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Tactical Plan...

An Operating Plan for Implementing Strategic Direction 1991-1995

Texas State
Department of Highways
and Public Transportation

June, 1990
Austin, Texas

FOREWORD

June 21, 1990

To the users of the transportation system:

This Tactical Plan presents the programs and thrusts that the State Highway and Public Transportation Commission and the State Department of Highways and Public Transportation will be emphasizing during the next five years. Many of these programs extend beyond this five year horizon. In all cases, there is a tradition of success surrounding these discrete elements that, collectively, comprise the transportation picture.

Past successes, as well as how successful we are in meeting the tremendous transportation needs during this five-year planning period, lie significantly with the 24 highway districts. Their day-to-day efforts and contributions that achieved the highway system that exists today will serve as a springboard for meeting the many complexities of the future. Districts, divisions, the administration, and the commission--working together, following this plan and applying our stated values of quality, integrity, and mutual respect--will continue to serve Texas and the nation at higher levels each year.

We, the Commissioners and the Engineer-Director, approve this Tactical Plan as a vehicle for adhering to our strategic direction and attaining our strategic goals.

Respectfully,

Robert H. Dedman, Chairman

Ray Stoker, Jr., Member

Wayne B. Duddlesten, Member

Arnold W. Oliver, P.E., Engineer-Director

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INTRODUCTION

The Tactical Plan

This Tactical Plan is a five year operating, or business, plan. It describes current major programs and areas of program emphasis, consistent with the strategic direction of the department and current funding levels. It is keenly focused on needs and the trade-offs required because of resource limitations. To illustrate, the 20-year requirements, or needs, identified in the department's 1989 Strategic Mobility Plan were $82.6 billion (1988 constant dollars), 63% of which could be met at current funding levels.

The Tactical Plan synthesizes a broad array of strategies, goals, objectives, and priorities. It is designed to help attain the mission of the department, which is to:

- provide a safe, economical, effective, and efficient highway transportation network for the people, commerce, and communities in Texas
- support economic development by providing transportation infrastructure
- assist political subdivisions in providing public transportation systems
- provide coordinated and customer-oriented vehicle registration and titling
- support the intracoastal waterway by providing the U.S. Corps of Engineers with adequate disposal sites for dredge materials.

More directly the plan is designed to:

- implement the strategic direction of the Strategic Plan
- provide focus and direction to the development of policies and programs
- serve as a basis for the development of the Legislative Appropriation Request and operating budgets
- give direction to such other planning endeavors as the management by objectives program at all operating levels.

Chapters 1, 2, 3, and 4 address the major programs and functions of the department in terms of:

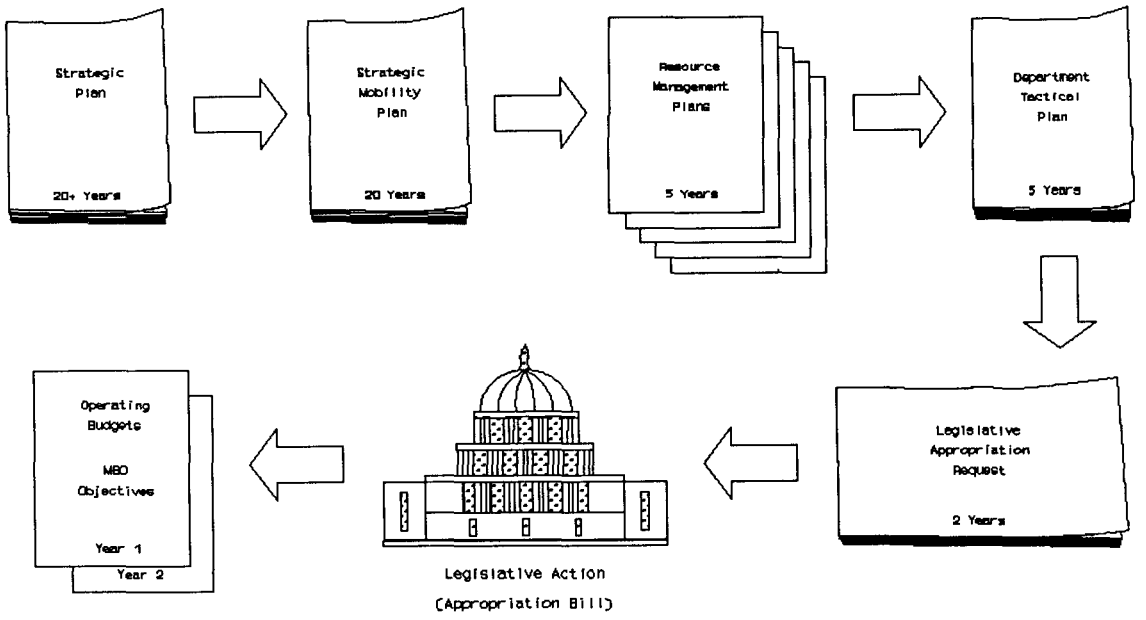
- strategic direction: statements of goals and strategies from the department's Strategic Plan.
- programs: brief description of existing programs or functions.
- program emphasis: the areas we plan to emphasize.

Integrated Planning Process

The Tactical Plan is the fourth element in the State Department of Highways and Public Transportation's integrated planning process. Figure 1 depicts this process.

INTRODUCTION

Figure 1



SDHPT Integrated Planning Process

The first component of integrated planning is the Strategic Plan. This plan, published in July, 1988, is a statement of the department's basic mission, values, goals, and strategies for responding to the transportation challenges during the years 1988-2008... and beyond.

The second component is the Strategic Mobility Plan which links the goals and strategies of the Strategic Plan to implementing programs and functions. Needs for a twenty year period (1990-2009) are identified, evaluated, validated and prioritized. This plan was last updated in February, 1989.

The third phase of the process involves resource management plans that identify specific projects and needs for such functional areas as construction project development, maintenance and highway system operations, automation, human resources, equipment, real property, and public transportation. These plans range from three to ten years in coverage and are completed at varying times during the planning cycle.

All three of the above efforts affect the development and content of the Tactical Plan. Conversely, the thinking, decisions, and dynamics that occur during tactical planning feed back to influence these other

plans. When the entire process is further augmented by the development of additional performance measures (which will measure plan attainment), higher levels of integrity will be added to the process.

Population, the Economy, and Infrastructure

One area noted in this Tactical Plan is the impact that infrastructure development has on the economy of the state. It is estimated that this impact is in the magnitude of approximately 25% of the gross state product. To further illustrate, the department's current construction budget of $1.4 billion per annum totals to a five year expenditure of $7.0 billion. Since each one million dollars of highway expenditures creates 23.7 jobs, highway construction at this level will provide 165,900 jobs in the Texas economy during this five year planning period. A sizeable body of literature developed over the past decade points to infrastructure investment giving the optimum return on investment among the choices the public sector makes.

The following trends and facts regarding population, economics, and the role of infrastructure development influence, and are influenced by, this plan. Dollar figures are in constant 1989 dollars. Some of the data were taken from state agencies such as the Comptroller of Public Accounts and from recent publications such as David Aschauer's "Rx for Productivity: Build Infrastructure," published by the Federal Reserve Bank of Chicago in the September, 1988 issue of Chicago Fed Letter.

Population Trends

- The population of the state is expected to grow from 17,809,000 in 1990 to approximately 19,216,000 in 1995. This represents an overall annual population growth rate of approximately 1.50%, with a slightly higher rate in the urban areas. Overall state growth will be greater than that of the nation as a whole.

- Approximately 80% of the state's population will reside in one of the 49 counties classified as a metropolitan statistical area by the Census Bureau.

- The state can expect an annual net in-migration of 100,000 persons during this planning period.

- Texas' population growth will occur most rapidly in the minority communities. To some extent the state's economic well being may depend upon the development of educational and employment opportunities for these communities.

- Under all projected scenarios the state's population will be aging and increasingly centered around the middle age groups.

- As the work force grows older and more experienced, productivity and economic growth will expand.

- About 65% of the state's population is licensed to drive (11,657,669 people as of April, 1990). This number will approach 13 million, or 68%, of the

state's population by the end of this five-year planning period.

- The state can expect to gain three or four seats in Congress as a result of the 1990 census, as well as an increase in funding from those federal programs that use population as part of their funding formulas.

Economic Trends

- Projected department revenues are expected to be in the range of $2.8 billion per annum during the planning period.

- The price of oil is projected to rise slowly but steadily from about $18 to $25 a barrel during the planning period.

- Based on an eleven year average the state's ports can be expected to handle an average of 539 million tons of freight per year, generating approximately 13.5 million tractor-trailer truck trips.

- As of 1989 there were 661 maquiladoras (twin plants) in the Texas border region. That number is expected to increase by 20% per year during the planning period, for a total of about 2,000 plants by 1995.

- The overall rail share of the freight market is declining; however, the number of freight cars carrying piggy-back trailers or containers is growing dramatically.

- Because of the growth in population, the increase of maquiladoras, and the opening of new bridges and ports of entry, the number of trucks and automobiles crossing the Mexican border is increasing. This rise was from 560,000 and 33,000,000, respectively, in 1983 to approximately 704,000 and 36,000,000 in 1988.

- Significant traffic growth will be from suburb-to-suburb, as well as city-to-city and suburb-to-city.

- Texas' economy will become more sensitive to national economic fluctuations as the state becomes more economically interdependent with the nation and the world.

- Inflation is expected to range from a low of 4.8% in 1992 to a high of 5.9% in 1993.

- The real estate glut in Texas will be slowly absorbed and the number of housing permits issued will grow at an average annual rate of 3.8%. The retail activity of the state is expected to grow at an annual rate of 7.2%.

- Travel and tourism are becoming very important components of Texas' economy. This may be seen with the opening of Sea World, the development of projects such as Fiesta Texas and Spaceship Houston, and the growth of winter tourism in South Texas. The Comptroller's Office estimates that travel and tourism in 1990 account for approximately 5% of the state's gross product, or approximately 20 billion dollars.

The Relationship of Infrastructure Development to Economic Growth

- Nationally, for every one dollar of public spending on highways there is a $15 infusion of private capital.
- Many economists now view increases in per capita highway expenditures as the best cost-benefit investment that state government can make. Infrastructure investment is a better economic stimulus for attracting industry than reducing or eliminating taxes.
- For every $1 million dollars of highway work contracted, 23.7 jobs are created, with a four-to-one, long-term return to the economy.
- A one percent increase in public sector capital relative to private sector inputs of labor and capital results in a one-third of one percent rise in productivity.
- A recent survey of manufacturing plants showed that two of the three most important criteria for selecting new plant sites are transportation-related.
- A study of the return on investment in Virginia's interstate system resulted in a rate of 16.25%, and one in Texas showed that transportation infrastructure contributes to 25% of the state's gross product.
- At the recent El Camino Real conference, the conclusion in many of the presentations was that the most important determinant of growth in the Austin-San Antonio-Monterrey-Saltillo corridor is infrastructure development.

TEXAS AT A GLANCE

	1990	1995
Population	17,809,000	19,216,000
Daily Vehicle Miles Traveled On-System	292,997,000	336,066,000
Vehicles Registered	14,260,000	14,911,000
On-System Lane Miles	183,000	189,000
High Occupancy Vehicle Lane Miles	47	116
Intracoastal Barge Tonnage	74,000,000	76,000,000
Ferry Boats	9	10

THE HIGHWAY SYSTEM

Prelude

Many steps are required in developing, constructing, maintaining, and operating a quality highway system. A brief summary follows:

Planning entails working with a variety of individuals, businesses, communities, and government officials to try to reach a consensus regarding the location of a roadway, its features, environmental impacts, right-of-way needs, utility adjustments required, and costs of the entire project.

Design. Roadway designs are finalized based upon established design standards and what has transpired during the planning stage. Right-of-way is acquired, if necessary, and the project plans, specifications, and estimates are approved for construction.

Construction. Contracts are awarded on the basis of competitive bids. Rigorous inspections and tests are performed on the construction materials used, and the construction work is inspected carefully.

Maintenance entails a broad range of activities required to keep the roadways, bridges, and roadsides in good order. This range includes pavement maintenance, litter control, vegetation management, snow and ice removal, rest area maintenance, and other activities that result in pleasant and safe motoring for the users of the system.

Operations involves management of the system in an optimal, safe manner. Activities involve pavement markings, signs, signals, illumination, railroad grade crossing protection, traffic management centers, and similar activities that serve to optimize the use of the system by managing the flow of vehicles.

The highway system programs outlined in this plan address many of the long-term goals and strategies of the Strategic Plan and needs identified in the Strategic Mobility Plan. Foremost among them are programs that address preserving the investment in the system, ensuring highway safety, attacking congestion and fostering economic development, all of which are done with the environment and aesthetics in mind.

Roadways

Strategic Direction

- Protect the taxpayers investment in the existing system through effective and efficient maintenance and rehabilitation practices.
- Increase safety for the traveling public through design, maintenance, and operational improvements...
- Improve the quality of the highway system by upgrading to modern standards the lane widths, horizontal and vertical alignments, shoulders, bridge widths, roadside services, and safety features to modern standards.

THE HIGHWAY SYSTEM

- Provide acceptable levels of service by increasing the capacity of existing highways and constructing new ones.

- Increase mobility and safety by providing grade separations, interchanges, or alternate routes on high-volume truck traffic corridors and grade separations within communities with high volume rail corridor crossings.

- Recognize and provide for environmental and aesthetic values in transportation planning and development.

Programs

Pavement Maintenance - correction of distressed conditions. Funding is through state maintenance dollars.

Preventive Maintenance - cost-effective seal coats and thin overlays on the highway system to prevent more expensive repairs at a later date. Funding is 100 percent state dollars.

Rehabilitation - rehabilitation of Interstate, Primary, Secondary, and State system roadways and pavement reconstruction of Interstate and U.S. Highways exhibiting severe deterioration caused by heavy truck traffic, weather, and soil conditions. The program also includes upgrading two-lane roadways to current design standards. Funding for approximately 75 percent of the program is from federal-aid sources with a 75 per cent federal share. Remaining funds are state-provided.

Hazard Elimination and Safety (HES) - safety improvement projects funded with 90 percent federal and 10 percent state participation.

Interstate Construction - construction/ reconstruction of interstate highway-eligible work. Funding is 90 percent federal and 10 percent state. The program includes projects previously defined and authorized at the national level for development in Texas.

Interstate Reconstruction - reconstruction projects that increase capacity by adding lanes or upgrading interchanges. Funding is through the Federal Interstate 4R program (resurfacing, restoration, reconstruction, and rehabilitation) with 90 percent federal and 10 percent state participation.

Primary, Secondary, and State Highway System Added Capacity/New Locations - added capacity and new location projects relieving congestion on the primary, secondary, and state highway systems. Projects on the federal-aid primary and secondary highway systems are funded 75 percent federal and 25 percent state. Projects not on the federal-aid systems are funded with 100 percent state funds. Subcategories for this program are:

New Loops and Bypasses - loops and bypasses other than in major metropolitan areas. Projects divert traffic from existing facilities operating at less-than-desirable levels. An added benefit is the removal of through-truck traffic from local-use facilities.

Interchanges - construction of interchanges on major arterials with congested at-grade intersections.

Capacity Increases - projects relieving congestion by adding travel lanes. This subcategory is further subdivided into two groups:

Multilane Expansions - expanding existing multilane highways to four lanes or greater and expanding two lane highways to greater than four lanes. Also includes projects upgrading facility type, such as upgrading an existing four lane facility to a four lane freeway.

Two to Four Lane Expansions - improving existing two lane facilities to four lane facilities.

New Location - all new location facilities in major metropolitan areas other than new loops and bypasses.

Principal Arterial System Gaps - upgrading the nationwide Principal Arterial System sections to the conditions existing on each end.

Geometric, Safety and Miscellaneous - rural interchanges needed for safety reasons, frontage roads and short sections needed for system continuity or safety, and previous commitments made to local governments but not cost effective enough to successfully compete for contract letting.

Traffic Management - congestion relief through the installation of traffic management systems, including surveillance, communications and control systems along freeways and signal control systems along arterials.

Farm to Market Roads - rehabilitation or reconstruction of existing roads, new construction that is an extension of a previously designated facility, or completion of a gap in the existing system.

Urban System/Principal Arterial Street System - applies to major and non-major urbanized areas in two subcategories.

Urban System - upgrade, reconstruction, and rehabilitation on federal-aid roadways in both major and non-major urbanized areas.

Principal Arterial Street System (PASS)- adding capacity to arterials that connect and serve principal arterial facilities in major urbanized areas with populations generally greater than 200,000. Projects are selected by local governments in consultation with the department.

Discretionary - allocations to the highway districts based on highway mileage and traffic and used on any type of project selected by the district engineers. Funded 100 percent from state funds.

Railroad Grade Crossing Programs - includes work involving replacement of grade crossing surfaces and the installation and maintenance of signal devices.

Railroad Grade Crossing Replanking - provides funding for the replacement of railroad crossing surfaces on state-system roadways. Funding is 100% state highway construction funds for crossing surfacing

only, with railroads contributing approximately an additional 50% for track work and/or labor.

Railroad Grade Crossing Protection Maintenance - provides funds to railroad companies for assisting in the maintenance of railroad crossing signal systems. Funding assistance is a fixed amount based on the type of signal device in place and the number of signalized railroad crossings on the state highway system listed in the railroad crossing inventory at the end of each fiscal year. Financed with maintenance work funds appropriated by the Legislature.

City-County Railroad Signal - provides funds for the installation of railroad crossing signal devices at crossings located on city and county public roads. Funding participation is currently 80% state, 10% city or county, and 10% railroad.

Federal Railroad Signal - provides funds for installing or upgrading railroad crossing signal devices on and off the state highway system.

On-State System - approximately 30% of the federal signal funds are programmed for projects at crossings on the primary, secondary, and state highway systems. Funding participation is 90% federal and 10% state.

Off-State System - approximately 70% of the federal signal funds are programmed for projects at crossings on city and county public roads. Funding participation is 90% federal, 5% state, and 5% municipal.

Program Emphasis

Highway System of National Significance - possible system to be made up of the existing Interstate highways and an appropriate portion of the principal arterial system necessary to address major national goals, provide access to markets and meet federal transportation responsibilities. Most likely, funding will be on a federal-state percentage basis.

Texas Highway Trunk System - a rural network of four-lane, or better, highways linking urban areas and providing access to major ports and points of entry. Development of the system is to be accomplished under existing highway construction programs and through upgrading existing roadways wherever possible. Should additional funds become available, this program could be accelerated.

Environmental Protection - the department is committed to proactive environmental protection during highway planning, design, construction, and maintenance. Greater emphasis is being placed upon avoiding, minimizing, and mitigating adverse environmental impacts; effective communication of our efforts and results; and a cooperative approach in working with other parties having environmental interests.

Hazardous Materials Sites - an increasing portion of construction and maintenance program costs are expected to be directed toward the removal of hazardous materials found to be in sites on existing and acquired right-of-way.

Maintenance Contracting - to utilize private sector contractors, when cost effective, for the performance of routine maintenance work on the roadways.

Railroad Grade Crossing - continue to address the safety needs of the approximately 13,800 at-grade highway-railway crossings through the full execution of re-planking and railroad signal programs.

Bridges

Strategic Direction

- Provide a safe, economical, effective and efficient highway transportation system.
- Develop and implement systems for the effective and efficient management of roadways, bridges and pavements, and improve overall highway performance.
- Improve the quality of the highway system by upgrading to modern standards the lane widths, horizontal and vertical alignments, shoulders, bridge widths, roadside services and safety features.

Programs

Bridge Work Under Roadway Work Programs - bridge work on state highways includes bridge replacement, rehabilitation, maintenance and new-location construction. These efforts are often accomplished in conjunction with roadway construction and maintenance programs presented earlier. Other bridge work is accomplished with funds allocated under the Federal-Aid Highway Bridge Replacement and Rehabilitation Program (HBRRP).

Federal-Aid HBRRP - replacing and rehabilitating deficient and obsolete bridges on public roads. Federal HBRRP fund participation in each project is 80%.

On-State System BRRP - approximately 75% of the federal HBRRP funds are devoted to projects on the primary, secondary, and state highway systems. Funds matching the 80% federal fund participation are provided from the state highway fund.

Off-State System BRRP - approximately 25% of the federal HBRRP funds are devoted to projects on city and county public roads. Funds matching the federal HBRRP fund participation are provided by the local county or city concerned.

Program Emphasis

Preventive Maintenance - continue bridge painting, joint cleaning and sealing, and other activities to prevent more expensive repairs at a later date.

Bridge Replacement and Rehabilitation - continue to address the large backlog of deficient and obsolete bridges on the primary, secondary, and state highways by fully utilizing all funds available for that purpose, including federal bridge replacement and rehabilitation funds.

Bridge Management System - development of a bridge management system to further assure proper management of highway bridges and the funds available for that purpose.

Bridge Inspection - increase staffing to enable more frequent and/or comprehensive inspections of above-ground and below-water structural members to help minimize the occurrence of catastrophic failure. The early identification of critical fractures and bridge member deterioration allows for timely preventive maintenance and rehabilitation countermeasures.

Design and Construction Assistance - provide districts with increased bridge design and construction consultation services.

Off-System Bridges - continue to address the backlog of off-state system deficient and obsolete bridges by maintaining a 25% allocation of the available federal bridge replacement and rehabilitation and replacement funds for projects on city and county roads.

Maintenance Contracting - to utilize private sector contractors, when cost effective, for the performance of routine maintenance work on bridges.

Roadsides

Strategic Direction

- Protect the taxpayer's investment in the existing system through effective and efficient maintenance and rehabilitation practices.
- Improve the quality of the highway system by upgrading to modern standards the...roadside services and safety features.
- Assist the traveling public and promote tourism through such services as...rest and picnic areas and scenic overlooks.

Programs

Roadside Maintenance - includes litter removal, mowing and vegetation management, picnic and rest area maintenance and routine maintenance supported by 100 percent state funds.

Litter Removal - involves removing debris from the roadway and roadside to provide safe and pleasant travel.

Mowing and Vegetation Management - increases safety, preserves the road shoulder and pavement edges, prevents erosion and makes the roadsides and medians more attractive.

Maintenance of Picnic and Rest Areas - ensures the facilities remain operational and attractive for use by the public.

Other Maintenance - ranges from approach repair and roadside drainage improvements to guard rail repair and replacement.

Picnic and Rest Area Rehabilitation - includes repair and upgrading of comfort stations and sheltered areas, their electrical, water, and waste-water systems, and site furnishings and fencing.

Construction Landscape - an annual program to identify, construct and maintain landscape projects needed to increase user enjoyment of the system.

Landscape Cost Sharing - provides financial support for cities, civic associations, businesses, and developers for landscape projects on the highway system.

Landscape Incentive Awards - provides landscape projects annually to nine cities, selected by Keep Texas Beautiful, for their demonstrated excellence achieved through anti-litter campaigns and quality-of-life issues.

Set-Aside Program - contracting portions of maintenance activities such as litter removal, maintenance of rest and picnic areas, and grounds maintenance by non-profit agencies employing the handicapped.

Adopt-A-Highway for Landscape - augments existing Adopt-A-Highway for Litter Control Program and promotes public participation in roadside landscaping.

Adopt-A-Freeway - promotes roadside landscape development in urban areas.

Program Emphasis

Rest Areas - additional rest areas are needed for the safety and comfort of motorists. Relocation of some rest areas is necessary because of urban growth. Generally, most facilities need to be upgraded and expanded in size in the interest of promoting tourism and because of increasing traffic volumes.

Litter Removal - continue media, education, and enforcement efforts which have resulted in a 64% decrease in litter during the last five years.

Maintenance Contracting - utilize private sector contractors, when cost effective, for the performance of routine roadside maintenance work.

Roadside Vegetation Management - formulates and updates mowing guidelines, coordinates standards for timing of roadside management activities, coordinates program for protection and monitoring of rare and endangered plant and animal species on the roadside.

Traffic Operations

Strategic Direction

- Provide a safe, economical, effective, and efficient highway transportation system.

THE HIGHWAY SYSTEM

- Provide urban roadways...and implement and maintain operational functions to eliminate excessive travel delays.

- Increase safety for the traveling public through design, maintenance, and operational improvements...

- Monitor and integrate into plans and programs, as appropriate, emerging technology and innovative advances in transportation such as vehicle designs, fuels, traffic control devices, automated guideways, traffic operation schemes, and other relevant considerations.

Programs

Statewide Traffic Operations - installation of signs, traffic signals, and pavement markings on the state highway system.

Urban Traffic Management Systems - to ease congestion in urban corridors by influencing the flow of traffic through the use of Intelligent Vehicle Highway Systems, automated systems, and the use of courtesy patrols to identify and resolve traffic flow problems.

Highway Safety Improvement - elimination or reduction of potential roadway hazards, funded through the federal Hazard Elimination and Safety program and the state Safety Improvement Program.

Highway Safety - to reduce traffic deaths, accidents, injuries, and property damage through programs such as:

Police Traffic Services
Alcohol and Drug Countermeasures
Emergency Medical Services
Vehicle Occupant Protection
Information Services
Roadway Safety
Motorcycle Safety

Central Permit Operations - to issue oversize/overweight permits and temporary registration for motor vehicles and loads that exceed statutory width, height, length, and weight.

Program Emphasis

Urban Traffic Management - construction and operation of traffic management systems in the state's six major metropolitan areas to increase capacity. The systems involve monitoring roadway traffic conditions, communicating traffic problems and alternatives to motorists, working in conjunction with local authorities to regulate traffic flow patterns, and managing incidents resulting from accidents and disabled vehicles.

Sign Improvement - to replace, refurbish, and improve guide signs, in part because of a rapidly growing older population. Signs to be more frequent, strategically placed, larger, brighter, and understandable.

Raised Reflective Pavement Markers - to install markers on highways throughout the state system not scheduled for other pavement work in the near future.

Highway Safety Program - to continue primary emphasis on police traffic services, vehicle occupant protection, alcohol and

other drug countermeasures, emergency medical services, and strong supplemental support in public education.

Maintenance Contracting - to utilize private sector contractors, when cost effective, for the performance of routine operations.

Right-of-Way Acquisition

Strategic Direction

- Secure sufficient right-of-way for current and future projects in a timely and cost-effective manner, using both public means and private participation.

Program

Acquisition of right-of-way for building new highways and increasing capacity and safety of existing highways through purchase and private sector donations.

Program Emphasis

Protective Buying - for that not needed in the immediate future when cost effective and critical for the prevention of encroachment.

Financing - through donations and contributions of others with minimum use of state funds.

Leasing - leasing from the department will increase as the program becomes more mature.

Ferries and Tunnel Operations

Strategic Direction

- Protect the taxpayer's investment in the existing system...
- Provide acceptable levels of service...

Programs

Ferries - operation and maintenance of the Galveston Ferry crossing between Galveston Island and the Bolivar Peninsula and the Aransas Ferry crossing between Port Aransas and Aransas Pass.

Tunnel - operation and maintenance of the Baytown Tunnel until it is closed upon completion of the Baytown/La Porte bridge in 1993.

Program Emphasis

Galveston Ferry - add one ferry to the fleet to meet projected traffic increases and replace one ferry reaching the end of its useful life.

Aransas Ferry - begin a planned replacement program and increase capacity by replacing the two remaining inefficient, nine-vehicle units with 20-vehicle units.

Transportation Planning and Research

Strategic Direction

- Anticipate and influence the future through sound planning...
- Promote a planning and research and development program to develop and implement increasingly efficient methods for meeting transportation needs.
- Coordinate transportation planning with private and public entities to obtain resources and maximize their use, identify requirements accurately, and set priorities.
- Initiate and participate in research in the areas of planning, design, construction, maintenance, and operational techniques and methods.
- Investigate new materials and material sources for roadway construction and maintenance.
- Promote the incorporation of innovative ideas and techniques to keep the department in the forefront in all management and transportation matters.

Programs

Transportation Planning - the collection, analysis, and dissemination of data that supports the planning for, location, and design of the multimodal transportation system.

Transportation Research - is geared toward formal cooperative research programs with Texas A&M University, the University of Texas, and Texas Tech University. The focus is on the improvement of current and the discovery of new methods, practices, materials, and technologies.

Program Emphasis

Traffic Data Collection and Analysis - increase and improve collection and analysis methods and techniques.

Transportation Research - closer monitoring of research efforts and implementation of research results.

Strategic Highway Research Program (SHRP) - active participation in this national program established by the Surface Transportation and Uniform Relocation Assistance Act of 1987 to seek improvements in pavements.

Roadside Vegetation Research - to include vegetation propagation, drainage, slope stabilization, erosion control, mowing, herbicide operations, and research on native and adapted plant material.

The Highway System's Management and Support

Strategic Direction

- Promote a safe, economical, effective, and efficient highway transportation system.
- Promote a planning and research and development program to develop and implement increasingly efficient methods for meeting transportation needs.
- Reduce the time required for project development.
- Develop and implement systems for the effective and efficient management of roadways, bridges, and pavements, and improve overall highway performance.
- Maintain acute awareness of the needs and expectations of public and commercial highway users.

Programs

The strategic goals will be realized by the development/refinement and implementation of computerized systems and planning and research programs for decision support throughout the department. These efforts will increase operating efficiencies and provide new capabilities for managing the improvement of transportation throughout the state.

The preceding section on Transportation Planning and Research and a subsequent section on Automation reveal a myriad of endeavors along these lines. Additionally, two other automated systems are in use:

Highway Performance Monitoring System (HPMS) - used to identify national highway requirements, the system has been adapted to estimate current and future Texas highway needs and the impacts of funding and improvement strategies on highway systems.

Bridge Needs Investment Process (BNIP) - because bridge needs are not specifically addressed by HPMS, BNIP was developed to forecast bridge deficiencies, improvements, and costs over a given planning horizon.

Program Emphasis

Maintenance Management Information System (MMIS)- will be further developed and used by the Austin headquarters and highway districts, allowing for better planning and more effective allocation of maintenance funds, use of materials, and equipment.

Reference Marker System - will be implemented to provide the department a unique roadway reference point. This system will link existing diverse mainframe databases to provide comprehensive information about any selected roadway location.

Pavement Management System - will be developed and implemented to allow more comprehensive life cycle analysis of pavement maintenance and rehabilitation activities and their scheduling. This will assure optimal use of maintenance and construction funds and give the department better control of its maintenance and rehabilitation program.

Information Network Manager (INM) - consideration is being given to test geographic information system (GIS) concepts for possible implementation. The INM will interface with other automated systems and provide graphic displays of information.

Bridge Management System - will be developed and implemented to allow better analysis of bridge repair and replacement needs. This will direct the most efficient use of bridge funds for preventive maintenance as well as replacement and reconstruction.

Automated Plan Preparation - This system will assist the engineer, designer, and drafter with graphics-aided software to reduce plan preparation time and standardize numerous plan sheets and procedures. The software developed by this project will operate on all mainframe and stand-alone engineering workstations used by the department.

Intelligent Vehicle Highway System - begin to implement the use of advanced information processing and communications technologies to manage traffic. This technology will allow improvements in safety and more efficient use of the existing roadway system.

MULTIMODAL TRANSPORTATION

A total transportation system is comprised of many subsystems. The multimodal approach to transportation creates the opportunity to maximize the contributions each component makes to the overall system. Components include highways, public transportation, rail, water, and air, and associated systems management. These modes are all part of the total transportation picture in big cities, small towns and country settings across the state.

Public Transportation

Strategic Direction

- Coordinate transportation planning with private and public entities to obtain resources and maximize their use, identify requirements accurately, and set priorities.
- Develop and support public transportation as a means of increasing mobility through increasing vehicle occupancy and highway system efficiency.
- Support access to transportation for all Texans by assisting the development of public transportation.

Programs

The public transportation efforts revolve around three programs: coordination with federal and local governments, and technical assistance and financial assistance to transportation providers.

Program Emphasis

Urban Mass Transportation Administration Funds - refine formulas for distributing funds to the 13 cities having Metropolitan Transit Authorities.

Communication and Mobility Goals reinforce between districts and transit providers.

Long and Short Range Transit Master Plans and Performance-based Reporting - expand through improved data collection and analysis.

Technical Assistance to Transportation Providers - increase to enable better planning and provide better service.

Multimodal Transportation Alternatives

Strategic Direction

- Support economic development by providing transportation infrastructure.
- Promote interstate and intrastate commerce by providing adequate transportation systems.
- Provide adequate access to the work place and mobility for business products.
- Develop multimodal transportation alternatives like high-occupancy vehicle

lanes, park-and-ride facilities, and ride-sharing programs to decrease urban congestion.

Programs

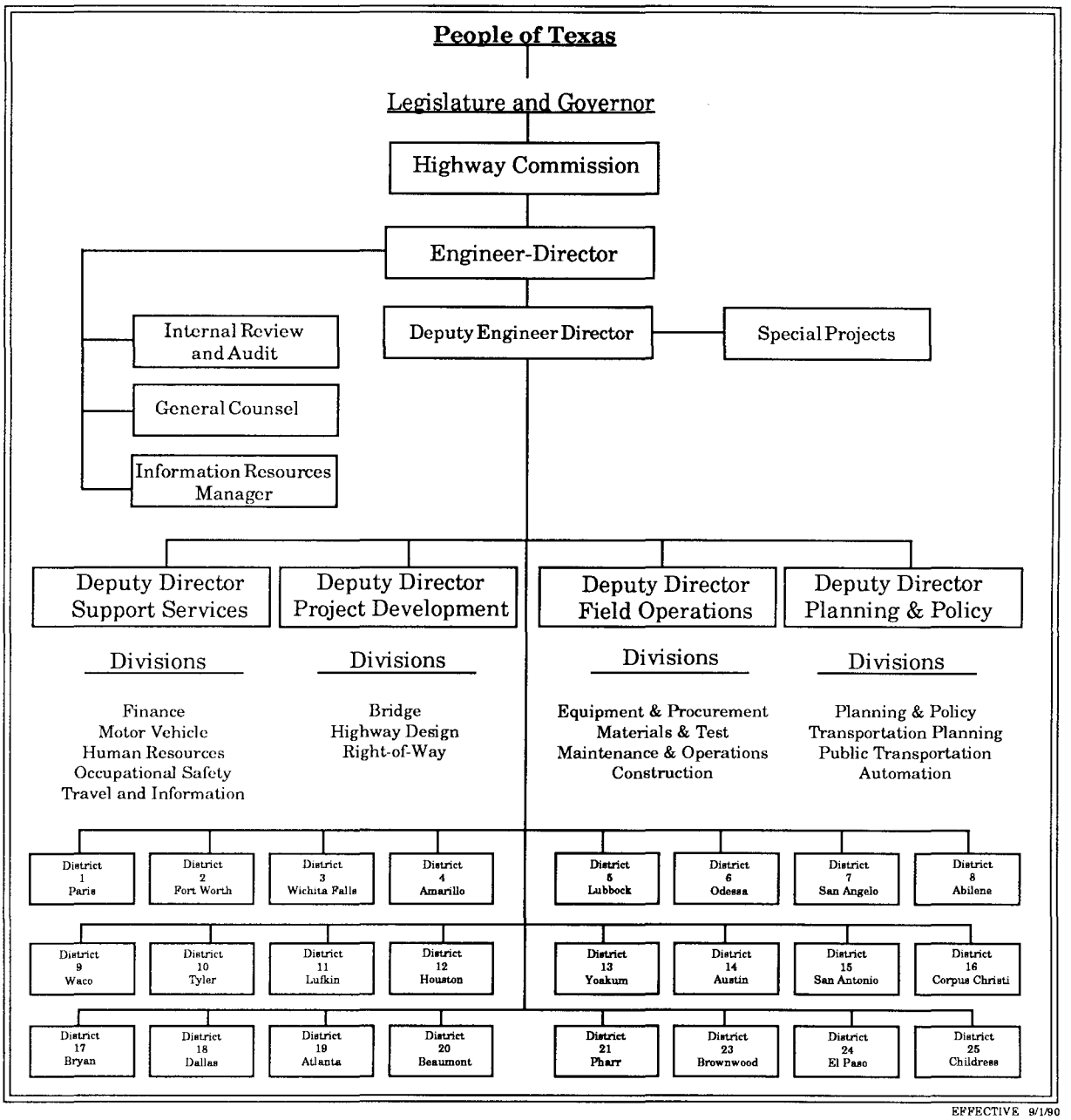
In addition to the employment of park-and-ride facilities and ride-sharing programs to reduce urban congestion, cooperative ventures have been undertaken with the Houston Metropolitan Transit Authority; some 47 miles of high-occupancy-vehicle lane facilities have been constructed. The system will ultimately total 96 miles in Houston, and plans are underway for introducing similar transitway systems in Dallas.

Program Emphasis

Explore Intermodal Possibilities - increase coordination efforts. The department is increasingly aware that growing transportation demands require development, enhancement, and linkage of various modes of transportation. Districts and appropriate divisions will be involved with airport, rail, and other transportation mode planners to insure appropriate coordination of the total transportation system.

ADMINISTRATION AND SUPPORT

The administration and support activities of the department extend from the executive management which provides overall direction to the many functions of the divisions, which, in turn provide headquarters and field support throughout the department. The department, one of the largest of the state agencies, is managed by the engineer-director through the executive administration staff, 16 Austin divisions, and 24 district offices located throughout the state and depicted below.



EFFECTIVE 9/1/90

ADMINISTRATION AND SUPPORT

Executive Administration

Strategic Direction

- Maintain a highly effective work force capable of performing the mission of the department.
- Use automation to increase cost-effectiveness, productivity, and efficiency.
- Assess the achievement of the department's goals and effectiveness of strategies by use of internal controls and performance measures.

Programs

The engineer-director and deputy engineer-director are responsible, respectively, for the overall and daily operations of the department. Functional area executive management is exercised by the deputy directors who provide direction to divisions and districts.

Program Emphasis

Executive Information System - develop to provide the department's top administrators with information to assist them in making key management decisions. The system being designed will synthesize data from the many diverse and complex automated systems currently in existence.

Finance

Strategic Direction

- Incorporate state-of-the-art...automated processes and management systems which increase the effectiveness and efficiency of the department.

Programs

The financial activities of the department include forecasting and budgeting all revenues and expenditures, analysis and interpretation of financial transactions, processing of payments, contract management, and maintenance of accounting and financial management records.

Program Emphasis

Budgeting - enhance process and streamline by consolidating into the Finance Division budgeting activities from other divisions.

Payroll System - continue implementation of a revised comprehensive system which incorporates the requirements of the Comptroller's Human Resources Information System.

Planning, Policy and Analysis

Strategic Direction

- Promote planning...to develop increasingly efficient methods for meeting transportation needs.
- Anticipate and influence the future through sound planning at all levels of management.
- Maintain acute awareness of the needs and expectations of public and commercial highway users.
- Analyze the demographic and socio-economic trends within the state and apply the information where pertinent.
- Monitor federal and state legislation and regulations in a comprehensive and timely manner.

Programs

Strategic and tactical planning, management by objectives, performance measures, policy management, legislative analysis and other related activities are emphasized heavily.

Program Emphasis

Demographic, Economic, Environmental, Social and Technological Trends - conduct additional and more exhaustive analyses.

Policy and Procedure Communications - refine through streamlined procedures and reviews and rewrites of department manuals.

Federal Funding - stay acutely attuned to activities as the Surface Transportation and Uniform Relocation Assistance Act of 1987 expires in 1991.

Human Resources

Strategic Direction

- Maintain a highly effective and efficient work force capable of performing the mission of the department.
- Foster decision-making at the lowest appropriate managerial level.
- Provide training programs in technical and interpersonal skills and occupational safety to ensure a flexible and expert work force.
- Promote adequate compensation and benefits to encourage a career-oriented work force.
- Nurture an environment that results in a dedicated, loyal, motivated, and career-oriented work force.
- Maintain an organizational structure and implement information systems that promote strong internal communications, participative decision making, and timely interaction at the local level.

ADMINISTRATION AND SUPPORT

Programs

Human resources management consists of the major components of recruiting and employment, affirmative action, employee relations and benefits, job classification, and training and development.

Program Emphasis

Affirmative Action - continues at the forefront of our thinking and decision-making. We are committed to making greater advances each year.

Alcohol and Drug-free Work Place - is necessary in providing a safe transportation system for the public. A balanced program of education, testing, rehabilitation, and disciplinary action will continue to evolve.

Training and Development - continue at high levels in order to maximize employee expertise, flexibility, and productivity. To be accomplished through a myriad of training programs, job rotation, and undergraduate and graduate college assistance, including department sponsorship of graduate civil engineering degree pursuits. Continue efforts to establish a cooperative education (work study) program with various universities.

Recruiting - the traditional in-state recruiting program will continue to be augmented by efforts outside the state in order to meet affirmative action goals.

Procurement and Inventory Management

Strategic Direction

- Incorporate...automated processes, efficient equipment, and a working environment that encourage creativity and maximize employee productivity.

Program

The procurement and inventory management function ensures that over 15,000 employees have the equipment and materials available to accomplish the mission of the department. The department manages $600 million of capitalized major highway, automation and minor equipment, in addition to warehouse stock.

Program Emphasis

Compressed Natural Gas - further explore as an alternative fuel for department vehicles.

Privatization - contract, as feasible, those functions that can be readily performed by the private sector.

Automation - explore such enhancements as blanket/on-call order concept for warehousing and electronic data interchange methods for purchasing in order to improve services.

Energy Conservation - continue to monitor usage and employ innovative techniques in department buildings.

Real Property Management

Strategic Direction

- Incorporate...efficient equipment and a working environment that encourage creativity and maximize employee productivity.

Programs

The physical plant of the department consists of about 3,000 acres of land at over 430 locations. The 1,441 buildings located on these sites have a replacement value of over $190 million.

Major programs involve the maintenance, repair, leasing, construction and/or purchase of sites and buildings, plus underground storage tank management.

Program Emphasis

Leased Space - Austin headquarters engineering functions will be consolidated into a single location for overall improved efficiency and cost reductions.

Headquarters Office Complex - seek approval for construction to achieve reduced costs and improved efficiency.

Asbestos Abatement - a statewide program is being implemented to eliminate potential health hazards.

Underground Storage Tanks - identify, evaluate, and remove, if necessary, to comply with environmental requirements.

Automation

Strategic Direction

- Use automation to increase cost-effectiveness, productivity, and efficiency.

- Incorporate state-of-the-art...automated processes that encourage creativity and maximize employee productivity.

Programs

The automation function consists of a sophisticated combination of mainframes and extensive distributed processing which use graphics workstations and personal computers. Major ongoing applications support a diversity of programs and functions and lead to efficiency:

Planning - Texas Reference Marker System, Highway Cost Index, Travel Demand Modeling, and Mapping

Design - Automated Plan Preparation

Construction - Contract Material Processing

Maintenance and Operations - Maintenance Management Information System, Central

Permits System, Single Entry Screen, Inventory Control by Location, Maintenance Management Contract System, and Pavement Management System

Support - Human Resources Information System, Statewide Office System, Automated Purchasing System, Executive Information System, Disaster Recovery Planning, Information Security Program, Funds Allocation Monitoring System and Statewide Payroll System

Transportation-Related Services - Registration and Titling System

Program Emphasis

In addition to the above projects other involvements for this planning period include:

Design - Automated Plan Preparation capabilities for drainage, signing and right-of-way; and a Bridge Management System

Construction - Right-of-Way Information System, Land Parcel Document Tracking System, and Right-of-Way Budget Tracking System

Maintenance and Operations - Preventive Maintenance Information Planning, and Signal Warrant Accident Tracking System

Support - Funds Allocation Monitoring System, Statewide Payroll System, and Miscellaneous Contract Management System

Management Involvement - at all levels and particularly the administration to insure that information systems are appropriately included in the department's strategic and tactical plans.

Recruitment and Retention - focus on the department's normal work load and improve the ability to recruit and retain qualified information systems professionals to address this level of work.

Training - essential in all districts and divisions to improve automation skills.

Structured Data Bases - provide efficient electronic access to enable retrieval in a form consistent with needs.

Information Security, Risk Management, and System Recovery Capability - to ensure continuous availability of information systems and data bases.

Information Technology - use effectively to position the department to capitalize on new opportunities in a systematic manner.

Procurement and Systems Development - streamline processes.

Occupational Safety

Strategic Direction

- Provide training programs in...occupational safety to ensure a flexible and expert work force.

Programs

This function consists primarily of advising and assisting department managers in those actions that should be taken to prevent accidents and, in the event accidents do occur, in minimizing the resultant human and financial losses.

Program Emphasis

Hazardous Materials - new regulations affecting employees in the work place and reflecting environmental concerns will require new programs, more training and increased managerial attention in this area.

Workers' Compensation - new state law requires that employees injured on the job receive the benefits to which they are entitled at minimum cost to the public.

Property and Personal Injury Claims - those presented primarily by the traveling public will continue to require the department to deal fairly with individuals who have legitimate grievances.

Transportation-related services involve such activities as registration and titling of motor vehicles, providing information to tourists and the traveling public, assisting in maintaining the Gulf Intracoastal Waterway, controlling outdoor advertising and junkyards, and promoting traffic safety. These activities augment the programs and products contained throughout this plan and serve to complete the transportation picture of the State Department of Highways and Public Transportation.

Motor Vehicle Registration and Titling

Strategic Direction

- Provide cost effective, efficient and responsive motor vehicle registration and titling services.

Programs

The department administers a statewide system for registering motor vehicles, issuing certificates of title and collecting associated activity fees.

Program Emphasis

Registration and Titling Point-of-Sale System - the department, in conjunction with counties, will be implementing an automated system in 1992 to provide faster turnaround time on title issuance, vehicle registration processing, and record updating.

Travel and Information

Strategic Direction

- Assist the traveling public and promote tourism through such services as an active travel information program...and scenic overlooks.

- Maintain a strong and proactive public information program for the mutual benefit of transportation systems users, the general public, and the department.

- Nurture an attitude among department employees that is responsive and sensitive to transportation systems users and the general public.

- Maintain an organizational structure and implement information systems that promote strong internal communications, participative decision making, and timely interaction at the local level.

Programs

The function entails the administration of a program to stimulate tourist and recreational travel to and within the state; the compilation and dissemination of information concerning all phases of the department's operations; and administration of a diverse program for providing information to the traveling public.

TRANSPORTATION-RELATED SERVICES

Program Emphasis

Texas Highways Magazine - keep subscription rates low by increased marketing efforts to increase out-of-state subscriptions and by providing more ancillary products.

Tourist and Travel Information - decrease response time by refinements in the electronic transmission of inquiries, which is required of each magazine in which the Department of Commerce advertises.

Travel Requestors Address Exchange Program - refinements in this system will improve the exchange of information between tourists and local tourist industries.

Travel Information Centers - remodel and modernize selected centers.

Emergency Road Information System - upgrade to be more responsive to inquirers.

Certification of Travel Counselors - continue implementation to enhance skills and professionalism.

Scenic Byways or Travel Trails - establish criteria for designation and promotion.

Audio-Visual Operations - continue to improve to meet the growing demand for high-quality presentation materials for various department programs.

"Don't Mess With Texas" - continue this antilitter campaign, but shift to encourage recycling.

Public Information - better inform legislators, other interested parties, and the general public of highway commission activities and actions.

Traffic Safety Public Awareness - a major campaign to promote traffic safety is being implemented.

Public Information Officer Certification - implement program to enhance skills.

Gulf Intracoastal Waterway

Strategic Direction

- Support the continued operation of shipping, fishing, and recreation by providing adequate acreage for disposal of dredge materials.

Program

The department serves as the non-federal sponsor for the Gulf Intracoastal Waterway. This responsibility normally entails providing the land required for the construction of dredge disposal projects at no cost to the federal government.

Program Emphasis

Twenty Year Plan - develop with the U.S. Corps of Engineers.

Land Acquisition - assist in the acquisition of approximately 4,000 acres needed for dredge disposal sites.

Outdoor Advertising and Junkyard Control

Strategic Direction

- Recognize and provide for environmental and aesthetic values...

Program

The surveillance of signs and junkyards was mandated initially by the Federal Highway Beautification Act of 1972; however, no federal funding has been available. The state's acquisition of signs and screening of junkyards has been accomplished through the use of state funds.

Program Emphasis

Surveillance - program is expected to remain active in the future. As of September, 1990, signs erected prior to 1985 will come up for renewal annually, rather than every five years.

FISCAL IMPLICATIONS

The ongoing work and programs identified for emphasis in this plan are necessary to preserve and support a highway system which has a replacement value in excess of $100 billion. Additionally, the requirements for transportation are becoming greater because of population increases, urban congestion, truck traffic growth, and other factors.

This plan was prepared with the current annual funding level of $2.6 billion in mind. Consideration for the erosive effect of inflation has not been included. Additionally, the federal Surface Transportation and Uniform Relocation Assistance Act of 1987 expires in 1991. Various alternatives, changes, funding and program realignments, and the role of state and local governments will be considered by Congress. Finally, there is the impact of the 1990 census. Results of this effort will give better insights into demographic patterns, including those affecting urban mobility requirements.

Depending upon the effects of these major considerations, the scope and direction of the programs contained in this plan might be altered. Some programs might be accelerated, expanded, deferred, downsized, or curtailed.