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16. Abstract Adoption of the Federal Clean Air Act, as well as numerous state clean air initiatives, has precipitated interest in alternative, "clean," fuels. Implementation of alternative fuels has important implications for state highway programs which draw resources from motor fuel taxes. Conversion of gasoline and diesel engines to natural gas could potentially draw financial resources away from dedicated highway trust funds without decreasing utilization of the highway system. The principal objective of this research was to evaluate the impact of alternative fuels legislation on highway financing in the southwest region of the United States through the use of conversion scenarios based on new state laws.					
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Analysis of Effects of Alternative Fuels Legislation on State Highway Funds in the Southwest Region

by

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EXECUTIVE SUMMARY

The principal objectives of this research were to evaluate the impact of alternative fuels legislation on highway financing in the southwest region of the United States through the use of conversion scenarios based on new state laws and to identify procedures for recovering lost highway revenues. The specific states analyzed in this study include Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

It is widely accepted that the economy of the United States is heavily dependent on an efficient transportation system. In turn, the transportation system must rely on stable and consistent financial resources in order to continue its operation, maintenance, and improvement. The Highway Trust Fund was established in 1956 with the intention of forming a relationship between the amount of highway user taxes collected and the level of system use. This established motor-fuel taxes which were collected and deposited directly into the Highway Trust Fund for the purpose of building, operating, and maintaining roads in the highway system. Today, most states use the same concept of highway user fees, particularly motor-fuel taxes, to supply revenue to their state transportation funds.

Recently, there has been increasing concern for the quality of the environment and legislation has been enacted at both the state and federal levels of government with the goal of reversing its deteriorating condition. One method of reducing environmental impacts is to reduce vehicle emissions by promoting or requiring the use of cleaner burning alternative fuels. In order to promote their use, these fuels are often exempt from motor-fuel taxes or taxed at different rates, thereby reducing the amount of transportation fund revenue. What is often not considered is the fact that under conditions of heavy congestion even with “clean” burning fuel a vehicle is not running at its most efficient state. Congestion can occur if the transportation system is not upgraded when necessary or when needed improvements to the system are not anticipated and planned for properly. This requires a stable source of revenue.

The implementation of alternative fuels programs has important implications for state highway financing. For example, revenue sources to the Texas State Highway Fund consist of various taxes of which the largest contributor is the state motor-fuel tax on gasoline and diesel which generally represents about 33% of the entire fund. Since alternative fuels are not taxed at

the same rate as gasoline, it is reasonable to anticipate that wide-scale conversion of gasoline-powered vehicles to alternative fuel vehicles could draw financial resources away from the Fund without decreasing utilization of the highway system.

As noted previously, the five states targeted by this project are Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. Each of these states employ their own forms of clean-air initiatives with some much more progressive than others. These programs will be explored in some detail in order to identify possible effects on their state highway funds.

The first step will be to describe the methods of highway finance for each of the states. The role of the motor-fuel tax in each state is of particular interest and will, therefore, be emphasized. In addition, all possible alternative fuels taxes and any foreseeable contributions they may have to the highway financing procedure will be investigated.

Next is a review of the Federal Clean Air Act and similar state legislation in the southwest region. The purpose of this task is to determine the level of alternative fuels utilization anticipated in the region. Following a brief statement of the legislative enactments for each state, the specific groups which have been targeted, such as state agencies or private fleets, will be identified. Each state has its own unique list of fuels which have been labeled acceptable "alternative" fuels; therefore, the group of fuels for each state will be listed and compared. In addition, if specific areas, such as federal non-attainment areas, have been targeted by these bills, and if parties have been designated for analyzing the programs, they will be reported as well.

An analysis of the implementation of the various programs throughout the southwest region will follow with specific emphasis given to the impact on highway financing. The analysis will be based on different levels of alternative fuels utilization, with the lowest level to include that mandated by current legislation. The highest level will be full-scale implementation of alternative fuels, which is estimated in the 10 to 25 percent range.

Finally, procedures for recovering lost highway revenues will be identified. Given the level of revenues lost to the highway program, different procedures will be explored for refurbishing funds for the highway program.

As mentioned above, the vitality of the nation's economy is directly related to the current condition of the transportation system, and in order to properly maintain this system, consistent and reliable financial resources must be available on both the national and state level. A

significant part of these financial resources arises through the current motor-fuel taxes, especially on gasoline and diesel. These rates are charged on a per gallon basis which is considered the most equitable method, since the more a consumer uses the system, the more they pay for its operation and maintenance.

Equally as important as the nation's economy is the need to improve the environment which again is affected by the state of the nation's transportation system; however, the introduction of "clean" alternative fuels as one means of reducing pollution may adversely affect the individual states' ability to maintain those systems with the current highway financing method by potentially reducing the revenue obtained through motor-fuel taxes. This possibility will be explored in this report.

Chapter 2 provides a discussion of the state highway funding issues relevant to this report. Many factors contribute to the growing concern that state highway funds throughout the nation are being seriously drained. Of greatest concern are the effects of inflation on transportation resources, the diversion of motor fuel tax revenues from state highway funds to other sources, and motor fuel tax exemptions. While a user-pay system was the intention in the early stages of these highway financing programs, diversions of motor-fuel tax revenue and exemptions on motor-fuel taxes have been granted over the years which undermine the original concept. Combining those activities with the effect of inflation gives a clear indication that there is a valid basis to the growing concern for the nation's highway funding programs.

In Chapter 3, state highway funding methods are identified. Both business and pleasure travelers throughout the nation have come to expect the transportation system to be efficient and well maintained. State governments have established a system of financing these highways and roads which are often as varied as the states themselves.

A significant highway funding source for each of the five states is the revenues received from motor-fuel taxes. Information on the current rate for each type of motor-fuel taxed in the five states and on the distribution of this revenue will be provided. This will help to identify the point at which the revenues from motor-fuel taxes are diverted away from the state highway funds.

The sources of state highway funds are as varied as the states themselves, with two important exceptions. First, all of the states in this study rely on both motor-fuel tax revenue

(directly or indirectly) and some type of federal-aid to support their various highways. Secondly, although motor-fuel tax revenue does contribute significantly to these funds, in each of these states some type of diversion of this revenue to non-highway programs does occur.

Chapter 4 is dedicated to identifying alternative fuels legislation in the five states - Arkansas, Louisiana, New Mexico, Oklahoma, and Texas - in the southwest region. We begin first with a brief description of the Federal Clean Air Act Amendment of 1990. Next, each state is taken individually and examined. In describing the alternative fuels legislation, a list of the alternative fuels adopted by each state is identified. The effective date, the organizations affected or targeted by the legislation, a schedule for implementation (if any), the parties responsible for implementation and any exceptions and waivers provided by the legislation are identified.

This information is summarize for the three states which have the most extensive alternative fuels programs - Louisiana, Oklahoma, and Texas. The information includes a list of the currently accepted alternative fuels in each of the three states. Compressed natural gas (CNG) is clearly an accepted alternative fuel in all three states and it is generally the alternative fuel of choice. The analysis of the clean fuels programs for each state will operate under this assumption. This chapter also indicates the effective starting date for the programs, and the organizations which have been targeted for vehicle conversion have also been listed. The last summary category in the chapter is the implementation schedule.

A summary table provided in this chapter is intended to be a quick reference guide to the clean air legislation in each of the three states in our study which have the most extensive programs. For instance, for the State of Louisiana there are six specific alternative fuels which are recognized as such. These are CNG, liquefied petroleum gas (LPG), reformulated gasoline, methanol, ethanol, and electricity. The clean air program is scheduled to begin on September 1, 1991, and all state agencies and political subdivisions are required to convert their vehicles to alternative fuel vehicles according to the schedule in the table.

In addition to being a quick reference to the clean air programs in each state, the table in Chapter 4 should also serve as an easy means of comparison between the three programs. For instance, while both Louisiana and Texas have very specific schedules for implementation for their programs, Oklahoma (as of this writing) does not.

The next step is to proceed with an analysis of the implementation of alternative fuels legislation and this is accomplished in Chapter 5 of the report. The objective is to gain an insight into the potential impacts on the state highway funds. This discussion will emphasize any foreseeable effects in the three states of the southwest region which have the most extensive clean air policies, namely Louisiana, Oklahoma, and Texas. The other two states are not analyzed because their programs do not mandate or provide strong incentives for alternatively fueled vehicles.

Conversion of public vehicles will have little effect on pollution in targeted areas because of the small numbers of vehicles; however, these conversions will develop a market for the new fuel, making the process of conversion in the private sector possible, whether it is mandated or not. With this in mind, three basic scenarios will be analyzed in Chapter 5. The first scenario will incorporate the current mandate, that is, what will be required by law, over a ten year period. The second will evaluate the results of a 10 percent private fleet conversion rate, viewed as the most probable rate for large-scale conversion. The last scenario analyzes the effects of a 25 percent private fleet conversion rate. These three scenarios are presented for passenger cars, trucks, and buses (where applicable) in each state, and they will illustrate the potential impact to the state highway funds given current approaches to highway financing. The federal fuel tax of 14.1 cents per gallon will be applied to these calculations when necessary with the assumption being that each state receives the exact amount of federal tax collected.

The purpose of Chapter 5 was to take information on existing state and federal fuel taxes along with recent alternative fuels legislation in the states of Louisiana, Oklahoma, and Texas to determine the potential impact on state highway funds. Through a series of figures the findings of this chapter are summarized given the previously stated assumptions. The three categories of vehicles used in this analysis are passenger cars, trucks, and buses; however, since Texas is currently the only state with a specific mandate on the conversion of buses, a direct comparison among the three states is not feasible. All of the state legislation targets state agencies with an expectation that private owners or fleet operators will convert. State-owned and privately-owned vehicles have been separated, as they were in the previous sections, due to their difference in magnitude. In the case of state-owned vehicles, two scenarios have been compared. The first, called the “base case”, is one in which over a ten-year period all the vehicles remain gasoline powered. The second, called the “phase-in case,” determines expected revenue for the period

during which vehicles are converted to CNG vehicles according to legislative mandates. In the case of privately-owned vehicles, three scenarios were compared. The first, again called the “base case,” is exactly as described above. The second analyzes the effects of a 10 percent state-wide conversion of privately-owned vehicles, and the third analyzes the potential outcome of a 25 percent state-wide conversion.

A summary of the expected revenue over a ten-year period from passenger cars owned by state agencies is provided in this chapter. In Louisiana, there are currently 3,091 state owned passenger cars. Alternative fuels legislation appears to have a positive effect with respect to raised revenue. The same is true for Oklahoma (2,841 vehicles); however, the increase in revenue is greater. In Texas (14,611 vehicles), the gross revenue is much less for the phase-in case than for existing conditions. For private passenger car revenue, both Louisiana and Texas show decreases in expected revenue from the base case, although the effects are more drastic in Texas, while Oklahoma is expected to have an increase in revenue.

A summary of the expected revenue over a ten-year period from state-owned trucks is also provided in Chapter 5. Both Louisiana and Texas show decreases in expected revenue; however, Texas again shows a much more dramatic decrease. Oklahoma is expected to receive a larger amount of fuel taxes from state-owned trucks after the conversion process.

In each state the revenue collected from privately-owned trucks is less after the conversion process. In both Louisiana and Oklahoma, the decrease is slight compared to the decrease projected in Texas.

Clearly, conversion of public vehicles will have a much smaller effect on state highway funds than conversion of private vehicles. This is due both to the fact that state vehicles are exempt from federal motor-fuel taxes and to the numbers of vehicles being converted. As mentioned previously, however, their conversion will help facilitate the development of a natural gas market. In both Louisiana and Texas, conversion of passenger cars and trucks to natural gas will have a negative overall effect on state highway funds, whereas in Oklahoma, the effect is expected to be positive. Not shown in the table for Texas is the conversion of the states public buses which, as indicated in Chapter 5, results in a decrease of about \$2.8 million annually to the state highway fund.

Chapter 6 provides the conclusions and recommendations developed for this report. So far, the underlying principal in funding state highways has been the user-pay strategy in which the users of the highway pay for its construction, operation, and maintenance in proportion to their use. A gallonage tax reflects this policy. Contrary to this is the annual fixed fee method, the current approach for taxing CNG on the state level, which is not directly related to the amount of highway travel during that year. In this case, there is no direct relationship to the number of miles traveled and the amount of revenue contributed to the fund. Compounding the problem is the lack of a federal CNG tax.

Even so, a gallonage tax is still not equitable unless it also reflects the energy content of the particular fuel. For instance, it takes almost 4 gallon-equivalent of CNG to travel the same distance as one gallon of gasoline, so a gallonage tax on CNG should probably equal about 25 percent of the gasoline tax. It is my recommendation, therefore, that a more equitable method of taxing fuel based on the energy content of the fuel be used in the future, i.e. a BTU tax. Further studies are warranted to determine the feasibility of altering the current taxing policy to account for the amount of energy consumed instead of the amount of fuel consumed.

It is also recommended that a federal CNG fuel tax be charged in the future. State highway funds benefit greatly from this tax albeit through Federal Highway Trust Fund formulas. As the number of CNG vehicle increases, the absence of a federal fuel tax on CNG will result in large decreases to state highway funds.

ABSTRACT

Adoption of the Federal Clean Air Act, as well as numerous state clean air initiatives, has precipitated interest in alternative, "clean," fuels. Implementation of alternative fuels has important implications for state highway programs which draw resources from motor fuel taxes. Conversion of gasoline and diesel engines to natural gas could potentially draw financial resources away from dedicated highway trust funds without decreasing utilization of the highway system. The principal objective of this research was to evaluate the impact of alternative fuels legislation on highway financing in the southwest region of the United States through the use of conversion scenarios based on new state laws.

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CHAPTER 1. INTRODUCTION

It is widely accepted that the economy of the United States is heavily dependent on an efficient transportation system. In turn, the transportation system must rely on stable and consistent financial resources in order to continue its operation, maintenance and improvement. The Highway Trust Fund was established in 1956 with the intention of forming a relationship between the amount of highway user taxes collected and the level of system use. This established motor-fuel taxes which were collected and deposited directly into the Highway Trust Fund for the purpose of building, operating and maintaining roads in the highway system. Today, most states use the same concept of highway user fees, particularly motor fuel taxes, to supply revenue to their state transportation funds.

Recently, there has been increasing concern for the quality of the environment and legislation has been enacted at both the state and federal levels of government with the goal of reversing its deteriorating condition. One method of reducing environmental impacts is to reduce vehicle emissions by promoting or requiring the use of cleaner burning alternative fuels. In order to promote their use, these fuels are often exempt from motor-fuel taxes or taxed at different rates, thereby reducing the amount of transportation fund revenue. What is often not considered is the fact that under conditions of heavy congestion even with "clean" burning fuel a vehicle is not running at its most efficient state. Congestion can occur if the transportation system is not upgraded when necessary or when needed improvements to the system are not anticipated and planned for properly. This requires a stable source of revenue. For example, the ability to implement an HOV (high occupancy vehicle) lane addition to the system may be hindered by lack of proper funding.

1.1 ECONOMIC SIGNIFICANCE OF HIGHWAYS

The current national transportation policy centers around six key elements which have been designed to address both short- and long-term transportation issues.¹⁸ This "agenda" (see Table 1-1) is motivated to a large degree by the need to maintain the nation's economic stability and to allow for growth by providing an efficient national transportation system. Represented by the first policy statement is the desire to support economic growth by reducing congestion, maintaining current assets, improving the management of these facilities, and providing efficient connections between the various parts of the transportation system.² The second and third policy statements provide the guidelines for accomplishing these goals.

Table 1-1. The National Policy Agenda

1. Maintain and expand the Nation's transportation system.
2. Foster a sound financial base for transportation.
3. Keep the transportation industry strong and competitive.
4. Ensure that the transportation system supports public safety and national security.
5. Protect the environment and the quality of life.
6. Advance U.S. transportation technology and expertise for the 21st century.

Source: Moving America: New Directions, New Opportunities

These policies can be applied on a smaller (but still vitally significant) scale on the state level as well. In fact, recent research indicates that investments in highway infrastructure can

¹⁸Kane, A. R. *Moving America: New Directions, New Opportunities*. A Statement of National Transportation Policy. Strategies for Action. February 1990. p. 2.

stimulate state economic development³ , supporting the idea of an intricate relationship between a state's economy and its transportation system.

This efficient movement of people and goods throughout the nation is without question one of the most significant factors contributing to the nation's economy and remains a priority on the state level as well.

1.2 ENERGY AND THE ENVIRONMENT

With the adoption of the Federal 1990 Clean Air Act Amendments and the development of new energy policies, the move towards the use of alternative fuels is expected to progress more rapidly. The motivating forces behind these initiatives are a desire for energy security and a cleaner environment.

The United States is the world's largest consumer of petroleum. Transportation accounts for about two-thirds of this consumption. Within the highway sector petroleum fuels 99 percent of the nation's vehicles.⁴ Since most of the world's present oil supplies are in politically and socially unstable regions, the U.S. is highly vulnerable. A desire for a more secure source of energy is one factor driving the utilization of alternative fuels.

A second factor of perhaps greater concern is the state of the environment. Mobile sources, i.e. transportation, produce more than half of the ground-level ozone (smog). Additionally, mobile sources account for between 70 and 90 percent of the U.S. carbon dioxide emissions, an important precursor to the development of greenhouse gases. Transportation emissions also include nitrogen oxides, particulate matter, and other toxic compounds.⁵

1.3 PROJECT OBJECTIVE

The implementation of alternative fuels programs has important implications for state highway financing. For example, revenue sources to the Texas State Highway Fund consist of various taxes of which the largest contributor is the state motor fuel tax on gasoline and diesel

² Kane. pp. 2-4.

³ Highways for Economic Development. Public Works. Vol. 119. May 1988. p. 100.

⁴ *U.T. Austin Committee to Assess the National Energy Strategy: Final Report*, Volume II, November 1991, p. 64.

which generally represents about 33 percent of the entire fund. Since alternative fuels are not taxed at the same rate as gasoline, it is reasonable to anticipate some impact to the Fund. It is possible that wide-scale conversion of gasoline-powered vehicles to alternative fuel vehicles could draw financial resources away from dedicated highway trust funds without decreasing utilization of the highway system.

The focus of this project is to identify the impact of alternative fuels on state highway finance for the southwest region and to identify procedures for recovering lost highway revenues.

1.4 SCOPE

The five states targeted by this project are Arkansas, Louisiana, New Mexico, Oklahoma and Texas. Each of these states employ their own forms of "clean-air initiatives" with some much more progressive than others. These programs will be explored in some detail in order to identify possible effects on their state highway funds.

With this in mind, the first step will be to describe the methods of highway finance for each of the states. The role of the motor-fuel tax in each state is of particular interest and will, therefore, be emphasized at this point. In addition, all possible alternative fuels taxes and any foreseeable contributions they may have to the highway financing procedure will be investigated.

Next will come a review of the Federal Clean Air Act and similar state legislation in the southwest region. The purpose of this task is to determine the level of alternative fuels utilization anticipated in the region. Following a brief statement of the legislative enactments for each state, the specific groups which have been targeted, such as state agencies or private fleets, will be identified. Each state has its own unique list of fuels which have been labeled acceptable "alternative" fuels, therefore, the group of fuels for each state will be listed and compared. In addition, if specific areas, such as federal non-attainment areas, have been targeted by these bills, and if parties have been designated for analyzing the programs, they will be reported as well.

An analysis of the implementation of the various programs throughout the southwest region will follow with specific emphasis given to the impact on highway financing. The analysis will be based on different levels of alternative fuels utilization. The lowest level will

⁵ Beckham, B., Reilly, W. and Becker, W., "Clean Air Act Amendments and Highway Programs," *TR News*, May-June 1990, p. 18.

include that mandated by current legislation. The highest level will be full-scale implementation of alternative fuels, which is estimated in the 10 to 25 percent range.

Finally, procedures for recovering lost highway revenues will be identified. Given the level of revenues lost to the highway program, different procedures will be explored for refurbishing funds for the highway program.

1.5 SUMMARY

As mentioned above, the vitality of the nation's economy is directly related to the current condition of the transportation system, and in order to properly maintain this system, consistent and reliable financial resources must be available on both the national and state level. A significant part of these financial resources arises through the current motor-fuel taxes, especially on gasoline and diesel. These rates are charged on a per gallon basis which is considered the most equitable method, since the more a consumer uses the system, the more they pay for its operation and maintenance.

Equally as important as the nation's economy is the need to improve the environment which again is affected by the state of the nation's transportation system; however, the introduction of "clean" alternative fuels as one means of reducing pollution may adversely affect the individual states' ability to maintain those systems with the current highway financing method by potentially reducing the revenue obtained through motor-fuel taxes. This possibility will be explored in the following chapters.

CHAPTER 2. STATE HIGHWAY FUNDING ISSUES

Many factors contribute to the growing concern that state highway funds throughout the nation are being seriously drained. Of greatest concern are the effects of inflation on transportation resources, the diversion of motor fuel tax revenues from state highway funds to other sources, and motor fuel tax exemptions.

2.1 INFLATION

The effect of inflation on highway improvements can be viewed on the national level. Capital spending for road improvements by all 50 states increased from \$6.5 billion in 1965 to \$22.9 billion in 1989; however, after adjusting for inflation, state capital spending actually decreased from a peak of \$29.4 billion (1989 dollars) in 1965 to \$14.6 billion in 1989. State spending for maintenance and operations, in inflation-adjusted 1989 dollars, peaked in 1978 at \$8.2 billion, but declined to the 1989 value of \$7.8 billion. Even more alarming, when accounting for the increase in vehicle miles of travel over the same period, maintenance expenditures per 1,000 miles traveled declined from \$7.32 (inflation-adjusted dollars) in 1965 to \$3.68 in 1989.¹⁹

The affects of inflation have been equally pronounced in Texas²⁰, as shown in Figure 2-1 on the following page. Construction and maintenance expenditures (C&M) is presented as a bar with diagonal slashes, and purchasing power in 1972 dollars is shown as a solid bar. In real dollars, C&M expenditures have increased significantly from 1972 to 1987 with annual fluctuations. Inflation, however, has eroded the value of these expenditures to the degree that in constant dollars, the 1972 level of expenditures was not even matched until 1986. In 1989 C&M expenditures exceed purchasing power by about 298 percent.

¹⁹ TRIP (The Road Information Program). State highway spending trends. State Highway Funding Methods 1991 May;p. 4.

²⁰ State Department of Highways and Public Transportation, Transportation Planning Division & Finance Division and Federal Highway Administration Department of Transportation. *Texas Transportation Finance Facts*. 1988. p. 45.

Effect of Inflation On Construction & Maintenance, 1972-1989

Total Construction & Maintenance Expenditures
 Purchasing Power in 1972 Dollars

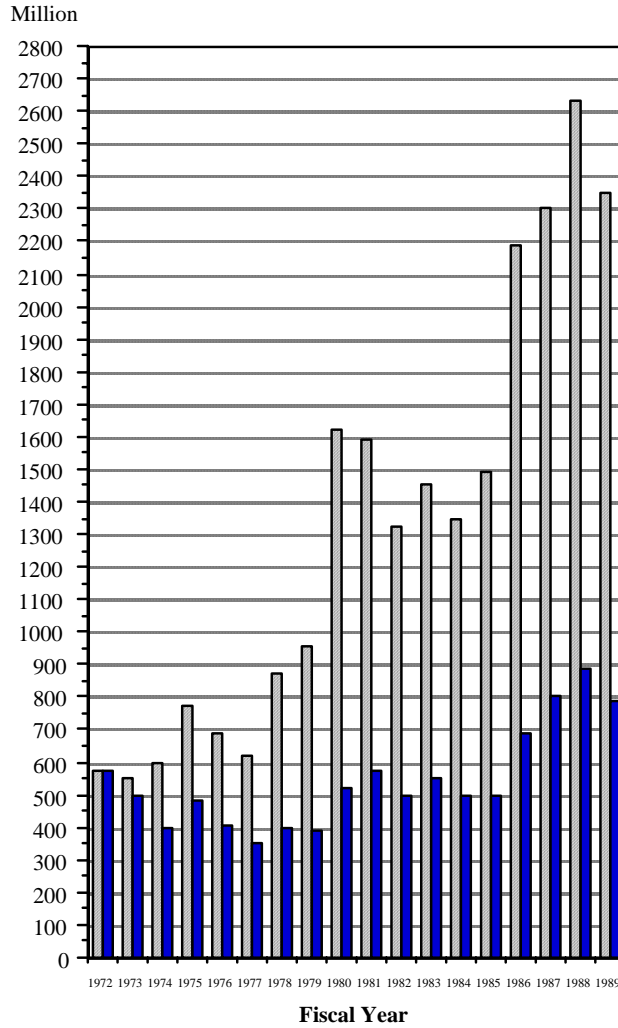


Figure 2-1. The effect of inflation on construction and maintenance in the state of Texas for the years 1972-1987.

Source: Texas Transportation Facts 1990

2.2 DIVERSION OF HIGHWAY FUNDING SOURCES

As mentioned before, the Highway Trust Fund was formed in 1956 and was supported by a user-pay system of fees and taxes, such as motor-fuel taxes.²¹ Many of the state highway programs operate in a similar manner, receiving revenue from user fees and taxes and from other automobile-related revenue for the construction and maintenance of highways. However, through the course of their existence some of the revenue from these vehicle user sources have been diverted to other non-highway activities. In the case of the Highway Trust Fund, payments have been made to the Aquatic Resources Trust Fund and the Land and Water Conservation Fund. The states have their own list of diversions from highway funds ranging from law enforcement to education and agriculture to tourism. These diversions will be identified and discussed in the following chapter.

2.3 SPECIAL EXEMPTIONS

There is an additional concern that revenue sources are lost due to tax exemptions for certain motor fuels. It is often the case that, in order to promote the production and use of "clean" fuels such as gasohol, those fuels are exempted from all or part of the motor fuel tax. This practice began in the late 70's with the federal 1978 Energy Tax Act which exempted gasohol from the federal motor fuel tax in order to reduce this nation's dependency on foreign oil, and with the hope of "increasing farm incomes, reducing grain surpluses and creating jobs".²²

The problem with this policy is that vehicles which operate on fuels which are either entirely or partially tax-exempt still use the roadway system. Their exemption status undermines the financial base for sustaining the road infrastructure. The Federal Highway Administration, for example, reported that gasohol tax exemptions drained \$101.4 million from state road finance programs in 1989 alone.²³ Exemption provisions for other alternative fuels can have the same type of effect and are a major concern to state transportation agencies.

²¹ U.S. Department of Transportation and Federal Highway Administration. Financing Federal-Aid Highways. November 1987. p. 37.

²² TRIP, p. 33.

²³ Ibid, p. 33.

2.4 SUMMARY

Much of the discussion so far has served to further emphasize the need for a stable finance program for the construction and maintenance of our nation's roads and highways. While a user-pay system was the intention in the early stages of these highway financing programs, diversions of motor-fuel tax revenue and exemptions on motor-fuel taxes have been granted over the years which undermine the original concept. Combining those activities with the effect of inflation gives a clear indication that there is a valid basis to the growing concern for the nation's highway funding programs.

CHAPTER 3. STATE HIGHWAY FUNDING METHODS

Both business and pleasure travelers throughout the nation have come to expect the transportation system to be efficient and well maintained. State governments have established a system of financing these highways and roads which are often as varied as the states themselves. This chapter will describe the highway funding methods employed by each of the five states in the southwest region.

A significant highway funding source for each of the five states is the revenues received from motor-fuel taxes. Therefore, this chapter will also contain information on the current rate for each type of motor-fuel taxed in the five states and on the distribution of this revenue. This will help to identify the point at which the revenues from motor-fuel taxes are diverted away from the state highway funds.

3.1 ARKANSAS

The Arkansas State Highway System consists of just under 16,200 miles. The State Highway System represents about 20 percent of the total number of road miles; however, it carries over 80 percent of the total vehicle miles traveled annually in the entire state.²⁴

At present, Arkansas has five major funding sources contributing to the State Highway Fund. They are federal-aid, state motor-fuel taxes, vehicle registration, miscellaneous truck fees, and other miscellaneous sources (see Figure 3-1).²⁵ The list of miscellaneous sources may include revenue received from tolls, fines, special fuels taxes, use taxes, severance taxes and cigarette taxes.²⁶ State motor-fuel taxes account for about 44.2 percent of the total revenue.

²⁴ TRIP (The Road Information Program). *State Highway Funding Methods*. May 1991. p. 6.

²⁵ TRIP, p. 10.

²⁶ Ibid, p. 10.

Sources of Arkansas Highway Funds

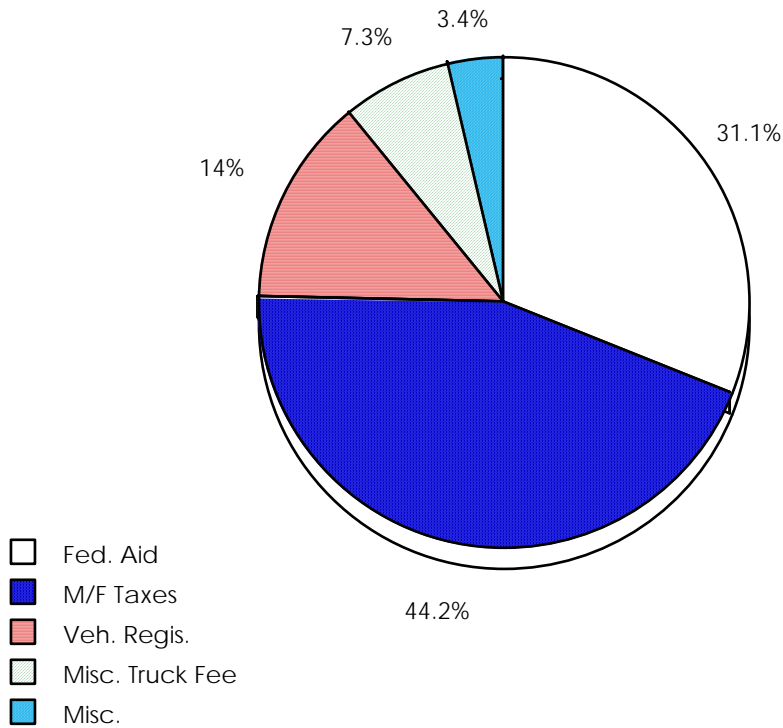


Figure 3-1. The five major Arkansas state highway funding sources shown as percentage of the total revenue.

Source: 1991 State Highway Funding Methods

As of January 1, 1991, the state tax rates on gasoline, diesel and gasohol were 13.7, 12.7 and 13.7 cents per gallon, respectively. These rates each include an 0.2 cents per gallon Petroleum Environmental Assurance Fee which is used for the clean-up of tank spills. The tax rate on liquefied petroleum gas (LPG) was 11.5 cents per gallon. The diesel rate was increased to 16.7 cents on March 1, 1991 and on April 1, 1991 the tax rates on gasoline, gasohol and diesel

increased to 18.7 cents a gallon, while the LPG tax rate increased to 16.5 cents a gallon.²⁷ There is currently no tax associated with CNG.²⁸

The flow chart in Figure 3-2 traces the distribution of State motor-fuel tax receipts for Arkansas. The process of distribution begins with the Petroleum Storage Tank Fund which receives the Petroleum Environmental Assurance Fee of 0.2 cents per gallon from gasoline, gasohol and diesel taxes for the clean-up of tank spills. The fee will continue until the balance in the Petroleum Storage Tank Fund reaches \$15 million. At that time, the fee will be adjusted quarterly whenever the balance of the fund falls below \$12 million or exceeds the maximum of \$15 million.²⁹

Next, is the distribution of the revenue of one cent (1 cent) per gallon tax of gasoline, gasohol and diesel fuel. Of this revenue, \$13 million is allocated to the State-Aid Road Fund for the construction, reconstruction and improvement of roads on the State-aid road system in the various counties. (County funds are used to match 20 percent of this revenue.) The remainder of the revenue is deposited into the State Highway Special Construction Account. Although it is not reflected in the flow chart, it is important to note that this account also receives revenue from motor vehicle registration fees, special license fees, franchise taxes and special weight fees. The total revenue in this account is distributed to the County-Aid Fund (15 percent), the Municipal-Aid Fund (15 percent) and the State Highway and Transportation Department Fund (70percent) for the construction, maintenance and administration of county roads, municipal streets and State highways, respectively.

²⁷ U.S. Department of Transportation and Federal Highway Administration. *Highway Taxes and Fees: How they are collected and distributed*. 1991. Pub. No. FHWA-PL-91-017. p. 117.

²⁸ Bailey, Thomas. State of Arkansas. Department of Finance and Administration. Phone conversation. July 9, 1992.

²⁹ Arkansas Code of 1987 Annotated Regulations. Subchapter 9. pp. 183-4.

Arkansas Motor-Fuel Tax Allocation

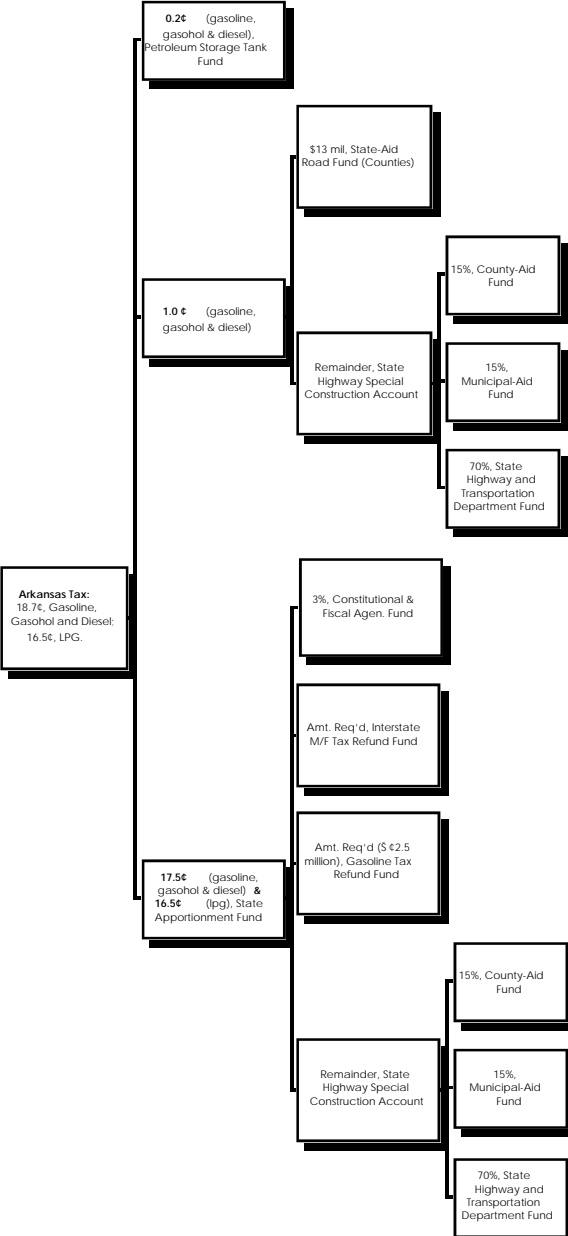


Figure 3-2. Allocation of Arkansas state motor-fuel tax receipts.

Source: 1991 Highway Taxes and Fees and conversations with state officials.

The remainder of the motor-fuel tax revenue, 17.5 cents per gallon for gasoline, gasohol, and diesel and 16.5 cents per gallon for LPG, is initially deposited into the State Apportionment Fund from which it is distributed, along with other motor-vehicle revenues, to the various funds listed on the flow chart in Figure 3-2.

Three of the motor-fuel tax revenue is deposited into the Constitutional and Fiscal Agencies Fund. Both the Constitutional Officers Fund and the State Central Services Fund draw from the Constitutional and Fiscal Agencies Fund to cover the cost of general State government, including the salaries of all constitutional officers and the cost of collection and administration of motor-fuel taxes. Next, the Director of the Department of Finance and Administration determines, on a quarterly basis, the amount of refund needed for the Interstate Motor-Fuel Tax Refund Fund to reimburse interstate operators for overpayment of motor-fuel taxes and special motor-fuel taxes. An additional amount, not to exceed \$2.5 million during any fiscal year, is deposited into the Gasoline Tax Refund Fund as certified by the Commissioner of Revenues. This fund is then used for gasoline tax refunds related to agricultural uses.

Finally, the remainder of the revenue from the 17.5 cent tax on gasoline, gasohol and diesel and 16.5 cent tax on LPG is deposited into the State Highway Special Construction Account (the same account mentioned above) from which it is then distributed to the County-Aid Fund (15 percent), the Municipal-Aid Fund (15 percent) and the State Highway and Transportation Department Fund (70 percent) for the same purposes mentioned previously.

In 1990, about \$8.1 million raised from state motor-fuel taxes was diverted to state fiscal agencies not directly responsible for maintaining or constructing highways.³⁰

³⁰ TRIP, p. 37.

3.2 LOUISIANA

The State of Louisiana currently has three major state highway funding sources: federal aid, general obligation bonds, and the General Fund.³¹ These sources are shown as a percent of the total revenue for 1989 in Figure 3-3. Revenues from motor fuel taxes are received indirectly through the General Fund as explained later in this section. General Obligation Bonds contribute about 28 percent of the revenue to the State Highway Fund. Indeed, the State of Louisiana reported that in 1990, \$28.4 million was raised with general obligation bonds. That figure increased by almost 190 percent to \$53.5 million in 1991.³² However, much of the debt service on these bonds is paid with motor-fuel tax, so once again, there is an indirect contribution of motor-fuel tax revenues to the State Highway Fund.

³¹ Ibid, p. 37.

³² Ibid, p. 29.

Sources of Louisiana State Highway Funds

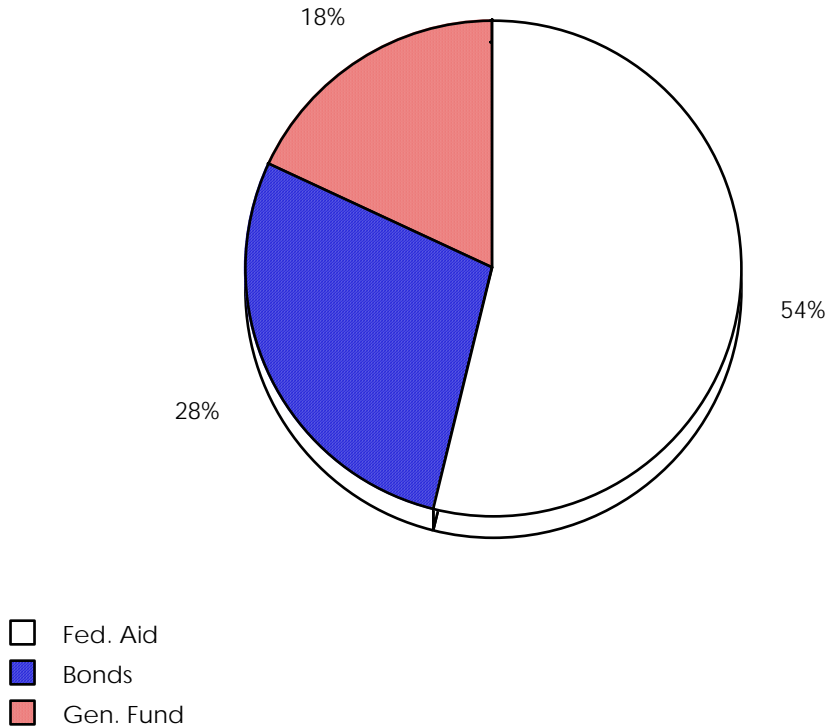


Figure 3-3. The three major Louisiana state highway funding sources shown as percentage of the total revenue.

Source: 1991 State Highway Funding Methods

The fuel tax rate for gasoline, gasohol, and special fuels is 20 cents per gallon.³³ Special fuels include diesel, compressed natural gas (CNG), liquefied petroleum gas (LPG), and any combustible gas or liquid suitable for use in an internal combustion engine or motor for the generation of power for motor vehicles.³⁴ The owners of LPG- and CNG-powered vehicles of 10,000 pounds or less gross vehicle weight pay an annual fee of \$150 in lieu of the gallonage tax. The owners of LPG- and CNG-powered vehicles weighing over 10,000 pounds must pay an amount of tax corresponding to the number of gallons of fuel used during the previous fiscal year with a minimum annual tax of one hundred eight-seven dollars (\$187) per vehicle.³⁵ The special fuels tax law provides estimates for the number of miles per gallon a vehicle will travel

³³ USDOT and FHA, p. 30.

³⁴ Louisiana Secretary of Revenue and Taxation. Louisiana Special Fuels Tax Law. R.S.47:801.

corresponding to the weight of the vehicle. For instance, a vehicle with two axles and a gross weight of between 10,000 and 20,000 pounds is estimated to consume fuel on a mileage basis at a rate of approximately nine (9) miles per gallon. Table 3-1 shows the schedule used for determining the motor-fuel consumption for LPG- or CNG-fueled vehicles.

Table 3-1. Louisiana Vehicle Fuel Consumption Schedule

Weight of Vehicle	# of Axles	Miles per Gallon
10,000 to 20,000 lbs	2	9
> 20,000 lbs	2	9
all weights	3	6
all weights	4	5
all weights	5	4

Source: Supplement to Louisiana Special Fuels Tax Law

The distribution of gasoline and gasohol tax revenue is shown in Figures 3-4 and 3-5, and the distribution of the special fuels tax revenue is illustrated in Figure 3-6. With respect to gasoline and gasohol tax revenue³⁶ the State Treasurer first receives an amount that is required to pay refunds on fuel taxes (Figure 3-4). This amount is not to exceed 6 cents per gallon of fuel taxed. The remaining 14 cents then goes to the Transportation Trust Fund from which it is then distributed in the following manner. First, 4 cents tax per gallon of gasoline is deposited into the Transportation Infrastructure For Economic Development Fund for the purpose of funding highway and bridge construction projects approved directly by the legislature. Next, the Louisiana Bond Security and Redemption Fund receives an amount required for highway bond debt service during the fiscal year. Any surplus at the end of the year is deposited into the General Highway Fund.

³⁵ Louisiana Secretary of Revenue and Taxation. Louisiana Special Fuels Tax Law (Supplement). R.S.47:802.3.A.

³⁶ USDOT and FHA, pp. 30-31.

Louisiana Gasoline/Gasohol Tax Allocation

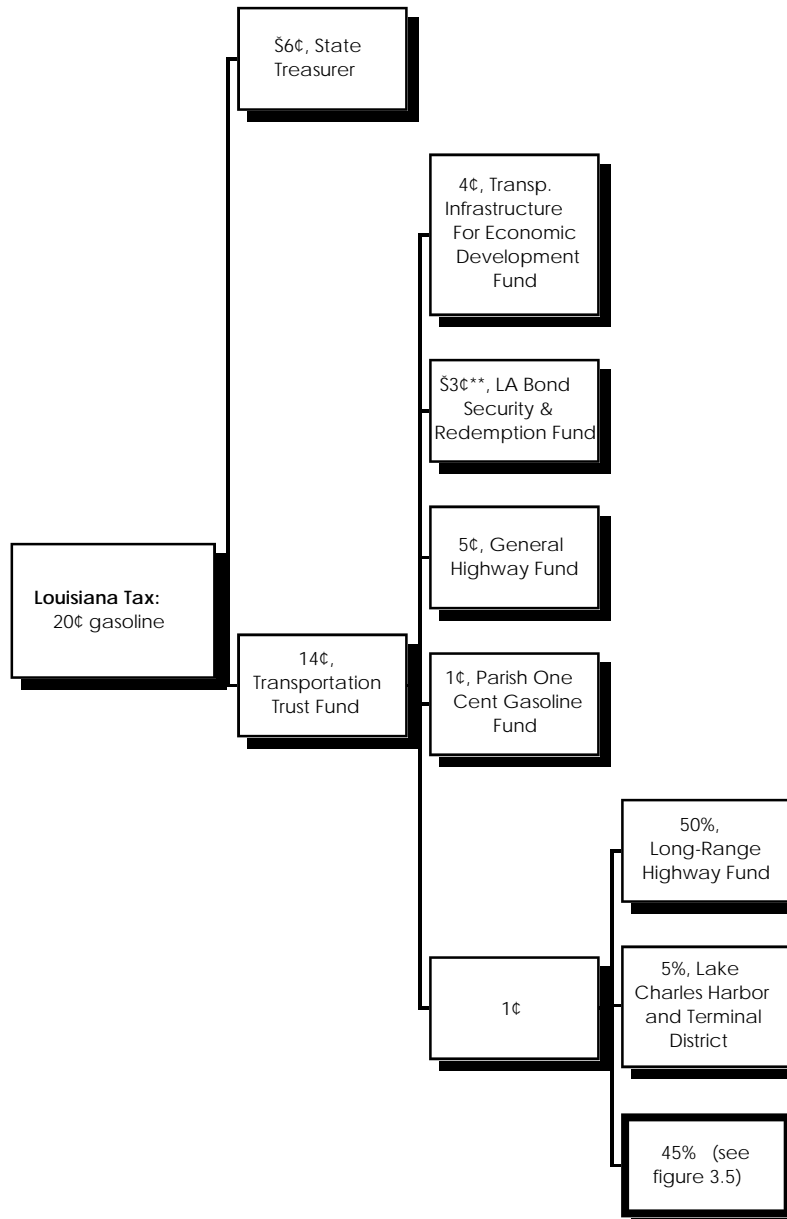


Figure 3-4. Allocation of Louisiana state gasoline and gasohol tax receipts.

Source: 1991 Highway Taxes and Fees and motor-fuel tax codes.

As indicated in Figure 3-4, the General Highway Fund receives 5 cents from each gallon of gasoline and gasohol sold. This revenue must be used for the "construction and maintenance

of the system of State highways and bridges".³⁷ The Parish One Cent Gasoline Fund receives one cent (1 cent) per gallon of gasoline for use in the construction and maintenance of Parish roads and streets, for payment of debt service for road bonds, and for assistance for public transit in the city of New Orleans. Of the remaining one cent per gallon, 50 percent is deposited into the Long Range Highway Fund for the construction and maintenance of highways and bridges. The Lake Charles Harbor and Terminal District receives 5 percent of this one cent of revenue for payment of debt service on outstanding bonds and to aid in covering operational expenses. The remaining forty-five percent (45 percent) is distributed as shown in Figure 3-5.

Next, the distribution of the special fuels tax revenue is illustrated in Figure 3-6.³⁸ Initially, all the revenue is deposited into the Louisiana Bond Security and Redemption Fund. The amount which is required to "pay all obligation secured by the full faith and credit of the state which become due and payable within"³⁹ the fiscal year is allocated from the fund and the remaining revenue is divided in two. The first half is deposited into the Louisiana Highway, Flood Control and Drainage Priority Fund and used solely to fund the projects of the Highway Priority Program, the Parish Transportation Fund, the Statewide Flood-Control Program, and the Parish Bridge Replacement Fund, as shown in Figure 3-6. The second half of the revenue is credited to the General Fund.

Thus, part of the motor-fuel tax revenue is diverted to ports and flood control when it could be used to aid in maintaining the 16,600 miles, on which about 94 percent of the vehicle miles are traveled annually⁴⁰.

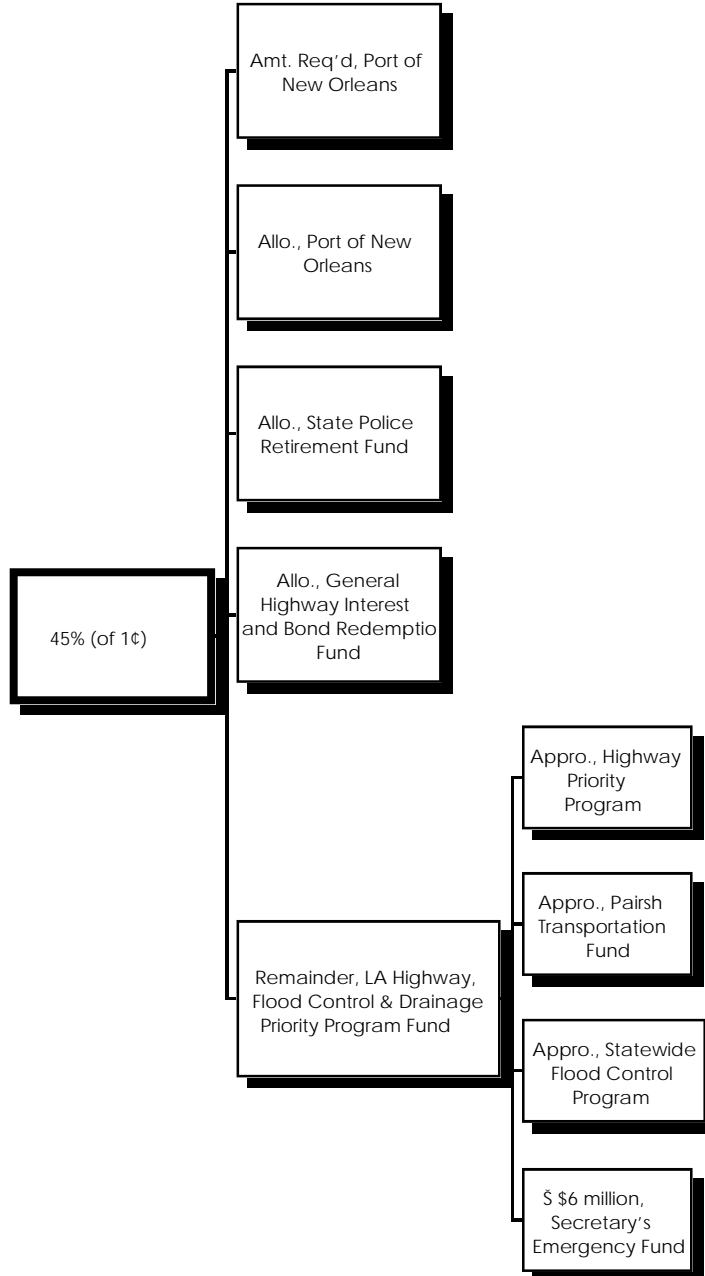
³⁷ Louisiana Secretary of Revenue. Louisiana Gasoline Tax Law & Regulations. 47:727.

³⁸ Louisiana Secretary of Revenue and Taxation. Louisiana Special Fuels Tax Law (Supplement). R.S.47:802.3.C-D.

³⁹ Louisiana Secretary of Revenue and Taxation. Louisiana Special Fuels Tax Law (Supplement). R.S.47:802.3.C.

⁴⁰ TRIP, p. 6.

Louisiana Gasoline/Gasohol Tax Allocation (Cont'd)



**Figure 3-5. Allocation of the Louisiana state gasoline and gasohol tax receipts.
(continued from Figure 3-4).**

Source: 1991 Highway Taxes and Fees and motor-fuel tax codes.

Louisiana Special Fuels Tax Allocation

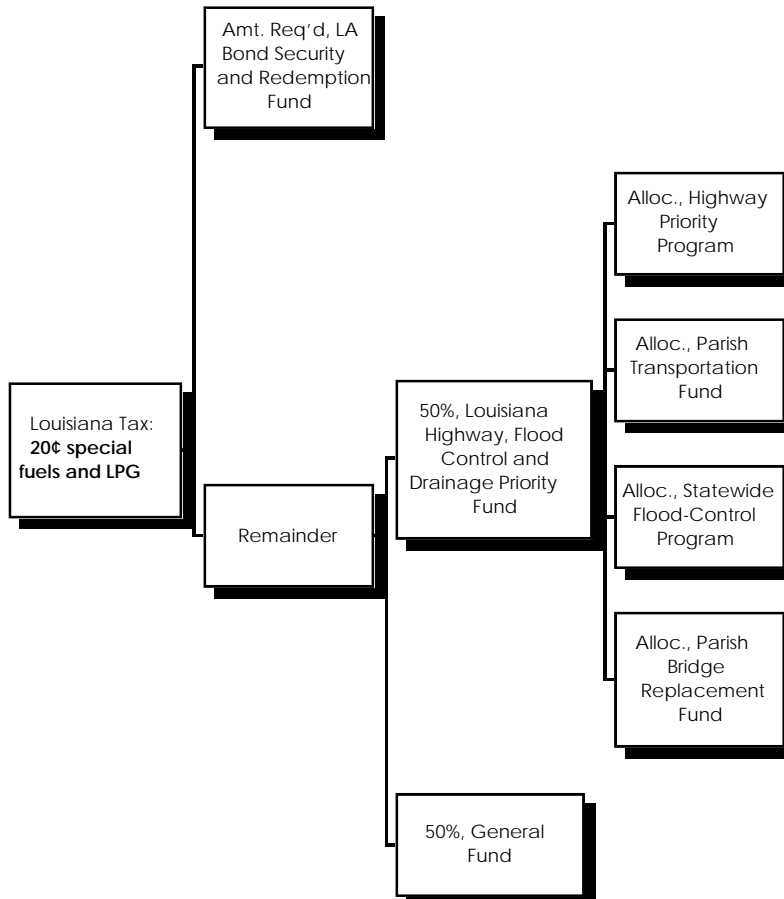


Figure 3-6. Allocation of the Louisiana state special fuels and LPG tax receipts.

Source: Motor-fuel tax codes.

3.3 NEW MEXICO

The State of New Mexico maintains over 11,760 miles of state roads which ultimately carry over 60 percent of the total vehicle miles traveled annually.⁴¹ As it stands, there are seven major sources supporting the State Highway Fund.⁴² Shown as percentages in Figure 3-7, they are federal aid, motor-fuel taxes, vehicle registration fees, sales tax on vehicle parts, miscellaneous truck fees, interest, and other miscellaneous sources. About 35.5 percent of the total revenue comes from state motor-fuel taxes.

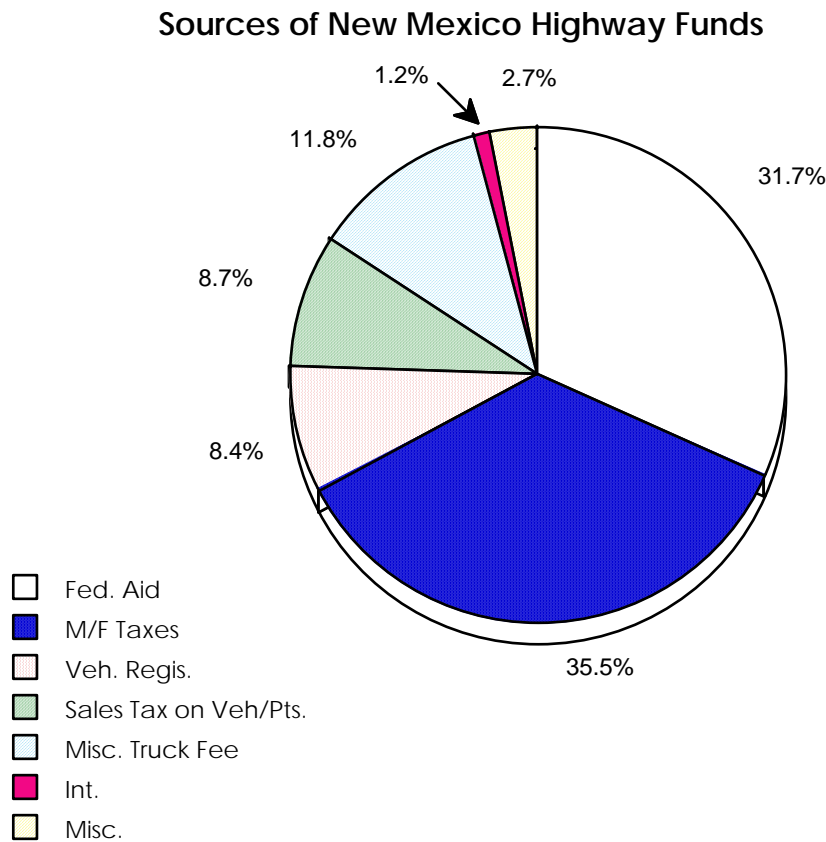


Figure 3-7. The seven major New Mexico state highway funding sources.

Source: 1991 State Highway Funding Methods

⁴¹ Ibid, p. 6.

⁴² Ibid, p. 10.

As of January 1, 1991 the tax rate on both gasoline and diesel was 17 cents per gallon and includes a 1 cent per gallon Petroleum Products Loading Fee⁴³ which will be explained later. The tax rate on liquefied petroleum gas is 16 cents per gallon of fuel; however, owners of LPG-powered vehicles of up to 26,000 pounds gross vehicle weight may pay an annual fee in lieu of a gallonage tax.⁴⁴

The fee is based on three vehicle weight groups. For vehicles with a gross weight of 8,000 pounds or less, the annual fee is \$75. The annual fee is \$150 for vehicles which weigh between 8,001 and 16,000 pounds, and for vehicles weighing between 16,001 and 26,000 pounds the annual fee is three hundred seventy-five dollars (\$375). The gasohol tax rate is 15 cents, and it too includes a 1 cent per gallon Petroleum Products Loading Fee.⁴⁵ In order to qualify as "gasohol", the motor-fuel must consist of at least 50 percent ethanol produced in-state and must have been derived from state agricultural feedstocks.^{46,34}

The motor-fuel tax revenue is distributed³⁵ as shown in Figure 3-8. The Petroleum Products Loading Fee is deposited into the Corrective Action Fund for the cleanup of petroleum leakage. The loading fee will not be charged when the balance in this fund exceeds \$25 million; however, should the balance drop below \$12 million the fee will be reimposed. The remainder of the motor-fuel tax revenue goes to the Gasoline Tax Suspense Fund. At this point, the amount required for refunds is determined and subtracted from the total. The remainder is then distributed in the following manner:

(1) The Motorboat Fuel Tax Fund uses 0.14 percent of the revenue for construction, improvement and furnishing of boating and related state facilities, and 0.27 percent is deposited in the State Aviation Fund for construction and development of public airport facilities.

(2) The County Government Road Fund receives 6.25 percent which is distributed to counties on the basis of road mileage. This fund also receives certain motor vehicle

⁴³ USDOT and FHA, p. 42.

⁴⁴ New Mexico Department of . Phone conversation. July 9, 1992.

⁴⁵ USDOT and FHA, p. 42.

⁴⁶ Ibid, p. 42.

³⁴ New Mexico Department of . Phone conversation. July 9, 1992.

³⁵ USDOT and FHA, p. 42.

revenues, including 17.6 percent of the collected motor vehicle registration fees and 50 percent of the operator's, chauffeur's and motor-carrier driver's license fees.

(3) Another 6.25 percent goes to the municipalities, distributed on taxable gallonage basis, for municipal road purposes, and the Municipal Arterial Program receives 1.56 percent for construction and reconstruction of urban extensions of rural state highways and other streets determined by the State Highway Department.

(4) Next, 11.25 percent of the revenue is divided into two parts. Ninety percent of this 11.25 percent portion is distributed among the municipalities and so-called "H-Class" counties in the proportion of sales, and 10 percent is distributed among the counties outside incorporated municipalities in proportion to their motor-fuel sales.

(5) Finally, the remainder (about 74.28 percent) is deposited into the State Road Fund to be used for maintenance, construction and improvement of State highways, parks and recreation roads, and for matching Federal allotments under Federal-aid provisions.

In 1990, about \$7.6 million was diverted from the motor-fuel tax revenue to vehicle and license collection, and tourism and motorcycle rider safety received \$1.6 million combined, for a total of \$9.2 million.³⁶

³⁶ TRIP, p. 32.

New Mexico Motor-Fuel Tax Allocation

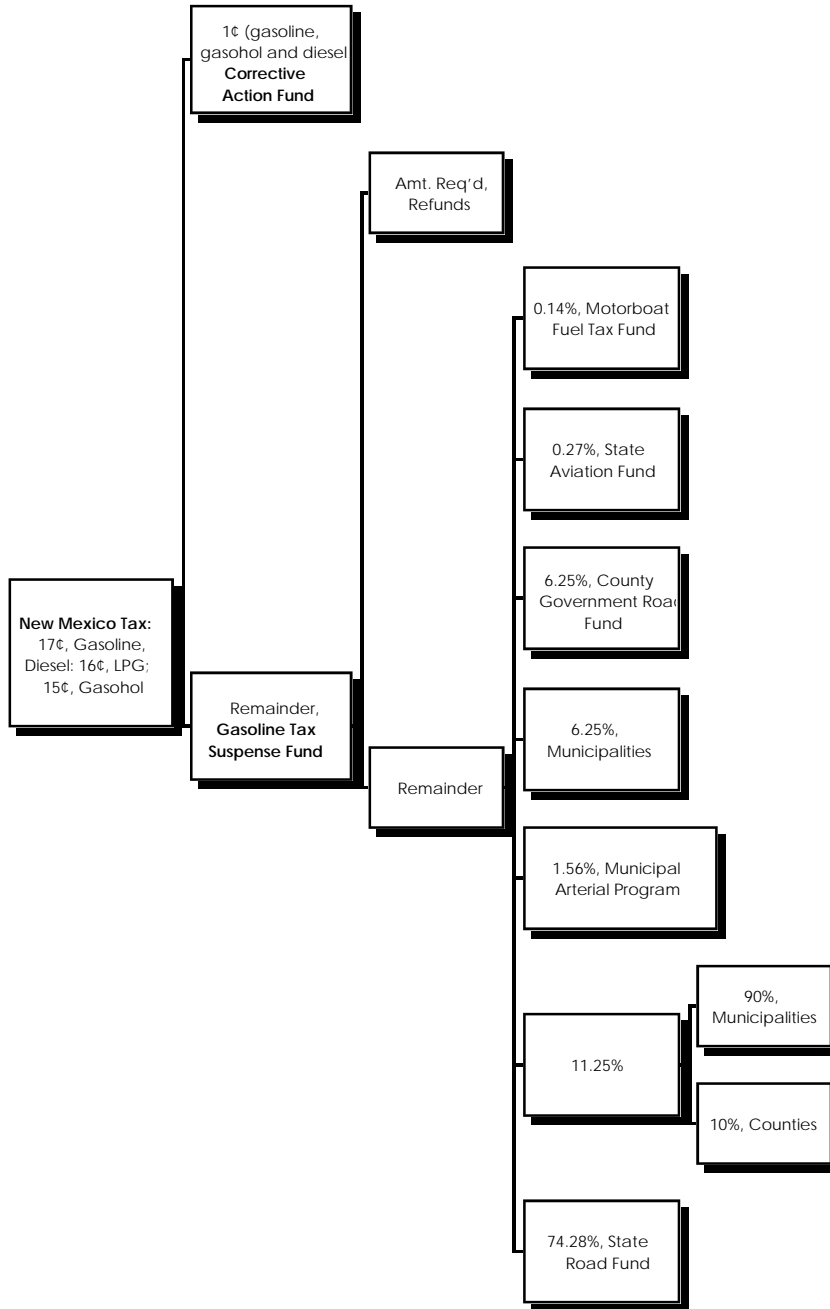


Figure 3-8. Allocation of the New Mexico motor-fuel tax revenue.

Source: Highway Taxes and Fees, 1991

3.4 OKLAHOMA

The State of Oklahoma currently has five major funding sources which are shown as percentages of total highway fund revenues in Figure 3-9.³⁷ They are federal aid, state motor-fuel taxes, vehicle registration fees, the General Fund, and other miscellaneous sources. About 48 percent of the total revenue comes from state motor-fuel taxes.

The tax rate on gasoline, liquefied petroleum gas and gasohol is 17 cents per gallon. This rate includes a 0.06 cents per gallon inspection fee. The diesel fuel tax rate is 14 cents per gallon. In addition, each of these rates include a 1 cent per gallon tax dedicated to the Petroleum Underground Tank Release Environmental Cleanup Indemnity Fund for reimbursement of underground tank release cleanup and property damage. When the Fund reaches a balance of \$5 million, future tax revenues will be deposited in the State Highway Fund. The tax rate on CNG is 16 cents per gallon. Owners of LPG- and CNG-powered vehicles registered in-state pay an annual fee in lieu of the gallonage tax. The annual fee varies according to the weight of the vehicle and the type of fuel used.

³⁷ Ibid, p. 10.

Sources of Oklahoma State Highway Funds

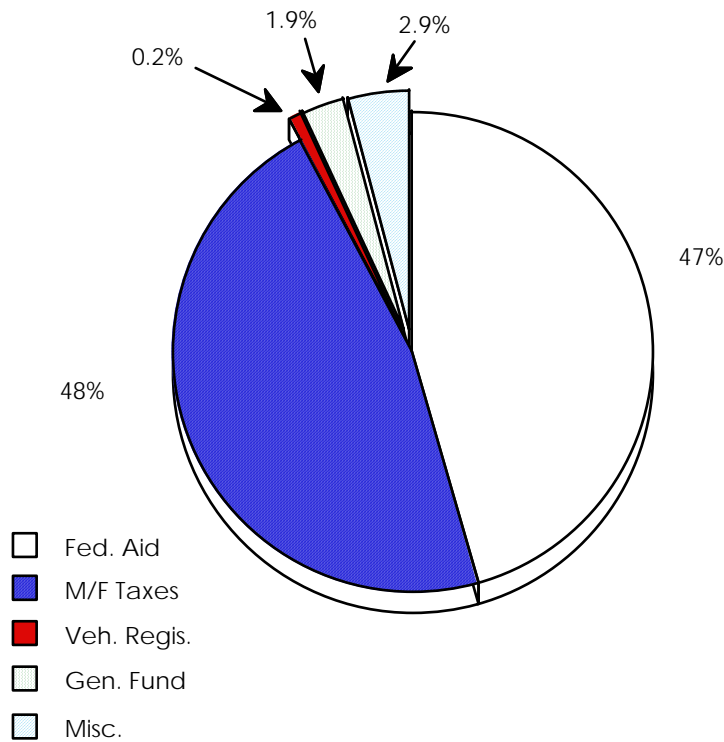


Figure 3-9. The five major Oklahoma state highway funding sources.

Source: 1991 State Highway Funding Methods

Vehicles which operate on CNG and which weigh less than or equal to one ton pay an annual fee of \$100. LPG-powered vehicles weighing less than or equal to one ton pay an annual fee of \$50. The fee increases to \$150 a year for any CNG- or LPG-powered vehicles weighing over one ton.³⁸

The chart in Figure 3-10 traces the distribution of motor-fuel tax revenue in the State of Oklahoma.³⁹ Similar to other states in the region, motor-fuel taxes are broken down into various funds according to the proportion of the fuel taxes each fund receives annually by either indicating a percentage of the tax or an actual cents per gallon of fuel sold. Because the portion of the tax which each fund receives often depends on the type of fuel, the chart in Figure 3-10 is formulated so that the rates shown are for all fuels, unless otherwise indicated.

³⁸ Smitherman, Jason. Oklahoma Corporation Commission. Phone conversation. July 8, 1992.

Six cents from each gallon of fuel sold is distributed into four major funds. The first is the State Tax Commission Fund which receives 3 percent, or about 0.18 cents per gallon for the collection and administration of the motor-fuel tax. The second fund, called the Incorporated Cities and Towns Fund, receives 5 percent of the revenue from 6 cents per gallon of gasoline and gasohol sold, or 0.30 cents per gallon of gasoline and gasohol sold, for the construction and maintenance of streets and alleys. (The cities and towns receive funds in proportion to the population indicated in the last Federal census.)

The County Highway Fund, the third fund in this group, is credited the amount corresponding to 22 percent of the revenue from 6 cents per gallon of gasoline and gasohol, or about 1.32 cents per gallon of gasoline and gasohol sold, in addition to an amount equal to 24.25 percent of the revenue from 6 cents per gallon of diesel and LPG, or about 1.455 cents per gallon of diesel and LPG sold. This revenue is for construction and maintenance of county or township highways and for debt service of county highway bonds. Finally, the State Transportation Fund receives the amount equal to 70 percent of 6 cents, or 4.2 cents, per gallon of gasoline and gasohol sold, as well as 72.75 percent of 6 cents, or 4.365 cents, per gallon of diesel and LPG sold during the fiscal year. The resources in this fund are expended on construction, repair, and maintenance of State highways.

³⁹ USDOT and FHA, p. 46-7.

Oklahoma Motor-Fuel Tax Allocation

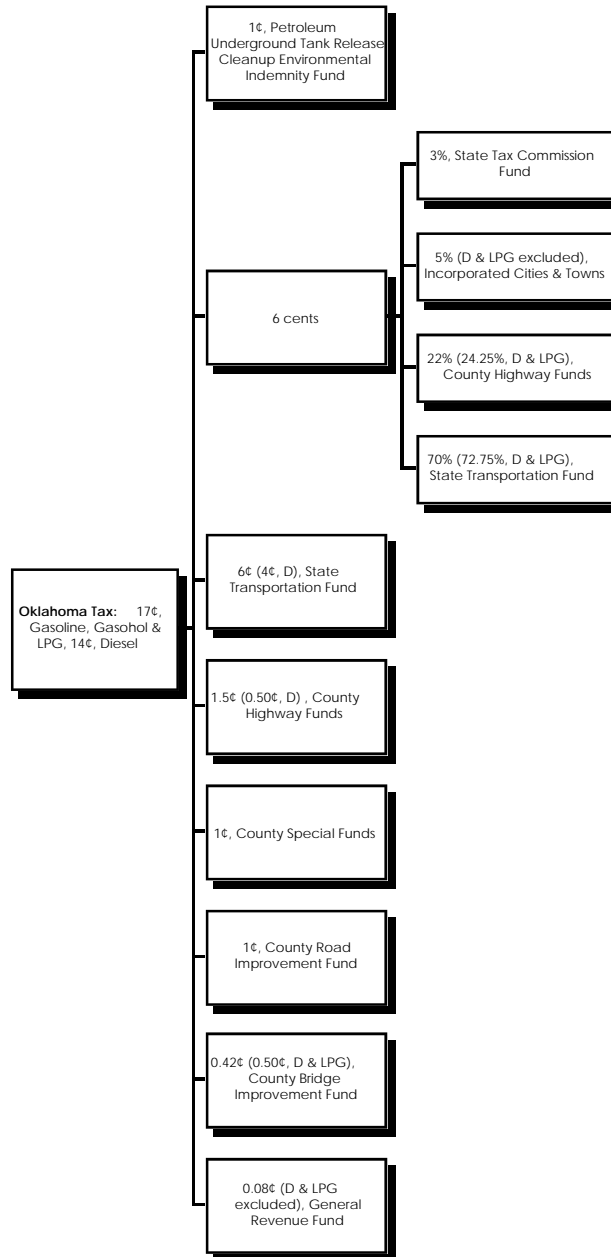


Figure 3-10. Allocation of the OK gasoline, special fuels, and LPG tax revenue.

Source: Highway Taxes and Fees, 1991

Next, the State Transportation Fund receives the revenue from 6 cents of every gallon of gasoline, gasohol and LPG, as well as the revenue from 4 cents per gallon of diesel. Of the 6 cents, one cent per gallon of gasoline sold is reserved for construction and maintenance of farm-to-market roads. The remaining funds are expended on the construction, repair and maintenance of State highways.

The County Highway Funds receive an additional allocation, as indicated, for the construction repair and maintenance of county and township roads, highways and permanent bridges. The County Special Fund, expends the revenue it receives on the construction of county roads and bridges. The County Road Improvement Fund was established to provide for the improvement and maintenance of county primary roads. The County Bridge Improvement Fund was established for the purpose of improving, repairing and replacing county bridges and for matching Federal-aid funds for that purpose. The last fund is the General Revenue Fund which receives the revenue from 0.08 cents per gallon of gasoline and gasohol sold to pay for the inspection of motor-fuel by the State Tax Commission.

The State of Oklahoma maintains over 12,200 highway miles, carrying 58 percent of the state's VMT, while reportedly diverting over \$203.3 million to the General Fund.⁴⁰ There is an indirect contribution of the motor-fuel tax revenue to the State Highway Fund through the General Fund; however, contributions from the General Fund must often be rewarded yearly as other groups seek aid from this source, therefore it is not really a stable source of State Highway Fund income.

⁴⁰ TRIP, p. 6 & 32.

3.5 TEXAS

The State of Texas currently has six major state funding sources. They are federal aid, motor-fuel taxes, vehicle registration, interest, oil lubricant sales tax and other miscellaneous sources (see Figure 3-11).⁴¹ The motor-fuel tax brings in about 38.1 percent of the total revenue. These resources are needed to maintain the 76,564 miles of State roads in Texas which carry about 66 percent of the state's VMT.⁴²

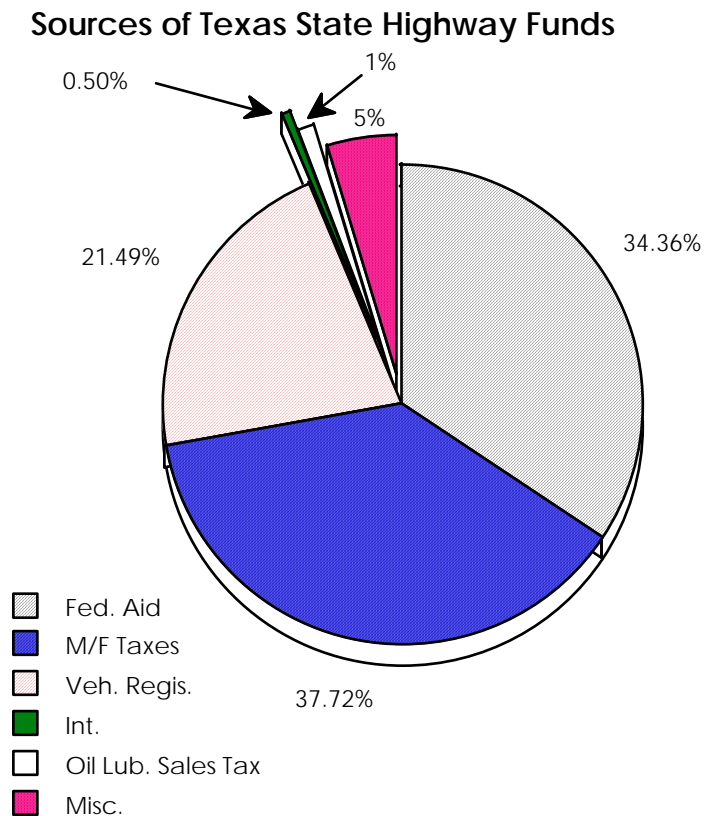


Figure 3-11. The six major Texas state highway funding sources shown as a percentage of the entire revenue.

Source: 1991 State Highway Funding Methods

As of January 1, 1991 the tax rate on gasoline, diesel, liquefied petroleum gas, compressed natural gas and gasohol was 20 cents per gallon. Owners of LPG- and CNG-

⁴¹ Ibid, p. 10.

⁴² Ibid, p. 6.

powered vehicles registered in-state pay an annual fee in lieu of the gallonage tax. The annual fee varies according to the weight of the vehicle and the estimated number of miles driven by each vehicle during the previous year.⁴³ Table 3-2 displays the current rates which are applied to these vehicles. Transit carrier vehicles operated by a transit company are charged an annual rate of \$444 per vehicle.

A graphical depiction of the flow of motor-fuel revenue throughout the various agencies in the State is shown with two graphs. The first (Figure 3-12) corresponds to the distribution of the gasoline and gasohol tax receipts.⁴⁴ The gross receipts of these two motor-fuel taxes are initially placed in the Highway Motor-Fuel Tax Fund. One percent of the collected taxes are placed into the Tax Administration Fund used by the state comptroller for administration and enforcement of the motor-fuel tax laws. Once this is done, the Comptroller of Public Accounts determines the amount needed for refunds of the motor-fuel tax. Of the remaining revenue, the portion which accounts for unrefunded motor-fuel tax used on boats is distributed to the Available School Fund (25 percent) and the General Fund (75 percent). The amount to the General Fund is appropriated to the Parks and Wildlife Department for such purposes as acquiring land for recreation purposes and for enforcement of the Water Safety Act, among others.

⁴³ Sharp, John. *Texas Tax Law: Motor Fuels Tax*. Sec.153.304. p. 36-7.

⁴⁴ Sharp, Sec.153.501-3. p. 44-46.

Table 3-2. LPG & CNG Fuel Tax Schedule for the State of Texas*

Vehicle Weight	Less than 5,000 miles	5,000 to 9,999 miles	10,000 to 14,999 miles	15,000 miles and over
Less than 4,000 lbs	\$ 30	\$ 60	\$ 90	\$120
4,000 to 10,000 lbs	42	84	126	168
10,001 to 15,000 lbs	48	96	144	192
15,001 to 27,500 lbs	84	168	252	336
27,501 to 43,500 lbs	126	252	378	504
43,501 lbs and over	186	372	558	744

*Transit carrier vehicles are charged an annual rate of \$444 per vehicle.

Source: Texas Motor Fuels Tax Law

The remainder of the gasoline and gasohol tax revenue is distributed in the following manner. First, 25 percent is deposited into the Available School Fund for the same purpose mentioned earlier, and then 50 percent is deposited into the State Highway Fund for the construction and maintenance of the state road system. The last 25 percent is distributed into two funds. The comptroller will deposit this revenue into the County and Road District Highway Fund until \$7,300,000 has been deposited for the fiscal year. All remaining funds are deposited into the State Highway Fund. The Texas Department of Transportation is to use these latter funds for the construction, improvement and maintenance of farm-to-market roads.

The gross receipts from the other motor-fuel taxes are distributed in much the same way⁴⁵; however, as shown in Figure 3-13 the remainder of the motor-fuel tax revenue, after the

⁴⁵ Ibid, Sec.153.504-5. p. 46.

Tax Administration receives its portion and after all refunds have been made, is only distributed to two funds which have been mentioned in the earlier discussion. The Available School Fund and the State Highway Fund receive 25 percent and 75 percent, respectively.

In the year 1990, diversions of motor-fuel tax revenue included \$314.3 million to education.⁴⁶

⁴⁶ TRIP, p. 32.

Texas Gasoline/Gasohol Tax Allocation

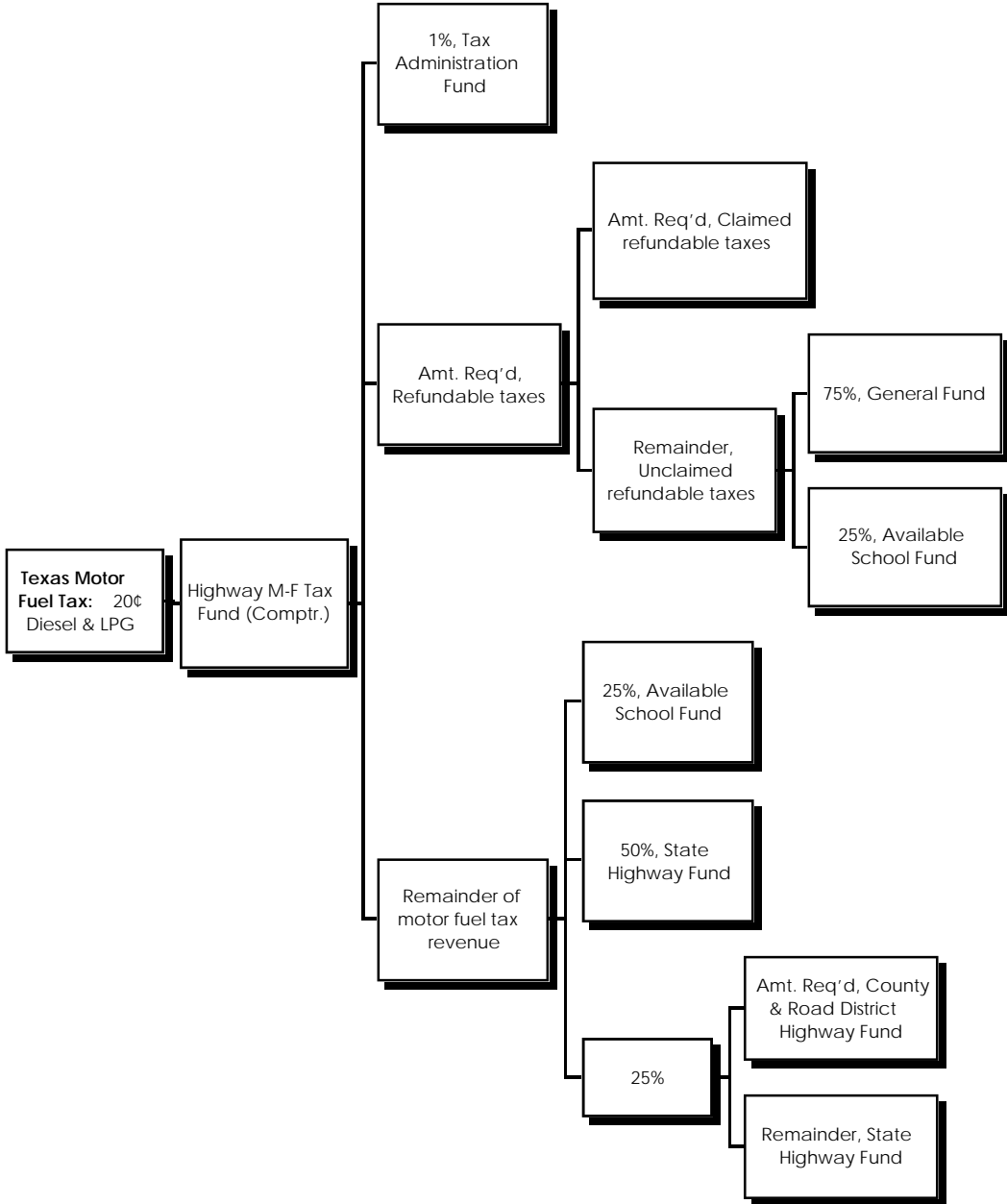


Figure 3-12. The distribution of the TX gasoline and gasohol tax.

Source: Texas Tax Law-Motor Fuels Tax

Texas Diesel/LPG Tax Allocation

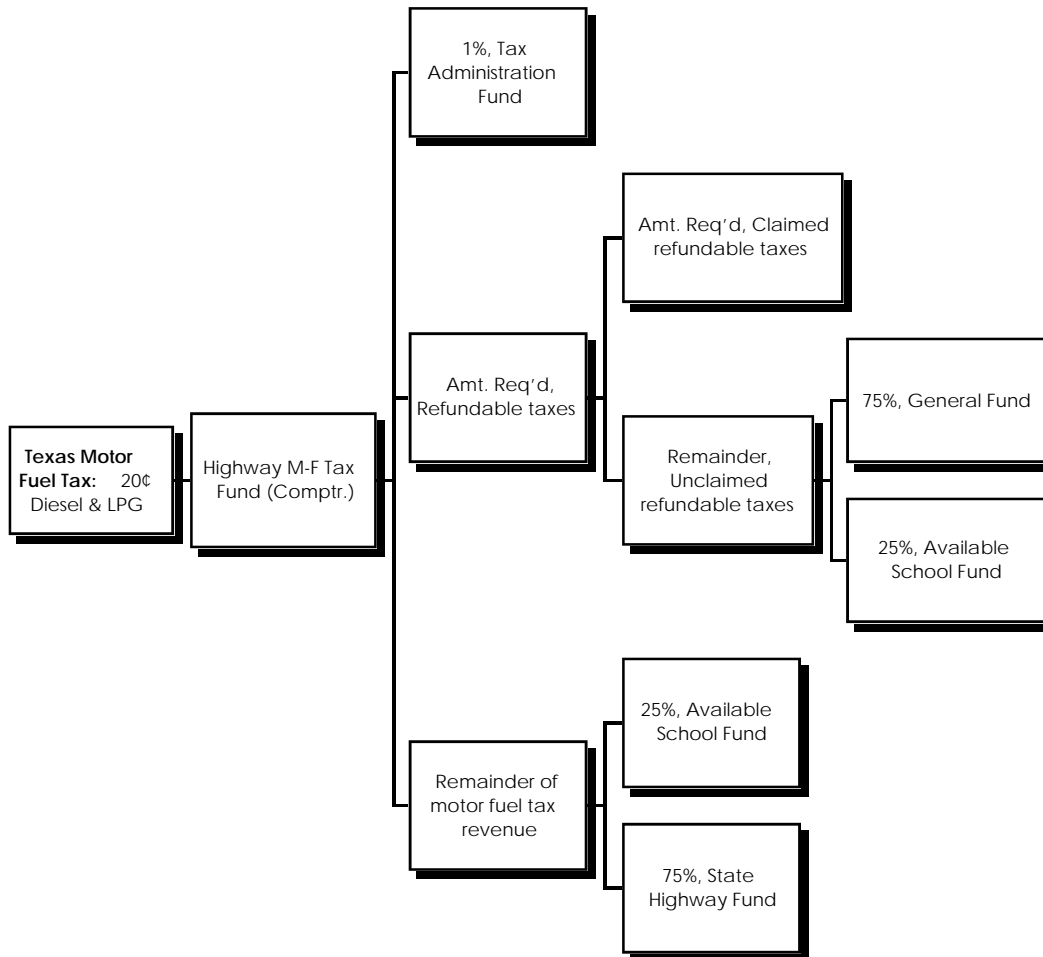


Figure 3-13. The distribution of the TX diesel & lpg tax.

Source: Texas Tax Law-Motor Fuels Tax

3.6 SUMMARY

The sources of state highway funds are as varied as the states themselves, with two important exceptions. First, all of the states in this study rely on both motor-fuel tax revenue (directly or indirectly) and some type of federal-aid to support their various highway. Secondly, although motor-fuel tax revenue does contribute significantly to these funds, in each of these states some type of diversion of this revenue to non-highway programs does occur.

CHAPTER 4. CLEAN AIR ACTS AND RELATED LEGISLATION

This chapter is dedicated to identifying alternative fuels legislation in the five states—Arkansas, Louisiana, New Mexico, Oklahoma, and Texas—in the southwest region. We begin first with a brief description of the Federal Clean Air Act Amendment of 1990. Next, each state is taken individually and examined. In describing the alternative fuels legislation, a list of the alternative fuels adopted by each state will be identified. The effective date, the organizations affected or targeted by the legislation, a schedule for implementation (if any), the parties responsible for implementation and any exceptions and waivers provided by the legislation will also be identified.

4.1 Federal Clean Air Act Amendments Of 1990

The Clean Air Act Amendments of 1990 were signed into law by President George Bush on November 15, 1990. Title I, entitled "Attainment of Ambient Quality Standards," addresses the problem of defining federal non-attainment areas by establishing categories ranging from "extreme" which is the nation's worst air quality to "marginal".⁴⁷ Ninety-six cities throughout the nation have been identified to have the worst ozone smog problems and have therefore been scheduled for the earliest implementation of federal clean air standards. Of those 96 cities, seven are located in the five study states.

For example, Houston, Texas has been classified as "severe," and has been assigned the deadline of November 2005 to meet all federal clean air standards. One of these requirements is that only reformulated gasoline, as opposed to traditional gasoline, can be sold in Houston beginning January 1, 1995. The other clean air act target cities located in the study area are Baton Rouge, LA (serious), Beaumont, TX (serious), El Paso, TX (serious), Dallas, TX (moderate), Lake Charles, LA (marginal), and areas in Arkansas affect by conditions in Memphis, TN (moderate).⁴⁸

⁴⁷Lee, B. *Highlights of the Clean Air Act Amendments of 1990*. Air/Water Pollution Report. Vol. 41, No. 1. January 1991. p. 17.

⁴⁸J. E. Sinor Consultants Inc. General: Government Actions. The Clean Fuels Report 1991 Feb;3(1):1-3.

Title II of the Clean Air Amendments, "Mobile Sources," establishes "stricter tailpipe emissions standard for vehicles," and in 1998 requires the use of clean fuel vehicles for privately owned fleets of 10 or more in cities with serious or worse ozone non-attainment.⁴⁹

The Federal Clean Air Act has sparked regulation from the state level as well. The rest of this chapter will describe clean air initiatives in each of the five states.

4.2 ARKANSAS

The State of Arkansas recently set up an Alternative Fuels Commission; however, no legislation has been passed at the time of this study.

4.3 LOUISIANA

In the State of Louisiana two bills, Senate Bill 2 and Senate Bill 309, were signed into law to promote the use of alternative fuels. At the moment, both state agencies and "political subdivisions" have been targeted, leaving private participation at a strictly voluntary level.

4.3.1 Louisiana Senate Bill 2

This legislation is described as "a law mandating purchases of or conversion to alternatively fueled vehicles by state agencies."⁵⁰ Law enforcement vehicles are not automatically exempt from the provisions of this bill; however, if it can be shown that it is not feasible for those vehicles to operate on an alternative fuel, those agencies may be granted an exemption. Alternative fuels include compressed natural gas (CNG), liquefied petroleum gas (LPG), reformulated gasoline, methanol, ethanol, electricity and any other fuels which meet or exceed federal Clean Air Act standards.

The bill, which became effective on September 1, 1991, states that by September 1, 1994, 30 percent of the fleet vehicles operated by state agencies must be capable of using an alternative fuel. The percentage increases to 50 percent by September 1, 1996, and if the secretary of the Department of Environmental Quality, who must review the alternative fuel use program on or before December 31, 1996, determines that the program has been effective in reducing total

⁴⁹Lee, p. 18.

emissions from motor vehicles in the area, the compliance requirement increases to 80 percent by September 1, 1998. This schedule is shown graphically in Figure 4-1.

The Commissioner of Administration, who is responsible for the purchase and lease of vehicles used by state agencies, is also responsible for achieving the required percentages of alternative fuel vehicles, and must also review and grant waivers whenever necessary. The commissioner may reduce any percentage specified or waive the requirements entirely for any state agency able to show that (1) the agency's vehicles will be operating primarily in an area in which neither the agency nor a supplier has or can be expected to establish a central refueling station for alternative fuels, or (2) the agency is unable to acquire or be provided equipment or refueling facilities necessary to operate vehicles using alternative fuels at a projected cost that is reasonably expected to result in no greater net costs than the continued use of traditional gasoline or diesel fuels measured over the expected useful life of the equipment or facilities supplied. The Division of Administration must show progress in achieving the percentages in its annual fiscal report to the legislature.

4.3.2 Louisiana Senate Bill 309

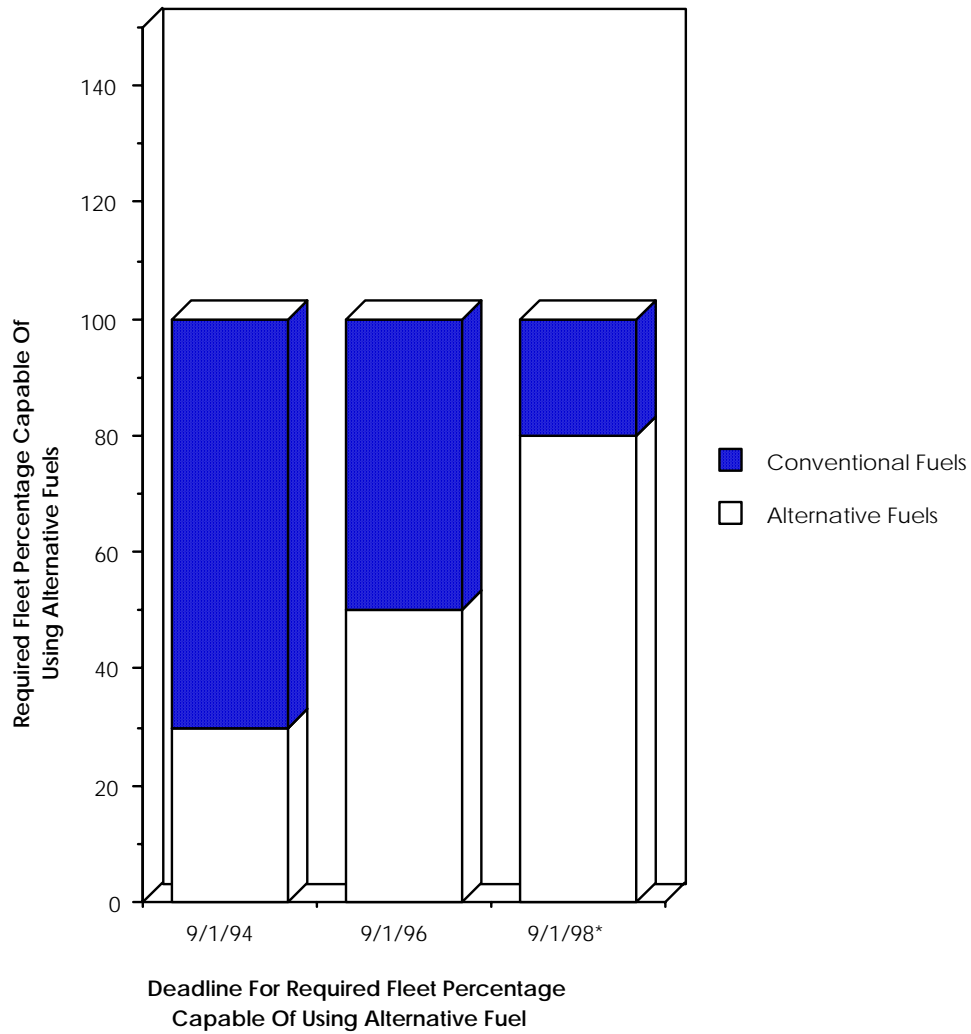
Senate Bill 309 is very similar to Senate Bill 2 except that it deals with the purchase or lease of alternatively fueled vehicles by "political subdivisions" as opposed to state agencies.⁵¹ A political subdivision is defined as a parish, municipality, and any other unit of local government, including a school board and a special district, authorized by law to perform governmental functions. Alternative fuels are exactly those described above in Senate Bill 2.

This bill also became effective on September 1, 1991 with the same schedule for conversion of vehicles as described in Senate Bill 2 (see Figure 4-1). Each political subdivision is responsible for achieving the required percentages as per Senate Bill 2; however, it is the governing authority of each political subdivision who will review the program by December 31, 1996 to determine its effectiveness so that the requirement of 80% alternative fuel vehicles by September 1, 1998 may be implemented. It is also the governing authority who must review and grant waivers.

⁵⁰ Louisiana Senate Bill 2

⁵¹LA Senate Bill 309

LOUISIANA VEHICLE CONVERSION SCHEDULE



*Deadline only if the Department of Environmental Quality finds that the program has been effective in reducing total annual emissions on or before Dec. 31. 1996.

Figure 4-1. The Louisiana Senate vehicle conversion schedule to alternative fuels.

4.4 NEW MEXICO

The State of New Mexico has created an Alternative Fuels Task Force to recommend a state alternative fuels program. The task force has decided on a two part strategy. The first goal will be to "make an immediate impact by stimulating markets for clean alternative fuels and vehicles." The second objective is to "establish New Mexico as a leader in research, development and marketing of new transportation technologies."⁵²

The task force has already outlined several recommendations to facilitate the accomplishment of these goals. The first is a government fleet vehicle conversion of a minimum of 30 percent newly acquired vehicles by June 1993. In addition, they recommend targeting the areas where the greatest pollution problems exist.

They have also recommended that a full time alternative fuels transportation managerial position be established. Their function would be to "promote, coordinate and monitor implementation of the state's clean alternative transportation fuels program." More recommendations include (1) altering the budget process in each department of state government, universities and school districts so that they may retain the fuel and vehicle maintenance savings derived from these programs for investment in future conversion programs, (2) implementation of a mass transit demonstration program, and (3) creating a revolving fund to expedite the conversion process.

New Mexico's state energy policy does indicate a move toward the promotion of alternative transportation fuels "as one of the policy options aimed at reducing petroleum consumption in the transportation sector," with specific emphasis in the promotion of locally available energy resources such as natural gas. In an effort to promote the use of alternative fuels, New Mexico's Department of Energy, Minerals and Natural Resources has funded several natural gas vehicle projects, "including the conversion of 30 city-owned vehicles in Albuquerque and 30 school buses in Los Lunas and the purchase of 2 natural gas buses for testing in Roswell."⁵³

⁵²J. E. Sinor Consultants Inc. General: New Mexico State Energy Plan Targets Alternative Fuels. The Clean Fuels Report 1992 Feb;4(1):36.

⁵³J. E. Sinor Consultants Inc. General: New Mexico State Energy Plan Considers Alternative Fuel Measures. The Clean Fuels Report 1991 Nov;3(5):14.

4.5 OKLAHOMA

The State of Oklahoma approved the Oklahoma Alternative Fuels Conversion Act (House Bill 2169) which became operative on July 1, 1990. This act defines alternative fuels as including CNG, LPG, liquefied natural gas (LNG), ethanol and electricity or any other fuels "which result in comparably lower emissions of oxides of nitrogen, volatile organic compounds, carbon monoxide, or particulates or any combination thereof."⁵⁴

Essentially this act creates a revolving fund, the "Oklahoma Alternative Fuels Conversion Fund," for the Corporation Commission to facilitate the conversion of gasoline powered school and government vehicles to alternative fuel vehicles. Metropolitan rapid transit motor vehicles, buses, trucks, law enforcement vehicles and emergency vehicles, owned and operated by the State of Oklahoma or any public trust authority, county, or municipality within the state, and whose fleets consisted of 100 or more vehicles are all considered "government vehicles." The term "school vehicle" is intended to include "all buses and multi-passenger motor vehicles owned and approved to operate by the State Department of Education or any school district within the state." The school districts are instructed, beginning July 1, 1995, to consider only the purchase of vehicles capable of operating on an alternative fuel. State agencies as well as counties, municipal governments and school districts have access to the fund as long as they are able to pay back the conversion costs within seven years of the conversion date.

The Oklahoma Alternative Fuels Conversion Fund is to be reimbursed by a surcharge on alternative fuels sold within the state. Initially a surcharge is levied equal to the amount saved on a per gallon basis by the purchase of an alternative fuel versus gasoline. The Oklahoma Tax commission adjusts the surcharge to "reflect any change in the amount of fuel savings actually received by the recipient." A reimbursement account is established within the fund in the name of the recipient (a school district, for example) in the amount of the vehicle conversion costs. The account is then either reduced by the amount of surcharges paid or increased by the amount of any subsequent conversion funds received by the recipient. Once the recipient's reimbursement account is reduced to zero, the surcharge levied by this bill will terminate until another reimbursement account is established by that recipient.

⁵⁴Oklahoma House Bill 2169

The Oklahoma Tax Commission is responsible for determining the amount of the surcharge, collecting and apportioning the surcharge, and adopting rules and regulations relating to its payment and collection. The Corporation Commission is responsible for disbursing money from the fund for expenses relative to the vehicle conversion. The amount expended per vehicle shall be equal to the actual cost of conversion or \$3000, whichever is less.

The last part of the act addresses the fuel tax issue. In lieu of a special fuel tax, a fee of \$100 is levied on each automobile, pickup truck or van not exceeding one ton in capacity operating on CNG or LNG effective January 1, 1991, unless conversion of the vehicle was done after July 1, 1991 in which case the fee is \$50. On January 1, 1993, the fee increases to \$200 again provided that conversion of the vehicle was not done after July 1, 1993 when the fee reduces to \$100 through the end of the year. Each person who operates a natural gas vehicle must apply for and obtain a decal from the Oklahoma Tax Commission wherein the fee is paid. The decal exempts the operator from the Special Fuel Use Tax and must be renewed every year. Funds acquired by this fee are collected by the Oklahoma Tax Commission and deposited annually into the State Transportation Fund.

In addition to the new laws mentioned above, beginning December 31, 1990 this act provides a one-time tax credit against the income tax of "20 percent of the cost of the qualified clean-burning motor vehicle fuel property." In the case of the taxpayer who purchases an original equipment alternative fuel vehicle from a manufacturer and is unable to determine the exact cost associated with the alternative fuel equipment, a credit amount of either 10 percent of the cost of the vehicle or \$1500, which ever is less, may be claimed.

4.6 TEXAS

Of the states in the southwest region, Texas has the most ambitious alternative fuels program. Two legislative enactments are the principal forces behind this program.

4.6.1 Texas Senate Bill 740 (Alternative Fuels Program)

The bill is described as “an act relating to the purchasing, lease or conversion of motor vehicles by state agencies, school districts, and local transit authorities and districts to assure use of compressed natural gas or other alternative fuels.”⁵⁵ Alternative fuels in Texas currently include CNG, LPG, methanol and electricity. The act became effective September 1, 1991, and the four organizations affected by this bill are (1) school districts with more than 50 vehicles used for transporting children, (2) state agencies with more than 15 vehicles, excluding law enforcement and emergency vehicles, (3) all metropolitan transit authorities, and (4) all city transit departments. As outlined in the act, these organizations must complete their conversions according to the seven year schedule illustrated in Figure 4-2.

By September 1, 1994, these organizations must have converted 30 percent of their fleet to vehicles capable of operating on an alternative fuel. By September 1, 1996 that number increases to 50 percent, and if the Texas Air Control Board (TACB) finds the program to be effective in reducing total annual emissions in that organizations' area, such as the school district or transit authority jurisdiction, the requirement is increased to 90 percent by September 1, 1998. Compliance with the act may be accomplished through the purchase of new vehicles, the conversion of old gasoline- (or diesel-) operated vehicles to alternative fuel vehicles, or by contracting to lease the necessary vehicles.

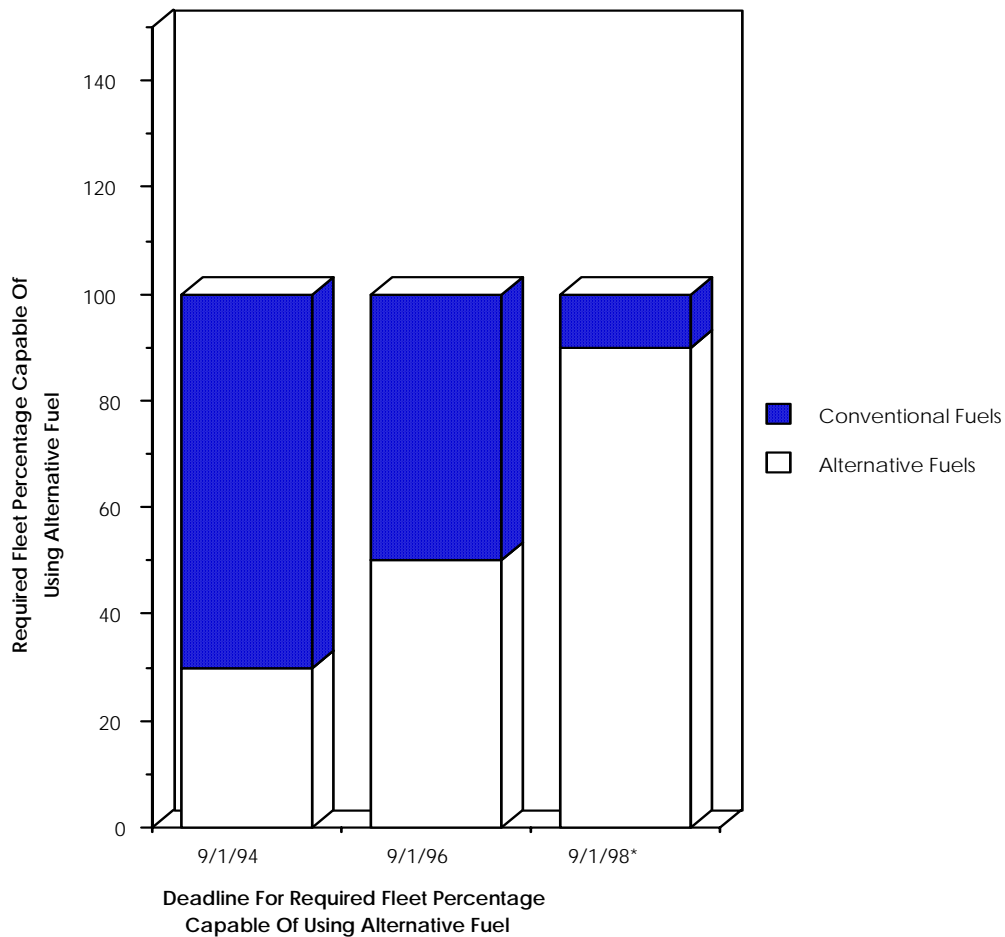
The act charges the TACB with analyzing the program to determine its effectiveness in reducing total annual emissions from motor vehicles in their respective areas. School districts are required to submit annual reports to the Texas Education Agency showing progress towards conversion. Each state agency must include in their annual financial reports to the legislature progress towards achieving the required fleet percentages, and transit authorities must submit similar reports to the TACB. All of these reports are to be used by the TACB in reviewing the effectiveness of the program.

The act does make provisions for waiver of the implementation requirements. The State Purchasing and General Services Commission may reduce or waive the required fleet percentages if an organization can prove one of two conditions. The first is the inability to secure an adequate fuel supply. If the organization can provide supporting evidence and certify that they (or fuel suppliers) do not have, nor can they be expected to establish a central refueling station

⁵⁵ Alternative Fuels Transportation Briefs, Center for Growth Studies, February 1991.

for alternative fuels, then they may be granted an exemption. The second condition is the ability to prove that costs of meeting the requirements exceed costs of using gasoline or diesel (net costs must be measured over the useful life of the equipment/facilities).⁵⁶ The existence of either one of these two conditions may result in an exemption for the organization, although to date, no exemptions have been allowed by the commission.

TEXAS VEHICLE CONVERSION SCHEDULE



*Deadline only if the TACB finds that the program has been effective in reducing total annual emissions.

Figure 4-2. The Texas vehicle conversion schedule to alternative fuels.

⁵⁶ Alternative Fuels Transportation Briefs

4.6.2 Texas Senate Bill 769 (Clean Air Amendments)

This bill, which amends the Texas Clean Air Act, is similar to SB 740; however, it is described as "an act relating to the adoption of certain regulations to encourage and require the use of natural gas and other alternative fuels"⁵⁷ in designated federal non-attainment regions. The areas around Houston, Dallas-Fort Worth, Beaumont-Port Arthur, and El Paso do not currently meet federal air quality standards. This bill became effective on September 1, 1991.

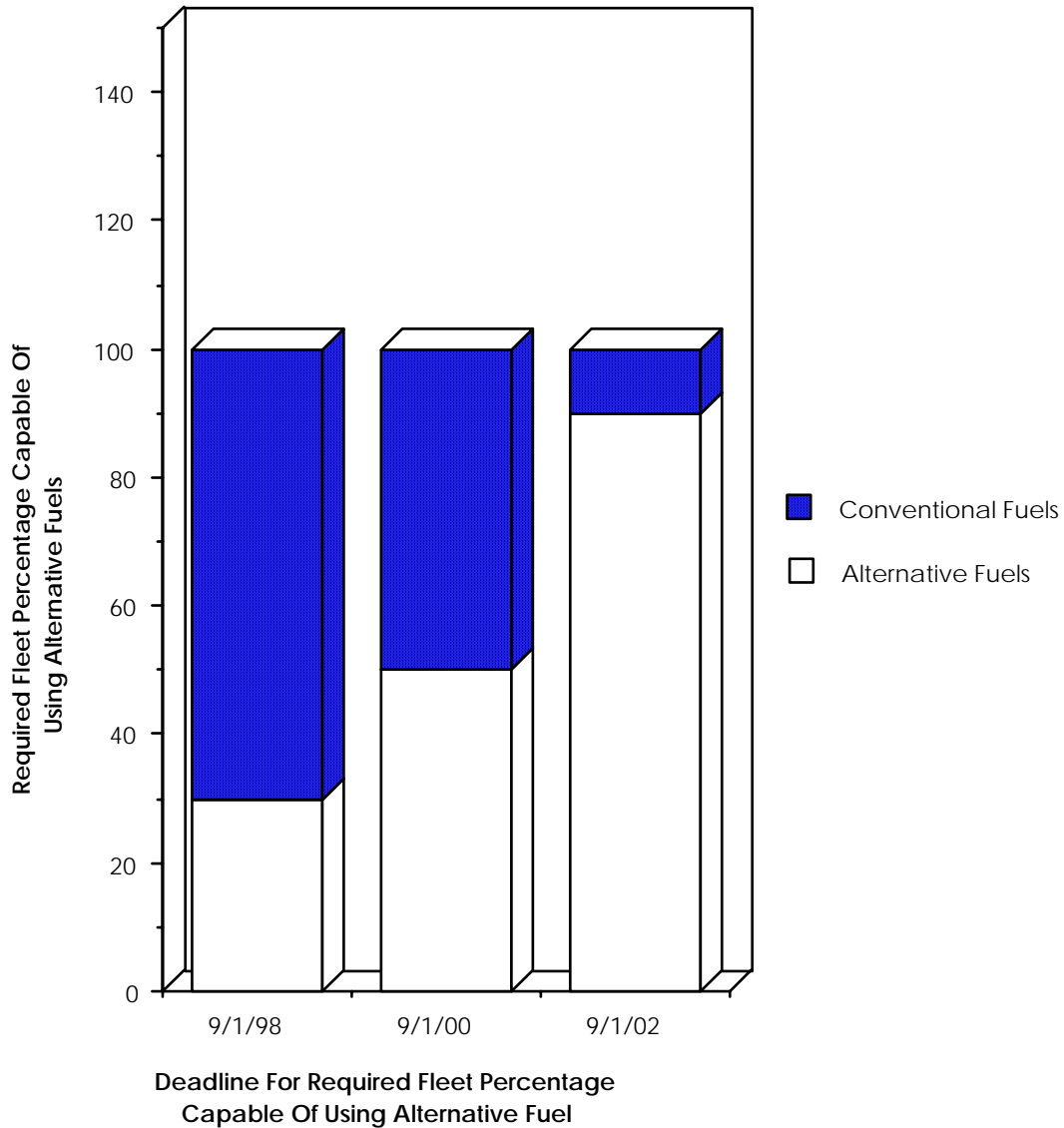
The organizations, in the areas mentioned above, affected by this bill include (1) both metropolitan and regional transit/transportation authorities, (2) city transportation departments, (3) local governments with 16 or more vehicles (excluding law enforcement and emergency vehicles), and (4) private fleets with 26 or more vehicles (excluding law enforcement and emergency vehicles).

The implementation schedule and requirements for the first two groups are the same as Senate Bill 740 illustrated in Figure 4-2. If the TACB rules that the alternative fuels program has been effective in reducing emissions, then groups 3 and 4 above will be required to convert to alternative fuels according to the schedule illustrated in Figure 4-3.

By September 1, 1998, local governments and private fleets must be 30 percent operable on alternative fuels. The requirements increase to 50 percent by September 1, 2000, and finally, each fleet must consist of 90 percent alternative fuel vehicles by September 1, 2002.

⁵⁷ Alternative Fuels Transportation Briefs, Center for Growth Studies, February 1991.

**TEXAS VEHICLE CONVERSION SCHEDULE FOR
LOCAL GOVERNMENTS AND PRIVATE FLEETS***



*This part of the requirements of SB 769 will go into effect only if the TACB has found the program to be effective.

Figure 4-3. The Texas Senate Bill 769 vehicle conversion schedule to alternative fuels for local governments and private fleets in federal non-attainment areas.

4.7 SUMMARY

The information detailed in the previous sections for the three states which have the most extensive alternative fuels programs—Louisiana, Oklahoma and Texas - is summarized in Table 4-1. The information includes a list of the currently accepted alternative fuels in each of the three states. CNG is clearly an accepted alternative fuel in all three states and it is generally the alternative fuel of choice. The analysis of the clean fuels programs for each state will operate under this assumption. The table also indicates the effective starting date for the programs, and the organizations which have been targeted for vehicle conversion have also been listed. The last category in the table is the implementation schedule.

The table is intended to be a quick reference guide to the clean air legislation in each of the three states in our study which have the most extensive programs. For instance, for the State of Louisiana there are six specific alternative fuels which are recognized as such. These are CNG, LPG, reformulated gasoline, methanol, ethanol and electricity. The clean air program is scheduled to begin on September 1, 1991 and all state agencies and political subdivisions are required to convert their vehicles to alternative fuel vehicles according to the schedule in the table. For example, they must have 30 percent of their fleet converted by September 1, 1994. The information for the States of Oklahoma and Texas should be interpreted in the same way.

In addition to being a quick reference to the clean air programs in each state, the table should also serve as an easy means of comparison between the three programs. For instance, while both Louisiana and Texas have very specific schedules for implementation for their programs, Oklahoma (as of this writing) does not.

Table 4-1. Clean Air Legislation Summary

	LOUISIANA	OKLAHOMA	TEXAS
Alternative Fuels	<ol style="list-style-type: none"> 1. CNG 2. LPG 3. Reformulated gasoline 4. Methanol 5. Ethanol 6. Electricity 	<ol style="list-style-type: none"> 1. CNG 2. LPG 3. LNG 4. Ethanol 5. Electricity 	<ol style="list-style-type: none"> 1. CNG 2. LPG 3. Methanol 4. Electricity
Effective Date	Sept. 1, 1991	July 1, 1990	Sept. 1, 1991
Affected Organizations	<ol style="list-style-type: none"> 1. State agencies 2. Political subdivisions 	<ol style="list-style-type: none"> 1. School vehicles 2. Government vehicles 	<ol style="list-style-type: none"> 1. School districts 2. State agencies 3. Metro. transit authorities 4. City transit authorities
Schedule for Implementation	<ol style="list-style-type: none"> 1. 30 percent by Sept. 1, 1994 2. 50 percent by Sept. 1, 1996 3. Review of program by Dec. 31, 1996 4. 80 percent by Sept. 1, 1998 	<ol style="list-style-type: none"> 1. After July 1, 1995, school districts should purchase only alternative fuel vehicles 	<ol style="list-style-type: none"> 1. 30 percent by Sept. 1, 1994 2. 50 percent by Sept. 1, 1996 3. Review of program by Dec. 31, 1996 4. 90 percent by Sept. 1, 1998

CHAPTER 5. ANALYSIS OF IMPLEMENTATION

Now that the highway funding methods for each state, as well as the alternative fuels legislation and related acts have been reviewed, the next step is to proceed with an analysis of their implementation. The objective is to gain an insight into the potential impacts on the state highway funds. This discussion will emphasize any foreseeable effects in the three states of the southwest region which have the most extensive clean air policies, namely Louisiana, Oklahoma and Texas. The other two states are not analyzed because their programs do not mandate or provide strong incentives for alternatively fueled vehicles.

Conversion of public vehicles will have little effect on pollution in targeted areas because of the small numbers of vehicles; however, these conversions will develop a market for the new fuel, making the process of conversion in the private sector possible, whether it is mandated or not. With this in mind, three basic scenarios will be analyzed. The first scenario will incorporate the current mandate, that is, what will be required by law, over a ten year period. The second will evaluate the results of a 10 percent private fleet conversion rate, viewed as the most probable rate for large-scale conversion. The last scenario analyzes the effects of a 25 percent private fleet conversion rate. These three scenarios are presented for passenger cars, trucks and buses (where applicable) in each state, and they will illustrate the potential impact to the state highway funds given current approaches to highway financing. The federal fuel tax of 14.1\$ per gallon will be applied to these calculations when necessary with the assumption being that each state receives the exact amount of federal tax collected.

5.1 LOUISIANA

As mentioned earlier, in the state of Louisiana all state agencies and "political subdivisions" (these include parishes, municipalities, school boards, special districts and any other unit of local government) are required to convert 30 percent of their vehicles to alternative fuel vehicles by September 1, 1994, 50 percent by September 1, 1996, and 80 percent by September 1, 1998. The current state tax rate on all fuel is 20 cents per gallon; however, the owners of liquified petroleum gas (LPG)- and compressed natural gas (CNG)-powered vehicles of 10,000 lbs or less gross weight pay an annual \$150 fee in lieu of the gallonage tax. Federal

taxes on fuel are also included in this analysis. Those of particular importance are the federal gasoline tax, which is 14.1 cents per gallon, and the CNG tax of which there is none.

Of the public institutions mentioned above all are exempt from federal fuel taxes, and only state agencies must pay the state 20 cents per gallon fuel tax. The private group pays both the state and federal motor-fuel taxes.

5.1.1 Passenger Cars

The section is divided into three parts. The first part discusses and analyzes information about stated-owned passenger cars according to the actions mandated by law. The second part analyzes the outcome of a 10 percent state-wide private fleet conversion under the scheduled implementation, and the third part studies the scenario of a state-wide 25 percent private fleet conversion.

5.1.1.1 Publicly Owned Passenger Cars. According to the parish summary report (see Appendix A.5) there are approximately 7,226 passenger vehicles owned and operated by the various *state agencies* throughout Louisiana. Of these, 3,091 vehicles are listed as passenger cars and 3,009 are light trucks. The remaining 1,126 vehicles, listed "other pass," will not be considered since their characteristics are not known. Also affected by the alternative fuels legislation are "*political subdivisions*", which include parishes, municipalities, school boards, special districts and any other local government unit, but as indicated previously, they are exempt from all motor-fuel taxes. This section will analyze the impact of alternative fuels legislation for state agency passenger cars under the following assumptions:

1. All passenger cars operate on gasoline before the conversion.
2. CNG is the alternative fuel of choice.
3. A ten-year analysis period.
4. No growth is assumed over the ten-year period.
5. The state tax of 20¢ per gallon of gasoline and the federal tax of 14.1¢ will remain constant throughout the period of conversion.
6. The annual fee on CNG-powered vehicles will remain constant at \$150 for vehicles which weigh less than or equal to 10,000 lbs.
7. All passenger cars weigh less than 10,000 lbs.
8. The average fuel consumption is equal to a regional average of about 18.1 miles per gallon for passenger cars.
9. The average number of gallons of fuel consumed annually is equal to the regional average of about 582.3 gallons per passenger car.
10. The average number of miles traveled annually would therefore correspond to about 10,540 miles per passenger car.

The first part of this analysis will provide a basis for comparison by determining the amount of revenue these 3,091 state-run passenger cars would provide if they were gasoline-powered over a ten-year period. The tax rate is equal to 20 cents per gallon since state agencies are exempt from federal fuel taxes. Table 5-1 indicates that the yearly revenue is projected at approximately \$359,978, or about \$116 per passenger car. The ten-year total is about \$3.6 million in gasoline tax revenue.

The next step is to determine the amount of revenue which will be raised during the seven years it will take the fleet characteristics to change from 100 percent gasoline-powered vehicles to only 20 percent gasoline-powered vehicles and an additional three more years of operation. It is assumed that the required conversions are phases-in according to the following scenario: (1) Between September 1, 1991 and August 31, 1992 the fleets consist of 0 percent CNG vehicles and 100 percent gasoline vehicles, and on September 1, 1992 10 percent of the vehicles are converted; (2) Between September 1, 1992 and August 31, 1993 the fleets consist of 10 percent CNG vehicles and 90 percent gasoline vehicles, and another 10 percent are converted on September 1, 1993; (3) Between September 1, 1993 and August 31, 1994 the fleets would consist

of 20 percent CNG vehicles and 80 percent gasoline vehicles, and an additional 10 percent of the vehicles are converted on September 1, 1994; (4) The process continues until September 1, 1997 when 15 percent of the vehicles are converted bringing the total to 65 percent CNG vehicles and 35 percent gasoline vehicles for the period from September 1, 1997 to August 31, 1998; (5) An additional 15 percent of the vehicles are converted on September 1, 1998 which brings the fleet to the required 80 percent CNG vehicles and 20 percent gasoline vehicles; (6) These final percentages continue through the next three years.

As indicated in Table 5-2, this scenario is estimated to raise about \$4.1 million, or about \$500,000 more than the gasoline-powered base case. The yearly revenue from CNG-fueled *passenger cars* increases from \$359,978 in the first year when there are still only gasoline-powered vehicles to \$442,922 in the eighth year when there are 80 percent CNG-powered vehicles and 20 percent gasoline-powered vehicles as required. Given the fuel consumption rate of 18.1 miles per gallon, a gasoline-powered passenger car would need to travel about 13,575 miles a year (compared to the current average of 10,540 miles per year) in order to net \$150 in fuel taxes. Taken another way, once the average miles travelled per CNG-powered passenger car exceeds 13,575 miles, the revenue to the state becomes less than that of a gasoline-powered passenger car, given the current CNG taxing structure.

Table 5-1. Base Case for Louisiana Publicly-owned Passenger Cars

Louisiana State Vehicles, Gasoline-powered (10 years)					
		annual gasoline consumption	fuel tax (\$/gal)	annual revenue (\$)	10-year revenue (\$)
	# of veh.	(gal/veh)			
Passenger Cars	3091	582.3	\$0.20	\$359,978	\$3,599,779

Table 5-2. Conversion Scenario for Louisiana Publicly-owned Passenger Cars

LA Publicly-Owned Passenger Cars, Phase-In Schedule							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	3,091	0	\$150.00	3091	582.3	\$0.20	\$359,978
9/1/92 to 8/31/93	3,091	309	\$150.00	2782	582.3	\$0.20	\$370,342
9/1/93 to 8/31/94	3,091	618	\$150.00	2473	582.3	\$0.20	\$380,706
9/1/94 to 8/31/95	3,091	927	\$150.00	2164	582.3	\$0.20	\$391,069
9/1/95 to 8/31/96	3,091	1236	\$150.00	1855	582.3	\$0.20	\$401,433
9/1/96 to 8/31/97	3,091	1546	\$150.00	1545	582.3	\$0.20	\$411,831
9/1/97 to 8/31/98	3,091	2009	\$150.00	1082	582.3	\$0.20	\$427,360
9/1/98 to 8/31/99	3,091	2473	\$150.00	618	582.3	\$0.20	\$442,922
9/1/99 to 8/31/00	3,091	2473	\$150.00	618	582.3	\$0.20	\$442,922
9/1/00 to 8/31/01	3,091	2473	\$150.00	618	582.3	\$0.20	\$442,922
Total:							\$4,071,485
Annual Average:							\$407,149

5.1.1.2 Privately-Owned Passenger Cars, Ten Percent State-wide Conversion. This section calculates the potential effects of converting 10 percent of the privately registered passenger cars in the state. Sources indicate that about 1,973,633 passenger cars were registered in the state of Louisiana in 1990.⁵⁸ Of these, 197,363 vehicles are assumed to convert to CNG according to this scenario.

Again, the base case is presented as a means of comparison. As shown in Table 5-3, the fuel tax for private vehicles is equal to 34.1 cents per gallon which yields about \$198 per vehicle per year for a gasoline-powered vehicles. Total federal and state gasoline tax revenues are equal to \$391 million/year.

As shown in Table 5-4, converting 10 percent of the private vehicles to CNG would mean an annual loss of \$9.6 million in revenue, or about a 2.4 percent decrease. In order to net the same amount of revenue, a CNG-fueled passenger car would have to pay an annual fee of \$198 or decrease its miles of operation to 7,985 a year.

5.1.1.3 Privately-Owned Passenger Cars, 25 Percent State-wide Conversion. The final scenario in passenger car fleet conversion for the state of Louisiana is the case in which 25 percent of the registered passenger cars are converted to CNG. As illustrated in Table 5-5, this scenario results in about \$367.9 million annually for a \$240 million decrease in fuel taxes. The average fuel tax decreases from the \$198/vehicle in the base case to \$186/vehicle in this scenario.

Table 5-3. Base Case for Louisiana Privately-Owned Passenger Cars

Private and Commercial Autos, Gasoline-powered (10 years)				
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)
Passenger Cars:	1,973,633	582.3	\$0.341	\$391,893,055

⁵⁸Highway Statistics, 1990.

**Table 5-4. Ten percent Conversion Scenario for Louisiana
Privately-Owned Passenger Cars**

Private and Commercial Autos, Phase-In Schedule (10%)						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
1,973,633	197,363	\$150.00	1,776,270	582.3	\$0.341	\$382,308,259

**Table 5-5 Twenty-five Percent Conversion Scenario for Louisiana
Privately-Owned Passenger Cars**

Private and Commercial Autos, Phase-In Schedule (25%)						
Passenger cars:						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
1,973,633	493,408	\$150.00	1,480,225	582.3	\$0.341	\$367,931,041

5.1.1.4 Passenger Car Summary. The results of the proceeding analyses are summarized into a base case and three scenarios to estimate annual fuel tax revenues. The results are shown in Figure 5-1. The base case represents 100 percent gasoline-powered public and private automobiles. The first scenario represents the Louisiana mandate discussed previously and no private CNG vehicles. The second scenario includes the Louisiana mandate

plus an additional 10 percent private automobile conversion to CNG. The final scenario represents the Louisiana mandate plus 25 percent of the private automobiles converted to CNG. The base case represents about \$391.1 million annually in fuel tax revenues. There is a slight increase in Scenario 1, since the revenues for the \$150 fee for CNG is greater than the revenues for a 20 cents/gallon fuel tax paid by state vehicles. There are significant decreases for private conversion, due principally to the fact there is no federal tax on CNG.

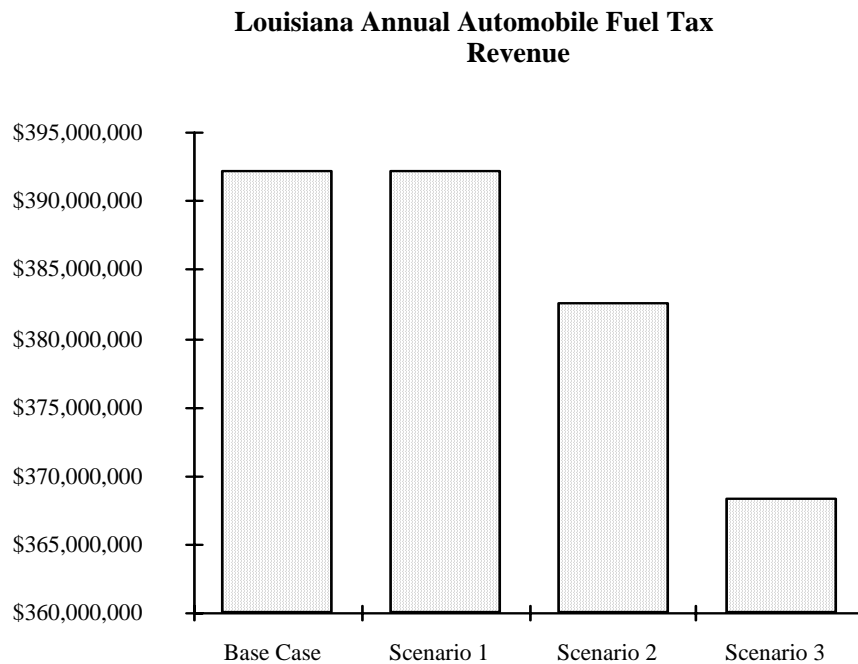


Figure 5-1. Summary of expected annual automobile fuel tax revenue in Louisiana.

5.1.2 Trucks

As with the section on passenger cars, this section is divided into three parts. The first part discusses and analyzes information about stated-owned trucks according to the actions mandated by law. The representative truck throughout this section will be the pickup. The second part analyzes the outcome of a 10 percent state-wide private fleet conversion under the scheduled implementation, and the third part studies the scenario of a 25 percent state-wide private fleet conversion. Again, private vehicle owners are not exempt from fuel taxes on any level, while publicly-owned vehicles pay only state fuel taxes.

5.1.2.1 Publicly-Owned Trucks. The parish summary also reports the number of trucks operated by state agencies. The figure reported is 3,009 vehicles. The analysis of the current mandate for these vehicles is made with the following assumptions:

1. All trucks operate on gasoline before the conversion.
2. CNG is the alternative fuel of choice.
3. A ten-year analysis period.
4. No growth is assumed over the ten-year period.
4. The state rate of 20¢ per gallon of gasoline and the federal rate of 14.1¢ will remain constant throughout the period of conversion.
5. The annual fee on CNG-powered vehicles will remain constant at \$150 for vehicles which weigh less than or equal to 10,000 lbs.
6. The representative truck weighs less than 10,000 lbs.
7. The average fuel consumption is equal to a regional average of about 14.0 miles per gallon for pickup trucks.
8. The average number of gallons of fuel consumed annually is equal to the regional average of about 879.0 gallons per pickup truck.
9. The average number of miles traveled annually would therefore correspond to about 12,306 miles per pickup truck.

The first part of this analysis provides a basis of comparison by determining the revenue publicly-owned trucks provide while operating on gasoline. The tax rate is equal to 20¢ per

gallon since state agencies are exempt from federal fuel taxes. Table 5-6 indicates that the yearly revenue is projected at approximately \$528,982, or about \$176 per truck.

Table 5-7 shows the total revenue for the ten-year period phase-in case equal to \$4.9 million -- a value about \$400,000 less than the base case. The yearly revenue decreases from a value of \$528,982 to a value of \$466,882 (roughly \$155.1 per vehicle) in the eighth year. Overall, the average annual loss amounts to \$35,325.

Table 5-6 Base Case for Louisiana Publicly-Owned Trucks

Louisiana State Vehicles, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10 year revenue (\$)
Trucks:	\$3,009	879	\$0.20	\$528,982	\$5,289,822

Table 5-7 Conversion Scenario for Louisiana Publicly-Owned Trucks

LA Publicly-Owned Trucks, Phase-In Schedule							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	3009	0	\$150.00	3009	879	\$0.20	\$528,982
9/1/92 to 8/31/93	3009	301	\$150.00	2708	879	\$0.20	\$521,216
9/1/93 to 8/31/94	3009	602	\$150.00	2407	879	\$0.20	\$513,451
9/1/94 to 8/31/95	3009	903	\$150.00	2106	879	\$0.20	\$505,685
9/1/95 to 8/31/96	3009	1204	\$150.00	1805	879	\$0.20	\$497,919
9/1/96 to 8/31/97	3009	1505	\$150.00	1504	879	\$0.20	\$490,153
9/1/97 to 8/31/98	3009	1956	\$150.00	1053	879	\$0.20	\$478,517
9/1/98 to 8/31/99	3009	2407	\$150.00	602	879	\$0.20	\$466,882
9/1/99 to 8/31/00	3009	2407	\$150.00	602	879	\$0.20	\$466,882
9/1/00 to 8/31/01	3009	2407	\$150.00	602	879	\$0.20	\$466,882
Total:							\$4,936,568
Annual:							\$493,657

5.1.2.2 Ten Percent Conversion of Privately Owned Trucks. The same set of assumptions apply for privately owned trucks. The total tax rate is therefore 34.1¢. Sources indicate that over 981,000 trucks are registered to private owners. For the base case (Table 5-8), these vehicles are estimated to produce about \$294.2 million in annual gasoline tax revenue. The scenario in Table 5-9 corresponds to a 10 percent state-wide private truck conversion. The result is a \$14.7 million annual decrease in fuel tax revenue. The average fuel tax per vehicle decreases from \$300 to \$285.

5.1.2.3 Twenty-five Percent Conversion of Privately Owned Trucks. As expected, the state-wide conversion of 25 percent of privately-owned trucks results in a further decrease in motor-fuel tax revenue. This value, \$57.4 million as shown in Table 5-10, is \$136.7 million less than the base case value.

Table 5-8 Base Case for Louisiana Privately-Owned Trucks

Private and Commercial Trucks, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	yearly revenue (\$)	total revenue (10 years)
Trucks:	981,482	879	\$0.34	\$294,188,433	\$2,941,884,332

Table 5-9 Ten Percent Conversion Scenario for Louisiana Privately-Owned Trucks

Private and Commercial Trucks, Phase-In Schedule (10%)						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
981,482	98,148	\$150.00	883,334	879	\$0.341	\$279,491,850

Table 5-10 Twenty-five Percent Conversion Scenario for Louisiana Privately-Owned Trucks

Private and Commercial Trucks, Phase-In Schedule (25%)						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
981,482	245,371	\$150.00	736,111	879	\$0.341	\$257,446,825

5.1.2.4 Truck Summary. The results of the proceeding analyses are summarized into a base case and three scenarios to estimate annual fuel tax revenues. The results are shown in Figure 5-2. The base case represents 100 percent gasoline-powered public and private trucks. The first scenario represents the Louisiana mandate discussed previously and no private CNG vehicles. The second scenario includes the Louisiana mandate plus an additional 10 percent private truck CNG conversion. The final scenario represents the Louisiana mandate plus 25 percent of the private trucks converted to CNG. The base case represents about \$294.7 million annually in fuel tax revenues. There is a slight decrease in Scenario 1, since the revenues for the

\$150 fee for CNG are less than the revenues for a 20 cents/gallon fuel tax paid by state vehicles. There are significant decreases for private conversion, again due to the fact there is no federal tax on CNG.

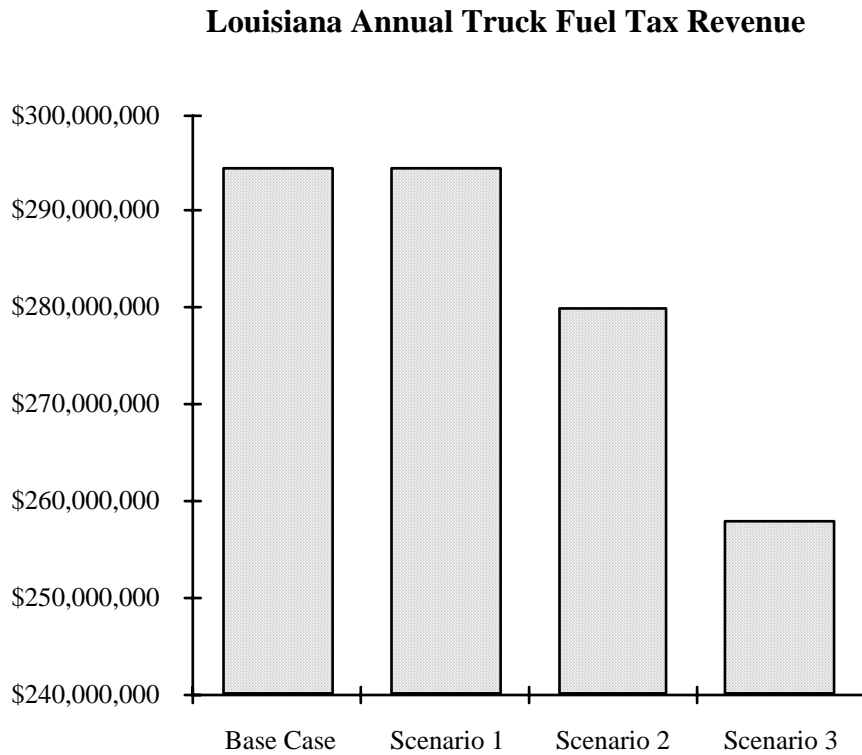


Figure 5-2 Summary of expected annual truck fuel tax revenue in Louisiana

5.2. OKLAHOMA

The situation in Oklahoma is quite different. The Oklahoma Alternative Fuels Conversion Act created the Oklahoma Alternative Fuels Conversion Fund to facilitate the conversion of gasoline-powered school and government vehicles to alternative fuels. Any of the agencies which operate these vehicles may apply to the fund as long as they are capable of paying back the conversion costs within seven years of the conversion date. The law does not provide a schedule for conversion other than to require school districts to consider the purchase of only alternative fuel after July 1, 1995. The current state tax rate on gasoline is 17¢ per gallon. CNG-powered vehicles which weigh one ton or less are charged an annual fee of \$100, beginning January 1, 1991. CNG-powered vehicles which weigh one ton pay an annual fee of \$150. It is assumed in this analysis that all passenger cars weigh over one ton. Beginning January 1, 1993, the previous rates increase to \$200 and \$250, respectively. The only vehicles of those mentioned above which are required to pay state fuel taxes are those operated by state agencies. Municipalities, school districts and other government agencies are exempt from Oklahoma motor-fuel taxes. Additionally, all public agencies are exempt from federal fuel taxes.

5.2.1. Passenger Cars

Since vehicle conversions were not mandated, it is difficult to determine the annual revenue associated with vehicle conversions to CNG. Instead, it is useful to pursue the trade-offs of a gallonage tax versus an annual fee using the current situation in Oklahoma as an illustrative example. Given the average annual fuel consumption discussed previously (582.5 gallons/year), an automobile is projected to travel an average of 10,540 miles and contribute \$98.99, annually in state gasoline taxes. A CNG-powered vehicle may travel any number of miles and still contribute \$150 in state CNG taxes, before 1993, or \$250 beginning in 1993.

For the period between January 1, 1991 and December 31, 1992, per vehicle gasoline tax revenue exceeds CNG tax revenue if the vehicle consumes an average of 882.3 gallons of fuel per year. With an average fuel consumption rate of 18.1 miles per gallon, this is equal to an annual average of 15,971 miles traveled per vehicle. After January 1, 1993, gasoline-powered vehicles will have to travel over 26,618 miles annually to equal the amount of revenue collected from the fuel taxes on a CNG-powered vehicle. One may interpret this information in a different

way and argue that a fixed fee does not capture vehicle road usage. Once the CNG vehicle reaches a certain threshold of annual vehicle miles travelled, it contributes less than a gasoline vehicle. In the first case, that threshold is 15,971 miles and in the second it is 26,618 miles.

5.2.1.1 Publicly-Owned Passenger Cars. It is too early to determine the rate at which public vehicles will convert to CNG. For comparative purposes, we will assume that Oklahoma will convert at a level equal to Louisiana. Table 5-11 below uses figures provided by the state for the number of passenger cars and annual fuel consumption to show the base case for state agency passenger cars. At a rate of 17¢ per gallon, these vehicles are estimated to provide \$281,233 annually, or about \$99 per vehicle.

Using the total number of vehicles and the regional average for annual fuel consumption, Table 5-12 indicates the results of a conversion to CNG according to the Louisiana schedule. The estimate for this scenario is about 69 percent greater than for the base case. The yearly revenue starts at \$281,233 as in the base case, but increases to \$624,477 by the end of the eighth year after 2,273 vehicles have been converted.

Table 5-11 Base Case for Oklahoma Publicly-Owned Passenger Cars

Oklahoma State Vehicles, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10 year revenue (\$)
Passenger Car:	2841	582.30	\$0.17	\$281,233	\$2,812,334

Table 5-12 Conversion Scenario for Oklahoma Publicly-Owned Passenger Cars

State Agency Vehicles, Phase-In Schedule							
Passenger cars:							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	2841	0	\$150.00	2841	582.3	\$0.17	\$281,233
9/1/92 to 8/31/93	2841	284	\$216.00	2557	582.3	\$0.17	\$314,464
9/1/93 to 8/31/94	2841	568	\$250.00	2273	582.3	\$0.17	\$367,007
9/1/94 to 8/31/95	2841	852	\$250.00	1989	582.3	\$0.17	\$409,893
9/1/95 to 8/31/96	2841	1136	\$250.00	1705	582.3	\$0.17	\$452,780
9/1/96 to 8/31/97	2841	1421	\$250.00	1420	582.3	\$0.17	\$495,817
9/1/97 to 8/31/98	2841	1847	\$250.00	994	582.3	\$0.17	\$560,147
9/1/98 to 8/31/99	2841	2273	\$250.00	568	582.3	\$0.17	\$624,477
9/1/99 to 8/31/00	2841	2273	\$250.00	568	582.3	\$0.17	\$624,477
9/1/00 to 8/31/01	2841	2273	\$250.00	568	582.3	\$0.17	\$624,477
Total:							\$4,754,477
Annual Average:							\$475,477

5.2.1.2 Ten Percent Private Passenger Car Conversion. Private auto owners are not exempt from federal fuel taxes and pay a combined federal and state rate equal to 31.1¢ per gallon of fuel. As before, it is useful to calculate the potential revenue of a gasoline-powered private passenger car and compare the result to the annual CNG tax. Given the average annual fuel consumption discussed previously, this vehicle is projected to travel an average of 10,540 miles and contribute \$181, annually in state gasoline taxes. A CNG-powered vehicle may travel any number of miles and still contribute \$150 in state CNG taxes annually through December 31, 1992, and \$250 annually, thereafter.

The number of privately-owned passenger cars in the state is equal to about 1,701,267. The total revenue expected from these vehicles is \$308.1 million per year, as shown in Table 5-13. The results of a 10 percent private auto conversion are shown in Table 5-14. The expected revenue increases from \$308.1 million for only gasoline-powered vehicles to \$317.5 million, based on a 10-year average, for 10 percent private vehicle CNG conversion. The total revenue collected for the ten-year period exceeds the base case by about \$94.4 million.

5.2.1.3 Twenty-five Percent Private Passenger Car Conversion. The expected results after a 25 percent state-wide conversion are listed in Table 5-15. This scenario predicts an increase in revenue from the base case by about \$23.6 million annually. The annual revenues are higher for Oklahoma because of the \$250 annual CNG fee versus the \$150 CNG fee for Louisiana.

Table 5-13 Base Case for Oklahoma Privately-Owned Passenger Cars

Private and Commercial Autos, Gasoline-powered					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10 year revenue (\$)
Passenger Cars:	1,701,267	582.3	\$0.31	\$308,091,458	\$3,080,914,577

Table 5-14 Ten Percent Conversion Scenario for Oklahoma Privately-Owned P.C.

Private and Commercial Autos, Phase-In Schedule (10%)							
	total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to							
8/31/92	1,701,267	170,127	\$150.00	1,531,140	582.3	\$0.311	\$302,801,308
9/1/92 to							
8/31/93	1,701,267	170,127	\$216.00	1,531,140	582.3	\$0.311	\$314,029,690
9/1/93 to							
8/31/94	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/94 to							
8/31/95	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/95 to							
8/31/96	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/96 to							
8/31/97	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/97 to							
8/31/98	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/98 to							
8/31/99	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/99 to							
8/31/00	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
9/1/00 to							
8/31/01	1,701,267	170,127	\$250.00	1,531,140	582.3	\$0.311	\$319,814,008
					Total:		\$3,175,343,058
					Annual		
					Average:		\$317,534,306

**Table 5-15 Twenty-five Percent Conversion Scenario for Oklahoma
Privately-Owned Passenger Cars**

Private and Commercial Autos, Phase-In Schedule (25%)							
Passenger cars:							
	total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	1,701,267	457,317	\$150.00	1,275,950	582.3	\$0.311	\$294,866,098
9/1/92 to 8/31/93	1,701,267	457,317	\$216.00	1,275,950	582.3	\$0.311	\$322,937,020
9/1/93 to 8/31/94	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/94 to 8/31/95	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/95 to 8/31/96	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/96 to 8/31/97	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/97 to 8/31/98	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/98 to 8/31/99	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/99 to 8/31/00	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
9/1/00 to 8/31/01	1,701,267	457,317	\$250.00	1,275,950	582.3	\$0.311	\$337,397,798
							\$3,316,985,502
					Total:		
					Annual		
					Average:		\$331,698,550

5.2.1.4 Passenger Car Summary. The results of the proceeding analyses are summarized into a base case and three scenarios to estimate annual fuel tax revenues. The results are shown in Figure 5-3. The base case represents 100 percent gasoline-powered public and private automobiles. The first scenario represents the Oklahoma conversions based on an implementation program illustrated for Louisiana. The second scenario includes the public conversions plus an additional 10 percent private automobile conversion to CNG. The final scenario represents the public conversions plus 25 percent of the private automobiles converted to CNG. The base case represents about \$308.4 million annually in fuel tax revenues. There is a slight increase in Scenario 1, since the revenues for the \$150 fee for CNG is greater than the revenues for a 17cents/gallon fuel tax paid by state vehicles. There are significant increases for private conversion, due to the \$250 annual CNG fee; this, despite the fact that there are no federal CNG taxes.

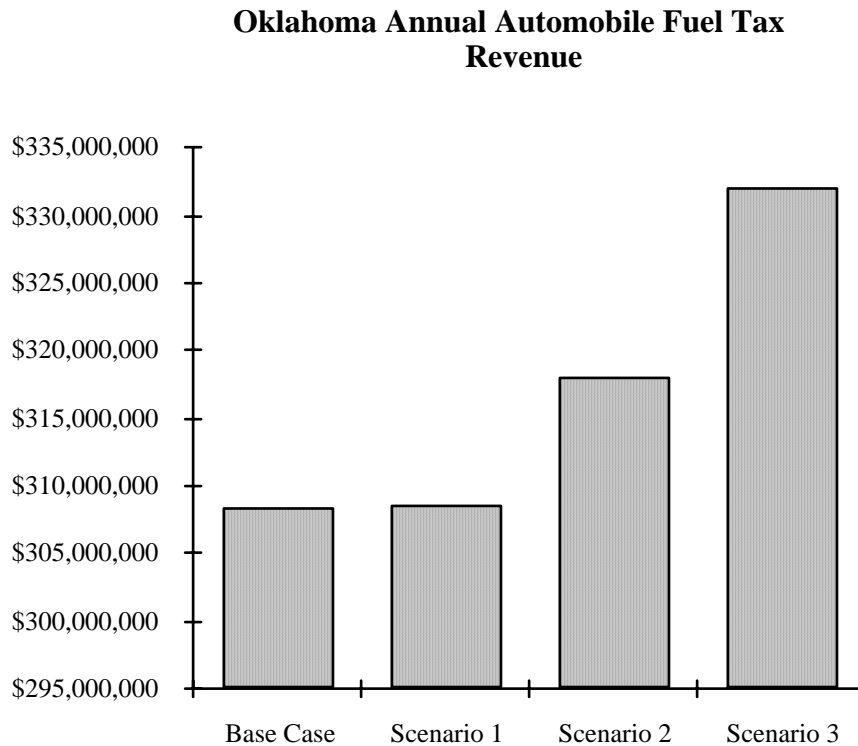


Figure 5-3 Summary of expected annual automobile fuel tax revenue in Oklahoma.

5.2.2 Trucks

5.2.2.1 Oklahoma State Agency Trucks. The same assumptions stated in the Louisiana section apply to this section. As mentioned earlier, state agencies are exempt from the federal fuel tax. Information obtained from the state indicates that there are about 1,544 state-owned trucks at the time of this study. The projected yearly fuel tax revenue for the base case, shown in Table 5-16, is about \$230,719, or \$149 per vehicle. This revenue compares favorably with that expected from CNG-powered vehicles (\$150) for the period between January 1, 1991 and December 31, 1992; however, after January 1, 1993 a CNG vehicle will clearly yield more revenue in fuel taxes per vehicle (\$250). The results from Table 5-17 show an annual average fuel tax collection of \$300,847, or about 30 percent higher than the base case.

Table 5-16 Base Case for Oklahoma Publicly-Owned Trucks

Louisiana State Vehicles, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10-year revenue (\$)
Trucks:	1,544	879.00	\$0.17	\$230,720	\$2,307,199

Table 5-17 Conversion Scenario for Oklahoma Publicly-Owned Trucks

State Agency Vehicles, Phase-In Schedule							
Trucks							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	1,544	0	\$150.00	1,544	879.00	\$0.17	\$230,720
9/1/92 to 8/31/93	1,544	154	\$216.00	1,390	879.00	\$0.17	\$240,972
9/1/93 to 8/31/94	1,544	309	\$250.00	1,235	879.00	\$0.17	\$261,796
9/1/94 to 8/31/95	1,544	463	\$250.00	1,081	879.00	\$0.17	\$277,284
9/1/95 to 8/31/96	1,544	618	\$250.00	926	879.00	\$0.17	\$292,872
9/1/96 to 8/31/97	1,544	772	\$250.00	772	879.00	\$0.17	\$308,360
9/1/97 to 8/31/98	1,544	1,004	\$250.00	540	879.00	\$0.17	\$331,692
9/1/98 to 8/31/99	1,544	1,235	\$250.00	309	879.00	\$0.17	\$354,924
9/1/99 to 8/31/00	1,544	1,235	\$250.00	309	879.00	\$0.17	\$354,924
9/1/00 to 8/31/01	1,544	1,235	\$250.00	309	879.00	\$0.17	\$354,924
Total:							\$3,008,467
Annual							
Average:							\$300,847

5.2.2.2 Ten Percent Conversion of Privately-Owned Trucks. The same procedure was used to determine the revenue yield from privately-owned trucks, keeping in mind once again that private vehicles pay state and federal fuel taxes. The annual gasoline tax revenue for the base case, using the same assumptions as before is expected to be about \$217.8 million, as shown in Table 5-18. A 10 percent private fleet conversion yields \$214.9 million average revenues for the 10 year period, or about 1.3 percent less. The \$250 annual CNG fee is nearly equivalent to a 31¢/gallon gasoline fuel tax.

5.2.2.3 Twenty-five Percent Conversion of Privately-Owned Trucks. The scenario for a 25 percent state-wide vehicle conversion is expected to yield about \$7.3 million less per year than the base case, according to calculations from Table 5-20.

Table 5-18 Base Case for Oklahoma Privately-Owned Trucks

Private and Commercial Trucks, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10-year revenue (\$)
Trucks:	796,729	879	\$0.311	\$217,801,010	\$2,178,010,100

**Table 5-19 Ten Percent Conversion Scenario for Oklahoma
Privately-Owned Trucks**

Private and Commercial Trucks, Phase-In Schedule (10%)							
Trucks							
	total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	796,729	79,673	\$150.00	717,056	879	\$0.311	\$207,971,832
9/1/92 to 8/31/93	796,729	79,673	\$216.00	717,056	879	\$0.311	\$213,230,250
9/1/93 to 8/31/94	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/94 to 8/31/95	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/95 to 8/31/96	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/96 to 8/31/97	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/97 to 8/31/98	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/98 to 8/31/99	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/99 to 8/31/00	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
9/1/00 to 8/31/01	796,729	79,673	\$250.00	717,056	879	\$0.311	\$215,939,132
					Total:		\$2,148,715,135
					Annual		
					Average:		\$214,871,513

**Table 5-20 Twenty-five Percent Conversion Scenario for Oklahoma
Privately-Owned Trucks**

Private and Commercial Trucks, Phase-In Schedule (25%)							
Trucks							
	total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	796,729	199,182	\$150.00	597,547	879	\$0.311	\$193,228,126
9/1/92 to 8/31/93	796,729	199,182	\$216.00	597,547	879	\$0.311	\$206,374,138
9/1/93 to 8/31/94	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/94 to 8/31/95	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/95 to 8/31/96	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/96 to 8/31/97	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/97 to 8/31/98	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/98 to 8/31/99	796,729	159,346	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/99 to 8/31/00	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
9/1/00 to 8/31/01	796,729	199,182	\$250.00	597,547	879	\$0.311	\$213,146,326
					Total:		\$2,104,772,870
					Annual		
					Average:		\$210,477,287

5.2.2.4 Truck Summary. The truck results are summarized into the same base case and three scenarios as passenger cars and are shown in Figure 5-4. The base case of 100 percent gasoline vehicles amounts to \$218 million annually in fuel tax revenues. There is a modest increase when public-owned trucks are converted. However, for privately-owned vehicles there is a decrease of 1.3 percent and 3.3 percent for the 10 percent and 25 percent conversion, respectively. In this instance, the \$250 annual CNG fee is not enough to offset the loss of federal fuel tax revenues.

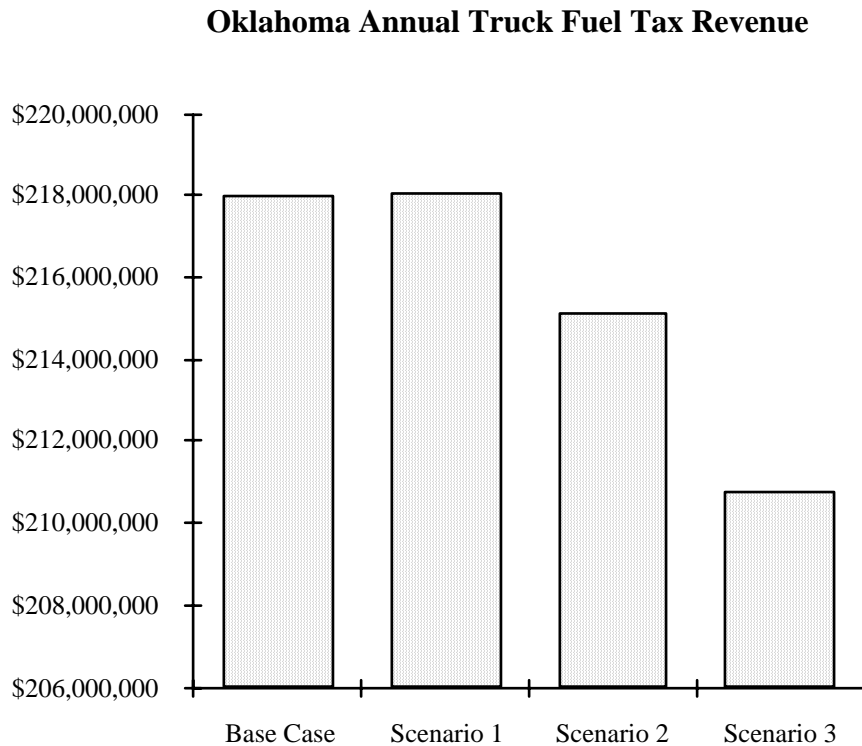


Figure 5-4 Summary of expected annual truck fuel tax revenue in Oklahoma.

5.3. TEXAS

Texas requires alternate fuel conversion of vehicles operated by state agencies with fleets of 15 or more vehicles, school districts operating 50 or more buses, all metropolitan transit authorities and all city transit departments. School districts are exempt from all state and federal motor-fuel taxes, so they will not be discussed further. The conversion schedule is similar to that of Louisiana; however, instead of requiring a final fleet percentage of 80 percent CNG vehicles, the state of Texas requires that fleets consist of 90 percent CNG in 1998. State and federal gasoline taxes are 20 cents and 14.1 cents, respectively except for transit vehicles which pay 19 cents in state fuel taxes. The CNG fuel tax is an annual fee based on annual mileage and weight (see Table 3-2). As noted previously, about 74 percent of motor fuel tax revenues go directly to the State Highway Fund; however, for ease of analysis total motor-fuel tax revenue will be examined.

5.3.1. Passenger Cars

The same assumptions listed for passenger cars in section 5.1.1.1 apply here. In order to determine the CNG fuel tax, Table 3-2 is used with an estimate of vehicle weight and vehicle miles traveled. The assumptions used for this study yield an annual CNG fuel tax of \$90 for passenger cars.

5.3.1.1 State Agency Passenger Cars. A list of the affected state agencies was obtained from the Texas General Land Office. The list provides the total number of vehicles operated by each agency and not a breakdown of vehicle types. It was therefore assumed that the vehicle types are roughly equal to that of the private sector. Of the 21,478 vehicles reported about 68 percent are assumed to be passenger cars. As in the previous two states discussed above, state agencies are exempt from federal fuel taxes, therefore the expected yield per state-owned passenger car is about \$115 which of course significantly exceeds the rate of \$90 for CNG fuel taxes. Table 5-21 estimates the fuel tax yield throughout the ten year conversion period to be about \$16.7 million compared to the conversion scenario in Table 5-22 which yields about \$15.3 million.

Table 5-21 Base Case for Texas Publicly-Owned Passenger Cars

Texas State Vehicles, Gasoline-powered (10 years)					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10-year revenue (\$)
Passenger Cars	14,611	572.3	\$0.20	\$1,672,375	\$16,723,751

Table 5-22 Conversion Scenario for Texas State-Owned Passenger Cars

TX Publicly-Owned Passenger Cars, Phase-In Schedule							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
9/1/91 to 8/31/92	14611	0	\$90.00	14611	582.3	\$0.20	\$1,701,597
9/1/92 to 8/31/93	14611	1461	\$90.00	13150	582.3	\$0.20	\$1,662,939
9/1/93 to 8/31/94	14611	2922	\$90.00	11689	582.3	\$0.20	\$1,624,281
9/1/94 to 8/31/95	14611	4383	\$90.00	10228	582.3	\$0.20	\$1,585,623
9/1/95 to 8/31/96	14611	5844	\$90.00	8767	582.3	\$0.20	\$1,546,965
9/1/96 to 8/31/97	14611	7306	\$90.00	7305	582.3	\$0.20	\$1,508,280
9/1/97 to 8/31/98	14611	9497	\$90.00	5114	582.3	\$0.20	\$1,450,306
9/1/98 to 8/31/99	14611	11689	\$90.00	2922	582.3	\$0.20	\$1,392,306
9/1/99 to 8/31/00	14611	11689	\$90.00	2922	582.3	\$0.20	\$1,392,306
9/1/00 to 8/31/01	14611	11689	\$90.00	2922	582.3	\$0.20	\$1,392,306
Total:							\$15,256,910
Annual Average:							\$1,525,691

5.3.1.2 Ten Percent Private Auto Conversion. This next section used information from Table 3-2 along with the assumptions stated above for passenger car fuel consumption to develop the base period analysis (Table 5-23) and the 10 percent scenario (Table 5-24). What these tables indicate is that even though only 10 percent of the privately owned passenger cars are converted to CNG, an overall revenue decrease occurs. The base case estimates annual revenue of \$1,700.6 million, while the 10 percent vehicle conversion estimates annual fuel tax revenues of \$1,607.6 million for a decrease of \$93 million a year.

Table 5-23 Base Case for Texas Privately-Owned Passenger Cars

Texas State Vehicles, Gasoline-powered (10 years)				
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)
Passenger Cars	8565850	582.3	\$0.341	\$1,671,662,461

Table 5-24 Ten Percent Conversion Scenario for Texas Privately-Owned Passenger Cars

Texas Private and Commercial Autos, Phase-In Schedule (10%)						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
8,565,850	856,585	\$90.00	7,709,265	582.3	\$0.341	\$1,607,614,572

5.3.1.3 Twenty-five Percent Private Auto Conversion. As shown in Table 5-25, the decrease in revenue continues with a 25 percent private auto conversion. Overall, annual revenue decreases 13.7 percent from the all-gasoline base case.

**Table 5-25 Twenty-five Percent Conversion Scenario for Texas
Privately-Owned Passenger Cars**

Texas Private and Commercial Autos, Phase-In Schedule (10%)						
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	annual revenue (\$)
8,565,850	2,141,463	\$90.00	6,424,387	582.3	\$0.341	\$1,468,116,506

5.3.1.4 Passenger Car Summary. The results of the proceeding analyses are summarized in the base case and three scenarios discussed previously. The results are shown in Figure 5-5. The base case represents about \$1,702.3 million annually in fuel tax revenues. There is a slight decrease in Scenario 1, since the revenues for the \$90 fee for CNG are less than the revenues for a 20¢/gallon fuel tax paid by state vehicles. There are significant decreases for private conversion, due in large measure to no federal fuel taxes for CNG.

Texas Annual Automobile Fuel Tax Revenue

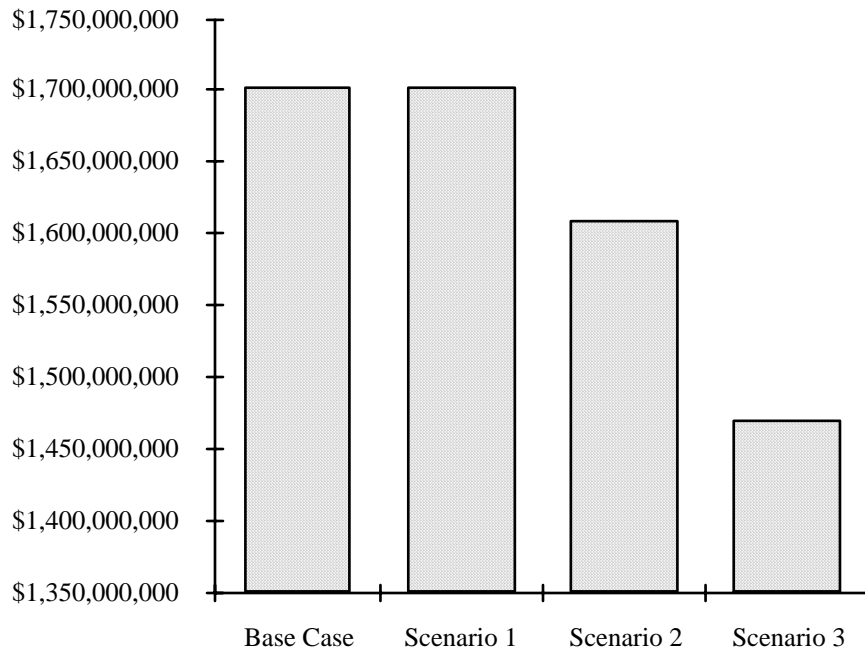


Figure 5-5 Summary of expected annual automobile fuel tax revenue in Texas.

5.3.2 Trucks

The same assumptions apply to trucks in Texas as in Louisiana and Oklahoma. Since these vehicles average 12,306 miles a year, the CNG fuel tax per vehicle is \$126/year (see Table 3-2).

5.3.2.1 State Agency Trucks. Each public vehicle yields about \$176 a year in gasoline taxes, therefore as expected, revenues after conversion are less than that of the base case. Table 5-27 shows a 13 percent decrease in projected revenue for the public conversion scenario.

Table 5-26 Base Case for Texas Publicly-Owned Trucks

Texas State Vehicles, Gasoline-powered					
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)	10-year revenue (\$)
Trucks:	6867	879	\$0.20	\$1,207,219	\$12,072,186

Table 5-27 Conversion Scenario for Publicly-Owned Trucks

TX Publicly-Owned Trucks, Phase-In Schedule							
	total # of veh.	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)
9/1/91 to 8/31/92	6867	0	\$126.00	6867	879	\$0.20	\$1,207,219
9/1/92 to 8/31/93	6867	687	\$126.00	6180	879	\$0.20	\$1,173,006
9/1/93 to 8/31/94	6867	1373	\$126.00	5494	879	\$0.20	\$1,138,843
9/1/94 to 8/31/95	6867	2060	\$126.00	4807	879	\$0.20	\$1,104,631
9/1/95 to 8/31/96	6867	2747	\$126.00	4120	879	\$0.20	\$1,070,418
9/1/96 to 8/31/97	6867	3434	\$126.00	3433	879	\$0.20	\$1,036,205
9/1/97 to 8/31/98	6867	4464	\$126.00	2403	879	\$0.20	\$984,911
9/1/98 to 8/31/99	6867	5494	\$126.00	1373	879	\$0.20	\$933,617
9/1/99 to 8/31/00	6867	5494	\$126.00	1373	879	\$0.20	\$933,617
9/1/00 to 8/31/01	6867	5494	\$126.00	1373	879	\$0.20	\$933,617
Total:							\$10,516,085
Annual Average:							\$1,051,609

5.3.2.2 Ten Percent Private Truck Conversion. The results of a 10 percent private truck conversion are shown in Table 5-28. Private citizens pay the entire gasoline fuel tax of 34.1¢ per gallon, resulting in estimated fuel tax collections of \$300 per vehicle. This is significantly more than the \$126 CNG fuel tax. Annual revenues decrease from \$1,116.9 million to \$1,052.1 million (see Table 5-29).

5.3.2.3 Twenty-five Percent Private Truck Conversion. For a 25 percent private truck conversion, there is a 14.5 percent decrease in annual revenues from the base case. As shown in Table 5-30, annual revenues drop to \$955.1 million per year.

Table 5-28 Base Case for Texas Privately-Owned Trucks

Texas State Vehicles, Gasoline-powered				
	# of veh.	annual fuel consumption (gal/veh)	fuel tax (\$/gal)	annual revenue (\$)
Light Trucks:	3726300	879	\$0.341	\$1,116,917,436

Table 5-29 Ten Percent Conversion Scenario for Texas Privately-Owned Trucks

Texas Trucks, Phase-In Schedule (10%)							
Trucks:							
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)	
3,726,300	372,630	\$126.00	3,353,670	879	\$0.341	\$1,052,177,072	

Table 5-30 Twenty-five Percent Conversion Scenario for Texas Privately-Owned Trucks

Texas Trucks, Phase-In Schedule (25%)							
Trucks:							
total # of vehicles	# of CNG vehicles	annual fee (\$)	# of gasoline vehicles	annual fuel consumed (gal./veh)	fuel tax (\$/gal)	yearly revenue (\$)	
3,726,300	931,575	\$126	2,794,725	879	\$0.341	\$955,066,527	

5.3.2.4 Truck Summary. The results of the base case and three scenarios are even more pronounced for trucks, as seen in Figure 5-6. The base case estimates \$1,118.1 million annually in fuel tax revenues. This decreases slightly for public truck conversions in Scenario 1. The 10 percent private conversions results coupled with the public conversions results in a 5.8 percent

decrease in annual revenues, and the 25 percent private conversion results in a 14.5 percent annual decrease.

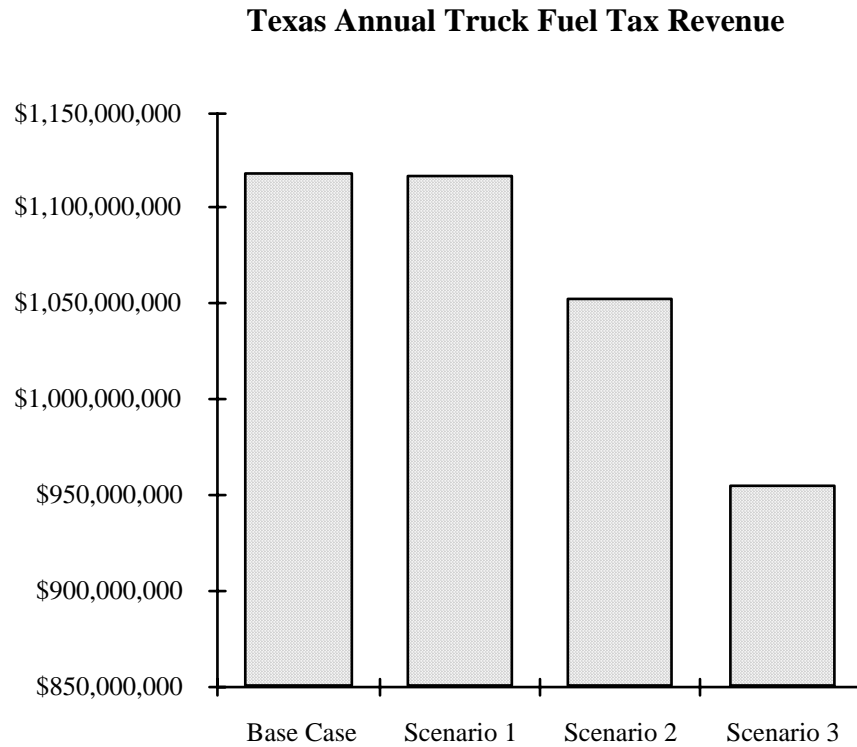


Figure 5-6 Summary of expected annual truck fuel tax revenue in Texas

5.3.3 Buses

The states mentioned above do not have specific mandates governing the conversion of publicly-owned buses, so comparison among the states would not be proper. However, since Texas does require the transit companies listed below to convert their buses to alternatively fueled vehicles it is interesting to note the effects.

5.3.3.3 Metropolitan Transit Authorities & City Transit Departments Base Case Compared With Mandated Conversion. Currently, there are a total of 23 transit authorities and city transit departments which are referred to as "urban transit systems." Urban transit systems are

taxed at a state rate of 19 cents per gallon of diesel purchased. Those transit vehicles which operate on CNG pay an annual fee of \$444 per vehicle (see Chapter 3).

Table 5-31 lists all urbanized transit systems in the state of Texas. This table uses vehicle miles reported for each system, along with the assumption of a rate of 4.5 mpg to determine the current fuel tax revenue collected from these companies. The annual revenue collected is equal to \$5.9 million. It has been assumed that fleets will meet conversion requirements through the purchase of new CNG vehicles to replace the old diesel buses.

No growth rate has been assumed, so Abilene will, for instance, purchase 9 new CNG vehicles and continue to use one diesel vehicle (see Appendix A). The annual revenue collected for this scenario is \$3.6 million. The substantial decrease indicates that the annual CNG fee of \$444 will not be enough to compensate for the loss in diesel fuel taxes after conversion.

Table 5-31 Base Case for Texas Publicly-Owned Buses

URBANIZED TRANSIT SYSTEM	Total Veh. Miles	Avg. Number of Buses	Total Diesel Consumption	Fuel Tax Revenue
ABILENE	536,449	10	119,211	\$22,650
AMARILLO	830,025	14	184,450	\$35,046
AUSTIN	11,751,844	184	2,611,521	\$496,189
BEAUMONT	642,375	17	142,750	\$27,123
BROWNSVILLE	625,838	12	139,075	\$26,424
BRYAN-COLLEGE STATION	486,804	9	108,179	\$20,554
CORPUS CHRISTI	3,503,242	42	778,498	\$147,915
DALLAS	37,683,400	814	8,374,089	\$1,591,077
EL PASO	5,483,139	90	1,218,475	\$231,510
FORT WORTH	4,668,527	105	1,037,450	\$197,116
GALVESTON	463,139	10	102,920	\$19,555
GALVESTON TROLLY	8,201	2	1,822	\$346
GALVESTON RAIL	18,446	2	4,099	\$779
HOUSTON	45,528,447	991	10,117,433	\$1,922,312
LAREDO	872,654	21	193,923	\$36,845
LUBBOCK	1,355,254	28	301,168	\$57,222
PORT ARTHUR	397,734	10	88,385	\$16,793
SAN ANGELO	324,536	8	72,119	\$13,703
SAN ANTONIO	23,596,459	510	5,243,658	\$996,295
SHERMAN-DENISON	269,523	10	59,894	\$11,380
TYLER	47,069	2	10,460	\$1,987
WACO	339,001	10	75,334	\$14,313
WICHITA FALLS	380,233	8	84,496	\$16,054
TOTALS	139812,339	2,909	31,069,409	\$6,415,523

5.4 SUMMARY

The purpose of this chapter was to take information on existing state and federal fuel taxes along with recent alternative fuels legislation in the states of Louisiana, Oklahoma and Texas to determine the potential impact on state highway funds. Below are a series of figures which summarize the findings of this chapter given the previously stated assumptions. The three categories of vehicles used in this analysis are passenger cars, trucks and buses; however, since Texas is currently the only state with a specific mandate on the conversion of buses a comparison among the three states is not feasible. All of the state legislation targets state agencies with an expectation that private owners or fleet operators will convert. State-owned and privately-owned vehicles have been separated, as they were in the previous sections, due to their difference in magnitude. In the case of state-owned vehicles, two scenarios have been compared. The first, called the "base case", is one in which over a ten-year period all the vehicles remain gasoline powered. The second, called the "phase-in case," determines expected revenue for the period during which vehicles are converted to CNG vehicles according to legislative mandates. In the case of privately-owned vehicles, three scenarios were compared. The first, again called the "base case," is exactly as described above. The second analyzes the effects of a 10 percent state-wide conversion of privately-owned vehicles, and the third analyzes the potential outcome of a 25 percent state-wide conversion.

Figure 5-7 is a summary of the expected revenue over a ten-year period from passenger cars owned by state agencies. In Louisiana, there are currently 3,091 state-owned passenger cars. Alternative fuels legislation appears to have a positive effect with respect to raised revenue. The same is true for Oklahoma (2,841 vehicles); however, the increase in revenue is greater. In Texas (14,611 vehicles), the gross revenue is much less for the phase-in case than for existing conditions.

For private passenger car revenue (see Figure 5-8), both Louisiana and Texas show decreases in expected revenue from the base case, although the effects are more drastic in Texas, while Oklahoma is expected to have an increase in revenue.

Figure 5-9 is a summary of the expected revenue over a ten-year period from state-owned trucks. Both Louisiana and Texas show decreases in expected revenue; however, Texas again

shows a much more dramatic decrease. Oklahoma is expected to receive a larger amount of fuel taxes from state-owned trucks after the conversion process.

In each state the revenue collected from privately-owned trucks is less after the conversion process (see Figure 5-10). In both Louisiana and Oklahoma, the decrease is slight compared to the decrease projected in Texas.

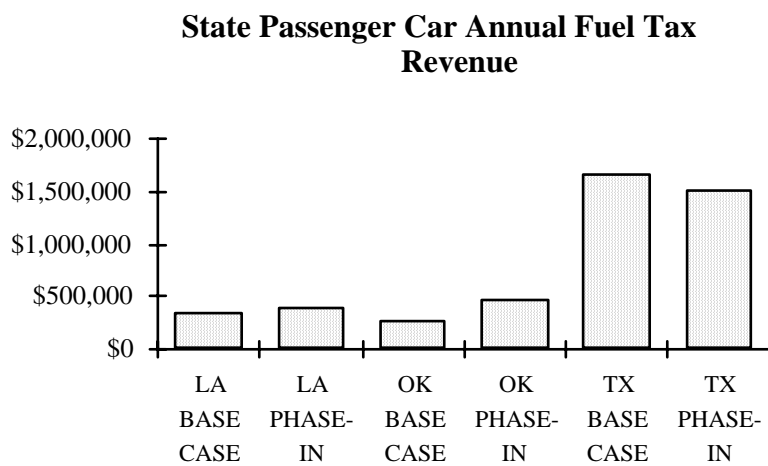


Figure 5-7 Summary of the expected annual fuel tax revenue from publicly-owned passenger cars for both the base and phase-in cases

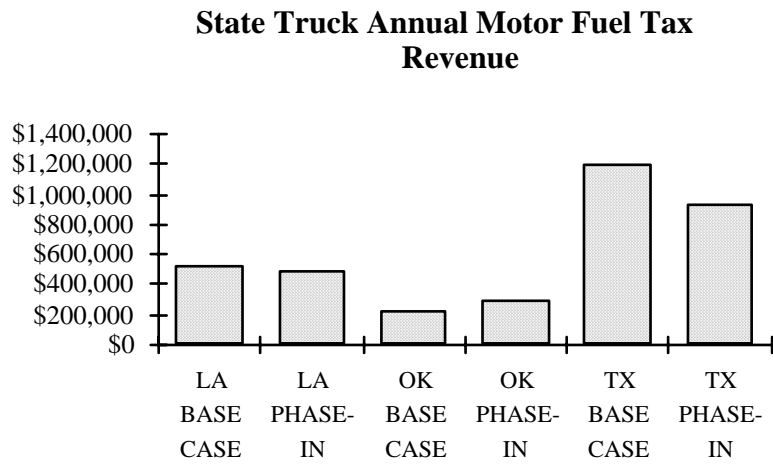


Figure 5-8 Summary of the expected annual fuel tax revenue from publicly-owned trucks for both the base and phase-in cases

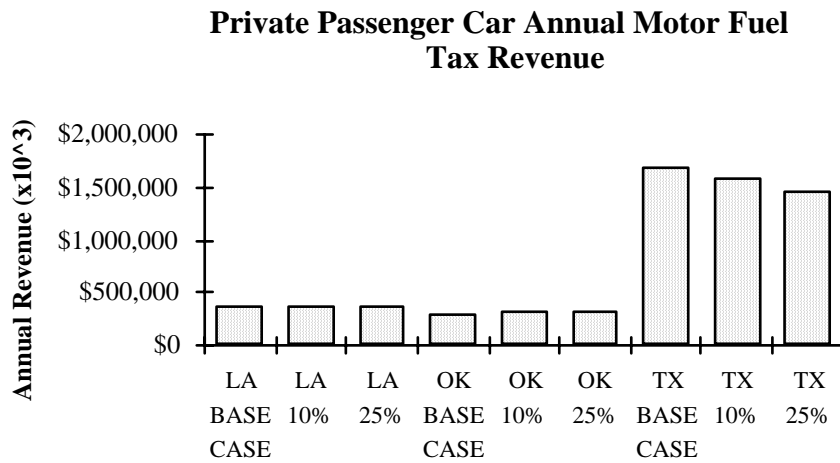


Figure 5-9 Summary of the expected annual fuel tax revenue from privately-owned passenger cars for the base (10 percent conversion and 25 percent conversion cases).

Private Truck Annual Motor Fuel Tax Revenue

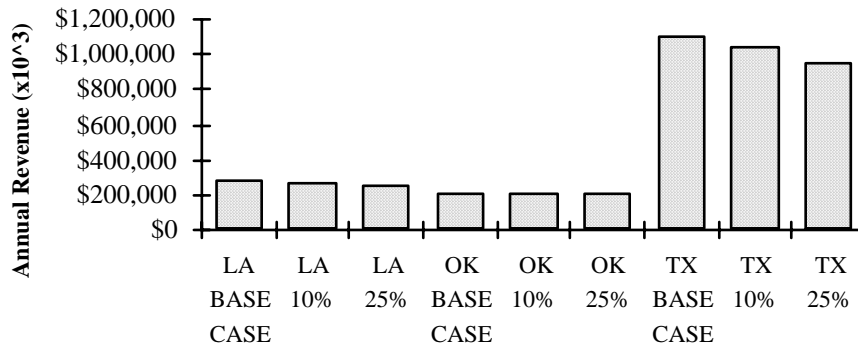


Figure 5-10 Summary of the expected annual fuel tax revenue from privately-owned trucks for the base (10 percent conversion and 25 percent conversion cases).

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this research was to explore the potential effects of recent alternative fuel legislation on the state highway funds in five states in the southwest region - Arkansas, Louisiana, New Mexico, Oklahoma and Texas. Motor fuel taxes, in particular those on gasoline, diesel and compressed natural gas (CNG), and other state highway funding methods were reviewed for each state in Chapter 3. Only three of the states - Louisiana, Oklahoma and Texas, currently have extensive alternative fuels legislation and these are described in Chapter 4. Using this information, an analysis was performed to determine the possible outcome of the legislation and its effects on the state highway funds (Chapter 5).

Given the mandated legislation a base case and three possible scenarios were defined for each state vehicle group as follows:

1. Base Case = Public gasoline + Private gasoline
2. Scenario 1 = Public CNG phase-in + Private gasoline
3. Scenario 2 = Public CNG phase-in + 10% Private CNG
4. Scenario 3 = Public CNG phase-in + 25% Private CNG

It was found that the outcome varies according to the type of vehicle, the state requirements and whether or not the vehicle is publicly or privately owned. With respect to the type of vehicle the variation in fuel tax collections is driven by differences in fuel economy. For example, the fuel economy of a passenger car was sometimes high enough that the estimated gasoline tax revenue, based on gasoline consumption, was less than the annual fixed fee on CNG resulting in higher total revenue. An example of this occurred in the state of Oklahoma which shows an increase from the base case, an estimate of both public and private passenger car annual gasoline tax revenue, to each subsequent scenario.

Since there is no federal tax on CNG, differences in fuel tax revenue before and after required conversions varied depending on whether the vehicle was owned by the state (since state agencies are not required to pay federal taxes) or by a private citizen. And since each state has its own method of taxing alternative fuels and of funding state highways, positive or negative effects on the state highway funds depended on the state itself.

The tables below summarize the findings of this paper with respect to individual state combined motor fuel tax revenue from each scenario. Clearly, conversion of public vehicles will

have a much smaller effect on the state highway funds than conversion of private vehicles. This is due both to the fact that state vehicles are exempt from federal motor fuel taxes and to the numbers of vehicles being converted. As mentioned previously, however, their conversion will help facilitate a market for the alternative fuel. In both Louisiana and Texas, conversion of passenger cars and trucks to alternative fuel will have a negative overall effect on the state highway funds, whereas in Oklahoma, the effect is expected to be a positive one. Not shown in the table for Texas is the conversion of the state’s public buses which, as indicated in Chapter 5, results in a decrease of about \$2.8 million annually to the fund.

Table 6-1. Summary of Louisiana Motor Fuel Tax Revenue For Each Scenario

	Passenger Cars	Trucks	Combined
Public Base Case	\$359,978	\$528,982	\$888,960
Public Conversion	\$407,149	\$493,657	\$900,806
Private Base Case	\$391,893,055	\$294,188,433	\$686,081,488
Private 10% Conversion	\$382,308,259	\$279,491,850	\$661,800,109
Private 25% Conversion	\$367,931,041	\$257,446,825	\$625,377,866

Table 6-2. Summary of Oklahoma Motor Fuel Tax Revenue For Each Scenario

	Passenger Cars	Trucks	Combined
Public Base Case	\$281,233	\$230,720	\$511,953
Public Conversion	\$475,477	\$300,847	\$776,324
Private Base Case	\$308,091,458	\$217,801,010	\$525,892,468
Private 10% Conversion	\$317,534,306	\$214,871,513	\$532,405,819
Private 25% Conversion	\$331,698,550	\$210,477,287	\$542,175,837

Table 6-3. Summary of Texas Motor Fuel Tax Revenue For Each Scenario

	Passenger Cars	Trucks	Combined
Public Base Case	\$1,672,375	\$1,207,219	\$2,879,594
Public Conversion	\$1,525,691	\$1,051,609	\$2,577,300
Private Base Case	\$1,671,662,461	\$1,116,917,436	\$2,788,579,897
Private 10% Conversion	\$1,607,614,572	\$1,052,177,072	\$2,659,791,644
Private 25% Conversion	\$1,468,116,506	\$955,066,527	\$2,423,183,033

So far, the underlying principal in funding state highways has been the user-pay strategy in which the users of the highway pay for its construction, operation and maintenance in proportion to their use. A gallonage tax reflects this policy. Contrary to this is the annual fixed fee method, the current approach for taxing CNG on the state level, which is not directly related to the amount of highway travel during that year. In this case, there is no direct relationship to the number of miles traveled with the amount of revenue contributed to the fund. Compounding the problem is the current nonexistence of a federal CNG tax.

Even so, a gallonage tax is still not equitable unless it also reflects the energy content of the particular fuel. For instance, it would take almost 4 gallons of CNG to travel the same distance as one gallon of gasoline, so a gallonage tax on CNG should probably equal about 25 percent of the gasoline tax. It is our recommendation that a more equitable method of taxing fuel based on the energy content of the fuel be used in the future. Further studies are warranted so as to determine the feasibility of altering the current taxing method to account for the amount of energy consumed instead of the amount of fuel consumed. Since the knowing the amount of energy a fuel provides corresponds to knowing distance traveled, taxing fuel in this method would probably be the most equitable user fee tax in existence.

It is also recommended that a federal CNG fuel tax be charged in the future. State highway funds benefit greatly from this tax (assuming that each receives the exact amount of federal tax that was collected) as illustrated in the tables above. The absence of a federal fuel tax on CNG resulted in large decreases in the funds.

APPENDIX

Texas Publicly-Owned Buses Conversion Scenario

Urban Transit System	Total # of Veh.	# of Diesel Vehicles	Fuel Consump.	Fuel Tax	# of CNG Vehicles	Fuel Tax	Fuel Tax Revenue
ABILENIE	10	10	11,921	\$0.19	0	\$444	\$22,650
	10	9	11,921	\$0.19	1	\$444	\$20,829
	10	8	11,921	\$0.19	2	\$444	\$19,008
	10	7	11,921	\$0.19	3	\$444	\$17,187
	10	6	11,921	\$0.19	4	\$444	\$15,366
	10	5	11,921	\$0.19	5	\$444	\$13,545
	10	3	11,921	\$0.19	7	\$444	\$9,903
	10	1	11,921	\$0.19	9	\$444	\$6,261
	10	1	11,921	\$0.19	9	\$444	\$6,261
	10	1	11,921	\$0.19	9	\$444	\$6,261
AMARILLO	14	14	13,175	\$0.19	0	\$444	\$35,046
	14	13	13,175	\$0.19	1	\$444	\$32,986
	14	11	13,175	\$0.19	3	\$444	\$28,868
	14	10	13,175	\$0.19	4	\$444	\$26,809
	14	8	13,175	\$0.19	6	\$444	\$22,690
	14	7	13,175	\$0.19	7	\$444	\$20,631
	14	4	13,175	\$0.19	10	\$444	\$14,453
	14	1	13,175	\$0.19	13	\$444	\$8,275
	14	1	13,175	\$0.19	13	\$444	\$8,275
AUSTIN	184	184	14,193	\$0.19	0	\$444	\$496,187
	184	166	14,193	\$0.19	18	\$444	\$455,639
	184	147	14,193	\$0.19	37	\$444	\$412,838
	184	129	14,193	\$0.19	55	\$444	\$372,290
	184	110	14,193	\$0.19	74	\$444	\$329,490
	184	92	14,193	\$0.19	92	\$444	\$288,942
	184	55	14,193	\$0.19	129	\$444	\$205,593
	184	18	14,193	\$0.19	166	\$444	\$122,244
	184	18	14,193	\$0.19	166	\$444	\$122,244
	184	18	14,193	\$0.19	166	\$444	\$122,244
BEAUMONT	17	17	8,397	\$0.19	0	\$444	\$27,122
	17	15	8,397	\$0.19	2	\$444	\$24,819
	17	14	8,397	\$0.19	3	\$444	\$23,668
	17	12	8,397	\$0.19	5	\$444	\$21,365
	17	10	8,397	\$0.19	7	\$444	\$19,062
	17	9	8,397	\$0.19	8	\$444	\$17,911

	17	5	8,397	\$0.19	12	\$444	\$13,305
	17	2	8,397	\$0.19	15	\$444	\$9,851
	17	2	8,397	\$0.19	15	\$444	\$9,851
	17	2	8,397	\$0.19	15	\$444	\$9,851
BROWNSVILLE	12	12	11,590	\$0.19	0	\$444	\$26,425
	12	11	11,590	\$0.19	1	\$444	\$24,667
	12	10	11,590	\$0.19	2	\$444	\$22,909
	12	8	11,590	\$0.19	4	\$444	\$19,393
	12	7	11,590	\$0.19	5	\$444	\$17,635
	12	6	11,590	\$0.19	6	\$444	\$15,877
	12	4	11,590	\$0.19	8	\$444	\$12,360
	12	1	11,590	\$0.19	11	\$444	\$7,086
	12	1	11,590	\$0.19	11	\$444	\$7,086
	12	1	11,590	\$0.19	11	\$444	\$7,086
B-C STATION	9	9	12,020	\$0.19	0	\$444	\$20,554
	9	8	12,020	\$0.19	1	\$444	\$18,714
	9	7	12,020	\$0.19	2	\$444	\$16,875
	9	6	12,020	\$0.19	3	\$444	\$15,035
	9	5	12,020	\$0.19	4	\$444	\$13,195
	9	5	12,020	\$0.19	4	\$444	\$13,195
	9	3	12,020	\$0.19	6	\$444	\$9,515
	9	1	12,020	\$0.19	8	\$444	\$5,836
	9	1	12,020	\$0.19	8	\$444	\$5,836
	9	1	12,020	\$0.19	8	\$444	\$5,836
CORPUS CRISTI	42	42	18,536	\$0.19	0	\$444	\$147,917
	42	38	18,536	\$0.19	4	\$444	\$135,606
	42	34	18,536	\$0.19	8	\$444	\$123,295
	42	29	18,536	\$0.19	13	\$444	\$107,905
	42	25	18,536	\$0.19	17	\$444	\$95,594
	42	21	18,536	\$0.19	21	\$444	\$83,283
	42	13	18,536	\$0.19	29	\$444	\$58,660
	42	4	18,536	\$0.19	38	\$444	\$30,959
	42	4	18,536	\$0.19	38	\$444	\$30,959
	42	4	18,536	\$0.19	38	\$444	\$30,959
DALLAS	814	814	10,288	\$0.19	0	\$444	\$1,591,142
	814	733	10,288	\$0.19	81	\$444	\$1,468,774
	814	651	10,288	\$0.19	163	\$444	\$1,344,895
	814	570	10,288	\$0.19	244	\$444	\$1,222,526
	814	488	10,288	\$0.19	326	\$444	\$1,098,647
	814	407	10,288	\$0.19	407	\$444	\$976,279
	814	244	10,288	\$0.19	570	\$444	\$730,032
	814	81	10,288	\$0.19	733	\$444	\$483,784

	814	81	10,288	\$0.19	733	\$444	\$483,784
	814	81	10,288	\$0.19	733	\$444	\$483,784
EL PASO	90	90	13,539	\$0.19	0	\$444	\$231,517
	90	81	13,539	\$0.19	9	\$444	\$212,361
	90	72	13,539	\$0.19	18	\$444	\$193,206
	90	63	13,539	\$0.19	27	\$444	\$174,050
	90	54	13,539	\$0.19	36	\$444	\$154,894
	90	45	13,539	\$0.19	45	\$444	\$135,738
	90	27	13,539	\$0.19	63	\$444	\$97,427
	90	9	13,539	\$0.19	81	\$444	\$59,116
	90	9	13,539	\$0.19	81	\$444	\$59,116
	90	9	13,539	\$0.19	81	\$444	\$59,116
FT. WORTH	105	105	9,880	\$0.19	0	\$444	\$197,106
	105	95	9,880	\$0.19	10	\$444	\$182,774
	105	84	9,880	\$0.19	21	\$444	\$167,009
	105	74	9,880	\$0.19	31	\$444	\$152,677
	105	63	9,880	\$0.19	42	\$444	\$136,912
	105	53	9,880	\$0.19	52	\$444	\$122,580
	105	32	9,880	\$0.19	73	\$444	\$92,482
	105	11	9,880	\$0.19	94	\$444	\$62,385
	105	11	9,880	\$0.19	94	\$444	\$62,385
	105	11	9,880	\$0.19	94	\$444	\$62,385
GALVESTON	10	10	10,292	\$0.19	0	\$444	\$19,555
	10	9	10,292	\$0.19	1	\$444	\$18,043
	10	8	10,292	\$0.19	2	\$444	\$16,532
	10	7	10,292	\$0.19	3	\$444	\$15,020
	10	6	10,292	\$0.19	4	\$444	\$13,509
	10	5	10,292	\$0.19	5	\$444	\$11,997
	10	3	10,292	\$0.19	7	\$444	\$8,974
	10	1	10,292	\$0.19	9	\$444	\$5,951
	10	1	10,292	\$0.19	9	\$444	\$5,951
	10	1	10,292	\$0.19	9	\$444	\$5,951
GALV. TROLLY	2	2	911	\$0.19	0	\$444	\$346
	2	2	911	\$0.19	0	\$444	\$346
	2	2	911	\$0.19	0	\$444	\$346
	2	1	911	\$0.19	1	\$444	\$617
	2	1	911	\$0.19	1	\$444	\$617
	2	1	911	\$0.19	1	\$444	\$617
	2	1	911	\$0.19	1	\$444	\$617
	2	0	911	\$0.19	2	\$444	\$888
	2	0	911	\$0.19	2	\$444	\$888
	2	0	911	\$0.19	2	\$444	\$888

GALV. RAIL	2	2	2,050	\$0.19	0	\$444	\$779
	2	2	2,050	\$0.19	0	\$444	\$779
	2	2	2,050	\$0.19	0	\$444	\$779
	2	1	2,050	\$0.19	1	\$444	\$834
	2	1	2,050	\$0.19	1	\$444	\$834
	2	1	2,050	\$0.19	1	\$444	\$834
	2	1	2,050	\$0.19	1	\$444	\$834
	2	0	2,050	\$0.19	2	\$444	\$888
	2	0	2,050	\$0.19	2	\$444	\$888
	2	0	2,050	\$0.19	2	\$444	\$888
HOUSTON	991	991	10,209	\$0.19	0	\$444	\$1,922,253
	991	892	10,209	\$0.19	99	\$444	\$1,774,177
	991	793	10,209	\$0.19	198	\$444	\$1,626,102
	991	694	10,209	\$0.19	297	\$444	\$1,478,027
	991	595	10,209	\$0.19	396	\$444	\$1,329,951
	991	496	10,209	\$0.19	495	\$444	\$1,181,876
	991	297	10,209	\$0.19	694	\$444	\$884,230
	991	99	10,209	\$0.19	892	\$444	\$588,079
	991	99	10,209	\$0.19	892	\$444	\$588,079
	991	99	10,209	\$0.19	892	\$444	\$588,079
LAREDO	21	21	9,234	\$0.19	0	\$444	\$36,844
	21	19	9,234	\$0.19	2	\$444	\$34,223
	21	17	9,234	\$0.19	4	\$444	\$31,602
	21	15	9,234	\$0.19	6	\$444	\$28,981
	21	13	9,234	\$0.19	8	\$444	\$26,360
	21	11	9,234	\$0.19	10	\$444	\$23,739
	21	6	9,234	\$0.19	15	\$444	\$17,187
	21	2	9,234	\$0.19	19	\$444	\$11,945
	21	2	9,234	\$0.19	19	\$444	\$11,945
	21	2	9,234	\$0.19	19	\$444	\$11,945
LUBBOCK	28	28	10,756	\$0.19	0	\$444	\$57,222
	28	25	10,756	\$0.19	3	\$444	\$52,423
	28	22	10,756	\$0.19	6	\$444	\$47,624
	28	20	10,756	\$0.19	8	\$444	\$44,425
	28	17	10,756	\$0.19	11	\$444	\$39,626
	28	14	10,756	\$0.19	14	\$444	\$34,827
	28	8	10,756	\$0.19	20	\$444	\$25,229
	28	3	10,756	\$0.19	25	\$444	\$17,231
	28	3	10,756	\$0.19	25	\$444	\$17,231
	28	3	10,756	\$0.19	25	\$444	\$17,231
PORT ARTHUR	10	10	8,839	\$0.19	0	\$444	\$16,794
	10	9	8,839	\$0.19	1	\$444	\$15,559

	10	8	8,839	\$0.19	2	\$444	\$14,323
	10	7	8,839	\$0.19	3	\$444	\$13,088
	10	6	8,839	\$0.19	4	\$444	\$11,852
	10	5	8,839	\$0.19	5	\$444	\$10,617
	10	3	8,839	\$0.19	7	\$444	\$8,146
	10	1	8,839	\$0.19	9	\$444	\$5,675
	10	1	8,839	\$0.19	9	\$444	\$5,675
	10	1	8,839	\$0.19	9	\$444	\$5,675
SAN ANGELO	8	8	9,015	\$0.19	0	\$444	\$13,703
	8	7	9,015	\$0.19	1	\$444	\$12,434
	8	6	9,015	\$0.19	2	\$444	\$11,165
	8	6	9,015	\$0.19	2	\$444	\$11,165
	8	5	9,015	\$0.19	3	\$444	\$9,896
	8	4	9,015	\$0.19	4	\$444	\$8,627
	8	2	9,015	\$0.19	6	\$444	\$6,090
	8	1	9,015	\$0.19	7	\$444	\$4,821
	8	1	9,015	\$0.19	7	\$444	\$4,821
	8	1	9,015	\$0.19	7	\$444	\$4,821
SAN ANTONIO	510	510	10,282	\$0.19	0	\$444	\$996,326
	510	459	10,282	\$0.19	51	\$444	\$919,337
	510	408	10,282	\$0.19	102	\$444	\$842,349
	510	357	10,282	\$0.19	153	\$444	\$765,360
	510	306	10,282	\$0.19	204	\$444	\$688,371
	510	255	10,282	\$0.19	255	\$444	\$611,383
	510	153	10,282	\$0.19	357	\$444	\$457,406
	510	51	10,282	\$0.19	459	\$444	\$303,429
	510	51	10,282	\$0.19	459	\$444	\$303,429
	510	51	10,282	\$0.19	459	\$444	\$303,429
SHER.-DEN.	10	10	5,989	\$0.19	0	\$444	\$11,379
	10	9	5,989	\$0.19	1	\$444	\$10,685
	10	8	5,989	\$0.19	2	\$444	\$9,991
	10	7	5,989	\$0.19	3	\$444	\$9,297
	10	6	5,989	\$0.19	4	\$444	\$8,603
	10	5	5,989	\$0.19	5	\$444	\$7,910
	10	3	5,989	\$0.19	7	\$444	\$6,522
	10	1	5,989	\$0.19	9	\$444	\$5,134
	10	1	5,989	\$0.19	9	\$444	\$5,134
	10	1	5,989	\$0.19	9	\$444	\$5,134
TYLER	2	2	5,230	\$0.19	0	\$444	\$1,987
	2	2	5,230	\$0.19	0	\$444	\$1,987
	2	2	5,230	\$0.19	0	\$444	\$1,987
	2	1	5,230	\$0.19	1	\$444	\$1,438

	2	1	5,230	\$0.19	1	\$444	\$1,438
	2	1	5,230	\$0.19	1	\$444	\$1,438
	2	1	5,230	\$0.19	1	\$444	\$1,438
	2	0	5,230	\$0.19	2	\$444	\$888
	2	0	5,230	\$0.19	2	\$444	\$888
	2	0	5,230	\$0.19	2	\$444	\$888
WACO	10	10	7,533	\$0.19	0	\$444	\$14,313
	10	9	7,533	\$0.19	1	\$444	\$13,325
	10	8	7,533	\$0.19	2	\$444	\$12,338
	10	7	7,533	\$0.19	3	\$444	\$11,351
	10	6	7,533	\$0.19	4	\$444	\$10,364
	10	5	7,533	\$0.19	5	\$444	\$9,376
	10	3	7,533	\$0.19	7	\$444	\$7,402
	10	1	7,533	\$0.19	9	\$444	\$5,427
	10	1	7,533	\$0.19	9	\$444	\$5,427
	10	1	7,533	\$0.19	9	\$444	\$5,427
WICHITAFALLS	8	8	10,562	\$0.19	0	\$444	\$16,054
	8	7	10,562	\$0.19	1	\$444	\$14,491
	8	6	10,562	\$0.19	2	\$444	\$12,929
	8	6	10,562	\$0.19	2	\$444	\$12,929
	8	5	10,562	\$0.19	3	\$444	\$11,366
	8	4	10,562	\$0.19	4	\$444	\$9,803
	8	2	10,562	\$0.19	6	\$444	\$6,678
	8	1	10,562	\$0.19	7	\$444	\$5,115
	8	1	10,562	\$0.19	7	\$444	\$5,115
	8	1	10,562	\$0.19	7	\$444	\$5,115
Ten-Year							
Total							\$36,436,192
Annual Rev.							\$3,643,619

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