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16. Abstract

The Texas Department of Transportation (TxDOT), like many state transportation agencies, is faced with limited resources to address growing transportation problems. A variety of non-traditional public and private financing methods are available. Greater private-sector involvement in the financing, constructing, and operating of highway infrastructure may be necessary to assist public agencies in resolving transportation problems. The California AB680 program and Virginia's Dulles Toll Road are good examples of private-sector participation. These experiences are similar to those used throughout Europe and Japan. Texas' experience with toll roads has been primarily through the Texas Turnpike Authority, although nine private toll road corporations have been authorized. The future effectiveness of a privatization program in Texas is contingent on policy directions from the Texas Transportation Commission and the ability of the private sector to work with TxDOT in addressing transportation problems.

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AN OVERVIEW OF HIGHWAY PRIVATIZATION

by

Mark Allen Euritt
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Research Report 1281-1

Research Project 0-1281
Highway Privatization in Texas

conducted for the

TEXAS DEPARTMENT OF TRANSPORTATION

in cooperation with the

U.S. Department of Transportation
Federal Highway Administration

by the

CENTER FOR TRANSPORTATION RESEARCH
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February 1994

IMPLEMENTATION STATEMENT

The intent of this project (1281) is to identify the potential for highway privatization inTexas. This report, when combined with Research Reports 1281-2 and 1281-3F, provides a basis for evaluating future public-private partnerships. This document also provides highway funding criteria to assist the Texas Department of Transportation (TxDOT) in exploring various alternatives. Primarily, this report provides background on national and international experiences with privatization.

Prepared in cooperation with the Texas Department of Transportation
and the U.S. Department of Transportation, Federal Highway Administration

DISCLAIMERS

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented within. The contents do not necessarily reflect the views or policies of the Federal Highway Administration or the Texas Department of Transportation. This report does not constitute a standard, specification, or regulation.

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BIDDING, OR PERMIT PURPOSES

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ABSTRACT

The Texas Department of Transportation (TxDOT), like many state transportation agencies, is faced with limited resources to address growing transportation problems. A variety of non-traditional public and private financing methods are available. Greater private-sector involvement in the financing, constructing, and operating of highway infrastructure may be necessary to assist public agencies in resolving transportation problems. The California AB680 program and Virginia's Dulles Toll Road are good examples of private-sector participation. These experiences are similar to those used throughout Europe and Japan. Texas' experience with toll roads has been primarily with the Texas Turnpike Authority, although nine private toll road corporations have been authorized. The future effectiveness of a privatization program in Texas is contingent on policy directions from the Texas Transportation Commission and the ability of the private sector to work with TxDOT in addressing transportation problems.

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SUMMARY

There are many alternative funding options available for use in the state of Texas. Selection of an appropriate method must be consistent with the funding goals and criteria identified by state policy-makers. These criteria include equity, economic efficiency, stability, adequacy, administration, political acceptability, social priorities, and applicability. Experiences around the world, and in the U.S., demonstrate that the private sector can play a meaningful role in infrastructure development. Private-sector participation generally takes the form of a toll road. Texas experience with toll roads, while positive, has been limited to state-operated facilities. Although they may not be the answer to Texas road funding difficulties, private toll roads may assist TxDOT in addressing state transportation bottlenecks. Texas has created an opening for private-sector participation through Transportation Corporations and Road Utility Districts. However, investment returns for these projects are tied directly to future development and not to traffic operations. The basic conclusion of this report is that TxDOT should explore avenues to more effectively capture private-sector road funding. The issues associated with this direction are explored in Research Reports 1281-2 (*Reliability of Toll Road Revenue Forecasts for Selected Toll Roads in the United States*) and 1281-3F (*Strategic and Implementation Issues in Texas' Public-Private Transportation Projects*).

CHAPTER 1. OVERVIEW OF TRANSPORTATION FINANCE

Introduction

As the twenty-first century approaches, the United States is facing a growing number of critical mobility dilemmas. Traffic on the nation's roads is increasing several times faster than available capacity. The resulting congestion costs Americans billions of dollars annually in lost productivity. This traffic congestion is also contributing to ever-worsening air quality, especially in urban areas. In addition, the nation's transportation infrastructure, some of it more than fifty years old, is in desperate need of overhaul. From the car-sized potholes of New York City to dangerously corroded bridges on the Pacific coast, billions of dollars are required to prepare the United States' transportation network for the future.

In order to meet these transportation needs, immense investment is required. Unfortunately, in terms of dollars per vehicle mile traveled (VMT), state and federal transportation budgets have been shrinking for the past couple of decades. In fact, constant dollar transportation expenditures have dropped by more than half since 1960 (Lockwood et al, 1992). In addition, traditional sources of transportation funding such as fuel taxes and vehicle registration fees are being redirected to fund non-transportation-related programs like schools, deficit reduction, and social services. This situation is true at all levels of government, and is likely to worsen as more and more government programs face budget crunches and turn to the perceived "cash cow" of transportation-related funding sources for help.

Transportation Funding Alternatives

Governments have experimented with a number of alternatives for financing highway and transportation improvements. Selection of an alternative depends on a number of issues and the defined role of the government. Specific categories of many of the alternative funding mechanisms include special financing districts, impact fees, tax increment financing, toll financing, and various forms of private-sector financing.

Special Financing Districts

Districts created for the purpose of funding transportation improvements take a variety of forms. One popular form is the benefit assessment district. A benefit assessment district assesses a tax on properties within a specifically defined area benefiting from transportation improvements. The premise is that infrastructure improvements increase the value of the properties which in turn are assessed a fee to recover some or all of the costs of the transportation improvements.

In San Diego, California, developers can request the city manager to create an assessment district. In creating the district, the city manager considers the area benefiting from the proposed project, prepares a schedule for the costs and timing of the capital

improvement, determines assessments, and schedules a public hearing. If more than 50 percent of the residents and property owners do not object, the benefit assessment district is created and all property is assessed a fee with a lien on the property until the assessment is paid. Since its inception in 1980, assessment districts have raised $3.5 million (Euritt and Walton, 1986). A benefit assessment district was also established in Arapahoe County, Colorado, to finance the Yosemite Street Overpass. The Joint Southeast Public Improvement Association (JSPIA) was created to design and construct a $4.5 million overpass with financing based on the proportional share of a district member's total assessed valuation (Meisner, 1984).

A second type of financing district, used in Texas, is the County Road District. The County Road District is the most extensively used financing district in Texas. Eleven such jurisdictions have been created in Travis County alone. County Road Districts are created by County Commissioners Courts for the purpose of financing, constructing, acquiring, and improving arterial and main feeder roads and related projects. Similar to municipal sewer or water districts, County Road Districts may issue bonds supported through levying property taxes or assessing fees. (Other Texas methods, the Texas Transportation Corporation and the Road Utility District, are explored in Chapter 5.)

The Transportation Development District (TDD) authorized by the Pennsylvania General Assembly in 1985 is another successful form of the financing district. The TDD establishes a framework for financing transportation improvements through joint public/private support. The legislation activates a number of funding mechanisms for municipalities, including: assessments on business property; assessments on benefited property; proceeds from any tax otherwise permitted by law; notes and bonds; and grants, gifts, or donations. The TDD is used in several locations, including East Whiteland and Tredyffrin Townships in Chester County, East Pennsboro Township in Cumberland County, Moon Township in Allegheny County, Cranberry Township in Butler County, and Patton Township in Centre County. The partnership approach benefits the state by allowing the Pennsylvania Department of Transportation to leverage its dollars with local and private funds. The Chester County partnership, alone, generated $7.5 million from local and private sources for roadway widening and construction of an interchange (Pennsylvania Department of Transportation, 1987).

Impact Fees

Impact fees are closely related to benefit assessment districts with one important distinction. Impact fees are assessed on businesses or property owners to cover the costs of increased traffic, etc., generated by the development. Basically, impact fees are a formalized exaction. Palm Beach County, Florida, instituted transportation impact fees in 1979, and through June 1985 generated $13.5 million in revenues (Sandler and Denham, 1986). The fees are based on a formula for residential and non-residential properties that estimates the amount of traffic generated by the development.

A similar traffic impact fee was instituted in Montgomery County, Maryland. Single-family and multi-family residential units are charged $1,591 and $1,161 per unit,

respectively. Offices pay $3.59/square foot ($38.64/square meter), retail businesses $3.24/square foot ($34.88/square meter), and industrial operations $1.56/square foot ($16.79/square meter). Other non-residential units are assessed at the office equivalent rate, except private schools and places of worship, which pay 31¢/square foot ($3.34/square meter) and 19¢/square foot ($2.05/square meter), respectively (Orlin, 1987).

Anaheim, California, expanded the impact fee concept to a traffic signal fee. Fees are assessed on all new developments and deposited into a special traffic signal fund used for new traffic signals or intersection modifications to control increased traffic. The assessment rates are based on trip-generation rates, land use, economic data, and projected traffic signalization costs as determined by the city traffic engineer.

Impact fees have also been implemented in a number of other areas, including Newport Beach, California; Broward County, Florida; Los Angeles, California; San Diego, California; Aurora, Colorado; Castle Rock, Colorado; and Kansas City, Missouri.

Tax Increment Financing

Tax increment financing (TIF) is a beneficiary-based method. TIF dedicates a portion of future tax revenues beyond a certain base amount for transportation improvements and is usually accompanied by bonds, with the increased tax revenues earmarked for bond financing. TIF is a method useful for areas anticipating growth, since the growth creates the additional revenues or tax increments. In practice, TIF is a method for allocating revenues rather than a method for generating new funds for transportation improvements. Operation of TIF is illustrated as follows:

> . . . assume a situation where a particular area of a city is blighted. If the taxable value of this area is $2,000,000, then, with a tax rate of $10 per $1,000 of taxable value, the city would receive $20,000 annually. Further assume that a redevelopment proposal would increase the taxable value to $250,000,000 and the annual tax receipts to $2,500,000. The tax increment would be $2,300,000 at full development of the project. The city could issue bonds against that increment and suffer no loss of revenue (Nicholas, 1987).

Although over one-half of the states have authorized the use of tax increment financing, it is not used extensively. Governments are hesitant to earmark future revenues from their property tax base for specific purposes. Consequently, TIF is not used as frequently as other methods. There are a number of examples, however, that illustrate the impact of TIF for developing new highway projects.

Four cities in Minnesota use TIF to assist funding of highway projects and improvements. The City of Brooklyn Park and a developer have identified an interchange improvement serving a large industrial park and have earmarked future increases in property taxes to finance the $4 million project. TIF is also being used to finance a portion of the Carlson Parkway interchange in Minnetonka. TIF will provide $3.25 million, and the city and developer will contribute $5 million and $1.75 million, respectively. The City of Plymouth is financing the entire $7 million interchange at I-494 and County Road 15

with tax increment financing. Finally, the City of Eden Prairie is using TIF to raise $17.6 million to fund access and circulation improvements near a development at I-494 and Highway 169 (Halvorson and Kreideweis, 1986).

A interesting variation of TIF occurred in Clark County, Washington, for funding access ramps at Vancouver Mall. Rather than use a property tax as the basis for the increment financing, an agreement was reached by County officials, the mall and its tenants, and a developer to use additional sales taxes received by the county as the tax increment. The County issued approximately $1.7 million in registered warrants that were purchased by the mall developers, with future repayment from the additional county sales tax generated by the mall (Meisner, 1984).

Toll Financing

Toll financing is one of the oldest forms of financing highways in the U.S. During the early 1800's, virtually every state supported turnpikes through corporate laws that enabled private organizations. More recently, federal funding restrictions have limited, somewhat, the development of new toll roads, although recent changes have lessened the restrictions for non-interstate facilities. Toll roads are discussed in much greater detail in Chapters 3, 4, and 5.

Private-Sector Financing

The previous alternatives for funding transportation improvements involved the use of the private sector. This category, however, focuses on joint development and cooperation between government and private enterprise or privatization and not on procedures for mandatory participation in transportation financing. The previous methods generally rely on taxes and other user charges, as opposed to private support through voluntary donations and negotiated agreements.

Private participation in funding transportation projects is often the product of a negotiated agreement or investment. The private developer agrees to contribute funds for a specified public infrastructure improvement in exchange for a concession in zoning, building regulations, building permits, etc., from the government. The negotiated agreement has become an important strategy for public agencies, especially in areas where fiscal constraints have seriously undermined efforts to improve transportation infrastructure. Developers recognize that, to receive timely approval of projects, contributions are essential to facilitate project development.

A number of examples illustrate the impact of negotiated agreements. A group of developers in New York City are providing $31.5 million to the city's railway system. This amount represents a portion of the $100 million package the developers are providing for their proposed housing and commercial project. The contribution is the result of negotiations with the planning commission to change the zoning of the project site from manufacturing to residential use (Johnson and Hoel, 1985). Similarly, negotiated agreements are encouraged in Dallas, Texas, to resolve major traffic bottlenecks. The City implemented a series of ordinances revising zoning regulations for major developments to

encourage developer financing of transportation improvements. Developers may request zoning changes if they can identify solutions to traffic problems. Zoning changes can also be granted if developers are willing to assist financing of off-site improvements ("Developers . . . ," 1985).

Officials in DuPage County, Illinois, prefer the negotiated agreement over a fixed fee arrangement because of the flexibility it affords, arguing that fees generally do not keep pace with the costs of improvements. The County uses conditional approval to meet each phase of a staged development project; the standard is to maintain a 110 percent level of service D through the construction of both on- and off-site improvements. As a highway authority the County authorizes access to the highway system. The County may require an escrow via a letter of credit for improvements to an intersection.

The basis of negotiated agreements is a derivative of an earlier form of requiring private-sector support for infrastructure improvements — exactions. Developers were required to donate land, facilities, or financial resources as a condition of development approval. Legal authority for exactions falls under a city's regulatory authority. A number of legal challenges have occurred, with the courts generally finding in favor of cities under the condition that the exactions are used for improvements impacted by the development. Generally, an exaction differs from a negotiated agreement in that the public agency makes only nominal or no concessions to the developer (other than granting him a permit to build) in exchange for the developer's financing transportation improvements. This form of private-sector participation has become an important source of funding in growing metropolitan areas.

Privatization generally refers to situations in which public services are provided by the private sector through contracting. The use of the private sector under contract is nothing new to highway development. However, within the scope of financing arrangements, there are a variety of ways to utilize privatization strategies.

In places where a transportation agency owns land not currently utilized for transportation purposes, there is an opportunity for generation of revenues through leasing or selling arrangements. Jurisdictions can generate a steady and dependable cash flow by the sale or lease of undeveloped land, subsurface rights, or air rights surrounding the public facility. This money can then be used for operating expenses or capital improvements. A developer in Boston, for example, negotiated a long-term lease for air rights over a portion of the Massachusetts Turnpike for mixed-use development with lease proceeds used for turnpike improvements (Rice Center, 1983). Similarly, the Denver Regional Transit District leased air rights over the Civic Center Transit Facility, providing $55 million over a 15-year period (Rice Center, 1982). In Miami, Florida, a lease agreement requires a developer to pay 4 percent of the development's unadjusted gross income for each year of the lease. The lease permits the developer to construct 650,000 square feet (60,385 square meters) of office and retail space and a 300-unit hotel adjacent to the Dadeland South Station. The transportation office expects to receive between $2 or $3 million dollars during the first year of the lease (Geltner and Moavenzadeh, 1987).

An interesting variation of leasing agreements is profit sharing. In Fairfield, California, the city granted approval for a large development when the developer agreed to

pay the city 55 cents per square foot ($5.92/square meter) of leasable floor area, or $350,000, each year for 25 years, with the money to be used for off-site improvements. In addition, the developer agreed to contribute annually 10 percent of leasing profits between $250,000 and $500,000, 15 percent of profits over $500,000 and less than $750,000, and 17 percent of profits in excess of $750,000. The agreement runs in perpetuity and includes collections from any refinancing with revenues generated from the profits assigned to the city's general fund (Johnson and Hoel, 1985).

The most active role for the private sector in the public/private arrangement is ownership of the highway or facility. In the recent past, the concept of private ownership has not been considered seriously as an alternative for financing the building of transportation facilities. However, as governmental budgets become more constrained, policy-makers are investigating this procedure more carefully (Geltner and Moavenzadeh, 1987). Proponents of private ownership cite a number of advantages:

1) It introduces competition into the development and operation of facilities, leading to lower operational costs and creative implementation strategies.
2) The sale of freeways to the private sector would free up capital currently frozen as a government asset and could provide the leverage to attract new private investment to finance needed rehabilitation of highways and freeways.
3) It provides additional incentives for cost-efficient and cost-effective operation of freeways (Fixler, 1986).

Although there are a variety of methods for establishing private ownership, all methods require some type of monetary compensation to the private group. The three most discussed methods are tolls, general access fees, and lease payments. The privately owned and operated toll road would function very much like existing toll facilities. The toll charged can be determined in advance or can be left to "market forces." It has been noted that although private highway companies are not in "perfect competition," they are competitive with each other and with other roads in the same travel markets (Geltner and Moavenzadeh, 1987). Revenues derived from the toll facility would be directly proportional to usage of the road. This should establish incentives for the company to provide services and traffic flows in a manner "satisfying the customer."

The fear of excessive tolls or poorly maintained facilities has led to the examination of general access fees as a method for compensation. With this approach, the private sector constructs and maintains the facility as a non-toll unlimited-access road and receives compensation from public access fees paid by the government per unit of usage (e.g., vehicle miles traveled). Since the revenue forms and collection procedures would remain the same, the potential advantage of private ownership lies in the owner's ability to operate more efficiently. This method requires monitoring to determine the level of usage, with payment to the firm based on a formula acceptable to the government and the contractor. This type of financing arrangement may be most appropriate for previously non-tolled facilities. The British government is considering a similar arrangement with a private

consortium. Under the proposal, the consortium is responsible for building highways with privately arranged financing and will be paid annual "royalties" based on road usage as determined by traffic counts (Orski, 1986).

A third approach involves a leasing agreement between the government and a private developer. An example of this occurred in Pittsburgh, where the city negotiated with U.S. Steel to build a bridge which the city would rent, allowing the firm to depreciate the asset and gain a significant tax advantage (Porter and Peiser, 1984).

A final variation of privatization involves land banking. Land banking is the process of acquiring land and holding it in anticipation of future use. This concept is similar in some respects to the issue of excess right-of-way. In practice, the transportation agency takes on the role of land speculator. This form of financing can be considered privatization in the sense that the public agency is involved in an activity normally reserved for the private sector. Eventually, the land would be leased, jointly developed, or sold to developers, with the proceeds dedicated to construction or operation of highways. The potential cost savings are significant; however, given the fiscal conditions of most state and local budgets, the required large capital outlays limit feasibility. In addition, there is risk in terms of return on investment, since the agency must accept the same risk as other investors.

Evaluating Transportation Funding Options

Selection of a highway funding program must be consistent with economic and political objectives of the state. Funding alternatives have various implications for the government and for transportation users. Importantly, criteria must be identified to evaluate the various funding options. Seven criteria are presented in this section which can serve as a rational basis for evaluating funding alternatives. (These criteria are based on the works of Kane and Cooper, 1987; Isser et al, 1992; Myer, 1992; and Mikesell, 1982.)

Equity

Equity is concerned with the relative differences among rates which users of the highway system are charged. Inequity occurs when a vehicle group receives benefits or is assigned costs that are disproportionate to the payments made to support the system. For example, in Texas, private automobile owners are responsible for 42 percent of the highway infrastructure costs, but pay 48 percent of the transportation-related user taxes and fees. Moreover, tractor semi-trailer combination trucks are responsible for 34 percent of the highway infrastructure costs but account for only 18 percent of the transportation-generated taxes and fees (Euritt et al, 1993). An equitable system, based on the cost-occasioned principle, argues that vehicle cost responsibility should equal vehicle user charges and fees, i.e., each vehicle pays for what it uses. In the previous example, there is inequity.

The cost-occasioned principle is a rational basis for assigning cost responsibility and is used throughout North America, Europe, and Australia. Other methods for evaluating equity include the benefits-received and ability-to-pay approaches. The

benefits-received approach assigns user fees according the benefits derived by a particular group, including non-vehicular. This method is often used as the basis for funding municipal roads with property and/or ad valorem taxes. This approach can also serve as a method for assigning costs to industrial or other benefactors on low-volume rural roads. The final method is assigning costs on the basis of ability to pay. This method is concerned about distributional consequences of road user fees. The cost-occasioned approach is generally used because it lends itself to more economically efficient operations, i.e., removes cross-subsidies between vehicle groups, as illustrated in the example above. The other methods do not lend themselves to a more economically efficient system.

Economic Efficiency

Economic efficiency is concerned with maximizing the social benefits derived from the transportation system. Economists, generally, are concerned with short-run marginal costs (Small et al, 1989). Short-run marginal costs include the amounts for maintaining the infrastructure through a cost-occasioned procedure (as discussed above) and, in addition, congestion costs, accident costs, pollution costs, and other transportation externalities. The short-run marginal cost approach is concerned with the system or full costs of transportation. Only when the full costs of transportation are factored will users make rational decisions that efficiently allocate the use of the system. Implementation of a short-run marginal cost approach is administratively and technologically difficult. However, with the growth in intelligent vehicle highway systems (IVHS) technology, short-run marginal cost methods can be more readily implemented.

Whereas the short-run marginal cost method ensures efficient use of the existing transportation system, it is not an effective method for making transportation investment decisions. Long-term investment, which includes fixed costs, is the preferred approach. By their nature, long-term costs include all costs that allow the decision-maker to consider a range of strategic alternatives. A benefit-cost analysis is the tool used for comparing cost-effectiveness.

Funding Stability

Many traditional sources of highway revenues are prone to long-term revenue fluctuations. Fuel tax revenues, which fluctuate with the supply and demand for fuel, are a prime example. The effect such fluctuations can have on transportation funding is shown in Figure 1.1. As the figure illustrates, these fluctuations can drastically affect the feasibility of meeting annual transportation needs. In addition, when used in conjunction with bond issues, funding instability can increase the risk perceived by investors and result in higher financing costs. A stable source of funding minimizes annual fluctuations in revenue collections.

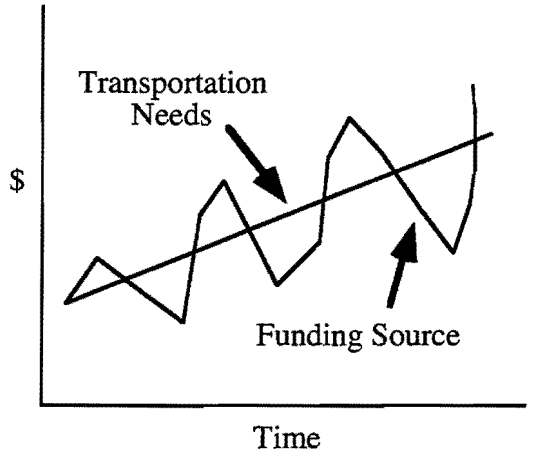

Figure 1.1
Unstable Funding Source

Funding Adequacy

The total revenue generated by transportation funding methods should be adequate to meet the transportation needs over the intended planning period. This goal of funding adequacy is closely related to the goal of financial stability but differs by focusing on preventing long-term shortfalls or funding gaps. Often, revenues received from traditional funding sources fail to keep pace with transportation needs. Figure 1.2 illustrates this problem graphically. Fuel taxes, which are generally a fixed rate, are unable to keep pace with inflation and serve as a good example of this problem. These shortfalls can cause major project delays and increase overall costs to the transportation consumer.

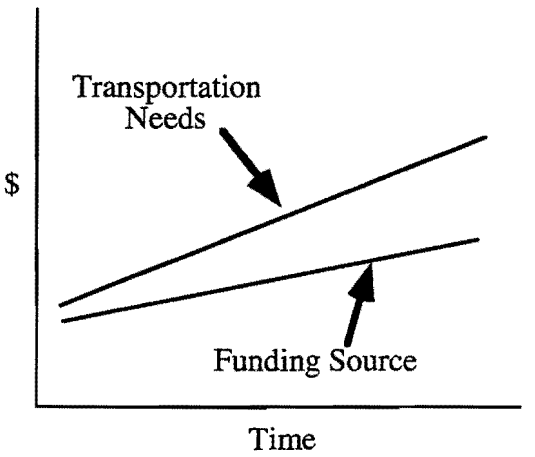

Figure 1.2
Example of Funding Inadequacy

Administrative Efficiency

All transportation funding methods incur administrative costs. Collection costs, enforcement costs, and implementation costs are components of administrative costs. The ratio of these costs to the amount of generated revenues is a measure of administrative efficiency: the lower the ratio, the better the administrative efficiency.

The administrative efficiency of a transportation funding method is often inversely related to the complexity of the funding mechanism. Thus, funding methods that involve complex collection schemes such as tolling and weight/distance taxes rate lower in terms of administrative efficiency. Typically, fee schemes that attempt to charge users directly for their use of the road system incur the highest administrative costs.

The costs of any funding mechanism must be balanced with the other intended objectives of the highway system. If economic efficiency is important, particularly for congested areas, then higher administrative costs can more easily be justified.

Contribution to Societal Goals

Although not a financial goal from the road builder's perspective, non-traditional financing methods should seek to positively influence society. Several funding methods achieve this goal by bringing the true costs of using a particular mode of transportation into line with the price charged to the user of that mode. Microeconomic theory predicts that such an increase in user price will result in reduced demand for the mode in question (usually single-occupant vehicles), relieving traffic congestion, improving air quality, and improving the quality of life. This goal is closely related to the goal of equitable fee distribution because it relies on increasing the price of using the transportation system to reflect the true costs of congestion.

Political Acceptability

The success of any funding mechanism is ultimately tied to its acceptance by the citizenry. A well-intentioned funding mechanism, based on a solid theoretical foundation, is meaningless if the public does not agree to support the system. Importantly, any funding plan must include efforts to clearly communicate the societal gains of the funding program in relation to the transportation improvements generated. If the public or affected groups can see that the benefits derived from the instituted taxes or fees are significant, then they are more willing to accept the funding program. Importantly, the users who are asked to pay for the system must see tangible benefits.

Applicability

Applicability is concerned with the appropriateness of the funding mechanism, and is less a method for evaluating than a method for screening. Project improvements that are linked to specific commercial activities may be more appropriately funded by impact or development fees, rather than by a more general fuel tax. The applicability measure is more clearly focused when the nature of the transportation improvement is examined. A

"system-wide" improvement suggests the need for a funding method that generates revenues applicable for use anywhere on the system. Fuel taxes are a good example of a system-wide funding method used in many countries. A "project-specific" improvement calls for funding from well-defined sources related to the specific improvement. Special assessment districts and tax increment financing are good examples of this method. In the project-specific method, funds are collected and used only on the related project. The applicability method is often used to assist in gauging public acceptance. The public is generally more amenable to a project-specific method, i.e., they want those benefiting from the improvement to pay for it.

Summary

The importance of these various criteria will vary with time and circumstances. From an economic perspective, however, economic efficiency can produce the maximum social gain. Equity, or fairness, using a cost-occasioned approach is consistent with the aims of economic efficiency. Related to this is a funding mechanism that is both stable and adequate. In order to generate public support, the goals and the benefits of a highway funding program must be clearly and widely disseminated to key political groups and to the general public. The public must be educated as to the gains that can be achieved by a more economically efficient transportation system.

Report Outline

The primary objective of this report is to identify experiences with highway privatization that are relevant to Texas. Chapter 2 summarizes the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991 in relation to its impact on privatization, particularly toll roads. Chapter 3 reviews U.S. experiences with privatization, focusing on recent developments in California and Virigina. Chapter 4 summarizes international experiences with privatization. Chapter 5 explores the role of toll roads and related private-sector programs in Texas. Finally, Chapter 6 presents a summary of the report.

This report is the first of three reports on Research Project 1281, "Highway Privatization in Texas." The second report, 1281-2, examines reliability of toll road revenue forecasts, an important component in evaluating privatization alternatives. This report is entitled *Reliability of Toll Road Revenue Forecasts for Selected Toll Roads in the United States*. The third report, 1281-3F, outlines the issues and policies related to implementing a program of privatization in Texas. It is entitled *Strategic and Implementation Issues in Texas' Public-Private Transportation Projects*. Taken together, these reports provide a basis for seriously evaluating highway privatization opportunities.

CHAPTER 2. INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT (ISTEA)

Though many states and municipalities face a growing demand for new highway capacity, most lack the funds to fully repair and maintain existing facilities, much less construct new ones. In an era of tight budgetary constraints, state transportation departments are searching for new ways to meet traffic demands without raising taxes. The traditional answer to this problem has been the toll road; when financed entirely by revenue bonds, this alternative meets the objective of construction without new taxes. However, start-up costs for these facilities are quite high, and other funds in addition to bond proceeds are often required.

Consistent with growing awareness of this problem, as well as of other transportation needs, the recently passed 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) can aid states through the co-mingling of state and federal money in the construction of tollways. Generally, the Act allows a 50 percent federal spending share on toll projects; the remaining 50 percent may come from any combination of state funds, public bond proceeds, and private monies. The Act's inclusion of private funding allowances represents the realization that there does exist a potential alternative to traditional public financing of highways. Current toll projects indicate that investors are confident that travel demand in selected (usually congested) areas warrants the construction of privatized toll facilities; they are willing to gamble that the commuter will be willing to pay for the privilege of avoiding congestion. Private ventures in Virginia and California illustrate that privatization of highway facilities is gaining acceptance.

ISTEA was signed into law by President George Bush on November 27, 1991. This Act marks the beginning of a new era in federal transportation policy. It establishes a 155,000-mile (249,395-km) National Highway System composed of the existing Interstate network as well as primary arterial roads. ISTEA authorized $155 billion for investment into the nation's highways and mass transit systems during the period 1992-1997. The authorizations are distributed according to the following (FHWA, 1992-b):

Surface Transportation		$120.8 billion
Highway Safety		1.6 billion
Mass Transit		31.5 billion
Motor Carrier Safety		0.5 billion
Research		0.8 billion
	TOTAL	$155.2 billion

Some analysts within the federal government claim that ISTEA will help create 1.1 million jobs, thus making it the principal "jobs" bill to come out of Congress in 1991. ISTEA also places a new emphasis on flexibility in state and local transportation spending and, even more importantly, allows for private-sector investment in some federally supported projects.

The large authorizations required for ISTEA are financed primarily from the proceeds of the current 14-cent motor fuels tax which is in effect through fiscal year 1995. After 1995, this tax will drop to 11.5 cents. Significant additional financing will be obtained by drawing down the Highway Trust Fund surplus by approximately $22 billion. Provisions in ISTEA will also lead to implementation of a new disbursement approach providing states and urban areas greater flexibility in allocating the funds they receive according to their own priorities and objectives. Furthermore, urban areas can receive federal money directly, thereby avoiding state-level administration, spending preferences, and procedures. Of course, greater flexibility translates into greater financial responsibility for the states and urban areas.

Under the new law, Texas will receive an average of about 94 cents, an increase of 8 cents over the current level, for every federal highway tax dollar paid into the Highway Trust Fund. Texas will continue to contribute more than it receives, but the new law provides a net increase of $385 million each year..

As alluded to earlier, ISTEA also contains new incentives for private-sector investment. For the first time since the Federal-aid system was established in 1916, federal funds can be used for toll road construction. Federal funding will be available for 50 to 80 percent of the costs of constructing new toll facilities or converting existing free facilities into toll facilities. One exception is that an existing toll-free Interstate highway may not be converted to a toll facility.

Unfortunately, many states and local governments, although they welcome toll road funding, do not have the money to match the federal contribution. There is also a risk that if too much federal money is quickly allocated for federally funded highway projects, the contracting market may become flooded with new orders, which could lead to inflated bids and wasted expenditures. Because of these concerns, states may, at their discretion, set a lower ceiling on maximum federal funding for projects within their jurisdictions.

A state may loan all or a portion of its federal share of the cost of a toll facility project to a public or private agency constructing the facility. Repayment of the loan to the state must begin not more than five years after the opening of the toll facility. The Act permits four uses of toll revenue: debt service, reasonable return on private financial investment, facility operating and maintenance costs, and other approved highway-related expenses. These four options are preconditions that must be agreed upon before federal funds are provided to private toll agencies.

The new ISTEA provision of federal matching for toll road projects is the first step towards significant private-sector involvement. This provision, however, effectively limits private toll facility investment to metropolitan areas where there is sufficient demand to cover construction and maintenance costs and to provide a return on investment to private agencies. ISTEA opens the door for greater private-sector involvement. However, it remains to be seen to what extent the private sector will take advantage of the available federal funding and whether the new initiatives will be successful.

CHAPTER 3. HIGHWAY PRIVATIZATION IN THE UNITED STATES

Overview of the U.S. Toll Road Experience

Toll roads have been a component of the United States transportation network since the late 18th century, when public funds for the construction and maintenance of roads were practically unavailable (Smith and Wuestefeld, 1983)[1]. The nation's first major tolled facility was the 62-mile (99.8-km) Lancaster Pike, a privately owned Philadelphia-to-Lancaster wagon route. The initial period of toll road development in the United States lasted from 1800 to 1830, when private investment represented the major force in developing the nation's road network (Schaevitz, 1988; Klein, 1985; Newlon, 1987).

Klein (1985) details the success of private turnpike companies in the late 18th and early 19th century; during this period, thousands of miles of roads were added in the Northeast and Mid-Atlantic states. Although the roads were privately built, the construction and operation of these early turnpikes were heavily regulated by local and state governments, especially in terms of toll limits. Largely because of such limits, these toll roads were *not* profitable enterprises. It was well-known that the tolls were insufficient to cover initial investment costs and ongoing maintenance.

By 1802, external benefits rather than internal benefits became a dominant reason for turnpike investment, including reduced transport costs and increased land value, not to mention convenience of direct access between established commercial areas. A new tactic, moral suasion, was used in an attempt to have all citizens in a town who benefited from a turnpike join in buying stock subscription. For instance, if a farmer whose land value would be increased by the building of a road did not apply to purchase stock, "moral suasion" was used at town meetings or personal visits to the farmer's home in attempts to solicit investment. The role of "public spiritedness" had a major effect in motivating private road investment (Klein, 1985). Stock subscriptions, rather than tolls, were the true source of funding private toll roads.

Nearly all the toll road facilities were financial failures. In fact, only one stock-subscribed toll facility turned a profit (Klein, 1985). The evolution of the American rail system contributed to this failure. Rail travel for passengers and freight was much quicker than the horse-drawn road vehicles, and resulted in the abandonment of numerous toll road facilities. The financially troubled facilities reverted to public ownership through abandonment, and in many cases no public responsibility was assumed for maintenance, leading to disuse and disappearance (Schaevitz, 1988).

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[1] Smith and Wuestefeld (1983) disagree with Schaevitz (1988) concerning the initial experience with toll roads in the United States. While both papers agree that Pennsylvania's Lancaster Pike, on which construction was begun in 1792, represents the nation's first major tolled facility, Smith and Wuestefeld note that the Commonwealth of Virginia provided for turnpike placement in 1785.

In the late 19th century, states had the resource base to fund road construction from general revenues, thus distinguishing this time period as the "era of free highways." During this period, very few toll roads were authorized and many existing toll roads were purchased by state and local governments and converted to free use, a practice which continued through 1940.

The "modern toll road era" began, arguably, in 1940 with the opening of the Pennsylvania Turnpike. Industrialization, increased automobile ownership, and changes in commuting patterns all contributed to the resurgence of toll roads. By 1960, tolled facilities totalling over 4,000 miles (6,440 km) were constructed in 40 states. While this total accounted for only 0.1 percent of the nation's roads, these facilities often connected large population centers, "resulting in very high traffic volumes and more than ample revenue collections" (Schaevitz, 1988).

While 3,100 miles (4,991 km) of tolled highways were built in the United States during the "toll road heyday" of the late 1940's and early 1950's, the modern toll road era was "overtaken, but not eliminated" by the largest free highway program ever undertaken — the federal interstate highway system, begun in 1956 with the Federal-Aid Highway Act (Schaevitz, 1988). This Act provided state incentives to build a free, national interstate system by contributing more than 75 percent of the funds needed for construction. The Highway Act also forbade the use of federal funds for new toll road construction. This undertaking, which obviated the need for toll financing in many areas, did not, however, lead to the elimination of tolls on many highways in the Northeast. Though tollway construction declined following the introduction of the interstate system, it picked up again in the 1980's as states began to examine the extent to which toll facilities could play a role in their transportation networks.

As the massive 35-year construction effort was drawing to a close, many observers began voicing concerns over how the interstate system, while an excellent road system, failed to anticipate the growth demands in many parts of the country. Increases in automobile and truck mileage rapidly outstripped population growth. The maintenance expenditures for these new highways were by now much greater than the cost of constructing the remaining interstate portions. In fact, many heavily traveled roads and bridges were beyond basic maintenance and needed to be completely reconstructed. Not surprisingly, new tollway construction rose dramatically in the 1980's from 87 miles (140 km) to over 1,300 miles (2,093 km) of toll roads, at a cost of over $13 billion, and it is predicted that the length of the 4,650-mile (7,487-km) toll road network will double over the next twenty years (Hartje, 1991).

Numerous factors exist which help to explain the current rise in toll road development, but foremost among these is a lack of public funds for needed highway construction. The literature demonstrates a general agreement that the current interest in toll roads is due primarily to what Schaevitz (1988) calls the "competing economic pressures" faced by state and local governments. Many states were forced to use significant amounts of their available funding for deferred maintenance and rehabilitation that led to a more

rapid deterioration of their transportation infrastructure.[2] Because of the costs involved in making major infrastructure repairs, the majority of public highway monies shifted from construction to maintenance (Hartje, 1991). At the same time, the demand for new highway capacity continued to increase due to continued growth in many of the nation's urban regions (Meisner, 1984).[3] Toll financing was seen as a vehicle to leverage or replace public dollars for new highway construction.

In larger part, the interest in toll roads was coupled with growing pressure to use the private sector in providing public services. In the provision of highways, privatization proponents cited four economic-related principles as justification for private-sector involvement (Geltner and Moavenzadeh, 1987):

1) Increased revenue to the government, since fuel taxes collected on private roads could be used on other projects.
2) Improvements in the efficiency of highway usage by making travel more costly.
3) Improvements in the efficiency of highway maintenance in order to keep costs low and quality of roads high.
4) Improvements in the quality of highway services so that the private roads become and remain the preferred travel route for many drivers.

Most road privatization advocates based their justification on the assumption that the private roads would be tolled. Toll financing allows for highway investment without placing significant additional pressures on state or federal government budgets because private capital is involved. It is argued that toll projects are usually built sooner than projects financed through government-collected user taxes. Toll financing enables society to raise more money for road construction than would be possible through ordinary public financing. Studies have shown that current toll roads and toll bridges are in better condition than other roads and bridges. These studies have also shown that toll roads provide a greater frequency of highway patrol, offer quicker emergency vehicle response, and have a better safety record (Guyton, Walton, and Boske, 1983). Furthermore, tolls can be used for better road pricing, a topic discussed later in this chapter. Finally, tolls are generally considered to be less regressive than sales taxes, motor fuel taxes, or vehicle registration fees. (They are more regressive than income taxes, however.)

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[2] Smith and Wuestefeld quote a 1983 TRIP study which concludes that 60 percent of the nation's 2 million miles (3.2 million km) of paved roadway needs resurfacing or rebuilding; the estimated cost of these repairs is $270 billion, or about ten times current annual federal highway spending. One would assume that since the time the study was undertaken, the cost of these repairs has increased considerably.

[3] Schaevitz (1988) notes that motivations for toll road development during the "modern era" arose primarily from "a large backlog of highway needs." Implicit in his explanation is the idea that the growth in vehicle volume was not being met with an equal rise in tax revenue. Though states did not face the same repair problems as those seen today, the problem — lack of revenue for needed construction — was essentially the same.

Toll roads that were in existence in the mid-1980's were mostly operated by public or quasi-public authorities. However, state and federal governments had no qualms about private funds being used for construction of additional highway facilities. They were in a quandary, however, with the inducements sought by the private sector as toll road participants. These inducements included (Merwin, 1991, and Roth, 1991):

a) Real estate development rights
b) Tax-exempt debt for issued toll road bonds
c) Tax increment financing
d) Dedication of rights-of-way
e) Guarantee of a minimum rate of return on investment
f) No competition from government-provided "free" roads
g) Acceptance of private road monopolies by the public

As a response to some of the private-sector concerns, the federal government in 1987 initiated a Toll Road Pilot Program through the Surface Transportation and Uniform Relocation Assistance Act of 1987. This Act provided for eight demonstration projects across the country with a mixture of state and federal funds. The Program marked a major turning point in federal toll road policy, permitting, for the first time, the use of federal highway trust fund monies in the financing of new toll roads. Table 3.1 shows the projects selected by each participating state and their estimated costs.

Table 3.1. Summary of Pilot Program Projects

State	Project Description	Miles	km	Cost
CA	Three corridors in Orange County: San Joaquin Hills (SR-73); Eastern; Foothill	64	103	Over $2.1 billion
DE	Relief route US-13	46	74	$480 million
FL	Extension of Sawgrass Expressway	3	5	$61 million
GA	GA-400 Extension	6	10	$272 million
PA	Mon-Fayette Expressway	53-57	85-92	$1.4-$1.6 billion
SC	Conway Bypass	28	45	$350 million
TX	Sam Houston Tollway-East	30	48	$239 million
WV	Extension of PA's Mon-Fayette Expressway	4	6	$90 million

The federal support for these projects was limited to a maximum of 35 percent, and all toll revenues from the demonstration facility had to be used for the construction, reconstruction, operation, maintenance, and debt service of the facility. Since the concerns of the private sector had not been fully resolved by the time the bill emerged, this Act also specifically stated that each demonstration project must be publicly owned or operated. It was not until 1991, when the Intermodal Surface Transportation Efficiency Act (ISTEA) was passed, that *private* toll operators could begin receiving federal funds. It is interesting to note that many states did not forbid the mixing of *state* funds and private funds for the construction of new roads. However, the overwhelming majority of states did not notably

increase their use of toll financing until after they began receiving significant federal assistance under the 1987 and 1991 Acts. Suddenly, when toll projects became financially feasible, these projects were classified as high priority in the state planning and programming process and tended therefore to be implemented faster than toll-free projects. The sudden high priority assigned to toll roads is clearly demonstrated by the fact that the total mileage for 35 new toll roads proposed in 1989 *alone* was approximately equal to the total toll road mileage built between 1959 and 1989.

Typically, toll roads in the United States are operated by public or quasi-public authorities, and, as such, are priced well below market value. That is, the toll rates charged per vehicle are not high enough to generate the revenues required for even basic road maintenance. In most instances, tolls do not keep pace with inflation. Even with 50 percent federal funding, only about 25 percent of the highway projects in any selected state's long-range capital program are viable with respect to toll financing at the current toll rates. These are the projects that would generate annual toll revenues such that half of the average annual debt service on bonds issued for highway construction are covered.

With the input of private funds, this inequity between revenues and expenditures has become a serious issue. One method of collecting more money in an equitable way from toll road users is known as road pricing, which includes congestion pricing. Pricing has been rationalized for many years by economists who assert that roads are public commodities like water lines and telephone lines and thus consumers (i.e., drivers) should be charged for the economic efficiency of this "scarce resource." They state that road pricing through vehicle ownership is inequitable and ineffective. A high gasoline tax — currently the largest component of federal highway funds — overprices off-peak travel but underprices peak-period travel. Two interesting benefits of the traffic jams created through this underpricing of peak-period travel are that (1) poor fuel efficiency in jams increases gasoline consumption and thus the tax revenues from the per-gallon levy; and (2) the frustrations experienced in traffic tie-ups may make citizens desperate enough to favor tax hikes for the purpose of building more roads (Semmons, 1986). However, the disadvantages of traffic jams, such as air pollution, time cost, and vehicle cost, clearly outweigh these benefits.

Essentially, the economic argument of road pricing is that each user of the existing road system should contribute towards the costs incurred on the road system by his/her presence. Efficient economic charges for the use of the road must cover three factors: (a) variable maintenance costs; (b) congestion costs, which are the delay costs incurred to other vehicles by making the vehicle journey; and (c) operating costs of the journey, which are borne by the traveller and are internal to the decision regarding use of the road network.

One of the key technologies required for implementing any road pricing scheme is the use of electronic toll collection such as Automatic Vehicle Identification (AVI). This technology, which is already in operation on a number of toll roads throughout the world, has numerous benefits and very few disadvantages. Because AVI eliminates queuing at toll plazas through the use of high-speed electronic sensors, the capacity of toll roads can easily be increased from 600 vehicles per hour per lane to 1,800. AVI can also reduce capital construction costs by up to 10 percent since toll plazas no longer need to have as

many throughput lanes. Finally, but most importantly, electronic toll collection has been shown to produce lower toll elasticities of demand. That is, the road users are not as likely to switch to alternate transportation routes or modes when a toll rate increase is implemented.

Besides electronic toll collection, another facilitator for road pricing would be the establishment of exclusive vehicle lanes or highways, where trucks and cars can be separated. The key benefit accruing to both types of vehicles is lower travel time due to smoother traffic flow, fewer accidents, and less delay. Exclusive vehicle facilities are especially appropriate for congested urban highways with significant percentages of single-unit and combination trucks in the traffic stream. However, such facilities are also extremely expensive to construct.

Current Examples of Highway Privatization in the U.S.

As mentioned in the first chapter, there are a variety of strategies available for utilizing funds from the private sector. The primary focus of this report is on privatization. Two examples highlight the current U.S. experience with privatization. The third example, Denver's E-470, is not a traditional privatization project, but is frequently listed as such in the literature. It has some interesting features that warrant its inclusion in this report.

Northern Virginia: Dulles Toll Road Extension

In the suburban Washington area of Northern Virginia, a private consortium was formed in the late 1980's to develop a 17-mile (27-km) extension of the existing Dulles Airport Road. The existing tollway extends from the Capital Beltway (I-495) to Dulles Airport, located 26 miles (42 km) west of Washington; development along the tollway corridor has been intense. Additional development beyond the corridor to the west and north of the airport was the motivation behind the decision to develop a private toll road which would cut through this new area of development from the airport to the town of Leesburg. Led by Ralph Stanley, former Urban Mass Transit Administrator and Elizabeth Dole's Chief of Staff at the U.S. Department of Transportation (USDOT), the private consortium entered into negotiations with the Virginia Department of Transportation (VDOT) in hopes of being granted permission to begin the process of land acquisition needed to construct the facility.

The Virginia legislature enacted legislation authorizing the construction of a privately owned toll facility, and the consortium, now known as the Toll Road Corporation of Virginia (TRCV), was ultimately successful in its negotiations with VDOT. The agreed-upon financial plan calls for the TRCV, which is both investor and developer in the project, to purchase all right-of-way and construct and operate the facility for an allotted period of time. TRCV was not given access, directly or indirectly, to the state's eminent domain powers. In return for the use of private venture capital, the agreement allows the TRCV a projected rate of return seen as commensurate with the risk involved (Wuestefeld, 1991). These rates are regulated by the Virginia Public Utility Commission. The maximum rate of return approved for the project is 14 percent during the first six years of

operation. After this period, the Public Utility Commission can either raise or lower this rate. The approved toll rate begins at $1.75 per vehicle in 1994, increasing to $2.00 in 1996 and to $2.25 in 1998. After 1998, the rate would increase by $0.25 every three years until 2010. Between 2010 and 2031 (the end of the franchise agreement), the rate would increase 3.2 percent annually.

There is no doubt that this extension project involves a great deal of risk and uncertainty. While the corridor through which the project will run is indeed developing at a rapid pace, private ownership of the project implies that if the projected rate of return is not met, the TRCV will be left to deal with irate investors, or, in a worst-case scenario, serious debt. Wuestefeld notes that fully private opportunities such as the Dulles extension "will be limited to a relatively few travel corridors that may possess essentially the same unique characteristics." He adds that most state programs will probably "remove some of the uncertainties and risks involved" with the Dulles-Leesburg project.

Original plans called for construction of the TRCV facility to begin in 1991. However, the acquisition of right-of-way became a more difficult process than originally anticipated, and construction did not begin until 1992. An important lesson from Virginia's experience is how much more time-consuming and expensive a private project can be than originally anticipated. Because of unforeseen government studies, the direct construction costs for the Dulles Toll Road Extension rose from $118 million in 1989 to $189 million in 1991. Not only had costs risen, but the projected traffic on the new facility increased substantially as well. The costly delay was mostly caused by a mandated comparison study between the private proposal and a public toll road proposal made by VDOT.

California: The CalTrans Lease Program (AB 680)[4]

One program that works at removing some of the risks involved in a fully private venture such as that in Virginia is the California Department of Transportation (CalTrans) lease program. Under this program, which was initiated by State Law AB 680, four consortia have been selected to develop four separate toll-road projects. Two of these projects are planned for the Orange County Corridor and are part of a set of tollways designed to alleviate existing congestion, as well as to offer access to still-developing areas of this affluent region, which lies roughly in the northern half of the developed corridor between San Diego and Los Angeles. A third tolled facility is planned for San Diego County and a fourth for the San Francisco Bay Area.

In each of the four AB 680 projects, a developer is part of the consortium, providing capital towards construction of his/her project. Partly as a result of the difficulties observed in the Dulles Extension project, Wuestefeld notes that the legislation in California calls for the facilities to be owned by the state and administered by CalTrans. The tollways will, however, be privately operated in addition to being privately financed. The state will, from the outset, own the land and improvements; the land will be leased by the private consortia for a period of 35 years.

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[4] The primary source for the information in this section is Gomez-Ibanez and Meyer (1991).

The California franchise agreements involve 115.2 miles (185 km) of tollway to be constructed at a projected cost of $2.5 billion. The facilities will be operated by the consortia for the 35-year franchise period, after which time operation responsibilities and toll revenues will revert to the state. The AB 680 enabling legislation governing this arrangement calls for this reversion regardless of whether or not the private lessees receive a return on their investment. Thus, while private risk is much less than in fully private projects such as Dulles-Leesburg, it is not eliminated under this leasing arrangement. Financing will consist mainly of taxable securities (unlike municipal bonds, which are tax-free) backed solely by toll revenues collected by the private consortia. Plans call for some of the facility costs to be paid by developer fees. The bulk of funding for bond and loan repayment, however, will come from toll revenues set by the private lessor-operators and collected during the 35-year franchise period. The state also plans to allow 99-year real estate leases on state-owned right-of-way (Hartje, 1991).[5]

While three of the four AB 680 projects are in the early planning stages, construction is nearly underway on the Route 91 facility in Orange County. The Route 91 consortium, led by CRSS of Houston, plans to begin construction on the project by September of 1992, contingent upon the completion of financing, which has not yet been fully secured. This project is being built along a planned state highway route for which environmental clearance had already been given before the CRSS-led consortium became involved in the project. Though travel demand in the area warranted construction of the new facility, state funding would not have been available for at least three to four years; the consortium could privately finance and construct the facility much sooner, though it will have to be tolled. (Route 91 was originally planned as a non-tolled state highway.)

The California experience illustrates one of the major advantages of private involvement in highway construction: needed highway projects need not be abandoned due simply to lack of public funding. Route 91 was deemed necessary to meet the Orange County region's mobility needs, and, while California lacked the funds to construct the facility, its lease plan provided enough incentive for a private consortium to finance and construct the project.

Table 3.2 summarizes the five private toll road projects along with their proposed rate schedules.

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[5] This arrangement is quite similar to the "build-operate-transfer" or "BOT" programs, which have been used successfully in Europe.

Table 3.2. Private Toll Roads Summary

	Toll Road	Total Construction Cost	Toll Road Length	Maximum Return on Investment
(1)	Midstate Toll Road	$1.2 billion	85 miles (137 km)	21.25%

The initial toll rates are $0.12 per mile for cars and $0.36 per mile for trucks, raised 4.5% annually.

(2)	San Diego Expressway	$260 million	10 miles (16 km)	18.5%

The initial toll will be $1.10 per vehicle in 1996, with any increases tied to inflation, currently projected at 4.0% annually.

(3)	SR-91 Median HOV Lanes	$88.4 million	10 miles (16 km)	17.0%

Tolls will only be imposed on single-occupant vehicles for the first five years of operation. After five years, vehicles with two occupants may also be tolled. The initial tolls will be $2.00 per car during peak hours and $1.00 per car during off-peak hours.

(4)	Santa Ana Viaduct Express	$701.7 million	11.3 mile (18 km)	20.25%

This toll road will be open to cars only. It is a limited road with only four interchanges over the entire route. The proposed vehicle tolls in 1997 for the single Mainline barrier are as follows. (Note that these only apply to northbound traffic; southbound traffic will be charged with the same rate structure but for different hours of the day.)

Time of Day	AVI Charge	Cash Charge
5:00 AM - 6:00 AM	$1.00	$3.00
6:00 AM - 7:00 PM	$5.00	$5.00
7:00 PM - 8:00 PM	$1.25	$3.00
8:00 PM - 9:00 PM	$1.00	$3.00
9:00 PM - 10:00 PM	$0.75	$3.00
10:00 PM - 5:00 AM	$0.25	$3.00

The California experiences are quite different from those in Virginia. In California, CalTrans formed a privatization committee which actively solicited private groups for toll road proposals. This committee wanted private parties to build and operate the toll facilities, but wanted California to retain ownership. This ownership was thought necessary to reduce the liability risks for the private companies. The private companies would lease and operate the facilities for up to 35 years, after which the state would assume operating responsibilities.

According to this privatization committee, the toll facilities in California would have to be self-supporting, with no state or federal funds involved. The state government would have to be fully reimbursed for any police or maintenance services which it agreed to supply during the life of the projects. The private developers of the toll facilities would have the authority to impose tolls for the use of the facilities in order to recover the costs of planning, building, and operating the roads, plus a reasonable return on their investments. Any excess toll revenues beyond those needed for these purposes would either be used for early reduction of the facility's debt or be paid into the State Highway Account. The state would also have the right to continue to charge tolls at the end of the lease.

One major difference between the Virginia and California projects is that the toll rates in Virginia are regulated by its public utility commission, whereas in California, the toll rates are clarified in the franchise agreements between the private developer and the state. The utility commission, CalTrans felt, was subject to political shifts, and thus might change the rules of the game during the life of the projects. The franchise agreements, on the other hand, would ensure continuity and stability. Finally, the public utility commission might reduce the freedom that the private owner would have in introducing innovative pricing strategies, such as congestion pricing.

CalTrans, through its Office of Privatization, developed an Evaluation Criteria List to select private consortia interested in building state toll roads. These criteria and their relative value are listed in Table 3.3.

Table 3.3. Evaluation Criteria List

	Criterion	Value
(1)	Transportation Service Provided	18%
(2)	Degree of Local Support	14%
(3)	Ease of Implementation	14%
(4)	Experience and Expertise of the Proposer	13%
(5)	Encourages Economic Prosperity and Makes Overall Good Business Sense	9%
(6)	Environmental Quality and Energy Conservation	9%
(7)	Degree of Technical Innovation	9%
(8)	Civil Rights Objectives	9%
(9)	Non-Toll Revenue Support	5%
		100%

CalTrans received proposals from ten private consortia on eight different toll roads. Each consortium spent approximately $1 million in identifying and preparing its proposals. The four consortia selected were composed mostly of large construction and transportation firms. One concession granted by CalTrans was an exclusive franchise in the service area of the proposed toll road; within this area, CalTrans promised not to build a "competitive transportation facility." The area was usually defined as a corridor parallel to the private toll facility extending 10 miles (16.1 km) on either side of the toll road.

The private developers were also free to set tolls, subject only to limitations of the maximum allowable rates of return on their investment. These maximum rates, varying from 17 percent to 23 percent depending on the risk of the private toll road project, were fixed to long-term Treasury Bill rates over the 35-year lease period. Thus, the maximum rates of return could *never* be lower than the initial maximum rates. The Dulles Toll Road Extension, in contrast, had its maximum return on investment fixed for the first six years of the project at 14 percent. Although California was much less restrictive in its rates, the state also realized that such high returns on investment gave private developers little incentive to increase auto occupancy or to encourage vanpools, since more cars mean more tolls. In order to alleviate this problem, CalTrans decided to allow increases in the allowable rates of return by up to six percentage points if the private developers increased auto occupancy or vanpooling, reduced accident and fatality rates, or reduced per-vehicle toll road operating costs.

The four California projects also differed from the Virginia project in that the former were subjects of a number of lawsuits. These lawsuits mostly contended that the projects violated California's environment laws, since no environmental impact statements had been completed. Other lawsuits argued that the franchise program violated the state's competitive contracting and procurement laws by not putting the construction of the toll road projects out to bid. These lawsuits, which are still in progress, have already cost the developers dearly in terms of time delays, even though most of the cases will eventually be dismissed.

Denver: E-470

E-470 is a proposed 48-mile (77-km) tolled "half-beltway" designed to serve the eastern portion of the Denver metropolitan region. This facility is an important link to the regional beltway (C-470), providing crucial north-south access to the new Denver airport, now being constructed in Adams County, northeast of the city. The facility is being developed and managed by the E-470 Authority, an independent public road authority working with local governments, principal landowners, and developers who own over half of the proposed right-of-way within the corridor. While a good portion of the project will be financed through the proceeds of bonds, an important component of the project's funding will be the collection of impact fees; original plans called for such fees to be levied on development within a 3-mile (4.8-km) corridor. Besides being used for initial financing, such fees have also been proposed as additional backing for the project's bond issue.

The impact fee structure is based on land use (commercial, industrial, or residential) and is progressively scaled according to square footage and proximity to the main line and interchanges; these serve as a proxy for trips generated on the facility. Though initially seen as an important component of E-470 funding, development impact fees in practice have been responsible for less than 1 percent of the project's financing. This is due to a lack of anticipated development along the corridor. Impact fees are due at the time building permits are issued; however, very little construction has been undertaken, and hence few fees levied. A $63 million letter of credit from Union Bank of Switzerland has been based mainly on interest accrued on proceeds from earlier bond sales, revenues generated by a special vehicle registration fee, and toll revenues. The annual registration fee, approved in 1988 by voters in the three counties to be served by E-470, is $10 per vehicle and currently provides the Authority with about $5 million per year. It is hoped, of course, that as the project proceeds, development, and hence impact fee revenue, will follow.

The first portion of the project, a 5.5-mile (8.9-km) segment, was completed and open to traffic during the summer of 1991. Financing for the next 30 miles (48 km) of the project will be augmented by federal funding, as the facility is being included as a demonstration project under the 1991 ISTEA. The E-470 Authority hoped to begin construction on the next segment, which is 12 miles (19 km) long, during the spring of 1993. Construction on future segments could begin as early as 1994, but completion of the project is many years away.

Summary

These three programs, while examples of privatization, clearly demonstrate markedly disparate levels of private participation. The Dulles-Leesburg project is the closest to a truly "private" facility. No proposed project comes close to the amount of private involvement seen in the Dulles extension; however, with private ownership comes a marked degree of risk and private liability. The California AB 680 projects, which are publicly owned, reduce private risk to a degree; however, risk is still present, as CalTrans does not guarantee investment return. The private CalTrans franchise participants are, to some extent, wearing the contractor's hat; here, though, private involvement has been extended from design, construction, and maintenance to include financing and operation as well. The case of E-470 in Denver represents the *potential* for a significant degree of private involvement in financing, but ownership and operation of the facility will remain public responsibility. It is difficult to ascertain the extent to which fee-based private financing differs from private purchases of public bonds. The E-470 example does, nevertheless, show up often in the privatization literature.

While the Dulles extension project would be considered a private venture under even the narrowest of definitions, as it involves fully private capital risk, the extent to which the other two cases represent significant privatization efforts seems problematic. However, their frequent inclusion in the literature has led to an important observation: it appears that "highway privatization" would include any effort which produces a greater role for the private sector than has been traditionally realized. While institutional purchases of bond

issues represent a traditional means of public infrastructure finance, funding from developer impact fees for a large project does not. Though private companies have long been involved in contracts to design, build, and maintain public facilities, their involvement in the operation of tolled facilities under a lease agreement is an arrangement considered novel in the United States.

Privatization, then, need not involve fully private ventures like that in Virginia, which will operate much like a regulated private utility. The key to understanding privatization efforts is to remember the primary factor in their recent popularization: the lack of public funding for new highway construction in areas undergoing significant growth and development. Thus, privatization may involve any new approach to highway funding which involves the use of private resources. As the three examples indicate, such approaches may involve non-traditional financing mechanisms, such as impact fees, or they may involve franchise agreements whereby the state receives revenue from the leasing of right-of-way. Of course, the approach may be one, as in Virginia, where the state allows a private entrepreneur to own and operate a facility for a prescribed period, with the understanding that ownership will revert to the state following that period. In any case, these examples indicate that private involvement in highway projects can indeed be of important assistance in the financing and construction of new facilities.

Analysis and Conclusions

While the commuting public would certainly welcome a reprieve from urban congestion, the general aversion to the idea of toll roads is well-documented. Recent studies have indicated, however, that given the assumption that tollways would be free of congestion, the public's primary concern is not the toll which must be paid, but rather the wait at the toll booth, which many commuters perceive as tantamount to, or worse than, the congestion they do not pay for on the free highway. A 1988 *Urban Transportation Monitor* survey revealed that while 48 percent of the respondents responded negatively to toll roads, 85 percent said that automated toll collection would improve their attitudes (Hartje, 1991). Similar results were found in a recent survey of San Francisco Bay Area motorists, who felt that automated toll collection would lessen congestion and improve air quality around toll plazas.

The technology for automated tolls has actually existed for nearly twenty years, and has improved to the point that facilities with electronic toll collection systems can function without toll plazas. A transponder, the size of a credit card, is placed on a vehicle's windshield, for example, allowing an electronic reader to obtain the vehicle's identification code and time of passage. A central computer stores the relevant information, and a variety of billing procedures may be used.

Automatic vehicle identification (AVI) systems are already in use on the North Dallas Tollway, Oklahoma turnpikes, and a few U.S. bridges. As an indication of their popularity, over 30,000 "toll tags" have been purchased by users of the North Dallas Tollway (Hartje, 1991). AVI technology is progressing rapidly; the system proposed for use on California's new tollways will not require significant reductions in vehicle speed as

the vehicles enter the toll road. Based on the advancements in electronic technology, toll plazas may become relatively obsolete (Brody, 1989).

Because construction of new tolled facilities is an expensive undertaking (up to $30 million per mile [$18.6 million per kilometer] for some urban routes), the importance of ascertaining the predicted volume needed to justify construction is paramount. With respect to cost factors, travel demand forecasting is a crucial issue. Interestingly, however, this issue is not specifically addressed in the literature. It is assumed that standard forecasting techniques will be used; however, the demand for toll road usage is affected by factors — the out-of-pocket cost factor, among others — that are not inherent to most forecasting models. There are numerous issues that the planner must contend with which are uniquely problematic to the forecasting of volume on a tolled facility; these include issues such as competition with free facilities and time versus money calculations. In order for private-sector participation in toll road construction to increase dramatically, the issue of demand forecasting must be addressed in greater detail. This topic is addressed in CTR Research Report 1281-2, *Reliability of Toll Road Revenue Forecasts for Selected Toll Roads in the United States*, and in an ongoing research project, 1322, "Evaluation of the Status, Effectiveness and Future of Toll Roads in Texas."

Gomez-Ibanez and Meyer (1991), in their case study of California and Virginia, point out that the private elements of the toll roads contribute much more than funding. They state that "private toll roads may make a contribution far greater than their mileage or investment by serving as a bench-mark against which the performance of public highway authorities can be measured and stimulated." The second observation they make is also very important. The authors claim that private toll roads are likely to be more innovative and "more willing to explore new technologies and techniques."

To date, ISTEA has had little impact on new toll road development. Federal aid requires its recipients (i.e., private consortia) to comply with federal regulations governing environmental reviews and contracting. These federal requirements may be more cumbersome than state or local regulations, adding to project costs and delays. The use of federal aid for a toll road also comes at the expense of the aid being used for other important road projects. Because of such regulations, the case studies seem to indicate that toll roads designed to foster growth or economic development may have a slightly better chance than roads designed to relieve congestion problems. Development roads have the advantage of being in situations where tolling is more likely to be politically acceptable. Environmental issues are also likely to be more difficult for congestion relievers than for development toll roads. By contrast, growth management is likely to be more of a problem in developmental situations.

Although private toll road projects are touted as being more efficient, flexible, and less costly to build and maintain, these recent experiences suggest that they have actually faced more financial and political obstacles than a public toll road would have. These obstacles include dealing with environmentalists or activists who are concerned about growth and who view a private company's commitment to the community with suspicion. Other obstacles include local and state governments that are less willing to exercise powers of eminent domain for a private road than for a public road, fearing that they may be

subject to charges that the government is exercising public powers on behalf of private rather than public interests. Indeed, Virginia's 1988 act authorizing private toll roads did not grant private operators eminent domain powers, and, in California, eminent domain was given to the state department of transportation (CalTrans) rather than to the private developers themselves.

These national experiences demonstrate three important elements in privatizing highways. First, there must be strong local public support. Generally, the public will not support the development of a toll road if it is perceived that the road can be developed as a free road. Privatization may be acceptable if it can be demonstrated that the development of a free road is years away and that a toll road could be implemented sooner. Second, there must be sufficient revenues to cover construction and operating costs. There must be sufficient demand to generate an adequate revenue stream over the life of the facility. Finally, the environmental and other external costs the road imposes on neighboring communities must be acceptable and reasonable.

CHAPTER 4. INTERNATIONAL EXPERIENCE WITH HIGHWAY PRIVATIZATION

International experiences with privatization most often take the form of toll roads, bridges, and tunnels. The acceptance of private-sector financing in each country is a product of political, cultural, and financial conditions that are unique to each nation, but most of the privatization efforts exhibit some common characteristics that are explored later in this chapter. An examination of these experiences can facilitate the development of comprehensive and sound privatization schemes in the United States.

The European Experience

France, Italy, and Spain have traditionally relied on the private sector to provide much of the investment in highways since World War II. The United Kingdom has a long history of private road networks, but, in modern times, private-sector involvement has been limited to tolled water crossings. The following summaries focus on the history of private-sector involvement in the provision of highways in each of these nations and the current financial health of their privatization projects. Additionally, recent proposals in other European countries are highlighted.

France

After World War II, French surface transport routes were inadequate to meet growing traffic levels. In the face of severe budget constraints, a 1955 statute approved the construction and operation of motorways by private companies. The only alternative to private toll roads was *no* construction of necessary infrastructure, which was clearly unacceptable.

In return for the authorization to charge tolls, the private companies issued long-term debt with supporting aid from the State. The State determined the construction schedule and the technical characteristics, set toll rates, and monitored the operation of the system. The agreements had a 35-year life with provisions for extensions. The contractors included four privately owned corporations and five publicly held organizations.

The four private companies began building highways in the early 1960's and, by 1982, three of them were not turning profits. A marked increase in construction costs, operating costs and borrowing rates and a slowdown in traffic growth all contributed to the financial instability of these private ventures. The government nationalized these three companies and thereby guaranteed the continuation of the road projects. The government also allowed for cross-subsidies between the three failed ventures and the five publicly owned road building groups. The one successful private outfit, *Cofiroute,* owns about 10 percent of the French road network.

After the 1982 reorganization, the French government imposed a more uniform toll rate structure and accepted cross-subsidies as a means of stabilizing the system. Toll roads are the foundation of the French road network, and it would be very difficult for the government to adopt a toll-free highway policy.

Organizational Structure of French Toll Roads (OECD, 1987)

The Ministry of Urban Development, Housing and Transport is responsible for granting concessions and supervising motorway concessionaire companies. The Ministry of Economy, Finance and Budget and the Ministry of State for Planning and Spatial strategy share in the latter responsibility. The transport ministry identifies construction programs, decides overall technical framework, and implements preliminary projects. It also supervises and ensures that the general specifications of the concession are adhered to, especially with regard to:

- the supervision of preliminary technical projects
- approval of tolls
- adoption of service levels

The Economic and Social Development Fund Committee (Comite du Fonds de Developpement Economique et Social) studies financial forecasts in order to determine the size of loans to be issued on the domestic and international markets.

The Caisse des Depots et Consignations (CDC — deposit and consignment office) is a national savings bank and the main partner of the central government in financing the French motorway network. It administers both short- and long-term loans. It is also a shareholder and administrator for the "Societes d'economie mixte" (SEM — semi-public companies). Apart from supplying some direct services, the CDC also is a management authority for the "Caisse Nationale des Autroutes" and "Autoroutes de France."

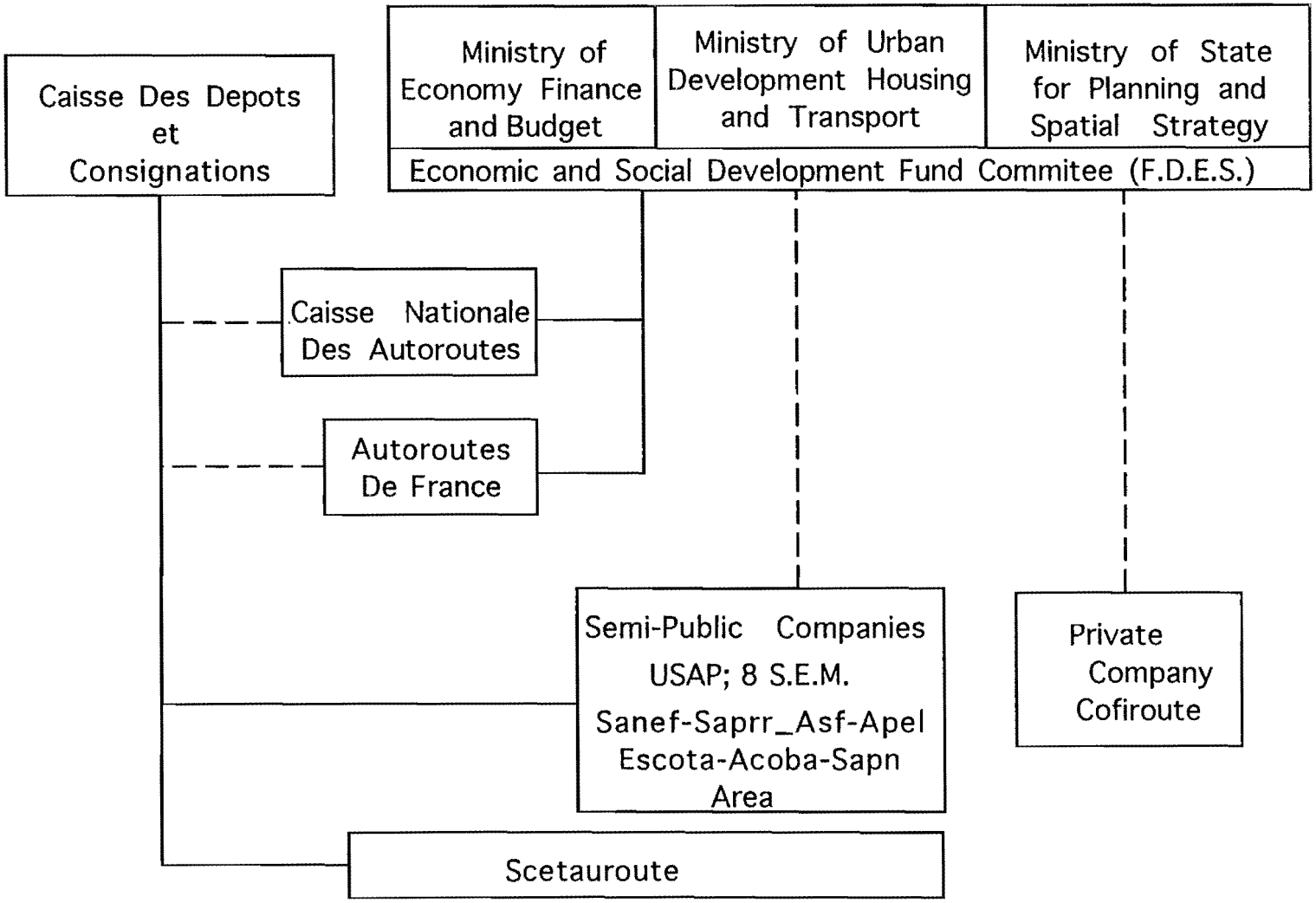
The Caisse Nationale des Autroutes is a public body that issues long-term loans in France and abroad for the SEMs. It is responsible for financing the SEMs.

The Autoroutes de France is a public body that receives revenues from the concessionaire companies in repayment of central government loans. Its objective is to ensure equal sharing of financial resources between the SEMs.

The Societes Concessionnaires D'autoroutes (companies operating motorway concessions), whether SEMs or private, finance, construct, maintain, and operate the motorway network within the framework of the concession contracts. The eight SEMs operating are SANEF, SAPRR, ASF, APEL, ESCOTA, ACOBA, SAPN, and AREA. These SEMs operate under the umbrella organization — "Union des Societes Francaises d'Autoroutes a Peage" (USAP). "Cofiroute" is the only independent private company that operates toll roads.

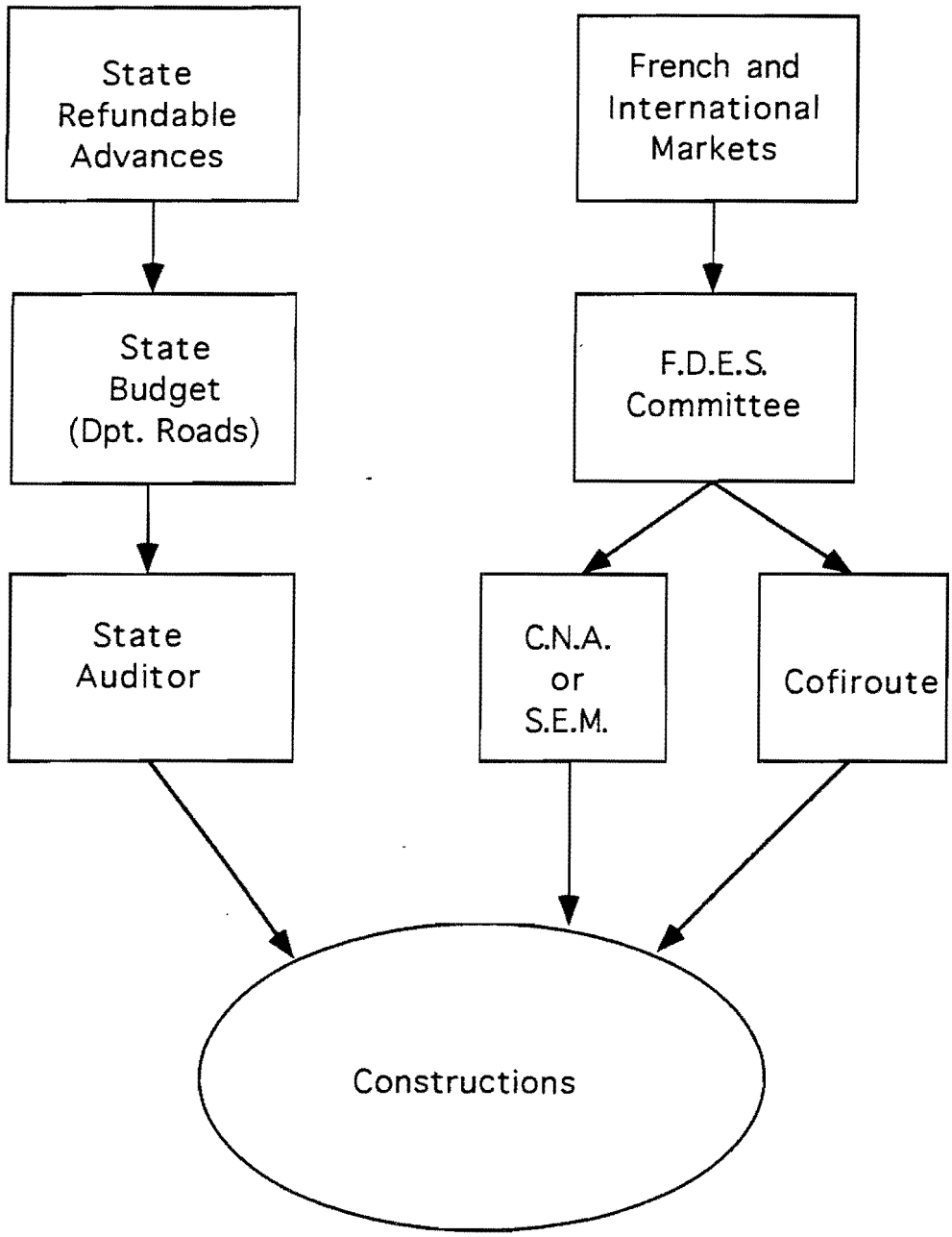
Scetauroute brings together the CDC group and the SEMs. It studies technical projects and acts as the prime contractor for motorway construction. For major projects on in service motorways, Scetauroute also supervises the construction work.

Figure 4.1 outlines the general organization of the French motorway system. Figure 4.2 sketches the flow of funds during the construction period and Figure 4.3 the financial flow during the operating phase of the toll road.



Source: Road Transport Research, Toll Financing and Private Sector Involvement in Road Infrastructure Development, OECD, Paris 1987, pp137.

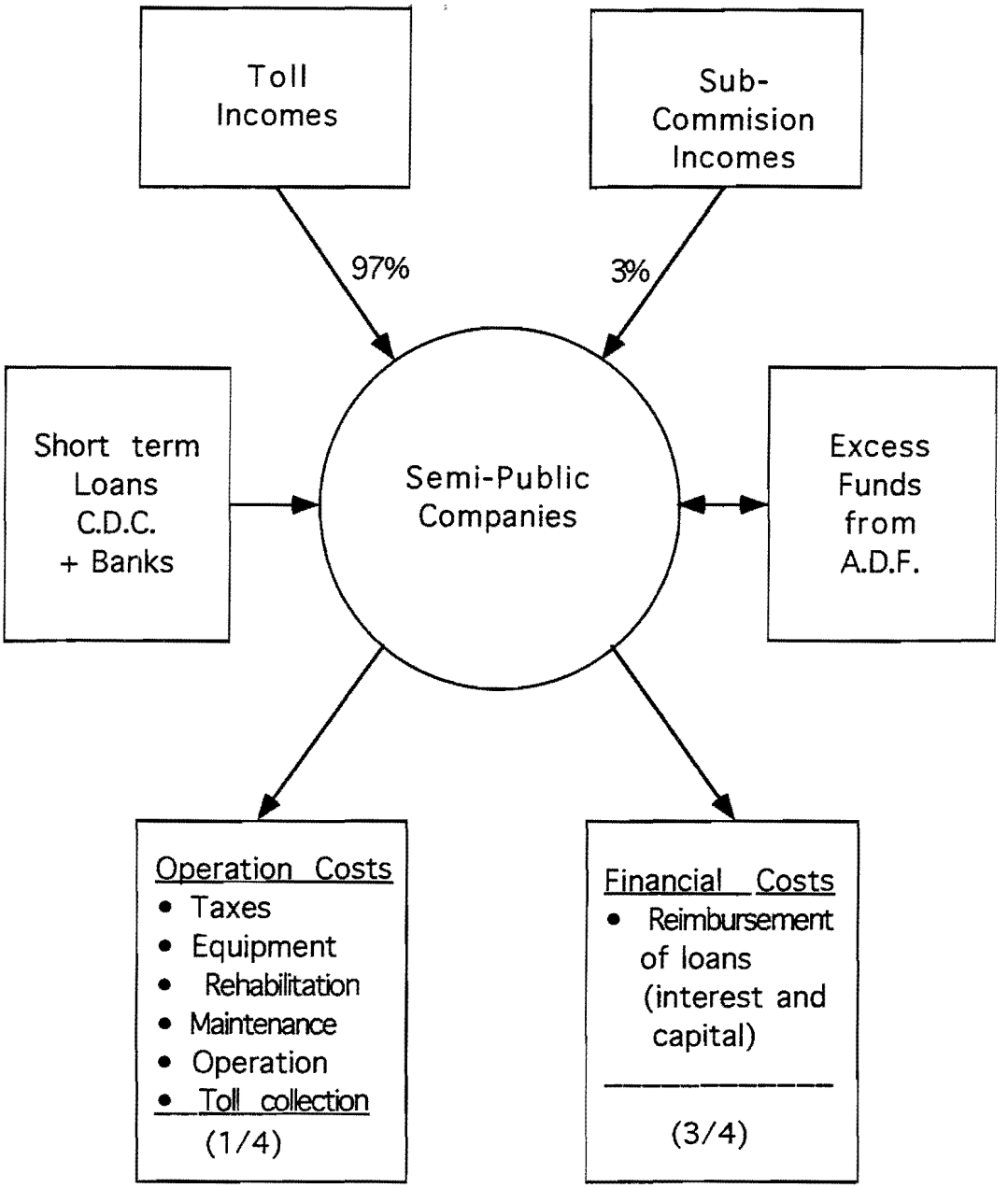
Figure 4.1. General Organization of the French Toll Motorway System



F.D.E.S. = Economic and Social Development Fund Committee
C.N.A. = Caisse Nationale des Autoroutes (National Motorway Bank)
S.E.M. = Societes d'Economie Mixte (Semi-public Companies)

Source: Road Transport Research, Toll Financing and Private Sector involvement in road infrastructure development, OECD 1987, pp138.

Figure 4.2. French Toll Motorways: Financial Flow During the Construction Period



C.D.C. = Deposit and Consignment Office

A.D.F. = French Motorway Company

Source: Road Transport Research, Toll Financing and Private Sector involvement in road infrastructure development, OECD 1987, pp139.

Figure 4.3. French Toll Motorways: Financial Flow During the Operation Period

Spain

The requirements of a booming tourist industry in the 1960's demanded extensive investment in a weak transportation network. The Spanish government was incapable of financing this investment from general revenues and turned to toll financing to capture the benefits tourists enjoyed as major users of the system.

In October 1972, legislation was passed authorizing the State to establish standards, technical considerations, and financing structures for toll roads. In order to avoid overburdening the internal capital markets with highway construction costs, the Spanish government required concession holders to finance at least 45 percent of their investment from foreign markets, and at least 10 percent from their own resources.

This left concessioners with huge amounts of foreign debt and vulnerable to currency fluctuations. Because of this instability, the State nationalized three of the eleven concession holders (approximately 14 percent of the road network). The State also created the successful "National Motorway Company" to promote and monitor the development of tolled highways with a mix of public and private funds. Contributions from the national budget included both non-returnable funds and capital advances repayable without interest on termination of the concession.

The Spanish approach has led to the successful construction of 2,000 km of tolled roads. The negative side, however, is that collection costs represent about 45 percent of total costs for these roads.

Organizational Structure of Spanish Toll Roads (OECD, 1987)

In Spain, the Ministry of Public Works and Urbanism and the Ministry of Economy (Finance Ministry) supervise the toll motorway concessionaire companies. They determine the program of construction, establish preliminary projects, and fix the technical framework. They also exercise supervisory control to ensure that the general specifications of the concession are fulfilled.

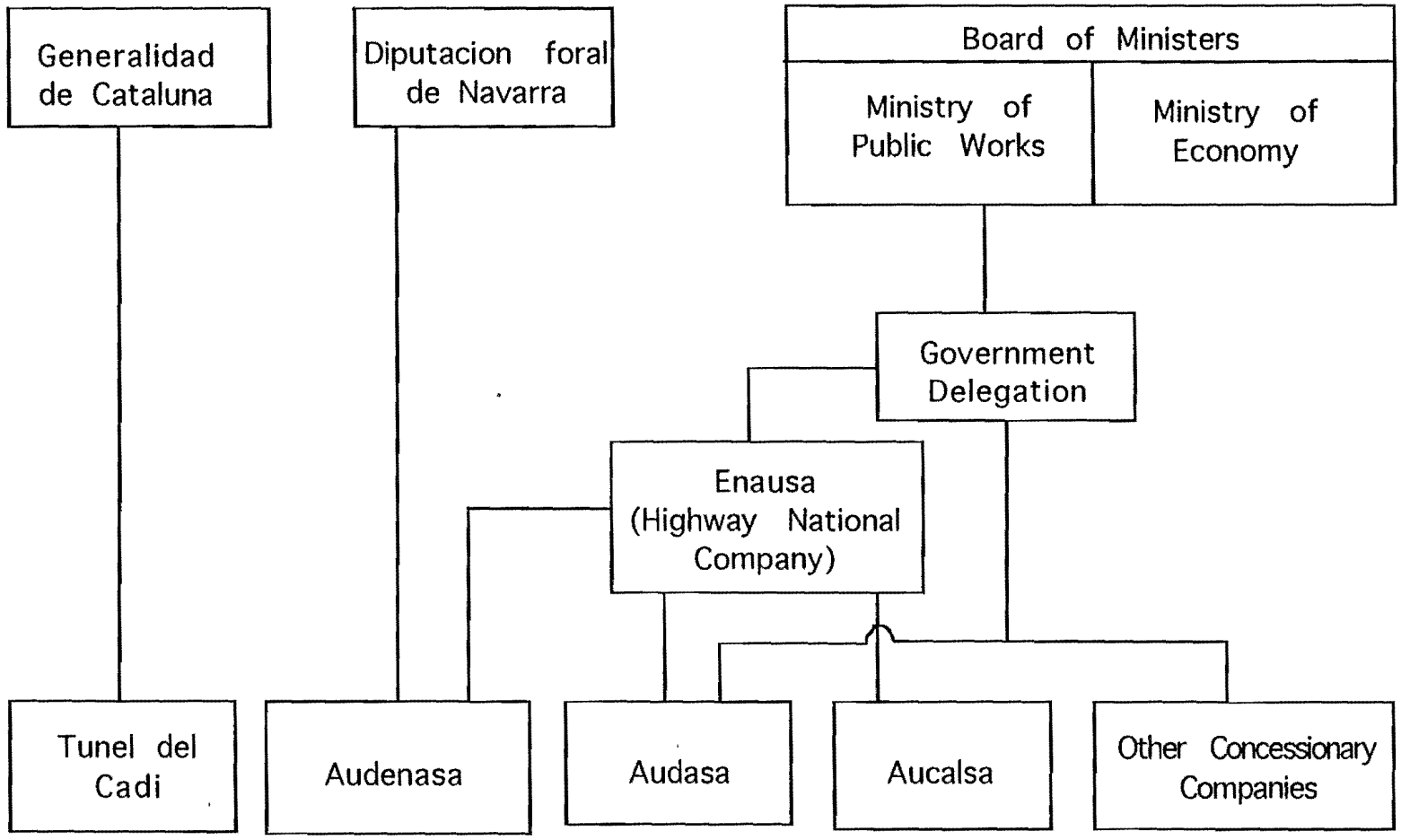
A government delegation to the toll motorway concessionaire companies is formed as a public body and as part of the Ministry of Public Works and Urbanism to supervise and inspect the work of the concessionaires.

The "Generalidad de Cataluna" and "La Diputacion Foral de Navarra" have the same responsibilities as the central administration with respect to motorways in their autonomous territories.

Toll motorway companies are responsible for financing, constructing, maintaining, and operating their authorized motorway network in accordance with the concession agreement. Some of these companies are TUNEL DEL CADI, AUDENASA, AUDASA, and AUCALSA.

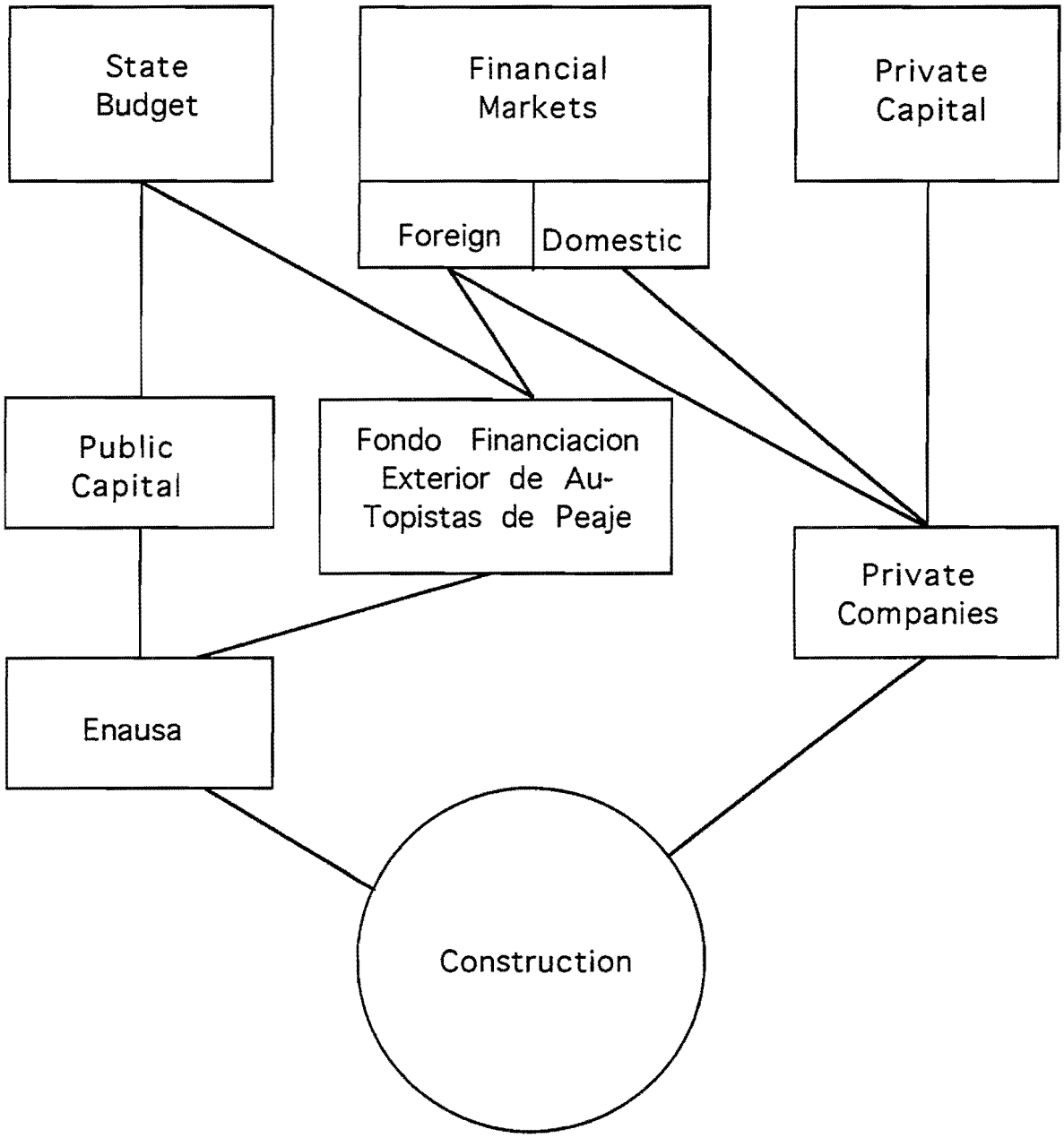
The Empresa Nacional de Autopistas (ENAUSA) is the national highway company and holds all the shares of the company AUCALSA and 50 percent of the shares of AUDENASA. ENAUSA constructs facilities (either by itself or through a third party), and operates toll motorways after authorization from the state. It plays a part in promoting the construction and operation of roads by private entities and may also provide management services.

Figure 4.4 outlines the general organization of the Spanish motorway system. Figure 4.5 sketches the flow of funds during the construction period and Figure 4.6 the financial flow during the operating phase of the toll road.



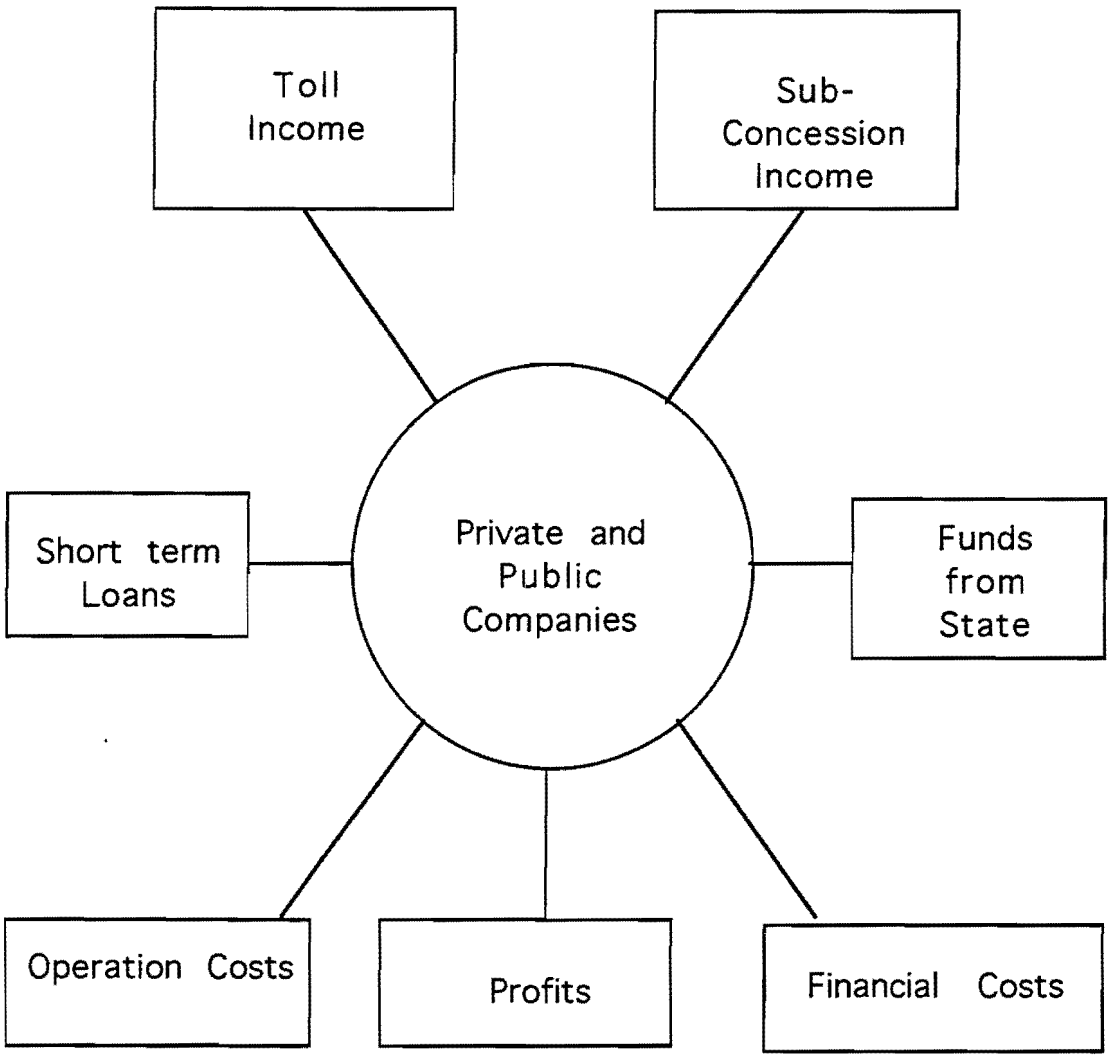
Source: Road Transport Research, Toll Financing and Private Sector involvement in road infrastructure development, OECD 1987, pp142.

Figure 4.4. General Organization of the Spanish Toll Highways System



Source: Road Transport Research, Toll Financing and Private Sector involvement in road infrastructure development, OECD 1987, pp143.

Figure 4.5. Spanish Toll Highways: Financial Flow During the Construction Period



Source: Road Transport Research, Toll Financing and Private Sector involvement in road infrastructure development, OECD 1987, pp144.

Figure 4.6. Spanish Toll Highways: Financial Flow During the Operation Period

The United Kingdom

In England, the concept of privately owned toll roads dates back to the 12th century. By 1281, tolls were applied to the old London Bridge and to ships passing beneath. By 1820, Britain had 20,000 miles of toll roads in operation. As in the U.S., competition from rail in the 19th century eventually led to the abandonment of the toll road system.

However, recent budget constraints and under-investment in the infrastructure have reopened the debate on toll roads. Toll roads are seen as an alternative to general revenue financing of roads and as a means of encouraging private-sector involvement. It is anticipated that road traffic in Great Britain will double in the next 35 years, as compared to the government's current road building scheme to add only 2 percent to the total capacity by the end of the century.

Today, tolls are largely confined to expensive engineering structures such as bridges and tunnels. The rationale is that these structures provide "exceptional" benefit to the user and, as a result, tolls provide a legitimate means of recovering the enormous construction costs and servicing the debt. Because these crossings are offered with little competition, the public is willing to accept tolls since alternative routes are usually much longer and more costly. There are eleven toll bridges and tunnels in Britain, financed through subsidies and government loans. Most are operating with net losses. This has not, however, dissuaded proponents of the the first modern toll road from moving forward: the proposed 19-mile (30.6-km) motorway running north of Birmingham parallel to the congested M6.

In the United Kingdom, a central theme of the conservative governments over the past decade has been to shift the balance of the economy in favor of greater private-sector participation. In the transportation sector, this shift means increased privatization of the existing network, deregulation, and creative initiatives for private-sector development of new transportation structures. Wherever possible, competition has been introduced to maximize efficiency gains. Cooperation between the public and private sectors on infrastructure development has occurred most often on bridge and tunnel projects.

Private-sector participation helps create services that are more responsive to demand and economic conditions and alleviates dependence on funding from the National Exchequer for the development of a high-quality road network. The current level of government funding at the national and local levels is approximately 2.5 billion pounds, and British officials anticipate that the private sector will play a significant role in providing transportation infrastructure services in the future.

Two outstanding examples of successful cooperation between the public and private sectors are the Dartford Bridge and the Channel Tunnel project. The Dartford Bridge, on the East side of London, is a 90-million-pound project that was financed privately without government guarantees and is operated by the private management company. Eurotunnel, a private consortium of French and British construction firms, is building the channel tunnel at an estimated total cost of 5 billion pounds without financial assistance or guarantees from the national governments involved in the project. Cooperation between government officials and private developers was instrumental in making this project a reality and demonstrates that high-level collaboration between the

public and private sectors can be a key component in the successful development of quality transportation infrastructure improvements.

Despite the proposed expansion of private toll financing to roads, the British Treasury is generally opposed to private development of projects that could be financed more cheaply with public borrowings; otherwise, it is argued, private firms are just borrowing on the Treasury's good name, as the government is the ultimate guarantor of such projects.

Italy

Toll roads in Italy are administered under a concession system, entrusting the tasks of financing, constructing, and administering a toll road to a consortium for a given period. At the end of this period, the entire structure is returned free of charge to the State. Concessions may consist of a single road or a major network. The concession of a network allows for cross-subsidies to less profitable roads within the network.

Italy uses a direct negotiation method rather than a competitive tendering approach for awarding concessions. Although it requires more safeguards, the Italians agree that it results in lower construction costs (Treglia, 1992).

The National Roads Service began commissioning toll road construction in 1924 with the Milan-Lakes route, the world's first toll highway. The majority of the Italian road network was built during the late 60's and 70's. The toll roads are managed by 25 companies, all of which are organized as "shareholding companies." The public authorities have a stake in most of these companies. *Autostrade* is the largest company responsible for about 40 percent of all toll roads, as well as a 10 percent partnership in the other companies (Treglia, 1992).

The Italian government does guarantee loans granted to the concessioners but, for protection, has set up a fund financed by value-added taxes on the tolls. Thus, the Italian road network is self-insured. The Italian system has successfully created a profitable, high-quality highway network. The system carries 18 percent of all inter-urban passengers and 53 percent of the goods traffic. To the year 1985, $5 billion (U.S.) has been invested in highway infrastructure, with only 8 percent coming from the government (Treglia, 1992).

Other European Experiences

Germany has the most extensive road network in Europe, but until recently there has been a strong national commitment to maintaining an unrestricted toll-free highway system. The German government has recently proposed instituting a program of user charges on the 11,000-km Autobahn system. This will be done initially through an annual charge and then with electronic toll collection. The system would be operated by a government-owned stock corporation, with shares in the corporation eventually sold to the public. This move is an important one, since Germany is one of the most powerful members of the European community.

Recently, Hungary has moved in the direction of granting concessions to private companies to build, operate, and transfer (BOT) highway facilities. The Ministry of Transportation announced plans to use a private consortium to "finance, design, develop, construct, and operate the proposed M1 and M15 toll highways ("Hungary . . .", 1992). These facilities provide an important eastern-western Europe linkage. Following the

submission of four bids, an award was granted the Hungarian Euro-Expressway consortium. Details of the contract are still being negotiated.

Other International Experiences

Japan

Although toll roads date back to 1871, the modern age of toll roads began in the mid-1950's with the creation of the "Public Road Company of Japan." In 1959 and 1962, public companies were established to construct toll roads in the Tokyo and Osaka-Kobe area. Since then, 34 local public companies and 21 independent local companies have been established. All companies are authorized to charge tolls for 30 years, or until all debts are retired; thereafter, the roads become toll-free.

Local toll roads are financed with interest-free State loans, capital provided by local authorities, and bonds purchased by special subscribers. Sharp increases in construction costs and maintenance costs after the 1973 oil crisis led to financial instability on numerous toll road projects. To correct this problem, a system of pooling receipts was initiated in 1972 to allow for cross-subsidies and the promotion of a national network. Despite financial problems of the companies, there should be over 13,000 km of tolled roads throughout the country by the year 2000.

In Japan, toll roads are built to higher standards and are better maintained than non-toll facilities, and increases in traffic volume are proof that Japanese motorists are willing to pay for high-quality facilities. Toll roads are the foundation of their road network and vital to their continuing economic stability.

Mexico

After the total failure of public highway infrastructure investment (only 50 km of Class I highway were built in the 10-year period ending 1987), Mexican planners concluded that private investment was the only solution to rapidly resolving the pressing needs for improved highways. Accordingly, the government of President Salinas sanctioned an ambitious toll road program which aimed at providing 5,000 km over a 6-year period at no cost to the federal government.

In general, Mexico's experience with privatization in the highway sector has been a salutary one. The need to accelerate the toll road planning process resulted in mistakes in awarding concessions. First, insufficient attention was paid to the privatization experiences in other countries such as Spain and France and, instead of learning, several fundamental but avoidable mistakes were incorporated into the process. There was also a lack of innovative technology in the design and operation of toll roads, particularly with respect to the treatment of trucks. Mexico's trucking fleet had increased over 10 percent, due to deregulation, since 1989. Moreover, the North American Free Trade Agreement (NAFTA) was expected to increase substantially the number of trucks operating in Mexico. Linking weigh-in-motion to toll booths would have enabled trucks to be charged on a road consumption basis rather than flat fees. Finally, the concession process was inherently quasi-monopolistic in nature and incurred the danger of creating private monopolies in place of state monopolies, with no guarantee of improved social welfare.

Proposals for toll road concessions were originally based on engineering designs, cost estimates, and traffic projections prepared by the Mexican Ministry of Transport

(SCT). These have resulted in high cost overruns, some as high as 200 percent, with an average of about 60 percent. The average construction cost for the 29 concessions so far has been around $3 million per kilometer (Carruthers, 1993).

In addition to poorly estimated costs, Mexican authorities failed to develop any demand estimates. SCT based its calculations on simple 4 percent annual increases in the relevant corridors. A failure to estimate demand elasticities meant that the true switching rate, about 15 percent, came as a tremendous shock. This, when combined with an overall growth rate of less than 2 percent, resulted in significantly constrained revenue flows. Of 16 concessions reviewed recently by the World Bank, ten have revenues less than half those predicted, two were within 15 percent of the projected level, and only four showed revenues higher than projected (Carruthers, 1993). Accordingly, only two of the current concessions produce rates of return greater than 20 percent, and seven are forecast to have negative rates, compared to 25 percent projected rates of return at the time of concession. The organization of the concessional process was also flawed. Most of the concessions were consortia comprised of a civil works contractor and a Mexican bank, often state-owned. The contractor had no interest in any long-term management of the project and typically tried to make as much profit as possible from the construction, with an internal charge made to the consortium. Since most of the banks were state-owned, they went along with government policy and supported these financial plans, and little attention was paid to whether revenue in fact related in any way to costs (Carruthers, 1993).

The impact of high costs has been aggravated by the method of awarding concessions on the basis of the shortest period to return the highway to public ownership. Experience in North America and Europe clearly indicates toll road cost recovery in about 25 to 50 years. The Dallas-Fort Worth tollway, for example, was repaid in 18 years, but this is an unusually short period of time and was predicated on the high traffic flows within the Dallas-Fort Worth metroplex. Comparing rates in the rest of the world, the awards in Mexico averaged about 11 years. Accordingly, tariffs had to be set high to provide for full cost recovery, which then significantly reduced demand. A cargo truck traveling the 142 km between Nuevo Laredo and Monterey pays more than $0.55 (U.S.) per km in tolls. In the fiercely competitive trucking sector, profit margins do not allow the typical trucker to pay these fees. In contrast, tolls in the United States average less than $0.19 (U.S.) per km.

As a result, traffic on Mexican toll roads is much less than projected, especially so for commercial traffic. In most cases, truckers choose free roads that parallel the toll roads, not only creating insufficient demand to support the toll roads but exacerbating the deterioration of the poor pavements on the free roads. In response, the Mexican government first considered regulations aimed at forcing truckers off the free roads and onto the toll roads. The law would prohibit vehicles with more than two axles or heavy trailers with more than three axles from using the public highways. However, the government now seems to favor reducing the tolls across vehicle types to stimulate demand (Boske et al, 1993). By forcing truckers onto the toll roads, the Mexican government hopes to guarantee sufficient traffic flows to make its concession program more attractive. Because of the lack of vehicles on the toll roads, concessions are struggling to repay loans made by banks, and lenders are becoming less willing to finance the construction of government highway projects.

A number of solutions are being explored by the Mexican government in an effort to attract more investment to its concession program. Some companies that have won

concessions to build highways are considering selling bonds on Wall Street to raise necesary funds. In addition, the government is beginning to offer traffic guarantees and is extending the terms of the concessions to up to 18 years in the hope of luring investment. Efforts are also directed toward upgrading and repairing the existing public highways in Mexico, with the government allocating 1.3 billion new pesos (U.S. $406 million) in 1993 for repair and maintenance of trunk highways.

Many of the toll road concessions have been awarded directly without any competitive process. In some cases, the operation of the toll road has passed to the state government. The concessions in the Veracruz port were awarded quickly to the three companies who made offers. The rail track maintenance contract also appeared to have been awarded directly. However, some privatization has been more open, such as the sale of shares in AeroMexico and Mexicana, proposed concessioning of railway workshops, and the awarding of new toll road concessions. It seems important to make all concession awards competitive and open and not allow them to be awarded through direct negotiation. Anything other than this will begin to stimulate private monopolies in place of state monopolies.

To summarize, in its rush to take advantage of private investment in the highway sector, the Mexican government permitted many serious mistakes which could have been avoided. Much closer attention to cost estimation needs to be paid, and even more important is demand analysis together with elasticities for different types of potential toll road users. This would allow the development of much longer periods for concessions and accord with other government planning objectives. Finally, the process needs to be more open in order to avoid the inefficiencies and quasi-monopolistic practices which attend the direct negotiation of concessions.

Summary of International Experiences

The following tables provide an overview of toll road system data from some selected countries. Most of the data corresponds to data from 1984 and is based on a report prepared by an Organization for Economic Co-operation and Development (OECD) scientific expert group. Table 4.1 summarizes the road network and some traffic information from these countries. Table 4.2 outlines road finance expenditures in these countries relative to gross national product and road user taxes. The 1984 status of toll facilities in these countries is summarized in Table 4.3. Finally, Table 4.4 summarizes toll revenues and the distribution of costs that these toll roads entail in different countries.

Table 4.1. Road Networks in Selected Countries Around the World, 1984

Country	Area 1000 sq km	Road Network 1000 km	Vehicles in 1000
France	549	805	24,110
Germany	249	487	26,936
Italy	301	298	22,170
Japan	378	1,125	44,530
Spain	505	319	10,485
United Kingdom (a)	230	347	18,377
United States	9,363	6,242	163,861

a) Great Britain only (excludes Northern Ireland)
b) 1983 data
Source: OECD, 1987.

Table 4.2. Road Finance in Selected Countries, 1984

Country	Gross National Product in billion US $	Road User Taxes in billion US $	Government Road Expenditure in billion US $			
			Construction	Maintenance	% GNP	% User Taxes
France	543	13.16	0.58	0.22	0.2	6
Germany	679	10.19	4.57	3.51	1.3	79
Italy	367	9.16	2.00	1.03	1	34
Japan	1,248	21.56	4.17	0.59	0.4	22
Spain	172	2.13	0.32	0.10	0.3	20
United Kingdom	481	10.7	1.20	0.13	0.2	13
United States	3,670	28	21.00	14.00	1	123

Source: OECD, 1987.

Table 4.3. Status of Toll Facilities, Selected Countries, 1984

Country	In Operation		Planned until 2000		Traffic	
	km	Bridges Tunnels	km	Bridges Tunnels	Vehicles per day per km toll road	Vehicles per day per bridge or tunnel
France	4,430	3	6150	-	15,192	5,600
Germany	-	-	-	-	-	-
Italy	5,105	3	667	-	20,666	6,727
Japan	6,096	-	5,806	-	24,450	-
Spain	1,780	1	240	-	7,403	..
United Kingdom	-	11	-	1	-	23,800
United States	7,109	171	..	..	..	..

- None
.. No information available
Source: OECD, 1987.

Table 4.4. Toll Road Finance Around the World,1984

(All figures in U.S. million dollars)

Country	Toll revenues	Collection costs	Collection costs as % of revenues	Yearly const. costs (b)	Government share of const. costs	Yearly maint. cost
France	924.82	..	10 to 12	604.64	551.44	348.9
Germany	-	-	-	-	-	-
Italy	0.8	..	..	0.23	-	0.29
Japan	4.24	1.14	27	5.6	0.66	0.6
Spain	200.16	..	9 to 11	210.03	0	..
United Kingdom	52.14	5.35	11	..	..	17.38
United States	2,003	696	35	542	325	448

- None
.. No information available
a) 1983 data
b) Yearly average 1980-1984 prices
Source: OECD, 1987.

Analysis and Conclusions

In many European nations, the distinction between the public and private sectors in the transportation industry is much less pronounced than it is in the United States. There is a greater recognition of national goals, and participants in both the public and private sectors cooperate to meet these stated objectives. The national governments, in recognizing that public revenues alone cannot keep pace with the demand for highway services, seek private-sector participation to forestall significant deterioration of their existing networks. This cooperation has led to private-sector involvement in the provision of transportation infrastructure and, in many cases, has served to greatly improve the quality on the national road networks.

Clearly, government is almost always involved at some level in any privatization scheme in the nations examined. For the most part, privatization efforts abroad have employed toll financing as the principal mechanism for encouraging private-sector investment. Collection costs are approximately 10 percent of total revenues in both Europe and Japan with the exception of Spain, where collection costs can be as high as 45 percent of total revenues. Clearly, the Spanish are not efficiently allocating their highway investment funds, but the government, at the present time, is content with the current system.

In addition to the prevalence of toll financing in all of the nations studied, the governments retain ultimate control of the road networks. The government usually guarantees the projects in some manner and sets standards and road specifications, and after a specified period of time the roads revert back to the State, usually free of charge.

In all of the countries mentioned earlier, government is usually involved in some manner. In the most common scenario, the government is the issuer of revenue or general obligation bonds, with institutional investors in the private sector purchasing the bonds. The public sector may also enter into a joint venture with the private sector, as is done in France, Spain, and Italy. These nations have authorized the joint private- and public-sector control of road corporations; Autostrade in Italy and the Semi-Public Companies in France (SEMs) are examples of structures that have evolved into joint ventures over time. Initially, these projects were private ventures, but financial instability forced the State to, in effect, become partners with the private sector.

Any private venture is a joint venture to a certain extent, in that the public sector usually assists in acquiring the right-of-way and grants authorization for the project to private-sector developers. There is a distinction, however, between a joint venture where public funds are contributed to the project at the outset and a situation in which public funds are used to rescue insolvent operations. There is also a distinction to be made between joint ventures that simply involve government approval and cooperation for a project and the actual earmarking of public-sector funds.

As discussed earlier, completely private-sector initiatives are unusual because the level of assumed risk is too high to make the project feasible with acceptable toll rates. Hence, the government often steps in to guarantee the projects' success. It is arguable that the experiences in Italy, Spain, France, and Mexico demonstrate that the government can be hasty in guaranteeing a project in its desire for infrastructure investment. Unfortunately, severe budget constraints create a situation where toll financing becomes the only realistic short-term option regardless of true long-term costs,which may indicate that an alternative means of financing is more appropriate.

Based on the analysis of the European and Japanese experience, public-sector involvement in privatization projects is essential to guarantee the development of an integrated network of high-quality roads and to ensure solvent operations. The experience is almost universal in the nations studied, where most private outfits eventually encounter insurmountable financial difficulties. In such cases, the State is forced to bail out the project at a time when its own financial situation may be severely constrained, a condition that led to the development of private-sector initiatives in the first place.

There are a number of reasons why it is difficult for private operations to realize a profit. Spiraling construction and maintenance costs, the inability to accurately predict traffic demands, and unstable economic conditions create management challenges that few road corporations can handle. Given the exceptionally high risk level associated with private-sector provision of roads, the State must decide if this is an appropriate means of providing roads.

If private roads are accepted as a feasible option, the government must develop stringent regulatory practices to ensure that financial austerity is maintained and that the system is not abused for financial gain. Any time the government guarantees private-sector business transactions, there is a potential for unscrupulous activity.

Another means of ensuring financial solvency besides regulation is the Italian practice of using a set percentage of toll revenues to establish a guarantee fund. In this manner, the system is self-insured and public tax dollars can be freed up for alternative uses. This strategy could be implemented in this country if there was a system of national control over the toll road network.

Financial conditions in this country dictate that the private sector must play a role in future infrastructure development and that there are a number of conditions that need to be met for the private sector to get involved on a meaningful scale (Wuestefeld, 1991). Some of the uncertainties and risks involved must be well-managed or removed for private road development. To control for risks and uncertainties involves a government guarantee of the type seen in Europe and an assurance that the investment will be protected from future competition by tax-supported investments.

The private sector can play a vital role in future infrastructure investment. Evidence from abroad indicates that successful operations entail joint cooperation between the private and public sectors, realistic interpretations of economic conditions, and excellent management techniques. The government and the private sector must be deliberate in their development of realistic proposals that will provide a valuable public good.

CHAPTER 5. HIGHWAY PRIVATIZATION IN TEXAS

Overview

As noted earlier, highway privatization is not a particularly new idea in the United States. Now that the interstate system is more than 96 percent complete, however, the need for private highways is being "rediscovered" across the nation; the state of Texas is no exception. The main concern of state transportation agencies, including TxDOT, has become the replacement and reconstruction of existing bridges and highways that have deteriorated beyond repair. The prohibitive cost of building new highways is also a factor that has renewed interest in private-sector involvement in highway transportation. The key principle to remember about private investment is that there must exist specific beneficiaries who gain from specific transportation improvements. The most visible example is of course a toll road — those who drive on it pay for its construction, operation, and maintenance, while those who do not drive on it do not pay. Besides private toll roads, there exist many other methods for capturing private-sector funds for infrastructure support and development. Many of these innovative techniques were described in Chapter 1. This chapter will summarize Texas' experience with toll roads, as well as other methods used to involve the private sector.

Historical Perspective

Texas' legislative record on the subject of highway privatization has mirrored political, administrative, and economic needs. This record can be divided into three distinct phases. The first phase, which spanned the first half of the twentieth century, saw infrastructure needs that consistently exceeded the state government's resources. Texas was not alone in this situation; the rapid popularization and distribution of the automobile, and the correspondingly immense infrastructure needs, caught most states off guard. One needs only to view photographs of the traffic congestion in 1920's metropolises or the poorly maintained dirt routes connecting the East and West Coasts to know that the nation as a whole faced an infrastructure crisis. The monumental task of constructing high-quality state highway infrastructure caused Texas to enlist the aid of the private sector. In 1913, the Texas Legislature passed Senate Bill 232 into law. This Bill ultimately became Chapter 11, Title 32 of the *Texas Revised Statutes* and authorized "the formation of corporations for the purpose of constructing, building, acquiring, owning, operating, and maintaining toll roads in the State of Texas." Title 32 granted toll road corporations broad powers, including the right to construct, build, and operate toll roads between *any* points in the state; the right to cross the rights-of-way of railroads and other highways; and, most importantly, the right of eminent domain. In addition, the legislation empowered private toll road corporations with "the ability to fix and charge tolls for the use of their roads provided that the rate to be charged for each class of vehicle shall be the same to all in each of such classes." Under Title 32, toll road corporations could be chartered for a maximum of fifty years, but with renewal possible at any time. In retrospect, the 1913 Act did not provide

for much explicit protection of the public interest. Rather, the Act adopted a laissez-faire attitude, relying on micro-economic forces to keep toll road corporations "honest."

This attitude may have changed with the coming of the Great Depression and welfare economics in the 1930's, but Texas' toll road legislation didn't change until the mid-1960's. A key reason for this legislative stagnation was that fact that few toll projects were in existence after the 1930's and 1940's. Federal government involvement, first under the National Public Highways Program and later under the Interstate Highways Program, provided ample funding for intercity roads. In addition, the Texas Highway Department had evolved into a leading public highway provider. By the mid-1950's, government intervention caught up with highway needs, and private-sector incentives for the road provision evaporated.

The next phase of Texas highway privatization legislation began with the chartering of the Texas Turnpike Authority (TTA) in 1953. However, the legislation chartering the TTA, currently published as Article 6674v of *Vernon's Texas Civil Statutes*, didn't deal with private highway providers explicitly. The private providers continued to be covered by Title 32. Rather, the TTA's authorizing legislation ushered in a new age of toll road provision in Texas. At its conception, the TTA was chartered as a ***non-profit*** corporation with the specific goal of constructing a toll facility in Dallas, Texas. This role, as well as the TTA's authorizing legislation, gradually evolved to a point such that TTA became an administrative body independent of the Texas government. The formation of the TTA is important because its evolution also reduced the incentives for private road provision.

The third phase of privatization legislation began in the late 1980's. With a considerable string of success stories behind it, the TTA had gained considerable political clout and administrative autonomy. In addition, the urban population explosion of the 1970's caused transportation needs to outpace government resources once again. Thus, in 1987, the Texas legislature authorized "joint venture agreements" between the TTA and state, county, and local transportation agencies. These agreements, authorized under Article 6674v.1 of *Vernon's Texas Civil Statutes*, allowed government agencies and the TTA to share the costs of turnpike project development. This Act gave the TTA access to low-interest state and municipal bond issues, further weakening the position of independent private turnpike projects.

The final phase of Texas privatization legislation began in 1991 with the passage of House Bill 749, legislation that is still in force today. The Bill's primary objective is to reauthorize the Texas Turnpike Authority. However, several of the Bill's provisions weaken the position of private toll road providers. First, as a result of a deletion in the original authorization act, the TTA is allowed to pursue projects anywhere in the state of Texas. Second, the legislation grants the TTA the power of condemnation. Most importantly, however, the bill repeals the Title 32 private toll road provisions described above. In their place, the Texas legislature gave the TTA the power to

> ...enter into agreements with private entities, including toll road corporations, to permit them, independently or jointly with the Authority, to construct, to maintain, to repair, and to operate turnpike projects, and the Authority may authorize the investment of private funds, including debt and equity participation, as a means for financing all or any of the above functions (House Bill 749).

In the case of joint development, the TTA has "broad latitude to negotiate the terms and conditions for the methods and types of financing" of the project. However, the legislation requires that facilities built or acquired for joint projects become public property belonging to the Authority. The Authority is authorized to lease or franchise these jointly developed facilities, but the Authority remains the ultimate owner of such facilities. The legislation allows independent private projects authorized by the TTA to own their facilities, but in such a case the TTA is forbidden to incur any financial obligations for the private entity.

Texas Toll Roads and Bridges

It is acknowledged that Texas participation in toll roads is primarily a public activity. The Texas Turnpike Authority (TTA) is a state agency. However, because privatization efforts will most often be tolled facilities, the experiences of TTA are relevant to any discussion of highway privatization. Moreover, future privatization efforts may be directly linked to TTA activities.

Texas Turnpike Authority (TTA)

As noted earlier, the most common form of private highway involvement is the tolled facility. The first modern toll road built in Texas after World War II was the Dallas-Fort Worth Tollway. It was built by the Texas Turnpike Authority using revenue bonds supported entirely by vehicle tolls. The TTA was prohibited from receiving any federal funds. This tollway was a major success story, with its indebtedness retired seventeen years ahead of schedule. The TTA then handed over this tollway to the State Highway Department, and it is now part of I-30. The TTA has also built three other toll facilities: 1) the Dallas North Tollway (1968); 2) the Mountain Creek Lake Bridge (1979) in Dallas County; and 3) the Houston Ship Channel Bridge (1982) in Harris County (TTA, 1990). The TTA is currently operating and maintaining these three projects as well as beginning construction of a third extension to the Dallas North Tollway (a second extension was completed a few years ago). All of these projects are funded by revenue bonds supported by toll revenues. As soon as the bonds are retired, the facilities are placed under the control of TxDOT and toll collection is suspended. A special note about the Dallas North Tollway should be mentioned. It was the first American turnpike to be fully equipped with automatic vehicle identification (AVI) capability, and already 45 percent of the Dallas area rush-hour commuters are utilizing this electronic toll tag system. An AVI system, such as the one used in Dallas, can increase the capacity of tollways from 600 vehicles per lane per hour to 1,800 vehicles. The key advantages to using such a system are that it reduces labor costs (e.g., no toll attendants), reduces the number of lanes required at toll plazas, and

eliminates the stop-and-go congestion at traditional toll booths. The disadvantage lies in enforcing the payment of tolls by users who have not purchased electronic sensors, and in the mailing costs of bills and reminder notices.

In 1991, TTA's enabling legislation expired, and, instead of continuing this agency as it had done in the past, the Texas Sunset Advisory Commission decided to withhold judgment until the election in November 1991. The reason was that a proposition (Proposition 2 authored by State Representative David Cain) had been placed on the ballot which would authorize TxDOT "to expend money, from any source available, for the costs of turnpikes, toll roads, or toll bridges of the Texas Turnpike Authority, or successor agency, provided that any monies expended out of the state highway fund shall be repaid to the fund from tolls or other turnpike revenue." This ballot was narrowly approved by the voters of Texas, but the exact status of the Texas Turnpike Authority is still uncertain. It is anticipated that, around 1997, the TTA will operate as part of TxDOT.

City and County Toll Roads and Bridges

The most prominent non-TTA toll authority is the Harris County Toll Road Authority (HCTRA). HCTRA was authorized by the Harris County Commissioners Court in 1983, following approval of a $900 million bond package for toll roads by Harris County voters. Summary financial statistics for HCTRA are shown in Table 5.1. HCTRA operates the 21.2-mile (34.1-km) Hardy Street Toll Road and the 27.3-mile (43.9-km) Sam Houston Tollway.

Galveston County Road District No.1 operates the 1.3-mile (2.1-km) San Louis Pass — Vacek Bridge from Galveston County to Brazoria County. Cameron County operates the Cameron County International Bridge in Brownsville and Starr County operates the Roma International Bridge in Roma. Both of these latter bridges are border crossings. Several cities also operate border bridges: 1) the Del Rio International Bridge to Ciudad Acuna, 2) the Laredo International Bridge on Convent Street to Nuevo Laredo, 3) the Laredo International Bridge on San Diario to Nuevo Laredo, 4) the Eagle Pass International Bridge to Piedras Negras, 5) the McAllen International Bridge to Reynosa, 6) the El Paso Bridge on Santa Fe Street to Juarez, and 7) the El Paso Bridge on Stanton Street to Juarez. Summary financial statistics for these operations are shown in Table 5.1. Laredo was the only jurisdiction to issue new bonds in 1990 ($449,662).

Finally, the Galveston County Navigation District operates the causeway between Galveston Island and Pelican Island. This District is also responsible for the Port of Galveston (TxDOT, 1992-a). Financial statistics for the District are included in Table 5.1.

Table 5.1
1990 Financial Summaries for Texas Public Toll Operations

	Receipts	Disbursements*	Net	Indebtedness
Cameron County	$3,561,035	$3,983,451	($422,416)	$2,225,000
Galveston County Navigation District	$491,268	$530,196	($38,928)	$0
Galveston County Road District No.1	$675,785	$484,288	$191,497	$1,350,000
Harris County Toll Road Authority	$48,415,191	$193,714,891	($145,299,700)	$1,110,157,900
Starr County Toll Bridge	$729,086	$884,318	($155,232)	$945,000
Del Rio Int. Toll Bridge	$1,043,670	$1,198,737	($155,067)	$3,620,000
Eagle Pass Toll Bridge	$2,005,547	$1,814,276	$191,271	$90,000
El Paso Toll Bridges	$2,050,969	$2,050,969	$0	$0
Laredo Int. Toll Bridges	$7,427,426	$7,873,470	($446,044)	$9,184,662
McAllen Int. Toll Bridge	$3,902,776	$4,445,468	($542,692)	$4,895,000

Source: TxDOT, 1992.

* Disbursements include transfers to counties, cities, and other non-road purposes.

Private Toll Roads

As noted in the first part of this chapter, the previous Chapter 11, Title 32 of the *Texas Revised Statutes* authorized private toll road corporations. House Bill 749, adopted in 1991, eliminated this provision effective June 1, 1991. The bill does not affect any private toll road corporations authorized before the June 1, 1991 deadline. Subsequent to the adoption of House Bill 749 and before June 1, 1991, a number of organizations filed with the State to create toll road corporations. They are summarized below:

1. Camino Falcon Inc., filed 9-5-90.

Road from Webb County "at or near an international bridge" to the Port of Corpus Christi and on to Padre Island. It will traverse Webb, Duval, Jim Wells, Nueces, and Kleberg Counties and be about 200 miles (321.8 km) long.

2. Camino Colombia, Inc., filed 3-15-91.

Road from a point near FM 1472 within a 2-mile (3.2-km) radius of the Columbia International Bridge on the Rio Grande River, easterly to end at IH-35. The road will be about 25 miles (40.2 km) long and will be in Webb County.

3. Southwest Toll Road Corporation, filed 5-29-91.

Road from Harris County near Sam Houston Parkway South and SH 35, proceeding southerly through Brazoria and Galveston Counties to Galveston Island. The road will be about 40 miles (64.4 km) in length.

4. Texas Turnpike Corporation, filed 5-30-91.

Roads with the following "terminal points": (A) Dallas, Fort Worth, Denton, McKinney, Rockwall, and Terrell, and (B) Georgetown, Austin, San Marcos, New Braunfels, San Antonio, Seguin, and Lockhart.

5. Road and Bridge Builders, Inc., filed 5-31-91.

Road A from a point within a 2-mile (3.2-km) radius of the intersection of IH-35 and SH 195, extending southerly to a point on Interstate 10 west of Seguin and westerly parallel to IH-10 to a point on Loop 410; a length of 100 miles (160.9 km).

Road B from the southern end of Loop 1 in Travis County, easterly, intersecting and crossing IH-35 near its intersection with FM 1327 and continuing to intersect with the toll road (A) described above. This second toll road (B) is about 20 miles (32.2 km) long.

6. National Tollroad Authority Texas I, Inc., filed 5-31-91.

Road from a point within a 5-mile (8.0-km) radius of the City of Avondale, Texas, near U.S. 287, extending easterly across I-35W and ending at Interstate 635 within a 2-mile (3.2-km) radius of the intersection of Interstate 635 and SH 114. The estimated length is 30 miles (48.3 km), all in Tarrant and Denton Counties.

7. National Tollroad Authority Texas 2, Inc., filed 5-31-91.

Road from SH 121 at a point within a 5-mile (8.0-km) radius of the City of Plano, Texas, extending northerly to a point at U.S. 82 approximately 5 miles (8.0 km) west of SH 289, all in Collin and Grayson Counties. The road is estimated to be 45 miles (72.4 km) in length.

8. National Tollroad Authority Texas 3, Inc., filed 5-31-91.

Road from a point within a 2-mile (3.2-km) radius of the intersection of Interstate 635 with SH 121, extending northeasterly to end at U.S. 75 at a point south of the City of McKinney, Texas. The road will be in Tarrant, Denton, and Collin Counties and will be about 30 miles (48.3 km) long.

9. National Tollroad Authority Texas 4, Inc., filed 5-31-91.

Road from Interstate 35E north of the City of Carrollton, extending easterly to end at U.S. 75 at a point north of the City of Richardson, Texas, all in Collin and Denton Counties. The length of the road is about 15 miles (24.1 km).

To date, none of these facilities are operational or under construction. Effectively, the Texas Transportation Commission is the authorizing agency for these toll roads. The toll road companies must receive approval from the Commission to connect to the state highway system prior to their development.

In addition to these private toll roads, there are several international bridges that are privately operated. The Brownsville and Matamoros Bridge Company operates a toll bridge across the Rio Grande River. The B & P Bridge Company operates a border bridge from Progreso to Nuevo Progreso, and the Dupont Denemours Company operates the Miero bridge at Texas Farm-to-Market Road 2727 to Lalinda, Mexico. Tolls for this bridge are collected on the Mexican side (TxDOT, 1992-a). Financial information on these operations are proprietary and, therefore, not available.

Texas Transportation Corporations

In 1984, the Texas Legislature passed House Bill 125, dubbed the Texas Transportation Corporation Act, to provide an opportunity for greater private-sector participation in funding highway improvements. Texas Transportation Corporations (TTCs) are project-oriented, with the usual goal of assisting the state in the promotion and development of a specific transportation facility. Permissible activities pursuant to this goal include feasibility studies, acquisition of right-of-way, environmental impact statements, scenic easement acquisition, alignment determination, and preliminary engineering. Actual construction of the facility remains the responsibility of TxDOT. All TTCs must be authorized by the Texas Transportation Commission (Euritt et al, 1992).

Since 1984, eight TTCs have been created. The Grand Parkway Association (GPA) was formed in October 1984 to assist the state in completing the proposed 155-mile (249.4-km) Grand Parkway around the Houston metropolitan area. From 1987 to 1990, the GPA raised $4.1 million for promotion and development of the Parkway. Moreover, the GPA received land contributions for right-of-way on one 19-mile (30.6-km) segment totaling $44 million in 1986 (Euritt et al, 1992). The MoPac South Transportation Corporation (MoPac South TC) was created in June 1986 to assist in developing extensions to Loop 1 in the Austin area. In December 1988, the Federal Highway Administration presented an award for fund-raising to the TTC, valuing its contributions to the project at over $30 million (Euritt et al, 1992). Probably the most successful TTC to date is the FM 3083 Corporation in Montgomery County. This TTC assisted the state in promoting and developing a 5.3-mile (8.5-km) segment of Farm-to-Market Road 3083. The final bid-letting was in July 1992, successfully ending the Corporation's efforts. Other TTCs include the Galveston-Alvin-Pearland Transportation Corporation, the Plateau Region Outer Parkway Corporation near Austin, the MOKAN Corridor Association (also near Austin), the San Marcos Parkway Association, and the Fort Bend Parkway Association. (For more detailed descriptions of TTCs, see Euritt et al, 1992.)

Texas Road Utility Districts

Also in 1984, the Texas Legislature approved Senate Bill 33 authorizing the creation of Road Utility Districts (RUDs). Like TTCs, RUDs provide an avenue for greater private-sector participation in road development. Unlike TTCs, however, RUDs are vested with limited power to issue bonds and levy taxes, and are intended to actually build the facilities they were organized to develop. Upon completion, the facility is conveyed to the responsible government jurisdiction.

Petitions for creation of a RUD must be approved by all land owners in the proposed district. Moreover, the RUD must receive the approval of the government jurisdiction that will eventually be conveyed the facility. After meeting these requirements, the RUD can seek formal approval from the Texas Transportation Commission. Once created, RUDs are authorized to issue and sell bonds in the name of the district in an amount not to exceed one-fourth of the assessed property valuation in the district. Bond proceeds must be used for acquiring property, for construction, and for improvement of the facility. To support the bonds, the RUD is given taxing authority. Subject to two-thirds voter approval at a properly called election, the district may annually levy taxes to retire the bonds. It may also levy a maintenance tax, subject to voter approval, of no more than $0.25 per $100 of assessed property value. The RUD is empowered to adopt and enforce fees to supplement its taxes in funding bond retirement. These funds may not, however, be imposed on the traveling public or used to encumber any facilities.

To date, only two RUDs have been formed: Denton County RUD No. 1 and Northgate Crossing RUD in Harris County. Denton County RUD is authorized to develop a series of improvements along IH-35E, particularly frontage roads and interchanges. The projects are to be financed by a proposed bond issue authority of $45.8 million, repaid with

proceeds from a taxing authority of $0.43 per $100 of assessed property value. The Northgate Crossing RUD is commissioned to finance and construct several arterial and main feeder roads in the district. The RUD has requested debt authorization of nearly $13 million to cover construction costs of $8 million and other costs near $5 million.

RUDs are severely limited as privatization projects, since proceeds cannot be drawn from motorists. Nevertheless, it is a vehicle for soliciting private-sector support. (For more information on Texas RUDs, see Euritt et al, 1992.)

Conclusion

Although the future of TTA is uncertain, the success it has attained so far illustrates that private partnerships in highway construction, operation, and maintenance are feasible supplements to the traditional methods of financing and building highway facilities. The ISTEA legislation recently passed by the United States Congress allows for 50 percent federal matching funds to be used for the construction of toll roads and bridges, be they public or private. Such monetary incentives will no doubt heighten the awareness of the feasibility and benefits brought about by privatization. It is important to remember, however, that in order for a public-private or fully private highway partnership to be successful, many factors need to exist simultaneously. These include partial traffic congestion, rapid growth, a strong economy, active citizen groups, and an active business community.

CHAPTER 6. SUMMARY

It is safe to conclude that the opportunities for greater private involvement in highway improvements are extensive and available in a number of forms. While the U.S. heritage is characterized by private participation in highways, current policies and procedures of state agencies may require modifications for such participation and may necessitate changes in state laws and/or local ordinances to become legally viable.

While the opportunities for public/private ventures are noteworthy, it must be remembered that these are not reliable, predictable, or stable sources of funding. The objective of state highway agencies is to seek a stable, reliable, and predictable funding base in order to perpetuate the extensive highway system. These joint techniques alone are not adequate, but can be viewed as an attractive option worthy of careful and thoughtful consideration. It has been estimated that private financial support could, nationwide, provide $770 million annually for highway improvements, approximately 6 percent of the annual budget requirements for state and local expenditures (Orski, 1986).

The challenge of meeting the mobility needs of the United States is tied to emerging technologies, innovation, and persistence — persistence in searching for opportunities while maintaining a perspective on the future. Therefore, every notion of resource capture must be carefully analyzed. Private and public partnerships are fundamental to the success of future mobility and economic achievements.

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