel Efficiency* are related to the goal of *Reducing Congestion*. The *Air Quality/Energy Conservation* rating is used to match *Reduce Environmental and Community Impacts* goal. The measure used is dollars per pound of Nitrogen Oxide Emission Reduction.

For the *Reduce Transportation System Cost* goal, the cost-effectiveness rating was used, and the measure is benefit-cost ratio. While cost-effectiveness is mostly used as the sole determinant criteria by most MPOs, NCTCOG used this criterion as part of the entire criteria. Of the 100 points set aside for the entire process, 20 points were acquired through this criterion.

Summary

Transit-friendly criteria could garner up to 40 of the maximum 100 points for CMAQ and 34 of the 100 maximum for STP-MM. Under the Intermodal/Multimodal/Social Mobility Rating, transit is awarded 20 points for its contribution in CMAQ programs and 16 points for STP-MM. More points under either category are possible depending on the individual projects benefit-cost ratio. However, the scope of this research is limited in its ability to evaluate that criterion.

Synopsis of Houston-Galveston Area Council (H-GAC) of Governments

Background

The following analysis focuses specifically on the Houston-Galveston area and the characteristics of the highlighted counties found therein. Local elected officials from the eight county region of Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller formed the H-GAC in September 1966. The H-GAC is a voluntary association of 148 local governments and local elected officials in the Houston-Galveston Transportation Management Area, consisting of 12,500 square miles with the population of approximately 4.6 million. H-GAC's mission is to serve local government today, while helping them to plan for tomorrow by:

- Promoting efficient and accountable use of local, state, and federal tax dollars;
- Serving as a problem-solving and information forum from local governments;
- Helping local governments, business, and civic organizations analyze trends and conditions affecting the area and respond constructively.

H-GAC gives highest priority to serving local government needs. It promotes voluntary approaches that encompass transportation system improvements including planning air and water quality, solid waste management, region-wide purchasing, work force development, and 9-1-1 emergency telephone communications parameters. In order to achieve its goals and objectives, H-GAC implemented a long-range transportation plan also known as 2022 Metropolitan Transportation Plan (MTP). The MTP is a strategic planning document designed to identify and address the transportation needs of the Houston-Galveston region through the year 2022. It is a multimodal plan that describes needed improvements for modes as diverse as cars, trucks, public transit, bicycles, and pedestrians. As such, the MTP forms the basis for transportation planning activities within the region and determines the nature of the future transportation system (Houston-Galveston Area Council, February 25, 2000).

Goals and Guidelines

H-GAC developed a set of goals to focus their planning process. These goals include mobility options, cost effectiveness and citizen involvement. The goals are as follows:

- Increase accessibility and mobility options available to people and freight
- Adequately maintain current roads and transit services
- Preservation of the existing infrastructure and transit services
- A cost effective and affordable transportation system
- Improve access to and connections within the transportation system
- Provide for efficient, safe, and secure movement of people and goods
- An environmentally responsible system

- Active citizen involvement
- Promote coordinated land use and transportation development (HGAC, February 25, 2000).

The H-GAC project selection process follows guidelines approved by the Transportation Policy Council in 1997. The criteria regarding project eligibility, project readiness, project selection, and the funding of Preliminary Engineering (PE) and Environmental Assessment (EA) work are included in these guidelines. Table 5 illustrates the guidelines categorized by project readiness, project selection year and STP-MM funding consideration. All three elements are critical in the decision-making process. A key criterion in the HGAC area is project readiness, a project must have all available funding matches and drawings must be far enough along that once approval is granted the project may proceed into construction.

Since NHS projects compete for funding statewide, STP and CMAQ funds could be used on NHS projects when the following conditions are met:

- The proposed project rank highly among other NHS/STP/CMAQ candidate projects in the short-range (10-year) MTP list;
- The proposed project does not rank competitively among statewide NHS candidates due to high costs;
- The proposed NHS project can be leveraged with STP or CMAQ funds by the selection of logical, useable elements of the project in effect making the remaining project elements competitive on a statewide basis
- The project is sufficiently limited in scope and its cost is within the scale and magnitude reasonably expected funding for the effected funding category.

(Source: Houston-Galveston Area Council, February 25, 2000).

The Transportation Policy Council (TPC) selects projects commensurate with expected federal funds for next six years time period (2000-2005). Based on the project ranking process and expected funding available, projects in the six-year list are ranked by year. Construction of new projects not in a previous TIP may not be programmed in the first two years of a TIP until the completion of PE/EA. Projects that are undergoing PE/EA may be programmed in the third year of the TIP.

According to H-GAC, in order for projects in the short-range element of the Vision 2020 MTP to be included in the TIP for PE/EA, there must be funding commitments from respective agency sponsors. The federal government takes responsibility for about 80 percent, leaving the local government with the accountability of 20 percent for the STP-MM projects. Under the CMAQ category, sponsors are charged with identifying projects that require PE/EA and including that in the project cost. This cost should impact the ranking and scoring of these projects (H-GAC, February 25, 2000).

Evaluation Methodology

H-GAC has established a set of requirements for candidate projects to be included in the list of priorities or short-range program. Since air quality conformity is so critical in transportation fund planning, all projects must conform to the required federal air quality standards. Also, these candidate projects are assessed for readiness, meaning whether they can proceed directly toward the next step to implementation. For example, adequate right-of-way has to be acquired, projects must undergo PE/EA and local funding commitment has to be reached. Once this condition is met, a benefit cost analysis is performed to weigh the feasibility or worthiness of the candidate projects. Roadway volume guideline is another factor used to serve as a decision-making tool in the project selection process.

Project Evaluation and Prioritization for TIP Candidate Projects

This process begins with sorting projects into categories, which include the following:

- Operations and Maintenance (Transit/Roadway)
- Rehabilitation and Preservation (Transit/Roadway)
- Roadway Expansion (Widening and New location)
- Transit (New transit services or expansion/HOV lanes) and
- TSMTDM (Grade separation/Vanpooling).

Different evaluation methods are applied according to the various categories. For purposes of this research the methodologies for roadway expansion, CMAQ and transit projects and new location roadway are reviewed.

Under the roadway expansion category, projects are evaluated for congestion and other benefits. The projects are rated on a scale of 0 to 200 points (100 for congestion and 100 for other benefits). Examples of other benefits are: the project contributes to the MTP goal of a multimodal system with seamless connections by improving passenger and commuter choices (25 points), and the project relieves a bottleneck or fills a gap in the existing roadway system resulting in improving traffic flow (25 points). Projects with a score of 50 and above will be regarded as short-range strategies and undergo the benefit/cost analysis to determine their relative priorities, then go on with the process to implementation.

Since CMAQ and transit projects improve the quality of air, they qualify for funds under the Congestion Mitigation and Air Quality Improvement Program. These projects could be implemented within the first ten years of the MTP depending on the level of funding. The evaluation for CMAQ/transit projects is based upon emission reduction, VMT reduction, and travel delay savings.

The New Location Roadway Construction Project skips the first step (readiness) in this process and goes directly to the benefit/cost analysis to determine the feasibility. These projects are evaluated using a methodology similar to widening projects.

However, since these projects are completely new and have no data like traffic volumes or speeds attached to them, staff uses a proxy approach to acquire the data, a method used to study characteristics of an existing roadway so that they can assign them to a non-existing or in pre-construction phase roadway project.

Summary of Transit Consideration

Transit is not provided any advantage; the approach and analysis yields no comparative assessment of projects across modes.

Synopsis of Denver Regional Council of Governments: Colorado

Background

The following analysis focuses specifically on the Denver metropolitan area and the involvement of the Denver Regional Council of Governments (DRCOG). The Denver Regional Plan covers eight counties- Adams, Arapahoe, Boulder, Clear Creek, Denver, Douglas, Gilpin, and Jefferson- whose total population equals 1.88 million based on the 2000 census bureau data.

The DRCOG is a voluntary association of 51 county and municipal governments in the Denver, Colorado metro area working together to address regional issues. DRCOG began when 39 elected officials and staff members met on Feb. 15, 1955, at the Denver Athletic Club in response to an invitation from Denver's then-Mayor, Quigg Newton. The purpose of this meeting was to encourage these officials "to consider a four-county district authority to plan for the development of the metropolitan area...and to meet the common problems that confront the four counties." The next month, the Inter-County Regional Planning Association, DRCOG's predecessor, was born. Adams, Arapahoe and Jefferson counties and the city and county of Denver were charter members.

During its five decades of service to the region, the council has taken pride in its long-term focus on issues, which directly affect quality of life. These include mobility, service to older adults, environmental concerns, planning for the future, public safety and the provision of information for sound decision-making (DRCOG, March 21, 2001).

As the MPO for the Denver region, DRCOG prepares short-range and long-range transportation plans and programs; selects and approves projects for federal funding; develops ways to reduce traffic congestion; and ensures that transportation projects in the region help improve air quality. It is the DRCOG's job to bring the region's transportation organizations together.

Transportation Goals, Objectives and Strategies

The primary purpose of a transportation system is to provide mobility and accessibility to commuters and goods. To achieve this purpose, DRCOG's Metro Vision defines the goal for the regional transportation system as *a balanced, multimodal transportation system that includes rapid transit, a regional bus network, regional beltways, bike and pedestrian facilities, and improvement to the existing roadway system* (DRCOG, 2001). The following are the seven objectives to guide the development of Denver's regional transportation system to achieve this vision.

- Restore and/or maintain the designed transportation functions of existing and future transportation facilities;
- Provide high-capital transportation facilities where development actions support the efficient use of those facilities;
- Implement rapid transit to reduce the need for additional roadway capacity and reconfigure the bus network to serve the rapid transit system;
- Implement high service frequency on principal bus corridor and alternative bus services for suburb-to-suburb travel and other markets not well served by the rapid transit system;

- Enhance the attractiveness and convenience of non-motorized modes in serving non-recreational travels;
- Improve the connection of passenger and commercial transportation systems within modes, between modes, and between the metropolitan area and other areas of the state; and
- Demonstrate the need for increased revenues to close the gap between needed facilities and the region's ability to pay for them.

DRCOG also established a list of five strategies to guide the project selection process for the Denver area. Before selected projects can be included in the TIP, they must be checked for their responsiveness to the following strategies, listed in priority order:

- Maintain and Improve the Integrated, Multi-Modal Metropolitan Transportation System
- Implement Transportation Control Measures to Meet Air Quality Goals
- Manage Mobility to Relieve Congestion
- Provide a Continuous and Complete Multi-Modal Transportation System and
- Enhance the Transportation System (DRCOG, 2001).

DRCOG TIP Selection Process

DRCOG has primary responsibility for selecting projects funded with federal Surface Transportation Program and Enhancement funds, as well as Congestion Mitigation/Air Quality funds. DRCOG committees follow eligibility standards and ranking criteria adopted by the Board of Directors to select projects. These eligibility requirements include transit improvements in accordance with the Regional Transit District guidelines, transfer facilities or park and rides, and vehicle rehabilitation and other improvements. The process begins when project sponsors submit their project application forms. After DRCOG receives the form, the committee reviews them for eligibility, then scores, ranks, selects and programs them. Consequently, between September 1999 and November 2000 the DRCOG Board of Directors conducted public hearings, board workshops, and DRCOG Committee meetings. Following, the Board of Directors reached consensus on projects to be included in the six year 2001-2006 TIP.

Project Eligibility Requirements

All projects to be funded using federal funds through the TIP must implement the improvements and policies contained in the fiscally constrained 2020 Regional Transportation Plan (RTP). Project types that must be consistent with 2020 RTP and the mechanism or eligibility requirements for selecting specific projects to be funded federally. A variety of project types are covered ranging from transit, safety to historical preservation/archaeological project types.

Some of these project types had both transit and highway elements. For instance, the *Maintenance* project type had transit reconstruction and highway reconstruction projects. An exception was made with this particular project type. Nevertheless, for the purpose of this study, the focus was placed on the non-highway and non-motorized project types.

Project types that were not reviewed are management (Operational/Highway), highway (Widenings/New Roadways), safety, and other (Transportation Aesthetics and

Scenic Values). Transit, elderly and disabled and non-urbanized transit projects, bicycle and pedestrians, and maintenance were the only project parameters reviewed.

A point system was used to help select eligible candidate projects for inclusion in the TIP programs. Points are awarded according to different criteria with focus on transit projects. The maximum a single project can be awarded is 126 points. For the purpose of this research, focus was placed on the non-highway and non-motorized projects.

Six project categories were evaluated using a variety of criteria ranging from usage to PM10 conformity. However, the scope of this study was only limited to reviewing those criteria that favor transit and non-motorized modes. Most project categories allocated the most points for their *Usage* criteria. For example, transit passenger facility allotted 44 points for its ability to serve a large number of people. *Cost-effectiveness* was also used to evaluate projects. In terms of this criterion, 34 points were awarded to new bus service proposed by local governments due to its affordability to users. Six additional points were garnered through the *Multimodal* criteria under the rapid transit goal. These points were earned for the inclusion of additional pedestrian facilities, bike lanes, and additional park-n-ride spaces. The points were evenly awarded, 2 for each of these intermodal aspects in transit projects.

Summary

DRCOG aspires to solve the area's traffic problems by implementing highway-oriented and transit-oriented projects. These include adding new lanes to the existing system of roadways, reconfiguring and improving roadways, adding HOV lanes, improving traffic signal synchronization, adding park-n-ride improvements, light rail facilities and stations, intermodal projects, bus service, transportation demand management programs, bicycle trails and pedestrian facilities, and promoting alternative travel modes (DRCOG, 2000). Still, most of the projects undertaken by DRCOG appeared to be highway-based rather than transit or non-highway based.

Synopsis of Atlanta Regional Council of Governments

Background

The Atlanta region is made up of 10 counties Cobb, Clayton, DeKalb, Cherokee, Fulton, Fayette, Douglas, Henry, Gwinnett, and Rochdale. The total population of the area is 3,429,379, based on the information collected by the Census Bureau in 2000.

Atlanta Regional Commission (ARC) coordinates the regional transportation planning in this region. ARC is the intergovernmental coordination agency for the above-mentioned counties, including the City of Atlanta. Since 1947, ARC and its' predecessor agencies have helped to focus the area's leadership, attention and resources on key issues of consequence. ARC is dedicated to unifying the region's collective resources in an effort to prepare the metropolitan area for a prosperous future. It does so through professional planning initiatives, the provision of objective information and the involvement of the community in collaborative partnerships (ARC, 1993).

ARC performs regional planning and coordination in the areas of aging services, community services, environmental planning, government services, job training, land use and public facilities planning, data gathering and analysis, and transportation planning. ARC has developed and listed a number of comprehensive goals in its RTP. The goals encourage economic advances and improvement in energy utilization, the environment and quality of life. Four of the goals are transportation focused. Table 4 illustrates both general and transportation-focused goals.

Table 4
ARC Regional Transportation Plan Goals
General Goals

Transportation Goals

- Improve Safety and Security
- Protect and Improve the Environment, Promote Energy Conservation and Improve Quality of Life
- Support Economic Activity
- Support Land Use and Goals
- Encourage Public Participation in the Planning Process
- Preserve and Modernize Key Elements of the Existing System
- Promote Efficient System Management and Operation
- Improve Accessibility and Mobility of People and Goods
- Enhance the Integration and Connectivity of the Transportation System, Across and between Modes, for People and Freight

Criteria

Specific criteria for each goal have been developed with each having high, medium or low impact criteria, receiving 15, 10, or 5 points, respectively. ARC also gives priority to projects that encourage commuters to carpool or use any type of transit rather than single occupant vehicle (SOV). In addition to reducing the congestion, transit usage benefits the Atlanta region by conforming to the federal air quality standards.

Several criteria encourage increased transit use and show the commitment of the region to reduce the trips made by SOVs. Those criteria are:

- Transit system connectivity (intermodal) and access (eliminates barriers),
- Reduce transit travel time (system reliability),
- Reduce auto-dependence and (SOV) travel,
- Promote park and ride lot construction,
- Promote construction of bicycle/pedestrian facilities that link to transit facilities (access),
- Encourage multi-occupant vehicle travel, car/van pooling, and elderly and disabled transportation, and
- Improve transit system security.

The criteria were matched with the respective goals. Projects were awarded points on a scale of 0—15 per criterion based on contribution to system improvement. The projects earning 15 points are regarded as high impact projects. Projects that are awarded 10 points are considered to be medium impact, and those earning 5 points are viewed as low impact. Examples of high impact projects are new transit service and bicycle/pedestrian facilities. Low impact projects include signing and informational systems and rehabilitation of an existing facility.

Summary

The Atlanta region places more emphasis on transit usage than on single occupancy vehicles. The goals and criteria that guide Atlanta's long-range plan prioritize transit programs, thus giving transit projects an opportunity to earn more points. Additional points for non-motorized travel are received through bicycle and pedestrian projects. These projects are rated favorably for their ability to replace short trips normally traveled by either transit or private vehicles.

Synopsis of Metropolitan Transportation Commission San Francisco Bay Area

Background

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. The counties include Alameda, Napa, Santa Clara, Contra Costa, Marin, San Francisco, Solano, Sonoma, and San Mateo. The total population of these counties is 6,783,760 according to 2000 Census data.

MTC is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. Created by the state legislature in 1970, MTC functions as both regional transportation planning agency—a state designation—and for federal purposes, as the region’s metropolitan planning organization. Therefore, it is responsible for the RTP, the comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle and pedestrian facilities. The Commission also screens requests from local agencies for state and federal grants in regards to transportation projects to determine their compatibility with the plan (MTC, October 18, 1999).

MTC focuses on planning and coordinating the region’s transportation system to ensure its efficiency and effectiveness. Its long-range transportation goals help to drive this plan to its success.

Goals and Objectives

MTC developed a set of transportation goals and objectives to improve the quality of life through mobility, accessibility and air quality for the residents of San Francisco Bay Area. In order to achieve these goals, the MTC established an agreement in 1998, known as Resolution 1876 Rail Extensions. This rail expansion program was adopted in the late 1980s and has delivered new BART service to Dublin (I-580 corridor) and Bay Point in the East Bay, the Tasman light-rail extension in Silicon Valley, and the BART extension to the San Francisco International Airport. Other projects covered under this agreement include BART to Warm Springs and Caltrain’s downtown extension. The innovative Resolution 1876 agreement has leveraged almost \$2 billion in state, regional, and local funds to obtain commitments for \$930 million in fiercely competitive federal new starts funds for Bay Area rail projects (MTC, 1999). An excerpt of Resolution 1876 is shown in Table 5.

Table 5 MTC Resolution No. 1876
MTC Resolution No. 1876

MTC Resolution No. 1876 is a multiyear rail expansion program adopted in 1988 and has delivered new BART service to Dublin (I-580 corridor) and Bay Point in the East Bay, the Tasman light-rail extension in Silicon Valley, and the BART extension to the San Francisco International Airport. Two other projects are: BART to Warm Springs and Caltrain's downtown extension. The innovative Resolution 1876 agreement has leveraged almost \$2 billion in state, regional, and local funds to obtain commitments for \$930. million in fiercely competitive federal New Starts funds for Bay Area rail projects.

Consequently, MTC established another policy known as Regional Transit Expansion Policy (RTEP), which was adopted in April 2001, as Resolution No. 3357. This policy includes detailed criteria used for evaluating projects for feasibility and funding before including in the final RTP. Unlike its predecessor (Resolution No. 1876), which only covered the rail element, this approach covers both rail expansion and improvement element and the express/rapid bus element.

Several goals and objectives favor a transit-oriented Bay Area over a single occupant vehicle-oriented Bay Area. The goals are as follows:

- Integrate and Coordinate Transit Operation
- Expand ridesharing
- Expand and improve the Region's Rail Network and Reinstate Train Service where feasible
- Improve Multimodal Access to Airports and Seaports
- Implement Market-Based Incentives to Reduce Solo Driving
- Expand Water Shuttle Transportation

Criteria and Procedures

Resolution No. 3357 established criteria for including projects in the new transit expansion plan and funding strategy. MTC criteria for selecting or identifying projects focus on rail and express/rapid bus and are arrayed in basically two categories: financial and performance-based. Performance based criteria include credit for new riders, frequency of transit service, and closing system gaps. Attention is also given to land use compatibility. Financial measures include appropriate local financial commitment to construction, maintenance and operation for at least 10 years.

Performance-Based Criteria Ranking

The performance criteria are ranked to encourage future transit-oriented development (TOD) through better land use policies. Cost-effectiveness is included with two measures of effectiveness; "cost per new rider" and "transit—user benefit". This criterion not only supports the attraction of new riders to transit but also encourages lower fares for the passengers. The overall goal of the transportation system is to allow more smooth and free movements of the passengers and goods and is represented by the

following criteria; system connectivity, gap closures and system access. For example, projects are ranked “high” for 5 or more connecting segments and frequent peak period headways of 10 minutes or less are assigned “high” under the system connectivity criterion. Project readiness is also considered under this criterion, and priority is given to those projects ready for implementation.

Table 6 represents rail and express/rapid bus criteria under MTC’s Resolution No. 3357: Section A and B. These criteria form the basis for MTC’s project selection process and inclusion in the MTC express/rapid bus and rail extension and improvement program. Section A covers rail criteria ranging from project status, importance, cost and funding to authorization law. Also included in the commitment of honoring Resolution No. 1876 are Tier-1 projects. Section: B comprises express/rapid bus criteria. Candidate projects in are not required to meet all criteria, yet those meeting more criteria than the others will be given priority. These criteria characterize a sound transit-oriented transportation system with the flexibility of moving people faster with less amount of traffic congestion.

Table 6
Rail and Express/Rapid Bus Criteria
(Resolution No.3357: Section A and B)
Rail Criteria Express/Rapid Bus Criteria Honor
Resolution No. 1876-Tier 1

- | |
|--|
| <ul style="list-style-type: none"> • TEA-21 Authorization/ Other federal actions • Traffic Congestion Relief Program/other state funding • Dedicated Local Funding • Operations, Maintenance and Rehabilitation Capacity • Supportive land Use Policies • Cost-Effectiveness • System Connectivity • System Access • Project Readiness • Demonstration that the service will result in faster and/or more convenient service to the customer than by traveling in a SOV. • Provision of a financial plan documenting capital and operating needs. • Demonstration of sponsor’s ability to sustain long-term funding of the service. • Demonstrate the cost-effectiveness of the proposed service. • Demonstrate that the service is able to relieve congestion. • Implementation that supports regional coordination. |
|--|

Any Bay Area rail projects seeking federal new start funds must be specifically authorized by TEA-21. Each project has to be fully funded or secure local funding commitment to be included in the RTEP. Projects can be funded through federal, state and local levels. Approximately 25 percent of the Resolution No.1876 programs received

\$1.1 billion funding from local sales tax revenue generated in four Bay Area counties. Local funding through transportation sales tax is critical because of the high level of competition for federal new start funding. Some projects can be funded through the Traffic Congestion Relief Program (TCRP).

Summary

MTC used a different project rating method that did not assign numerical points to respective projects. Instead, MTC assigned “high” as a value to favored projects, “medium” to fairly favored, and “low” to the least favored projects. Projects were rated based on “performance” and “financial” criteria. Most of the projects undertaken were transit-friendly and were given priority over SOV or highway projects

Synopsis of Portland's Regional Government

Background

The following analysis concentrates specifically on the Metro, Portland's MPO and the characteristics of the highlighted counties found therein. Metro is the directly elected regional government that serves more than 1.3 million residents in Clackamas, Multnomah and Washington counties, in 24 cities in the Portland, Oregon, metropolitan area based on 2000 Census.

Metro was formed in 1979 when voters approved the merger of a council of governments (Columbia Region Association of Governments - CRAG) that had land-use and transportation planning responsibilities within the Metropolitan Service District (MSD). A region-wide elected executive officer and a seven-member council elected by districts governed the new MSD. It had the combined authority of the two predecessor agencies and other potential additional powers.

During the years, additional responsibilities were assigned to Metro by the state legislature with concurrence of the jurisdictions within Metro's boundaries. In 1980, Metro became responsible for regional solid waste disposal when it took over operation of the one existing publicly owned regional landfill and began construction of a transfer station. In November 1986, voters approved general obligation bond funding for the Oregon Convention Center, built and operated by Metro. In January 1990, Metro assumed management responsibility for the Portland Center for the Performing Arts, Portland Civic Stadium and Portland Memorial Coliseum (though management of the coliseum was later returned to the city, which turned it over to the new Oregon Arena Corporation). Finally, in 1994, Metro assumed management responsibility for the Multnomah County parks system and Expo Center. Ownership of these facilities was transferred to Metro on July 1, 1996 (Metro, Oct 14, 2002).

In addition to its' responsibilities, Metro plans and manages the transportation sector for the three county Portland area. In order to better manage the transportation system of Portland, Metro has developed Regional Transportation Plan (RTP) a 20-year blueprint for Portland metropolitan region's transportation system. RTP is guided by a string of transportation goals, which include the following:

- Limit the amount of congestion that motorists experience
- Maintain access for national and international rail, air, truck, and ship freight to reach its destination with limited travel delay
- Balance the need to maintain motor vehicle and freight mobility with potential impacts of these improvements on our communities and other modes of travel
- Expand public transit service and improve pedestrian access to transit
- Build new sidewalks and bicycle facilities
- Develop system and demand management strategies to improve how the system operates

Project Selection Process/Criteria

Metro's project selection process is divided into the following five steps:

- **Step 1:** Metro receives project applications from state, regional and local jurisdictions, including park and recreation districts.
- **Step 2:** This step involves the application of threshold criteria. These criteria include 4 parts: 1) Projects must meet street design guidelines 2) Projects must be consistent with RTP functional classification maps 3) Projects must be included in the 2000 RTP financially constrained system 4) Cost of candidate projects is limited to target amounts established by Metro.
- **Step 3:** Metro calculates and ranks projects by technical score. Each project is eligible for up to 100 points. The highest scoring project will receive the number one ranking in its respective mode. The scores are not compared across modes. For example, a bike project with a score of 89 is not necessarily superior to a freight project with a score of 84.
- **Step 4:** Metro considers the following administrative criteria. 1) Is the candidate project the minimum logical phase? 2) Is the project linked to another high priority project? 3) Is there local or private over-match? 4) Is there past regional commitment? 5) Does the project include significant multi-modal benefits? 6) Is there an affordable housing connection? 7) Does the project assist recovery of the endangered fish species? 8) What other factors are not reflected by the technical criteria?
- **Step 5:** Metro adopts and drafts funding recommendation for public hearing and consideration by JPACT and the Metro Council.

Summary

Metro listed six transportation goals in their RTP document. Only two of the six goals were directly related to transit, whereas the rest were general or highway oriented. The highest score a project could earn was 100 points. Notably, the highest score awarded of 35 points was applied to the transit-friendly goal of *increase modal share*—increasing transit trips and reducing SOV travel.

SUMMARY FINDINGS

The purpose of this research was to identify the criteria used by MPOs in their decision-making process. This research focused on the following six MPO's: Dallas/Fort Worth area (NCTCOG), Houston-Galveston area (H-GAC), Portland (Metro), San Francisco Bay area (MTC), Atlanta area (ARC), and Denver region (DRCOG).

After thorough analysis, the six MPOs have common responsibilities, although their project types and prioritization strategies are different. The common characteristic between the MPOs is they follow a similar pattern regarding transportation planning and coordination and arrangement of information. The MPOs defined their goals in their RTP and established related criteria to support those goals in their TIP document.

The MPOs also vary in a number of ways. The MPOs priorities differed based on the importance of the projects in their communities. Some regions place high importance on alleviating their congestion problems through transit projects and other congestion mitigation strategies. Others have less emphasis on transit and other strategies that encourage more occupants per vehicle.

Some of these MPOs listed numerous transit-friendly goals in their RTP and others had shorter lists. In terms of criteria, pro-transit MPOs scored their transit-friendly criteria favorably with high points while others gave greater value to highways. Another difference between these MPOs is that some compare project scores across modes and others do not. The synthesis that follows highlights approaches of each MPO.

North Central Texas Council of Governments

The NCTCOG's project selection process indicates this MPO's goal statements show a commitment to implementing transit projects. A few of the criteria by which projects are selected in the Dallas/Fort Worth area provided a somewhat competitive opportunity for transit when compared to highway projects. Thirty-four (34) of 100 STP and 40 of 100 CMAQ points would yield non-HOV projects.

Atlanta Regional Council of Governments

After analyzing Atlanta's TIP project selection process, ARC's commitment to transit projects as the solution to the region's traffic situation became apparent. Five solid transit-friendly criteria for ARC's project selection were highlighted. These criteria involved new park and ride lots, HOV lanes, vanpooling, bicycle and pedestrian facilities. Most of the transit-friendly projects were awarded the highest points (15) as compared to highway.

Houston-Galveston Area Council

H-GAC's project selection process seemed to put more emphasis on highway projects rather than transit projects. Projects were first sorted into nine categories, of which five of them were highway or highway related. Projects were limited to two hundred points, 100 of which were strictly for congestion mitigation through roadway expansion projects and the remaining 100 points were divided among four project types—each receiving 25 points. All these points were awarded to highway projects except for a multimodal project, which could include an HOV lane and Park & Ride facilities implementation.

Portland Regional Government

Metro project selection process comprises five critical steps. The first step involves the submission of project applications from state, regional and local jurisdictions, followed by the application of threshold criteria in step two. Step three, the technical score, is calculated and projects are ranked. Two transit-friendly projects were awarded highest (35) points each for encouraging more transit usage and discouraging SOV travel. Administrative criteria are considered in step four, and lastly Metro adopts funding recommendation in step five.

Metropolitan Transportation Commission

The analysis of MTC's project selection process demonstrated the prioritization of transit over highway. All six goals and objectives listed in their RTP document were transit-related. In addition, the criteria for selecting projects focused mainly on transit projects (rail and express/rapid bus).

Denver Regional Council of Governments

DRCOG listed several objectives in its RTP document to support the goal of a multimodal system. Some objectives were directly transit-related and the rest were transit and highway—related. DRCOG demonstrated its commitment to transit through project types included in the tables. Three of those project types were 100% transit-friendly.

MPO STUDY AREA SYNTHESIS

The study showed that most of the studied communities have goals that support their vision statements to prioritize transit, bicycle and pedestrian projects within their metropolitan transportation plans. Table 7 shows the displayed goals expressed by two or more MPOs. The shared goals across communities are very similar. The most commonly stated goals are to increase multimodal utilization and improve quality of life. Only one MPO did not state these two goals directly.

Table 8 displays the number of the transit, bicycle or pedestrian oriented criteria listed by the communities in their Transportation Improvement Plan. This table was structured by listing each criterion that would be conducive to a project leading to an option other than the single occupant vehicle. A criterion identified by any one of the MPOs was listed; thereafter, if another MPO displayed the same criterion, such was noted. A criterion listed by only one MPO was deleted from the table. The rationale is that communities seeking to increase sustainability based on the experiences of other communities are more likely to replicate criteria used by multiple agencies, as compared to including a criterion unique to one MPO. The two most utilized criteria were to increase new transit facilities/reduce overcrowding and a cost-effectiveness criteria tied to a transit mode.

In terms of leading regions, Portland's Metro clearly displayed 7 of the 8 listed criteria, supporting a widely held view that Portland is one of many national communities setting the pace in implementing a smart, transit-oriented and generally more sustainable community. The Houston Galveston area seemed to be the least structured through its criteria to attempt to resolve congestion and address future growth with transit-oriented measures.

Table 7 Study MPOs and Designated Goals

| Goals and Objectives | Atlanta | Dallas/ Ft. Worth | Denver | Houston/ Galveston | Portland | San Francisco |
|--|---------|----------------------|--------|-----------------------|----------|------------------|
| Reduce/Relieve Congestion | | ✓ | ✓ | | ✓ | |
| Multimodal, including non-motorized | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Accommodate Growth | | ✓ | | | | |
| Travel Efficiency | ✓ | ✓ | | ✓ | | |
| Economic Vitality or Development | ✓ | ✓ | | | | ✓ |
| Accessibility | ✓ | ✓ | | ✓ | | ✓ |
| Environment/Community/Quality of Life | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Maintain/Improve Current System | ✓ | | ✓ | ✓ | ✓ | |
| Citizen Involvement/Public Participation | ✓ | | | ✓ | | |
| Goods Movement | ✓ | | ✓ | ✓ | ✓ | ✓ |
| High Capacity and Transit Focus | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Suburb to Suburb Movement | | | ✓ | | | |
| Pay | | | ✓ | | | |
| Consider Land Use | ✓ | ✓ | | | | |
| Public Involvement | ✓ | ✓ | | | | |
| Connectivity | ✓ | | | | | |
| Safety or Security | ✓ | | | ✓ | | ✓ |
| Affordability | | | ✓ | ✓ | | |

**Table 8 MPOs and Number of Observed Criteria Directly Related to Transit,
Non-Motorized Transportation or Sustainability**

| Transit/Non-Motorized Criteria | Atlanta Area | Dallas Fort Worth Area | Denver Area | Houston Galveston Area | San Francisco Area | Portland Area |
|--|---------------------|-------------------------------|--------------------|-------------------------------|---------------------------|----------------------|
| Promotes reduction in transit overcrowding; provides new facilities | X | | X | | X | X |
| Directly promotes shift from SOV to bus/HOV lanes | X | X | | | | X |
| Town centers proximate to transit station | X | | | | | X |
| Supports redevelopment; infill shift/land use policies | X | | | | X | X |
| Rail corridor investment/commuter rail | X | | | | X | |
| Project supports core transit services to transit dependent | | | | | X | X |
| Cost effectiveness linked with mode shift from auto to transit or transit travel time improvements | | X | X | | X | X |
| Specific criteria for air quality improvement via pedestrian, bicycle or transit | | | X | X | | X |
| Number of Criteria Utilized | 5 | 2 | 3 | 1 | 5 | 7 |

This table reflects the list of criteria shared by at least 2 MPOs. It reflects criteria that were readily observed in the text, tables or appendixes of the MPO TIP documents for the years 1999-2002.

SUMMARY

Analysis of the data presented by the studied MPOs showed commonalities and dissimilarities. The MPOs exhibited common responsibilities, although their project types and prioritization strategies are different. Also, they all followed the requirements set fourth by TEA-21 as planning guidelines. In addition, they followed a similar pattern regarding transportation planning and coordination and arrangement of information. All the MPOs defined their goals in their RTP and established related criteria to support those goals in their TIP document.

The MPOs also vary in a number of ways. One strategic difference among these MPOs is some compare project scores across modes and others do not. Also, their priorities differed based on the importance of the projects in the communities they service. Some regions place high importance on measures that help reduce traffic congestion, maintain air and water quality, and improve quality of life through transit projects and other congestion mitigation strategies while others have less emphasis on transit and other strategies that encourage more occupants per vehicle.

CONCLUSION

Several studies conducted across the nation have shown usage of transit, bicycles and non-motorized modes helps to alleviate exasperating congestion experienced by commuters. In an attempt to solve this problem, Congress passed TEA-21 to authorize the use of transportation funds, previously used for highway (STP and CMAQ), to be spent on transit projects, at the local discretion. Still, there are millions of dollars and numerous hours spent on highway-oriented projects even though history has shown highway improvements only attract more low-occupant vehicles. This research shows that communities have set goals toward greater sustainability and lesser dependence on single occupant automobiles. The criteria across the communities vary, however, in the degree to which they support the stated goals.

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