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Technical Report:

Planning and Financing Urban Mobility in Texas

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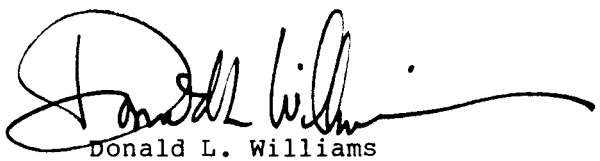

Donald L. Williams
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Executive Summary

Planning and Financing Urban Mobility in Texas

This report reviews the status of planning for regional mobility improvements in five major urban areas in Texas. The review includes a comparison of the Regional Mobility Planning efforts in Austin, Dallas, Houston, Fort Worth, and San Antonio in order to provide a basis for improving the implementation of Regional Mobility Planning.

The key concepts of Regional Mobility Planning are highlighted as:

- inter-agency cooperation at the highest administrative and technical levels
- recognition of the interdependence of the highway, arterial and transit systems
- involvement of the private sector business community
- use of an agreed upon data base
- use of a mutually agreed upon definition of adequate mobility and reasonable standards and criteria to assess the need for improvement of transportation facilities
- determination of improvements based on need, not funding availability
- assessment of the ability of current funding mechanisms to meet the need for mobility improvements
- calculation of the cost of not providing adequate mobility.

Further, this review considers the projected cost of federal/state related highway infrastructure requirements through the year 2000; the projected cost of county/city related highway infrastructure requirements through the year 2000; and public transit system performance/needs in each of the case study urban areas. Existing financial resources available at the federal, state, and local level to meet mobility objectives are identified, and the resulting deficiencies in available and projected financial capability from existing funding sources to meet perceived mobility requirements are discussed.

In addition, this study analyzes several funding mechanisms which have the potential to bridge the funding gap identified in all the case study areas. A summary is provided of state legislative action which could assist urban areas in improving their efforts to regain or maintain acceptable levels of regional mobility.

The Regional Mobility Planning process was developed in Houston as an alternative to traditional transportation planning methods

which were perceived as being unable to cope with the city's mobility crisis. The State Highway and Public Transportation Commission, recognizing the value of Regional Mobility Planning for identifying transportation improvement needs and developing support for increased funding, requested that other large cities in Texas also prepare Regional Mobility Plans (RMPs). Dallas, Fort Worth and San Antonio complied with the request primarily because they did not want their transportation needs overshadowed by Houston's.

The plans evolved differently in each of the cities because there were no established rules for preparing an RMP. None of the RMPs in the other cities were as successful as the RMP process in Houston. Five basic reasons were identified for these differences.

1) The problem faced in Houston -- a transportation crisis and a need to <u>return</u> to an acceptable level of mobility -- was fundamentally different from the situation faced in the other cities.

2) The other cities were requested to complete their RMPs in less than three months, compared to the nine months spent preparing the Houston RMP. This time constraint affected the quality of the final products.

3) The fact that the preparation of an RMP was externally suggested in Dallas, Fort Worth and San Antonio seems to have had a tremendous effect on the success of Regional Mobility Planning in those cities. In Houston, the RMP was the result of an internal process which grew from the need to find a solution to a critical problem.

4) While Houston is facing a widespread mobility crisis, Dallas, Fort Worth, San Antonio, and Austin are not. Although severe congestion may exist in limited areas, such as in north central Dallas, a condition of heavy congestion throughout an entire region exits only in Houston.

5) The Houston effort also was fueled by a lack of confidence in the ability of the traditional regional transportation planning process to solve the mobility crisis. In Dallas, Fort Worth and San Antonio, however, the existing transportation planning process was considered to be adequate. Each of these cities viewed the Regional Mobility Planning task as a required political tool for assuring the consideration of transportation funding needs in the allocation of the state's financial resources.

Because of the conditions under which the RMPs in Dallas, Fort Worth, and San Antonio were developed, the RMPs have had a limited and short-lived local impact. Once presented to the State Highway and Public Transportation Commission, the RMPs essentially were put on the shelf.

However, as growth in these cities continues, they soon may face problems similar to those in Houston. What currently is a good level of cooperation among transportation planning agencies may not be adequate to meet the challenge. Regional Mobility Planning can be most useful as an advance planning tool to obviate the crisis congestion being experienced in Houston.

Even though these cities have yet to experience the transportation problems now being experienced by Houston, all the RMPs reviewed identified a gap in existing funding sources and their identified transportation needs. Projected additional financial resources necessary to meet mobility objectives in Houston, Dallas, Fort Worth, San Antonio and Austin are substantial.

Projected federal/state highway related financial needs for all urban case study areas combined (capital improvement only) total approximately $16.5 billion. Projected revenues from existing resources to support federal/state related highway improvements are approximately $7.5 billion or 45% of the funds required. Accordingly, $9 billion in additional revenues must be found to support projected federal/state related highway requirements, if year 2000 mobility objectives are to be achieved.

For county and city highway/arterial requirements, a similar financial picture is projected. Approximately $9 billion in city/county highway infrastructure requirements for case study areas (Austin excluded) are anticipated, while existing financial resources are anticipated to generate $3.4 billion (Austin excluded) in revenue or approximately 37% of projected requirements. Therefore, additional revenue sources will be needed to provide an additional $5.6 billion in revenues.

Developing public transit systems in Houston, Dallas, and San Antonio are supported by communitywide sales tax revenue, fare box revenue, and federal/state subsidies which should provide required financial resources for the next 10 years. Supplemental bonding authority may be required to enable major capital initiatives such as the Houston MTA rail proposal.

The major financial issue facing the case study area public transit systems appears not to be the need for additional public resources to support transit, but the need to provide transit services on a more cost effective basis to reduce dependency on federal, state, and local subsidies. To this end, creative

approaches to financing capital improvements, reducing operating costs, utilizing existing private sector transportation capability, and increasing fare box revenues to adequate (representative) levels are all important ingredients toward providing cost effective transit.

Based upon existing financial resources to support city/county projected mobility needs, financial resources will have to be increased at the following annual cummulative growth rates in order to meet identified mobility requirements:

Harris County / City of Houston	8%
Dallas County / City of Dallas	10%
Tarrant County / City of Fort Worth	9%
Bexar County / City of San Antonio	18%.

To assist the communities in closing this gap, 17 alternative financing mechanisms were examined. These mechanisms were assessed in light of both need and likelihood of application in Texas. Factors considered included political climate, business climate, opportunity, and public/private relationships. Techniques examined included:

Highways

User Fees
- o Fuel Taxes
- o Registration Fees
- o Toll Financing
- o Auto and Auto Parts Sales Tax

Taxation and Assessments
- o Special Districts
- o Municipal Utility Districts

Private Funding
- o Private Sector Contribution
- o Trust Fund

Issuance of Debt
- o State Bonding
- o Grant Anticipation Notes
- o Interest Arbitrage
- o Certificates of Obligation

Transit

User Fees
- o Fare Increases

Taxation
- o Dedicated Local Sales Tax

Privatization
- o Turnkey Facility Development
- o Contracting for Transit Service
- o Safe Harbor Leasing

Finally, this report provides a brief analysis of potential legislation which could strengthen the ability of the state and its urban areas to meet mobility objectives. The discussion includes:

1) increases in the use and dedication of user fees to support Fedeal/State related highway improvements;

2) enhanced county assessment ability;

3) greater use of local improvement districts;

4) consideration of tax increment financing;

5) changes to the state public transportation trust fund; and

6) support for city mass transit departments.

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Part One

Regional Mobility Planning in Texas:

Case Studies of Current Practice

PART ONE

REGIONAL MOBILITY PLANNING IN TEXAS: CASE STUDIES OF CURRENT PRACTICES

1.0 BACKGROUND

1.1 The Regional Mobility Planning Process

The Regional Mobility Planning process was developed in Houston as an enhancement to traditional transportation planning methods and has served as a catalyst for efforts to solve the city's mobility crisis. Not unlike traditional comprehensive transportation planning, Regional Mobility Planning seeks to quantify the overall needs of an area's transportation network, recognizing the interdependency of the freeway, arterial and transit systems, and to evaluate tradeoffs among and between them. However, Regional Mobility Planning also is structured to promote the concerted action needed to achieve improvements.

The key element in successful Regional Mobility Planning is the coordination, at the highest staff level, of the various agencies responsible for implementing transportation improvements. It is this joint effort by high level administrators and technical staff incorporating the exchange of ideas and data which establishes the cooperative spirit necessary to implement needed transportation infrastructure improvements.

Involvement of local business leaders in the formulation of a Regional Mobility Plan (RMP) further increases the likelihood of success by creating additional support for the plan and heightening within the private sector awareness of the lack of sufficient resources to fund needed transportation improvements. This private sector involvement and support also enhances the credibility of the Regional Mobility Planning process in the eyes of the public and its political representatives, directly influencing the process which determines the extent of financial resources available to meet mobility objectives.

An RMP is not a set of improvements which has been determined based on available funding resources, but a realistic set of improvements whose need can be substantiated independently of whatever level of resources actually exists. It is an identification of those projects necessary to provide adequate mobility (recognizing the trade-offs inherent in public service provision) while assuring an efficient interdependence among and between the highway, arterial and transit systems.

The Regional Mobility Planning process relies on a consistent approach to the forecasting of population, land use, and employment growth, the projection of traffic volumes, and the assessment of need for increased capacity of transportation facilities. The appropriate assessment of need requires the development of a mutually agreed upon definition of adequate mobility and a determination of the point at which a facility requires added capacity. The criteria for assessing the need for improvement must be reasonable, allowing for an acceptable level of congestion, rather than unrealistically providing for free movement at all times during the day.

The Regional Mobility Planning process should project in a consistent manner the cost of the required improvements. This projected overall cost then is compared to the projected availability of funding from all relevant agencies, based on current funding levels, in order to assess the community's ability to attain the financial resources necessary to achieve an adequate level of mobility.

To put in perspective the need for expenditure of funds to solve transportation problems, the cost of not providing the required mobility improvements is calculated. Such a calculation takes into account costs associated with increased travel time and higher insurance rates.

In summary, the key concepts of Regional Mobility Planning are highlighted below:

- inter-agency cooperation at the highest administrative and technical levels
- recognition of the interdependence of the highway, arterial and transit systems
- involvement of the private sector business community
- use of an agreed upon data base
- use of a mutually agreed upon definition of adequate mobility and reasonable standards and criteria to assess the need for improvement of transportation facilities
- determination of improvements based on need, not funding availability
- assessment of the ability of current funding mechanisms to meet the need for mobility improvements
- calculation of the cost of not providing adequate mobility.

The result of the Regional Mobility Planning Process is a plan which consolidates the transportation needs of the area and highlights the extent to which current funding sources can facilitate adequate mobility. As a cooperative effort, it becomes a tool providing united support for securing sufficient funds and implementing necessary improvements.

1.2 The Concept of Regional Mobility Planning

The concept behind Regional Mobility Planning has existed in Federal legislation for over twenty years. The Housing Act of 1961 and the 1962 Federal-Aid Highway Act required, for the first time, that urbanized areas with a population of over 50,000 prepare a comprehensive transportation plan as a prerequisite to federal funding. The transportation planning process was required to be continuing, comprehensive and coordinated, called 3C planning. All urbanized areas of Texas had a 3C planning process in place by 1964. The Urban Mass Transportation Act of 1964, and its 1968 amendments, put further emphasis on comprehensive transportation planning.

In 1966, the Demonstration Cities and Metropolitan Development Act required the establishment of Metropolitan Planning Organizations (MPOs) with responsibility for coordinating all transportation planning activities and assuring that all transportation projects requesting federal funding are consistent with regional comprehensive planning.

In 1974, FHWA and UMTA further emphasized comprehensive regional planning by issuing their first joint planning regulations. The 1976 UMTA-FHWA Joint Planning Requirements were established as a way to further unify and coordinate transit and highway planning. The urban transportation planning process was required, through this legislation, to include a short-term Transportation Systems Management (TSM) plan element and a long-term plan element. In addition, a Transportation Improvement Program (TIP) was required. The TIP is a staged, multi-year (3-5) program of transportation improvement projects consistent with the long-term and short-term elements, which must include an annual plan element (AE) listing projects to be accomplished in the coming year.

FHWA and UMTA have recently approved a 1983 revision of the Joint Planning Regulations. This revision provides for increased flexibility at the state and local levels, a shift of certain responsibilities from the federal level to the state and local levels, and a simplification of the planning process, especially in urbanized areas with less than 200,000 people.

The formal, institutionalized transportation planning process, as embodied in the FHWA/UMTA regulations, historically has been a largely theoretical process with little actual impact on the implementation of urban mobility improvements. Several factors have combined to hinder comprehensive, coordinated and cooperative transportation planning:

- Local regional planning capability often falls short of that necessary to bring together all modes of urban transportation.
- Local political balance often precludes a regional planning organization from exerting the influence necessary to achieve a coordinated and cooperative transportation plan.
- Federal planning requirements are undergoing perpetual change, reflecting new priorities; this often diminishes the credibility of the local planning process.
- The local regional planning process is now largely dependent upon a federal funding capability to support urban transportation development; the availability of this funding source is constantly subject to change.

It is important to note that the State of Texas through the State Highway Department and subsequently SDHPT (and the Governor's Office) embraced and implemented the notion of comprehensive planning long before the flurry of recent federal legislation and regulations. In many instances, the intervening federal role has complicated comprehensive mobility planning already existent. Accordingly, the Regional Mobility Planning process grew out of confusion over several layers of planning guidelines, and the need to bridge the gap between theoretical expectation and realistic application of comprehensive planning for urban mobility.

1.3 Purpose of the Study

The development of the Houston RMP has resulted in several positive conditions supporting Houston's goal of increased mobility. Most significantly, it has provided a political base upon which higher levels of state and federal funds can be sought.

Additionally, at the local level, it has provided an overall perspective on the need for mobility and the cost of improving it, and has created greater cooperation among agencies which traditionally plan and develop transportation facilities independently.

The Houston RMP was enthusiastically received by the State Highway and Public Transportation Commission. The Commission responded by requesting that other large cities in Texas undertake a similar planning process in order to provide a realistic assessment of the overall transportation needs and funding requirements of the urban areas in the state.

This portion of the study was undertaken in order to determine the extent to which Regional Mobility Planning has been applied

successfully in large urban areas of the State of Texas. Five cities are examined: Houston, Dallas, Fort Worth, San Antonio and Austin. To date, all but Austin have prepared a Regional Mobility Plan of sometype. Austin is included here in order to look at the reasons an RMP has not yet been prepared.

Part one of this report includes an evaluation of the RMP produced in each city, a description of the Regional Mobility Planning process as it was applied in each city, and a discussion of the local issues which have impacted, or will impact, the success of Regional Mobility Planning. From that base, Part Two of the report moves to an analysis of transportation financing issues in the case study areas, looking at both highways and transit.

Part Three presents a number of alternative "mechanisms" that might be applied in the case study areas to meet funding needs for urban mobility. The report concludes with a summary of major findings and several recommendations for consideration by state officials.

2.0 CITY SUMMARIES

2.1 Introduction

For each of the five study cities, the discussion and evaluation of Regional Mobility Planning is divided into three sections. The first is an evaluation of the contents of the RMP. In each case, the Houston Regional Mobility Plan, the most comprehensive of the RMPs, is used as a comparative base. An outline matrix was developed from the Houston RMP, and the RMPs of the other cities are applied to that framework. The matrices are included in Appendix A.

The second section describes the Regional Mobility Planning process as it was applied in each city. This section is based on information gained from interviews in each city with key staff and administrative officials of transportation agencies and with private business leaders. Those contacted included representatives of the city, the county, the transit agency, the district office of the State Department of Highways and Public Transportation, the designated Metropolitan Planning Organization (MPO), and the Chamber of Commerce.

The final section discusses local issues which have impacted the success of the Regional Mobility Planning process and which will impact the future effectiveness of Regional Mobility Planning in each of the study cities.

2.2 Houston

The Regional Mobility Plan

The need for an overall mobility plan for Houston became evident in the late 1970s when it was obvious that the city had a serious transportation problem. In the 1970s, the freeway system in Houston had expanded by only 22%, but freeway travel had increased by 106%. Other transportation data, compiled for over twenty years by SDHPT and the Houston-Galveston Regional Transportation Study (HGRTS) office, reflected increased travel time and longer congestion periods, further emphasizing that transportation infrastructure was not keeping up with increased travel demand. According to the Texas Transportation Institute in a 1979 study, the five most congested freeways in Texas were all in Houston.

The significant increase in demand on the transportation system in Houston stemmed from the region's dramatic population and employment growth experienced during the 1970s. According to the Bureau of the Census, Harris County's population went from 1.7 million in 1970 to 2.4 million in 1980, the number of dwelling units rose from .59 million in 1970 to .98 million in 1980, and employment increased from .77 million in 1970 to 1.44 million in 1980.

The goal of Houston's RMP is to identify transportation projects which will provide substantially improved mobility throughout the Houston area by reducing overall travel time and congestion. The objectives of this fifteen year plan are: to get maximum utility from existing facilities, to encourage development of an integrated system that will efficiently use available resources, and to encourage mass transportation.

Given the enormous need for increased capacity and the desire to be realistic about recommended improvements, criteria were established to evaluate improvement needs. For roadway expansion projects to be included in the plan, the minimum level of traffic volume had to be 13,000 vehicles per day per lane on freeways and 5,000 vehicles per day per lane on arterials. Also included in the plan are additions or improvements to major streets, primarily to intersections, needed to support projects justified by the assessment criteria. Attention also was given to measures that could improve use of existing facilities, such as flex time, and car and van pooling, and transportation system management measures, such as contraflow lanes.

Three sets of improvements were defined: improvements to meet today's demand, those needed to complete the system, and those needed to serve new growth. The projects needed to meet today's demand add up to 150 miles of new freeway facilities,

20 miles of high capacity transitways, 800 miles of new arterials, 15-25 new park-and-ride lots, several hundred new buses, and over 160 miles of high occupancy vehicle facility improvements. Projects needed to complete the system (those needed to meet demand during the 15-year implementation period of the plan) total: 34 miles of freeway, 10 miles of high capacity transitway, and 8 miles of improvements for High Occupancy Vehicles (HOV). For new growth, it is estimated that -- for each additional one million people -- 600 miles of new arterials, 100 miles of new freeways, and more High Occupancy Vehicles (HOV) facilities will need to be implemented.

Of the $16.2 billion needed to implement the entire plan, $6.9 billion is expected to come from existing funding sources (1982-1996). A variety of funding options for the $9.3 billion unfunded amount are presented in the plan. These options include increasing the percentage of state highway funds allocated to Harris County, issuance of MTA bonds, increasing the state motor fuel tax, and increasing motor vehicle registration fees. It was emphasized by the plan authors that securing funding, as well as implementing the improvements, will require an organized coordinated effort.

The Regional Mobility Planning Process

With traffic congestion at the crisis stage, the Houston Chamber of Commerce initiated the Regional Mobility Plan by asking two questions: what would it take to solve our problems? and, are existing financial resources adequate to solve these problems? Although these topics initially were discussed in a fairly low-keyed manner by a Chamber task force, the participants became very excited about joining together to find a solution to Houston's transportation problems and eventually came up with the idea of doing a Regional Mobility Plan. The key premise underlying the RMP is that the transportation system as a whole cannot be improved unless all modes of transportation and all organizations, public and private, are involved and continue to participate in the planning and implementation process.

In May 1981, the Chamber created the task force by bringing together high-level representatives of each of the agencies responsible for local transportation planning and development: the City, Harris County, the District office of the State Department of Highways and Public Transportation (SDHPT), the Houston-Galveston Regional Transportation Study (HGRTS), the Metropolitan Transit Authority (MTA) and the Texas Turnpike Authority (TTA). The Houston-Galveston Area Council (HGAC), the local MPO, initially was left out of the process because of skepticism over its past performance and a perception that it would make a very limited contribution. HGAC is now, however, an active participant in ongoing RMP activities.

Each agency assigned a top staff person, on a volunteer basis, to a Technical Task Force which also included top local transportation professionals and staff from the Chamber. The Technical Task Force began by establishing some agreed upon criteria for assessing acceptable levels of congestion. These criteria then were compared to the latest traffic count data to determine where improvements were necessary. Special emphasis was given to the interdependency of the highway, arterial and transit systems, and trade-offs among and between improvements to each of them were examined closely.

It was recognized that it would take at least 15 years, given no funding constraints, before all improvements recommended could be implemented. By that time, the network would again be congested due to growth during those 15 years. The latest available growth projections were used to estimate the overall need for arterial lane-miles and freeway lane-miles to accommodate additional growth.

The process resulted in two lists of projects: those justified by existing traffic conditions, and a less specific list of improvements to accommodate growth in the next 15 years. The improvement needs were kept general, because the Technical Task Force preferred to leave the details to the implementing agencies.

A Finance Committee, also made up of agency representatives and top local professionals, was formed to study the availability of funding resources and to suggest alternative funding strategies and legislative initiatives required to fill the gap between available resources and the cost of implementing the RMP. A Legislative Committee was responsible for keeping abreast of the transportation funding related activities of the state legislature.

The Technical Task Force continues to meet regularly to discuss the continuing implementation of the RMP and ongoing activities include refining and expanding the plan. A series of technical reports, called the "Plans in Action" series, are being prepared by members of the Technical Task Force. Topics include an assessment of the potential for toll facilities, the importance of achieving continuity in the arterial network, and a closer look at the Hardy Street Toll Road. The Chamber hopes that each of these technical papers will increase the understanding of the importance of specific segments of the overall transportation network, and act as a tool to gain further support for transportation improvements.

The Technical Task Force also has begun establishing a priority list of improvements since prioritization of improvements was not originally addressed in the RMP. The projects included in the RMP also are being re-evaluated to determine which projects

can be accomplished in the next five years and can make the biggest contribution to relieving congestion. The implementation of these priority projects, requiring "expeditious handling," will become the short-term agenda of the Technical Task Force, the Chamber of Commerce, and the local transportation agencies.

The Regional Mobility Planning process has generated considerable activity outside of the Chamber and the RMP Technical Task Force. More localized forms of the RMP, called Subregional Mobility Plans, have been prepared in coordination with the RMP to define further the needs of areas within the original scope of the RMP or to expand the scope of the RMP. To date, Subregional Mobility Plans have been created in West Houston, Humble, South Montgomery County and Fort Bend County.

The Houston-Galveston Area Council, (HGAC) originally not included in preparing the RMP, now is actively involved in refining the Regional Mobility Planning process. Its activities include weighing the impact of the implementation of the Regional Mobility Plan in light of social, economic and environmental concerns. HGAC also is facilitating the development of Subregional Mobility Plans in the counties adjacent to Houston within the HGAC region in conjunction with updating county Major Thoroughfare Plans.

Local Issues Affecting Regional Mobility Planning

The major issue currently impacting Houston's Regional Mobility Planning process is its ability to be responsive to changing circumstances and financial reality. The process is being challenged by the failure of the MTA bond referendum in June 1983, and the continuing lack of sufficient state funding for highways and public transportation.

Because state action on the Hardy Street Toll Road appears unlikely, Harris County has taken the initiative to implement the facility. The strength of the Regional Mobility Plan has helped enable the County to assume this responsibility and given them a base of support with which to move ahead. However, the robustness of the plan has been tested by controversy surrounding the toll road and resulted in the county administered alternative of providing the required mobility improvement. The County's initiative to finance both Hardy Street and West Belt improvements by toll and general fund backed bonds was successful in September 1983.

The Regional Mobility Planning process will have to find ways of achieving mobility objectives within projected financial resources. For example, if Houstonians are unwilling to pay for heavy rail, as perhaps was demonstrated in the recent MTA referendum, then the Regional Mobility Planning process must

identify effective alternatives or redefine "mobility" commensurate with community objectives. It will be the ability of the Regional Mobility Planning process in Houston to be flexible and responsive to changing circumstances which will enhance the credibility of the process and maintain a consensus of support throughout it.

2.3 Dallas

The Regional Mobility Plan

The Greater Dallas Mobility Study is a compilation of transportation planning efforts by a coalition of Dallas area agencies concerned with reducing traffic congestion. The study focuses on forming a balanced transportation system by the year 2000. The plan sought to maximize the efficiency of existing facilities and to build a system that balances roadways and mass transit. The primary purpose of forming the coalition was not to prioritize transportation projects, but to present a unified report to the state. The objectives of presenting this information to the state were: that the state's 20 year plan be accelerated, that state funds be channeled to best meet local needs, and that the state provide direction in developing new funding sources.

The coalition's effort is just one step in a series of regional transportation planning efforts for the Dallas area. In 1964, a group of 10 counties and 74 cities began studying transportation needs, supported by technical data from SDHPT's computer-based traffic projections. In 1974, the North Central Texas Council of Goverments (NCTCOG) produced a 1990 multimodal transportation plan for the Dallas/Fort Worth area. Building upon these previous studies and with the guidance of the Houston Regional Mobility Plan for technical evaluation criteria, the coalition produced the mobility plan for the year 2000.

The criteria used for project selection were based on Houston's congestion measures: thoroughfares with 5,000 or more vehicles per lane per day and highways with 13,000 or more vehicles per lane per day. Using these criteria, 646 projects were included in the Dallas plan.

Back-up information for the plan consists of both demographic and transportation data. The source of demographic input was the 1980 census. According to the census, Dallas County's population in 1980 was 1,556,549 and the City of Dallas' 1980 population was 904,078. Population figures for 1970 and 1980 also are provided for all communities in Dallas County. Population and employment projections for Dallas County were provided by SDHPT for the years 1990 and 2000.

Demographic data are complemented with transportation statistics to describe the total transportation situation. Data such as daily vehicle trips and vehicle miles of travel provided by SDHPT were used to predict that 90,000 cars would be added to the area each year. Using the same data, calculations of cost of delay and cost of congestion were projected to year 2000.

The breakdown of projects that exceed the congestion criteria are: 343 route miles of SDHPT plans, 184 route miles of city requested projects on the state system, 55 route miles of Texas Turnpike Authority projects, and 662 route miles of local projects. The funding requirements for these projects, based on 1981 dollars are:

State/Texas Turnpike Authority	$4.77 Billion
City/County	2.33 Billion
*Other projects	1.59 Billion
	$8.69 Billion

*Public transportation requirements are not included.

Local funding is being augmented by local bond programs and private sector contributions. Although it is mentioned that current funding alone cannot complete the plan, there is no net unfunded amount given. Some of the future funding options being considered are:

- o increasing state funds to the counties;
- o establishing a state public transportation fund;
- o increasing the State Motor Fuel Tax to 9.8¢/gallon.

Public transportation was not included as part of this overall plan, but it was mentioned as a study area for the Interim Regional Transportation Authority Board (IRTA). Currently the only public transportation in the Dallas area is the municipally owned Dallas Transit System. This service will be expanded in the near future as a result of creation and funding in August 1983 of the Dallas Area Rapid Transit (DART) Authority.

Since Dallas had the Houston RMP as a reference, the Dallas RMP contents coincide with most of the cells of the RMP matrix in Appendix A. Not covered in the Dallas RMP are the transportation needs of today as compared to needs for the future. All improvements are defined as those needed by year 2000.

The Regional Mobility Planning Process

The Dallas Area Chambers of Commerce were very much responsible for the development of the Dallas RMP, called the "Greater

Dallas Mobility Study", which was initiated at the request of the State Highway and Public Transportation Commissioners. The Downtown Dallas Chamber played the lead in preparation of the RMP. It requested that each agency with responsibility for transportation planning and development within the Dallas area submit a list of improvements based upon the criteria which had been developed for the Houston Regional Mobility Plan. Six counties and thirty-three cities participated.

Two committees were formed: a Technical Committee made up of technical staff from the Chamber and other agencies, and a Voting Committee made up of representatives from the 23 area Chambers of Commerce. The Technical Committee was made up of relatively junior level staff people, not the senior level staff as was the case in Houston. The Chambers in the Voting Committee were the ones who actually decided which projects would be included in the final document.

During the time the RMP was being developed, an Interim Regional Transit Authority was in place. Due to the unsettled nature of transit planning, awaiting an agreed upon service plan and creation of a permanent transit authority, the Chamber of Commerce chose not to include transit system needs in the RMP.

The North Central Texas Council of Governments (NCTCOG) and the local SDHPT District and Regional Planning Offices were not active participants but were contacted in connection with the development of the RMP. The SDHPT traffic forecasts were heavily relied upon by the Technical Committee.

Local Issues Affecting Regional Mobility Planning

In August of this year, residents of the Dallas area approved creation of DART, the Dallas Area Rapid Transit Authority, which will be responsible for transit planning and development in the Dallas area. The current transit system, Dallas Transit System (DTS), is municipally owned and operates only within the city limits. Transit needs and facilities were intentionally left out of the Dallas RMP because of the impending referendum and an unwillingness to get involved in controversy surrounding DART's proposed service plan. Future Regional Mobility Planning efforts will need to include transit and will have the benefit of DART and its service plan.

The appropriate geographic scope of Regional Mobility Planning is an issue in Dallas. On the one hand, Dallas and Fort Worth form an integrated urban region for which planning to coordinate activities within the entire region is appropriate. The NCTCOG does planning at this level. Yet, the Dallas and Fort Worth areas really are very separate, and within themselves contain a multitude of jurisdictions. Coordination of all

these jurisdictions, even within Dallas, may not be possible. A successful Subregional Mobility Plan for North Dallas has achieved a significant level of cooperation and coordination, but even for a fairly limited geographic area, eleven jurisdictions were involved in the process. The question of the most effective scale for Regional Mobility Planning in Dallas will need to be examined further.

In Dallas and Fort Worth, the role of NCTCOG in Regional Mobility Planning needs to be resolved in order for the process to be successful. Though NCTCOG has done a significant amount of credible regional transportation planning, their role in Regional Mobility Planning in Dallas and Fort Worth has been limited. This probably is due to the significant difference between the mobility needs and desires of Dallas and of Fort Worth. However, NCTCOG's extensive data projects and travel demand forecasts could become the catalyst for successful Regional Mobility Planning by providing a substantial information base and by improving interagency involvement and cooperation and thus, more accurately reflecting community objectives.

2.4 Fort Worth

The Regional Mobility Plan

The Regional Mobility Plan in the the Fort Worth area is called the "Tarrant County 2000" plan. This plan was produced as a cooperative effort by the Fort Worth Chamber of Commerce, the City of Fort Worth, and Tarrant County. The goal of transportation planning in the Fort Worth area is to maximize the efficiency of the existing system and to provide the citizens with an equitable transportation network that accommodates all parts of the county.

Recognition of need for this plan came from the fact that most of the major highways and thoroughfares in the area were designed and constructed in the 1940's and 1950's and no longer can handle the demand placed upon them due to population growth. It was not explained in the plan which specific criteria were used to determine acceptance or rejection of projects. The plan does offer current and future demographic statistics for Tarrant County (provided by NCT COG), which show the county growing 30% between 1980 and the year 2000. Population for Tarrant County in 1980 was 860,880 and year 2000 population is projected to be 1,137,924. Employment for Tarrant County is expected to increase from 400,323 in 1980 to 665,944 in 2000. Specific attention is also drawn to downtown Fort Worth, which was said to be undergoing high growth although no data were presented.

The breakdown (by number of projects, number of miles, and cost) for improvements to accommodate the Tarrant County/Fort Worth growth follows:

Highway System		
136 projects	314 miles	$1,897,301,000
Arterial System		
168 projects	282 miles	1,410,281,000
Public Transportation		
19 projects	56 miles	271,466,000
	TOTAL	$3,579,048,000

Following past and present funding trends, it is estimated that $1.3 billion will be available from private, local, state, and federal funds. The net unfunded $2.3 billion will require additional contributions from existing sources or from new revenue sources, but there is no indication in the plan as to what these sources might be.

The Fort Worth Regional Mobility Plan has a very extensive list of transportation projects needed by the year 2000, but the criteria used to compile these needs are not provided. Travel demand and supply, travel trends, and historical and future transportation data are not part of the document. There is also no breakdown of today's needs versus year 2000 needs.

The Regional Mobility Planning Process

Regional Mobility Planning in Fort Worth was a joint effort between the city and Tarrant County. Although initially encouraged by the Chamber, the RMP had a great deal of support from the City Manager very early in the process. Soon after it was decided that the city would do an RMP, Tarrant County requested that the scope of the plan be widened to include all of Tarrant County.

The RMP process was well organized from the start. A concept for completion of the RMP and schedule of events were developed right away. It was decided that the city would prepare its portion of the RMP (the majority of the projects) and the county would be responsible for all projects in the other cities in the county. A staff person at the city, and a staff person at the county were given responsibility for coordinating the efforts within each jurisdiction.

At the city level, a technical committee was established with representatives from various city agencies including, the Planning Department, Department of Transportation, Public Works, and CITRAN, the transit system.

The City of Fort Worth is divided into four planning sectors. In each of these sectors, a one-day workshop was held at which

the RMP Technical Committee, joined by the city planner assigned to that particular planning sector, reviewed the transportation needs of that portion of the city.

The SDHPT Operational Planning Document was used as a base for identifying urban highway system improvements. The city accepted all of SDHPT's recommendations except their Southwest Corridor proposal. The city included the cost of a comparable facility, but a decision about the exact location was held in abeyance pending results of further analysis.

Improvements to the arterial system were examined with cooperation from NCTCOG. The regional major thoroughfare plan provided a base from which to work. Recommendations were made for improving the Ride Share program, providing HOV lanes and developing transit service along the Rock Island Railroad right-of-way between Fort Worth and Dallas.

Concurrently, the county was collecting a list of improvements from other cities in the county. In each case the city was asked to submit a list of desired improvements, and then the county staff mapped out the projects. If inconsistencies were found among adjacent communities, the issue was discussed with a representative of each of the cities involved and an agreement was reached.

The city and county portions of the RMP were integrated after the City Council and County Mayors Council had accepted their respective sections of the plan.

The Fort Worth Chamber of Commerce presented the RMP to the State Highway and Public Transportation Commissioners on May 27, 1982. As a final step, the projects which made up the RMP were submitted to NCTCOG for inclusion in the regional Transportation Improvement Program.

At the city level, the RMP is viewed as quite successful in terms of associating an overall cost, and resulting deficit, with a reasonable level of improvement to the transportation system. At the county level, however, the process resulted in much more of a "wish list" which included improvements of questionable justification, particularly in the smaller cities. The county's portion of the plan, however, was quite small compared to that of the city.

The RMP was put together very hastily (March to May of 1982) and, although quite organized, city and county staff feel it suffered from the time constraint.

Throughout the process, creation of the RMP was viewed as more of a political tool than a technical one. As a result, the technical committee and contributing cities kept in mind the

goal of determining a dollar amount for improvements rather than determining the exact nature of improvements to the transportation network. Improvement projects were not prioritized.

Local Issues Affecting Regional Mobility Planning

Submission of the RMP improvement recommendations to NCTCOG for inclusion in the TIP was considered to be the culmination of the RMP process. This reflects the prevalent view that NCTCOG has primary responsibility for transportation planning in the area and that it does a good job of it.

The city and county viewed the RMP as a political tool appropriately done outside the existing regional transportation planning structure. However, they also were of the opinion that realistic (within reasonable funding parameters) and technically competent transportation planning is best handled and coordinated through NCTCOG. The RMP was developed at the request of the State Highway and Public Transportation Commissioners as a move to insure Fort Worth's fair share of state transportation funding.

NCTCOG itself appears to be concerned about the creation of RMPs, both in Fort Worth and Dallas, primarily due to their perceived "wish list" nature, hasty development and the great amount of attention they are receiving at the state level. Their concern appears to be primarily that resource allocation decisions may be based more on the RMPs than on NCTCOG's extensive transportation planning efforts.

2.5 San Antonio

The Regional Mobility Plan

The Regional Mobility Plan for the San Antonio-Bexar County area, called "One Step Ahead", covers new freeway and arterial construction, reconstruction of certain existing roadways, construction of High Occupancy Vehicle (HOV) lanes, and the purchase of transit buses/vans and park-and-ride facilities that will be needed for the area between now and the year 2000.

The overall goal of the Regional Mobility Plan is to "stay one step ahead" of transportation needs to the year 2000. Some of the needs that are brought up in the plan have existed since the 1960's, but due to a lack of funding, improvements have not been implemented. Although the transportation needs for the San Antonio area are greatly increasing, the sources of funding for these projects remain the same. The current sources of funding are the federal government, the State of Texas, Bexar County, the City of San Antonio, and VIA Metropolitan Transit Authority.

No new sources of funding were discussed, although there is a net shortfall of $2.6 billion between total funds required and projected funds from existing sources. The total cost of meeting the San Antonio - Bexar County long-range transportation needs in 1981 dollars is $5.2 billion. The $5.2 billion is expected to add 470 new lane miles of freeway, 1,200 of arterials, 47 miles of HOV lanes, 1,864 transit buses/vans, 10 new park-and-ride facilities, and to reconstruct 540 lane miles of freeways, 2,700 lane miles of arterials, and four park-and-ride facilities.

Demographic and transportation projections that went into the planning process were provided by the designated MPO. The population of San Antonio is projected to be 1,400,000 by the year 2000, but that population increase alone does not suggest a dramatic transportation need -- tripmaking patterns, income levels and land use patterns also are important variables considered.

The RMP consists mainly of a project list for the year 2000, and of the cost of the projects. There is no breakdown of current versus future need and no criteria for the selected projects.

The Regional Mobility Planning Process

The San Antonio RMP was initiated by the downtown Chamber of Commerce at the suggestion of the State Highway and Public Transportation Commission shortly after the Houston Regional Mobility Plan had been completed and presented to the Commission.

The Alamo Area Council of Governments was originally the MPO for the region, but it was never thought to be very effective in that role. The San Antonio - Bexar County Transportation Study (SABCUTS) was later established as the designated MPO (and is called both SABCUTS and MPO) and is perceived by other government agencies as an effective organization.

Each of the transportation improvement implementing agencies (Bexar County, City of San Antonio, other cities in the county, SDHPT, and VIA) was asked to submit to the MPO its assessment of improvement needs and costs for its own jurisdiction. The administrator of the MPO was responsible for consolidating the needed improvements into a single document. The Chamber of Commerce took responsibility for presentation of the plan to the State Highway and Public Transportation Commission on May 27, 1982.

The process of preparing the RMP, though it did provide a basis for the accumulation of the various city, county and state plans, did not provide a forum for cooperative evaluation and

prioritization of the area's transportation needs. In effect, one person was assigned the responsibility for consolidating the information but was provided no opportunity to gain input or support from a technical task force or steering committee representing all the agencies.

The needs, as assessed by each of the implementing agencies, went directly into the final document. During the process of preparing the RMP, it was assumed that each agency adequately had evaluated the need for each of its projects. This approach, however, ignores the need for evaluation in a regional, inter-agency context, that is essential to the Regional Mobility Planning concept.

It appears that the Regional Mobility Planning process in San Antonio also suffered from a lack of communication due to its disjoint nature. Because each agency had been asked to prepare its contribution to the RMP individually, there was not common agreement on standards which should be used to assess the need for a particular improvement.

For example, the District Office of SDHPT modified its input to the RMP by considering only those projects which were technically and politically feasible. The Northern Expressway, for instance, will require additional lanes to accommodate growth, but such expansion was not deemed feasible and, therefore, the need was not included in the plan. VIA Metropolitan Transit, on the other hand, submitted improvement requirements based on projections of significant growth in transit demand which other agencies considered unreasonable.

The San Antonio RMP generally is seen by the city's transportation agencies and the Chamber of Commerce, as a useful document because it gathered all the various agencies' needs into one place, indicating the magnitude of the mobility problem to be solved by the year 2000 and highlighting the overall funding deficiency.

Local Issues Affecting Regional Mobility Planning

Coordination and cooperation among the City of San Antonio, Bexar County and the SDHPT District Office traditionally has been excellent. In one official's estimation, they have worked together "just like one outfit".

Although the MPO provides a forum for cooperation among these agencies, the real cooperation reportedly happens behind the scenes at the staff level. The MPO serves primarily as a method of keeping key elected officials up to date on transportation planning issues.

The MPO is a necessary channel for federal money, but it does not appear to direct policy for or provide guidance to the various transportation agencies. A great deal of freedom is given to the implementing agencies on the grounds that they are the ones most qualified to make decisions affecting the transportation facilities for which they have primary reponsibility.

The MPO has a Technical Advisory Committee which includes people such as the Director of County Public Works, the Director of City Planning, the VIA Manager of Planning, and the SDHPT District Planning Engineer. The MPO Steering Committee is made up of local elected officials representing the city and county. These committees meet regularly to review transportation planning efforts. The MPO has one staff person responsible for administrative and technical duties.

The exception in this highly cooperative atmosphere is the relationship between VIA and the City, County and SDHPT planning office. The transit system originally was owned and operated by the city. When VIA was created, other agencies perceived that there was an attitude within VIA suggesting that it, with its own dedicated tax revenue, was in a position which did not require cooperation with other agencies.

The power structure in the VIA Board of Directors reportedly changed recently, and there is an increased emphasis on developing a more cooperative relationship between VIA and the other transportation agencies. Although there has been improvement in those relationships, the need for increase in cooperative efforts remains.

One example of the lack of cooperation between SDHPT and VIA is HOV facility planning. SDHPT has been solely responsible for sponsoring studies to determine the need for HOV facilities. Although obviously highway facilities, the existence of HOV lanes is integral to transit system development, therefore, the lack of VIA's involvement is notable. The District SDHPT office has also been actively pursuing vehicle efficiency through a large Park and Pool program, again without VIA involvement.

VIA created a controversy in downtown San Antonio when it produced plans for a downtown transit mall. Its actions were viewed as forcing its will on the rest of the community. Controversy over the transit mall, bus traffic and patrons downtown, and substantial new development downtown resulted in the creation of the Tri-Party Committee, charged with looking at solutions to downtown congestion problems.

The Tri-Party Committee is made up of representatives of VIA, the city, and downtown property owners. The Tri-Party

Committee, initiated by business interests who are concerned about overall urban design in downtown, has chosen the transportation issue for particular focus. There is evidence of some unresolved conflict between the Tri-Party Committee and the MPO, since VIA and the city are working outside of the established cooperative MPO structure, while they still are requesting MPO allocated study money.

The business power structure in San Antonio appears to be in transition, with the older, established business leaders being replaced by younger business leaders, often from large banks, and frequently from out of town. Due to the resultant fragmentation in the business community, the new group of business leaders is heavily represented on the Tri-Party Committee.

Although the Tri-Party Committee has been established, it has has not yet completed any formal studies. In August 1983, however, the Committee issued a Request for Proposals to carry out a downtown transportation implementation plan. VIA and the city have produced many studies of transportation problems, and each is continuing to do so with considerable vigor despite the joint effort agreement implied by creation of the Tri-Party Committee.

For the most part, the spirit of cooperation necessary for effective Regional Mobility Planning exists in San Antonio, but that cooperation was not formalized and used in a creative way to prepare the RMP. The various agencies responsible for transportation planning and development in San Antonio did not sit down, discuss, and analyze, evaluate and prioritize the projected transportation needs for their area. In addition, if the Regional Mobility Planning process is going to be meaningful in San Antonio, it is necessary to develop a realistic data base for future growth that is accepted by all the planning entities.

2.6 Austin

An RMP for Austin has not been developed. The city's Urban Transportation Department made moves toward creating an RMP shortly after the Houston RMP was presented to the State Highway and Public Transportation Commissioners. That effort reportedly, however, was suppressed by city officials opposed to doing the plan. A delegation representing Austin did appear before the State Commissioners on the day other Texas cities presented their Regional Mobility Plans. This private sector delegation presented a slide show highlighting the need for state funding for highways, but the presentation was not the result of any comprehensive mobility planning process.

Local Issues Affecting Regional Mobility Planning

The atmosphere surrounding transportation planning in Austin by the city, county and SDHPT has not been conducive to coordinated planning in the past. The Austin Transportation Study was established in the 1970s as the MPO for the Austin area. It began with a staff of six people, two from the city, two from the county, and two from SDHPT. After some controversial work thought to be too long-range, the city pulled its staff people out of the organization. Not long after the city pulled out, SDHPT withdrew its staff.

The Austin Transportation Study Steering Committee, made up of local elected politicians, still exists but they meet only to give approval to the TIP or Unified Work Program. One staff person remains, a representative of Travis County, who acts as Secretary/Administrator to the Steering Committee. The Austin Transportation Study did produce a Long-Range Transportation Plan in 1979, a pure policy planning document, but it was never officially adopted by any of the agencies.

The transportation planning process in Austin now runs on three very separate tracks. After the city pulled out of the MPO, it began preparing its own planning documents which are comprehensively done and considered active documents. The state does its own highway planning, and the county is not very active in transportation planning at all.

Growth control is a very controversial issue in Austin, and a continuing source of conflict among the transportation agencies. The population of the City of Austin tends to be very environmentally conscious and anti-growth oriented. In 1975, the Austin Tomorrow Program began looking at long-range comprehensive planning for the city. As a spin-off of that process, neighborhoods began to organize and form neighborhood associations. There are now about 170, highly organized, very powerful neighborhood groups which tend to be anti-growth, pro-transit and against additional highways.

The anti-growth climate in Austin seems to be changing. The business community, which until now has been very quiet, has started to organize and speak up. In general, Austin residents are beginning to feel the pinch of high growth and are weakening their anti-growth stand on transportation issues. However, there is no longer any single group controlling public opinion in Austin.

In the past, transportation improvements in Austin were severely limited because the neighborhood groups were so strongly opposed to them. They viewed increased street capacity or improved highway access as an invitation to growth. There is a chance that in the new political environment the philosophy

that infrastructure improvement to direct growth is better than limiting improvement to restrict growth will gain popularity.

In general, when a plan for a highway improvement is introduced in Austin there is considerable controversy. The local SDHPT District Office has expressed a desire to stay out of local politics and will not get involved in projects until the local entities have coordinated and are in agreement. It has been suggested that about 90% of the reason additional transportation improvements have not been made in Austin is politics, not funding restrictions.

3.0 CONCLUSIONS

Of the RMPs examined, only Houston's fully achieves the goals and objectives basic to the Regional Mobility Planning process. The RMPs prepared in Dallas, San Antonio and Fort Worth fall short of the these goals for various reasons. Austin has not yet prepared an RMP.

The State Highway and Public Transportation Commissioners, after having seen the Houston RMP and recognizing its value as a tool for identifying the need for transportation improvements and for developing support for increased funding, requested that other large cities in Texas also prepare RMPs. Dallas, Fort Worth and San Antonio complied with the request primarily because they did not want their transportation needs overshadowed by Houston's.

The Regional Mobility Planning process evolved differently in each of the cities, because there were no established rules for preparing an RMP. Each city had only the Houston RMP for guidance, and since the problem faced in Houston -- a transportation crisis and a need to return to an acceptable level of mobility -- was fundamentally different from the situation faced in the other cities, for the most part the Houston RMP was not viewed as a necessary, or even helpful, format to follow.

In addition, these other cities were requested to complete their RMPs in less than three months. This time constraint considerably limited the quality of the final products. From conversations with those involved in preparing the RMPs in Dallas, Fort Worth and San Antonio, there is resentment evident concerning the need to put together their RMPs so quickly when compared to the nine months spent preparing the Houston RMP.

The fact that the preparation of an RMP was externally suggested in Dallas, Fort Worth and San Antonio had a tremendous effect on the success of Regional Mobility Planning

in those cities. In Houston, the RMP was a result of an internal process which grew from the need to find a solution to a critical problem. In other words, the crisis situation which was the impetus for creation of the RMP in Houston, did not exist in the other cities.

While Houston is facing a widespread mobility crisis, Dallas, Fort Worth, San Antonio, and Austin are not. Although severe congestion may exist in limited areas, such as in north central Dallas, a condition of heavy congestion throughout an entire region exits only in Houston.

The Houston effort also was fueled by a lack of confidence in the ability of the traditional regional transportation planning process to solve the mobility crisis. In Dallas, Fort Worth and San Antonio, however, this was not the case. In Dallas and Fort Worth, NCTCOG is a well respected, competent regional transportation planning agency which has cultivated a history of interagency cooperation and joint effort toward achieving mobility objectives. San Antonio also has a smooth functioning, although not quite as formalized, process of coordination and cooperation between the agencies responsible for transportation planning and development. Each of these cities viewed the Regional Mobility Planning task not as realistic transportation planning, but as a required, political tool for assuring the consideration of transportation funding needs in the allocation of the state's financial resources. The traditional transportation planning process is still relied upon by these areas for effective, technical needs assessment, and for federal/state capital grant eligibility.

However, as growth in these cities continues and in some cases escalates, they soon may face problems similar to those in Houston. When congestion reaches crisis proportions, the ability of the traditional transportation planning process to respond effectively is questionable. If the failure of the traditional approach in Houston can be used as an example, what currently is viewed as a good level of cooperation may not be adequate to meet the challenge. Accordingly, Regional Mobility Planning can be most useful as an advanced planning tool to obviate the crisis congestion being experienced in Houston.

A major weakness of the RMPs developed in Dallas, Fort Worth and San Antonio, is the lack of interaction among high level administrative and technical staff from each agency. Such interaction would have facilitated the exchange of data and ideas necessary to assess accurately the needs of each area's transportation system as a whole.

As reliable, realistic, technical, transportation planning documents, the RMPs done in Dallas, Fort Worth and San Antonio are of minimal value. Because of the emphasis on use of the

RMP to secure funding for transportation projects, most of those agencies responsible for submitting projects to the RMPs appeared to have an attitude of "more is better". On the other hand, in San Antonio for instance, the district SDHPT office took a very conservative approach to determining the need for transportation infrastructure and thus probably underestimated the actual need. Without a solid evaluation and review process, the actual needs of each city may not have been captured in the RMPs prepared in Dallas, Fort Worth, and San Antonio.

The Regional Mobility Planning process must be ongoing and continue to adjust to changing circumstances. Because of the conditions under which the RMPs in Dallas, Fort Worth, and San Antonio were developed, the RMPs have had a very limited and short-lived local impact. Once presented to the State Highway and Public Transportation Commissioners, the RMPs essentially were put on the shelf.

The accompanying summary chart of Regional Mobility Planning attributes (see Table I-1) provides an overview of the extent to which each of the RMPs achieved the objectives of Regional Mobility Planning.

TABLE I-1

SUMMARY CHART
REGIONAL MOBILITY PLAN ATTRIBUTES

	Houston	Dallas	Fort Worth	San Antonio
1. High-level Inter-agency Cooperation	Yes	No	No	No
2. Multi-modal (Highway, Arterial and Transit)	Yes	No	Yes	Yes
3. Private Sector Involvement	Yes	Yes	Yes	Yes
4. Consistent Data base	Yes	No	No	No
5. Consistent Assessment Criteria	Yes	Yes	No	No
6. Financial Unrestricted	Yes	Yes	Yes	Yes
7. Identification of Unmet Funding Need	Yes	No	Yes	Yes
8. Cost of Not Implementing	Yes	Yes	No	No

Part Two

Urban Mobility in Texas: Financing Issues

PART TWO

URBAN MOBILITY IN TEXAS: ANALYSIS OF FINANCING ISSUES

1.0 GENERAL OVERVIEW: FINANCIAL SUPPORT FOR MOBILITY

This portion of the overall project reviews the historic basis of mobility funding. Major legislative initiatives at the federal level which have encouraged rapid development of the federal/state urban highway network, as well as the rehabilitation of public transit systems, are reviewed. Recent initiatives in Texas which have had a significant impact on urban mobility also are discussed. Additionally, details of the 1982 Surface Transportation Assistance Act are discussed as they relate to and support urban mobility objectives. Finally, results of case study reviews in Houston, Dallas, Fort Worth, San Antonio and Austin of financial support for mobility improvement, future mobility requirements, and funding gaps in these areas are discussed.

1.1 Federal Legislation - Historic Perspective

At the conclusion of World War II, the U.S. war industry's conversion to automobile production prompted significant federal financial support for urban mobility improvements, resulting in the development of the U.S interstate highway system. These improvements were one of the factors which expedited the rapid suburbanization of U.S. cities. Legislative initiatives which greatly enhanced federal funding available to support expansion of the interstate system and improvement of urban mobility are described below.

1944 Federal-Aid Highway Act

The Federal-Aid Highway Act of 1944 is the milestone legislation marking the start of the period of federal aid to urban road systems. While the 1936 Highway Act had authorized urban extensions of the federal aid system, cities were completely dependent on rural oriented state highway agencies for actual funding.

The 1944 act created a new appropriation category, the federal-aid urban system, with monies apportioned among the states according to their urban populations. Authorized annual sums for the several federal-aid systems were:

$225 million	45%	Primary system (intercity) including urban extensions

150 million	30	Secondary and feeder systems (rural farm-to-market roads, mail and school bus routes.)
125 million	25	Urban system
$500 million	100%	Total Annual Authorization

The act of 1944 also is noteworthy for providing for creation of a 40,000 mile "National System of Interstate Highways."

Following the 1944 act, state highway agencies prepared, often for the first time, comprehensive highway plans for urban areas indicating the preliminary locations of the proposed interstate highways.

1956 Federal Highway Act

Implementation of the Interstate System was not specifically financed until the Federal Highway Act of 1956. It provided for an extraordinary 90-10 (federal-state) split of costs for a 13-year improvement program for the Interstate System.

1956 Highway Revenue Act

An important innovation in the 1956 Highway Revenue Act was the creation of the Highway Trust Fund which, for the first time, united Federal tax income from user charges, such as the gasoline tax, with highway expenditures to make the program self-financing.

The decade of the 1960's saw four major trends affecting urban transportation legislation - federal funding of transit, protection of the environment, comprehensive planning, and the creation of departments of transportation (DOTs) at the state and federal levels.

1961 Housing Act

The first federal aid for transit was contained in the Housing Act of 1961, which provided $25 million for mass transportation demonstration projects. In addition, it provided for low-interest loans to states, localities, and other authorities for land acquisition, facilities, and equipment for mass transportation. This was very limited funding for very limited purposes, especially when compared with the substantial sums made available for highway improvements.

1962 Federal-Aid Highway Act

In November 1960, the intensified efforts to improve urban transportation led to the identification of a number of additional factors in the problem or solution to be considered. This led Congress to require comprehensive

planning as a prerequisite to federal aid. The transit grants and loans provided in the Housing Act of 1961 could be obtained only where a plan for a coordinated mass transportation system, as an integral part of a metropolitan comprehensive plan, had been or was being developed. The Federal Aid Highway Act of 1962 contained a similar requirement, which because of the magnitude and prestige of the highway program, had a greater impact.

The Federal-Aid Highway Act of 1962 was evidence of a shift in emphasis from rural highways to urban transportation needs. In 1966, the Bureau of Public Roads was transferred from the Commerce Department to the newly established Department of Transportation.

1964 Urban Mass Transportation Act

Appropriations large enough to aid urban transit on a significant scale date from the Urban Mass Transportation Act of 1964, with initial annual appropriations totaling $375 million. The act's main purpose was to establish firmly a mass transportation program to assist state and local governments in planning, developing and improving mass transportation facilities, to coordinate them into area-wide systems for supporting urban development by moving people and goods efficiently and economically. The federal share of a project could be as much as two-thirds, provided there was a comprehensive transportation plan. Otherwise the federal share would be 50 percent.

This expanded program of grants, loans, and demonstration projects was conducted by the Urban Mass Transportation Administration of the Housing and Home Finance Agency. Most important, the act marked a turning point in the previously pessimistic outlook for mass transit by creating a hospitable climate for planning and implementation.

1966 UMTA Amendments

The 1966 Amendments to the 1964 Act required (1) more rigorous technical studies as a prerequisite to grants, (2) transit management training grants, (3) university research and training grants, and (4) the Secretaries of Housing and Urban Development and Commerce (this was just prior to creation of DOT) to work together in research and development of new transportation modes and systems. The Department of Transportation was established in 1966 and given responsibility for Urban Mass Transportation Administration in 1968 along with the Federal Highway Administration, the Federal Aviation Administration, and the Coast Guard. The major administrative impact of this move, theoretically, has been closer coordination of a broadened transportation policy.

1968 UMTA Amendments

The UMTA amendments of 1968 recognized that highway building was not an independent activity, especially in urban areas, and that it must be coordinated with services provided by other modes of transportation with major emphasis on comprehensive transportation planning and programming. This policy was strongly stated in the 1962 act and subsequently reinforced by the 1968 and 1970 acts.

The amendments also were evidence of increasing concern for those parties dislocated by the various highway programs and the development of policy to deal equitably with the problem. Although relocation was dealt with in the 1962 act, major legislation was included in the 1968 act increasing the assistance made available through the highway programs. Relocation concern culminated in the Uniform Relocation Assistance and Real Property Acquisition Act.

1970 Urban Mass Transportation Act

The Urban Mass Transportation Act of 1970 represented a strengthened federal commitment to transit. It authorized $10 billion over a 12-year period, with a limit of $3.1 billion annually after fiscal 1975. In addition, a 10-year loan program was established for purchase of real property or equipment for transit purposes. Applications for loans and grants are subject to mandatory review by the Secretary of Transportation and the governor in those states which have comprehensive planning programs.

1970 Federal-Aid Highway Act

The Federal-Aid Highway Act of 1970 fostered the concept of sound transportation planning with the establishment of the federal-aid urban system. Special highway programs were provided for, such as the construction of exclusive or preferential bus lanes, highway traffic control devices, bus passenger boarding areas and facilities, and fringe and corridor parking facilities. States could use funds apportioned for the urban system programs to finance the federal share of construction in urbanized areas. The 1970 act also set guidelines designed to assure that possible adverse economic, social, and environmental effects are taken into account before implementation of proposed federal projects.

1973 Federal-Aid Highway Act

The central achievement of the Federal-Aid Highway Act of 1973 was the new flexibility provided to state and local governments in the use of urban highway program funds for highway or transit capital investments. The Federal-Aid Highway Act of

1970 authorized the establishment of a federal-aid urban system in all urbanized areas. The initial urban system consisted of a limited number of high priority intraurban routes. The Federal-Aid Highway Act of 1973 broadened the eligibility criteria for the urban system in urbanized areas and also allowed for the establishment of the urban system in small urban areas of 5,000 to 50,000 population.

The Act of 1973 added highway/transit flexibility in the expenditure of urban system funds. This flexibility is afforded by amended Section 142 of Title 23 which provides that the Secretary may approve the construction, reconstruction, and improvement of fixed rail facilities, and the purchase of passenger equipment for rail or bus systems.

1974 UMTA Amendments

The 1974 Amendment to the UMTA Act provided for the first time federal support for operating expenses of public mass transportation systems. The legislation earmarked $3.975 billion to be distributed over the following six years pursuant to the formula grant program. This program provided distribution of these funds to the nation's 278 urbanized areas with population of 50,000 or more, on the basis of a formula of 50% population and 50% population weighted by density. Federal funding pursuant to the formula grant program allowed local officials the opportunity to devote up to 50% of their allocated funds to help defray operating deficits of their public transportation systems.

1978 Surface Transportation Act

This act amended the Urban Mass Transportation Act of 1964 and added several new features to the program for federal assistance to support public transportation.

These new features included:

- capital and operating assistance for rural and small urban areas (Section 18);
- formula distribution of funds for bus projects;
- second tier operating assistance;
- formula funds for commuter rail and fixed guideway capital or operating assistance;
- funds for intercity bus service, bus terminals, and transit institutes;
- capital grants for joint development and urban initiative projects.

The Surface Transportation Act of 1978 authorized appropriations of $13.58 billion for fiscal years 1979-1982, and $1.58 billion in discretionary funds for FY 1983.

Federal-Aid Highway Act of 1981

Though the Surface Transportation Act of 1978 provided authorizations for Federal-aid highways in FY 1979-1982, the act called for substantially lowered funding levels in its last fiscal year. President Reagan's budget at the time called for reductions below the level of funding in FY 1981, but the level recommended by the President for FY 1982 was still substantially higher than what is contained in the existing law.

A multi-year highway authorization bill was being considered at the time, but because of the diversity of opinion on the future role of the Federal government in highway revenue questions, Congress opted for a one year highway authorization bill. This one year bill increased the funding level for FY 1982 to the Reagan administration's proposed level.

The one-year act increases authorizations out of the Highway Trust Fund and establishes limitations on the authority of the Secretary of Transportation to incur obligations for highway construction and highway safety programs. This legislation also redefines remaining Interstate System costs to enable timely completion of the Interstate System and to provide a base for apportioning FY 1983 and future Interstate construction funds.

An interesting aspect of this legislation is that the Interstate 3R program (resurfacing, restoration, and rehabilitation) was expanded to a 4R program which includes reconstruction. Eligible costs deleted from Interstate construction were made eligible under the expanded Interstate 4R program, and funding for this program was increased substantially.

The following legislative acts also contributed to the effectiveness of federal financial assistance to support comprehensive planning for urban mobility.

1966 Demonstration Cities and Metropolitan Development Act

In the Demonstration Cities and Metropolitan Development Act of 1966, Title II requires that federal funds for any project in 34 program categories, including highways, transit, and airports, be dependent upon: (a) existence of a metropolitan body composed of at least 50 percent of local elected officials of general government, and (b) the body having at least 60 days in which to recommend approval, disapproval, or otherwise

comment on the project. This act was further strengthened in 1968 and was implemented by Bureau of the Budget (now Office of Management and Budget) Circular Letter A-95. Hence these area-wide reviews have come to be known as "A-95 reviews."

1970 National Environmental Policy Act

An extremely important refinement was added by the National Environmental Policy Act of 1970. Section 203 of the act requires the federal agency responsible for any federally aided project to submit a draft Environmental Impact Statement on a project to any affected local, state or federal agency and to the general public for comment. The act, enforced in nearly 200 courts during its first two years, has been highly significant in forcing: (1) interagency and intergovernmental planning, (2) attention to the entire range of impacts on social, economic, natural, and physical aspects of the projects' environment and (3) a more open public decision process. The addition of all these factors in many instances also increased the planning time frame of major projects.

1.2 Recent Initiatives

FHWA/UMTA Joint Planning Requirements

In summer 1983, FHWA and UMTA published new regulations which govern the Federal government's role in transportation planning. These regulations:

(1) provide greater state and local flexibility in administering the planning process and its funding;

(2) clarify the intent with respect to the flexibility of institutional relationships; and

(3) eliminate most of the non-regulatory language from the regulations.

More specifically, these regulations have changed the definition of MPOs (Section 450.106) by removing any federal prescription regarding their membership and composition and relying upon the statutory requirement added by the Surface Transportation Assistance Act of 1978 for designation. This statute requires that MPOs designated or redesignated after November 6, 1979 be, "by agreement among the units of general purpose local government and the Governor."

These new regulations (Section 450.108) have also changed the funding allocation to MPOs in areas with under 200,000 in population. This rule allows UMTA Section 8 funds to be made available to a state, if the state opts to receive such funds,

to allocate among smaller urbanized areas. The funds are intended for use directly by the small urbanized areas; however, if the MPO concurs, the states could expend these funds directly for the benefit of a particular urbanized area. If the state does not elect to receive and directly administer the funds, these funds are to be made available directly to the MPO, as is the current practice.

In addition, these regulations eliminate the requirement for a unified planning work program (UPWP) for areas under 200,000. Planning tasks for these areas would be agreed to by the state and MPO and documented as appropriate.

No specific guidelines are given as to the process for determining the development of a state Section 8 funding formula and MPO planning tasks in that process. Nor is any language present as to who finally approves a state's allocation formula.

The product requirements to the transportation plan, the TIP and its annual (biennial) element, have been reduced (Section 450.110). Specific information on the elements of the transportation planning process also has been deleted. FHWA and UMTA believe that the planning process has matured to the point at which specific plan elements need not be determined by the Federal government.

The regulations which specify the roles and responsibilities of the MPO, the state, and publicly owned transit operators in the urban transportation planning process (Section 450.112) have been changed so that these roles now are mutually determined at the local level. This change allows principal participants to determine their appropriate roles and eliminates federal prescription regarding the involvement of implementing agencies in the planning process. These are substantial changes from the old regulation which required that the "MPO, in cooperation with the state, and in cooperation with publicly owned operators of mass transportation services shall be responsible for carrying out the urban transportation planning process." This new section, however, does not indicate whether all publicly owned operators should be involved or just those that are designated recipients of federal mass transit funds.

Finally, these new regulations (Section 450.202 and 450.210) now allow a state, upon agreement in writing with the MPO, to propose Federal-aid primary, Interstate (including 4R) and Highway Bridge and Railroad (HBRR) projects for implementation in the statewide program of projects (105 program). These projects do not need to be drawn from the annual (or biennial) element of the TIP if they are repair, safety, or localized traffic operation projects that do not alter the functional

traffic capacity or capability of the facilities being improved. (Federal-aid urban system projects, Interstate substitution projects or UMTA-funded projects do not qualify.)

This authority also adds urban system projects to an existing provision which permits those projects for which a substantial commitment of federal funding has been made, to be included in the statewide program of projects under 23 U.S.C. 105, without having been on the current annual (or biennial) element. These recent UMTA/FHWA planning guidelines have clarified some of the confusion generated by federally imposed planning requirements on the previously planning processes of existing state and local governments.

1982 Surface Transportation Assistance Act

Highway Assistance

Title I of the Surface Transportation Assistance Act of 1982 provides substantial funding for the nation's Interstate and Urban Highway systems during fiscal years 1983-1986 through a five cent increase in the federal gasoline excise tax. Approximately $48 billion over the next four years will be available to complete Interstate construction ($16 billion), to improve the existing system ($10 billion), to improve primary/secondary support systems ($11.5 billion), to provide federal aid for urban infrastructure ($3 billion) and to support a variety of demonstration programs ($7 billion).

The Surface Transportation Assistance Act (STAA) took heed of two significant problems related to state highway funding--the 85% floor and the matching requirement by the state. Under the previous law, the highway users of some states paid sharply disproportionate amounts into the the Highway Trust Fund. The STAA ensures each state a minimum of an 85% return of that state's contribution. A special funding provision is used to accomplish this, so that no single state's apportionment is reduced.

This special funding for FY 1983 exceeded $500 million. The amounts actually allocated are not subject to the Highway Trust Fund obligation ceiling unless Congress so directs.

The STAA provides for a waiver of the matching requirement for the states. In effect, states are given two fiscal years to adjust to the higher matching requirements brought about by increased Federal funding. States may apply for a waiver of matching requirements for FY 1983 and FY 1984 to the extent that a state's obligation ceilings would have to be raised. A sum equivalent to the waived matching requirement must be paid

by the state into the Highway Trust Fund. If it is not paid, the amount will be deducted from the state's apportionments for FY 1985 and FY 1986. A summary of the Highway authorization levels for FY 1983 through FY 1986 is presented in Table II-1.

TABLE II-1
SUMMARY OF HIGHWAY AUTHORIZATION
(millions of dollars)

	FY 1983	FY 1984	FY 1985	FY 1986
Interstate Construction (matching ratio: 90-10)	$ 4,000	$ 4,000	$ 4,000	$ 4,000
Interstate 4R (matching ratio: 90-10)	1,950	2,400	2,800	3,150
Interstate Transfers (matching ratio: 85-15)	775	700	700	725
Primary System (matching ratio: 75-25)	1,850	2,100	2,300	2,450
Secondary System (matching ratio: 75-25)	650	650	650	650
Urban System (matching ratio: 75-25)	800	800	800	800
Federal Lands	250	300	300	300
Demonstration Projects	224	131	157	75
85% minimum (est.)	515	577	631	634
Emergency Relief	100	100	100	100
TOTALS	$11,114	$11,758	$12,438	$12,884

A major change to the Interstate 4R (rehabilitation, restoration, resurfacing, and reconstruction) program is that lapsed Interstate 4R funds will be allocated to states which have exhausted their Interstate 4R funds and can use the reapportioned funds in a timely manner.

Interstate transfers (Highway Trust Fund) changed so that substitute highway projects for withdrawn Interstate segments will be funded from the Highway Trust Fund. Beginning with FY 1984, 25% of the funds will be distributed at the discretion of the Secretary of Transportation; 75% will be apportioned on a needs basis.

The apportionment formula for Primary Systems also has been changed in the STAA to provide two methods of calculating shares:

(1) Each state's share is weighted 2/3 on area, rural population and postal route mileage; and 1/3 on urban population.

(2) Each state's share is computed using a new formula weighted 50% on rural population and 50% on urban population.

The more favorable of the two apportionment factors is used for each state. A pro rata adjustment is then made to bring the total apportionment factors down to 100%. Further adjustments are made to ensure that each state does not get less than the more restrictive of the two formulas and to provide each state with a minimum apportionment of 1/2 of 1 percent.

Under the new STAA, Urban System funds allocated to an urbanized area may be transferred to another urbanized area within the state, or to the state for use in any urban area, with the permission of the appropriate local officials.

Apportionments for Fiscal Year 1983 non-interstate and FY 1984 Interstate Highway programs (millions of $) for the State of Texas are shown in Table II-2.

Transit Assistance

The Surface Transportation Act of 1982 uses one cent of the five cent increase in federal fuel tax to establish a Mass Transit Account in the Federal Highway Trust Fund as a source of funding for capital expenditures. The approval of a project for funding from the Mass Transit Account is treated as a contractual obligation of the United States government.

Several provisions of the STAA are designed to encourage recipients of Federal assistance to use federal funding for capital projects rather than operating expenses. The Mass Transit Account cannot be used for operating assistance. In general, federal funding used for operating assistance is limited to a percentage of an area's federal operating assistance in FY 1982. That percentage is 80% for an area with a population of 1,000,000 or over, 90% for areas with population from 200,000 to 1,000,000, and 95% for areas whose population is less than 200,000. In cases in which an area only became eligible with the 1980 census, it may not use more than 40% of its apportionment for operating assistance.

In spite of the limitations on operating assistance described above, an area may transfer additional grant funds from capital programs to operating assistance. However, for each two

TABLE II-2
ESTIMATED APPORTIONMENTS FOR TEXAS*
HIGHWAY IMPROVEMENT ACT OF 1982
(Dollars in Millions)

	FY 83 Noninterstate & FY 84 Interstate	FY 84 Noninterstate & FY 85 Interstate	FY 85 Noninterstate & FY 86 Interstate	FY 86 Noninterstate & FY 87 Interstate
Interstate Const.	$ 178.165	$ 178.165	$ 178.165	$ 178.165
I-4R	148.248	182.460	212.870	239.478
Primary	114.155	119.755	131.160	139.714
Secondary	39.391	39.391	39.391	39.391
Urban	50.383	50.383	50.383	50.383
Bridge	60.908	63.090	67.453	80.543
Hazard Elimination	12.136	12.136	12.136	12.136
Railroad Crossing	12.241	12.241	12.241	12.241
Total Apportionments	$ 615.627	$ 657.621	$ 703.799	$ 752.051
Percent of National Total	5.88	5.59	5.66	5.68
85 Percent Floor	$ 135.712	$ 186.116	$ 189.177	$ 198.529
GRAND TOTAL	$ 751.339	$ 843.737	$ 892.976	$ 950.580

*Source: Surface Transportation Assistance Act of 1982 (HR 6211). Figures also verified by FHWA.

dollars so transferred, one dollar must be forfeited. Public hearings must be held to ensure that the public is aware of this loss of federal funding. At the discretion of the Secretary, any forfeited funds will be reassigned to capital funding projects of other jurisdictions.

Specific provisions for the transit grant programs are as follows:

- Section 3 (Capital Development) will receive $1621.7 million in FY 1983. For the remaining three years of the program, Section 3 will be funded by the proceeds from transit's one-cent of the gasoline tax revenue for discretionary capital purposes. Enactment of the new law reduces the federal share of Section 3 grants from 80% to 75%. The bill provides $1.25 billion in discretionary capital funds for FY 1984 for new rail starts or extensions of old systems. Section 3 grants will remain discretionary throughout the four-year program.

- The existing Section 5 program of formula grants for capital and operating assistance will remain in effect for FY 1983. The FY 1983 appropriations act provides $1.2 billion. However, a one-time reduction in operating assistance will take effect in FY 1983 only, as provided by the new bill. The reductions will be made differently for areas of differing population size. Urbanized areas in excess of 1 million population may apply an amount equal to 80% of their FY 1982 apportionment to operating assistance. Areas with population from 200,000 to 1 million may apply 90% and areas with population less than 200,000 may apply 95%. The overall impact of the new legislation on federal operating assistance will be minimal.

- The act creates a new Section 9 block grant program which will be available for capital development and operating assistance under a new distribution formula. The gasoline user fee which was implemented on April 1, 1983, will provide $779 million in FY 1983 for capital purposes. After FY 1983, the gasoline tax revenues will fund the Section 3 discretionary fund. The new Section 9 block grant formula program will be implemented in FY 1984 and funded from general revenues. The distribution formula for this new program is: 8.64% to areas with less than 200,000 in population; 2.93% to Section 18 (rural); and 88.43% to areas with a population greater than 200,000 in population. In areas of over 200,000, 2/3 of the funds will be distributed through a formula based on 1/2 bus revenue vehicle miles, 1/2 population, and 1/4

population/density. The remaining 1/3 of the funds will be distributed through a formula based on 60% rail revenue vehicle miles, and 40% rail route miles.

Section 9 block grant funds can be used for capital and operating purposes. However, the amount available for operating in FY 1984 - 1986 is limited as described earlier to 80/90/95% of FY 1982 Section 5 operating apportionments, depending on population size.

Mass Transit Appropriation for FY 1984

The fiscal year 1984 appropriation for the U.S. Department of Transportation authorizes mass transit programs below the level authorized in the Surface Transportation Act of 1982, but authorizes $540 million above the President's budget request.

For the Mass Transit Account of the Highway Trust fund for Section 3 discretionary capital grants, $1.225 billion in contract authority is provided by the new bill. The bill also provides the following:

- $2.389 billion for Section 9 and Section 18 formula grants for capital and operating assistance;
- Section 9 funds totalling $873 million to be used for operating assistance as was provided for in the Surface Transportation Act of 1982; and
- the three-for-two capital for operating assistance feature.

1.3 State Role in Urban Mobility

The state role in urban highway development will continue to comprise the administration of federal assistance funds, provision of state/local matching funds, and maintenance of the federal/state related highway network. Traditionally state DOT's have assured a coordinated and well planned interface between federal interstate/primary highway development and urban mobility infrastructure requirements. The Texas Highway Department had a long history of requiring impact of local elected officials in its planning efforts.

Until 1975, the only real effort toward transit support in Texas was the Texas Mass Transportation Commission. That agency had no funding for support of transit, nor was it an integral part of the state transportation planning process. The Texas Highway Department, supported by the Texas Highway Trust Fund, was the sole major actor in the field of transportation.

In 1975, the seven largest cities in Texas, those with populations of over 200,000 (Houston, Dallas, Fort Worth, San Antonio, Corpus Christi, Austin, El Paso), joined to lobby in the 64th Legislature for a state department of transportation with the mandate to deal with urban transit needs, including the need for state financial aid. Led by the City of Houston, legislation was prepared to establish the State Department of Highways and Public Transportation.

The legislation included a $30 million biennial appropriation to provide capital assistance to Texas urban areas for transit development. Under a formula provision, 60% of available funding was earmarked for use by designated recipients in urbanized areas to provide 13% of total project costs associated with federal grants. Accordingly, an urban area's local matching share for federal funds could be as low as 7%. A discretionary program, funded by 40% of the Public Tansit Trust Fund, was available to support transit capital needs of urban areas with less than 200,000 population or, after a lapse period, to any urban area that could demonstrate need. If federal funding were unavailable, the state (SDHPT) could provide up to 50% matching funds.

Several problems have surfaced during the administration of the Public Transit Trust Fund. Only a few urban areas are effectively utilizing the state assistance. Too much time must pass before unused discretionary funding can be redistributed. Appropriated funding is not considered obligated by the state until expended, thus creating problems related to the state appropriation process.

Several factors have evolved in recent years which have greatly reduced the state's ability to respond to urban highway development/maintenance needs in Texas. Available state resources for urban highway development have been continually eroded by inflation in construction costs, heavy maintenance requirements associated with the deterioration of urban highway networks in growth areas such as Houston and Dallas, project delays due to needed compliance with federal procedures, and right-of-way acquisition requirements. As a result, available state resources for highway development/maintenance fall far short of that needed to fulfill mobility requirements in growing urban areas.

1.4 Local Roles in Urban Mobility

Cities and counties are expected to provide sufficient financial resources to help fill the financial gap toward achieving urban mobility that results from shortfalls in current funding. In Houston alone, according to the Houston RMP estimate, Harris County and the City of Houston will

fall $1.4 billion short of achieving projected mobility requirements if current resources are not increased. Other Texas counties/cities display similar deficiencies.

The role of local government in helping to finance mobility is critical, since local transportation infrastructure provides the base which makes major federal/state related improvements a success. For example, the double decking and expansion of an urban freeway system requires an appropriate level of arterial feeder support, grade separations, and adequate signalization to achieve the increased capacity objectives. Therefore, local support is crucial for necessary interfaces with major urban federal/state related highway expansion.

In a similar context, the private sector will be required, by public financial constraints, to contribute financial assistance and other support to help urban communities meet mobility objectives made more difficult by additional growth and development. Methods of incorporating private sector support in urban mobility development are discussed later in this report.

The role of public transit at the local level in helping to achieve urban mobility objectives is often misunderstood. Even the most successful transit systems in transit commuter-oriented cities such as Boston, New York, and Philadelphia carry a relatively low percentage of total commute trips (the nationwide average is 3% to 4%). In Texas, transit systems in Houston and Dallas play relatively minor roles in their ability to carry peak hour commute trips. However, if the impact of all peak hour multi-occupancy travel such as carpooling, vanpooling, and transit is assessed, then public transit is significant.

Moreover, the development of transportation infrastructure which provides priority access for peak hour multiple occupancy travel can have the most attractive cost/benefit impact of any urban mobility improvement in terms of the absorption of added commuter requirements associated with growth and development. Such growth-related demands are greatly reducing the ability of current transportation infrastructure to maintain mobility.

Rail initiatives in cities such as Dallas and Houston will take many years to develop and, when completed, can be expected to address only a small portion of overall mobility objectives. Accordingly, rapid expansion of all available transit modes which can have an immediate beneficial impact on mobility is essential.

There is significant debate over the actual benefit derived from the provision of public transit service in growing urban

areas. It is difficult to quantify and calculate transit's beneficial impact on employment, fuel consumption, pollution, and land use. Yet, efficient public transit unquestionably can greatly enhance the overall quality of life in urban areas.

The current assessment of public transit in Houston, Dallas, San Antonio, Austin, and Fort Worth reveals a financial profile consistent with other findings nationally. Operating costs have skyrocketed, transit ridership is not increasing significantly, and in many urban areas has declined slightly over the last two years. Transit revenue increases are far outweighed by operating cost escalation. The result is a deteriorating picture as far as public transit's ability to pay a representative share of operating cost from the fare box.

Many large urban areas have moved to create a local tax base to help finance transit improvements. Local sales tax has been the most commonly used local source of revenue.

Public transit increasingly is moving toward greater public subsidy and less financial independence. Whether the availability of federal transit operating funds has increased dependence of urban transit systems on public subsidies is open to question; however it is clear that the availability of federal and local operating assistance has not enhanced the ability of urban transit to operate in more cost effective ways.

2.0 URBAN MOBILITY IN TEXAS - A FINANCIAL ASSESSMENT

2.1 Introduction

During the course of reviewing Regional Mobility Planning in the cities of Houston, Dallas, San Antonio, Fort Worth, and Austin, data were gathered to enable a summary profile of mobility requirements in these cities through the year 2000. Data utilized to project need include the SDHPT 20 Year Operational Planning Document, Regional Mobility Planning documentation from the case study cities, and interviews with local/state officials responsible for urban mobility improvements.

Mobility requirements for major urban areas were grouped into (1) those addressing federal/state urban highway development, and (2) those required for local (county/city) arterial support systems. Public transit operating/capital requirements are considered in the following section on transit system performance.

Financial requirements to implement mobility improvement have been projected in 1983 dollars; when appropriate, projected growth in financial resources has been included within

estimated needs. Available financial resources to support mobility improvement were analyzed from an historical perspective to identify past growth, and then trends were projected to the year 2000 to indicate a theoretical availability of funds if all current conditions remain the same.

Additional factors considered in the review of mobility requirements are:

- The recent Texas legislative session and its failure to substantially increase available state funds to support highway development.

- Recent passage of the 1982 Federal Surface Transportation Assistance Act which substantially increases the availability of federal support for urban mobility.

- Houston's recent referendum which turned down support for MTA's ability to issue revenue bonds.

- Harris County's approved referendum implementing $900 million of toll related facilities.

- Dallas voters' passage of the Dallas Area Rapid Transit (DART) Program.

- Sales tax support for transit authorities in Houston, Dallas, and San Antonio.

2.2 Urban Area Case Study Analysis

Federal/State Related Highway Improvement

Need

The SDHPT Operational Planning document was reviewed to determine the anticipated highway improvement requirements for those districts which represent Harris County/Houston, Dallas County/Dallas, Travis County/Austin, Tarrant County/Fort Worth, and Bexar County/San Antonio. Data compiled represent projected highway improvement needs between 1983-2000 and funding priorities distributed between the Interstate Highway System, U.S. Primary System, State Highway System, and Farm-to-Market System. The results are shown in Table II-3.

In determining the allocation of need between each case study urban/county area and its district total, an allocation formula was derived through use of historic information as well as estimates by each district on future need. Applying the allocation formula to the total projected need of each district

has resulted in an estimate of federal/state highway related mobility requirements for each case study area.

Projected Revenue

Projected revenues to support federal/state highway requirements are based upon a five year historic assessment of capital expenditures for highway improvements in each district. It should be noted that projections reflect recent increases in state expenditures due to additional federal resources. Expenditures for 1980-1981 were used to create a 1982 base level. An 18 year constant projection of revenues was used to determine a theoretical projection of financial resources from current sources. From these calculations, a funding gap between need (SDHPT Operational Planning Document) and projected revenue from existing resources was determined.

Growth factors were then applied to demonstrate the average yearly amount of additional state/FHWA resources which will be required to meet projected federal/state related highway mobility requirements in the five case study areas.

Funding Gap

Our analysis indicates that, based upon existing financial resources to support federal/state related highway improvements and projected needs identified through the Operational Planning Document, existing financial resources will have to be increased at the following annual cummulative growth rates in order to meet identified federal/state highway related mobility objectives:

Harris Co.: 11% - 12%;
Dallas Co.: 5% - 6%;
Tarrant Co.: 2% - 3%;
Bexar Co.: 1%;
Travis Co.: 9%.

City/County Mobility Requirements

Mobility Needs

Regional mobility planning documents and subsequent conversations with local officials were reviewed to identify the need for city/county transportation infrastructure requirements in each of the case study areas. Data compiled represent projected needs between 1983-2000 and are as follows:

Harris Co./Houston: $34 billion;
Dallas Co./Dallas: $28 billion;
Tarrant Co./Fort Worth: $14 billion;
Bexar Co./San Antonio: $15 billion;
Travis Co./Austin: not available.

TABLE II-3
FEDERAL/STATE HIGHWAY RELATED NEEDS
(in millions of dollars)

	Harris County	Dallas County	Tarrant County	Bexar County	Travis County
I-H System	3,861.89	1,477.36	762.16	850.74	139.70
% in Co.	90%	88%	79%	92%	62%
Co. Need	3,475.70	1,300.08	601.65	782.68	86.61
U.S. System	2,560.64	621.75	330.99	224.71	775.60
% in Co.	81%	56%	15%	32%	73%
Co. Need	2,074.12	348.18	49.35	72.33	566.19
SH System	5,558.00	1,594.29	1,051.74	689.37	584.68
% in Co.	61%	71%	77%	72%	60%
Co. Need	3,390.38	1,131.95	811.52	499.17	350.81
FM System	2,971.52	343.65	173.66	386.13	544.74
% in Co.	18%	25%	48%	26%	50%
Co. Need	534.87	85.91	83.50	98.58	272.37
TOTAL COUNTY NEEDS	$9475.07	$2,866.12	$1,546.02	$1,452.76	$1,275.98

SOURCE: SDHPT Operational Planning Document Study, July 1982.

TABLE II-4
FEDERAL/STATE HIGHWAY REVENUE PROJECTIONS
(in millions of dollars)

	Ave.Ann. Historic Base	18 Yr. Constant Yield	18 Yr. Yield 4% Growth	18 Yr. Yield 8% Growth	18 Yr. Yield 10% Growth	18 Yr. Yield 14% Growth
Harris	$174.55	$3,141.90	$4,655.47	$7,059.91	$8,755.28	$13,609.86
Dallas	77.45	1,394.10	2,062.71	3,132.58	-	-
Tarrant	67.9	1,222.20	1,808.52	-	-	-
Bexar	78.11	1,405.90	2,083.29	-	-	-
Travis	29.1	523.80	776.13	1,176.97	1,459.65	-

SOURCE: SDHPT Finance Division, 1983.

Projected Revenues

Actual expenditures for 1980 and 1981 on capital improvements only (excluding maintenance and right-of-way acquisition) were averaged to obtain the 1982 base from which future revenue projections were derived. Historic city/county expenditures include General Road and Bridge Funds, Road Bond Funds, and City bond funds. The need for city/county transportation infrastructure improvements has been used along with revenue projections (with a constant 18 year yield) to identify future need for additional financial resources. Growth projections have been applied to existing financial resources to determine the extent additional revenue growth will be required to meet city/county arterial requirements to support projected mobility needs.

TABLE II-5
CITY/COUNTY REVENUE OBJECTIVES
(in millions of dollars)

County	Historic Base	18 Yr. Constant Yield	18 Yr. Yield 4% Growth	18 Yr. Yield 8% Growth	18 Yr. Yield 10% Growth	18 Yr. Yield 18% Growth
Harris	$84.10	$1,513.80	$2,243.10	$3,401.81		
Dallas	56.80	1,022.40	1,514.79	2,297.21	2,849.16	-
Tarrant	32.75	589.50	873.31	1,324.78	1,642.94	-
Bexar	12.10	217.80	322.52	489.65	606.73	1,481.18
Travis	10.65	191.70	284.16	430.56	534.72	-

SOURCE: City and County Planning and Budget Offices, 1983.

Funding Gap

Our analysis indicates that, based upon existing financial resources to support city/county projected mobility needs, financial resources will have to be increased at the following annual cummulative growth rates in order to meet identified city/county highway related mobility requirements:

Harris Co.: 8%;
Dallas Co.: 10%;
Tarrant Co.: 9%;
Bexar Co.: 18%;
Travis Co.: not available.

3.0 TRANSIT SYSTEM PERFORMANCE

The review of operating and financial data relative to transit systems which serve the case study urban areas of Houston, Dallas, Fort Worth, San Antonio, and Austin is based primarily on data derived from the Urban Mass Transportation Administration Section 15 Fare Study. Operating data obtained from the finance/management departments of Houston MTA, Dallas Transit System, Dallas Area Rapid Transit, VIA Metropolitan Transit, Fort Worth Transit System (CITRAN) and the Austin Transit System supplemented that information.

Information covering the past ten year period was obtained to develop the profile for the Austin Transit System and Fort Worth's CITRAN system, and four year historical data were gathered with respect to the Houston MTA and VIA Metropolitan Transit systems (representing their entire operating histories). The recent creation of DART to support the development of transit in the Dallas Metropolitan Area limits the benefit of historical analysis relative to Dallas Transit System. Nevertheless, a five year historical profile of DTS was obtained.

Transit system historical data were analysed in terms of system financial performance (e.g., operating expense, revenues, deficit, average fare, etc.) and transit system productivity (e.g., total passengers, service miles, and corresponding cost/revenue analysis). Transit system performance is assessed from the standpoint of "trends" which indicate that system performance (operational and financial) is becoming more or less productive. Historical information then is utilized to highlight future trends which may have an impact on the financial viability of public transportation in the case study areas.

3.1 Houston - Metropolitan Transit Authority

In June 1983, Houston voters (approximately 12% of those registered) overwhelmingly turned down a proposal which would have enabled the MTA to issue bonds supported by sales tax revenues. The MTA initiative called for the construction of an 18.5 mile, 17 station rail line running from Crosstimbers in the north through the Central Business District (CBD) to the West Belt. The financing plan also included significant upgrading of bus equipment, facilities, and infrastructure support such as High Occupancy Vehicle (HOV) lanes. The total Capital Improvement Program would cost $5.236 billion from 1983-1990 and include approximately $2.3 billion in debt service requirements. The plan was based upon estimates of sales tax revenue that were somewhat less than earlier projections due to the recent recession. The May 1983 METRO

"Plan of Financing for the Regional Transit Capital Improvement Program" estimated the sales tax annual growth rate at approximately 9% with a 2.4% real growth through 1990.

Since defeat of the bond issue, Houston MTA has been reassessing its options for rail development as well as rapid expansion of its bus operation.

Historic Analysis

MTA's operating performance during the last few years demonstrates that the national trend toward significantly increased operating cost and reduced fare box revenue-to-expense ratios exists in Houston. However, of all transit systems surveyed through this project, Houston MTA has the potential to post the most significant increase in fare box revenues, ridership, and overall transit productivity.

For the five year period from FY 79 through FY 83, MTA operating revenues rose from $13.3 million in FY 79 to $29.7 million in 1983, a 125% increase. However, operating expenses rose 142% from $51.1 million in 1979 to $123.8 million in 1983. MTA's fare box revenue to operating expense ratio fell slightly in five years from 26% to 24%, although the 1983 ratio represents a substantial recovery from the 1982 low of 18%.

Perhaps the most dramatic characteristic of Houston MTA's operating history is the increase in operating expense per service mile. In 1979, it cost MTA $2.04 for every mile of revenue operation. In 1983, the projected cost is $3.49; an increase in five years of 71%. Passenger revenue in 1979 per operating mile was 53 cents, increasing to a projected 84 cents per mile in 1983.

MTA has experienced substantial passenger increases since it began revenue service in 1979, and this trend is projected to continue:

1979 - 38.8 million passengers
1980 - 41.9 million passengers
1981 - 47.7 million passengers
1982 - 50.0 million passengers
1983 - 65.7 million passengers (projected).

In 1979, it cost METRO $1.32 to carry each passenger. In 1983, it is projected to cost METRO $1.88 to carry each passenger.

In 1979, MTA was collecting 34 cents for each passenger carried, increasing to 40 cents for each passenger carried in 1982. The average fare is expected to increase to 45 cents in 1983. If METRO projections are achieved, ridership will have increased by 69% and service miles by 41% during its first five years of operation.

TABLE II-6
HOUSTON MTA FINANCIAL PROFILE

FY	Operating Expense (millions)	Operating Revenue (millions)	Deficit (millions)	Revenue/ Expense Ratio	Ave. Fare
79	$ 51.1	$ 13.3	$ 37.8	.26	$ .34
80	74.9	15.5	59.4	.21	.37
81	91.3	18.3	73.0	.20	.38
82	113.3*	20.2	93.1	.18	.40
83**	123.8	29.7	94.1	.24	.45

*Exclusive of 22.7 M expense write off of Grumman Flexible Bus loss.

**Projected.

SOURCE: MTA Financial Department, 1983.

TABLE II-7
HOUSTON MTA PRODUCTIVITY PROFILE

FY	Passengers (millions)	Service Miles (millions)	Cost/Mile (dollars)	Revenue/ Mile (dollars)	Passengers /Mile
79	38.8	25.1	$ 2.04	$ .53	1.55
80	41.9	17.7	4.23	.88	2.37
81	47.7	21.0	4.35	.87	2.27
82	50.0	25.1	4.51	.80	1.99
83**	65.7	35.5	3.49	.84	1.85

**projected

SOURCE: MTA Financial Department, 1983.

Future Prospects

MTA's passengers and fare box revenues have been increasing at a significant rate. However, increased operating expense is continuing to keep MTA's passenger revenue to operating expense ratio extremely low.

MTA Board policy has stated the objective of achieving a 50% return of operating expense from the fare box. Achieving this objective would substantially increase MTA's operating revenue stream. The MTA administration recently announced its intention to raise passenger fares an average of 25%, raising the average base fare to 50 cents. If the MTA Board approves this recommendation, the agency's average base fare would approach the national average of 54.6 cents recently reported in U.S. News and World Report (September 5, 1983). Based upon projected 1983 passenger levels, MTA's revenue could increase by $5 to $6 million due to this proposed fare increase.

Because of the defeat of its bond election earlier this year, MTA currently is in the process of developing alternate plans for improving transit in Houston. A detailed corridor by corridor analysis, which is considering a range of transit technologies, is in process. It is therefore difficult at this time to project accurately future capital and operating needs for the system.

The Houston Regional Mobility Plan (RMP), prepared in 1982, estimated that $6.4 billion (1981 dollars) would be needed over the next 15 years for transit improvements, including high capacity transitways (rail), high occupancy vehicle lanes, maintenance facilities, park-and-ride lots and buses. Transit needs represent nearly 40% of the $16.2 billion total transportation need stated in the RMP.

3.2 Dallas Transit System

Historic Analysis

The Dallas Transit System (DTS) historically has displayed a cost effective approach to the provision of public transportation. DTS currently derives about 50% of the funds required to meet operating expenses from the fare box. This is one of the highest ratios in the nation. Passenger trips in 1979 were 27.7 million increasing to 30.8 million in 1983, a five year increase of 11%. However, operating costs over the same period increased from $23.0 million to $41.3 million, an increase of 80%. Fare box revenues over the same period increased from $12.5 million to $19.9 million, an increase of 60%.

TABLE II-8
DALLAS TRANSIT SYSTEM FINANCIAL PROFILE

FY	Operating Expense (millions)	Operating Revenue (millions)	Deficit (millions)	Revenue Expense Ratio	Ave. Fare (dollars)
78/79	$ 23.0	$ 12.5	$ 10.5	.54	$ .45
79/80	28.3	15.4	12.9	.54	.51
80/81*	30.6	15.1	15.5	.49	.56
81/82	37.2	19.8	17.4	.53	.64
82/83	41.3	19.9	21.4	.48	.65

* 54 day strike

SOURCE: Dallas Transit System, Finance Department, 1983.

From a transit productivity perspective, DTS has maintained a fairly constant profile during the last five years (see Table II-9). Passengers per mile in 1983 are the same as they were in 1979. Total service miles and revenue per mile have increased only slightly over that time period.

TABLE II-9
DALLAS TRANSIT SYSTEM PRODUCTIVITY PROFILE

FY	Passengers (millions)	Service Miles	Cost/ Mile	Revenue/ Mile	Passenger /Mile
78/79	27.7	13.2	$1.74	$ .95	2.10
79/80	30.2	13.6	2.08	1.13	2.22
80/81*	26.8	12.5	2.45	1.21	2.14
81/82	30.8	13.8	2.70	1.43	2.23
82/83	30.8	14.7	2.81	1.35	2.10

*54 day strike

SOURCE: Dallas Transit System Financial Department, 1983.

DART Future Prospects

In August 1983, the Dallas area voters confirmed the creation of the Dallas Area Rapid Transit, (DART), which is to be supported by a one cent increase in the sales tax. The DART initiative will greatly expand the current coverage of public transit for the Dallas metropolitan area and have a major impact on operating profiles. The DART proposal was passed in Dallas and thirteen other municipalities; eight communities rejected the proposal. DART plans call for the construction of a 160 mile rail network at a cost of $3.6 billion. It is yet

undetermined whether DART intends to directly operate public transit or to act as a broker of service to its constituent communities. The following discussion is based upon DART's projections of future ridership, revenue, and cost trends.

The DART Service Plan calls for an Immediate Action Program (IAP) which includes significant improvements between 1984 and 1986. The key aspects of the IAP are as follows:

- Bus service in the DTS area will be increased by more than 35 percent.
- The total bus fleet will be almost doubled by the end of 1986.
- More than 100 of the new buses will be used to provide service to suburban cities presently unserved by transit.
- Ten percent of the fleet in 1986 will be devoted to providing express service.
- Twenty-one Timed Transfer Centers will be constructed in suburban communities to increase the ease and efficiency of passenger transfers, without forcing all trips through the Dallas Central Business District (CBD). Four additional transfer centers are planned but the locations have not been designated.

Table II-10 indicates the capital improvement requirements to implement the DART Immediate Action Program.

The DART Service Plan includes bus and fixed guideway capital costs through year 2010. These costs are estimated to total $4.03 billion in 1982 dollars, adjusted upward to incorporate estimated inflation cost for transit construction that is over and above the estimated inflation in the consumer price index (CPI) between 1984 and 2010.

Of the total budget, $.34 billion will be funded from federal grants based on 75 percent federal funding of the high occupancy vehicle lane construction on Route 14.(LBJ), and all bus and bus garage capital costs. The cost to DART will be $3.7 billion for 25 percent of bus and HOV facilities, and all costs to construct and equip the fixed guideway network.

The DART program calls for an initial immediate reduction in fares beginning January 1, 1984. In 1986, fares will be raised to a level that permits 45% of operating cost to be recovered from the fare box. In the year 2000, the DART Board policy suggests that at least 50% of operating cost will be recovered from the fare box.

TABLE II-10
DALLAS AREA RAPID TRANSIT
CAPITAL PROGRAM: IMMEDIATE ACTION PROGRAM
1984-1986
(1982 Dollars in Millions)

	QUANTITY	CAPITAL COST
1. Replacement Buses	256	$ 38.4
2. New Buses		
- Articulated	100	27.5
- Standard	200	30.0
3. Fare Box & Radio Equipment	556	3.5
4. Support Bus Facilities		
- Maintenance Facilities	4	48.5
- Transfer Centers (Including 4 Undesignated)	25	10.6
5. Contraflow Bus Lane (East R.L. Thornton)	4 Miles	3.5
6. Ridesharing Program	15 Seat Vans	0.2
	Misc.	0.1
7. Elderly & Handicapped		
- Lifts (Bus)	125	1.9
- Demand Responsive Vans	20	0.6
8. Subscription Bus Service	6	0.9
9. TSM/Other Improvements		
- Signal Preemption	-	0.5
- Shelters/Signs, Etc.	-	1.5
- Priority Bus Lanes	-	8.0
Subtotal		$175.7
5% Contingency		8.8
TOTAL		$184.5
Federal Grants		$139.0
DART Cost		$ 46.5

3.3 Fort Worth - CITRAN

In November 1981, the Fort Worth Public Transportation Advisory Committee studied a range of alternatives for continued support

of public transportation in Fort Worth. The recommendation of the committee was that "Fort Worth should rely on user fees, a transportation authority, and a limited sales tax to fund the continuation and development" of Fort Worth's public transportation system.

With respect to user fees, the Fort Worth study assumes that 50% of operating costs should be covered by fare box revenues. CITRAN currently provides 40% of operating cost from the fare box.

The study recommended that the City of Fort Worth proceed quickly with formation of a transit authority totally separate from the Dallas Area Rapid Transit effort. It also recommended a sales tax rate not to exceed one-half cent, and established a goal of creating a transit authority by October 1983. Information from the study presented in Table II-11 indicates the operating funding needed through 1985 to maintain the current level of public transportation service.

TABLE II-11
OPERATING FUNDING NEEDED TO MAINTAIN
CURRENT LEVEL OF PUBLIC TRANSPORTATION SERVICE:
CITRAN AND MITS*
(Thousand dollars)

FY	Total Operating Expenses**	Subsidy Required	Maximum Federal Share	General Fund Contribution
1982	$ 8,726	$ 4,940	$2,470	$ 2,470
1983	9,691	5,285	2,643	2,643
1984	10,655	5,799	2,530	3,269
1985	11,955	6,510	-0-	6,510

*Includes both CITRAN and Mobility Impaired Transportation Service.

**Assumes inflation and maintenance of a 50% revenue-to-expense recovery ratio beginning in 1983. These assumptions will require significant fare increases each fiscal year.

SOURCE: Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee, November 1981.

Historic Analysis

Fort Worth (CITRAN) ridership has had an interesting ten year history, as illustrated in Table II-12. In 1973, annual ridership was 5,104,819, peaking at 5,631,355 in 1974, with the height of the fuel crisis. However, ridership fell to a low

of 5,095,274 in 1978. In 1980, CITRAN ridership reached a new peak of 6,425,618, but lost 7% in 1981.

TABLE II-12
CITRAN RIDERSHIP

Fiscal Year Ending September 30	Total Passengers
1973	5,104,819
1974	5,631,355
1975	5,441,552
1976	5,477,500
1977	5,147,368
1978	5,095,274
1979	5,698,574
1980	6,425,618
1981	5,975,905

SOURCE: Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee, November 1981.

Operating expenses during the same period rose from $2.205 million in 1974, or 39 cents per passenger trip, to $6.646 million in 1982, or $1.11 per passenger trip. Accordingly, while ridership has risen 17% during the period 1973-1981, operating cost per passenger trip has increased at a rate seven times faster, or 185%.

TABLE II-13
CITRAN FINANCIAL PROFILE

FY	Operating Expense (millions)	Operating Revenue (millions)	Deficit (millions)	Revenue/ Expense Ratio	Ave. Fare
72/73	$ .4	$ .35	$ 0.5	.88	$ .07
73/74	2.2	1.7	.5	.77	.30
74/75	2.6	2.1	.5	.81	.39
75/76	3.1	1.6	1.5	.52	.29
76/77	3.5	1.7	1.8	.49	.33
77/78	3.6	1.7	1.9	.47	.33
78/79	4.0	1.8	2.2	.45	.32
79/80	4.6	1.9	2.7	.41	.30
80/81	5.8	2.2	3.6	.38	.37
81/82	6.6	2.7	3.9	.41	.46

SOURCE: Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee, November 1981.

Fort Worth also has experienced a typical increase in the dependency on public subsidy. The operating revenue-to-expense ratio deteriorated from 88% in 1973 to 41% in 1982.

TABLE II-14
CITRAN PRODUCTIVITY PROFILE

FY	Passengers (millions)	Service Miles (millions)	Cost Mile	Revenue /Mile	Passenger /Mile
72/73	5.1	3.2	$ .13	$ .11	1.59
73/74	5.6	3.0	.73	.57	1.87
74/75	5.4	3.1	.84	.68	1.74
75/76	5.5	3.0	1.03	.53	1.83
76/77	5.1	2.9	1.21	.59	1.76
77/78	5.1	2.9	1.24	.59	1.76
78/79	5.7	3.0	1.33	.60	1.90
79/80	6.4	3.0	1.53	.63	2.13
80/81	6.0	3.2	1.81	.69	1.88
81/82	5.9	3.3	2.00	.82	1.79

SOURCE: Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee, November 1981.

CITRAN's ten year transit operating history exhibits similarities to many other transit systems throughout the nation. Since 1973, operating expense has tripled. Operating revenue has increased only half as much. As a result, revenue to expense coverage has dropped from 88% in 1973 to 41% in 1982. On the other hand, CITRAN's average fare has increased steadily since 1973 from 30 cents to 37 cents in 1981. A recent base fare increase from 50 cents to 75 cents has helped increase the average fare to 46 cents.

CITRAN's transit productivity has shown an increase in ridership from 5.1 million in 1973 to 5.9 million in 1982. However, ridership has declined 8% since its 6.4 million high in 1980. Operating cost per mile has increased by 175% since 1974, while passenger revenue per mile has increased only 44%. Passengers per service mile have decreased 16% since the 1980 high. Declining passenger ridership for CITRAN over the last two and a half years follows a nationwide trend.

Future Prospects

The Tarrant County Year 2000 Transportation Plan (the Fort Worth area RMP) provides a projection of CITRAN's needs through the year 2000. These are presented in Table II-15.

TABLE II-15
CITRAN - TWENTY YEAR PLAN
ONGOING FUNDING REQUIREMENTS

YEAR	EST. BUS FLEET SIZE	CAPITAL (thousands) of $'s)	OPERATING (thousands) of $'s)
1983	141	$ -0-	$ 8,000
1984	141	1,200	8,000
1985	149	17,980	8,700
1986	152	780	8,860
1987	158	7,300	9,390
1988	166	3,780	10,090
1989	174	2,280	10,790
1990	201	21,170	12,910
1991	205	1,490	13,260
1992	207	3,240	13,440
1993	207	1,000	13,440
1994	207	1,000	13,440
1995	257	9,300	17,840
1996	257	1,300	17,840
1997	267	2,900	18,720
1998	277	2,900	19,600
1999	277	1,300	19,600
2000	277	17,800	19,600
TOTAL		96,720	243,520

CITRAN ASSUMPTIONS FOR 20 YEAR PLAN ESTIMATES:

Operating:
(1) All dollars are 1982 dollars.
(2) 1983 base budget for total expenses assumed to be $8,000,000.
(3) Added $87,500 operating cost for each bus placed in expanded service each year.

Capital:
(1) All dollars are 1982 dollars.
(2) Misc. capital expenditures (i.e. tools and equipment) estimated from 1982-87 TIP projects.
(3) Other capital projects estimated from specific capital cost estimates from quadrant sheets (i.e. # of buses to purchase).
(4) Bus cost estimated at $160,000 per bus.
(5) Assumed $8,000,000 to construct additional support and maintenance facilities.

SOURCE: Tarrant County Year 2000 Transportation Plan.

3.4 San Antonio VIA Metropolitan Transit

VIA Metropolitan Transit has been cited as one of this nation's most efficiently operated bus systems. VIA consistently maintains an excellent rating in the transit operating and maintenance areas, as well as overall system cost effectiveness.

From a financial perspective, VIA traditionally has offered an extremely low transit fare structure for its San Antonio patrons. Up until 1980, the base transit fare for adult travel was 25 cents. This fare structure had lasted a decade until the VIA Board authorized a fare increase to 40 cents in the summer of 1980. The impact of this 1980 fare adjustment has significantly raised VIA's fare box revenues, while ridership loss has been minimal.

Historic Analysis

A four year history of VIA's transit system from 1979 through 1982 has been analyzed here. From an operating perspective, VIA's ridership declined by less than 1% from 37 million in 1972 to 36.9 million in 1982. Operating expenses during the same time period increased 49% from $20.9 million in 1979 to $31.1 million in 1982. Passenger revenues increased at a greater rate (55%) during the same time period.

As a result of VIA's 1980 transit fare increase and steady patronage, transit revenue to operating expense ratios were better in 1982 (37%) than in 1972 (30%). VIA is one of the very few transit systems which can make that claim.

TABLE II-16
VIA FINANCIAL PROFILE

FY	Operating Expense (millions)	Operating Revenue (millions)	Deficit (millions)	Revenue/ Expense Ratio	Ave. Fare
79/80	$ 20.9	$ 7.5	$ 13.4	.36	$ .20
80/81	25.3	9.5	15.8	.38	.25
81/82	28.8	11.5	17.3	.40	.31
82/83	31.1	11.6	19.5	.37	.31

SOURCE: VIA Metropolitan Transit, Finance Department, 1983.

During the period 1979-1982, VIA' service miles increased very little. However, operating cost per mile increased 44%, while passengers per mile decreased slightly.

TABLE II-17
VIA PRODUCTIVITY PROFILE

FY	Passengers (millions)	Service Miles (millions)	Cost/ Mile	Revenue/ Mile	Passenger/ Mile
79/80	$ 37.0	$ 13.1	$1.60	.57	2.82
80/81	37.3	13.5	1.87	.70	2.76
81/82	36.9	13.6	2.12	.85	2.71
82/83	36.9	13.5	2.30	.86	2.73

SOURCE: VIA Metropolitan Transit, Finance Department, 1983.

Future Prospects

VIA currently does not have plans to significantly expand its service beyond the addition of a number of park-and-ride facilities. The San Antonio RMP "One Step Ahead," prepared in 1982, indicated that Bexar County would require $5.2 billion before the year 2000 for transportation facilities, $1.5 billion of which would be required for transit facilities such as buses and vans, high occupancy vehicle lanes, and park-and-ride lots. The plan estimated than VIA would have available to it $.9 billion from existing sources during that time frame, leaving a shortfall of $.6 billion.

3.5 Austin Transit System

Historic Analysis

The Austin Transit System displays a rather typical trend of revenue-to-cost economics during the past ten-year period. Transit ridership in 1972-73 was approximately 4.1 million passenger trips over 2.2 million operated miles. Transit revenue derived was $820,000 and operating expense approximately $1.2 million. The Transit System was deriving 55 cents per operating mile on an average per trip fare of 20 cents. The fare box was contributing 68% of operating expense; the City of Austin was subsidizing the remaining cost.

Ten years later, the Austin Transit System displays a much different profile. Information for 1981-82 reveals approximately 5.5 million passenger trips over 2.9 million operated miles. There were 1.91 passengers per operating mile in 1982 compared with 1.88 in 1973; virtually no change in passengers per mile productivity. Transit operating revenue in 1982 was $1.85 million and operating expense had ballooned to $6.4 million reducing fare box revenue-to-expense productivity to 28.8%.

TABLE II-18
AUSTIN TRANSIT SYSTEM FINANCIAL PROFILE

FY	Operating Expense (millions)	Operating Revenue (millions)	Deficit (millions)	Revenue/ Expense Ratio	Ave. Fare
72/73*	$ 1.2	$ .8	$ .4	.67	$ .20
73/74	1.7	.9	.8	.53	.17
74/75	2.1	.9	1.2	.43	.16
75/76	2.5	1.0	1.5	.40	.16
76/77	3.0	1.1	1.9	.37	.17
77/78	3.5	1.1	2.4	.31	.17
78/79	4.3	1.0	3.3	.23	.16
79/80	5.2	1.5	3.7	.29	.23
80/81	5.7	1.6	4.1	.28	.26
81/82	6.4	1.9	4.5	.30	.35

*During the first quarter of FY 1973, the system was owned and operated by the American Transit Corporation.

SOURCE: Final Report, Metropolitan Transit Authority Task Force, February 9, 1983.

While transit operating expense per operating mile has increased from 55 cents in 1973 to $2.21 in 1982, (a 400% increase), transit revenue derived per operating mile has increased only 73% from 37 cents in 1973 to 64 cents in 1982. In other words, during the last ten years, Austin Transit System operating costs have increased at a rate 6-1/2 times as fast as fare box revenues.

Further analysis into the Austin Transit System's ten-year operating profile reveals another distinct trend. Transit ridership reached its peak in 1979-80 when 6.4 million passengers were carried over 3 million operating miles. Since that period, ridership actually has declined 13% to 5.5 million trips. The average transit fare per trip of 20 cents in 1973 has risen to 33 cents in 1982 for an increase of 65%. However, the corresponding cost of providing transit per passenger trip of 29 cents in 1973 has risen to $1.16 in 1982 for an increase of 300%.

TABLE II-19
AUSTIN TRANSIT SYSTEM PRODUCTIVITY PROFILE

FY	Passengers (millions)	Service Miles (millions)	Cost/ Mile	Revenue/ Mile	Passenger/ Mile
72/73*	4.1	$ 2.2	$ .55	.36	1.86
73/74	5.2	2.5	.68	.36	2.08
74/75	5.8	2.6	.81	.35	2.23
75/76	6.3	2.6	.96	.38	2.42
76/77	6.3	2.9	1.03	.38	2.17
77/78	6.3	2.8	1.25	.39	2.25
78/79	6.2	2.9	1.48	.34	2.14
79/80	6.4	3.0	1.73	.50	2.13
80/81	6.1	2.7	2.11	.59	2.26
81/82	5.5	2.9	2.21	.66	1.90

SOURCE: Final Report, Metropolitan Transit Authority Task Force, February 9, 1983.

*During the first quarter of FY 1973, the system was owned and operated by the American Transit Corporation.

The recent decline in ridership is disturbing. If the trend is projected to the 1990-91 period, ridership will fall from its 1981-82 level of 5,549,281 to a 1990-91 level of 3,001,640. If the operating cost trend of 22.4% increase (average of 11.2% annually) from the 1979-80 period to 1981-82 period is carried forward, current operating expense of $6,428,910 will balloon to $16,714,000. It is clear, however, that Austin Transit System has the opportunity to reverse current unfavorable economic/market trends through a variety of factors such as: fare adjustments, operating cost efficiencies, and specific targeted ridership increase programs.

Had Austin Transit System's average fare per trip increased over the last ten years at a rate comparable with operating cost increases, the current average fare would be 60 cents. This would have derived $3.3 million in total revenues or an additional $1.5 million in 1982 alone.

Future Prospects

The Austin transit experience is disturbing but typical of the similar experiences of other transit systems in auto oriented/dependent areas. Austin's ridership decline in the

TABLE II-20
OPERATING CHARACTERISTICS OF THE
AUSTIN TRANSIT SYSTEM

Fiscal Year	Total Ridership	Total Mileage Operated	Cost/ Bus Mile	Fare Structure
72-73*	4,143,666	2,201,925	$.55	30¢ All Times
73-74	5,246,809	2,494,336	.68	30¢ Peak; 15¢ Off-Peak
74-75	5,821,180	2,563,363	.84	Same
75-76	6,317,843	2,616,480	.95	Same
76-77	6,312,642	2,898,230	1.04	Same
77-78	6,321,496	2,824,201	1.25	Same
78-79	6,239,116	2,883,854	1.48	35¢ Peak; 15¢ Off-Peak
79-80	6,360,359	3,003,947	1.73	40¢ Peak; 20¢ Off-Peak
80-81	6,057,485	2,744,734	2.06	40¢ All Times; 5¢ Transfer Fee
81-82	5,549,281	2,905,377	2.21	50¢ All Times; 5¢ Transfer Fee

*During the first quarter of FY 1973, the system was owned and operated by the American Transit Corporation.

SOURCE: "Financial and Operations Summary of the Austin Transit System Since City Acquisition in 1972," Austin Transit System.

last several years corresponds with the decline in sharply rising fuel costs, ready availability of automobile fuel, and the public's perception of abundant fuel resources. It also should be noted that Austin's base fare increased from 30 cents in 1973 to 40 cents in 1980 (the period of most significant ridership gains). In 1981-82, Austin Transit increased its base fare once again to 50 cents with a five cent transfer charge. The current base fare is extremely low when viewed in light of alternative commuting cost and system operating cost increases. The City of Austin seems an ideal climate for transit ridership. The privately operated Transportation Enterprises, Inc. has taken advantage of transit opportunities related to the University of Texas. With several other universities, state government, and continual growth, Austin Transit ridership's recent decline is particularly perplexing.

The City of Austin Public Transportation Plan, prepared in 1977, remains in effect today. Uncertainty over creation of a transit authority has inhibited a revision of the plan. The main concept of the plan is a system of primary and secondary transfer terminals throughout the city. Should a transit

authority be created, this concept, applied to a larger service area, would probably become part of the service plan. Unfortunately, the concept has yet to be implemented. During the City of Austin's Capital Improvements Program (CIP) approval process last year, a six year facilities and land acquisition project for transfer terminals, which would have cost just over $10 million, was deleted. The approved CIP for FY 1983-84 through FY 1988-89 does include a downtown transfer facility for $3.7 million and $13.4 million in transit improvements including new buses and park-and-ride facilities.

3.6 Summary

A comparison of the most recent fiscal year of reported operating and financial characteristics for the transit systems surveyed is summarized in Table II-21.

TABLE II-21
SUMMARY OF TRANSIT SYSTEM PERFORMANCE
FY 1982/1983

City	Cost per Service Mile	Revenue per Mile	Passengers per Mile
Houston	$3.49	$ .84	1.85
Dallas	2.81	1.35	2.10
Fort Worth	2.00	.82	1.79
San Antonio	2.30	.86	2.73
Austin	2.21	.66	1.90

This comparison confirms that operating costs per mile in the larger urban areas are significantly higher. However, revenues per mile appears consistent, with the exception of Dallas Transit System which is achieving approximately 60% greater revenue per mile yields than any other large urban area in Texas. San Antonio (VIA) carries more passengers per mile than any other large transit system in Texas.

Part Three

Mechanisms/Techniques for Financing Regional Mobility Improvements

PART THREE

MECHANISMS/TECHNIQUES FOR FINANCING REGIONAL MOBILITY IMPROVEMENTS

1.0 OVERVIEW OF POTENTIALLY USEFUL TECHNIQUES

This part of the report presents a review of the recent use of innovative mechanisms for financing highway and transit improvements. A variety of mechanisms that would be applicable to financing different types of transportation improvements were identified. These mechanisms were catagorized according to their ability to:

- o raise revenues,
- o reduce costs,
- o shift costs from the public sector, and
- o improve debt management.

Each technique was examined as to its applicability to different transportation needs including streets and minor arterials, major arterials and freeways, vehicle purchase, operations, and facility development. Table III-1 provides an overview of the mechanisms identified and their applicability to various transportation needs.

The potential utility of each mechanism was assessed in light of both need and liklihood of application in Texas. Factors considered included:

1) Political Climate - For instance, corporate and payroll taxes to support mobility appear to be unlikely in Texas due to long standing political opposition over these forms of taxation. A sales tax, however, has been widely accepted and already is used;

2) Business Climate - For instance, unlike many states which have a strongly pro-union orientation, the Texas union climate enables its transit systems to have significant ability to contract for private services when those services are deemed to be more efficient.

3) Opportunity - Since joint development has produced significant additional revenue only when associated with major rail transit initiatives, Texas has limited existing applications. However, DART and Houston's future initiatives may create a more significant arena of opportunities. Nevertheless, extensive use of joint development is seen as only a distant future possibility.

TABLE III-1
USES OF FINANCING TECHNIQUES

Techniques	Highway		Transit		
Raise Revenue	Streets and Minor Arterials	Major Arterials and Freeways	Vehicle Purchase	Operations	Facility Development
Special Purpose Districts	*	*		*	*
Tax Increment Financing	*				*
County Road Districts	*				
Municipal Assessment	*	*			*
Transit Impact Fees			*	*	*
Corporate Payroll Tax			*	*	*
Employee Income Tax	*	*	*	*	*
Fuel Tax	*	*	*	*	*
Registration Fees	*	*	*	*	*
Auto and Parts Sales Tax	*	*	*	*	*
Dedicated Local Sales Tax	*		*	*	*
Peak Hour Surcharge			*	*	*
Leasing/Selling of Development Rights	*	*	*	*	*
Leasing/Selling of Existing Facilities			*	*	*
Safe Harbor Leasing			*		
Lottery	*		*	*	*
Toll Financing		*			
Trust Fund		*			
Employer Sponsored Pass Program				*	
Joint Development	*	*			*
Shift Cost to Private Sector					
Private Sector Contributions	*	*	*	*	*
Private Provision of Service				*	
Reduce Costs					
Turnkey Facility Development					*
Land Banking					*
Contracted Transit Service				*	
Contracted Maintenance				*	
Debt Financing					
Certificates of Participation			*		
Grant Anticipation Notes	*	*	*	*	*
Lease Purchase Agreements			*		
Vendor Financing			*		
Zero Coupon Bonds			*		
Industrial Development Bonds	*				*
State Bonding		*			
Certificates of Obligation	*				

4) Public/Private Relationships - The general lack of strong land use controls such as zoning in large Texas cities provides less control over developer activity, thus reducing the applicability of locally assesssed development fees and taxes to support mobility. Strong developer awareness of mobility benefits, however, has created a unique environment in Texas where direct financial involvement or support by developers in providing mobility improvements is common.

Based on this analysis, seventeen mechanisms which appeared to have the highest potential for application were selected for further study. These included:

Highways

User Fees
- o Fuel Taxes
- o Registration Fees
- o Toll Financing
- o Auto and Auto Parts Sales Tax

Taxation and Assessments
- o Special Districts
- o Municipal Assessment

Private Funding
- o Private Sector Contribution
- o Trust Fund

Issuance of Debt
- o State Bonding
- o Grant Anticipation Notes
- o Interest Arbitrage
- o Certificates of Obligation

Transit

User Fees
- o Fare Increases

Taxation
- o Dedicated Local Sales Tax

Privatization
- o Turnkey Facility Development
- o Contracting for Transit Service
- o Safe Harbor Leasing

The following sections of this chapter examine these mechanisms in detail, providing examples of actual use when available, and projections of use in Texas when appropriate.

2.0 ANALYSIS OF SPECIFIC MECHANISMS FOR FUNDING HIGHWAY IMPROVEMENTS

2.1 User Fee Increases

Fuel Taxes

Since 1929, fuel taxes have been one of the United State's major sources of revenue for highway improvements. These taxes traditionally have been assessed by state governments, which in some cases passed a portion of the revenues on to local governments. Fuel taxes, however, have not been traditionally utilized directly by local governments. Only recently has the use of fuel taxes by local governments been explored as a source of revenue for local (urban) highway improvements. Regardless, much of the experience with state fuel taxes can be utilized to examine the issues involved with the development and use of local fuel taxes.

The first motor fuel tax was adopted in Oregon in 1919, and by 1929, all states had adopted some form of motor fuel tax. Until early in the 1970s, motor fuel tax revenues supplied 56 percent of all state tax revenue for highways and were increasing at a rate rapid enough to keep up with inflation and demand for new services. However, between 1973 and 1980, motor fuel taxes did not keep up with inflation, and in terms of constant dollars actually declined. This was due primarily to a steady increase in the efficiency of motor vehicles in response to higher fuel prices (resulting in fewer gallons of fuel being consumed per mile of highway use). In the 20 years prior to 1980, the average state motor fuel tax increased by only 3 cents, from 5.7 to 8.7 cents per gallon. By June of 1983, the average rose to 10.4 cents, a 20 percent increase. However, this still was not fast enough to match inflation.

Currently, there are a variety of different types of fuel taxes that individual states are utilizing. The main issue facing states today is insuring that the revenues gained from the fuel tax programs will continue to be sufficient to meet highway maintenance and construction needs.

There are two basic types of motor fuel taxes:

1) Static unit taxes, which are based on a unit of consumption, e.g. 1 cent per gallon, and whose rate can be changed only by legislative action; and

2) Variable taxes, which are based either on a unit of consumption, e.g. 1 cent per gallon, or on the value of the fuel consumed, e.g. 1 cent per 1 dollar of retail sales, and whose rate varies periodically with changes in some indicator of inflation.

Static unit taxes until recently have been the most common form of fuel tax, and it is the type of fuel tax Texas currently uses. However, unit taxes do not compensate for inflation, and must be changed by legislative action. As a rule, the need for repeated legislative action is not politically desirable, particularly in areas where resistance to new or existing taxation is high. It has been estimated that, at a 14% inflation rate, most states would have to increase their unit based static fuel tax 1 cent every year merely in order to keep up with inflation. Such increases, however, would not offset the effects of declining fuel consumption many states are experiencing.

A variable fuel tax is one way states have tried to increase their fuel tax revenues without having repeatedly to change the unit tax rate. Some states, in response to declining fuel consumption and rapid inflation, adopted an ad valorem (sales tax) type of fuel tax. Essentially this uses the price of fuel as an indicator of inflation.

During 1979 and 1980, four states -- Indiana, Massachusetts, Nebraska, and Illinois -- adopted some form of ad valorem fuel tax. However, after several years of large motor fuel price hikes, fuel prices began to moderate or drop. As a result, in some cases these ad valorem based fuel taxes which were passed to increase revenues, suddenly were doing the opposite.

More recently, several states have adopted variable unit based fuel taxes. The rate of these fuel taxes has been tied to the wholesale price of fuel, the CPI index, and the Federal Highway Maintenance and Operations Index. As of May 1983, 13 states had adopted some type of variable fuel tax. Most of these fuel taxes have a ceiling, which limits the absolute amount to which the tax rate can be automatically increased. In some states, tax rates have risen so fast that they have already reached their ceilings, and the state legislatures have had to raise those ceilings. Some states, particularly those which have variable fuel taxes based on the value of the fuel, have experienced decreases in state revenues and have had to place "floors" on the limit to which the tax rate can drop automatically.

Currently, the state of Texas imposes a fuel tax of 5 cents per gallon on gasoline and 6.5 cents on diesel fuel used in motor vehicles. These rates are the lowest in the nation. Diesel fuel consumption in Texas has been rising steadily since 1978; however, gasoline consumption declined between 1978 and 1982. In 1982, consumption rose to 1980 levels, but still was 8% less than 1978 levels.

After deduction of enforcement fees, refunds, and transfers, the net Motor Fuel Fund total is divided between education and highway funding. The Available School Fund receives 25 percent

of the net total; a portion is transferred to the County and Road District Highway Fund ($7.3 million was appropriated for fiscal 1984). The balance is received by the State Highway Fund. Table III-2 lists historical and projected fuel tax revenues assuming that the current state fuel tax rate remains unchanged.

TABLE III-2
HISTORICAL AND ESTIMATED FUEL TAX REVENUES
AVAILABLE FOR THE STATE HIGHWAY FUND
(dollars in millions)

Year	Revenue
1981	$ 353
1982	365
1983	384
1984	406
1985	426

SOURCE: "Summary of the 1984-1985 Biennial Revenue Estimate," prepared by the Texas Comptroller's Office for the 68th Legislature, January 1983.

Though fuel taxes traditionally have been a source of revenue, because of the recently volatility of the world energy market, these taxes have been producing revenues at a rate which has not matched inflation or growth, particularly in Texas. Attempts to make these taxes more responsive to inflation have not been wholly successful. In states where public opposition to new taxes is high, continually increasing the per gallon tax rate has been a difficult process. Texas currently has the lowest fuel tax rate in the nation; and, changing this rate will require legislative action.

Under current enabling legislation, Texas cities cannot impose local option gas taxes. This technique would require legislative authorization. Past sentiment in Texas has been to require a voter referendum for sensitive provisions such as the establishment of tax-funded transit authorities; and this is most likely how a local option tax in Texas would be structured. In other parts of the country, it has been very difficult to obtain public approval for similar propositions. In the major urban areas of Texas, transportation referendums have met with mixed success. The prospects for approval of a local option gas tax likely would be improved if the tax were tied clearly to specific identifiable and visible transportation improvements.

It is estimated that a 1 cent per gallon local option fuel tax in Dallas, Fort Worth, San Antonio, Houston, and Austin could

generate a total of $33 million dollars in 1985, and over $190 million between 1985 and 1990. Table III-3 gives estimates of fuel tax revenue potential for each of these cities. If such taxes are based on a straight cents per gallon ratio it estimated that effective total revenues would slowly decline during this period.

Registration Fees

Shortly after the Texas state highway system was established, counties were permitted to share in state motor vehicle registration fees collected by the counties for the state. Currently counties retain $1.50 of every vehicle legislation fee to cover administrative expenses. In addition to this counties are permitted to retain the first $50,000 of motor vehicle registration fees collected each year, and half of the amount collected that is over $50,000 with a maximum of $125,000 being retained. Most urban counties are retaining the full $175,000 permitted under these two allocation formulas. In addition to this allocation, since July of 1982 counties have also been able to retain $350 for every mile of county road maintained by the county, with a maximum of $175,000 being retained. This allows county's to retain up to $350,000 in vehicle registration fees. Effective in January 1, 1985, county's will have the option to change an extra $5 per vehicle which the county may retain for its own use.

Vehicle registrations revenues have not matched the rate of increase in vehicle registrations or inflation. This is because these fees are based on weight. Improved automobile technologies have resulted in increasingly lighter cars, thus less revenue per vehicle. Vehicle registration fees could be adjusted to more accurately reflect inflation and increasing registrations by making the fees based on value or model, rather than weight, and thus become a more significant revenue source.

Changes in the fee structure and county allocation formulas require state legislative action.

Toll Financing

Toll financing is an alternative to general revenue and user tax financing of highway construction. Roads, bridges and tunnels have been built using the proceeds from the sale of bonds backed by tolls collected from users of the facilities. In this way, although almost always constructed and operated by a public agency, the costs of building and operating a new toll highway facility are paid directly by the users of that facility, leaving scarce public resources available for use in

TABLE III-3

REVENUE ESTIMATES FOR LOCAL OPTION FUEL TAX
BASED ON ONE CENT/GALLON TAX

	Historical Estimates				Projected Estimates*	
Year	1978	1979	1980	1981	1985	1990
DALLAS (Urban)						
VMT/Year (millions)	12,017	12,466	12,509	13,171	14,711	16,636
Gallons (millions)	1,070	1,045	1,012	1,010	953	902
MPG	11.23	11.93	12.36	3.04	15.44	18.44
Potential Revenue (million $)					9.53	9.02
FORT WORTH (Urban)						
VMT/Year (millions)	6,189	6,417	6,525	7,068	8,239	9,703
Gallons (millions)	551	538	528	542	534	526
MPG	11.23	11.93	12.36	13.04	15.44	18.44
Potential Revenue (million $)					5.34	5.26
SAN ANTONIO (Urban)						
VMT/Year (millions)	5,585	6,342	5,823	6,014	6,587	7,303
Gallons (millions)	497	532	471	461	427	396
MPG	11.23	11.93	12.36	13.04	15.44	18.44
Potential Revenue (million $)					4.27	3.96
HOUSTON (Urban)						
VMT/Year (millions)	12,061	12,991	15,381	15,927	18,112	20,843
Gallons (millions)	1,074	1,089	1,244	1,221	1,173	1,130
MPG	11.23	11.93	12.36	13.04	15.44	18.44
Potential Revenue (million $)					11.73	11.30
AUSTIN (Urban)						
VMT/Year (millions)	2,406	2,520	2,394	2,547	2,735	2,970
Gallons (millions)	214	211	194	195	177	161
MPG	11.23	11.93	12.36	13.04	15.44	18.44
Potential Revenue (million $)					1.77	1.61

*These values are based on straight linear projections of historical trends.

SOURCE: Mileage Data from State Department of Highways and Public Transportation. Gasoline Consumption estimated from the state's average miles per gallon based on state wide gasoline consumption figures (Texas Comptroller's Office) and statewide mileage data (State Department of Highways and Public Transportation).

other priority transportation projects. In most cases, toll financing also allows for expeditious completion of necessary highway improvements for which public money will not be available for many years.

Currently, there are just over 4,770 miles of toll facilities in operation in the United States. Over one half of these miles are on the Interstate Highway System. In 1980, toll mileage represented one tenth of one percent of the total urban and rural road mileage in the country. As of January 1983, there were a total of 80 toll roads in operation in 23 states and Puerto Rico.

The Texas Turnpike Authority (TTA) was created by the state in 1955. It is authorized to issue only revenue bonds, bonds backed solely by toll revenues generated by specific projects, as opposed to general obligation bonds which have been used outside of Texas and are backed by the state's general revenues. Although very successful in the past, a sharp rise in interest rates on municipal bonds has made financing toll roads backed only by toll revenue very difficult.

On September 13 1983, Harris County residents voted to create a county toll road authority. The major advantage to the county toll road authority over the TTA is that the county can issue combination bonds which are backed by toll road revenues first, and then general revenues as backup to cover any shortfall. From this approach, the risk to the investor is lessened; thus, the interest rates on county authority bonds (currently Harris County has a AAA bond rating) will be significantly lower than on revenue bonds issued by TTA.

Of great concern to Harris County voters was the chance that taxes would have to be raised in order to pay off debt from the toll road bonds. This is a possibility, but the County has expressed its intention to build only projects that will be self-supporting or that will pay for themselves when pooled together. The County estimates that $150 million in bond interest can be saved because of the significantly lower interest rate on bonds backed by general funds.

Harris County plans to begin work on two projects as soon as possible. The first is the Hardy Toll Road, a 21-mile radial north of downtown. Over 150,000 cars and trucks per day are projected to use the tollway. The total project cost is estimated to be $384 million not including interest costs. The road is expected to be open in 1988. The second project includes two sections of Beltway 8 which eventually will circle the city. Detailed cost estimates have not been developed yet, although the proposed 30 miles of toll road are expected to cost about $500 million.

It is likely that, without toll financing, neither one of these much needed projects could be built from public resources for many years to come. The willingness of the private sector to invest in the road and the willingness of individual users to pay for use of the road will make it possible to finance these projects without public money unless County resources are called upon. Even if the County is required to contribute to retirement of the bonds, a much smaller amount of public money will have been used than the 100% that would be required for other means of local funding.

Auto and Parts Sales Tax

Currently Texas charges a four cent general sales tax which includes auto and auto parts sales and rentals. Though this tax is a type of user fee, revenues from the tax are allocated to the state's General Fund. These revenues could be utilized as an indirect user fee revenue source for highway improvements. Table III-4 lists historical and projected tax revenues from auto sales and rentals.

TABLE III-4
MOTOR VEHICLE SALES AND RENTAL TAX REVENUE
1981-1985 (millions of dollars)

Year	Revenue
1981	$ 511
1982	575
1983	631
1984	686
1985	743

Source: "Summary of the 1984-1985 Biennial Revenue Estimate," prepared by the Texas Comptroller's Office for the 68th Legislature, January 1983.

Utilization of automobile-related sales tax revenues for highway improvements would require legislative action. Such an appropriation would not constitute a new revenue source, but would redirect funds which could be considered a user fee back to the facilities generating the revenues, highways.

Highway Cost Index

House Bill No. 3, passed by the 65th state legislature, enables the use of a Highway Cost Index to determine the extent to which inflation has eroded the buying power of the highway financing dollar. Funds may be transferred from the state's General Fund, supplementing user fee revenues, to compensate

for the impact of inflation. Use of the General Fund constitutes an obligation which must be weighed against the use of additional user fees to provide increased highway improvement funding.

2.2 Taxation and Assessments

Special Districts

The Texas Constitution specifically authorizes the state legislature to establish special districts to provide a specific service within a defined area. Such districts are a form of local goverment. Texas has over 3,000 of these districts, which is almost three times its number of municipalities. The legislature has adopted special acts which allow for the general creation of certain types of districts for various purposes. Thus, some districts -- such as municipal utility districts -- can be created without a special act of the legislature, because they can be created according to the guidelines of a general enabling act. Others have been created by special legislative action.

Some of these districts are well suited to act as a source of revenue for local street and highway improvements. These include municipal utility districts, road districts, metropolitan transit authorities, and special purpose districts. The following discussion examines each of these and their current and possible future roles in transportation funding.

Municipal Utility Districts

Municipal utility districts (MUDs) were enabled by the state legislature primarily to provide water and sewer related services; however, because of the vague wording in the state statutes, municipal utility districts have provided a variety of services including water and sewer services, drainage improvements and maintenance, fire protection, water quality related programs, mosquito control, and security services. There even have been proposed solar energy use districts.

MUDs are administered by an elected board and have taxing and bonding authority subject to board and voter approval. Currently, MUDs cannot provide transportation services or improvements; however, they can be structured by state legislative action to do so.

Texas MUDs are very similar to the Metropolitan (METRO) Districts in Colorado. These districts, paticularly those around Denver, have been active in funding highway improvements. The Joint Southeast Public Improvement Association (JSPIA), an association of ten METRO districts near Denver, has been active

in assisting the state in funding improvements along the IH-25 corridor north of Denver. JSPIA has been involved in raising over $15 million to fund the rebuilding of five overpasses and the construction of one new overpass, all to be built at a total cost of over $20 million. These funds were generated through ad valorem taxes assessed within the districts. The boundaries of these districts have been structured so that over 99% of the land uses within them are commercial/office in nature, with an estimated market value of $600 to $800 million. One reason that these ten districts were able jointly to fund these projects is that Colorado's METRO District enabling legislation allows them to spend money for improvements outside their boundaries, if it can be shown that the improvement will directly benefit the districts. This is not the case for MUDs in Texas, which must restrict the expenditure of their funds to improvements within district boundaries.

MUDs are very commonplace in Texas and, if feasible, could provide a readily accessible organizational unit to support newly developing areas where road improvements will be in great demand. Legislative changes, however, would be required to permit municipal utility districts to assess taxes for road improvements.

County Road Districts

The Texas Constitution allows County Commissioners Courts to establish and administer road districts. Such districts may, with approval of the voters within the district, issue bonds and collect taxes in order to construct, maintain, and operate roads and highways within its boundaries.

At one time, road districts were a popular means for funding rural road improvements and bridges, with over 48 districts in 1979 in Texas having outstanding bonds. Today, there are fewer than a dozen road districts with outstanding bonds. However, the concept of the road district could be revived as a means to fund road improvements in the unincorporated portions of rapidly growing/urbanizing counties. Even in those counties which have rather large existing road districts, new smaller special purpose road districts could be initiated by the county in high growth, unincorporated communities. Such districts could aid in the funding of highway improvements needed to support the existing and/or projected growth of the area.

In addition to the traditional county road district, Harris County is authorized to create "pay-as-you-go" or toll road districts.

Establishment of such a district requires action by the County Commissioners Court and approval of the voters within the proposed district boundaries if taxes are to be levied. One

limitation on overlaying of such districts is that the total debt for all the taxing jurisdictions within the district including the road district cannot exceed 25% of the total assessed value of the land. Toll road districts currently are limited to Harris County; a constitutional change would be required to allow other counties to create toll road districts.

Special Purpose Districts

Special purpose districts are similar to municipal utility districts, except they are created under specific action of the state legislature. Such districts can be given the power to tax all their properties to pay for all or a part of the cost of specific improvements made within them. The boundaries of the district are normally defined to include all properties specially benefitting from an improvement. Because a highway or a special transportation system frequently provides benefits to nearby property owners that are greater than the benefits provided to the community at large, special assessments constitute an opportunity to finance some types of highway improvements.

A tax may be levied by a district and used to finance bonds. Assessments are one-time or recurring liens which are issued by the local district in accordance with a formula for recouping some of the costs of the benefits provided. Tax assessment formulas may be based on site size, floor area, value or other measures.

Special purpose assessments can be used to pay for up to 100% of the cost of facilities within a special purpose district. The assessments typically will be used to retire the bonds financing the improvements. Revenue potential will depend upon the cost of improvements, the size of the district, and the intensity of economic activity within the district. Revenue potential also depends on the attractiveness of rents within a district compared to rents in other places within the region, because businesses may move to avoid the special tax.

The state legislature recently formed a special purpose district in Las Colinas, near Dallas (Senate Bill 963). The purpose of this district is to provide transportation improvements which will include street and highway improvements as well as the construction and operation of a people mover system.

Municipal Assessment

Municipalities in Texas have the power to make special assessments for capital improvements. These assessments are over and above the community's normal ad valorem taxes and can be based on either a ratio of property value or a set value.

Such assessments can be used only for improvements which are "beyond" what would be spent for a similar project in any other part of the community. For example, if a city were repaving a new street, and the residents along the street wanted to have a sidewalk put in -- an improvement not normally provided by the city -- and if the majority of the property owners along the street agreed to pay the cost of the sidewalk, the city could assess all the property owners along that street a portion of the sidewalk improvement.

It is important that the project for which the funds are being assessed not be one which the city would conduct as part of its normal capital improvements. This will prevent the occurrence of double taxation. For this reason, the assessment is not a tax and cannot be deducted from federal income taxes.

This is not as flexible as the special assessment district concept used in Denver. The Metropolitan Districts permitted in Colorado are different, in that they are created as entities separate from the local municipality. They have their own boards which are elected by the registered voters of the districts. These METRO districts have taxing authority, and can use tax revenues for a variety of projects. Such tax levies and subsequent bonding require voter and board approval. Taxes assessed by the "metro" districts can be used as a valid income tax deduction.

Assessment districts have been used to fund street and highway improvements and transit facilities. In some cases, districts have contributed monies for construction of state and federal highways. Corpus Christi aggressively has used municipal assessments to raise revenues for their local match to federal/state funds for highway improvements.

Projects funded by municipal assessments must involve improvements which would not have been undertaken under the city's normal improvement program. This is an important point, because it establishes that everyone is being treated equitably, and that property owners will not be assessed for a project which normally would be funded with general fund or general obligation bond revenues. The area assessed normally includes only those who directly benefit from the project (i.e., adjacent land owners), thus the area available for assessment is small. In most cases, the city must have the approval of over 50% of the landowners involved.

2.3 Private Funding

Private Sector Contribution

In many of the high growth areas of Texas, local and state governments have been unable to provide expanded infrastructure

fast enough to meet the growing demand. In many cases, this has overloaded existing facilities and has limited the rate at which local growth could occur. Many developers, whose project financing plans are based on projected high rates of growth, have found it to be to their advantage to assist local and state agencies in providing local infrastructure in a timely fashion. This assures them that local growth, and thus the rate of the growth affecting their projects, will not be hampered by inadequate local infrastructure.

There are numerous examples of local developers contributing to street and highway improvements. Several of these are described below.

1. North Beltway 8 Houston. Friendswood Development Company (FDC) participated in the construction of frontage roads along the proposed North Beltway 8 adjacent to a major commercial, office, and multi-family residential development planned by FDC. This was done as an incentive to SDHPT to facilitate essential access which otherwise would have been delayed considerably due to lack of state funds. FDC agreed to donate right-of-way, design the project, and make a cash contribution toward construction, in exchange for SDHPT expediting completion of the project. The contract for construction was awarded in April 1983. FDC's participation was as follows:

Component	Total*	FDC	% FDC
Additional right-of-way	$5,508,000	$ 277,000	5%
Utility adjustments (est.)	757,000	--	--
Design	360,000	360,000	100%
Construction	4,875,000	313,000	6.4%
Total	$11,500,000	$ 950,000	8.3%

*Does not include original right-of-way.

2. The Woodlands. The Woodlands Development Corporation (WDC) has been active financially and politically in expediting highway improvement to increase access to The Woodlands, a new town development about 25 miles north of Houston. The Woodlands has participated directly in three projects on I-45, the major access route to downtown Houston.

   The so called "northeast connector" project will provide a much needed final piece of a currently incomplete interchange between I-45 and Woodlands Parkway, the main entrance to The Woodlands, and thus relieve a major congestion point. The entire project, for which construction has not yet begun, will cost $930,000 of which about 68% is for

right-of-way acquisition. WDC has contributed $164,000 in cash to SDHPT for the project, representing nearly 18% of its total cost.

At the same interchange, a right turn from Woodlands Parkway onto the southbound freeway frontage road is currently controlled by a stop sign. A merge lane is planned to allow free flow for this turning movement. Although a deal has not been finalized, WDC has offered to provide the construction materials for this project in exchange for design and labor to be provided by SDHPT. This arrangement will facilitate completion of the project. The total cost of the project will be about $75,000. WDC's offer, if accepted, will amount to between $15,000 and $20,000.

WDC also has agreed to commit $2.2 million dollars to a series of interchange improvements along the portion of I-45 adjacent to The Woodlands. This portion of I-45 is projected to continue to be the most congested in Montgomery County, and by the year 1990, it is estimated that, without capacity improvements, congestion will reach a severe level similar to that currently experienced in parts of central Houston. WDC hopes to raise the priority of these freeway improvements through its contribution.

3. Las Colinas. The Southland Financial Corporation, the developer of Las Colinas, a major planned office, commercial and residential community near the Dallas-Fort Worth Airport, has dedicated approximately 300 acres of property over the last 15 years to support the construction of SH 114 from the airport to Las Colinas, SH 161 from Loop 635 to Belt Line Road, SH 114 interchanges at Mac Arthur, West Hill, Caldwell Drive, and Rochelle. The value of the dedicated right-of-way is approximately $85 million (1983 dollars).

Trust Fund

The Texas Constitution precludes an agency of the state from obligating or committing itself to the expenditure of future funds. Therefore, SDHPT has maintained the position that funds required to fulfill a contractual obligation must be appropriated prior to its ability to enter into a contract. Accordingly, the state historically has limited its ability to plan, develop and maintain federal/state related highways to the level of funding appropriated each biennial period by the state legislature.

With the tremendous growth of large urban areas such as Houston and Dallas, the State of Texas now finds itself with severe shortages in the state funding necessary to meet highway improvement and maintenance requirements. This is occurring

while, at the same time, and for the first time in recent history, there is an abundance of federal funding available to support highway development in Texas. Sufficient state resources necessary to match all available federal funding do not exist without some form of leverage capability.

Adding to the state's funding constraint is the great need to utilize 100% state funds on highways not eligible for federal aid assistance, but just as significant to satisfying mobility requirements. The state faces the difficult choice of losing leverage capacity to satisfy state highway needs; or allowing federally assisted projects to take precedence over non-Federal projects. It is important to note that federally assisted projects require significantly more time and funding due to the nature of the projects and Federal requirements.

Estimates for Texas for FY 83-86 indicate federal funds available for highway related improvement will average approximately $850 million annually. In addition, Texas has the opportunity to leverage substantial funding from states such as California and Pennsylvania which have significant unobligated portions of allocated federal highway funding, <u>if Texas has sufficient financial resources to do so.</u>

A trust, or escrow, fund concept is being pursued to assist Texas in increasing the resources available for highway improvements. The trust fund concept uses local public and private resources to achieve the following objectives:

- Maximize use of new federal/state resources available for highway development;
- Leverage maximum available federal resources with minimum state funds;
- Eliminate the need for state "front-end" funding as a basis for implementation of highway improvements;
- Enable federal reimbursement to flow back to the state for further project implementation; and
- Create significant incentives for increased local public/private funding to support highway development.

The "Trust Fund" would be established through an intergovernmental agreement between the funding parties which identifies a group of projects to be implemented under an umbrella financial commitment. The financial commitment would allow projects to go to contract using local funds to supplement or replace the state's 10% or 25% match requirement. The funding entities guarantee to maintain the trust fund at a financial level necessary to cover each designated portion of the project improvement program (such as six month construction increments).

The most important aspect of the trust fund concept is that eligible reimbursement for project improvements from FHWA through the SDHPT would be channelled back to the trust fund for leveraging further improvements. In order for the trust fund concept to operate in a timely fashion, projects must be ready to go to construction within 90 days of federal/state funding and design approvals.

The key objective of the trust fund concept is to encourage private sector contributions to project funding and to leverage federal funding that exceeds the normal FHWA allocation to the state.

2.4 Issuance of Debt

State Bonding

There has been recent discussion about the state issuing bonds based on future state appropriations in order to raise capital funds needed for current highway needs. Unfortunately, it is likely that the issuance of these bonds would cost the state more over the term of the bonds than if the funds were utilized when available. This method of raising current dollars could be considered cost effective only if the savings achieved from accelerating the completion of current highway needs, such as inflation cost savings and lower future maintenance costs, exceed the cost for retiring the bonds. However, bonding can be a financial detriment if the constant dollar cost of improvements is substantially higher than the pay-as-you-go approach.

Legislative action will be required to enable the state to issue bonds based on anticipated state highway appropriations or federal funds, and may require some legal clarification as to whether such bonding will violate the constitutional prohibition against an agency's obligating future funds.

Obligating future appropriations to generate current dollars has several advantages and disadvantages which need to be considered in determining the desirability of such actions. First, the generation of such dollars could help the state leverage more federal dollars for highway improvements. Since additional federal dollars may become available during a biennial period, bonding could be used to generate additional state match capability. This would allow the state to apply for federal funds in excess of the state's normal biennial appropriations.

Second, the ability to raise sufficient revenues to address current highway needs would save the public money in terms of reduced congestion impact (i.e. maintenance, travel delay, and

air quality). These are savings which under usual conditions would not be realized until some future date. In Houston's Regional Mobility Plan; these costs are estimated to amount to $1.9 billion dollars per year in 1981; and in Dallas' Regional Mobility Plan they are estimated to be $1.6 billion dollars per year in 1990. Savings also can be realized in lower current costs, reducing inflationary effects on projects which otherwise would be delayed to future years.

However, bonding can result in increased actual costs to address highway needs over the life of the bonds. This capitalization, the dollar value of improvements divided by the dollar value required to retire the bonds, can be quite low. Table III-5 estimates the capitalization rate for several bonding scenerios assuming a continued state biennial highway fund appropriation of $1.374 million. These capitalization ratios vary from 29% to 58% depending on the tax rate and structure of the bond. Table III-6 shows the benefit from considering reduced inflation costs. This table uses the best and worst cases from Table III-5's examples of state bonding, and shows the net present value of capital and interest streams assuming a 4% inflation rate. These revised capitalization rates vary from 32% to 59%.

Another consideration with respect to state bonding is that such large public borrowing, regardless of how desirable in terms of needed highway improvements, obligates investment dollars which otherwise could be used by the private sector.

Grant Anticipation Notes

Revenue and Grant Anticipation Notes are short term instruments which states, counties, and cities can use to match the flow of income and expenditures related to the reimbursement of federal or state funded projects. Unless the issuer is an unrated entity, the credit of the issuer usually is not directly involved in the security analysis of the note. Rather it is the stability of the revenue source, in this case appropriated grant funds, that is analyzed.

Two recent examples of the use of Grant Anticipation Notes for highway improvements include Utah's $40 million, 24 month, Federal Highway Reimbursement Anticipation Notes issued in April of 1983; and the State of Alabama's $64 million 30 month Federal Reimbursement Anticipation Bonds issued in July 1981. The purpose of these bonds was to supply front end cash to begin construction of federally approved highway improvements.

Both of these bonds were used as a funding mechanism for Advanced Construction Interstate (ACI) Program projects. The Federal Highway Administration provided to the bond broker a letter stating that FHWA had approved the projects in question

TABLE III-5
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	10793
Interest Rate	10:	Net Interest Paid	10793
Term of Bond Issue	30:	Capitalization Ratio	0.31
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4946:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	0		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	10793
Interest Rate	10:	Net Interest Paid	10793
Term of Bond Issue	30:	Capitalization Ratio	0.31
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4946:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	0		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	3432
Yearly Bond Payment	525:	Total Interest Paid	10793
Interest Rate	10:	Net Interest Paid	7361
Term of Bond Issue	30:	Capitalization Ratio	0.40
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4946:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	1		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	3574
Yearly Bond Payment	525:	Total Interest Paid	10793
Interest Rate	10:	Net Interest Paid	7219
Term of Bond Issue	30:	Capitalization Ratio	0.41
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4946:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	1		

TABLE III-5 (continued)
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	8353
Interest Rate	10:	Net Interest Paid	8353
Term of Bond Issue	25:	Capitalization Ratio	0.36
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4762:		

FUNCTIONS	
Drawdown 0-flat 1-Peak	0
Use Arbitrage 0-NO 1-YES	0

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	8353
Interest Rate	10:	Net Interest Paid	8353
Term of Bond Issue	25:	Capitalization Ratio	0.36
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4762:		

FUNCTIONS	
Drawdown 0-flat 1-Peak	1
Use Arbitrage 0-NO 1-YES	0

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	3060
Yearly Bond Payment	525:	Total Interest Paid	8353
Interest Rate	10:	Net Interest Paid	5294
Term of Bond Issue	25:	Capitalization Ratio	0.47
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4762:		

FUNCTIONS	
Drawdown 0-flat 1-Peak	0
Use Arbitrage 0-NO 1-YES	1

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	3196
Yearly Bond Payment	525:	Total Interest Paid	8353
Interest Rate	10:	Net Interest Paid	5157
Term of Bond Issue	25:	Capitalization Ratio	0.48
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4762:		

FUNCTIONS	
Drawdown 0-flat 1-Peak	1
Use Arbitrage 0-NO 1-YES	1

TABLE III-5 (continued)
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	6026
Interest Rate	10:	Net Interest Paid	6026
Term of Bond Issue	20:	Capitalization Ratio	0.43
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4466:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	0		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	2653
Yearly Bond Payment	525:	Total Interest Paid	6026
Interest Rate	10:	Net Interest Paid	3373
Term of Bond Issue	20:	Capitalization Ratio	0.57
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4466:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	1		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	2781
Yearly Bond Payment	525:	Total Interest Paid	6026
Interest Rate	10:	Net Interest Paid	3245
Term of Bond Issue	20:	Capitalization Ratio	0.58
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4466:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	1		

DATA		RESULTS	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	11178
Interest Rate	11:	Net Interest Paid	11178
Term of Bond Issue	30:	Capitalization Ratio	0.29
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4561:		
FUNCTIONS			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	0		

TABLE III-5 (continued)
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

-------D A T A ----------			R E S U L T S ----------	
Available Revenue Stream	682:			
Coverage Rate	1.30:	Total Interest Earned		0
Yearly Bond Payment	525:	Total Interest Paid		11178
Interest Rate	11:	Net Interest Paid		11178
Term of Bond Issue	30:	Capitalization Ratio		0.29
Private Interest Rate	12:			
Project Years	15:			
Total Bond Amount	4561:			
--- F U N C T I O N S ---				
Drawdown 0-flat 1-Peak	1			
Use Arbitrage 0-NO 1-YES	0			

-------D A T A ----------			R E S U L T S ----------	
Available Revenue Stream	682:			
Coverage Rate	1.30:	Total Interest Earned		3312
Yearly Bond Payment	525:	Total Interest Paid		11178
Interest Rate	11:	Net Interest Paid		7866
Term of Bond Issue	30:	Capitalization Ratio		0.37
Private Interest Rate	12:			
Project Years	15:			
Total Bond Amount	4561:			
--- F U N C T I O N S ---				
Drawdown 0-flat 1-Peak	0			
Use Arbitrage 0-NO 1-YES	1			

-------D A T A ----------			R E S U L T S ----------	
Available Revenue Stream	682:			
Coverage Rate	1.30:	Total Interest Earned		0
Yearly Bond Payment	525:	Total Interest Paid		8697
Interest Rate	11:	Net Interest Paid		8697
Term of Bond Issue	25:	Capitalization Ratio		0.34
Private Interest Rate	12:			
Project Years	15:			
Total Bond Amount	4418:			
--- F U N C T I O N S ---				
Drawdown 0-flat 1-Peak	0			
Use Arbitrage 0-NO 1-YES	0			

-------D A T A ----------			R E S U L T S ----------	
Available Revenue Stream	682:			
Coverage Rate	1.30:	Total Interest Earned		0
Yearly Bond Payment	525:	Total Interest Paid		8697
Interest Rate	11:	Net Interest Paid		8697
Term of Bond Issue	25:	Capitalization Ratio		0.34
Private Interest Rate	12:			
Project Years	15:			
Total Bond Amount	4418:			
--- F U N C T I O N S ---				
Drawdown 0-flat 1-Peak	1			
Use Arbitrage 0-NO 1-YES	0			

TABLE III-5 (continued)
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

-------D A T A		R E S U L T S	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	2952
Yearly Bond Payment	525:	Total Interest Paid	8697
Interest Rate	11:	Net Interest Paid	5745
Term of Bond Issue	25:	Capitalization Ratio	0.43
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4418:		
--- F U N C T I O N S			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	1		

-------D A T A		R E S U L T S	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	3079
Yearly Bond Payment	525:	Total Interest Paid	8697
Interest Rate	11:	Net Interest Paid	5618
Term of Bond Issue	25:	Capitalization Ratio	0.44
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4418:		
--- F U N C T I O N S			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	1		

-------D A T A		R E S U L T S	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	6315
Interest Rate	11:	Net Interest Paid	6315
Term of Bond Issue	20:	Capitalization Ratio	0.40
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4178:		
--- F U N C T I O N S			
Drawdown 0-flat 1-Peak	0		
Use Arbitrage 0-NO 1-YES	0		

-------D A T A		R E S U L T S	
Available Revenue Stream	682:		
Coverage Rate	1.30:	Total Interest Earned	0
Yearly Bond Payment	525:	Total Interest Paid	6315
Interest Rate	11:	Net Interest Paid	6315
Term of Bond Issue	20:	Capitalization Ratio	0.40
Private Interest Rate	12:		
Project Years	15:		
Total Bond Amount	4178:		
--- F U N C T I O N S			
Drawdown 0-flat 1-Peak	1		
Use Arbitrage 0-NO 1-YES	0		

TABLE III-5 (continued)
BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

D A T A		R E S U L T S	
Available Revenue Stream	682		
Coverage Rate	1.30	Total Interest Earned	2563
Yearly Bond Payment	525	Total Interest Paid	6315
Interest Rate	11	Net Interest Paid	3752
Term of Bond Issue	20	Capitalization Ratio	0.53
Private Interest Rate	12		
Project Years	15		
Total Bond Amount	4178		

F U N C T I O N S	
Drawdown 0-flat 1-Peak	0
Use Arbitrage 0-NO 1-YES	1

D A T A		R E S U L T S	
Available Revenue Stream	682		
Coverage Rate	1.30	Total Interest Earned	2683
Yearly Bond Payment	525	Total Interest Paid	6315
Interest Rate	11	Net Interest Paid	3632
Term of Bond Issue	20	Capitalization Ratio	0.53
Private Interest Rate	12		
Project Years	15		
Total Bond Amount	4178		

F U N C T I O N S	
Drawdown 0-flat 1-Peak	1
Use Arbitrage 0-NO 1-YES	1

TABLE III-6
STATE BONDING ANALYSIS
NET PRESENT VALUE
(Million Dollars)

-------D A T A ----------			R E S U L T S ----------			
Available Revenue Stream	682:				Actual	NPV
Coverage Rate	1.30:	Total Interest Earned			2781	2265
Yearly Bond Payment	525:	Total Interest Paid			6026	4439
Public Interest Rate	10:	Net Interest Paid			3245	2174
Term of Bond Issue	20:	Capitalization Ratio			0.58	0.59
Private Interest Rate	12:					
Project Years	15:					
Total Bond Amount	4466:					
Inflation Rate for (NPV)	.04:					
--- F U N C T I O N S ----------						
Drawdown 0-flat 1-Peak	1					
Use Arbitrage 0-NO 1-YES	1					

	DEBT SERVICE			:		BOND PROCEEDS	
	Debt			:	Project	Debt	Arbitrage
Year	Service	Interest	Principal	Balance: Drawdown	Balance	Reserve	Interest
1983	525	447	78	4388 58	4408	525	592
1984	525	439	86	4303 141	4267	525	575
1985	525	430	94	4208 261	4007	525	544
1986	525	421	104	4104 328	3679	525	63
1987	525	410	114	3990 370	3309	525	63
1988	525	399	126	3865 312	2997	525	63
1989	525	386	138	3727 187	2810	525	63
1990	525	373	152	3575 179	2631	525	63
1991	525	357	167	3407 241	2390	525	63
1992	525	341	184	3224 360	2030	525	63
1993	525	322	202	3021 457	1574	525	63
1994	525	302	222	2799 536	1038	525	63
1995	525	280	245	2554 447	591	525	63
1996	525	255	269	2285 380	211	525	63
1997	525	228	296	1989 211	0	525	63
1998	525	199	326	1663 0	0	525	63
1999	525	166	358	1305 0	0	525	63
2000	525	130	394	910 0	0	525	63
2001	525	91	434	477 0	0	525	63
2002	525	48	477	0 0	0	525	63
2003	0	0	0	0 0	0	0	0
2004	0	0	0	0 0	0	0	0
2005	0	0	0	0 0	0	0	0
2006	0	0	0	0 0	0	0	0
2007	0	0	0	0 0	0	0	0
2008	0	0	0	0 0	0	0	0
2009	0	0	0	0 0	0	0	0
2010	0	0	0	0 0	0	0	0
2011	0	0	0	0 0	0	0	0
2012	0	0	0	0 0	0	0	0
Total	10492	6026	521	0 4466			2781
Net Present Value	7130	4439	2691	0 3170			2265

TABLE III-6 (continued)
STATE BONDING ANALYSIS
NET PRESENT VALUE
(Million Dollars)

DATA			RESULTS		
				Actual	NPV
Available Revenue Stream	682:				
Coverage Rate	1.30:	Total Interest Earned		0	0
Yearly Bond Payment	525:	Total Interest Paid		11178	7088
Public Interest Rate	11:	Net Interest Paid		11178	7088
Term of Bond Issue (Yrs)	30:	Capitalization Ratio		0.29	0.32
Private Interest Rate	12:				
Project Years	15:				
Total Bond Amount	4561:				
Inflation Rate for (NPV)	.04:				

FUNCTIONS	
Drawdown 0-flat 1-Peak	0
Use Arbitrage 0-NO 1-YES	0

	DEBT SERVICE			:		BOND PROCEEDS	
Year	Debt Service	Interest	Principal	Balance:	: Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	502	23	4538	304	4257	525	0
1984	525	499	25	4513	304	3953	525	0
1985	525	496	28	4484	304	3649	525	0
1986	525	493	31	4453	304	3345	525	0
1987	525	490	35	4418	304	3041	525	0
1988	525	486	39	4380	304	2737	525	0
1989	525	482	43	4337	304	2432	525	0
1990	525	477	48	4289	304	2128	525	0
1991	525	472	53	4236	304	1824	525	0
1992	525	466	59	4178	304	1520	525	0
1993	525	460	65	4113	304	1216	525	0
1994	525	452	72	4040	304	912	525	0
1995	525	444	80	3960	304	608	525	0
1996	525	436	89	3871	304	304	525	0
1997	525	426	99	3772	304	0	525	0
1998	525	415	110	3663	0	0	525	0
1999	525	403	122	3541	0	0	525	0
2000	525	390	135	3406	0	0	525	0
2001	525	375	150	3256	0	0	525	0
2002	525	358	166	3090	0	0	525	0
2003	525	340	185	2905	0	0	525	0
2004	525	320	205	2700	0	0	525	0
2005	525	297	228	2472	0	0	525	0
2006	525	272	253	2219	0	0	525	0
2007	525	244	280	1939	0	0	525	0
2008	525	213	311	1628	0	0	525	0
2009	525	179	346	1282	0	0	525	0
2010	525	141	384	898	0	0	525	0
2011	525	99	426	473	0	0	525	0
2012	525	52	473	0	0	0	525	0
Total	15738	11178	4561	0	4561			0
Net Present Value	9072	7088	1983	0	3381			

and that the funds for the projects had been appropriated. Further, the letter stated that once the state had sufficient obligational authority from its Interstate apportionment, FHWA would reimburse the states for their advanced funds, subject to the 90% federal share, over a 36 month schedule. These notes received excellent ratings; Utah's note had a 6-1/8% interest rate and Alabama's had a 6-1/2% interest rate.

Grant Anticipation Notes would allow the Highway Department to use note funds as a project's "cash in hand" to cover each phase of the project; thus allowing state funds to leverage greater amounts of federal revenues.

The use of grant anticipation notes by the SDHPT would involve the same constitutional questions assiociated with state bonding. These types of notes can only achieve prime bond ratings if: 1) FHWA documents the availability and timeliness of anticipated grant revenues, and 2) the coverage ratio on the bonds is high. Utah's coverage ratio varied month to month from 2.5 to 17%. Utah pledged all of its projected federal grant revenues (even those grant funds to be received for projects not funded by the notes) to secure their note, and then utilized a $25 million general obligation bond to fund all their remaining projects.

The excellent credit rating of federally backed grant anticipation notes provides states with the opportunity to experience very low interest rates for short term debt instruments, without having to pledge the state's credit. Whether this avoids Texas State Constitutional provision against pledging the state's full faith and credit will require further legal analysis. However, if feasible, these short term notes could result in significant capitalization rates.

Interest Arbitrage

Interest arbitrage is the reinvestment of public revenues received from the sale of public bonds. Since the interest on tax free public bonds often is lower than the interest rate which can be obtained in the private investment market, this technique can be utilized as a way to generate new revenue streams from otherwise idle funds.

The use of arbitrage is permitted under current Texas state constitutional and legislative provisions, but the technique is used very little. Few public administrators appear to be familiar with it.

Interest arbitrage is subject to strict federal Internal Revenue Service restrictions. A public entity is permitted to reinvest bond proceeds for only a period of up to three years. Moreover, only bond proceeds to be used for capital projects

TABLE III-7
STATE GRANT ANTICIPATION NOTE ANALYSIS
FOR FEDERAL HIGHWAY IMPROVEMENT FUNDS
(dollars in millions)

DATA		RESULTS	
Available Revenue Stream	44.8416671		
Coverage Rate	1.00	Total Interest Earned	16
Yearly Bond Payment	45	Total Interest Paid	18
Interest Rate	.513333333	Net Interest Paid	1
Term of Bond Issue	12	Capitalization Ratio	.997850025
Private Interest Rate	1		
Project Years	12		
Total Bond Amount	521		

FUNCTIONS	
Drawdown 0-flat 1-Peak	1
Use Arbitrage 0-NO 1-YES	0

	DEBT SERVICE				BOND PROCEEDS			
Month	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1	45	3	42	478	43	477	45	5.22
2	45	2	42	436	43	434	45	4.79
3	45	2	43	393	43	390	25	4.15
4	45	2	43	351	43	347	25	0.25
5	45	2	43	308	43	304	25	0.25
6	45	2	43	264	43	260	25	0.25
7	45	1	43	221	43	217	25	0.25
8	45	1	44	177	43	174	25	0.25
9	45	1	44	133	43	130	25	0.25
10	45	1	44	89	43	87	25	0.25
11	45	0	44	45	43	43	25	0.25
12	45	0	45	0	43	0	25	0.25
Total	538	18	521		521			16

DATA		RESULTS	
Available Revenue Stream	44.8416667		
Coverage Rate	1.00	Total Interest Earned	0
Yearly Bond Payment	45	Total Interest Paid	18
Interest Rate	.513333333	Net Interest Paid	18
Term of Bond Issue	12	Capitalization Ratio	.967417514
Private Interest Rate	1		
Project Years	12		
Total Bond Amount	521		

FUNCTIONS	
Drawdown 0-flat 1-Peak	0
Use Arbitrage 0-NO 1-YES	0

	DEBT SERVICE				BOND PROCEEDS			
Month	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1	45	3	42	478	43	477	45	0.00
2	45	2	42	436	43	434	45	0.00
3	45	2	43	393	43	390	25	0.00
4	45	2	43	351	43	347	25	0.00
5	45	2	43	308	43	304	25	0.00
6	45	2	43	264	43	260	25	0.00
7	45	1	43	221	43	217	25	0.00
8	45	1	44	177	43	174	25	0.00
9	45	1	44	133	43	130	25	0.00
10	45	1	44	89	43	87	25	0.00
11	45	0	44	45	43	43	25	0.00
12	45	0	45	0	43	0	25	0.00
Total	538	18	521		521			0

can be invested. Public entities can reinvest any debt service reserves for the duration of the bonds. Though there are no constitutional prohibitions to the use of arbitrage, it can cause great public concern when public funds are invested in private investment markets. Many communities run into public complaints when they try to invest temporary windfalls on user fees or property taxes.

Certificates of Obligation

Certificates of obligation, as enabled by the Certificate of Obligation Act of 1971, originally were intended to assist local govermental entities in coping with rapidly inflating construction costs during the decade of the 1970's. During this period, it was not unusual for total construction costs to exceed total available bond proceeds because of inflated costs. The Certificate of Obligation (CO) provided an expedient investment instrument to cover these overruns.

COs can be issued by cities and counties to raise funds for the construction of any public work; for the purchase of materials, supplies, equipment, machinery, land and rights-of-way; or for the payment of contractual obligations for professional services. Further, they can be used to pay for the principal amount of contractual obligation as well as unanticipated changes and cost escalations of up to 25 percent of the original contractual amount.

COs can be issued without a general referendum, unless a petition calling for a vote is filed after a public notice is posted stating intent to issue such an instrument. COs may be sold for cash or tendered directly with contractors and vendors who construct or furnish authorized facilities or services, and, unless sold for cash, do not need to be approved by the Texas Attorney General. Though the original intent was not for COs to be issued as the primary funding source for major projects, they frequently have been used as such in cases where electoral approval is required.

3.0 ANALYSIS OF SPECIFIC MECHANISMS FOR TRANSIT FUNDING

3.1 Fare Increases

Local options for raising revenue for transit operations are user fees (fares) and public tax resources, with a combination of the two almost always used. The proportion of total operating expenses covered by each of these sources is a local decision reflecting the perceived role of transit in a community. When additional funds are needed for transit operations, the level of one of these two sources usually must be increased.

Raising fares, or changing the fare structure to increase the proportion of operating expenses covered by fare box revenue is one way to increase transit funds. In the Texas cities studied, the ratio of fare box revenue to operating expenses currently ranges between .24 and .48. Maintaining a ratio of .50 is often considered a reasonable and achievable goal and would generate an additional $38.9 million annually (in 1982 dollars) for transit operations in Houston, Dallas, Fort Worth, San Antonio and Austin. Raising the ratio to .40 would generate an additional $21.3 million.

Issues

Transit pricing generally is a controversial issue because transit's role in a community is often controversial. At one extreme is the view that transit is a public service, not unlike water and sewer systems, to which everyone is entitled and for which government should be willing to pay through its tax revenues nearly all, if not all, costs. The other extreme view is that transit is a commercial venture to be run as a private enterprise, and therefore users of the service should pay 100% of the costs. Normally there is an understanding that transit provides community-wide benefits such as reduced air pollution, reduced congestion and access to employment and medical facilities, and therefore communities, through general tax or dedicated tax revenues, are willing to pay for transit service to some extent.

Establishing the structure and level of transit fare is a delicate political process which must carefully consider issues of equity and the sensitivity of riders to fare increases. If fares are raised too high, the system may lose too many passengers and actually bring in less revenue despite the fare increase.

Financial Impact

When the Houston transit authority was created, its board adopted the goal of achieving a ratio of fare box revenue to

operating expenses of .50. In the last five years, the ratio has averaged .22, well below the goal. Dallas Transit System has averaged a ratio of .52 over the last five years. However, expansion of Dallas's transit system as a result of the recent creation of DART (the regional transit authority) may lower the ratio considerably. Even so, according to the service plan, DART will aim for a .45 ratio in 1986 and a .50 ratio by the year 2000.

Table III-8 demonstrates the additional annual income (1982 dollars) which could be generated by the transit systems in Houston, Dallas, Fort Worth, San Antonio, and Austin if each recovered 40% or 50% of their operating expenses from the fare box. It is important to note that this analysis assumes that ridership and operating expenses remain constant, unlikely under a substantial fare increase. "Current Ratio" is the ratio of annual fare box revenue to annual operating expense, based upon the most recent fiscal year data. For each ratio level, the total fare box revenue and additional revenue over the current level is shown.

3.2 Dedicated Local Sales Tax

Across the country, dedicated local sales taxes have been very successful in supporting transit operations and service improvements, most often in conjunction with the establishment of a transit authority, a political subdivision with defined local taxing powers. Legislation defeated in the most recent session of the Texas Legislature (SB12) would have allowed cities with populations of 50,000 or greater to levy a 1/4% to 1% dedicated sales tax for transit, without creating a transit authority. Instead, a mass transit department of the city would have been created.

The main advantage of a dedicated sales tax is that it allows transit agencies to plan ahead based upon a fairly predictable level of funding. If empowered to do so, a municipality or transit agency has a revenue stream which it can use to issue bonds for major capital improvements.

The five urban areas studied in Texas either have a sales tax supported transit authority or have the ability to create one:

Houston - The voters of Harris County approved the creation of the Metropolitan Transit Authority of Harris County (MTA or METRO) in 1978 to be financed by a 1 cent sales tax.

Dallas - The creation of the Dallas Area Rapid Transit Authority (DART) along with a 1 cent sales tax, was approved by voters on August 13, 1983.

TABLE III-8
POTENTIAL ADDITIONAL FARE REVENUE
FROM INCREASED FARE BOX REVENUE TO OPERATING EXPENSE RATIOS

City	Current Revenue/ Expense Ratio	Current Operating Revenue (millions)	Current Operating Expense (millions)	.40 Ratio Operating Revenue (millions)	.40 Ratio Additional Revenue (millions)	.50 Ratio Operating Revenue (millions)	.50 Ratio Additional Revenue (millions)
Houston[1]	.24	$ 29.7	$ 123.8	$ 49.5	$ 19.8	$ 61.9	$ 32.2
Dallas[1]	.48	19.9	41.3	-	-	20.7	.8
Fort Worth[2]	.41	2.7	6.6	-	-	3.3	.6
San Antonio[1]	.37	11.6	31.1	12.4	.8	15.6	4.0
Austin[2]	.30	1.9	6.4	2.6	.7	3.2	1.3
TOTAL					$ 21.3		$ 38.9

1. 1982 - 1983.
2. 1981 - 1982.

Fort Worth* - An interim transit authority board has been in place since early this year and an election for creation of a permanent authority, probably funded by 1/2 cent sales tax, is likely later this year.

San Antonio - The VIA Metropolitan Transit Authority was created in 1977 and is funded by a 1/2 cent sales tax.

Austin - A task force appointed by the City Council has recommended the creation of a transit authority funded by a 1% sales tax, however to date no formal steps have been taken toward creation of an interim board.

Issues

Not all elections held to create transit authorities in Texas have been successful. In 1973, Houston residents voted down the creation of the Houston Area Regional Transit Authority (HARTA) which would have been financed by a vehicle emissions tax. Reasons attributed to failure were the unpopularity of the vehicle emissions tax and a controversial board of directors composition. In the Dallas/Fort Worth Metroplex, an attempt to create the Lone Star Regional Transit Authority failed in 1980 reportedly due to an effort to include Fort Worth in the Dallas dominated service area. Eighty-seven percent of Fort Worth residents were opposed to the measure while only 33% voted against it in Dallas. El Paso voters narrowly defeated creation of the Sun City Area Transit Authority (SCAT) in 1981, probably because the public had not been properly educated on the issue.

Establishing new taxes is obviously a difficult political issue, especially if the public is not sufficiently informed about the benefits associated with creation of a transit authority. Implementing such an authority nearly always includes expansion of the transit service area to suburban areas previously not served by transit. Residents of these areas may be very unfamiliar with transit and may not perceive a need for it. Also, creation of a metropolitan transit authority does require the establishment of an additional political unit, an idea which may not be acceptable.

Financial Impact

Houston - The Metropolitan Transit Authority of Harris County and its dedicated 1 cent sales tax were adopted primarily in

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*In November 1983, prior to the printing of this report, Fort Worth voters approved the creation of a transit authority supported by an initial 1/4 cent sales tax which later may be increased to 1/2 cent without voter approval.

order to expand the municipal bus system to a regional multi-modal system. In 1981, annual sales tax revenue for 1983 was projected to be $158 million.

Dallas - With the recent electoral approval of the Dallas Area Rapid Transit Authority (DART), a 1% sales tax will be dedicated to the expansion of the municipal bus system to a regional bus and rail system. It has been projected that $5.56 billion will be realized by the sales tax during the period 1984 to 2010 (using 1982 constant dollars adjusted for construction inflation in excess of the consumer price index.) This revenue stream would account for nearly 67% of the total received from all revenue sources over the same period of time.

Fort Worth - The purpose of creating a transit authority in Fort Worth with the ability to collect a dedicated sales tax is to finance the existing municipal system, not to expand it to a regional scale. It has been projected that a 1/4 cent sales tax within the city limits would generate $7 million in fiscal year 1984. This compares to a projected $7 million yield in fiscal year 1984 of a 6 cent increase in the property tax, the current funding mechanism.

San Antonio - VIA Metropolitan Transit Authority was the first transit authority created in Texas (1977). The 1/2 cent sales tax is projected to yield $20.7 million in 1983.

Austin - The outlook for creation of a Metropolitan Transit Authority in Austin is not optimistic at this time. The Austin City Council, under 1981 state legislation, has until the end of 1985 to appoint an interim MTA board. The interim board would have three years to hold a confirmation election to approve creation of a permanent board, a service plan and a funding mechanism. The City of Austin is considering creation of an MTA because of the need to expand service to the rapidly growing city and surrounding areas and to generate additional funding.

If restricted to Travis County alone, it is estimated that a one cent sales tax could generate about $25 million in 1985 and $35 million in 1990.

3.3 Turnkey Facility Development

The turnkey development concept can play an important role in providing transit facilities such as park-and-ride lots and maintenance facilities at a lower cost than the traditional construction process through the purchase of completed facilities constructed to detailed specifications. In Houston, the Metropolitan Transit Authority (MTA) has realized savings

of 20% on the construction cost of park-and-ride facilities through the use of turnkey development. In addition, MTA turnkey park-and-ride lots have been constructed in an average of 60% less time than those using standard public construction methods. Substantial MTA administrative and technical time and expense has been avoided through the turnkey process.

The turnkey process for park-and-ride development was created in Houston as a response to a need to expand very quickly the park-and-ride program after creation of the MTA in 1978. The MTA has a service area more than twice the size of the area previously served by the city-owned HouTran system. Difficulties with mixed-use leased lots and limited staff time to devote to park-and-ride development led to using the turnkey process.

In the turnkey process, the transit agency prepares a "request for proposal" (RFP) seeking a qualified developer/contractor who will design and construct the needed facility and sell the completed facility, and the land it is on, to the transit agency at a pre-arranged price. In the case of park-and-ride development in Houston, the MTA requests that the improved site be within a certain geographic area.

For park-and-ride facilities, the developers/contractors develop proposals which respond to transit agency desires for site visibility and accessibility as well as specific design standards such as the number and layout of parking spaces, the location of drop-off spaces, pedestrian access requirements, and the location of the bus shelter.

Park-and-ride proposals are evaluated based on the responsiveness of each to the following criteria:

- proposer's qualifications and experience
- requested data
- Equal Employment Opportunity and Minority Business Enterprise provisions
- site location
- land cost
- improvement cost (cost per space and cost per square foot)
- overall project cost
- site accessibility and visibility
- environmental concerns
- site design
- construction schedule

Once selected, the developer/contractor is awarded an earnest money contract which states that the transit agency will purchase the completed facility provided that the improvements

meet the transit agency's approval. Once completed, the transit agency's engineering staff certify that the facility meets established standards before the sale is closed.

Issues

Transit industry experience with the turnkey concept has been very limited. Currently, federal capital asssistance funds are not available to support the type of turnkey park-and-ride program used by Houston MTA. However, there may be an opportunity to modify the MTA approach so that it would qualify for these funds. The turnkey process as it is currently used in Houston does not include public hearings or formal environmental impact studies, activities which probably would be required under federal procurement regulations.

The turnkey process deviates from the normal public competitive bidding context, since proposals are evaluated on a variety of aspects and not just the lowest bid price as is often the case in public sector procurement of material and services. Many details are negotiated even after selection of a developer/ contractor.

Under current UMTA policy, transit agencies need to weigh the potential inability to use federal funds against the significant time savings available through the use of the turnkey development process. The advantages of completing a needed park-and-ride or other transit facility such as a maintenance garage or rail transit station in less than half the time that would normally be required may indeed outweigh the disadvantage of building the facility with 100% local money.

Financial Impact

Experience with the turnkey process in Houston has been successful. Using the turnkey process, Houston MTA was able to construct 6,392 park-and-ride spaces in one year. Based upon experience in Houston, MTA provides a comparison between the turnkey process and the conventional design/bid/construct process of park-and-ride lot development yields the following time and expense savings data:

- Under the standard construction process, 20 months is required. For five turnkey lots, the average time between issuance of an RFP and completion of the lot was 8 months, representing a 60% time savings.

- Under the turnkey process, lot design and construction management become the responsibility of the developer/contractor and not the MTA. Total staff commitment for turnkey lot development has averaged 27 person-days including proposal evaluation, contract management, and inspections.

- Improvement cost per space for two similar park-and-ride facilities vary from $1,796 for the lot constructed using the conventional process, to $1,425 for the turnkey lot, representing a savings of 21%.

In order to to get an idea of the statewide impact of use of the turnkey concept if it were used only for park-and-ride lot development, the need for park-and-ride lots as projected by each of the study cities has been analyzed. Constant 1983 dollars are used, and it is assumed that the cost savings relationship found in the Houston experience (a cost savings of 21% for turnkey over the conventional process), would hold true in the other cities examined.

As shown in Table III-9, the need for park-and-ride lots by the year 2000 for the five urban areas studied will require nearly $104 million. Use of the turnkey concept to construct these lots could result in savings of about $22 million. Again, this $22 million savings reflects using turnkey only for park-and-ride lots, and does not include other facilities such as maintenance garages.

TABLE III-9

Projected Resource Requirement and Potential Savings
from Turnkey Development of
Park-and-Ride Facilities
(1983-2000)

	Cost (millions)	21% Savings (millions)	Notes
Houston	$ 36.0	$ 7.6	RMP estimated 20 lots @ 1000 spaces @ $1800/sp.
Dallas	$ 10.6	$ 2.2	DART service plan--25 timed transfer centers
Ft. Worth	$ 6.7	$ 1.4	Regional Mobility Plan
San Antonio	$ 40.0	$ 8.4	Regional Mobility Plan
Austin	$ 10.5	$ 2.2	Public Transportation Plan-4-area terminals/timed transfer centers
TOTAL	$103.8	$21.8	

3.4 Contracting for Transit Service

A public transit agency may choose to contract with private companies to provide regular fixed-route or demand-responsive transit service. In most cases, the private company owns, operates, and maintains the transit vehicles, although in some instances the vehicles may be owned by the public agency and operated and maintained by the private company. Contracting for service has been particularily successful for demand-responsive service, often operated by taxi companies, and has been used to a limited extent for regular fixed-route service.

All five of the urban areas studied in Texas have some level of contracted demand-responsive transit service for the elderly and handicapped. In Houston, Dallas, San Antonio and Austin, the transit agencies contract for the service from private companies. In Fort Worth, a separate city department does the contracting. Houston MTA also contracts for long-haul commuter service to most of its park-and-ride lots. Although very successful in Houston, other cities in the state do not currently contract for this type of regular route service.

Across the country, there is a notable shift toward contracted transit service. Private operators have firmly rooted themselves in contracting for the provision of demand-responsive transit service although there is still considerable experimentation with contract structure and payment agreements. It has not been until quite recently however, that contracted regular route service has made an impact on transit service in major metropolitan areas.

Contracting for transit service is likely to become the next major evolutionary step in the changing role of the public sector as transit provider. The public take-over of private transit operators in the 1960s and 1970s has not been as successful in solving the problems plaguing urban transit systems as was hoped. As a result of a rethinking of the organizational structure of transit service delivery, the "brokerage concept" has been developed.

In its true form, the "brokerage concept" suggests that the appropriate role of the public transit agency is to coordinate transit service delivery but not operate it. Various private carriers would compete for contracts with the public agency to supply service on specific routes. The public agency would be responsible for matching each community's need for transit service with the appropriate service and overall system planning. Public subsidy would flow through the public transit agency to the private contractors. Interestingly, although the "brokerage concept" has been discussed theoretically for quite some time and to some extent is practiced in the delivery of demand-responsive service, using contracts with private

carriers has been almost a grass roots movement, the result of community opposition to high fares or poor service from existing transit agencies. For example:

Kansas City - In 1981, Johnson County, just outside Kansas City, found that it could contract with a private carrier for less money than that county contributed to the area transit authority (KCATA) each year. After Johnson County withdrew from the regional transit system, the city of Blue Springs decided to do the same thing. At first, KCATA fought the moves away from the regional authority but eventually decided that it was in the best interest of the public to cooperate to provide cheaper transit service and is actually assisting communities which want to contract for private service. KCATA handles scheduling for the contract carrier and insures integration of the service into the regional system.

Washington, D.C. - Now that the Metrorail subway lines are being extended into the Virginia and Maryland suburbs of Washington D.C., what was previously commuter bus service into downtown (operated by the Washington Metropolitan Area Transportation Authority--WMATA) is being reoriented to a rail feeder system. The suburban communities of Alexandria and Fairfax County in Virginia plan to set up municipal bus systems using private contractors to replace the more expensive WMATA service.

Minneapolis - The University of Minnesota has found that contracting with a private carrier, rather than the public transit authority, for intra-campus service will save them $900,000 over a two-year contract.

Chicago - As a result of two sizeable 1981 fare increases on the commuter railroads, suburban commuters began grouping together to charter commuter bus service on a subscription basis. By the spring 1982, there were 3,000 riders using such a service. The subscribers pay the full cost of the service, with the most important cost saving feature part-time drivers whose wages are well below those of drivers working for the Regional Transportation Authority (RTA).

There is an important difference between the examples above and the contracting for service by private carriers as it is used in Houston.

In Houston, it is the transit authority, not community groups or other institutions, which has taken the initiative to use private contract service. Unlike the other examples, the transit service Houston MTA contracts for is subsidized with public funds. Even though transit service contracted for by the MTA is cheaper on a per revenue hour basis, fare box revenues do not pay the full cost of the service.

Issues

Maintaining control over a regional transit system is a serious issue with respect to contracting for transit service. Although Houston MTA has used contracting since the transit authority was created, it always has intended to take over the contracted service as soon as it had the fleet and maintenance facilities to do so, regardless of any cost advantages offered by private contractors, in order to have direct control of all service operations. To maintain political power, transit agencies often seek to reinforce their identity by providing service throughout the entire community with their own vehicles and personnel. The passenger who rides a private contractor's vehicle may not be aware that the transit agency is responsible for that service.

In some cases, transit agencies have legitimate concern about their ability to control the quality of service provided by private contractors. Discussions with transit agency representatives in Austin, San Antonio and Houston have revealed that the personal relationships and trust between transit agency management and private contractors are a very important part of the ability of a transit agency to obtain a high level of service.

Due to labor agreements, many transit agencies may only have an opportunity to contract with private providers for new service rather than replacement of existing service. Private operators can have lower wage scales and hire part-time workers, options not usually available to public transit agencies. There are federal regulations which protect transit labor (Urban Mass Transportation Act Section 13(c) currently inhibits the use of contracted service particularily if it replaces existing service). Texas, however, is an environment particularly conducive to contracted service, because it is a "right to work" state.

If is often difficult to get a clear comparison between the costs of a particular service operated by the public transit agency and those of a private contractor. A private contractor has a good idea of the real costs of providing a specific service in terms of cost per revenue hour, but transit agencies tend to determine their per revenue hour cost based upon their entire operation which includes long-haul commuter service and short-haul shuttles. Also, a transit agency may or may not include capital costs in its per revenue hour calculation. Therefore, a clear comparison between the providers is difficult.

Financial Impact

Demand-Responsive Transit Service. Each of the Texas cities studied successfully uses private contractors to provide some percentage of their demand-responsive service. In Austin and San Antonio, a taxi cab company, using regular taxi cabs, provides service during peak hours thus eliminating the need for the transit agencies to purchase vehicles and hire drivers beyond their base period service requirements. In Houston, the MTA's Metrolift program provides service through several contracts, all of which are currently held by one company. The Metrolift program carries 38,000 riders per month with an annual payment to the contractor of about $3,900,000. The city of Fort Worth contracts with a private company for drivers and maintenance but owns its own fleet of vehicles for demand-responsive service. The Dallas Transit System contracts for all their demand-responsive service with six separate companies. Most of the vehicles used are owned by the private contractors, although a few of the lift-equipped vans are leased to private contractors by the transit system. Indications are that DART will provide demand-responsive service in a similar manner.

Regular Fixed-Route Transit Service. Of the case study areas, with the exception of the University of Texas' contract with Transportation Enterprises, Inc. for city wide student shuttle service in Austin, only Houston contracts for this type of service. The MTA currently has 125 buses, operated by four companies, running contract service to park-and-ride lots all around Houston. Twenty-four percent of the buses operated daily are operated by private contractors. An MTA study done in March 1983 reviewed the quality of service provided by private contractors and determined that it was safe and reliable. The study revealed the following statistics:

1. Operating cost per revenue mile (last quarter of 1982 average)

Metro	$ 4.14
Contract Carriers	$ 3.42

2. On-time performance (February 1983)

Metro	87%
Contract Carriers	96%

3. Miles between road calls (November 1982)

Metro	838
Contract Carriers	24,044

The Houston MTA began using contract carriers in 1979 with the inauguration of its commuter/park-and-ride service, because the newly created transit authority could not get the necessary vehicles and maintenance facilities in place quickly enough. The MTA has always intended to take over these routes as soon as it was able. This year, the first reduction in contract carrier service will go into effect. Based on per revenue hour cost comparisons (the MTA now estimates their per revenue hour cost at $57.11) MTA will take over 4 routes (29 buses) as of October 3, 1983.

Prospects vary for the use of private contractors for regular-fixed route transit service in the other study cities. In Dallas, the creation of DART, and subsequent substantial expansion of its transit service area, will provide an excellent opportunity for contracting with private carriers. Fort Worth offers little potential because CITRAN currently operates a fairly new fleet of buses and plans for creation of a regional transit authority do not include expansion of the service. In San Antonio, VIA is not likely to contract with private carriers since it successfully competes with private carriers to provide charter service. Unless a transit authority is created in Austin enabling an expanded transit service area, contracting for service has limited applicability in the near future.

3.5 Safe Harbor Leasing

The "safe harbor" provisions of the Economic Recovery Tax Act of 1981 and the 1982 Tax Act permit public transit agencies to lease their mass commuting vehicles from private corporations, and, in effect, sell the accelerated depreciation deductions associated with that equipment to private corporations seeking shelter for their taxable income. This opportunity currently is available on the purchase of rail and bus vehicles or vans placed in service by December 31, 1987. The use of safe harbor leasing to purchase new buses in Texas could result in considerable savings.

In a typical safe harbor lease transaction, the transit agency lends, through a debt instrument of some type, bond proceeds or other funds to a tax-paying firm. The firm purchases the rolling stock with the money lent to it, and leases the vehicles back to the transit agency. The lease payments are usually equal to the debt service payments owed by the private firm to the transit agency and therefore, money does not actually change hands. The private investor must put up cash equal to at least 10% of the purchase price. A minimum of 5% of the transit agency's share must be from a non-taxable funding source. Only tax benefits on the non-federal share of the vehicle purchase can be transferred to a private investor,

and the lessor cannot write off more than 50% of his tax liability through safe harbor benefits. At the termination of the lease, usually 12 years for buses and 30 years for rail vehicles, the transit agency purchases full ownership of the equipment for a nominal sum. Since August 1981, a minimum of 15 safe harbor deals have been negotiated nationwide, involving over $400 million in equipment.

Issues

This financing mechanism is somewhat controversial because it results in a direct loss to the U.S. Treasury, since it substantially reduces federal tax liabilities of participating private corporations. The transit industry and its advocates argue that the safe harbor provisions will enhance the nation's overall economic picture, and that the loss of tax revenues will be more than offset by the significant investment in the transit industry created by the safe harbor provisions. This dispute makes further extension of the provisions uncertain.

Leverage leasing is available to almost any transit agency which has the power to enter into a lease with a private company. Usually, no special state or local enabling legislation is required to use the safe harbor provisions. Private corporations purchasing the vehicles can depreciate the full value of the local share of the vehicles over a five year period.

Financial Impact

The Houston MTA has used safe harbor leasing on two separate occasions. (Safe harbor leasing was also intended for new rail vehicles to be financed as part of the defeated rail bond election held earlier this year.) In December 1981, MTA sold the tax benefits on eight new GMC buses which had been purchased earlier that year and 84 rehabilitated older model GMCs. First City Leasing Corporation paid $1.2 million of the $8.4 million total cost of the project, for which no federal money was used. In order to meet the safe harbor leasing requirement of 5% tax exempt funding, the MTA, which is unable to issue bonds, entered into a lease-purchase agreement with Western Bank for $500,000 over a five year period. The lease agreement with First City Leasing will last 13 years.

In 1982, MTA again entered a safe harbor lease agreement with First City Leasing Corporation for 65 rehabilitated GMC buses. First City Leasing put up $1 million in cash to acquire the tax benefits on the $7.9 million local share of the $39 million total project cost. This time, MTA signed a lease-purchase agreement with Capital Bank for $1,250,000 over five years to satisfy the tax-exempt funding requirement. First City Leasing Corporation paid $1.2 million, and $1 million respectively for the tax depreciation rights.

Part Four

Summary and Recommendations

PART FOUR

SUMMARY AND RECOMMENDATIONS

1.0 SUMMARY

This report has reviewed the status of planning for regional mobility improvements in the Houston, Dallas, Fort Worth, San Antonio, and Austin urban areas. The review has considered the projected cost of federal/state related highway infrastructure requirements through the year 2000; the projected cost of county/city related highway infrastructure requirements through the year 2000; and public transit system performance/need in each urban area. Existing financial resources available at the federal, state, and local level to meet mobility objectives (capital improvement) have been identified, and the resulting deficiencies in available and projected financial capability from existing funding sources to meet perceived mobility requirements have been discussed. The projected additional financial resources necessary to meet mobility objectives in Houston, Dallas, Fort Worth, San Antonio and Austin are substantial.

Projected federal/state highway related financial needs for all urban case study areas combined (capital improvement only) total approximately $16.5 billion. Projected revenues from existing resources to support federal/state related highway improvements are approximately $7.5 billion or 45% of the funds required. Accordingly, $9 billion in additional revenues must be found to support projected federal/state related highway requirements, if year 2000 mobility objectives are to be achieved.

For county and city highway/arterial requirements, a similar financial picture is projected. Approximately $9 billion in city/county highway infrastructure requirements for case study areas (Austin excluded) are anticipated, while existing financial resources are anticipated to generate $3.4 billion (Austin excluded) in revenue or approximately 37% of projected requirements. Therefore, additional revenue sources will be needed to provide an additional $5.6 billion in revenues.

Developing public transit systems in Houston, Dallas, and San Antonio are supported by communitywide sales tax revenue, fare box revenue, and federal/state subsidies which should provide required financial resources for the next 10 years. Supplemental bonding authority may be required to enable major capital initiatives such as the Houston MTA rail proposal.

The Austin and Fort Worth communities currently are considering proposals to create permanent regional transportation authorities supported by a 1/4 cent to 1 cent increase in the sales tax.

The major financial issue facing the case study area public transit systems appears not to be the need for additional public resources to support transit, but the need to provide transit services on a more cost effective basis to reduce dependency on federal, state, and local subsidies. To this end, creative approaches to financing capital improvement, reducing operating costs, utilizing existing private sector transportation capability, and increasing fare box revenues to adequate (representative) levels are all important ingredients toward providing cost effective transit.

This research also has focused on methods in which case study urban areas can help "fill the gap" between projected mobility requirements and available financial resources to achieve mobility objectives, through the use of innovative approaches to financing mobility improvements.

With respect to methods to increase available support for highway related improvements, the following have been considered:

- local transit funds
- user fee increases
- special assessments
- private support
- issuance of debt

With respect to methods to assist urban areas in meeting financial requirements to support public transit system development, the following have been considered:

- user fee increases (fare box)
- sales tax/transit authorities
- turnkey facility development
- contract transit services
- safe harbor leasing

The responsibility for generating new financial resources to support mobility objectives in Texas' large urban areas rests largely with the public and private leadership of those communities. However, the state legislature can play a significant role in insuring that the state has sufficient financial resources to meet its responsibilities for urban mobility improvements, and that the legislative framework exists to enable local urban areas creatively and cost effectively to meet their responsible share of mobility requirements.

2.0 STATE LEGISLATIVE INITIATIVES AND RECOMMENDATIONS FOR FUTURE ACTION

A summary of initiatives in the 1983 state legislative session is included in Appendix C as background material for the discussion of future legislative initiatives to support urban area mobility objectives. The most notable results of the 1983 legislative session and their implications are discussed below.

2.1 User Fee Increases to Support Federal/State Related Highway Improvement

Since passage of the 1982 Surface Transportation Assistance Act which substantially increases available federal funding to support urban highway improvement through a 5 cent increase in the federal gasoline excise tax, many states have imposed similar increases in state gasoline taxes in an effort to keep pace with the growing need for increased financial support for federal/state related highway improvement.

The State of Texas currently imposes the lowest gasoline sales tax (5 cents) in the nation, while having the most extensive highway network in the nation. Additionally, the other primary user fees to support state highway development, motor vehicle registration fees, have not been substantially increased for many years. Other user fees such as the sales tax on motor vehicles and automobile parts go to the general fund of the state and not directly to support highway development. The result is that the state's ability to keep pace with highway infrastructure requirements (especially for growing urban areas) continually has been eroded by increased maintenance requirements, inflation, and urban growth.

It is ironic that Texas, which has the most significant urban highway improvement requirements in the nation, is faced for the first time with the possibility of losing available federal funding to help meet its highway needs due to insufficient state funding to meet federal matching requirements. To amend this situation, a considerable amount of effort was made to persuade the State Legislature to support substantial increases in state revenues available to help meet required highway development. Joining in this effort were the Houston Chamber of Commerce RMP participants, RMP participants in other urban areas, the State Department of Highways and Public Transportation, and other interest groups such as the Texas Municipal League and Texas Good Roads Association.

Senate Bill 287, introduced by Representative John Traeger, proposed to increase the State Highway funding base index from $.75 billion annually to $1.25 billion annually of dedicated

state support. In addition, the legislation proposed to dedicate all highway rebated user fees to satisfying annual highway funding requirements. The legislation would have established a "city street improvement fund", equalling 6% of the sum of highway revenue, to be allocated to each city in the state through an apportionment formula to be used for the maintenance, repair, or reconstruction of bridges and paved streets maintained by the city. Each city would be required to provide a local match of 30%.

S.B. 287 died in the Senate Finance Committee. Accordingly, state generated resources available to maintain and improve highways have not increased over previous levels.

Recommendation

Texas requires substantially increased financial support for federal/state related highway improvement, if mobility objectives are to be met. Recent increases in federal support provide Texas with the opportunity to fill this financial gap, if sufficient state resources are made available.

Passage, as soon as possible, of legislation which would provide the means to expand access to federal support to meet mobility requirements in urban areas in Texas should be pursued.

2.2 County Assessment Ability

The shift in emphasis from federal support for infrastructure improvements to state and local governments creates the need for counties and cities to increase significantly their ability to pay for local urban highway and arterial support systems which are required to meet mobility objectives and to complement investment made in major federal/state related highways.

Senate Bill 969, introduced by State Representative Don Henderson, and passed into law during the 1983 legislative session authorizes Harris County to contract for the improvement of highways (and related support structures) and to assess the cost of improvement to owners of property benefited by the improvements. Harris County has the power to assess all or part of the costs of the improvements against benefited property owners.

This legislation broadly defines "highways" as any street, highway, limited-accessway or toll road.

Thus, this legislation substantially increases Harris County's ability to finance highway related improvements, provides the county added leverage with property owners, and supplements general fund and bond monies available to support mobility.

Recommendation

The State should consider providing all counties in Texas with a population of 200,000 or more similar authority to assess benefiting property owners for transportation improvements in order to supplement financial resources available for mobility improvements in all large urban areas in Texas.

2.3 Local Improvement Districts

The 1977 Public Improvement District Assessment Act enables any incorporated city or town to call for an election where a majority of qualified voters voting may approve a city undertaking an improvement project which confers a special benefit on a definable part of the city. Improvements may include highway related needs, and the acquisition of property.

The city is authorized to collect "special assessments" on property in the area based upon the benefit created by the improvement. The cost of improvements may be assessed against affected property owners on a per front foot, per square foot, value, or other reasonable basis. The governing body establishes the assessment formula by ordinance.

Qualified voters may present a petition for authorized improvements to be financed under the Act. The petition must be signed by at least two-thirds of property owners liable to be assessed for the proposed improvement; or of the owners of record of property which comprises at least two-thirds the area liable for assessment under the petition.

The city may issue general obligation or revenue bonds to support required improvements. These bonds are financed from income derived through the assessment and through other forms of security.

The 1977 Public Improvement District Assessment Act enables the creation of special improvement districts through successful referendum and affirmative action by the governing body of a city. Other states such as Colorado have enacted legislation which enables creation of special improvement districts in a similar manner, but without the need for voter approval and local governing body action. Local improvement districts which

can help provide additional local revenue for specific infrastructure needs, through special assessments passed on to the beneficiary, could be extremely useful in addressing specific local mobility needs which arise due to intensive private development.

Recommendation

There should be consideration of legislation which would enable the establishment of special improvement districts to address specific transportation infrastructure requirements by the qualified registered voters and owners of property in unincorporated jurisdictions.

2.4 Tax Increment Financing

The Texas Tax Increment Financing Act of 1981 and Senate Bill 641 introduced by Senator Ray Farabee enables the creation of tax increment districts which utilize increases in tax revenue generated by private/public development to support infrastructure improvements within a specific area. In effect, this act enables the creation of a special district which insures that increased tax revenues resulting from improvements within a specific area are used to support additional improvements within the area from which the additional tax revenues are derived.

The current legislation requires that a Tax Increment District, (a "Reinvestment Zone"), only can be established within a deteriorated or economically/socially deprived area. Therefore, this form of financing is not available to support new development.

Recommendation

Consideration should be given to enable the use of Tax Increment Financing in any area in need of special infrastructure requirements, including highway and transit development. All increased tax revenues realized from new development could be used to finance public mobility improvements required to support growth resulting from the development. The legislation could insure participation by the private sector by requiring property owners benefited by the development to pay a portion of infrastructure costs.

2.5 State Public Transportation Trust Fund

In 1975, the state legislature created the Texas State Public Transportation Trust Fund from which the state supports capital improvement requirements of public transit systems. The

legislation created two funding categories: a formula program, from which 60% of funds appropriated by the legislature are allocated for use among urbanized areas in excess of 200,000 population; and a discretionary program from which 40% of the funds are utilized to support transit capital requirements of urbanized areas of less than 200,000 population, and transit capital requirements of larger urban areas which utilize their entire formula allocation.

Original funding levels called for a $30 million biennial appropriation. Funds earmarked for the Public Transit Trust Fund are made available to help local urban areas match federal capital grants to improve transit. The formula portion of the fund provides 65% of the local share requirement of a federally funded transit project and may be used only for this purpose. The discretionary program enables rural and urban areas of the state, not eligible for the formula program, to pay for 65% of local share requirements of federally funded projects or, where federal funds are not available, 50% of total project costs.

Non-utilized formula and primary discretionary funds also are made available for use by all eligible recipients after a lapse period.

Since 1975, approximately $55 million has been appropriated by the legislature for the Public Transportation Trust Fund. Of this amount, $53 million has been obligated to support qualified transit projects. However, only $40.7 million has been expended. This creates a significant balance of obligated, but unexpended funds within the State Public Transportation Trust Fund account. This condition has significantly affected the credibility of transit advocates in the state who claim that additional state support for public transit is required.

Additionally, some urban areas which are entitled to receive formula funds, such as El Paso, Austin, and Corpus Christi, have not utilized their formula allocations effectively, creating a disparity when compared to the great transit needs of Houston, Dallas, and San Antonio, for instance, and available state support to those larger areas through the Public Transportation Trust Fund.

The state's general prohibition against obligating beyond its current appropriation level and the long lead time for completing public transit capital improvements have created a very confused situation with respect to administration of the Trust Fund. To alleviate this situation, SDHPT was given the authority by the 1983 legislature to obligate 50% more funds than the $28 million appropriated for FY 84 and FY 85. Therefore, the state can obligate $42 million conditional upon the actual availability of this amount.

Recommendation

In light of the above, legislation which would provide the following changes to the State Public Transportation Trust Fund should be considered.

Formula Program: The current formula for distribution of funds to large urban areas should be re-analyzed in light of past use and projected needs to provide a more appropriate distribution of funds. The current formula is based upon a combination of population and population density styled after the original UMTA Section 5 formula. Since 1975, the extent of state financial resources to support public transit in Texas' large urban areas has been tied more to the level of transit improvements required in selected urban areas (i.e. Houston, Dallas) than to the population, population density formula. Perhaps a formula based upon service miles in each urban area (in addition to population) would be more appropriate.

The formula program provides a basis upon which large urban areas have an allocation of state funds to support transit development. This opportunity for urban areas should be maintained.

Formula/Discretionary Lapse Period: The current legislation (S.B. 762) provides that "funds allocated by the department for use in the formula program which are unencumbered and unexpended 180 days after the close of the fiscal year for which the funds were originally allocated shall be transferred" to the discretionary program. This enables formula recipients eighteen months within which to obligate funds. This long obligation period has created problems for the SDHPT in its administration of the Trust Fund.

Since obligated funds cannot be considered expenditures, the Trust Fund is continually "clogged" with obligated but unspent funds, and appropriated unobligated funds; all of which are considered unused by the legislature.

The state legislature has taken action to alleviate this situation by allowing SDHPT to obligate (conditionally) 50% more funds than appropriated for FY 84 and FY 85, and to require that funds be expended within one year subsequent to their obligation. If transit projects require longer lead times to complete, recipients must seek renewed obligation by SDHPT.

The State should consider amending the current legislation to reduce the period within which funds must be obligated from 18 months to 6 months after they become available.

This will require obligated funds to be expended within 12 months subsequent to their availability and reduce the backlog of funding in the Trust Fund.

Extent of State Participation: Current legislation virtually eliminates the need for urbanized areas to provide local matching requirements to support federal transit capital grants. Recent passage of the 1982 Surface Transportation Assistance Act reduces UMTA Capital Grant participation to 75% of net project costs of urban related transit improvements. Therefore, the current local share requirement is 25%.

Since there is strong interest at all levels of government to reduce dependency on public funds and to create new sources of local revenue, the following recommendation should be considered.

The State Public Transportation Trust Fund could be utilized, at the discretion of the SDHPT Commission, to provide up to 100% of the local share requirement to match federal funds for capital improvement depending upon several criteria: (1) project cost effectiveness; (2) use of private sector support; (3) fare box revenue returns; (4) operating/ridership data.

In this manner SDHPT can make its own determination of the value, need, and cost effectiveness of requested capital improvements and then can participate at an appropriate level.

Administrative Cost: Current legislation does not specifically authorize the Public Transportation Trust Fund to provide funds to support administrative-related expenses incurred by SDHPT. Legislation should be considered to provide SDHPT a portion, for example up to 5%, of the Trust Fund appropriation to help defray the cost of administering the public transportation program.

2.6 Support for City Mass Transit Departments

Senate Bill 12, introduced by Senator Hector Uribe but not passed in the just completed session, proposed to enable an incorporated area of 50,000 or greater population, which does not have a Metropolitan Transit Authority but which operates a Mass Transit Department, to be supported by a 1/4¢ to 1¢ local sales tax. The cities would be required to hold a special election to create and fund the authority.

There currently are 15 cities with a population over 50,000 which would have qualified under the Uribe legislation.

Included cities are Fort Worth, El Paso, Austin, Abilene, Amarillo, Corpus Christi, Beaumont, Galveston, Port Arthur, San Angelo, Waco, Wichita Falls, Brownsville, Lubbock, and Laredo. However, since Fort Worth, Austin, and El Paso, and Corpus Christi have enabling legislative to create areawide MTA's, there may be only 11 cities practically effected by this legislative initiative.

Mid-sized urban areas have a substantial need for additional financial resources to support improvement and expansion of mobility systems.

Recommendation

Passage of new legislation similar to that which provides urban areas of 50,000 population or greater the ability to fund their own Mass Transit Departments through sales tax support should be considered. Such legislation could provide mechanisms for intrajurisdictional coordination for those areas that have two or more smaller cities in close proximity and having a combined total population exceeding 50,000.

Appendices

APPENDIX A

COMPARATIVE RMP MATRICES

APPENDIX A

Comparative Matrices

The Regional Mobility Plans from Houston, Dallas, Fort Worth and San Antonio were analyzed through the use of a matrix which distilled their characteristics into a common format. The matrix is based on an outline of the Houston RMP, considered the most comprehensive RMP prepared to date. Information from each of the other RMPs was entered into the matrix in order to determine the comprehensiveness of each RMP.

The columns of the matrix are as follows:

- Method/Role describes the information that is provided for each topical area. The source of the information is given if available.

- Data identifies the type of data presented and where it can be found in the plan.

- Responsible Entity indicates the agency responsible for a specific project, if given.

There are eight categories for which information in the matrix is presented. These are:

I. Existing Conditions. This section indicates the extent to which the RMP describes the existing transportation-related conditions.

II. Goals, Objectives and Criteria for Plan.

III. Facility Improvement Plans.

IV. Estimated Costs of Improvements.

V. Funding Resources.

VI. List of Projects. Indication of the extent to which specific projects were identified and listed in the plan.

VII. Cooperating Public Agencies.

VIII. Private Sector Participants.

AREA: Houston

SOURCE: Houston Chamber of Commerce

PLAN: Regional Mobility Plan

TYPE: to Year 2000

	Method/Role	DATA Historical/Current	Responsible Entity
I. EXISTING CONDITIONS			
A. Development of Freeway and Thoroughfare System	Planning began after WW II. Funding and implementation began in mid '50's to mid 60's. Between 1970-1980 frwy system expanded 22%, frwy travel increased by 106%.	Exhibit 1-Development & use of frwy system in Harris Co. p. 2. (pop, lane-miles, miles of frwy, vehicle miles) Source: (Houston-Galveston Regional Transportation Study Office and U.S. Census.	
B. Travel Demand and Supply	Travel demand recorded in Historical Transp. data (D.2) and frwy travel increased more than frwy system growth.		
C. Trends in Travel Times	o SDHPT travel times study show average travel speed during PM peak dropped from 36.6 mph (1969) to 24.4 mph (1979) o Duration of peak congestion period o Report by Texas Transportation Institute "index"for congestion	Cost of congestion estimate theory Appendix B -2 hrs (1968) to 7 1/2 hrs (1981)/13 min/ workday -list of examples of critical locations p.4 -Exhibit 4 p. 6 Congestion Value indices -Exhibit 5 p. 7 Trends in Congestion Indices	
D. Historical Growth Characteristics			
1. Demographic data		Exhibit 2-p.3 Harris Co. growth in '70's (population, dwelling units, employment, office space, vehicle registration)	
2. Transportation data		Exhibit 2 p. 3 - Harris Co. growth (lane miles of frwy, Vehicle Miles Traveled (VMT), VMT on freeways	
E. Projected Growth Characteristics			
1. Demographic data	Rice Center projections for 1980 employment and population	Appendix C Forecast 2000 for Houston/Galveston	
2. Transportation data			

	Method/Role	DATA Historical/Current	Responsible Entity
II. GOALS, OBJECTIVES, AND CRITERIA FOR PLAN			
A. Statement of Goals and Objectives	To identify transportation projects which will provide substantially improved mobility throughout the Houston area by reducing overall travel time and congestion. Objectives - To make the most of existing facilities, encourage development, encourage joint development and public/private coordination, encourage high occupancy vehicles, avoid competition, assess funding limitations.		
B. Criteria to Evaluate Projects	(1)Existing traffic volumes on existing facilities (2)Support of critical facilities (arterials) (3)System continuity (4)All should form a unified, integrated and coordinated transp. system	o Requirement: 13,000 veh/day/lane frwy 5,000 " " " arterial	
C. Interdependence and Role of Transportation System's Components	(1)Arterial Streets-to serve trips of less than 5 min and access to and from freeways (2)Frwys and tollways - to serve trips less than 5 min (3)Bus and high occupancy vehicles (HOV) needed to increase productivities of frwys (4)High capacity transit ways-along corridors of major activity centers and concentrated travel demand areas (Flex time, increase vehicle occupancy, TSM)		
III. FACILITY IMPROVEMENTS PLANS			
A. Improvements Needed to Meet Today's Demand	150 miles of new frwy, 20 mi. high capacity transitways, widen 42 miles of existing frwys, 90 mi of major capacity improvements to existing frwys, 30 mi minor capacity improvements, 800 mi new arterial streets and roads, 16 grade-separations at congested intersections 5-3 level interchanges, 6-8 new bus maintenance facilities, 15-25 new Park-n-Ride lots, several hundred new buses. There will also be improvements needed during the implementation of the plan.	Exhibit 6, p. 16 shows these imps Exhibit 7, p. 18 map identifying all major transp improvement projects under contract by City, County SDHPT, MTA and TTA.	
B. Improvements Needed to Serve New Growth (mandated plans)	This was based on Rice Center's population forecasts- -600 mi major streets & roads, 100 miles of frwys, added buses, transit maintenance facilities, Park & Ride lots, HOV lanes.		

	Method/Role	DATA Historical/Current	Responsible Entity
IV. ESTIMATED COSTS OF IMPROVEMENTS A. Capital Costs to Meet Current Demand (Shown in solid lines on Exhibit 6) (Those facilities needed to complete system)	This plan is the least cost plan Estimated in 1981 $.	Summary of costs - p. 20 total = $9.8 billion Total amount to complete system = $1.9 billion	
B. Capital Costs to Serve New Growth		Costs to keep existing facilities functional during implementation - $1.0 billion Costs to serve new growth $3.5 billion (p.21)	
C. Capital Costs to Meet Planned Improvements	The total of these costs are the costs to meet planned improvements.	Total - $16.2 billion	
V. FUNDING RESOURCES			
A. Existing Funding		Total $365 million to yield $6.9 billion over next 15 yrs	
B. New Funding Potential	Increase % state hwy funding, farebox rev, MTA bonds, State Public transportation funds, increase state motor fuel tax, application of sales tax to motor fuel, dedicate state motor vehicle tax, increase motor vehicle registration fees - Increase local capital improvement program, user-toll financing, Harris Co. User Fee improvement, private sector, federal government	SDHPT share of cost of plan $9.3 billion	
C. Funding Needs (net-unfunded)		$9.3 needed	

	Method/Role	DATA Historical/Current	Responsible Entity
VI. LIST OF PROJECTS			
A. Current	Total list of projects by project (quadrant) area	Appendix A: Information given-project location project description, type, agency, length. No cost/project	
B. Future			
VII. COOPERATING PUBLIC AGENCIES	City of Houston, Harris County, SDHPT, HGRTS, Texas Turnpike Authority, MTA		
VIII. PRIVATE SECTOR PARTICIPANTS	Houston Chamber of Commerce, Rice Center, Barry Goodman Associates, Turner Collie and Braden, Inc., Underwood Neuhaus & Co., Texas Good Roads Transportation Association		

AREA: Greater Dallas

SOURCE: Greater Dallas Coalition

PLAN: Regional Mobility

TYPE: to year 2000

	Method/Role	DATA Historical/Current	Responsible Entity
I. EXISTING CONDITIONS			
A. Development of Freeway and Thoroughfare System	Development and use of freeway system in Dallas County Source: SDHPT	Exhibit 6 Exhibit 7 - most traveled thoroughfares	
B. Travel Demand and Supply		Exhibit B - Average Daily traffic/lane at selected highways Exhibit 9-B - Typical weekday/hourly traffic volume at selected highways	
C. Trends in Travel Times	Congestion Index Comparison, Source: Texas Transportation Institute Assumptions: 1.25 ppv, 250 commute days, $1981 wages rate, travel speeds cost data (no sources) SDHPT	Since 1970, peak commuting periods in Dallas have increased, 1/2 hour am and 1 hour pm. Exhibit 5 Exhibit 14 - Daily Travel Delay Exhibit 15 - Annual Congestion Delay Costs Exhibit 16 - Ciruclation of Travel Delay and Cost of Congestion	
D. Historical Growth Characteristics			
1. Demographic data	City of Dallas 1980 1970 and 1980 population of Cities, source: Dallad Herald Times	Population, no breakdown by sex, ethnicity, education, age, # households, (p8), buying income, budget - Cost of Living. Dallas Co. 1980 pop 1,556,549 p.10	
2. Transportation data	source: SDHPT	o each year 90,000 cars added to area, 2 M vehicles, 89% of work force commute by car	
E. Projected Growth Characteristics			
1. Demographic data	SDHPT Dallas Co. projections MPF Research Co. of Dallas projections of employment and office space	1980, 1990, 2000 pop, dwelling units and employment.	

	Method/Role	DATA Historical/Current	Responsible Entity
2. Transportation data			
II. GOALS, OBJECTIVES, AND CRITERIA FOR PLAN			
A. Statement of Goals and Objectives	Requests to commission SDHPT o Expediate 20 yr plan by accelerating construction schedule channel SDHPT funds to projects that decrease congestion and best G/B ratio and provide leadership to local level to develop new funding sources o Develop funding sources and transp. programs		
B. Criteria to Evaluate Projects	Criteria based on Houston RMP p. 20. All projects submitted for inclusion should meet or exceed 5,000 vehicles/lane/day for thoroughfares and 13,000 vehicles/lane/day for highways.		
C. Interdependence and Role of Transportation System's Components			
III. FACILITY IMPROVEMENTS PLANS			
A. Improvements Needed to Meet Today's Demand			
B. Improvements Needed to Serve New Growth (mandated plans)	Improvements that meet criteria for year 2000	Map I - Needs Assessment Overview Map II - Projects whose traffic is expected to increase criteria p. 24 - # miles/entity	State, County, City

	Method/Role	DATA Historical/Current	Responsible Entity
IV. ESTIMATED COSTS OF IMPROVEMENTS			
A. Capital Costs to Meet Current Demand			
B. Capital Costs to Serve New Growth		State/Tx Turnpike - $4.77B City/County - 2.33B Projects Not Listed 1.59B 8.69B	
C. Capital Costs to Meet Planned Improvements			
V. FUNDING RESOURCES			
A. Existing Funding Fed		o Exhibit 17 - % Fed. Hwy Aid in Tx ('68-'80) o Exhibit 18 - SDHPT revenues ('68-'80)	
B. New Funding Potential	Based on documentation of new sources prepared by Houston Chamber of Commerce 1982. o increase state hwy funds o establish state transportation fund o increase state motor fuel tax o apply sales tax to motor fuel o increase motor vehicle registration fees o user tolls		
C. Funding Needs (net-unfunded)			

	Method/Role	DATA Historical/Current	Responsible Entity
VI. LIST OF PROJECTS			
A. Current			
B. Future	Listed by project location, project description, funding agency & length	A. State projects pps 29-36 B. Local projects pps 37-68 C. Tx Turnpike Authority pps 70	
VII. COOPERATING PUBLIC AGENCIES	Counties, cities, COG, SDHPT, Tx Turnpike Authority		
VIII. PRIVATE SECTOR PARTICIPANTS	Area Chambers of Commerce Employer sponsored vanpools DARS - Dallas Area Rideshare Services Employee Discount Bus Pass Program Flex-time Transportation Task Force - group of 700 businesses and civic volunteers		

* No page numbers available for exhibits

AREA: Tarrant County

SOURCE: Tarrant Co., Ft Worth and other cities

PLAN: Regional Mobility

TYPE: Year 2000 Long Range

	Method/Role	DATA Historical/Current	Responsible Entity
I. EXISTING CONDITIONS			
A. Development of Freeway and Thoroughfare System	Most major highways & thoroughfares designed and constructed during 40's and 50's		
B. Travel Demand and Supply			
C. Trends in Travel Times			
D. Historical Growth Characteristics			
1. Demographic data	Tarrant County population employment source: NCTCOG	1980 860,880 400,323	
2. Transportation data	source: SDHPT		
E. Projected Growth Characteristics			
1. Demographic data	Tarrant County Population Employment source: NCTCOG	1990 / 2000 1,050,958 / 1,137,924 538,904 / 665,944	

	Method/Role	DATA Historical/Current	Responsible Entity
2. Transportation data			
II. GOALS, OBJECTIVES, AND CRITERIA FOR PLAN			
A. Statement of Goals and Objectives	To move people and goods in a more efficient manner. To provide an equitable transportation network providing a system accomodating all segments of the communities of the county.		
B. Criteria to Evaluate Projects	Based on population projections		
C. Interdependence and Role of Transportation System's Components	Present planning for transportation authority		
III. FACILITY IMPROVEMENTS PLANS			
A. Improvements Needed to Meet Today's Demand			
B. Improvements Needed to Serve New Growth (mandated plans)			

	Method/Role	DATA Historical/Current		Responsible Entity
IV. ESTIMATED COSTS OF IMPROVEMENTS				
A. Capital Costs to Meet Current Demand				
B. Capital Costs to Serve New Growth		State/Tx Turnpike -	$4.77B	
		City/County -	2.33B	
		Projects Not Listed	1.59B	
			8.69B	
C. Capital Costs to Meet Planned Improvements	CITRAN - 20 yr funding requirements MITS - 20 yr plan Transportation Services Info. Center	Highway	$1,897,301,000	
		Arterial	1,410,281,000	
		Public Transportation	271,466,000	
			3,579,048,000	
			96,720,000	(p 29)
			3,445,000	(p. 31
			6,021,000	(p. 33)
V. FUNDING RESOURCES				
A. Existing Funding	Local involvement through issuance of bonds are arterials and thoroughfares			
B. New Funding Potential	Estimated using past trends.	SDHPT	$576,000,000	
		Local Governments	527,000,000	
		(Private) Developers	146,000,000	
		UMTA (50%)	76,000,000	
			1,325,000,000	
C. Funding Needs (net-unfunded)		$2,254,048,000		

	Method/Role	DATA Historical/Current	Responsible Entity
VI. LIST OF PROJECTS			
A. Current			
B. Future	136 Highway projects Arterial Public Transportation	Location, Limits, Description, Cost (pps 4-11) Location, type of work, length, jurisdiction (pps 12-22) Name/Location, type of work, cost (pps. 23-24) Appendix A - SDHPT and Public Transportation projects w/cost (pps 25-27) Appendix F - (p 37) gives road classification system	
VII. COOPERATING PUBLIC AGENCIES	City of Ft. Worth, Tarrant County, other municipalities in county		
VIII. PRIVATE SECTOR PARTICIPANTS	Fort Worth Chamber of Commerce		

AREA: San Antonio

SOURCE: MPO/AACOG/VIA

PLAN: Long-Range Transportation Plan: Public Trans. Element

TYPE: Long Range (Yr 2000)

	Method/Role	DATA Historical/Current	Responsible Entity
I. EXISTING CONDITIONS			
A. Development of Freeway and Thoroughfare System			
B. Travel Demand and Supply	1969 Origin - Destination Study, 1969, San Antonio, SDHPT, Land use and development studied from 1950 Source: City of San Antonio	Table II-1, p.21-1977 Land Use in acres by type and area Table III-4, p. 51-54 Sevice required for year 2000 peak load by corridor and line Table IV-3 Forecasted and Potential Transit trips for each alternative p. 76.	
C. Trends in Travel Times			
D. Historical Growth Characteristics			
1. Demographic data	Population source: City of San Antonio Employment for County	1978 - 816,000 San Antonio 1977 - 936,000 Bexar Co. 1977 - 319,000	
2. Transportation data	o VIA provided trip info on exisiting transit services, travel patterns and projected operating costs. o Vehicle miles of travel/day for San Antonio SMSA o Total peak passenger trips, peak passengers per bus - taken at peak time 7-8 am.	1977 - 15,531,600	
E. Projected Growth Characteristics		Table IV-VIA Transit Stats p. 72A passengers, lines, service area, operating cost, revenues, buses for '79-'80	

	Method/Role	DATA Historical/Current	Responsible Entity
1. Demographic data	Pop and socioeconomic variables developed to year 2000, based on 1977 growth sketch *Demographic employment and income projections provided by City Dept. of Planning *Employment for County (TEC - Source)	Yr 2000 San Antonio - 1,070,200 Bexas Co. - 1,198,300 City of San Antonio Planning Dept. 1977-418,000	
2. Transportation data	*Year 2000 travel patterns derived from forecast data based on the 1969 Origin-Destination Study. *Travel demand forecasts based on data in Growth Sketches for San Antonio, prepared by the city *City of San Antonio projected year 2000 parking availability *Passenger demand based on Mode Split Model-Wilbur Smith & Assoc (1977)	1969 = 2.3 M person trips/day 2000 = 5.8 M person trips/day Table III -1, p. 40 - Transit Trips Comparison 1969 and 2000 by trip purpose Table III-2, p. 41 Comparison of year 2000 and 1969 person trips by trip purpose and car ownership	
II. GOALS, OBJECTIVES, AND CRITERIA FOR PLAN			
A. Statement of Goals and Objectives *Predict overall travel patterns to year 2000 and develop system to respond to need. Relieve congestion on streets and increase public patronage	Goals to guide local planning process: 1)Transporation should serve all people in the area 2)People-goods should be transported with maximum safety, efficiency, and conservation of resources. 3)Maintain and strengthen transportation modal choices and approached w/in frame of Master Plan. 4)Transportation planning must be comprehensive and approached within frame of Master Plan.	*To create a set of transit service alternatives, analyze their performance and select a preferred alternative for Year 2000	
B. Criteria to Evaluate Projects *The results of computer modelling of the alternatives yielded transit patronage data, vehicle requirements , etc., used to evaluate the features of each alternative transit system	*Current 1978 highway and transit networks were analyzed to determine whether they could accurately serve year 2000 demands *Modal split used to determine # of transit vs. auto users. *Deficiency "analysis" used to illustrate where transit service deficiencies would exist in year 2000. (do nothing)		
C. Interdependence and Role of Transportation System's Components	To determine optimum mix of highway and transit facilities to accomodate travel patterns: 1)Observe travel patterns and correlate w/ observed land use information and socio-economic charts of population (see D. 1 & 2)		

	Method/Role	DATA Historical/Current	Responsible Entity
III. FACILITY IMPROVEMENTS PLANS			
A. Improvements Needed to Meet Today's Demand			
B. Improvements Needed to Serve New Growth (mandated plans)	Determined with/demographic and growth projections to project year 2000 travel patterns by trip origin and destination, trip purpose, and magnitude of travel demand.		
p 73-87 stats and narrative comparing the 4 alternatives by trips, passengers, rates and vehicle miles	4 Alternatives: I-Increase frequency with/current routes II-Expanded System - extend service beyond 410 loop III-Multi-Center System -short distance routes to activity centers IV-Major Corridor System - combine II & III preferred alternative	map on p. 65 representing Alternative II map on p. 67 representing Alternative III maps on p. 70-71 representing Alternative IV	
IV. ESTIMATED COSTS OF IMPROVEMENTS			
A. Capital Costs to Meet Current Demand			
B. Capital Costs to Serve New Growth			
C. Capital Costs to Meet Planned Improvements		Table IV -12A p. 84 Capital Costs of year 2000 Transit Alternatives in 1980 $	
V. FUNDING RESOURCES			
A. Existing Funding	User Fare, VIA levies a 1/2% sales tax in all jurisdictions that receive service, and the federal government provides funds to meet 80% of VIA's annual capital costs and 50% annual operating costs. The state provides from its Public Transporation Fund, an additional 13% of capital costs.	Table IV-12 P. 85 -Operating Costs and Rev Year 2000 for alternatives	
B. New Funding Potential			
C. Funding Needs (net-unfunded)			

	Method/Role	DATA Historical/Current	Responsible Entity
VI. LIST OF PROJECTS			
A. Current			
B. Future			
VII. COOPERATING PUBLIC AGENCIES	Alamo Area COG, VIA Metropolitan Transit, City of San Antonio, Bexar County, SDHPT Metropolitan Planning Organization		
VIII. PRIVATE SECTOR PARTICIPANTS	San Antonio Chamber of Commerce		

APPENDIX B

STATE BONDING TABLES

APPENDIX B

Bond Model Assumptions and Definitions

Assumptions

- Arbitrage was used according to IRS rules as follows:
  - bond proceeds invested for only three years
  - only capital portion of proceeds invested
  - debt reserve invested for life of bonds
- Projects would take 15 years to complete.
- Two drawdown schedules:
  - Flat rate - equal amounts each year
  - Peak rate - binomial distribution as follows

Drawdown Ratios	% of Total Costs	PLOT
.012987541	1	*
.031548436	3	***
.058372743	5	*****
.073395203	7	*******
.082781592	8	********
.069941520	6	******
.041782354	4	****
.040087296	4	****
.053923214	5	*****
.080599203	8	********
.102253581	10	**********
.12	12	************
.1	10	**********
.085	8	********
.047327316	4	****

- Debt reserve equals one yearly bond payment.
- Coverage ratio is 1.3.
- Private market interest rate is 12% (.12).
- Two public interest rates 10% and 11% (.1 and .11).
- Three bond terms -- 20, 25, and 30 years.
- Equal annual interest and principal payments on an amortized schedule.
- An annual revenue stream of 682,000,000.

Definitions

1) Yearly Bond Payment (interest + principal) = Coverage Rate x Available Revenue Stream

2) Total Bond Amount $= \dfrac{\text{Yearly Bond Payment}}{\dfrac{(1 + \text{Interest Rate})^{\text{Term}}}{(1 + \text{Interest Rate})^{\text{Term}} - 1}}$

3) Total Interest $= (\text{Interest Rate} \times \text{Bond Amount}) + \sum_{N=2 \text{ to Term}} (\text{Interest Rate} \times \text{Balance}_{N=1})$

4a) $\text{Balance}_{N=1} = \text{Bond Amount} - [\text{Yearly Payment} - (\text{Bond Amount} \times \text{Interest Rate})]$

4b) $\text{Balance}_{N=2 \text{ to Term}} = \text{Balance}_{N=1} - [\text{Yearly Payment} - (\text{Balance} \times \text{Interest Rate}_{N=1})]$

5) Total Interest Earned (with arbitrage) $= \sum_{N = 1 \text{ to Term}} (\text{Private Interest} \times \text{Debt Reserve}_N) + \sum_{N=1 \text{ to } 3} (\text{Bond Amount} - \sum_{X=1 \text{ to } N} \text{Project Drawdown}_X) \times \text{Private Interest}$

6) Net Interest = Total Interest Paid - Total Interest Earned

7) Capitalization Ratio $= \dfrac{\text{Bond Amount}}{\text{Bond Amount} + \text{Net Interest}}$

where,

Term is last year of bond life;

N an X are year in bond life.

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	2952
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8697
Interest Rate % >>>>	11	Net Interest Paid >>>>	5745
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.43
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4418		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	1

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	486	39	4380	295	4124	525	558
1984	525	482	43	4337	295	3829	525	522
1985	525	477	48	4289	295	3535	525	487
1986	525	472	53	4236	295	3240	525	63
1987	525	466	59	4178	295	2945	525	63
1988	525	460	65	4113	295	2651	525	63
1989	525	452	72	4040	295	2356	525	63
1990	525	444	80	3960	295	2062	525	63
1991	525	436	89	3871	295	1767	525	63
1992	525	426	99	3772	295	1473	525	63
1993	525	415	110	3663	295	1178	525	63
1994	525	403	122	3541	295	884	525	63
1995	525	390	135	3406	295	589	525	63
1996	525	375	150	3256	295	295	525	63
1997	525	358	166	3090	295	0	525	63
1998	525	340	185	2905	0	0	525	63
1999	525	320	205	2700	0	0	525	63
2000	525	297	228	2472	0	0	525	63
2001	525	272	253	2219	0	0	525	63
2002	525	244	280	1939	0	0	525	63
2003	525	213	311	1628	0	0	525	63
2004	525	179	346	1282	0	0	525	63
2005	525	141	384	898	0	0	525	63
2006	525	99	426	473	0	0	525	63
2007	525	52	473	0	0	0	525	63
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8697	4418	0	4418			2952

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3079
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8697
Interest Rate % >>>>	11	Net Interest Paid >>>>	5618
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.44
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4418		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	486	39	4380	57	4361	525	586
1984	525	482	43	4337	139	4221	525	570
1985	525	477	48	4289	258	3964	525	539
1986	525	472	53	4236	324	3639	525	63
1987	525	466	59	4178	366	3273	525	63
1988	525	460	65	4113	309	2964	525	63
1989	525	452	72	4040	185	2780	525	63
1990	525	444	80	3960	177	2603	525	63
1991	525	436	89	3871	238	2365	525	63
1992	525	426	99	3772	356	2008	525	63
1993	525	415	110	3663	452	1557	525	63
1994	525	403	122	3541	530	1026	525	63
1995	525	390	135	3406	442	585	525	63
1996	525	375	150	3256	376	209	525	63
1997	525	358	166	3090	209	0	525	63
1998	525	340	185	2905	0	0	525	63
1999	525	320	205	2700	0	0	525	63
2000	525	297	228	2472	0	0	525	63
2001	525	272	253	2219	0	0	525	63
2002	525	244	280	1939	0	0	525	63
2003	525	213	311	1628	0	0	525	63
2004	525	179	346	1282	0	0	525	63
2005	525	141	384	898	0	0	525	63
2006	525	99	426	473	0	0	525	63
2007	525	52	473	0	0	0	525	63
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8697	4418	0	4418			3079

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6315
Interest Rate % >>>>	11	Net Interest Paid >>>>	6315
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.40
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4178		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	460	65	4113	279	3899	525	0
1984	525	452	72	4040	279	3621	525	0
1985	525	444	80	3960	279	3342	525	0
1986	525	436	89	3871	279	3064	525	0
1987	525	426	99	3772	279	2785	525	0
1988	525	415	110	3663	279	2507	525	0
1989	525	403	122	3541	279	2228	525	0
1990	525	390	135	3406	279	1950	525	0
1991	525	375	150	3256	279	1671	525	0
1992	525	358	166	3090	279	1393	525	0
1993	525	340	185	2905	279	1114	525	0
1994	525	320	205	2700	279	836	525	0
1995	525	297	228	2472	279	557	525	0
1996	525	272	253	2219	279	279	525	0
1997	525	244	280	1939	279	0	525	0
1998	525	213	311	1628	0	0	525	0
1999	525	179	346	1282	0	0	525	0
2000	525	141	384	898	0	0	525	0
2001	525	99	426	473	0	0	525	0
2002	525	52	473	0	0	0	525	0
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6315	4178	0	4178			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6315
Interest Rate % >>>>	11	Net Interest Paid >>>>	6315
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.40
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4178		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	460	65	4113	54	4123	525	0
1984	525	452	72	4040	132	3992	525	0
1985	525	444	80	3960	244	3748	525	0
1986	525	436	89	3871	307	3441	525	0
1987	525	426	99	3772	346	3095	525	0
1988	525	415	110	3663	292	2803	525	0
1989	525	403	122	3541	175	2629	525	0
1990	525	390	135	3406	167	2461	525	0
1991	525	375	150	3256	225	2236	525	0
1992	525	358	166	3090	337	1899	525	0
1993	525	340	185	2905	427	1472	525	0
1994	525	320	205	2700	501	971	525	0
1995	525	297	228	2472	418	553	525	0
1996	525	272	253	2219	355	198	525	0
1997	525	244	280	1939	198	0	525	0
1998	525	213	311	1628	0	0	525	0
1999	525	179	346	1282	0	0	525	0
2000	525	141	384	898	0	0	525	0
2001	525	99	426	473	0	0	525	0
2002	525	52	473	0	0	0	525	0
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6315	4178	0	4178			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	2563
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6315
Interest Rate % >>>>	11	Net Interest Paid >>>>	3752
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.53
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4178		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	460	65	4113	279	3899	525	581
1984	525	452	72	4040	279	3621	525	497
1985	525	444	80	3960	279	3342	525	464
1986	525	436	89	3871	279	3064	525	63
1987	525	426	99	3772	279	2785	525	63
1988	525	415	110	3663	279	2507	525	63
1989	525	403	122	3541	279	2228	525	63
1990	525	390	135	3406	279	1950	525	63
1991	525	375	150	3256	279	1671	525	63
1992	525	358	166	3090	279	1393	525	63
1993	525	340	185	2905	279	1114	525	63
1994	525	320	205	2700	279	836	525	63
1995	525	297	228	2472	279	557	525	63
1996	525	272	253	2219	279	279	525	63
1997	525	244	280	1939	279	0	525	63
1998	525	213	311	1628	0	0	525	63
1999	525	179	346	1282	0	0	525	63
2000	525	141	384	898	0	0	525	63
2001	525	99	426	473	0	0	525	63
2002	525	52	473	0	0	0	525	63
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6315	4178	0	4178			2563

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	2488
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6315
Interest Rate % >>>>	11	Net Interest Paid >>>>	3632
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.58
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4178		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	460	65	4113	54	4123	525	558
1984	525	452	72	4040	132	3992	525	542
1985	525	444	80	3960	244	3748	525	513
1986	525	436	89	3871	307	3441	525	63
1987	525	426	99	3772	346	3095	525	63
1988	525	415	110	3663	292	2803	525	63
1989	525	403	122	3541	175	2629	525	63
1990	525	390	135	3406	167	2461	525	63
1991	525	375	150	3256	225	2236	525	63
1992	525	358	166	3090	337	1899	525	63
1993	525	340	185	2905	427	1472	525	63
1994	525	320	205	2700	501	971	525	63
1995	525	297	228	2472	418	553	525	63
1996	525	272	253	2219	355	198	525	63
1997	525	244	280	1939	198	0	525	63
1998	525	213	311	1628	0	0	525	63
1999	525	179	346	1282	0	0	525	63
2000	525	141	384	898	0	0	525	63
2001	525	99	426	473	0	0	525	63
2002	525	52	473	0	0	0	525	63
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6315	4178	0	4178			2488

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	10793
Interest Rate % >>>>	10	Net Interest Paid >>>>	10793
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.31
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4946		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	495	30	4915	330	4616	525	0
1984	525	492	33	4882	330	4286	525	0
1985	525	488	36	4846	330	3956	525	0
1986	525	485	40	4806	330	3627	525	0
1987	525	481	44	4762	330	3297	525	0
1988	525	476	48	4714	330	2967	525	0
1989	525	471	53	4660	330	2638	525	0
1990	525	466	59	4602	330	2308	525	0
1991	525	460	64	4537	330	1978	525	0
1992	525	454	71	4466	330	1649	525	0
1993	525	447	78	4388	330	1319	525	0
1994	525	439	86	4303	330	989	525	0
1995	525	430	94	4208	330	659	525	0
1996	525	421	104	4104	330	330	525	0
1997	525	410	114	3990	330	0	525	0
1998	525	399	126	3865	0	0	525	0
1999	525	386	138	3727	0	0	525	0
2000	525	373	152	3575	0	0	525	0
2001	525	357	167	3407	0	0	525	0
2002	525	341	184	3224	0	0	525	0
2003	525	322	202	3021	0	0	525	0
2004	525	302	222	2799	0	0	525	0
2005	525	280	245	2554	0	0	525	0
2006	525	255	269	2285	0	0	525	0
2007	525	228	296	1989	0	0	525	0
2008	525	199	326	1663	0	0	525	0
2009	525	166	358	1305	0	0	525	0
2010	525	130	394	910	0	0	525	0
2011	525	91	434	477	0	0	525	0
2012	525	48	477	0	0	0	525	0
Total	15738	10793	4946	0	4946			

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	10793
Interest Rate % >>>>	10	Net Interest Paid >>>>	10793
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.31
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4946		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	495	30	4915	64	4881	525	0
1984	525	492	33	4882	156	4725	525	0
1985	525	488	36	4846	289	4437	525	0
1986	525	485	40	4806	363	4074	525	0
1987	525	481	44	4762	409	3664	525	0
1988	525	476	48	4714	346	3318	525	0
1989	525	471	53	4660	207	3112	525	0
1990	525	466	59	4602	198	2913	525	0
1991	525	460	64	4537	267	2647	525	0
1992	525	454	71	4466	399	2248	525	0
1993	525	447	78	4388	506	1742	525	0
1994	525	439	86	4303	593	1149	525	0
1995	525	430	94	4208	495	654	525	0
1996	525	421	104	4104	420	234	525	0
1997	525	410	114	3990	234	0	525	0
1998	525	399	126	3865	0	0	525	0
1999	525	386	138	3727	0	0	525	0
2000	525	373	152	3575	0	0	525	0
2001	525	357	167	3407	0	0	525	0
2002	525	341	184	3224	0	0	525	0
2003	525	322	202	3021	0	0	525	0
2004	525	302	222	2799	0	0	525	0
2005	525	280	245	2554	0	0	525	0
2006	525	255	269	2285	0	0	525	0
2007	525	228	296	1989	0	0	525	0
2008	525	199	326	1663	0	0	525	0
2009	525	166	358	1305	0	0	525	0
2010	525	130	394	910	0	0	525	0
2011	525	91	434	477	0	0	525	0
2012	525	48	477	0	0	0	525	0
Total	15738	10793	4946	0	4946			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3432
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	10793
Interest Rate % >>>>	10	Net Interest Paid >>>>	7361
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.40
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4946		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	1

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	495	30	4915	330	4616	525	617
1984	525	492	33	4882	330	4286	525	577
1985	525	488	36	4846	330	3956	525	538
1986	525	485	40	4806	330	3627	525	63
1987	525	481	44	4762	330	3297	525	63
1988	525	476	48	4714	330	2967	525	63
1989	525	471	53	4660	330	2638	525	63
1990	525	466	59	4602	330	2308	525	63
1991	525	460	64	4537	330	1978	525	63
1992	525	454	71	4466	330	1649	525	63
1993	525	447	78	4388	330	1319	525	63
1994	525	439	86	4303	330	989	525	63
1995	525	430	94	4208	330	659	525	63
1996	525	421	104	4104	330	330	525	63
1997	525	410	114	3990	330	0	525	63
1998	525	399	126	3865	0	0	525	63
1999	525	386	138	3727	0	0	525	63
2000	525	373	152	3575	0	0	525	63
2001	525	357	167	3407	0	0	525	63
2002	525	341	184	3224	0	0	525	63
2003	525	322	202	3021	0	0	525	63
2004	525	302	222	2799	0	0	525	63
2005	525	280	245	2554	0	0	525	63
2006	525	255	269	2285	0	0	525	63
2007	525	228	296	1989	0	0	525	63
2008	525	199	326	1663	0	0	525	63
2009	525	166	358	1305	0	0	525	63
2010	525	130	394	910	0	0	525	63
2011	525	91	434	477	0	0	525	63
2012	525	48	477	0	0	0	525	63
Total	15738	10793	4946	0	4946			3432

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3574
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	10793
Interest Rate % >>>>	10	Net Interest Paid >>>>	7219
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.41
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4946		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	495	30	4915	64	4881	525	649
1984	525	492	33	4882	156	4725	525	630
1985	525	488	36	4846	289	4437	525	595
1986	525	485	40	4806	363	4074	525	63
1987	525	481	44	4762	409	3664	525	63
1988	525	476	48	4714	346	3318	525	63
1989	525	471	53	4660	207	3112	525	63
1990	525	466	59	4602	198	2913	525	63
1991	525	460	64	4537	267	2647	525	63
1992	525	454	71	4466	399	2248	525	63
1993	525	447	78	4388	506	1742	525	63
1994	525	439	86	4303	593	1149	525	63
1995	525	430	94	4208	495	654	525	63
1996	525	421	104	4104	420	234	525	63
1997	525	410	114	3990	234	0	525	63
1998	525	399	126	3865	0	0	525	63
1999	525	386	138	3727	0	0	525	63
2000	525	373	152	3575	0	0	525	63
2001	525	357	167	3407	0	0	525	63
2002	525	341	184	3224	0	0	525	63
2003	525	322	202	3021	0	0	525	63
2004	525	302	222	2799	0	0	525	63
2005	525	280	245	2554	0	0	525	63
2006	525	255	269	2285	0	0	525	63
2007	525	228	296	1989	0	0	525	63
2008	525	199	326	1663	0	0	525	63
2009	525	166	358	1305	0	0	525	63
2010	525	130	394	910	0	0	525	63
2011	525	91	434	477	0	0	525	63
2012	525	48	477	0	0	0	525	63
Total	15738	10793	4946	0	4946			3574

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8353
Interest Rate % >>>>	10	Net Interest Paid >>>>	8353
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.36
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4762		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	476	48	4714	317	4444	525	0
1984	525	471	53	4660	317	4127	525	0
1985	525	466	59	4602	317	3810	525	0
1986	525	460	64	4537	317	3492	525	0
1987	525	454	71	4466	317	3175	525	0
1988	525	447	78	4388	317	2857	525	0
1989	525	439	86	4303	317	2540	525	0
1990	525	430	94	4208	317	2222	525	0
1991	525	421	104	4104	317	1905	525	0
1992	525	410	114	3990	317	1587	525	0
1993	525	399	126	3865	317	1270	525	0
1994	525	386	138	3727	317	952	525	0
1995	525	373	152	3575	317	635	525	0
1996	525	357	167	3407	317	317	525	0
1997	525	341	184	3224	317	0	525	0
1998	525	322	202	3021	0	0	525	0
1999	525	302	222	2799	0	0	525	0
2000	525	280	245	2554	0	0	525	0
2001	525	255	269	2285	0	0	525	0
2002	525	228	296	1989	0	0	525	0
2003	525	199	326	1663	0	0	525	0
2004	525	166	358	1305	0	0	525	0
2005	525	130	394	910	0	0	525	0
2006	525	91	434	477	0	0	525	0
2007	525	48	477	0	0	0	525	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8353	4762	0	4762			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8353
Interest Rate % >>>>	10	Net Interest Paid >>>>	8353
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.36
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4762		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	476	48	4714	62	4700	525	0
1984	525	471	53	4660	150	4550	525	0
1985	525	466	59	4602	278	4272	525	0
1986	525	460	64	4537	350	3922	525	0
1987	525	454	71	4466	394	3528	525	0
1988	525	447	78	4388	333	3195	525	0
1989	525	439	86	4303	199	2996	525	0
1990	525	430	94	4208	191	2805	525	0
1991	525	421	104	4104	257	2549	525	0
1992	525	410	114	3990	384	2165	525	0
1993	525	399	126	3865	487	1678	525	0
1994	525	386	138	3727	571	1106	525	0
1995	525	373	152	3575	476	630	525	0
1996	525	357	167	3407	405	225	525	0
1997	525	341	184	3224	225	0	525	0
1998	525	322	202	3021	0	0	525	0
1999	525	302	222	2799	0	0	525	0
2000	525	280	245	2554	0	0	525	0
2001	525	255	269	2285	0	0	525	0
2002	525	228	296	1989	0	0	525	0
2003	525	199	326	1663	0	0	525	0
2004	525	166	358	1305	0	0	525	0
2005	525	130	394	910	0	0	525	0
2006	525	91	434	477	0	0	525	0
2007	525	48	477	0	0	0	525	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8353	4762	0	4762			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

D A T A		R E S U L T S	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3060
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8353
Interest Rate % >>>>	10	Net Interest Paid >>>>	5294
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.47
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4762		

F U N C T I O N S	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	476	48	4714	317	4444	525	596
1984	525	471	53	4660	317	4127	525	558
1985	525	466	59	4602	317	3810	525	520
1986	525	460	64	4537	317	3492	525	63
1987	525	454	71	4466	317	3175	525	63
1988	525	447	78	4388	317	2857	525	63
1989	525	439	86	4303	317	2540	525	63
1990	525	430	94	4208	317	2222	525	63
1991	525	421	104	4104	317	1905	525	63
1992	525	410	114	3990	317	1587	525	63
1993	525	399	126	3865	317	1270	525	63
1994	525	386	138	3727	317	952	525	63
1995	525	373	152	3575	317	635	525	63
1996	525	357	167	3407	317	317	525	63
1997	525	341	184	3224	317	0	525	63
1998	525	322	202	3021	0	0	525	63
1999	525	302	222	2799	0	0	525	63
2000	525	280	245	2554	0	0	525	63
2001	525	255	269	2285	0	0	525	63
2002	525	228	296	1989	0	0	525	63
2003	525	199	326	1663	0	0	525	63
2004	525	166	358	1305	0	0	525	63
2005	525	130	394	910	0	0	525	63
2006	525	91	434	477	0	0	525	63
2007	525	48	477	0	0	0	525	63
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8353	4762	0	4762			3060

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3196
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8353
Interest Rate % >>>>	10	Net Interest Paid >>>>	5157
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.48
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4762		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	476	48	4714	62	4700	525	627
1984	525	471	53	4660	150	4550	525	609
1985	525	466	59	4602	278	4272	525	576
1986	525	460	64	4537	350	3922	525	63
1987	525	454	71	4466	394	3528	525	63
1988	525	447	78	4388	333	3195	525	63
1989	525	439	86	4303	199	2996	525	63
1990	525	430	94	4208	191	2805	525	63
1991	525	421	104	4104	257	2549	525	63
1992	525	410	114	3990	384	2165	525	63
1993	525	399	126	3865	487	1678	525	63
1994	525	386	138	3727	571	1106	525	63
1995	525	373	152	3575	476	630	525	63
1996	525	357	167	3407	405	225	525	63
1997	525	341	184	3224	225	0	525	63
1998	525	322	202	3021	0	0	525	63
1999	525	302	222	2799	0	0	525	63
2000	525	280	245	2554	0	0	525	63
2001	525	255	269	2285	0	0	525	63
2002	525	228	296	1989	0	0	525	63
2003	525	199	326	1663	0	0	525	63
2004	525	166	358	1305	0	0	525	63
2005	525	130	394	910	0	0	525	63
2006	525	91	434	477	0	0	525	63
2007	525	48	477	0	0	0	525	63
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8353	4762	0	4762			3196

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(Million Dollars)

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6026
Interest Rate % >>>>	10	Net Interest Paid >>>>	6026
Term of Bond Issue (Yrs) >>>>	20	Capitalization Ratio >>>>	0.43
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4466		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	447	78	4388	298	4169	525	0
1984	525	439	86	4303	298	3871	525	0
1985	525	430	94	4208	298	3573	525	0
1986	525	421	104	4104	298	3275	525	0
1987	525	410	114	3990	298	2978	525	0
1988	525	399	126	3865	298	2680	525	0
1989	525	386	138	3727	298	2382	525	0
1990	525	373	152	3575	298	2084	525	0
1991	525	357	167	3407	298	1787	525	0
1992	525	341	184	3224	298	1489	525	0
1993	525	322	202	3021	298	1191	525	0
1994	525	302	222	2799	298	893	525	0
1995	525	280	245	2554	298	596	525	0
1996	525	255	269	2285	298	298	525	0
1997	525	228	296	1989	298	0	525	0
1998	525	199	326	1663	0	0	525	0
1999	525	166	358	1305	0	0	525	0
2000	525	130	394	910	0	0	525	0
2001	525	91	434	477	0	0	525	0
2002	525	48	477	0	0	0	525	0
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6026	4466	0	4466			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6026
Interest Rate % >>>>	10	Net Interest Paid >>>>	6026
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.43
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4466		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	447	78	4388	58	4408	525	0
1984	525	439	86	4303	141	4267	525	0
1985	525	430	94	4208	261	4007	525	0
1986	525	421	104	4104	328	3679	525	0
1987	525	410	114	3990	370	3309	525	0
1988	525	399	126	3865	312	2997	525	0
1989	525	386	138	3727	187	2810	525	0
1990	525	373	152	3575	179	2631	525	0
1991	525	357	167	3407	241	2390	525	0
1992	525	341	184	3224	360	2030	525	0
1993	525	322	202	3021	457	1574	525	0
1994	525	302	222	2799	536	1038	525	0
1995	525	280	245	2554	447	591	525	0
1996	525	255	269	2285	380	211	525	0
1997	525	228	296	1989	211	0	525	0
1998	525	199	326	1663	0	0	525	0
1999	525	166	358	1305	0	0	525	0
2000	525	130	394	910	0	0	525	0
2001	525	91	434	477	0	0	525	0
2002	525	48	477	0	0	0	525	0
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6026	4466	0	4466			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	482		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	2653
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6026
Interest Rate % >>>>	10	Net Interest Paid >>>>	3373
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.57
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4466		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbirtage 0-NO 1-YES >>>>	1

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	447	78	4388	298	4169	525	563
1984	525	439	86	4303	298	3871	525	527
1985	525	430	94	4209	298	3573	525	492
1986	525	421	104	4104	298	3275	525	63
1987	525	410	114	3990	298	2978	525	63
1988	525	399	126	3865	298	2680	525	63
1989	525	386	138	3727	298	2382	525	63
1990	525	373	152	3575	298	2084	525	63
1991	525	357	167	3407	298	1787	525	63
1992	525	341	184	3224	298	1489	525	63
1993	525	322	202	3021	298	1191	525	63
1994	525	302	222	2799	298	893	525	63
1995	525	280	245	2554	298	596	525	63
1996	525	255	269	2285	298	298	525	63
1997	525	228	296	1989	298	0	525	63
1998	525	199	326	1663	0	0	525	63
1999	525	166	358	1305	0	0	525	63
2000	525	130	394	910	0	0	525	63
2001	525	91	434	477	0	0	525	63
2002	525	48	477	0	0	0	525	63
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6026	4466	0	4466			2653

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	2781
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	6026
Interest Rate % >>>>	10	Net Interest Paid >>>>	3245
Term of Bond Issue Yrs >>>>	20	Capitalization Ratio >>>>	0.58
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4466		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	447	78	4388	58	4408	525	592
1984	525	439	86	4303	141	4267	525	575
1985	525	430	94	4208	261	4007	525	544
1986	525	421	104	4104	328	3679	525	63
1987	525	410	114	3990	370	3309	525	63
1988	525	399	126	3865	312	2997	525	63
1989	525	386	138	3727	187	2810	525	63
1990	525	373	152	3575	179	2631	525	63
1991	525	357	167	3407	241	2390	525	63
1992	525	341	184	3224	360	2030	525	63
1993	525	322	202	3021	457	1574	525	63
1994	525	302	222	2799	536	1038	525	63
1995	525	280	245	2554	447	591	525	63
1996	525	255	269	2285	380	211	525	63
1997	525	228	296	1989	211	0	525	63
1998	525	199	326	1663	0	0	525	63
1999	525	166	358	1305	0	0	525	63
2000	525	130	394	910	0	0	525	63
2001	525	91	434	477	0	0	525	63
2002	525	48	477	0	0	0	525	63
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	10492	6026	4466	0	4466			2781

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

D A T A		R E S U L T S	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	11178
Interest Rate % >>>>	11	Net Interest Paid >>>>	11178
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.29
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4561		

F U N C T I O N S	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	502	23	4538	304	4257	525	0
1984	525	499	25	4513	304	3953	525	0
1985	525	496	28	4484	304	3649	525	0
1986	525	493	31	4453	304	3345	525	0
1987	525	490	35	4418	304	3041	525	0
1988	525	486	39	4380	304	2737	525	0
1989	525	482	43	4337	304	2432	525	0
1990	525	477	48	4289	304	2128	525	0
1991	525	472	53	4236	304	1824	525	0
1992	525	466	59	4178	304	1520	525	0
1993	525	460	65	4113	304	1216	525	0
1994	525	452	72	4040	304	912	525	0
1995	525	444	80	3960	304	608	525	0
1996	525	436	89	3871	304	304	525	0
1997	525	426	99	3772	304	0	525	0
1998	525	415	110	3663	0	0	525	0
1999	525	403	122	3541	0	0	525	0
2000	525	390	135	3406	0	0	525	0
2001	525	375	150	3256	0	0	525	0
2002	525	358	166	3090	0	0	525	0
2003	525	340	185	2905	0	0	525	0
2004	525	320	205	2700	0	0	525	0
2005	525	297	228	2472	0	0	525	0
2006	525	272	253	2219	0	0	525	0
2007	525	244	280	1939	0	0	525	0
2008	525	213	311	1628	0	0	525	0
2009	525	179	346	1282	0	0	525	0
2010	525	141	384	898	0	0	525	0
2011	525	99	426	473	0	0	525	0
2012	525	52	473	0	0	0	525	0
Total	15738	11178	4561	0	4561			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	11178
Interest Rate % >>>>	11	Net Interest Paid >>>>	11178
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.29
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4561		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	502	23	4538	59	4502	525	0
1984	525	499	25	4513	144	4358	525	0
1985	525	496	28	4484	266	4092	525	0
1986	525	493	31	4453	335	3757	525	0
1987	525	490	35	4418	378	3379	525	0
1988	525	486	39	4380	319	3060	525	0
1989	525	482	43	4337	191	2870	525	0
1990	525	477	48	4289	183	2687	525	0
1991	525	472	53	4236	246	2441	525	0
1992	525	466	59	4178	368	2073	525	0
1993	525	460	65	4113	466	1607	525	0
1994	525	452	72	4040	547	1060	525	0
1995	525	444	80	3960	456	604	525	0
1996	525	436	89	3871	388	216	525	0
1997	525	426	99	3772	216	0	525	0
1998	525	415	110	3663	0	0	525	0
1999	525	403	122	3541	0	0	525	0
2000	525	390	135	3406	0	0	525	0
2001	525	375	150	3256	0	0	525	0
2002	525	358	166	3090	0	0	525	0
2003	525	340	185	2905	0	0	525	0
2004	525	320	205	2700	0	0	525	0
2005	525	297	228	2472	0	0	525	0
2006	525	272	253	2219	0	0	525	0
2007	525	244	280	1939	0	0	525	0
2008	525	213	311	1628	0	0	525	0
2009	525	179	346	1282	0	0	525	0
2010	525	141	384	898	0	0	525	0
2011	525	99	426	473	0	0	525	0
2012	525	52	473	0	0	0	525	0
Total	15738	11178	4561	0	4561			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3312
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	11178
Interest Rate % >>>>	11	Net Interest Paid >>>>	7866
Term of Bond Issue Yrs >>>>	30	Capitalization Ratio >>>>	0.37
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4561		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	1

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	502	23	4538	304	4257	525	574
1984	525	499	25	4513	304	3953	525	537
1985	525	496	28	4484	304	3649	525	501
1986	525	493	31	4453	304	3345	525	63
1987	525	490	35	4418	304	3041	525	63
1988	525	486	39	4380	304	2737	525	63
1989	525	482	43	4337	304	2432	525	63
1990	525	477	48	4289	304	2128	525	63
1991	525	472	53	4236	304	1824	525	63
1992	525	466	59	4178	304	1520	525	63
1993	525	460	65	4113	304	1216	525	63
1994	525	452	72	4040	304	912	525	63
1995	525	444	80	3960	304	608	525	63
1996	525	436	89	3871	304	304	525	63
1997	525	426	99	3772	304	0	525	63
1998	525	415	110	3663	0	0	525	63
1999	525	403	122	3541	0	0	525	63
2000	525	390	135	3406	0	0	525	63
2001	525	375	150	3256	0	0	525	63
2002	525	358	166	3090	0	0	525	63
2003	525	340	185	2905	0	0	525	63
2004	525	320	205	2700	0	0	525	63
2005	525	297	228	2472	0	0	525	63
2006	525	272	253	2219	0	0	525	63
2007	525	244	280	1939	0	0	525	63
2008	525	213	311	1628	0	0	525	63
2009	525	179	346	1282	0	0	525	63
2010	525	141	384	898	0	0	525	63
2011	525	99	426	473	0	0	525	63
2012	525	52	473	0	0	0	525	63
Total	15738	11178	4561	0	4561			3312

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS
(Million Dollars)

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	3443
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	11178
Interest Rate % >>>>	11	Net Interest Paid >>>>	7735
Term of Bond Issue (Yrs) >>>>	30	Capitalization Ratio >>>>	0.37
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4561		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	1

	DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	502	23	4538	59	4502	525	603
1984	525	499	25	4513	144	4358	525	586
1985	525	496	28	4484	266	4092	525	554
1986	525	493	31	4453	335	3757	525	63
1987	525	490	35	4418	378	3379	525	63
1988	525	486	39	4380	319	3060	525	63
1989	525	482	43	4337	191	2870	525	63
1990	525	477	48	4289	183	2687	525	63
1991	525	472	53	4236	246	2441	525	63
1992	525	466	59	4178	368	2073	525	63
1993	525	460	65	4113	466	1607	525	63
1994	525	452	72	4040	547	1060	525	63
1995	525	444	80	3960	456	604	525	63
1996	525	436	89	3871	388	216	525	63
1997	525	426	99	3772	216	0	525	63
1998	525	415	110	3663	0	0	525	63
1999	525	403	122	3541	0	0	525	63
2000	525	390	135	3406	0	0	525	63
2001	525	375	150	3256	0	0	525	63
2002	525	358	166	3090	0	0	525	63
2003	525	340	185	2905	0	0	525	63
2004	525	320	205	2700	0	0	525	63
2005	525	297	228	2472	0	0	525	63
2006	525	272	253	2219	0	0	525	63
2007	525	244	280	1939	0	0	525	63
2008	525	213	311	1628	0	0	525	63
2009	525	179	346	1282	0	0	525	63
2010	525	141	384	898	0	0	525	63
2011	525	99	426	473	0	0	525	63
2012	525	52	473	0	0	0	525	63
Total	15738	11178	4561	0	4561			3443

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

DATA		RESULTS	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8697
Interest Rate % >>>>	11	Net Interest Paid >>>>	8697
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.34
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4418		

FUNCTIONS	
Drawdown 0-flat 1-Peak >>>>	0
Use Arbitrage 0-NO 1-YES >>>>	0

		DEBT SERVICE			BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	486	39	4380	295	4124	525	0
1984	525	482	43	4337	295	3829	525	0
1985	525	477	48	4289	295	3535	525	0
1986	525	472	53	4236	295	3240	525	0
1987	525	466	59	4178	295	2945	525	0
1988	525	460	65	4113	295	2651	525	0
1989	525	452	72	4040	295	2356	525	0
1990	525	444	80	3960	295	2062	525	0
1991	525	436	89	3871	295	1767	525	0
1992	525	426	99	3772	295	1473	525	0
1993	525	415	110	3663	295	1178	525	0
1994	525	403	122	3541	295	884	525	0
1995	525	390	135	3406	295	589	525	0
1996	525	375	150	3256	295	295	525	0
1997	525	358	166	3090	295	0	525	0
1998	525	340	185	2905	0	0	525	0
1999	525	320	205	2700	0	0	525	0
2000	525	297	228	2472	0	0	525	0
2001	525	272	253	2219	0	0	525	0
2002	525	244	280	1939	0	0	525	0
2003	525	213	311	1628	0	0	525	0
2004	525	179	346	1282	0	0	525	0
2005	525	141	384	898	0	0	525	0
2006	525	99	426	473	0	0	525	0
2007	525	52	473	0	0	0	525	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8697	4418	0	4413			0

STATE BONDING ANALYSIS
FOR STATE HIGHWAY IMPROVEMENT FUNDS

D A T A		R E S U L T S	
Available Revenue Stream >>>>	682		
Coverage Rate >>>>	1.30	Total Interest Earned >>>>	0
Yearly Bond Payment >>>>	525	Total Interest Paid >>>>	8697
Interest Rate % >>>>	11	Net Interest Paid >>>>	8697
Term of Bond Issue Yrs >>>>	25	Capitalization Ratio >>>>	0.34
Private Interest Rate % >>>>	12		
Project Years >>>>	15		
Total Bond Amount >>>>	4418		

F U N C T I O N S	
Drawdown 0-flat 1-Peak >>>>	1
Use Arbitrage 0-NO 1-YES >>>>	0

	DEBT SERVICE				BOND PROCEEDS			
Year	Debt Service	Interest	Principal	Balance	Drawdown	Project Balance	Debt Reserve	Arbitrage Interest
1983	525	486	39	4380	57	4361	525	0
1984	525	482	43	4337	139	4221	525	0
1985	525	477	48	4289	258	3964	525	0
1986	525	472	53	4236	324	3639	525	0
1987	525	466	59	4178	366	3273	525	0
1988	525	460	65	4113	309	2964	525	0
1989	525	452	72	4040	185	2780	525	0
1990	525	444	80	3960	177	2603	525	0
1991	525	436	89	3871	238	2365	525	0
1992	525	426	99	3772	356	2008	525	0
1993	525	415	110	3663	452	1557	525	0
1994	525	403	122	3541	530	1026	525	0
1995	525	390	135	3406	442	585	525	0
1996	525	375	150	3256	376	209	525	0
1997	525	358	166	3090	209	0	525	0
1998	525	340	185	2905	0	0	525	0
1999	525	320	205	2700	0	0	525	0
2000	525	297	228	2472	0	0	525	0
2001	525	272	253	2219	0	0	525	0
2002	525	244	280	1939	0	0	525	0
2003	525	213	311	1628	0	0	525	0
2004	525	179	346	1282	0	0	525	0
2005	525	141	384	898	0	0	525	0
2006	525	99	426	473	0	0	525	0
2007	525	52	473	0	0	0	525	0
2008	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0
Total	13115	8697	4418	0	4418			0

APPENDIX C

SUMMARY OF PROPOSED STATE LEGISLATION

APPENDIX C

SUMMARY OF PROPOSED STATE LEGISLATION
Related To Urban Highway/Public Transit Funding, 1983

HB 632 by Cain/SB 287 by Traeger

Key legislation introduced to increase the base level of highway funding. This legislation was supported by the Texas Good Roads Association, the Texas Municipal League, SDHPT, and many urban areas.

Legislation proposed an increase of the base highway cost index formula funds from $750 million (1979 dollars) to $1,250 million.

This legislation also proposed assistance to cities for city streets. An amount equivalent to 6% of state highway revenue would have been devoted for maintenance and "pothole" repair.

HB 632 was left as pending business in the House Committee on Transportation and its companion document SB 287 was not reported out of the Senate Committee on Finance.

HB 965 by Jackson

This bill provides authority to a commissioners court of a county to impose up to a $5 surcharge fee for motor vehicle registration. This law became effective August 29, 1983.

HB 1229 by Cain

This legislation introduced by Representative Cain relates to the service plan, fare, and service changes of a regional transportation authority in a metropolitan area. This bill specifically places controls on the Dallas Area Rapid Transit (DART) board regarding changes to the Dallas service plan after the August 1983 election.

Specific procedures are required to be followed where there is a "major change in the service plan," defined as follows:

- change in right-of-way location, width of right-of-way;
- changes in grade separation requirements;
- location of stations;
- alignment of guideway;
- changes in location of parking lots, maintenance facilities, transfer facilities; and
- the addition of these types of facilities.

Procedures which must be followed include:

- written notice of public hearing to all affected property owners, and to each governing body in which the change is to be located
- 20 day notice requirement by direct mail
- major change in the service plan requires a 2/3 vote of executive committee members who are present at the meeting
- after approval of the change, notice must be given to all parties mentioned above

After the Authority is created, a public hearing must be held (requires 30 day notice in a newspaper of general circulation before the day of hearing) when the following occurs:

- change in fare
- 25% change in route structure or a new transit route
- notice and full description of change must be posted in each transit vehicle serving affected routes at least two weeks prior to date of hearing

This bill became effective on May 24, 1983.

HB 1628 by Cain

This piece of legislation relates to the eligibility for participation in the discretionary program of the public transportation fund. It provides that rural and urban areas of the state not already eligible for participation in the formula program be eligible for participation in the discretionary program and be given priority by the commission in the allocation of funds. Any local government having the power to operate or maintain a public transportation system may be a designated recipient of funds from the discretionary program. In designating the recipients of funds, the commission would give priority consideration to rural and urban areas of the state other than those already eligible for participation in the discretionary program.

No action was taken on this bill.

HB 1967 by Emmett

Introduced by Representative Emmett this legislation relates to the designation of county roads as farm-to-market roads. It would allow SDHPT to designate any county road in the state as a farm-to-market road for purposes of acquisition of rights-of-way, construction, reconstruction, and maintenance provided that the Commissioners Court in the county of that road waive any rights that county may have for participation by the state in any debts incurred by the county in the construction of such

county road. The SDHPT Commission and the Commissioners Court of the county in which such a road is located would enter into a contract that would set forth the duties of the state in the maintenance and construction and would relinquish any and all claims for state participation in any road bonds, warrants, or other debts outstanding against such road for construction or improvement before being designated by the SDHPT Commission.

*This bill was vetoed by Governor on grounds that channelling of funds for right-of-way would decrease available funds for construction/maintenance.

SB 369 by Williams

This bill would require the State (SDHPT) to pay 100% of the cost of right-of-way up front. Counties would then reimburse State for their 10% share.

The bill passed both houses and was then vetoed by the Governor on grounds that permitting a city/county to bind the state by contract is a dangerous delegation of authority.

SB 549 by Truan

This legislation relates to areas in which rapid transit authorities may be created. It lowers population minimum for creation of a rapid transit authority to include the city of Corpus Christi.

Bill became law August 29, 1983.

SB 763 by Parker/Hall

Allows public school districts to contract with private industry transportation carriers for transporting students. (Note: UMTA limits ability of subsidized public transit carriers to carry school children.)

Became effective August 29, 1983.

SB 969 by Henderson/HB 1653 by El Franco Lee

Provides the authority of certain counties (population over 2 million) to contract for highway improvement and to assess the cost to property owners benefitted by the improvement.

- definition of property and (owners) benefitted is very broad
- includes all property where market value is enhanced due to highway improvements within 1,000 feet
- county may unilaterally improve the highway and assess all or part of the cost against properties benefitted (within the county)

- county must prepare an estimate of improvement costs prior to initiating any assessment to property owners; county may not assess over 100% of actual cost of improvements
- owners of the property may be personally liable for any assessment in connection with the property; county may enforce its authority by issuing a lien against the property and owner and, if necessary, sell the property to satisfy the lien
- public hearing and public notice is required to allow property owners to present evidence against any proposed assessment
- the determination by Commissioners Court may be appealed to District Court

Bill became effective June 17, 1983.

APPENDIX D

REFERENCES

REFERENCES

Alamo Area Council of Governments and VIA Metropolitan Transit. San Antonio Bexar County Long Range Transportation Plan - Public Transportation Element. Transportation Department. Sponsored by the Metropolitan Planning Organization. August, 1981.

Anderson, Lynn F. "Financing County Roads in Texas: An Overview of Existing Resources and Their Future Potential." Prepared for Houston Galveston Area Council. May 11, 1981.

Austin Transportation Study. 1982-83 Annual Element of the 1982-87 Transportation Improvement Program for the Austin Urbanized Area and Travis County. Developed by City of Austin, County of Travis, and State Department of Highways and Public Transportation. Adopted June 18, 1979.

Austin Transportation Study. Long Range Transportation Plan for Austin/Travis County. Austin, Texas. September 1979.

Austin, City of. Austin Bikeway Plan. Urban Transportation Department. Adopted October, 1980.

Austin, City of. Austin Pedestrian Plan. Urban Transportation Department, October, 1978.

Austin, City of. Energy Contingency Plan for the Austin Transit System. September, 1979.

Austin, City of. Final Report Metropolitan Transit Authority Task Force. February 9, 1983.

Austin, City of. Public Transportation Plan. Urban Transportation Department. June, 1977.

Austin, City of. Tranportation Systems Management Plan. Urban Transportation Department. January 1980.

Austin, City of. Urban Transportation System For The Mobilty Impaired. Urban Transportation Department. June, 1979.

Austin, City of. Austin Metropolitan Area Roadway Plan. Adopted October, 1980.

Dallas Area Rapid Transit. Final Service Plan and Supporting Documentation. Adopted April 14, 1983.

Dallas Transit System. "Dallas Transit System at Your Finger Tips". Dallas, Texas.

Dallas Transit System. "Dallas Transit System Operating Data". Dallas, Texas. March, 1983.

Dallas Transit System. "Dallas Transit System Operating Budget 1982-1983".

Engineers of the Southwest. Regional Airport Airspace System Plan. Houston Galveston Area Council. November 1981.

Fort Worth Chamber of Commerce, City of Fort Worth, and Tarrant County. Tarrant County 2000 - A Total Transportation Plan. Presented to the State Department of Highways and Public Transportation, Austin, Texas. May 27, 1982.

Fort Worth, City of. Executive Summary - Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee. November 1981.

Fort Worth, City of. Funding Public Transportation in the City of Fort Worth. Public Transportation Advisory Committee. November 1981.

Gulf Coast State Planning Region. 1981 Transportation Planning Unified Work Program. Policy Advisory Committee for Multimodal Transportation Planning. January 1981.

Greater Dallas Coalition for Improved Transportation. Greater Dallas Area Mobility Study. Presented to the State Department of Highways and Public Transportation. May 27, 1982.

Hamilton, Randy. "The World Turned Upside Down: The Contemporary Revolution in State and Local Government Capital Financing". Public Administration Review. January/February 1983.

Houston Chamber of Commerce. Getting Houston Moving Again: Regional Mobility Plan, A Summary. Transportation Committee. January 1982.

Houston Chamber of Commerce. Regional Mobility Plan For The Houston Area. Transportation Committee. February, 1982.

Houston Chamber of Commerce. Houston and Regional Mobility: Plans Into Action - The North Corridor and Hardy Road. Regional Mobility Plan, Technical Group of the Committee for Regional Mobility. July 1982.

Houston Galveston Area Council. Third Ward Transportation Study. Prepared in Cooperation with Urban Resources Center, Texas Southern University. April 1983.

Houston Galveston Area Council. 1981 Transportation Improvement Program for the Gulf Coast State Planning Region. Houston, Texas. November 1980.

Houston Galveston Area Council. 1983 Unified Planning Work Program - Transportation Planning - Gulf Coast State Planning Region. Houston, Texas.

Houston Galveston Area Council. Petroleum Shortage Preparedness Plan for the Houston Transporation System. Houston, Texas. August 1982.

Houston Galveston Area Council. 1982 Houston Central Business District Cordon Count. In cooperation with the City of Houston. January 1983.

Houston Transit Consultants. The Corridor Refinement Study - Summary Report. Prepared for Metropolitan Transit Authority of Harris County. September 1982.

McDonald Transit Associates, Inc. "Financial and Operating Report - September." Prepared for CITRAN City Transit Service of Fort Worth. October 1982.

Metropolitan Transit Authority of Harris County. Project Overview Proposed Dedicated Transitway (Barrier Protected) for I-10 Katy Freeway Houston, Texas. Transit Systems Development. September 1982.

Metropolitan Transit Authority of Harris County. Budget, Fiscal Year October 1, 1979 - September 30, 1980. Houston Texas. 1979.

Metropolitan Transit Authority of Harris County. Southwest/ Westpark Corridor Conventional Rail and Busway Preliminary Engineering, UMTA Section 3 Application. January 1981.

North Central Texas Council of Governments. Areawide Transportation System Management/Air Quality Study. Department of Transportation and Energy. July 1981.

North Central Texas Council of Governments. "Dallas-Fort Worth Urban Transportation Study Transportation Improvement Program (Highway Section)." 1983 Transportation Improvement Program for North Central Texas. Highway Technical Committee. 1982.

Parker, Jeffrey A. "Financing Public Transit: Recent Efforts to Enact Dedicated Revenue Sources - October, 1982 through March 31, 1983." UMTA Project #DC-06-0429 Final Report. April, 1983.

Parker, Jeffrey A. "Leveraging Federal Capital Assistance for Transit - Draft Interim Report." Prepared for UMTA Office of Policy. May 3, 1983.

Pershing, John. "The Principles of Toll Road Financing in the United States." International Road Federation, London, England. September 1966.

Regional Transportation Council Dallas-Fort Worth Region. Dallas North Central Subarea Transportation System Management and Air Quality Study - Volume 1: 1977 and 1990 Baseline System Evaluation. Technical Report Series 33. Transportation and Energy Department of the North Central Texas Council of Governments. July 1982.

Regional Transportation Council Dallas-Fort Worth Region. Dallas North Central Subarea Transportation System Management and Air Quality Study - Volume 2: Analysis of TSM/TCM Actions. Technical Report Series 34. Transportation and Energy Department of the North Central Texas Council of Governments. March 1982.

Regional Transportation Policy Advisory Committee. Executive Summary - The Total Transportation Plan for the North Central Texas Region for 1990. Steering Committee. Arlington, Texas. November 1974.

Regional Transportation Policy Advisory Committee. The Total Transportation Plan for the North Central Texas Region for 1990. Steering Committtee. Arlington, Texas. October 1974.

Rice Center. A Guide to Innovative Financing Mechanisms for Mass Transportation. Report prepared for Office of Planning Assistance, Urban Mass Transportation Administration, U.S. Department of Transportation, Washington D.C. DOT-1-82-53. December 1982.

Rice Center. An Evaluation of the Range of Financial Benefits Utilizing Innovative Financing Techniques for the Denver Light Rail Transit System. Report prepared for the Denver Regional Transportation District and the Urban Mass Transportation Administration, U.S.DOT. Houston, Texas. April 1983.

San Antonio-Bexar County Metropolitan Planning Organization. Downtown San Antonio Subarea Transportation Improvement Study. Prepared by the Department of Planning, City of San Antonio. November 1982.

San Antonio - Bexar County Metropolitan Planning Organization. San Antonio - Bexar County Long Range Transportation Plan. Plan Development Report No. 12-B. January, 1981.

San Antonio - Bexar County Metropolitan Planning Organization. "San Antonio - One Step Ahead: San Antonio - Bexar County Transportation Needs Through the Year 2000". Presentation made by the Chairman of the MPO. Undated.

San Antonio, City of. Major Thoroughfare Plan. Adopted by Planning Commission on July 12, 1978 Resolution No. 78-07-02, and by San Antonio City Council on September 21, 1978 Ordinance No. 49818.

Schimpeler-Corradino Associates and Fleet Maintenance Consultants, Inc. Facilities Study and Capital Needs Forecast Final Report . Prepared for Dallas Transit System and North Central Texas Council of Governments. March, 1982.

Tarrant County Planning Dept. and Fort Worth Planning Dept. Tarrant County Year 2000 Transportation Plan. May 1982.

Texas Advisory Commission on Intergovernmental Relations. Handbook of Governments in Texas. Austin Texas. March 1973, revised.

Texas Comptroller's Office. "Paying to Repair and Build Roads: Where to Get the Money?" Fiscal Notes, Issue 83:6. May 1983.

Texas Comptroller's Office. "Summary of the 1984-1985 Biennial Revenue Estimate." Report to 68th Legislature. January 1983.

Texas State Department of Highways and Public Transportation. Plans for Public Transportation in Texas. In cooperation with UMTA-DOT. November 1982.

Texas State Department of Highways and Public Transportation. Operational Planning Document Study. Management Information, Policy, and Research Division. July 1982.

Turner Collie and Braden Inc. Houston Overview. Business Development Department. March 1983.

U.S. Department of Transportation. Innovative Transit Financing. Office of the Secretary, Urban Mass Transportation Administration. February 1979.

U.S. Department of Transportation. Transit Financing: An Overview of the National Transit Financing Picture in Terms of Federal and State Funding Levels, Fare Structures and Local Revenue Sources. Office of the Secretary. DOT-P-30-80-34. October 1980.

Walther, Erskine S. State and Local Financing of Public Transit Systems - Executive Summary. Final Report - Project 1. The Transportation Institute, North Carolina A&T State University. U.S. Department of Transportation. June 1983.

Walther, Erskine S. State and Local Financing of Public Transit Systems. Final Report - Project 1. The Transportation Institute, North Carolina A&T State University. U.S. Department of Transportation. June 1983.

West Houston Association. "Association Presents West Houston Mobility Plan." Report to the Membership. Vol. 6, No.1.