FISCAL RESEARCH CENTER

GASOLINE TAXES IN GEORGIA

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FRC Report No. 126
April 2006

Georgia State University | ANDREW YOUNG SCHOOL OF POLICY STUDIES

Acknowledgments

We would like to thank Mizameddin Rzayed for his assistance in compiling and organizing the data used in this paper.

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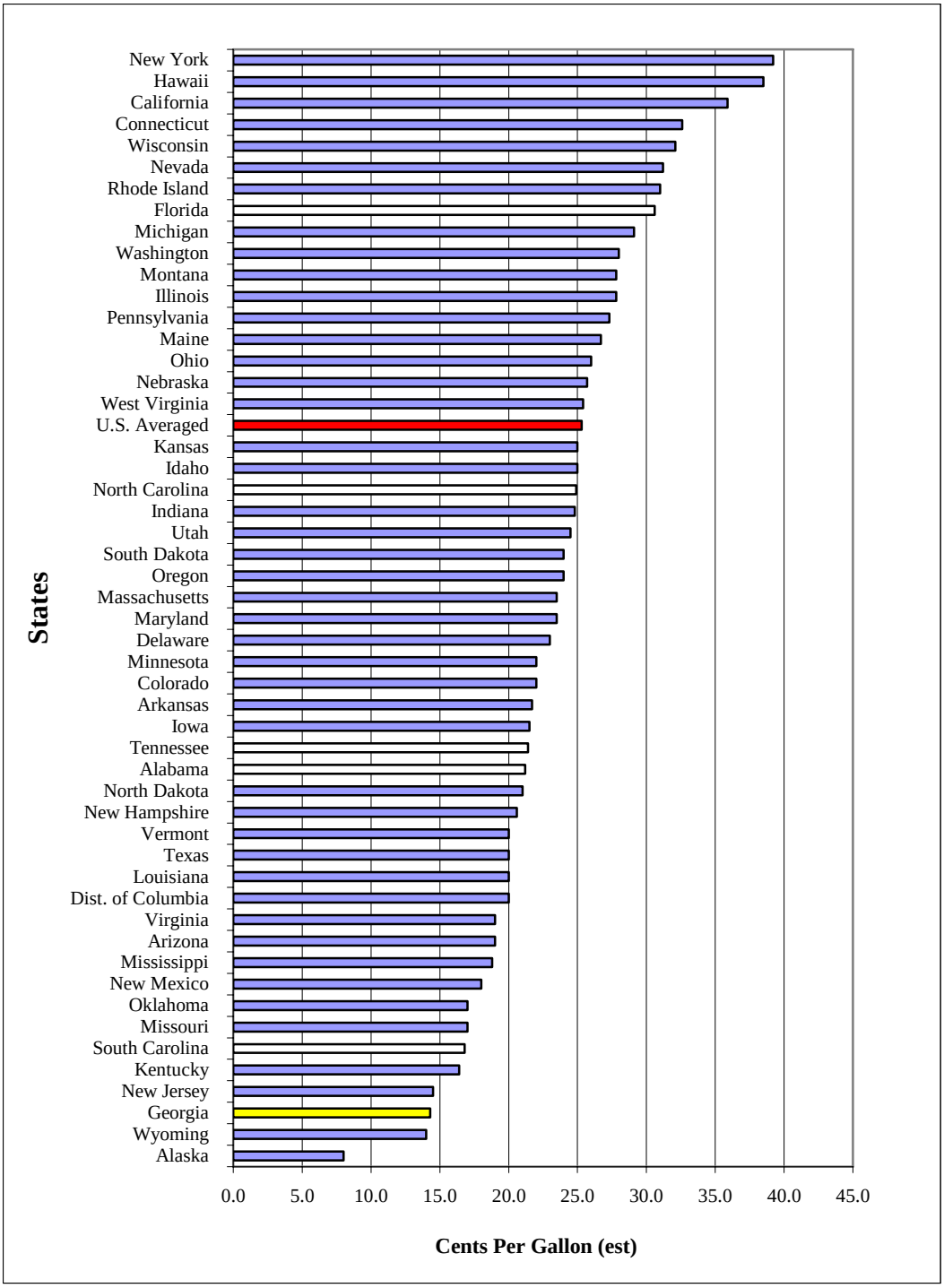
Executive Summary

The motor fuel tax is the oldest of Georgia's major taxes and the third largest revenue source for the state, behind the personal income tax and the sales and use tax. Unlike the other major taxes in Georgia, the revenue from the motor fuel tax is entirely dedicated to a single activity, the building and maintenance of roads and bridges in the state. Because motor fuel tax revenues are dedicated, the tax acts as a user fee for all users of the highway system in the state. More use of the roads results in more fuel use, and as a consequence, more fuel taxes being paid. The structure and rates of the motor fuel tax have been very stable, remaining almost unchanged since the 1950s. However, there are questions about the current and future adequacy of the motor fuel tax in its current form as a dedicated revenue source for highway transportation.

Comparing Georgia with Other States

Motor fuel taxes apply to the sale of gasoline, diesel, aviation grade gasoline, liquefied petroleum gas, compressed natural gas and other special fuels. The excise portion of the motor fuel tax is currently 7.5 cents per gallon for motor fuels. In 2004, the excise portion of the motor fuel tax in Georgia accounted for $527 million in revenue. The Prepaid Motor Fuel Tax (formerly the Second Fuel Tax), which is 3 percent of the average retail price of each fuel, is currently 7.8 cents per gallon for gasoline and 9 cents per gallon for diesel (based on fuel prices as of January 2006). Figure A shows the effective per gallon total state fuel tax rate for all 50 states and the District of Columbia as of 2004. At that time only Alaska and Wyoming had lower effective fuel tax rates. Increases in fuel prices have increased the effective tax rate in Georgia, as well as in several other states. At the current (2006) effective tax rate of 15.3 cents per gallon (gasoline) and 16.5 cents per gallon (diesel), Georgia's effective motor fuel tax ranks among the lowest in the nation.

FIGURE A. TOTAL STATE TAXES ON GASOLINE, 2004



Adequacy of Georgia's Fuel Tax

A low tax rate does not necessarily mean inadequate revenue. In general, an adequate tax is one whose revenues change to reflect changes in the costs of providing the desired amount of a public service.

Two major sources of increasing costs are inflation and increased public demand (i.e., increased usage). The following figures indicate that the tax on fuel (specifically gasoline) has not kept pace with either inflation or with the increasing demands of Georgia's drivers. In Figure B, we measure demand by population and inflation by both the Consumer Price Index (CPI) and by an index of road building costs (RPI) produced by the Federal Highway Administration. The figure shows that on a per capita inflation adjusted basis, in 2002, Georgians paid half the fuel tax on gasoline that they paid in 1980.

FIGURE B: PER CAPITA GASOLINE EXCISE TAX REVENUES: GEORGIA

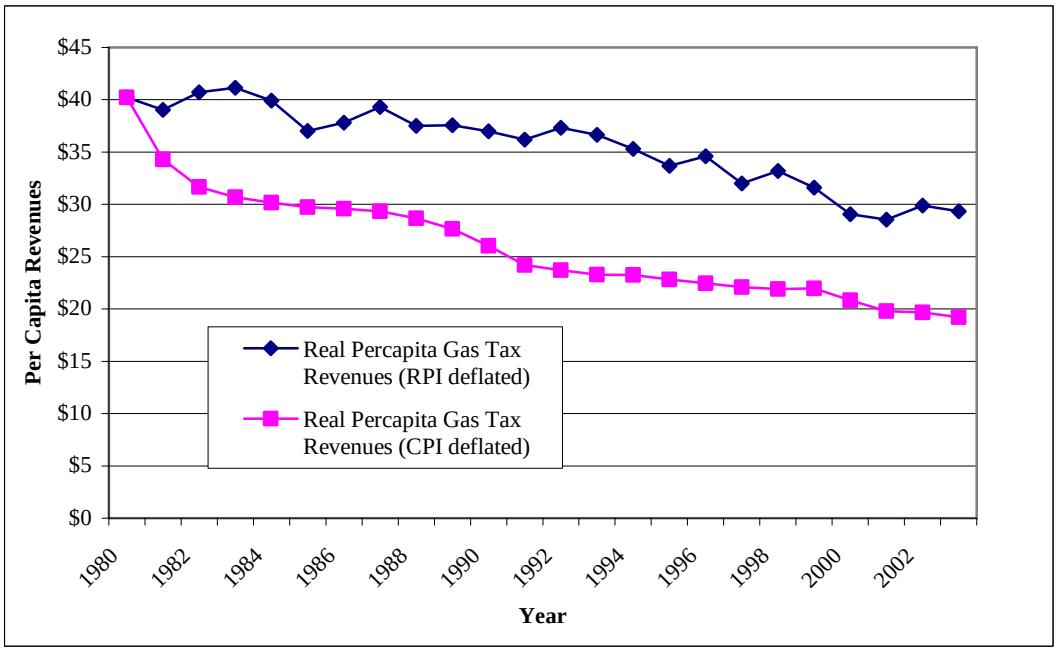
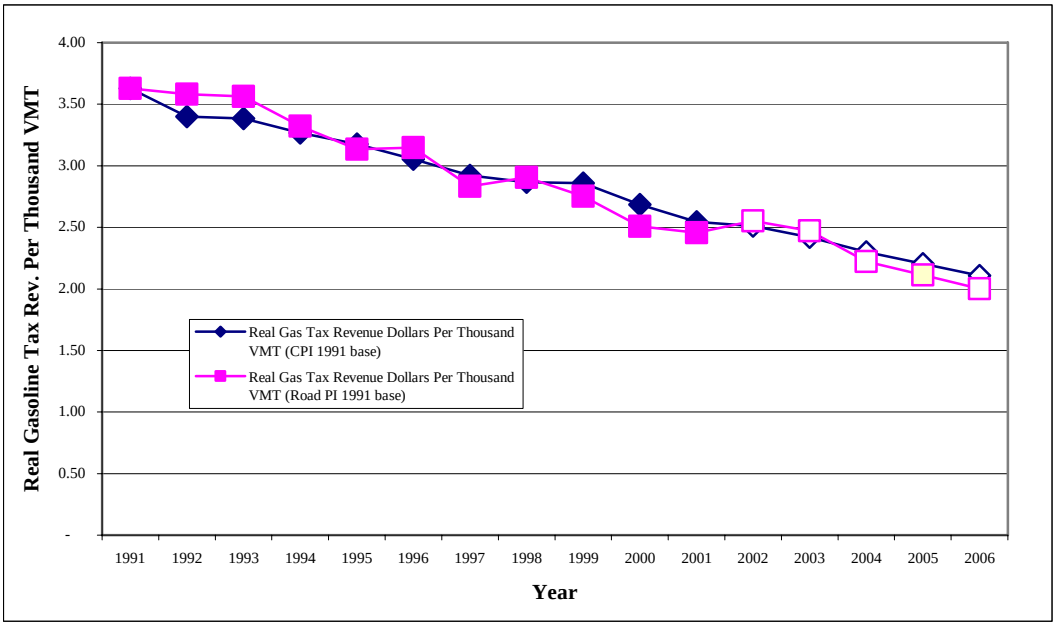


FIGURE C: GASOLINE EXCISE TAX REVENUE PER THOUSAND VMT (ESTIMATED 2002-2006)



Road repair costs generally rise with use, and vehicle miles traveled (VMT) has been steadily rising in Georgia. In Figure C, we use VMT to measure demand. The revenues per VMT, after adjusting for inflation, have been steadily declining. With the recent increases in fuel prices, the Prepaid Tax revenues have risen sharply. However, these increases are not enough to counterbalance the declining real (inflation adjusted) revenue of the excise portion of the fuel tax. Declining revenue per VMT, without injecting revenues from another source, will eventually lead to a reduction in the building and maintenance of roads and bridges in the State.

Revenue Alternatives

This growing divide between transportation demands and transportation revenue is not confined to Georgia. Because all states use an excise tax on gasoline to fund a large portion of transportation, to some extent they all face the same fundamental problem. A per unit excise tax (i.e., one that is based on the volume of gasoline used) has two primary shortcomings as a revenue source intended to maintain highways: 1) the revenues are tied to the volume gasoline sold and not to price, thus, revenues rise only with consumption, not inflation, and 2) increasing fuel economy of cars, over time, will lead to a declining tax paid per mile traveled.

Linking a portion of the fuel tax to the price through the Second Fuel Tax has provided a relatively small offset to declining real (inflation adjusted) revenues. As a result, states have turned to more creative sources for funding current transportation needs.

One alternative involves using general fund revenues to make up the difference, but this alternative reduces the connection between the costs drivers generate and the taxes paid. Using the general fund means that non-resident drivers pay less and resident drivers and non-drivers would pay more. Furthermore, it would increase the competition for revenue between road funding and other government programs, like education.

Georgia's fuel excise taxes could be periodically adjusted either by legislation or through a formula based indexation process. But, legislation that increases taxes is not popular among legislators, and indexation faces the criticism that it removes the accountability for the tax increase from the legislators' hands. Based on our analyses presented in this paper, it is likely that Georgia is a net exporter of fuel and a net importer of fuel tax revenue. The relatively low fuel taxes in Georgia along with the likelihood that a substantial portion of the revenue is, on net, imported leaves some room for increasing highway funding by increasing or indexing rates, while allowing the state to maintain a competitive advantage over most of its neighbors.

A more geographically targeted alternative is a regional fuel tax. This option would divide the state into separate taxing jurisdictions for the purpose of levying and collecting fuel taxes and adopting highway projects. The effect of a regional fuel tax would be to transfer many of the decisions about revenue generation and highway development to the local level. However, differences in fiscal capacity, regional priorities and actual transportation need may make this alternative difficult to coordinate into a coherent state transportation plan.

Perhaps the most talked about alternative for alleviating the transportation funding shortfalls is through a debt financing instrument called Grant Anticipation Revenue Vehicles (GARVEE) bonds. These GARVEE bonds are secured with future federal highway funds. GARVEE bonds are attractive because they allow for accelerated project delivery. They may allow for cost savings from speeding up

projects and avoiding inflation. They also may enable states to avoid state limitations on debt, and no bond referendum is required.

There are, however, potential risks and costs of using this alternative. By promising future federal highway disbursements (and possibly tax revenues), a state reduces its ability to remain fiscally flexible, especially if changes were to occur in the appropriation and authorization of federal funds. In past years, the benefits of avoiding inflation may have been overstated; historically, road building costs (as estimated by the Federal Highway Administration) have risen slower than the costs of other goods and services in the economy, but note that road building costs estimated by the FHWA do not include recent price increases of petroleum-based products (a key raw material used in building roads), nor does it include price increases in labor and other materials used in road building caused by demand from hurricane rebuilding efforts. As a result, some states have been forced to postpone major highway projects because of the price spike in critical inputs.

The search for funding alternatives that do not involve tax rate increases or the reliance on an index has led many states to consider GARVEE bonds. Although GARVEE bonds are being touted as a transportation cure-all alternative to increasing fuel taxes, their usefulness as an alternative for highway funding may be quite limited. What GARVEEs do offer is fast money, but the risks associated with GARVEEs are not trivial. The use of GARVEEs may substantially limit policy makers from reacting to new and emerging transportation needs should future transportation revenues become constricted.

Summary

Population growth, longer commutes, and more commercial traffic have increased the demands on Georgia's roads and bridges; but revenues from Georgia's fuel tax have not kept pace with either the costs of road construction or the rising demands being placed on the road network. Inflation has eroded the revenue generating capacity of the fuel excise tax. The addition of the Prepaid Tax Motor Fuel Tax provides some adjustment for cost increases, but the adjustment is small and far from adequate. Although the 2005 hurricane season brought with it a sudden and substantial increase in fuel prices (and consequently, revenues from the Prepaid Fuel

Tax), this represented only a temporary increase in fuel tax revenues. Recent record-high prices are not likely to substantially change Georgia's overall fuel tax revenue trends unless fuel prices rise to (or above) what was experienced in the 2005 hurricane season and remain there.

I. Introduction

States use a mix of federal highway grants, fuel excise tax revenues, general fund revenues, local government revenues and bond receipts to finance transportation systems. This report compares Georgia's fuel tax with other states and examines its current uses and its revenue performance over time.

The motor fuel tax is the oldest of Georgia's major taxes and the third largest revenue source for the state, behind the personal income tax and the sales and use tax. Unlike the other major taxes in Georgia, the revenue from the motor fuel tax is entirely dedicated to a single activity, the building and maintenance of roads and bridges in the state. The structure and rates of the motor fuel tax have been very stable, remaining almost unchanged since the 1950s. This paper analyzes the motor fuel tax in the state of Georgia to gauge its adequacy as a dedicated revenue source for transportation infrastructure funding. This paper traces the development of the motor fuel tax as a revenue source for highways, and compares the motor fuel tax in Georgia with similar fuel taxes in other states. This report also examines the geographic incidence of possible changes in the motor fuel tax. Finally, this paper explores a recent alternative avenue of transportation financing (GARVEE bonds), focusing on the pros and cons associated with this option.

II. The Development of Highway Funding[1]

In the early 1900s, as automobiles began to dominate the transportation landscape, the need for more and better roads became apparent. The roads that had been built up to the early 1920s were generally funded entirely by state governments, and because no provisions were made to link transportation networks between states, roads often ended at state lines. Road quality also varied by state, making transportation across the country a difficult undertaking. National concerns about road links between states and of standardization about road construction resulted in two pieces of federal legislation, the Federal Highway Acts of 1916 and of 1921. The 1916 act authorized the establishment of a federal body to oversee a federal highway program, while the 1921 act provided federal matching grants for highway construction. These early matching grants required that only half of the funds for road building come from the states. The provisions of these two pieces of legislation provided incentives for states to build roads that would meet newly established federal-level highway construction standards and that would be linked between states throughout the country. By providing federal matching grants and imposing standards for road building, these two bills substantially accelerated the investment in highway infrastructure throughout the country.

States

To take full advantage of these new federal highway funds, states responded by imposing a state fuel (or gasoline) tax to fund the state's share of the road building costs. Early on, many states included fuel tax revenues as part of general fund revenues, so the use of fuel tax revenues were not statutorily restricted to highway construction. Over time, however, the use these revenues was increasingly restricted to the construction, expansion and maintenance of state roads and bridges.

[1] This section draws heavily from Talley (2000), and from conversations with officials at the Georgia Department of Revenue.

Some states (like Georgia) acted to ensure funding for roads by placing legislative or constitutional restrictions on the activities for which the fuel tax could be appropriated.[2] In contrast, other states, since their adoption of the fuel tax, have reserved a portion of these revenues for transportation-related activities other than strictly road building (e.g., mass transit, bicycle lanes or other types of transportation improvements designed to alleviate highway congestion).

Federal

Although the initiative to implement highway standards and to provide a national highway system was spearheaded at the federal level, the use of a fuel-based excise tax was not. Initially, the federal portion of the matching grants came from general revenues. The mass adoption (and success) of the state-level fuel taxes prompted efforts to institute a federal fuel excise tax. In 1932, a federal excise tax of 1¢ per gallon was implemented. Since its adoption, the perception of the federal fuel tax, the tax rates and uses of fuel tax revenue have changed substantially.

At the outset, the federal gasoline tax was not dedicated to highway improvement. Its initial use was primarily for federal deficit reduction (i.e., all of the revenues from this new revenue source were included as part of the general fund, from which highway matching grants continued to be appropriated). Soon after its implementation, the federal gasoline excise tax was "temporarily" increased to cover the cost associated with WWII and the subsequent Korean War. Originally, only gasoline was taxed, but in 1951 (at the start of the Korean War) both diesel and other special fuels were added to the list of taxed fuels. At approximately the same time, the fuel tax revenue was moved from the general fund to a highway trust fund. This change directly tied a portion of future fuel tax revenues to highway improvements. This also changed the general perception of the tax. The national fuel tax, which was initially viewed as a general revenue source, had been transformed (at least in large part) into a "user fee." Linking the fuel tax revenues directly to road building proved to be a successful strategy for promoting growth in the interstate highway program in future years.

[2] Georgia is one of 30 states that have either a legislative or constitutional restriction on the appropriation of state fuel taxes. See Appendix Table A3.

In 1956, the Congress enacted the Federal-Aid Highway Act, which substantially expanded federal aid to the interstate highway program and increased the fuel excise tax in order to reduce the federal deficit. Between 1956 and the 1990s, fuel tax rates rose periodically, and what had began as a temporary tax effectively became a permanent funding source for state grants used for highway and bridge construction, maintenance, and expansion.

During the 1980s and 1990s, Congress substantially increased the federal fuel tax rate, and expanded the uses of the revenues to cover fuel storage tank leakage cleanups, mass transit and other modes of transportation. The rationale was that drivers directly benefit from expenditures on mass transit (or other modes which may reduce highway congestions) and that fuel leakage was a substantial environmental problem that should be paid for by the users of fuel. The inclusion of other forms of transportation also marked the partial transition back to fuel taxes being used for more general transportation purposes instead of being viewed solely as a user fee effectively dedicated to transportation networks for automobiles and trucks only.

Currently, the federal fuel tax stands at 18.4 cents per gallon for gasoline, 24.4 cents per gallon for diesel, 13.1 cents per gallon for gasohol, and 13.6 cents per gallon for other special fuels. These federal revenues are returned to states in the form of matching grants for transportation projects.

Georgia

As in many other states, the motor fuel tax has a relatively long history in Georgia. According to the Georgia Department of Revenue, Georgia's motor fuel tax is the oldest major state tax currently in use.[3] Georgia was one of the first 15 states to adopt the tax (1919-1921), which by 1929 was being used by (then) all 48 states.

After the adoption of the motor fuel tax in Georgia, it quickly became the top revenue source for the State and remained so until after WWII; however, the personal income tax and the sales tax, both of which have revenue streams that increase with inflation, overtook the motor fuel tax in the 1950s and 1960s.

[3] See the Georgia Department of Revenue's *Annual Statistical Report* (2004).

Initially, the tax on motor fuel was not an excise tax, but rather an occupation tax on fuel distributors. Since its adoption, the motor fuel tax has gone from its original 1 cent per gallon in 1921, to 7 cents in 1950. It was reduced to 6 cents per gallon in 1951, but increased again in 1955 to 6.5 cents per gallon. The current rate of 7.5 cents per gallon was adopted in 1971. In 1979, a second motor fuel tax was added in the form of a 3 percent tax on the sale price.

Prior to 1951, the Georgia Constitution prohibited the earmarking of revenues for a specific purpose. However, in 1951, the General Assembly proposed and ratified a constitutional amendment that provides a single exception specifically for motor fuel taxes. The amendment requires the Georgia legislature to allocate for state and county roads an amount not less than the net revenue received from motor fuel taxes collected during the preceding fiscal year.[4] The amendment reads as follows:

> Georgia Constitution 2-1406(b)(1)
> (b) An amount equal to all money derived from motor fuel taxes received by the state in each of the immediately preceding fiscal years, less the amount of refunds, rebates, and collection costs authorized by law, is hereby appropriated for the fiscal year beginning July1, of each year following, for all activities incident to providing and maintaining an adequate system of public roads and bridges in this state, as authorized by laws enacted by the General Assembly of Georgia, and for grants to counties by law authorizing road construction and maintenance, as provided by law authorizing such grants (State of Georgia)

Prior to this amendment, revenues from the fuel tax were included as part of general revenues and, as such, could have been legally appropriated by the Legislature for any state use. But the fuel tax amendment to the Georgia Constitution restricted the use of fuel tax revenue to the construction and maintenance of roads and bridges. Thus, non-road and non-bridge transportation projects must be financed by other revenue sources. The decision to use fuel taxes as a dedicated revenue source is not an uncommon one. Many states currently have restrictions on the use of tax revenues derived from motor fuels. Currently, 30 states earmark the fuel tax for highway construction. Table A3 provides a list of states with legislative or constitutional restrictions on the use of state fuel tax revenues.

[4] The shift of Georgia's fuel tax from a general revenue source to a "user fee" coincided with the similar shift of federal fuel tax revenues from the general fund into the Highway Trust Fund.

Before 1979, motor fuels were subject to the state's general sales tax of 3 percent. In 1979, an additional motor fuel tax was added in the form of a 3 percent tax on the retail sales price of fuel, and at the same time, motor fuels were exempted from the general sales tax. The new 3 percent fuel tax was known as the "second motor fuel tax." Georgia's Constitution does not explicitly define the fuel tax as a per gallon tax. By redefining the 3 percent sales tax as a 3 percent motor fuel tax, lawmakers were able to use the general code to extend the 1951 fuel tax earmarking amendment to other taxes levied on motor fuels (in this case, a sales tax). When the state sales tax was increased to 4 percent in 1989, motor fuel was subject to a 7.5 cents per gallon fuel tax, a 3 percent fuel tax and a 1 percent sales tax.

Prior to 2004, the second motor fuel tax and the 1 percent sales tax were collected by the retailer. As of January 2004, the second motor fuel tax and the 1 percent sales tax on fuel have been replaced with the 4 percent Prepaid State Tax. This new prepaid motor fuel tax is paid by the fuel distributor (or wholesale level) on a cents-per-gallon basis. Every six months the Department of Revenue determines a statewide average retail price. The per gallon tax equals 4 percent of this retail price. The following is an excerpt from Georgia state law for determining the per gallon amount of the prepaid tax:

> Georgia Code 48-9-14 (B)
> The commissioner shall issue the rate of prepaid state tax on a semiannual basis, rounded to the nearest $.001 per gallon for use in the following semiannual period. The rate shall be calculated at 4 percent of the state-wide average retail price by motor fuel type as compiled by the Energy Information Agency of the United States Department of Energy, the Oil Pricing Information Service, or a similar reliable published index less taxes imposed under Code Section 48-9-3, this subsection, and all local sales and use taxes. In the event that the retail price changes by 25 percent or more within a semiannual period, the commissioner shall issue a revised prepaid state tax rate for the remainder of that period (State of Georgia).

The state revenue commissioner uses generally recognized sources of fuel price information and publishes a list of "average retail prices" that are used by fuel distributors (wholesalers) to calculate their taxes due. These "average retail prices" are published twice per year. Sudden price changes greater than 25 percent would result in a mid-period adjustment in the posted prices. These prices are published on the Georgia Department of Revenue's web site.

Of the 4 percent tax, three percent represents the fuel tax and is dedicated to the State's highways and bridges. The remaining 1 percent remains a general sales tax that goes into the state's general fund.[5]

In Georgia, the addition of the sales tax part of the motor fuel tax in 1979 (as modified in 2004) tied part of the fuel tax to the price of fuel. As the price of fuel increases, the tax paid per gallon increases. Table 1 provides an illustration of how Georgia's total state tax on gasoline (or diesel) would change as the average retail price increases from $1.50 to $3.50 per gallon.[6] The total state taxes levied ranges

TABLE 1: VALUE OF GEORGIA'S STATE FUEL TAXES BY PRICE

Price of Gasoline Per Gallon	State Excise Tax	Prepaid Tax	Total State Tax on Fuel	Total State Tax Available for Roads & Bridges
$1.50	$0.075	$0.060	$0.135	$0.120
$1.60	$0.075	$0.064	$0.139	$0.123
$1.70	$0.075	$0.068	$0.143	$0.126
$1.80	$0.075	$0.072	$0.147	$0.129
$1.90	$0.075	$0.076	$0.151	$0.132
$2.00	$0.075	$0.080	$0.155	$0.135
$2.10	$0.075	$0.084	$0.159	$0.138
$2.20	$0.075	$0.088	$0.163	$0.141
$2.30	$0.075	$0.092	$0.167	$0.144
$2.40	$0.075	$0.096	$0.171	$0.147
$2.50	$0.075	$0.100	$0.175	$0.150
$2.60	$0.075	$0.104	$0.179	$0.153
$2.70	$0.075	$0.108	$0.183	$0.156
$2.80	$0.075	$0.112	$0.187	$0.159
$2.90	$0.075	$0.116	$0.191	$0.162
$3.00	$0.075	$0.120	$0.195	$0.165
$3.10	$0.075	$0.124	$0.199	$0.168
$3.20	$0.075	$0.128	$0.203	$0.171
$3.30	$0.075	$0.132	$0.207	$0.174
$3.40	$0.075	$0.136	$0.211	$0.177
$3.50	$0.075	$0.140	$0.215	$0.180

[5] Appendix Table A2 provides a breakout of where state motor fuel revenues are spent, by transportation category for all states.

[6] It should be noted that the Prepaid tax amounts in Table 1 assume the price level on fuel remains fixed for a 6 month period.

from 13.5 cents per gallon (at a retail price of $1.50 per gallon) to 21.5 cents per gallon (at a retail price of $3.50 per gallon). Because 1 percent of the 4 percent prepaid tax goes into the general fund, the total revenues available for roads and bridges is from 12 to 18 cents per gallon over the same price range.

In 2004, the motor fuel excise tax in Georgia accounted for $527 million in revenue. Motor fuel taxes applies to the sale of gasoline, diesel, aviation grade gasoline, liquefied petroleum gas, compressed natural gas and other special fuels; however, the sale of gasoline for passenger cars and light trucks in Georgia accounts for 75.1 percent of the motor fuel sold by volume. Gasoline tax revenues also account for 74.9 percent of the gross tax revenues generated under the motor fuels tax.[7] Given that most of Georgia's motor fuel tax is derived from the sale of gasoline to consumers, we focus primarily on the gasoline excise tax for across-state comparisons.

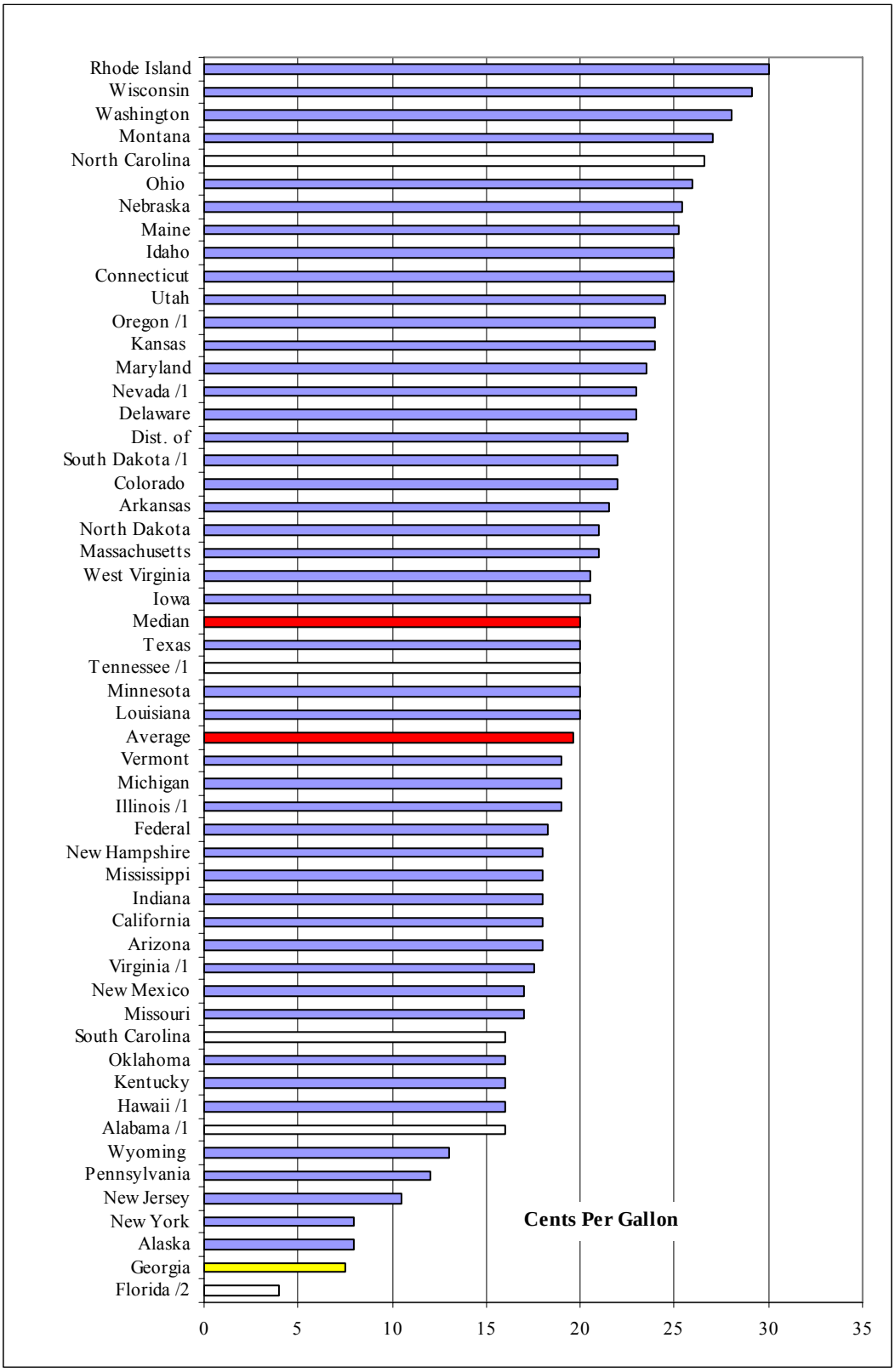
[7] Source: The Energy Information Administration. The remainder of the motor fuel tax revenues comes from fuels used in heavy trucks (primarily diesel) and other alternative fuels such as LPG and CNG

III. Comparing Georgia's Fuel Taxes with Other States

Although gasoline and other fuels are often subject to several different taxes at different levels of government, the per unit excise tax is used by all states. This section compares the excise portion of fuel taxes for all 50 states and the District of Columbia. This section also briefly describes other taxes on fuel used by Georgia's neighbors.

Georgia is not atypical in its choice to tax fuel or in the types of fuel it chooses to tax; however, it does have an uncommonly low fuel excise tax rate. Figure 1 presents the ranked per-gallon excise tax on gasoline for all 50 states and the District of Columbia. At 7.5 cents per gallon, Georgia's gasoline excise tax ranks as the second lowest in the nation and amounts to only 38.2 percent of the average gas tax among all of the states. Georgia's gas tax is also substantially lower than most of its immediate neighbors (denoted by white bars). Excise tax rates in North Carolina, South Carolina, Tennessee and Alabama, range from 16 cents per gallon in Alabama and South Carolina to 26.6 cents per gallon in North Carolina. At a rate of 4 cents per gallon, only Florida has a lower state-level excise tax on gasoline. However, Florida's low state excise tax rate is due primarily to the availability of county-level and municipality-level fuel excise taxes. Florida has effectively shifted a large share of road and bridge building and maintenance to the local level.

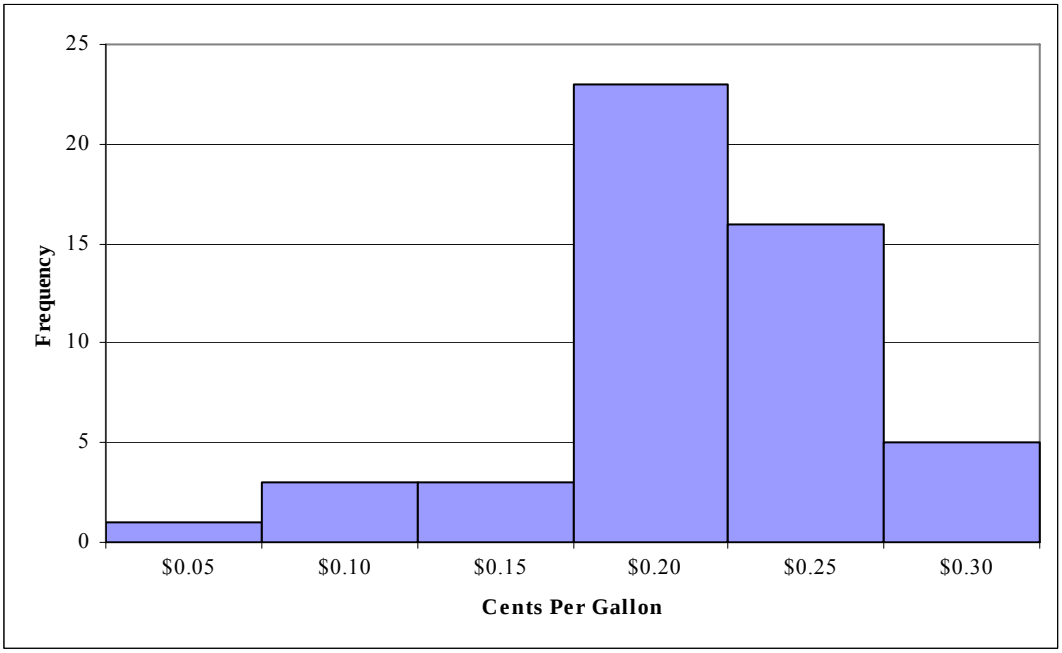
FIGURE 1: STATE GASOLINE EXCISE TAX RATES (2005)



Source: Federation of Tax Administrators (2005)

Figure 2 represents the distribution of the state gas excise tax rates across the country. The majority of states have their gas tax set at between 20 and 29 cents per gallon with a standard deviation of 5.6 cents per gallon. At 7.5 cents per gallon, Georgia's gas excise tax is 2.14 standard deviations below the mean for the 50 states (and the District of Columbia), an indication that not only is Georgia's gas excise tax lower than average (shown in Figure 1), it is relatively far away from the mean state-level gas tax.

FIGURE 2: DISTRIBUTION OF EXCISE TAX RATES (2005)



Additional Fuel Taxes

The per unit excise tax rates do not account for all charges that apply to gasoline or motor fuels. In addition to a state-level fuel excise tax, more than half of the states in the U.S. impose one or more additional taxes or fees to gasoline sales. Georgia is one of eight states that currently levy a sales tax on fuel in addition to the state and federal fuel excise tax. All five states that border Georgia and more than half of the states in the nation add on state or local fees or taxes to the state excise tax on gasoline (See Appendix Table A1).

A host of states apply environmental cleanup fees, Leaking Underground Storage Taxes (LUSTs), inspection fees, licensing fees or some other charge on the

use or sale of motor fuels. However, these fees and taxes are not earmarked for transportation.

In Florida, fuel sales are subject to the sales tax (as they are in Georgia) and to a pollution tax of 2.07 cents per gallon. In addition, county and municipal governments in Florida levy from 9.7 to 17.7 cents per gallon in local option fuel taxes. North Carolina imposes two additional charges, an inspection fee of 17.5 cents per gallon plus 7 percent of the average wholesale price and a local excise tax of 0.25 cents per gallon. Tennessee imposes a 1.0 cent per gallon petroleum tax and a 0.4 cent per gallon environmental fees. South Carolina has a 0.5 cent per gallon LUST tax and 0.25 cent per gallon inspection fee.

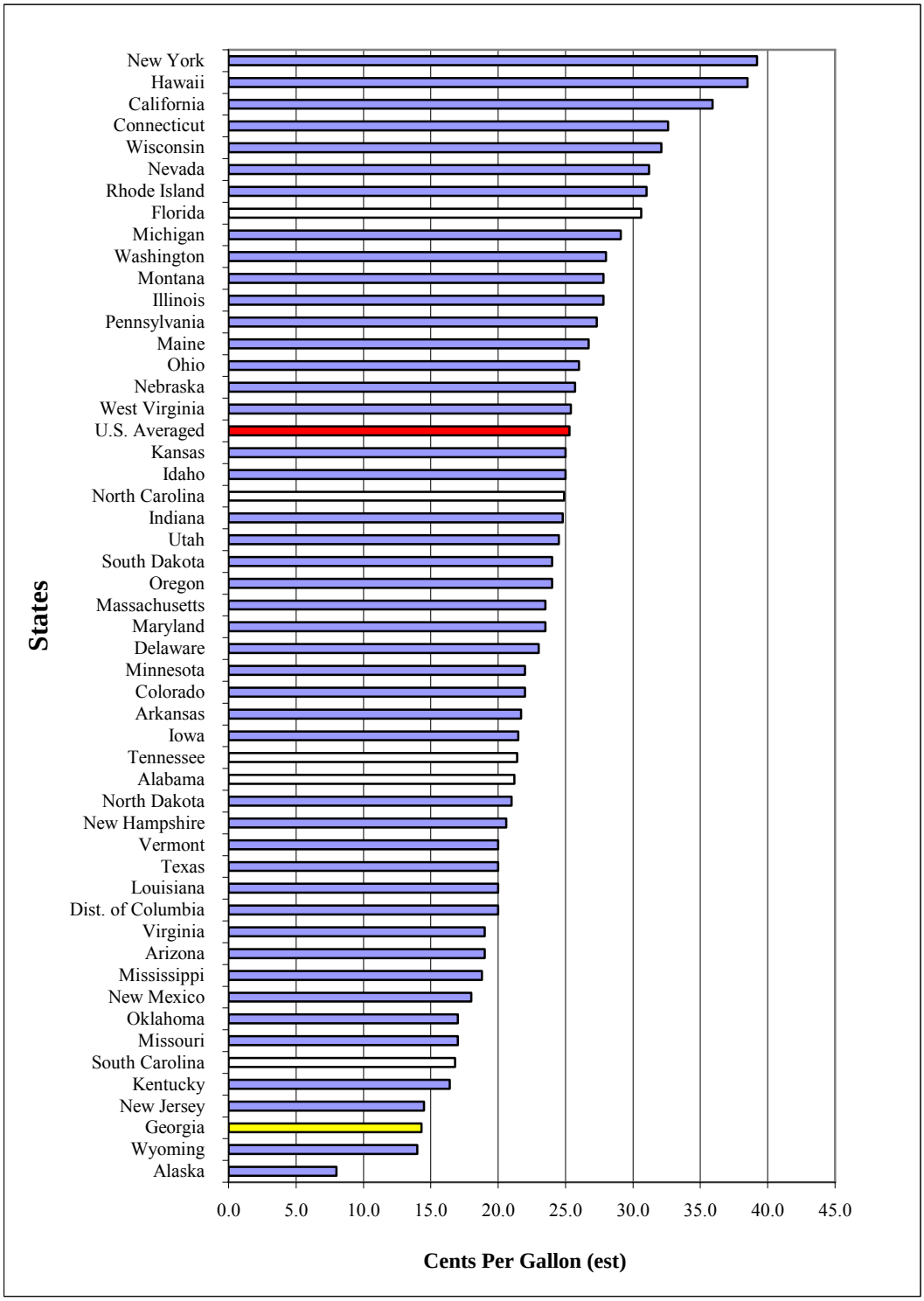
In Georgia, along with the 7.5 cents per gallon excise tax, an additional 4 percent Prepaid State tax applies to the value of the purchase on gasoline, and local option sales taxes (LOST, SPLOST, HOST and ELOST) that apply to other goods also apply to fuel.[8] The addition of sales taxes potentially amounts to an additional tax of six to seven percent of the sale price in most of the state and eight percent in the City of Atlanta.[9]

Making fuel subject to state and local sales taxes, fees and other miscellaneous charges increases a state's effective tax rate on fuel (the share of the total fuel cost that is paid in state tax). The American Petroleum Institute publishes annual estimates of the effective state tax rates for gasoline that accounts for the addition of these other state taxes. Figure 3 shows the estimated effective rates for each state and for the District of Columbia.

[8] This includes the Local Option Sales Tax (LOST), the Special Purpose Local Option Sales Tax (SPLOST), the Homestead Option Sales Tax (HOST), and the Education Local Option Sales Tax (ELOST).

[9] One quarter of Georgia's Prepaid Tax flows into the general fund, while the remaining 75 percent is dedicated to highway projects. Revenues from local sales taxes (i.e., LOST, SPLOST, HOST and ELOST) are not dedicated for highway projects; however, in practice local revenues in Georgia are used for road building (see Figure 3 in the next section). Table A1 (see Appendix) provides a more detailed description of all taxes applicable to gasoline in all states.

FIGURE 3: TOTAL STATE TAXES ON GASOLINE, 2004[10]



Source: American Petroleum Institute

[10] Some states allow for local fuel taxes, e.g., Florida. These data do not reflect local taxes.

Based on the API estimates, Georgia, at 14.3 cents per gallon in 2004, ranks as the state with the third lowest effective tax rate on gasoline, ahead of only Alaska and Wyoming. Florida, Georgia's only neighboring state with a lower excise tax rate, moves from the lowest excise tax rate in the U.S. to the eighth highest effective tax rate, once other state taxes are factored in.

Because of the increases in fuel prices over the past year, Georgia's effective fuel tax has increased. The current state fuel tax in Georgia is 17.1 cents per gallon for gasoline (and 17.2 cents per gallon for diesel), which includes both the excise portion and the 3 percent prepaid portion of the fuel tax. For a more detailed description of all fuel taxes and fees applicable in all 50 states, see Appendix Table A1.

IV. Taxation Theory

This section describes the basic principles of excise taxation and explains the appeal of the excise tax as a mechanism for highway financing.

There are two basic principles of taxation. The first, known as the "benefit principle," states that beneficiaries of a public good or service should shoulder the burden of paying for that good or service. Additionally, the taxes paid should be proportional to the benefits received. In the case of public roads, the benefits principle would lead to all users of roads paying for some portion of the costs of providing roads. Those who derive more benefits or impose more maintenance costs, such as transporters of freight, would pay more than those who benefit less, such as a home-based computer programmer.

The benefits principle, however, has some major limitations in its applicability. Often government goods and services are provided to individuals who are least able to afford them. For example, poor families are the primary beneficiaries of welfare programs; however, to expect only poor individuals to pay for welfare programs would make public assistance meaningless. Furthermore, the benefits and beneficiaries of a public good or service are not always apparent. This has led to an alternative view of taxation.

The second principle of taxation is called "the ability-to-pay" principle. This principle is based on the idea that taxes used to pay for needed government-provided goods and services should be based on an individual's ability to pay, regardless of the actual direct benefits received. Embedded in the ability-to-pay principle is the assumption that people with a greater ability to pay (i.e., higher income, wealth, etc.,) suffer less discomfort paying taxes than do poorer individuals and thus should pay more taxes.

Roads and bridges provide substantial benefits to both users and non-users alike. The most obvious benefit for users comes in the form of easier and more efficient personal transportation. High quality roads result in easier commutes and more efficient travel. Both users and non-users benefit from easy access to goods that are less expensive because of efficient road networks. The distribution of goods across an efficient road network reduces the delivered price of these goods. Better

roads reduce prices even to people who do not own cars. So, which principle of taxation is most applicable to roads, benefit or ability-to-pay?

The benefits principle has a natural appeal based on equity because everyone that uses the roads or consumes goods that are transported over the roads pays for a portion of the cost, and people who rely on it more pay more. The benefits principle also has appeal based on efficiency. Because users pay more to use the roads more, there is an incentive to reduce the usage of the road system.

Under the ability-to-pay principle the costs of building and repairing roads would not be connected to the individual's usage, but on some measure of income or wealth. Some users (beneficiaries) of the road network would pay very little, while others would pay more. By moving the tax from fuel to income or wealth, the price of fuel would be reduced. Reducing the cost of using the roads would lead to an increase in the use among these individuals, increasing their contribution to both wear and tear and to traffic congestion. A tax or charge to finance roads based on the ability to pay principle would lead to higher average traffic volume and less equity among users with similar travel.

A fuel tax provides a mechanism for increasing the total benefits tax paid as travel increases. The fuel tax has the effect of increasing the efficiency with which highway space is allocated. However, the fuel tax has a major disadvantage in that it prices all road space the same at all times of the day, so, rush hour traffic congestion is virtually unaffected by the fuel tax.

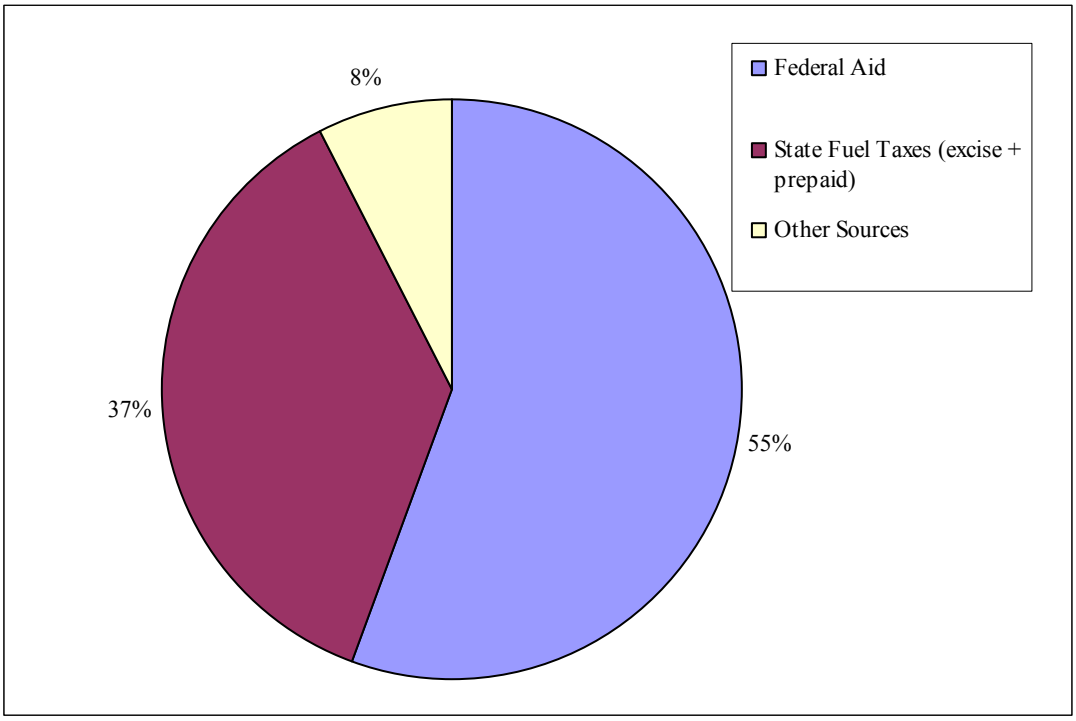
To address peak hour congestion, a different approach has been employed in areas of high congestion. Congestion tolls and fees (in addition to the current fuel taxes) have been developed and used in large urban areas across the country to target particularly congested parts of the highway network during peak traffic hours. Because fuel-based taxes and fees are not sensitive to either time-of-day or route traveled, a fuel tax alone cannot be used to address congestion during traffic peaks.

A second more minor disadvantage of the fuel tax is that its efficiency depends on all comparably sized vehicles being capable of achieving the same miles per gallon. Newer electric or hybrid vehicles pose a problem in this respect. Because they use substantially less currently taxable fuel, they currently pay little or nothing to use the road network. Despite these shortcomings in efficiency, the fuel excise tax

remains popular among states because of issues of equity and the relative ease of administration.

In earmarking Georgia's fuel excise tax revenues for roads and bridges, this tax approximates a user fee; thus, the benefits principle of taxation is at the core of Georgia's transportation funding philosophy. A user fee is to government service what a price is to private sector goods and services. Figure 4 indicates that not all of highway funding comes from fuel excise taxes. Approximately 8 percent of highway funding in the state comes from other sources, which include local sales taxes and property taxes. This does not include local government spending on its streets.

FIGURE 4: SOURCES OF HIGHWAY FUNDING IN GEORGIA, 2003



Source: U.S. Bureau of the Census, Census of Government

V. Georgia's Fuel Excise Tax: Equity and Efficiency

Simply because much of highway funding in Georgia comes from user-based excise or sales taxes does not guarantee that costs are being distributed among users in either an equitable or efficient manner. This section explores some of the equity and efficiency issues common to state transportation funding mechanisms, highlighting Georgia's transportation funding system.

Generally, the costs associated with the operation of a highway system can be divided into two types: 1) fixed costs, which consist of costs that are invariant to traffic volume (e.g., land acquisition), and 2) variable costs, which change with the traffic volume and with the weight of the vehicles on the road (e.g., regular maintenance). Typically, these two types of costs are supported by highway users through two types of taxes or user fees. The fixed portion of the costs is financed with taxes that do not vary with the miles traveled by the vehicle (e.g., tag fees and license fees). Variable costs are generally financed with a tax that reflects the individual vehicle's marginal cost imposed. In all states, an excise tax on fuel is used to approximate the costs imposed by each vehicle per mile traveled.

Georgia imposes fixed fees on heavy trucks based on weight and the number of axels; however, these fees are not earmarked for funding highway projects. The only revenue source earmarked specifically for the maintenance of roads is from the fuel excise tax and the state prepaid tax, the majority of which comes from gasoline. Thus, in Georgia, the fixed costs of road building (e.g., land acquisition) are implicitly amortized over the life of the road.

Beyond assuring that all individuals who derive benefits from the transportation system pay something, consideration must also be given to constructing user fees that achieve some degree of equity among users by accurately accounting for costs imposed by different vehicles. In general, heavier vehicles cause more damage to roads, cause more congestion and pollution and use more fuel, and

thus pay a higher absolute tax per mile traveled.[11] However, having a taxing system under which a heavier vehicle pays a higher tax does not guarantee an equitable allocation of costs.

A study of the Minnesota highway user taxes (primarily the excise tax) demonstrated that the increasing fuel consumption for heavier vehicles did not offset the additional repair costs these vehicles imposed (Pogue, 1986). They found that repair costs increased with the weight of vehicles, but decreased with the number of axles, holding weight constant. This finding is similar to engineering studies of long-term road performance (Croney and Croney, 1998; Fenves et al, 2005). Thus, a user fee that accurately reflects the costs imposed should take both the weight and the number of axles into account. A per gallon tax can not closely approximate the costs imposed because of inequities between vehicles of similar weight but different numbers of axles. Furthermore, because large trucks carry weight more fuel efficiently, their user tax per pound declines as weight increases even thought the repair costs are increasing with weight.

Georgia has no substantial provisions in its current array of fuel taxes that provide for the kind of differential tax (based on the number of axles) that Pogue (1986) suggests would increase horizontal equity among vehicles. The excise and prepaid taxes on gasoline (and other fuels) are the same for all vehicles, regardless of the number of axles or weight carrying efficiency. Though certainly inequitable, Georgia's choice of user fee structure is common among states. Only a handful of states apply an additional tax directly to fuel used by commercial carrier (and by assumption larger) vehicles[12] and no state currently has different fuel tax rates based on the number of axles on the vehicle.

The more common approach has been to impose a different tax rate for fuels commonly used in commercial transportation. Heavy trucks, which cause more road damage, are more likely to use diesel fuel than passenger cars. Because large trucks move heavy weight more fuel efficiently, the work of Pogue suggests that heavier

[11] On any road, the load per vehicle axle passing over it is mainly responsible for the amount of wear. According to the AASHO Road Test, it was determined that the effective wear inflicted the road is roughly proportional to the 4th power of vehicle weight. As a result, truck traffic is the primary use-based cause of road damage. For more information see Fenves et al. (2005).
[12] See notes #3 and #6 in Appendix Table A1.

vehicles end up paying less than the marginal cost of the damage that they inflict on the road network.

A second feasible way to increase the vertical equity among different vehicle classes would be to have a higher excise tax on diesel than on gasoline. Across the U.S., 14 states and the federal government impose a higher excise tax on diesel than on gasoline, while 8 have a higher rate on gasoline which likely further reduces the vertical tax equity between passenger and commercial vehicles in these states (see Appendix Table A1). The remaining states (which include Georgia) impose the same rates on both fuels.

Physical damage is only one type of cost that vehicles impose. Past a certain threshold, each vehicle on the road also imposes costs on everyone else on the road in the form of congestion. Because a fuel tax cannot vary with driving condition or driving location, it cannot be used to address congestion costs associated with peak-hour traffic.

In response to rising levels of congestion, many large local governments across the country and around the world have turned to or are considering congestion-based tolls or fees, e.g., London, New York, San Diego and Orange County California (Environmental Defense, 2005; Litman, 2006). These tolls in addition to other fees or taxes levied on the use of fuel or the road, and not in place of them.[13] They are time and/or location specific.

Each individual driver would make her choice about paying the fee and using the road based on her individual opportunity cost of time. By increasing the cost of highway travel during specific times in the day, drivers with a lower opportunity cost of time will, in the short-term, choose a different mode, route or time of day to commute. Over time, these commuters may also decide to move closer to their job locations to reduce the commute distance. The people who choose to use the highway at the specified time will pay the toll, but in return they will experience a shorter commute time because of reduced congestion. For the toll to achieve maximum efficiency, it must vary by both time-of-day and location.

[13]It should be noted that a congestion tax could be used to generate all the revenues necessary for road building and maintenance; however, for practical reasons, this alternative has yet to be adopted by any local government. See O'Sullivan, (2000). p. 564

Congestions tolls, when first conceived, were impractical because it initially required closely spaced toll booths along major highways. Such an alternative would have actually increased congestion from the toll collection process. However, advances in technology have lead to several promising alternatives. Most of the recent congestion-based tolling systems in the U.S. are based on in-vehicle devices that monitor and charge commuters based on their incremental use of designated roads or lanes. Nevertheless, the main hurdle of congestion tolls remains toll collection.

Despite popular complaints about Atlanta's increasing traffic congestion problems, there are no congestion-based tolls in Georgia. Currently, the only toll road in the state is GA Highway 400, and the toll is $0.50 regardless of traffic conditions or the time of day, making this toll ineffective for mitigating peak-hour congestion.

VI. Has the Gas Tax Kept Pace with Costs?

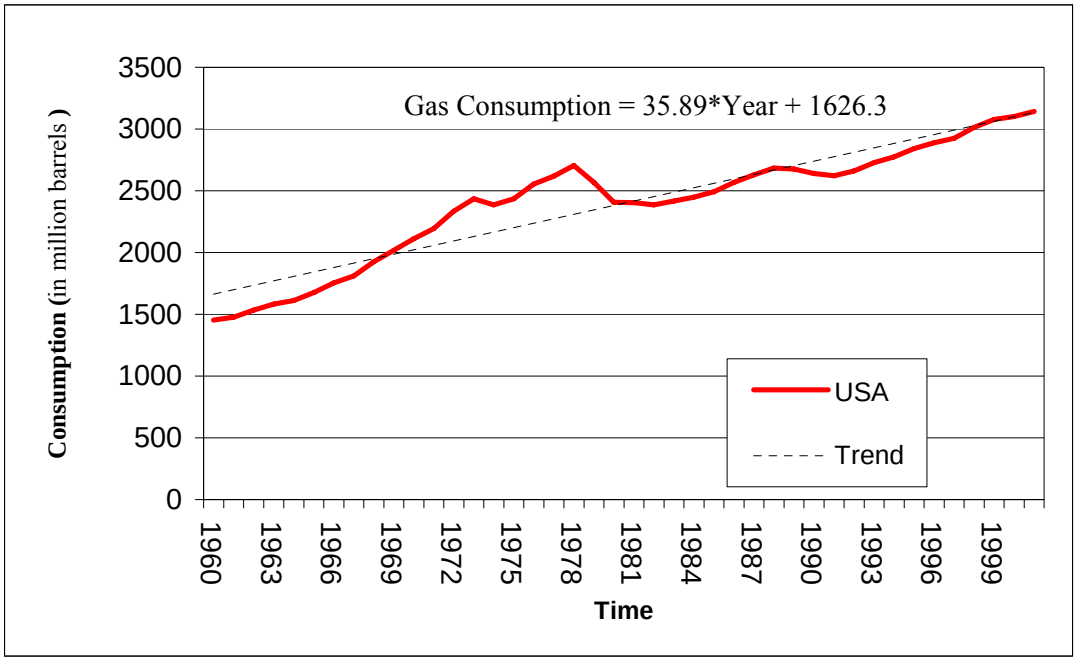
Across the nation, neither gas tax rates nor its revenue has kept pace with the costs of road building. In this section we explore state fuel tax revenues, fuel consumption, highway building costs, and travel data to paint a picture of the changing demand for highways in the U.S. and in the state of Georgia. We also compare the changes in demand within Georgia with the changes in Georgia's inflation-adjusted fuel tax revenue over time to gauge the overall adequacy of the fuel tax as a funding mechanism of highway transportation in the state.

Utilization and Costs

Georgia's population has increased substantially since 1980, bringing with it ever increasing traffic volume. Since transportation demands are tied directly to fuel consumption, one way to visualize long-term demand trends is to examine fuel consumption trends.

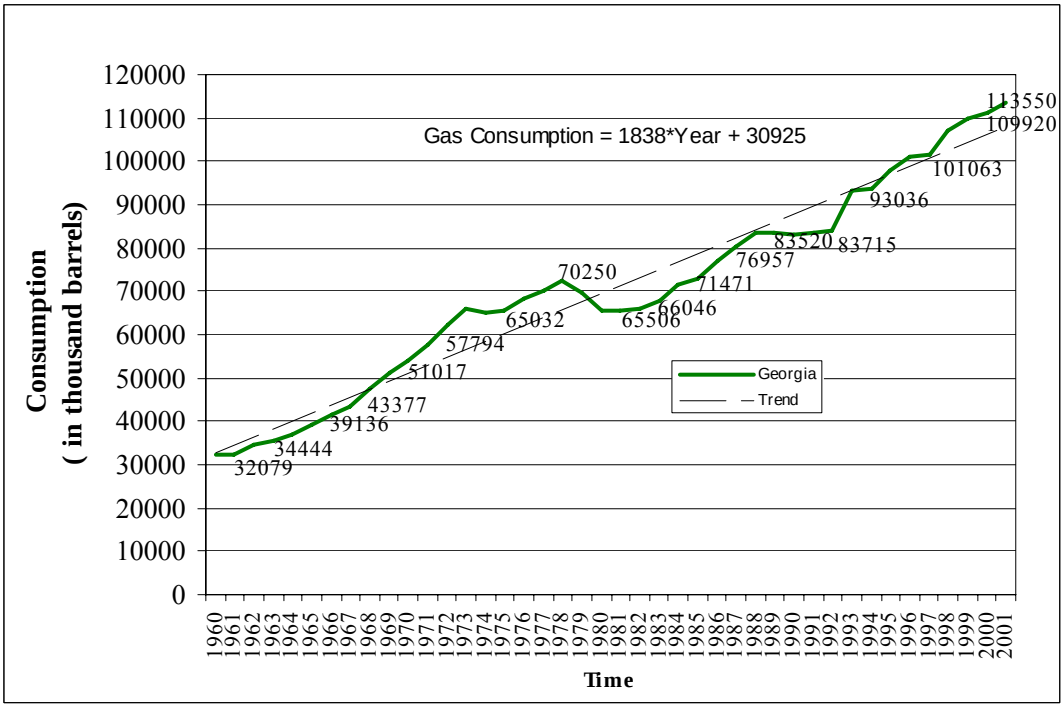
Figures 5 and 6 show gasoline consumption in barrels in the U.S. and in Georgia, respectively, from 1960 to 2001. With the exception of large dips in recession years, the trend in gasoline consumption in both the U.S. and in Georgia has been upward, and in recent years consumption in Georgia has been slightly above the linear trend for the state. Given that fuel efficiency has increased over the period, the upward trends in Figures 5 and 6 indicate that demand for highway transportation in the U.S. and in the state of Georgia has increased substantially and steadily since the 1980s. Given the linearity and stability of both trends, Georgia should expect gasoline consumption to continue to increase.

FIGURE 5: MOTOR GASOLINE CONSUMPTION IN THE US1960-2001 (IN MILLIONS OF BARRELS)



Source: The Energy Information Administration

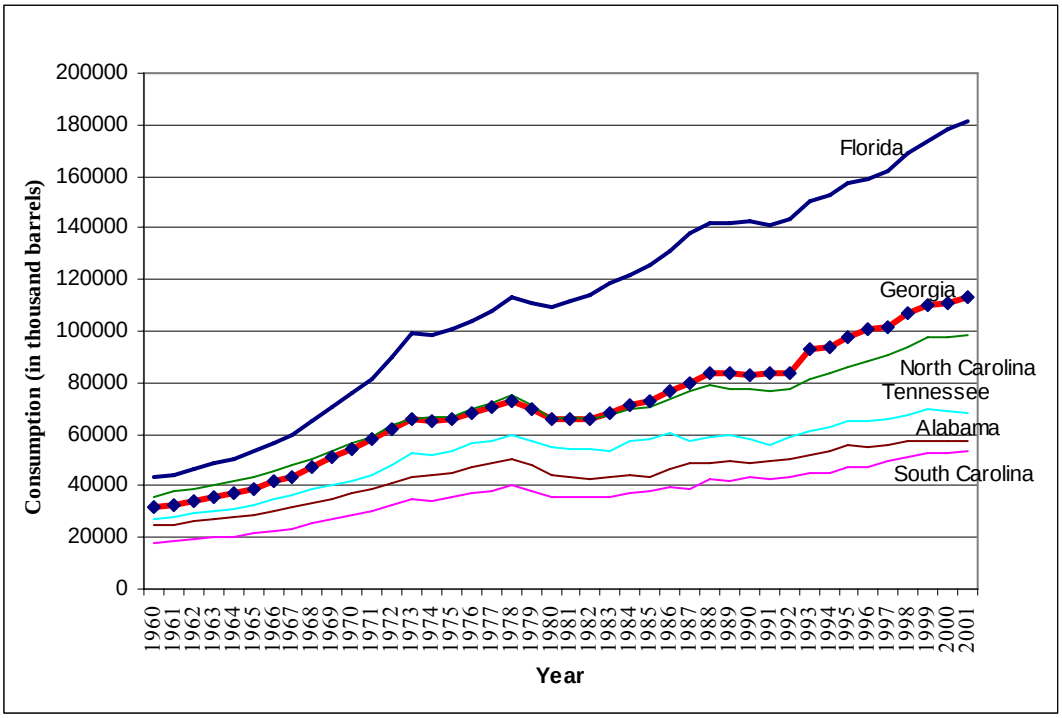
FIGURE 6: GASOLINE CONSUMPTION IN GEORGIA 1960-2001 (IN THOUSAND BARRELS)



Source: The Energy Information Administration

Figure 7 compares the annual gasoline consumption of Georgia with that in neighboring states. Florida's demand for gasoline is substantially larger and has increased at a much faster rate than in other states that border Georgia. However, Florida's increasing demand is likely due in part to gasoline sales to non-residential vacation travelers. In 1960, Georgia's gasoline consumption was lower than that in Florida and North Carolina; however, since the 1980s, Georgia's gasoline consumption surpassed North Carolina's and, with the exception of Florida, has grown faster than other states in the immediate area.

FIGURE 7: GASOLINE CONSUMPTION IN GEORGIA AND SURROUNDING STATES 1960-2001 (IN THOUSAND BARRELS)



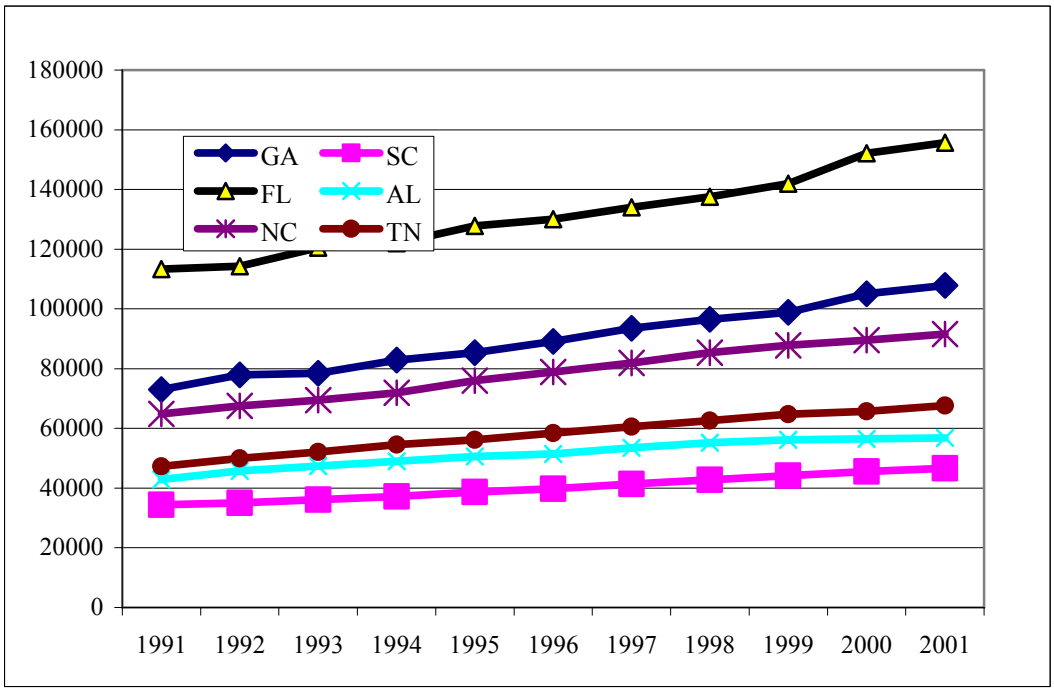
Source: Energy Information Administration

We might expect that the rise in popularity of SUVs in the 1990s could explain some of the increased demand in gasoline across the country and in Georgia. A recent report from the U.S. Environmental Protection Agency that tracks the average fuel economy of vehicles indicated that average miles per gallon (MPG) increased in the late 1970s and early 1980s. Over the 1990s, however, average MPG declined because of higher sales volume of heavier truck-based SUVs, but the decline

was not substantial. The report states that overall the average fuel economy has remained essentially flat over the past 15 years, thus, increased demand for gasoline in Georgia is not likely to be entirely due to substantially lower fuel economy of vehicles, unless Georgia's vehicle sales mix is substantially different from that in the rest of the country. Taken together, no change in average fuel economy of vehicles and increasing average fuel consumption, indicates that traffic volume in Georgia has increased at a considerably faster rate than in most of its neighboring states, except Florida.

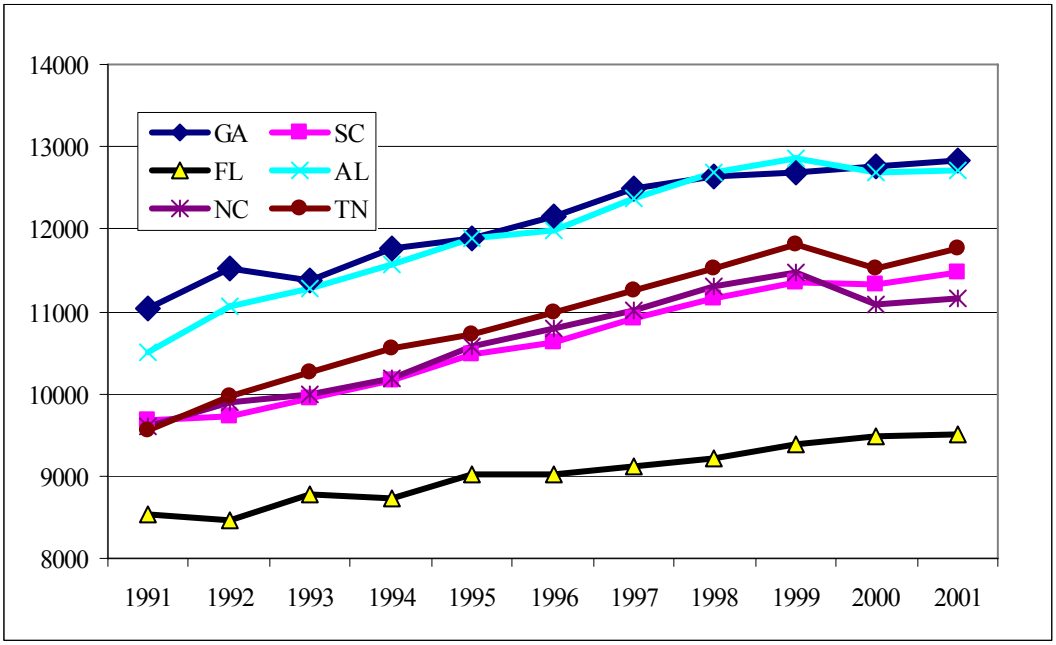
At about the same time that average fuel economy remained close to constant (1990-2001), the annual driving distance increased substantially for Georgia and surrounding states. In 1990, the average Georgian drove 10,500 miles annually, but by 2001, that had increased to 12,700 (or a 21.0 percent increase in annual driving). Although Florida's total miles traveled remained higher than that in Georgia, miles traveled per capita remained highest in Georgia and Alabama. Among its neighbors, Georgia remained at or near the top in both total miles traveled and total miles traveled per capita (see Figures 8 and 9).

FIGURE 8: TOTAL VEHICLE MILES TRAVELED (1991-2001)



Source: Federal Highway Administration

FIGURE 9: VEHICLE MILES TRAVELED PER CAPITA (1991-2001)



Source: Federal Highway Administration and The U.S. Bureau of the Census

The lack of substantial changes in average fuel economy of vehicles over the past 15 years along with demand trends measured by fuel consumption (Figures 5 and 7) and by vehicle miles traveled (Figures 8 and 9), indicate that increasing gasoline sales are due primarily to increased traffic loads or miles traveled. Furthermore, based on trends in annual travel distance, traffic loads will likely continue to increase over time. Stated another way, use of roads in Georgia is likely to continue to increase into the foreseeable future, both in total and on a per capita basis. If population and vehicle miles traveled (VMT) trends continue, there will be 9.8 million people living in Georgia by 2010 and on average they will spend 14,600 miles on Georgia's roads annually, or 30.6 percent more than they did in 1991.

Revenue

Inflation, population, and the changing fuel economy of cars each have an effect on the revenue generating capacity of the excise tax on gasoline. Although the overall price level of goods and services has risen steadily over the past half century, only the state Rhode Island has seen its excise tax rate increase faster than inflation. Had all states adjusted their gasoline excise tax rates for inflation (as measured by the

Consumer Price Index) beginning in the 1950s, when the Highway Trust Fund was implemented, the average excise tax rates across the U.S. would be 38.2 cents per gallon (in addition to the federal gas tax) instead of the actual average of 21 cents per gallon. Had Georgia's gasoline excise tax rate increased with the rate of inflation over the same period, the current rate would be 43 cents per gallon instead of its current rate of 7.5 cents per gallon or 17.1 cents per gallon including the prepaid fuel tax.[14]

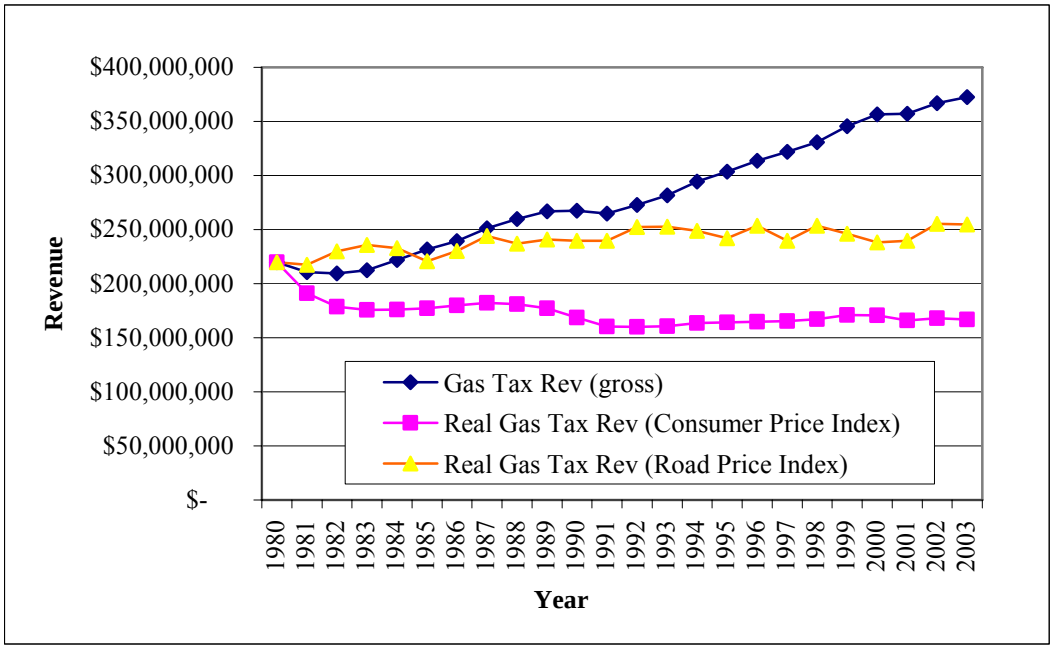
For the gas tax to be an effective and adequate source of revenues for funding highways, given the current fuel economy of vehicles, it must both keep pace with inflation and with traffic volume on highways. We adjust for inflation using two different indices of costs. The first adjustment uses the Consumer Price Index (CPI), which is produced by the Bureau of Labor Statistics and is commonly used to adjust prices between years within the U.S. The second adjustment for inflation uses the Price Trends in Federal-Aid Highway Construction produced by the Federal Highway Administration.[15]

Using the CPI, Georgia's inflation-adjusted fuel tax revenues (excise tax and prepaid tax) have been relatively stable since 1990 (Figure 10). Between 1980 and 1990, however, revenues declined after adjusting for inflation. Over the period between 1980 and 2003, inflation-adjusted (real) gasoline excise tax revenues declined by $52.9 million (or by 24.1 percent). However, when we deflate revenues by federal-aid highway construction costs, real revenues experience an increase of 15.9 percent over that same period.

Although these indices provide very different answers as to whether revenues have kept pace with inflation, Figure 11 goes a step further and calculates both price-deflated revenues on a per capita basis. Regardless of which index is used, Georgia's per capita revenues have declined substantially. Between 1980 and 2003, the average Georgian has seen her inflation-adjusted user fees decline by between 27.1 percent or 52.2 percent, depending on which price index is used, while vehicle miles traveled increased.

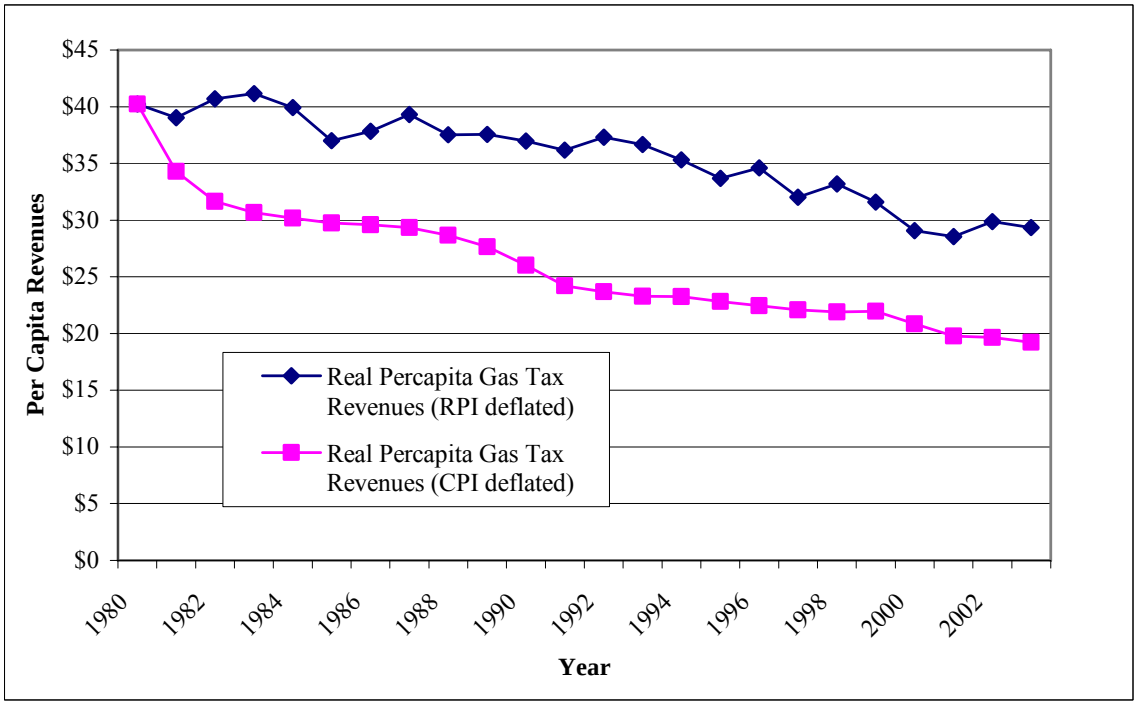
[14] See Appendix Table A4 for estimates for each state.
[15] See Appendix Figure A1 for a graph depicting annual costs in highway construction.

FIGURE 10: REVENUE FROM GASOLINE TAX (GROSS)



Source: Georgia Department of Revenue Statistical Reports 1980-2003

FIGURE 11: PER CAPITA GASOLINE EXCISE TAX REVENUES

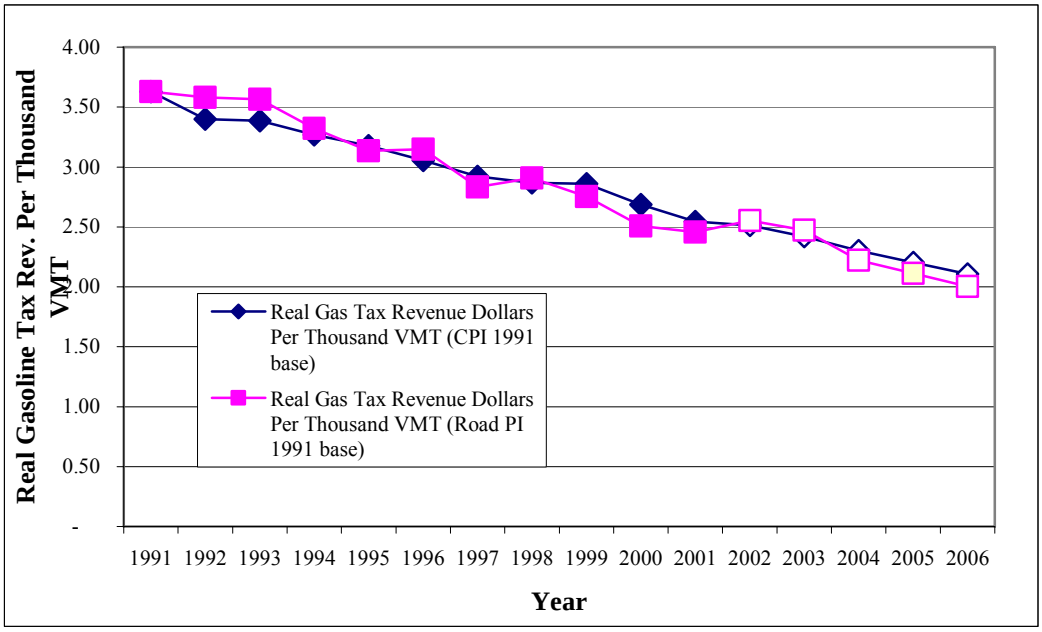


Source: Federal Highway Administration

A declining user fee, however, does not indicate that highways in Georgia are under funded. For most public goods, like roads, one might expect the average user fees to decline as users are added because the only additional costs imposed by one more user is her marginal wear on the road and her impact on congestion. However, maintenance for roads and bridges are based primarily on usage. The most often used measure of road and bridge usage is the VMT.

Figure 12 provides real gas tax revenues collected per vehicle mile traveled using both the CPI and the road construction price index. One would expect that, for a given size vehicle, each VMT should generate approximately the same physical costs. Therefore, over time, the inflation-adjusted revenue per VMT would need to be the same, year after year, just to maintain a highway system. However, Figure 12 shows that even when deflating with the road price index, revenue per vehicle mile has declined substantially in the past decade. Not only is the average Georgia residents paying less in absolute terms per year, she is also paying less per mile of travel. Over time, declining revenue per VMT would lead to disinvestment in the highway network, or a shift from construction expenditures to maintenance expenditures.

FIGURE 12: GASOLINE EXCISE TAX REVENUE PER THOUSAND VMT (ESTIMATED 2002-2006)



Source: VMT 1991-2001 comes from the Bureau of Transportation Statistics. The highway construction price index comes from the Federal Highway Administration. The CPI comes form the Bureau of Labor Statistics.

Highway transportation demands are expected to continue to rise. Based on the linear trends, by 2010, the average Georgia resident will be driving a distance in excess of 14,600 miles a year, which is 11.3 percent more than in 2003 and 30.6 percent more than in 1991. Furthermore, if trends continue in the real revenue raised per vehicle mile traveled, Georgians can expect their average user fee per mile traveled to continue to decrease. Linear projections using both price indices indicate gross state gasoline excise tax revenues between $1.26 and $1.65 per thousand VMT by 2006, a substantial reduction in revenues per VMT regardless of which index is used (Figure 12). An increase in congestion, a decrease in road maintenance, road quality, and highway safety are likely the eventual result of the reduction in revenue per VMT.

VII. Alternative Avenues of Transportation Financing

In the past, user-based taxes have been supported by both policymakers and the public alike; however, the idea of increasing current fuel tax rates or imposing altogether new fuel taxes, even to support critical highway infrastructure upgrades and expansions, has become so unpopular that it has forced policymakers to seek alternatives to the fuel tax for raising revenues.

This growing divide between transportation demands and transportation revenue is not confined to Georgia (see Appendix Table A4). Because all states use an excise tax on gasoline to fund a large portion of transportation, to some extent they all face the same fundamental problems. A per unit excise tax (i.e., one that is based on the volume of gasoline used) has two primary shortcomings as a revenue source intended to maintain highways: 1) the revenues are tied to the volume gasoline sold and not to price, thus, revenues rise only with consumption, not inflation, and 2) increasing fuel economy of cars, over time, will lead to a declining tax paid per mile traveled. This section describes some of the alternative funding mechanisms available to transportation policymakers.

One alternative for increasing funding for Georgia's highways and bridges could be to use revenues from the general fund to supplement user-based taxes for highways. The primary benefit of such an option is that the general fund represents a substantially larger revenue base than is available from the gas tax. There are several issues, however, that make this option undesirable. First, it would reduce the connection between beneficiaries of the road network and the costs they generate. Most notably, non-resident drivers would pay less and resident drivers and non-drivers would pay more. Furthermore, it would increase the competition between road funding and other government programs, like education (see Table 2). In 2003, more than half of the state's general revenue was spent on education (elementary, secondary and post secondary). Georgia state government currently spends more from the general fund for roads and bridges than the average state (only Alaska and New Jersey spend more as a percentage of their budget), and highways are currently the only state government program that has available to it both a constitutionally dedicated revenue source and access to the state's general revenues.

TABLE 2: DISTRIBUTION OF STATE GENERAL FUND EXPENDITURES (DOLLAR AMOUNT IN MILLIONS), FY2003

	GA ($)	GA (%)	US ($)	US (%)
Elementary & Secondary	6,030	41.3	177,292	35.5
Higher Education	1,988	13.6	60,547	12.1
Public Assistance	190	1.3	11,067	2.2
Medicaid	1,609	11.0	82,322	16.5
Corrections	1,230	8.4	35,087	7.0
Transportation	639	4.4	3,009	0.6
All Other	2,903	19.9	130,103	26.1
Total	14,589	100.0	499,427	100.0

Source: Kaiser Family Foundation at http://www.statehealthfacts.kff.org.

Currently, the ad valorem tax on vehicles is included as part of county general revenues. Part or all of this revenue source could be dedicated to roads: however, this would require a constitutional amendment similar to the one used to earmark fuel taxes for highway building and maintenance.

Georgia's fuel excise taxes could be periodically adjusted. If the gasoline excise tax is to remain the primary source of funding for the construction and maintenance of roads and bridges, it could be periodically adjusted to account for changes in construction costs and fuel efficiency. Adjustments could be enacted periodically through the legislative process; however, in practice this alternative is difficult. In Georgia the excise tax on gasoline has remained at 7.5 cents per gallon since 1971.

An alternative adjustment method that has been used in Wisconsin (in 1985) and Maine (in 2002), and considered in several other states, is the indexing of the fuel tax rate. Fuel tax indexing is the automatic and periodic adjustment of the state fuel excise tax rate by small and predictable amounts (up or down) to reflect inflation as measured by a generally recognized cost index. The adjustment is similar to a Cost Of Living Adjustment (COLA) made to wages and retirement benefits. Automatically adjusting the fuel excise tax rates by a formula that accounts for the annual changes in road construction and maintenance costs could be used to provide long-term funding stability for road building, while keeping the incremental rate adjustments small.

According to a recent report from Wisconsin's Transportation Development Association, the average annual price increase between 1985 and the present day due

to the tax has been less than 0.5 cents per gallon, while the price of fuel at the pump has fluctuated by as much as 34 cents per gallon in a single year.[16] Tying the fuel tax rate to overall prices, and not to the price of fuel alone, also prevents funding problems that arise when fuel prices decline relative to other prices. States, like Georgia, which uses a tax based on fuel price saw real revenue from the fuel sales tax decline during the 1990s when fuel prices were stable or falling and other prices were rising steadily. Recently, however, fuel price increases have outpaced inflation.

Though credited as being effective in stabilizing real revenues for highway projects in these states, fuel tax indexing in Wisconsin, Maine and the other states considering indexing as an option has been hotly criticized for taking the decision to increase taxes out of the voters' and legislators' hands. Because rates are determined by a formula, annual tax adjustments are made without oversight from policymakers. As a consequence, indexing has been blamed for substantial budget-creep over the past 20 years in the Wisconsin's state transportation department. However, other types of taxes that grow at the rate of inflation have not faced the same criticism. The general sales taxes, most property taxes and state income taxes increase with prices, home values and wages, but generally these taxes are criticized based on their nominal rates, not on the basis of indexing.

A more geographically targeted alternative that has been proposed by the Georgia Municipal Association (GMA) for Georgia is a regional fuel tax. A regional fuel tax would divide the state into separate taxing jurisdictions for the purpose of levying and collecting fuel taxes and adopting highway projects. Differential fuel tax rates would be possible within the state, along with differential revenues by region. The effect of a regional fuel tax would be to transfer many of the decisions about revenue generation and highway development to a more local level, similar to what Florida has done.

A regional fuel tax has several potential difficulties. To implement a regionally-based fuel tax would require changes to state law and would require an amendment to the State Constitution, which currently prohibits local taxes on motor fuel. If regions are to consist of multiple counties, there may be disagreement about

[16] See Transportation Development Association of Wisconsin (2005).

which counties belong in each region. Once these political obstacles are overcome, there remain administrative hurdles. Currently, fuel taxes are collected at the distribution level, not at the retail level. To accurately allocate taxes to the correct jurisdiction, additional information would have to be collected from the distributor, or the collection of the tax would have to be moved to the retail level where the local sales tax is currently collected.

Differential tax rates across jurisdictions provide an incentive for cross-jurisdiction shopping for fuel. If the price of fuel only differs by the tax, Georgia residents, especially drivers who commute between regions, will have the incentive to purchase fuel in low-tax regions. However, this incentive is likely to be small relative to other retail purchases. For example, a 3 cent per gallon price differential would result in a $0.60 difference in the cost of a 20 gallon fill up. That would amount to about 0.25 gallons of fuel at $2.40 per gallon. At 24 miles per gallon, a driver might be willing to drive up to 6 miles round trip to obtain fuel at the lower price, excluding time costs.

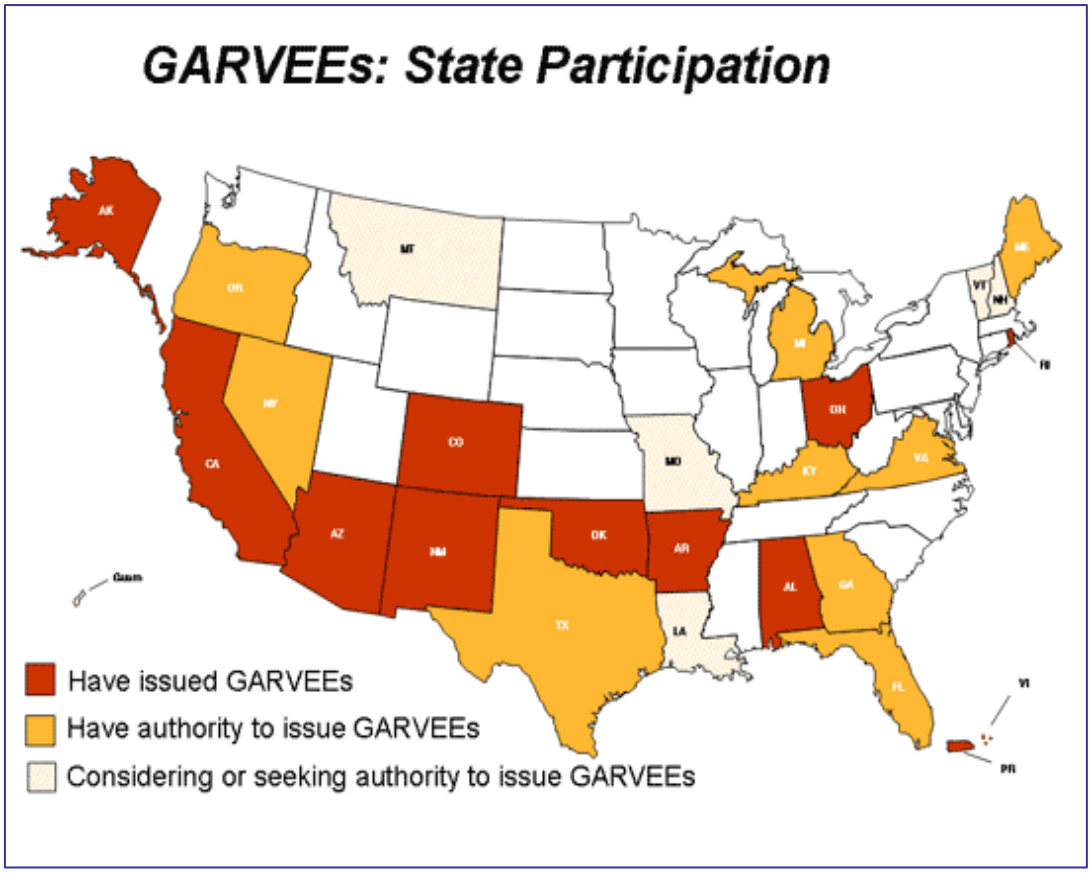
Differences in fiscal capacity among regions may also result in difficulties maintaining consistent transportation quality across the state. Regions with the greatest transportation needs may not necessarily be the ones that will end up with the revenues. Furthermore, if each region is allowed to pursue its own transportation agenda, there may be difficulties aligning all the regional projects into a coherent state plan, an issue that plagued the development of a federal highway system in its earliest years.

Another transportation funding alternative that is growing in popularity among states is debt financing. A recent report (Wachs, 2003) points out that between 1995 and 1999, collections of user fees through tolls and taxes increased by only 18 percent, while borrowing to fund transportation projects increased by 92 percent. Some states have issued bonds that borrow against anticipated federal transportation appropriations and future transportation earmarked tax revenues to cover the difference between current revenues and current transportation demands.

Grant Anticipation Revenue Vehicles (GARVEE) bonds allow states to borrow funds for road building and maintenance based on anticipated federal apportionments. In some cases, future state fuel tax revenues are also pledged as

additional revenue sources (Back-Stopped GARVEE). As of 2004, 16 states have issued GARVEE bonds totaling $7.5 billion dollars (Puentes and Warren, 2005). An additional nine states have authorized GARVEE bonding, including Georgia and Florida (see Map 1).

MAP 1. GARVEES: STATE PARTICIPATION



Map Source: American Association of State Highway & Transportation Officials

The touted benefits of GARVEE are the following:

- Accelerated project delivery
- Cost savings from speeding up projects
- May allow states to avoid state debt limits
- No bond referenda required

The main benefits most proponents of GARVEE bonds cite is that they allow road or bridge projects to be initiated sooner and constructed more quickly. In doing so, states may avoid cost inflation associated with large projects that take multiple

years to complete and are able to more quickly realize any economic benefits of the project. Possibly the most desirable benefit of building roads today using GARVEEs is that if policymakers are able to anticipate regional population growth, they can lower the cost of land acquisition by buying land before it is populated and developed; but, anticipating regional growth brings with it its own difficulties.

There are also concerns about risks and costs of the GARVEE option. First, GARVEES increase debt, debt service costs and do not produce new revenues. Second, there are risks regarding federal reauthorization.

Speeding up the rate at which highways are built may satisfy current demand for highway construction, but if population growth is expected to continue, the state is simply moving future consumption of highways into the present. In doing so, the state may be reducing the amount of revenues available for future road building and future maintenance. Furthermore, new roads bring with them new and increased maintenance costs. A road built today will increase total maintenance costs in the future; however, if the new road is financed with GARVEEs, part of future highway revenues will be diverted to repaying the bonds outstanding, leaving even less revenue for future maintenance of presently existing roads.

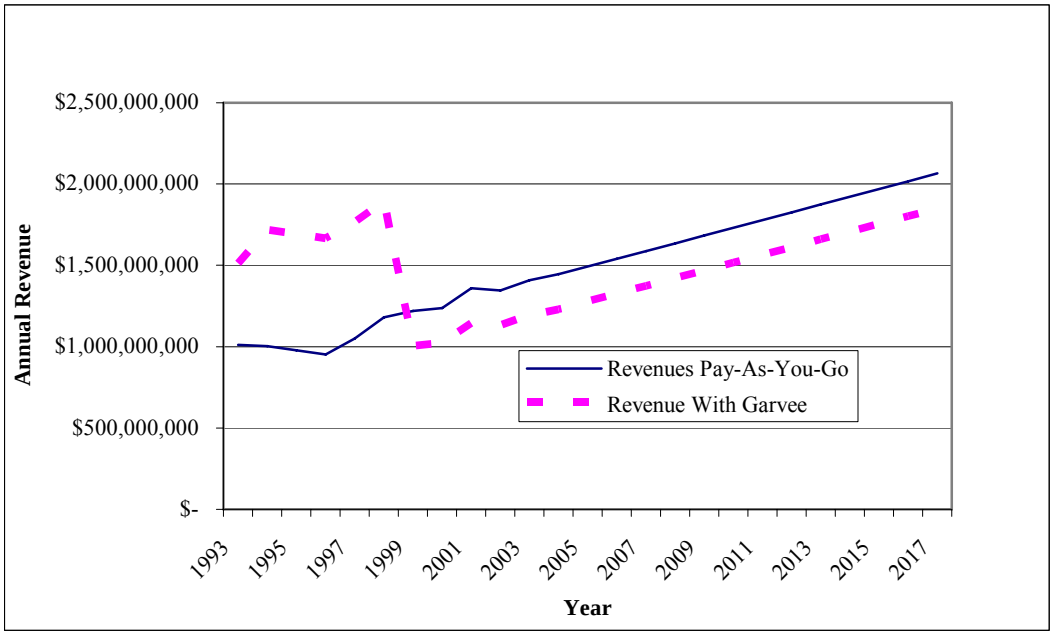
GARVEEs also carry with them some risk because revenues are not certain. GARVEEs rely primarily on federal highway funds for debt service; however, if Congress does not continue to authorize highway funds during the full term of the bond, the states must find other revenue sources for bond repayment.[17]

Figure 13 depicts two funding options that Georgia could have undertaken starting in 1993, fund highways with only pay-as-you-go (PAYGO) or augment PAYGO with a GARVEE of $3 billion. Since Georgia actually has not used GARVEEs at this point, the line representing the PAYGO option is the choice that was actually made. However, these two options are constructed using highway revenues from 1993 to 2004 and forecasted revenues through 2017.

Let us assume that in the second option the state borrows against future federal highway allocations and spends the $3 billion along with other federal and state revenues (less bond payments) on roads and bridges over a 6-year period

[17] For a detailed description of the positive and negative aspects of the adoption of GARVEE bonds for transportation, see Puentes and Warren (2005).

FIGURE 13: ANNUAL REVENUES AVAILABLE UNDER TWO ALTERNATIVE FUNDING OPTIONS



following the bond issuance (spending the money all in the first year would likely place inflationary pressures on road building). The effect is an increase in the revenues available in the earlier years, and a decrease in the revenues available in later years. We use the Federal Highway Administrations Index of Road Building Costs, along with forecasted values of the index, to adjust available revenues for inflation in road building. The cost of borrowing the money is at the prevailing rate of interest, and not tied to changes in road building costs.

Whether speeding up the road building process saves tax dollars over the long term depends on the interest rate at which the bond is issued. Cost saving from borrowing and building in the present is only possible if the costs of debt financing are offset by the gains or savings from avoiding inflation.

It should be noted that there are others costs of delaying projects that may not be fully captured in the interest and inflation rates, such as improved transportation safety, improved highway rehabilitation scheduling, and potential economic development from road building; however, these costs are generally unquantifiable. Nevertheless, in the example depicted in Figure 13, for borrowing to result in an overall cost savings through the avoidance of inflation, the 1993 GARVEE bond

would have required an interest rate of 5.07 percent or lower. A bond interest rate of 6 percent would have resulted in a real (inflation adjusted) loss of $286 million in 1993 dollars over the life of the bond (and a real loss of $605 million at a 7 percent interest rate), given prevailing road building costs. This example is only meant to illustrate for Georgia the inherent uncertainties involved in GARVEE bonds that may be overlooked.

By promising future federal highway disbursements (and possibly tax revenues), a state reduces its ability to remain fiscally flexible, especially if changes were to occur in the appropriation and authorization of federal funds. By binding future revenues to a particular slate of projects, a state becomes less able to reallocate money to new priorities. Furthermore, road building costs have historically risen slower than the costs of other goods and services in the economy. Between 1980 and 2001, the overall price level as measured by the CPI increased by 115 percent, whereas the costs associated with building roads increased by 49.0 percent. According to Kennedy (2006), road building costs have risen substantially over the past two years. Repairing damage from two hurricane seasons has increased the demand for construction inputs and services. The result has been a price spike for inputs such as concrete, fill dirt, and asphalt and a tightening market for construction and road building services. Using GARVEE bonds to speed up past highway projects may have allowed those issuing jurisdictions to avoid the price increases that have accompanied two consecutive abnormally destructive hurricane seasons. For jurisdictions considering a GARVEE bond, it is difficult to determine how much weight to place on the long-term trend in road costs versus the short-term price fluctuations when estimating the potential cost savings from avoiding inflation.

Of all the options described, the most fiscally conservative method of ensuring stability and flexibility in road funding would be through increasing the fuel excise tax rate either by the legislative process or by an automatic indexation of the rate (with periodic readjustment). Either course allows highways to remain user-fee based without adversely affecting the fiscal underpinning of future highway funding.

Although GARVEE bonds do not change the funding sources for highways, they provide a potential avenue for speeding up the rate at which highway projects are undertaken, but at an additional cost and at a fiscal risk. By using GARVEEs, a

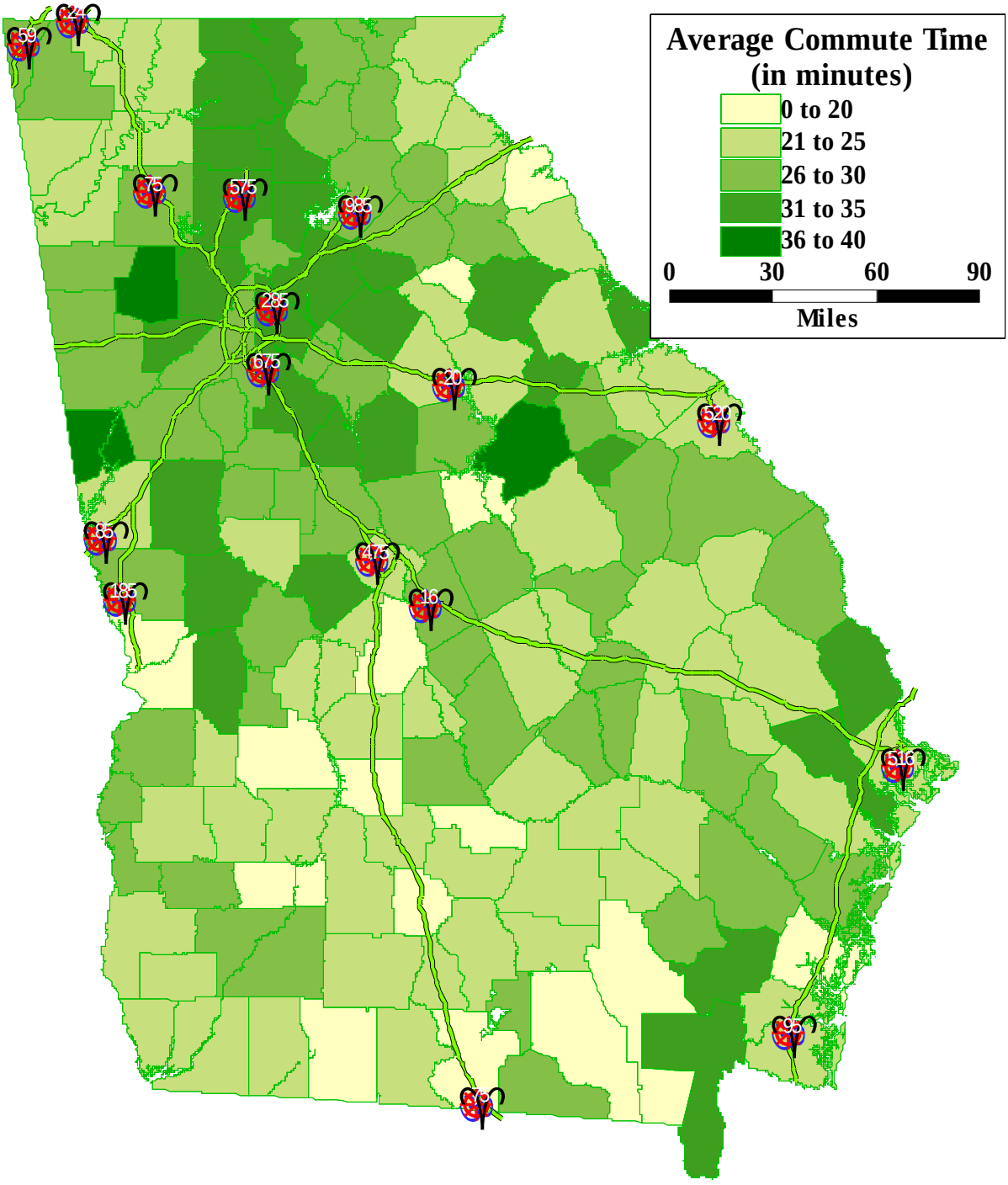
state is effectively locking into a package of transportation projects and improvements that ties the hands of future legislators and possibly commits future funds from sources outside the direct control of the state. In all, GARVEE bonds have a relatively limited appeal for road finance, but, as Map 1 (page 35) indicates, they are, nevertheless, increasing in popularity.

VIII. Potential Gains and Losses from Increasing the Gas Tax

Any change in the Georgia's gasoline excise tax will have a differential effect throughout the state. The following section examines the likely effects of a change in the state's gasoline excise tax at the county level, using the average commute time and employment in gasoline stations as a measure of gasoline sales.

Residents with longer average commute times are likely to consume larger quantities of gasoline and, in turn, pay more excise tax per commuter. Within Georgia, commute times differ substantially by county. Map 2 depicts average commute times for Georgia's counties divided into five-minute intervals for 2000. As Map 2 shows, those counties with higher average commute times are more heavily concentrated in the northern half of the state. The largest concentration of counties with long commute times is north of I-20, surrounding Fulton County and extending north along the I-575 and Highway 400 corridors to the state line. Paulding County stands out as having the longest average commutes in both the Atlanta MSA and for the state. Notably, Hancock, Heard, and Paulding, each having average commute times in excess of 35 minutes, all lack direct access to interstate highways. But this measure is subject to several limitations. Speeds differ, and thus, longer commute times may not reflect longer distance commutes, but slower commutes. Additionally, commutes from out of state are not captured at all.

MAP 2: AVERAGE COMMUTE TIMES

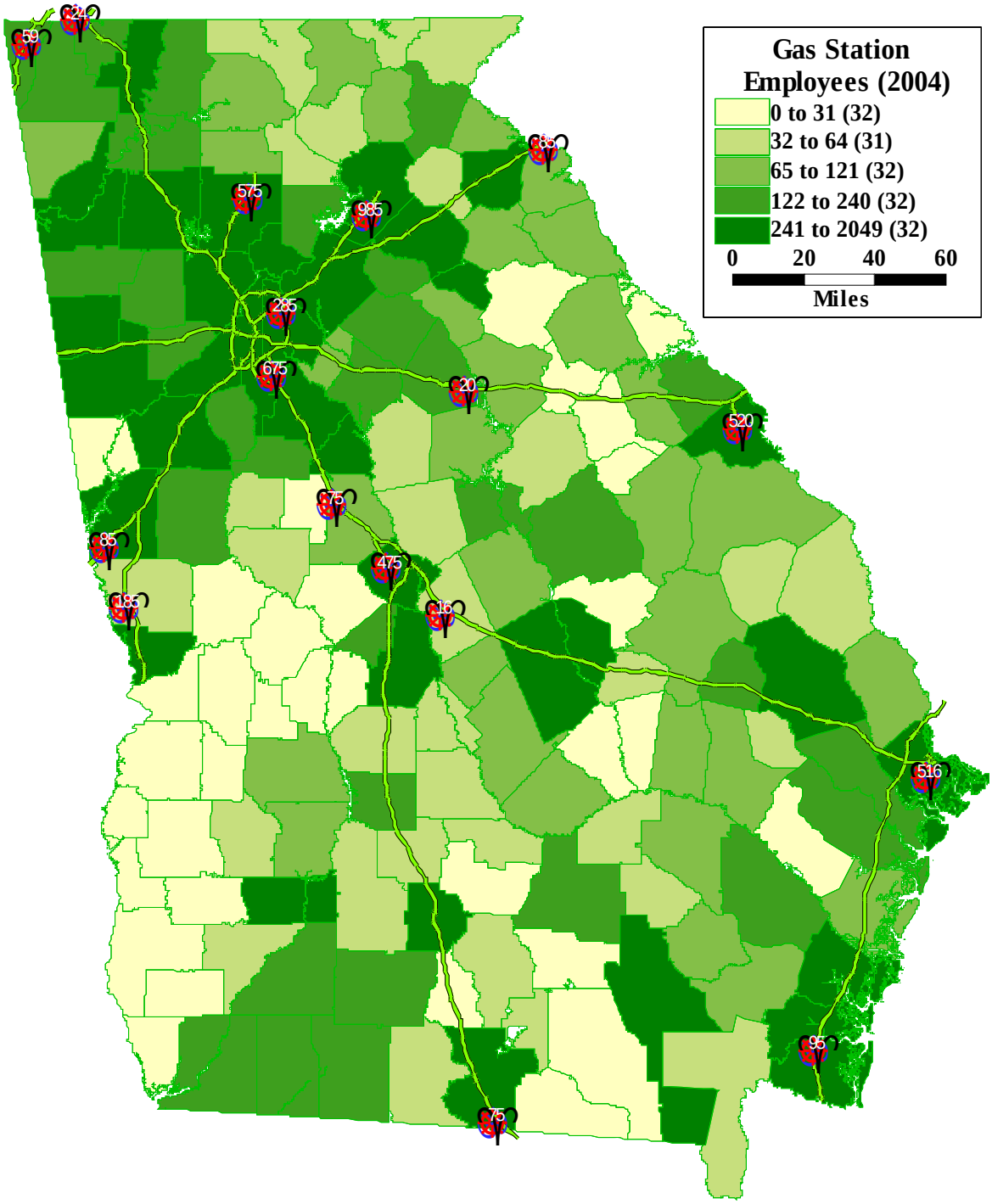


Map 3 depicts the county employment in gasoline stations for 2004. If gas station employment is indicative of sales in gasoline, counties with higher levels of gasoline station employment will end up generating more gasoline excise tax revenue, in total. The main limitation of this measure is that sales volume differs across stations.

Again, the Atlanta MSA has several counties with a relatively large number of gas station employees; however, several urban areas in the southern parts of the state also have large gas station employment. The counties containing more urbanized areas like Macon, Columbus, Dublin, Statesboro, Albany, Tifton, Valdosta, Savannah, and Brunswick each have relatively high numbers of gas station employees. Furthermore, having access to a major interstate highway appears to substantially increase the likelihood that a county will have a relatively high level of gas station employment. Counties with the least number of gas station employees are most concentrated in the southwestern area of the state, extending from just south of Columbus to Georgia's state line in the south.

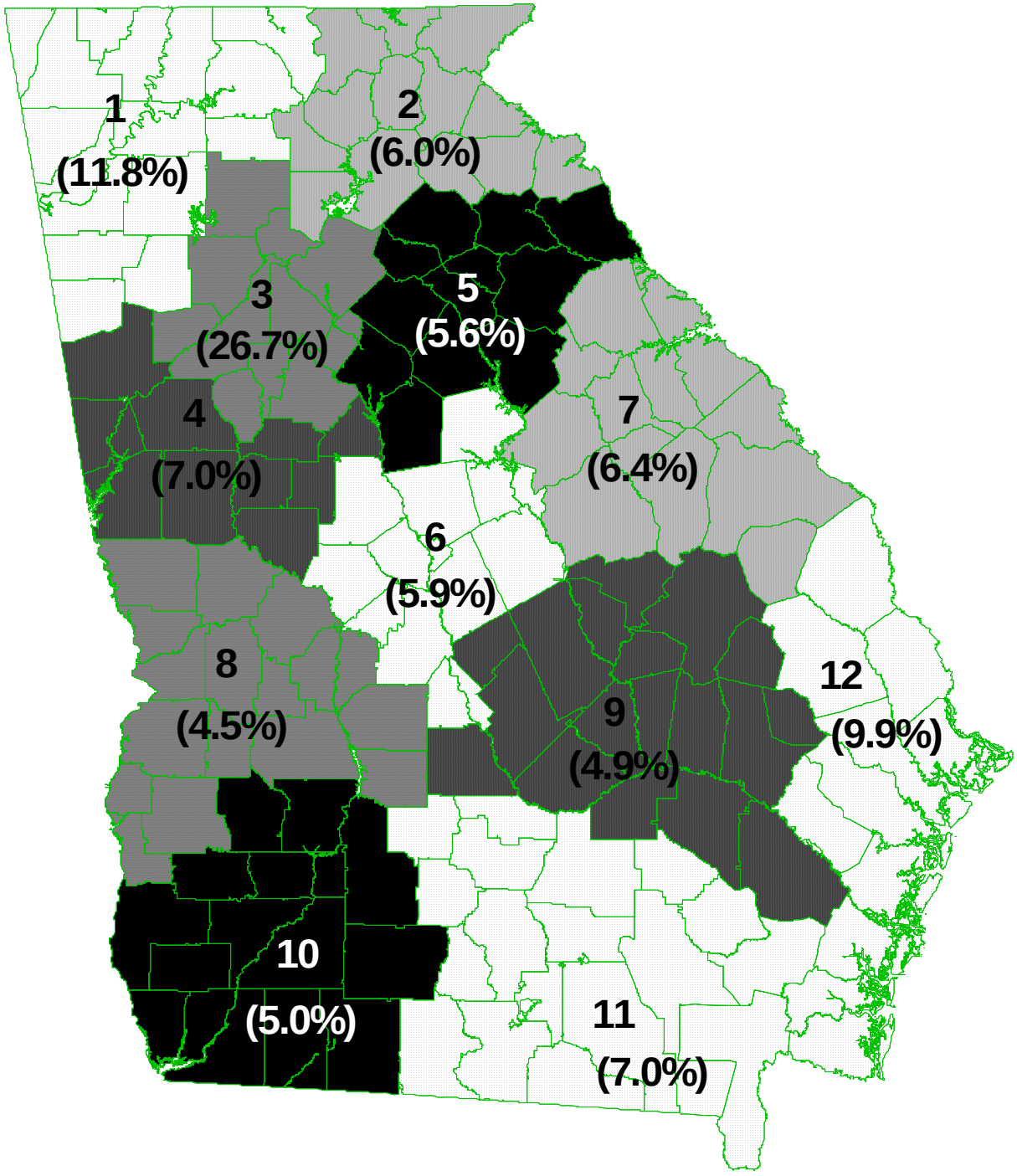
Whether measured by employment or commute time, changes in the gasoline tax are likely to have a geographically concentrated effect concentrated in the northern half of the state and centered on the Atlanta Metropolitan Area. The average commuter in the northern half of the state tends to commute for a longer period of time, thus, will bear a larger burden from a tax increase on an individual basis. Counties with large urban areas and with access to interstate highways contain more gas station employment and, for this reason, an increase in the gas tax will draw more from these counties.

MAP 3: COUNTY-LEVEL EMPLOYMENT IN GASOLINE STATIONS



Using a county's share of the employment in gasoline stations as a measure of the county's share of fuel tax revenue, we find that the 10-county Atlanta Regional Commission area accounts for 26.7 percent of the state's total. Map 4 shows the proposed regions in the GMA proposal and the estimated state share of regional fuel tax revenue from each region. Appendix Table A5 presents the share for each county and the proposed regions for the regional gasoline tax.

MAP 4: ESTIMATED STATE SHARE OF A REGIONAL FUEL TAX BY REGION



IX. Exporting the Tax

The following section uses a simple linear regression to estimate gasoline sales in Georgia made to visitors from other states. The purpose is to provide an estimate of the degree to which non-residents pay for the use of Georgia's roads.

It is expected that some of Georgia's gasoline tax is exported to citizens of other states. Travelers, visitors and cross-border shoppers that purchase gasoline within Georgia account for a portion of the total revenues generated by the tax. However, there are no data available on the gasoline purchases made by non-residents in Georgia, and the Georgia Department of Revenue does not estimate the effects of cross-border gasoline sales. We can estimate the amount of fuel used by Georgia residents indirectly and from that calculate the likely Georgia gasoline sales made to non-residents.

Let us assume that in all states the per person gasoline consumption is approximately the national average. In Georgia, the actual gasoline consumption is substantially above the national average. In 2003, Georgians consumed an average of 569.6 gallons of gasoline per year, while the average for the U.S. was 461.8 gallons per year.

Some of the difference might come from commute distances. Georgia contains a relatively large rural population, even within the Atlanta MSA. Residents of rural areas tend to face a longer commute to work because of the relatively low geographic density of jobs. Another factor that would affect demand is car ownership. Families with multiple commuters that commute to different jobs would tend to use more gasoline than families that have only a single commuter, or multiple commuters that carpool. Income may also be an important factor in gasoline demand. If gasoline is a normal good, persons with higher income will consume more gasoline. After accounting for these factors, the difference that remains between average consumption of gasoline in the U.S. and in Georgia would be the effect of non-residential gasoline purchases in Georgia. The differences between actual and expected gasoline consumption is expressed in Table 3.

TABLE 3. ESTIMATED NET MOTOR FUEL TAX EXPORTING, 2001

State	Per Capita Sales of Gasoline 2001	Estimated Per Capita Sales of Gasoline 2001	Difference	Estimated Percent Exported
Alabama	539.4	530.0	9.3	1.8%
Florida	464.2	411.8	52.4	12.7%
Georgia	569.6	490.3	79.2	16.2%
North Carolina	507.7	518.2	-10.5	-2.0%
South Carolina	557.4	503.3	54.1	10.7%
Tennessee	501.8	502.6	-0.8	-0.2%

After accounting for other factors that might affect gasoline consumption, we estimate that Georgians are expected to consume 490.3 gallons of gasoline per person per year, or 79.2 fewer gallons per person than what is actually consumed in Georgia. By interpreting this difference as non-residential purchases, we estimate that 16.2 percent of total gasoline sales in Georgia are made to non-residents and, as such, represents at least a partial exporting of the burden of the fuel tax to non-resident drivers. Thus, a sizable part of any increase in the state's gasoline excise tax will be borne by residents of other states that use Georgia highways.

X. Summary and Conclusions

Population growth, longer commutes, and more commercial traffic have increased the demands on Georgia's roads and bridges; but revenues from Georgia's fuel tax have not kept pace with either the costs of road construction or the rising demands being placed on the road network. Inflation has eroded the revenue generating capacity of the fuel excise tax. The addition of the 2nd Fuel Tax, now part of the Prepaid Tax, provides some amount of cost adjustment, but the adjustment is small and far from adequate. Although the 2005 hurricane season brought with it a sudden and substantial increase in fuel prices, this represented only a temporary increase in fuel tax revenues. Recent record-high prices are not likely to substantially change Georgia's overall fuel tax revenue trends unless fuel prices rise to (or above) what was experienced in the 2005 hurricane season and remain there.

Whether measured by only the fuel excise tax or by the fuel excise and prepaid taxes together, Georgia's fuel tax rates have been and continue to be substantially lower than in most other states. It is also likely that Georgia is a net exporter of fuel and a net importer of fuel tax revenue. The relatively low fuel taxes in Georgia along with the likelihood that a substantial portion of the revenue is, on net, imported leaves some room for increasing highway funding by increasing or indexing rates, while allowing the state to maintain a competitive advantage over most of its neighbors. However, the largest share of any rate increase is likely to be shouldered by urban and suburban residents across the state or any area with relatively long work commutes.

The search for funding alternatives that do not involve tax rate increases or the reliance on an index has led many to consider GARVEE bonds. Although GARVEE bonds are being touted as a transportation cure-all alternative to increasing fuel taxes, their usefulness as an alternative for highway funding may be quite limited. The two main justifications for employing the GARVEE option are 1) to speed up projects that are reasonably expected to result in substantial economic growth, and 2) to avoid inflation costs associated with putting off a necessary project. There are inherent difficulties in predicting economic growth that results from a transportation project. There is also little evidence that the costs of road building is

rising faster than other costs, thus borrowing and building may not be the most economical approach. What GARVEEs do offer is fast money, but the risks associated with GARVEEs are not trivial. The use of GARVEEs may substantially limit policymakers from reacting to new and emerging transportation needs should future transportation revenues become constricted.

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APPENDIX

TABLE A1. MOTOR FUEL TAXES BY STATE, 2004

State	------Gasoline------			---------Diesel--------			-------Gasahol-------			Notes
	Excise Tax	Add'l Tax	Total Tax	Excise Tax	Add'l Tax	Total Tax	Excise Tax	Add'l Tax	Total Tax	
Alabama /1	***16***	***2***	***18***	***19***		***19***	***16***	***2***	***18***	***Inspection fee***
Alaska	8		8	8		8	0		0	
Arizona	18		18	18		18	18		18	/3
Arkansas	21.5		21.5	22.5		22.5	21.5		21.5	
California	18		18	18		18	18		18	Sales tax applicable
Colorado	22		22	20.5		20.5	22		22	
Connecticut	25		25	26		26	25		25	
Delaware	23		23	22		22	23		23	Plus 0.5% GRT /5
Florida /2	***4***	***10.5***	***14.5***	***16.8***	***10.5***	***27.3***	***4***	***10.5***	***14.5***	***Sales tax added to excise /2***
Georgia	***7.5***		***7.5***	***7.5***		***7.5***	***7.5***		***7.5***	***Sales tax applicable (3%)***
Hawaii /1	16		16	16		16	16		16	Sales tax applicable
Idaho	25		25	25		25	22.5		22.5	/7
Illinois /1	19	1.1	20.1	21.5	1.1	22.6	19	1.1	20.1	Sales tax add., env. & LUST fee /3
Indiana	18		18	16		16	18		18	Sales tax applicable /3
Iowa	20.5		20.5	22.5		22.5	19		19	
Kansas	24		24	26		26	24		24	
Kentucky	16	1.4	17.4	13	1.4	14.4	16	1.4	17.4	Environmental fee /4 /3
Louisiana	20		20	20		20	20		20	
Maine	25.2		25.2	26.3		26.3	25.2		25.2	/5
Maryland	23.5		23.5	24.25		24.25	23.5		23.5	
Massachusetts	21		21	21		21	21		21	
Michigan	19		19	15		15	19		19	Sales tax applicable
Minnesota	20		20	20		20	20		20	
Mississippi	18	0.4	18.4	18	0.4	18.4	18	0.4	18.4	Environmental fee
Missouri	17	0.03	17.03	17	0.03	17.03	17	0.03	17.03	Inspection fee
Montana	27		27	27.75		27.75	27		27	
Nebraska	25.4	0.9	26.3	25.4	0.9	26.3	25.4	0.9	26.3	Petroleum fee /5
Nevada /1	23		23	27		27	23		23	
New Hampshire	18	1.5	19.5	18	1.5	19.5	18	1.5	19.5	Oil discharge cleanup fee
New Jersey	10.5	4	14.5	13.5	4	17.5	10.5	4	14.5	Petroleum fee
New Mexico	17	1.9	18.9	21	1.9	22.9	17	1.9	18.9	Petroleum loading fee
New York	8	15.2	23.2	8	13.45	21.45	8	15.2	23.2	Sales tax applicable, Petrol. Tax
North Carolina	***26.6***	***0.25***	***26.85***	***26.6***	***0.25***	***26.85***	***26.6***	***0.25***	***26.85***	***/4 Inspection tax***
North Dakota	21		21	21		21	21		21	
Ohio	26		26	26		26	26		26	Plus 3 cents commercial
Oklahoma	16	1	17	13	1	14	16	1	17	Environmental fee
Oregon /1	24		24	24		24	24		24	

Table A1 continues next page…

TABLE A1 (CONTINUED). MOTOR FUEL TAXES BY STATE, 2004

State	------Gasoline------ Excise Tax	Add'l Tax	Total Tax	---------Diesel-------- Excise Tax	Add'l Tax	Total Tax	-------Gasahol------- Excise Tax	Add'l Tax	Total Tax	Notes
Pennsylvania	12	18	30	12	24.4	36.4	12	18	30	Oil franchise tax
Rhode Island	30	1	31	30	1	31	30	1	31	LUST tax
South Carolina	***16***		***16***	***16***		***16***	***16***		***16***	***LUST tax, Inspection Fee***
South Dakota /1	22		22	22		22	20		20	
Tennessee /1	***20***	***1.4***	***21.4***	***17***	***1.4***	***18.4***	***20***	***1.4***	***21.4***	***Petroleum Tax & Envir. Fee***
Texas	20		20	20		20	20		20	
Utah	24.5		24.5	24.5		24.5	24.5		24.5	
Vermont	19	1	20	25	1	26	19	1	20	Petroleum cleanup fee
Virginia /1	17.5		17.5	16		16	17.5		17.5	/6
Washington	28		28	28		28	28		28	0.5% privilege tax
West Virginia	20.5	6.5	27	20.5	6.2	27	20.5	6.5	27	Sales tax added to excise
Wisconsin	29.1		29.1	29.1		29.1	29.1		29.1	/5
Wyoming	13	1	14	13	1	14	13	1	14	License tax
Dist. of Columbia	22.5		22.5	22.5		22.5	22.5		22.5	
Federal	18.3	0.1	18.4	24.3	0.1	24.4	13	0.1	13.1	/7 LUST tax

SOURCE: Compiled by the Federation of Tax Administrators (FTA) from various sources (http://www.taxadmin.org).
/1 Tax rates do not include local option taxes. In AL, 1 - 3 cents; HI, 8.8 to 18.0 cent; IL, 5 cents in Chicago and 6 cents in Cook county (gasoline only); NV, 1.75 to 7.75 cents; OR, 1 to 3 cents; SD and TN, one cent; and VA 2%.
/2 Local taxes for gasoline and gasohol vary from 9.7 cents to 17.7 cents. Plus a 2.07 cent per gallon pollution tax.
/3 Carriers pay an additional surcharge equal to AZ-8 cents, IL-6.3 cents (g) 6.0 cents (d), IN-11 cents, KY-2% (g) 4.7% (d).
/4 Tax rate is based on the average wholesale price and is adjusted quarterly. The actual rates are: KY, 9%; and NC, 17.5¢ + 7%.
/5 Portion of the rate is adjustable based on maintenance costs, sales volume, or inflation.
/6 Large trucks pay an additional 3.5 cents.
/7 Tax rate is reduced by the percentage of ethanol used in blending (reported rate assumes the max. 10% ethanol).

TABLE A2. DISPOSITION OF STATE MOTOR-FUEL TAX RECEIPTS – 2002

State	For State-Administered Highways**	For Local Roads and Streets***	For Mass Transit Purposes	For General Fund and Non-Highway Uses***
Alabama	55.0%	38.7%	0.1%	6.2%
Alaska*	72.3%	4.6%	0.1%	23.0%
Arizona	67.5%	32.5%	0.0%	0.0%
Arkansas	59.9%	34.0%	1.9%	4.2%
Average By State	**61.3%**	**29.7%**	**4.0%**	**5.0%**
California	54.0%	35.4%	8.5%	2.2%
Colorado	78.0%	21.6%	0.4%	0.0%
Connecticut	64.3%	6.1%	21.5%	8.1%
Delaware	100.0%	0.0%	0.0%	0.0%
Dist. of Col.*	0.0%	100.0%	0.0%	0.0%
Florida	67.8%	19.5%	10.4%	2.3%
Georgia	67.2%	14.1%	1.6%	17.0%
Hawaii	86.6%	0.0%	0.8%	12.6%
Idaho	51.1%	46.7%	0.3%	1.9%
Illinois	34.8%	62.9%	1.4%	0.9%
Indiana	36.8%	63.2%	0.0%	0.0%
Iowa	33.5%	65.9%	0.6%	0.0%
Kansas	57.6%	40.9%	0.6%	0.9%
Kentucky	60.2%	30.9%	0.0%	8.9%
Louisiana	63.4%	36.3%	0.2%	0.1%
Maine	76.3%	22.4%	1.3%	0.0%
Maryland	24.7%	39.7%	21.3%	14.3%
Massachusetts	77.7%	22.3%	0.0%	0.0%
Median By State	**61.5%**	**26.7%**	**0.6%**	**1.1%**
Michigan	58.1%	41.9%	0.0%	0.0%
Minnesota	45.7%	54.3%	0.0%	0.0%
Mississippi	57.1%	39.7%	0.0%	3.1%
Missouri	58.8%	39.1%	2.1%	0.0%
Montana	88.9%	9.4%	1.7%	0.0%
Nebraska	39.9%	58.5%	0.5%	1.1%
Nevada	62.3%	37.7%	0.0%	0.0%
New Hampshire	73.7%	16.5%	2.6%	7.2%
New Jersey*	55.5%	17.1%	27.4%	0.0%
New Mexico	74.3%	24.5%	0.6%	0.6%
New York	34.5%	16.7%	48.6%	0.2%
North Carolina	87.6%	8.3%	2.0%	2.1%
North Dakota	31.2%	68.8%	0.0%	0.0%
Ohio	57.1%	40.5%	1.0%	1.4%
Oklahoma	61.4%	26.7%	0.2%	11.6%
Oregon	61.5%	37.1%	0.0%	1.4%

Table A2 continues on next page…

TABLE A2 (CONTINUED). DISPOSITION OF STATE MOTOR-FUEL TAX RECEIPTS – 2002

State	For State-Administered Highways**	For Local Roads and Streets***	For Mass Transit Purposes	For General Fund and Non-Highway Uses***
Pennsylvania	89.2%	8.4%	2.5%	0.0%
Rhode Island*	66.7%	7.2%	19.3%	6.8%
South Carolina	63.9%	15.5%	0.7%	19.8%
South Dakota	71.4%	15.4%	1.6%	11.6%
Tennessee	58.4%	28.2%	2.6%	10.8%
Texas	39.1%	0.3%	0.6%	60.0%
US Total	**57.9%**	**28.4%**	**5.9%**	**7.8%**
Utah	75.2%	22.5%	2.2%	0.0%
Vermont	79.4%	13.7%	0.0%	6.9%
Virginia	76.4%	13.8%	6.5%	3.4%
Washington	57.9%	41.9%	0.0%	0.2%
West Virginia	100.0%	0.0%	0.0%	0.0%
Wisconsin	34.9%	50.7%	8.9%	5.4%
Wyoming	74.7%	24.4%	0.8%	0.0%

Source: FHWA, December 2003

*In these States, most highway-user revenues are placed in the State general fund. **Includes capital outlay, maintenance and administration, highway law enforcement and safety and debt service. ***Includes direct expenditures by state, and transfers to local governments. ****Includes local and state general non-highway purposes.

TABLE A3. STATES WITH CONSTITUTIONAL OR STATUTORY PROVISIONS RESTRICTING EXPENDITURE OF STATE GASOLINE TAX REVENUES TO HIGHWAYS

State	Constitutional or Statutory Restriction on State Gasoline Tax Expenditures
Alabama	Constitutional
Alaska	Statutory
Arizona	Constitutional
Arkansas	Statutory
Colorado	Constitutional
Georgia	Constitutional
Idaho	Constitutional
Indiana	Statutory
Iowa	Constitutional
Kansas	Constitutional
Kentucky	Constitutional
Maine	Constitutional
Minnesota	Constitutional
Mississippi	Statutory
Missouri	Constitutional
Montana	Statutory
Nebraska	Statutory
Nevada	Constitutional
New Hampshire	Constitutional
New Mexico	Statutory
North Dakota	Constitutional
Ohio	Constitutional
Oregon	Constitutional
Pennsylvania	Constitutional
South Dakota	Constitutional
Tennessee	Statutory
Utah	Constitutional
Washington	Constitutional
West Virginia	Constitutional
Wyoming	Constitutional

Source: http://www.transact.org/library/reports_html/measuring_up/exec_sum.asp.

TABLE A4. 1957 STATE MOTOR FUEL TAXES ADJUSTED FOR INFLATION TO 2004 (CENTS PER GALLON)

	1957 State Gas Tax	1957 State Gas Tax Adjusted Using the CPI to 2004	2004 Actual Gas Tax	Difference Between Actual and Inflation Adjusted 1957 State Gas Tax
Alabama	7.0	46.9	18.0	-28.9
Alaska*	5.0	33.5	8.0	-25.5
Arizona	5.0	33.5	18.0	-15.5
Arkansas	6.5	43.6	21.5	-22.1
California	6.0	40.2	18.0	-22.2
Colorado	6.0	40.2	22.0	-18.2
Connecticut	6.0	40.2	25.0	-15.2
Delaware	5.0	33.5	23.0	-10.5
District of Columbia	6.0	40.2	22.5	-17.7
Florida	7.0	46.9	14.5	-32.4
Georgia	6.5	43.6	7.5	-36.1
Hawaii*	5.0	33.5	16.0	-17.5
Idaho	6.0	40.2	25.0	-15.2
Illinois	5.0	33.5	20.1	-13.4
Indiana	4.0	26.8	18.0	-8.8
Iowa	6.0	40.2	20.5	-19.7
Kansas	5.0	33.5	24.0	-9.5
Kentucky	7.0	46.9	17.4	-29.5
Louisiana	7.0	46.9	20.0	-26.9
Maine	7.0	46.9	25.2	-21.7
Maryland	6.0	40.2	23.5	-16.7
Massachusetts	5.0	33.5	21.0	-12.5
Michigan	6.0	40.2	19.0	-21.2
Minnesota	5.0	33.5	20.0	-13.5
Mississippi	7.0	46.9	18.4	-28.5
Missouri	3.0	20.1	17.0	-3.1
Montana	7.0	46.9	27.0	-19.9
Nebraska	6.0	40.2	26.3	-13.9
Nevada	6.0	40.2	23.0	-17.2
New Hampshire	5.0	33.5	19.5	-14.0
New Jersey	4.0	26.8	14.5	-12.3
New Mexico	6.0	40.2	18.9	-21.3
New York	4.0	26.8	23.2	-3.6
North Carolina	7.0	46.9	26.9	-20.1
North Dakota	6.0	40.2	21.0	-19.2
Ohio	5.0	33.5	26.0	-7.5
Oklahoma	6.5	43.6	17.0	-26.6
Oregon	6.0	40.2	24.0	-16.2

Table A4 continues next page…

TABLE A4 (CONTINUED). 1957 STATE MOTOR FUEL TAXES ADJUSTED FOR INFLATION TO 2004 (CENTS PER GALLON)

	1957 State Gas Tax	1957 State Gas Tax Adjusted Using the CPI to 2004	2004 Actual Gas Tax	Difference Between Actual and Inflation Adjusted 1957 State Gas Tax
Pennsylvania	6.0	40.2	30.0	-10.2
Rhode Island	4.0	26.8	31.0	4.2
South Carolina	7.0	46.9	16.0	-30.9
South Dakota	5.0	33.5	22.0	-11.5
Tennessee	7.0	46.9	21.4	-25.5
Texas	5.0	33.5	20.0	-13.5
Utah	5.0	33.5	24.5	-9.0
Vermont	5.5	36.9	20.0	-16.9
Virginia	6.0	40.2	17.5	-22.7
Washington	6.5	43.6	28.0	-15.6
West Virginia	6.0	40.2	27.0	-13.2
Wisconsin	6.0	40.2	29.1	-11.1
Wyoming	5.0	33.5	14.0	-19.5
Average	5.7	38.2	21.0	-17.4

*Alaska and Hawaii became states after 1957

TABLE A5: ESTIMATED COUNTY SHARE OF THE STATE GAS TAX

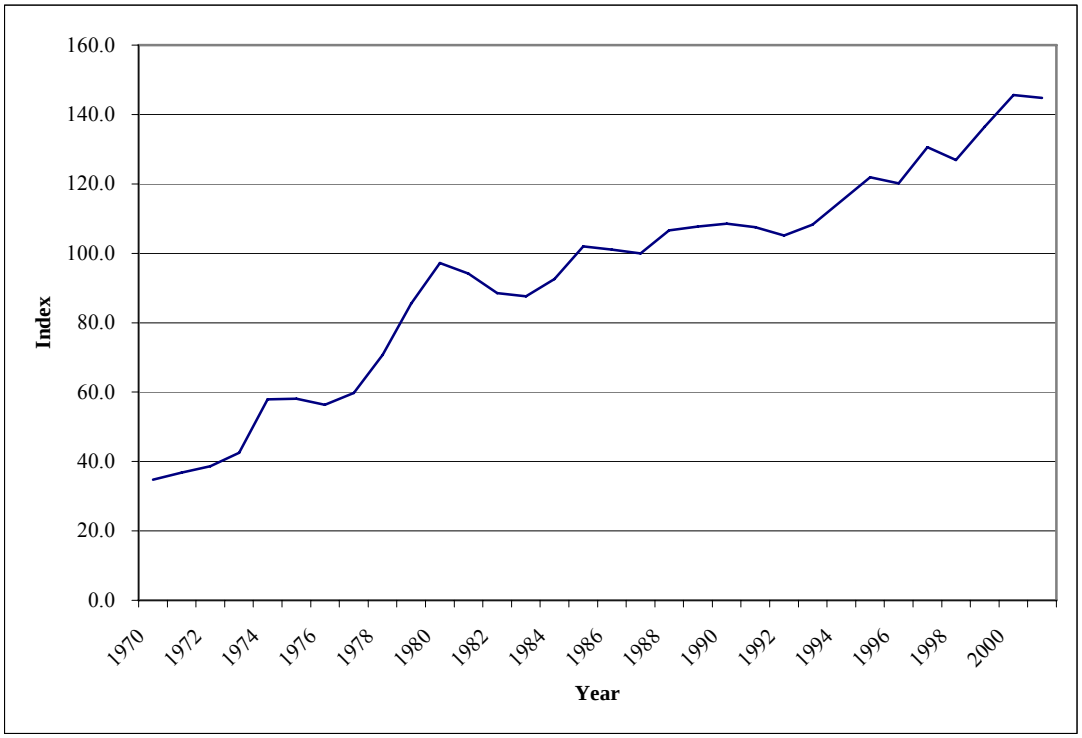
Region	Name	Est. Percent of State Gas Tax	Region	Name	Est. Percent of State Gas Tax	Region	Name	Est. Percent of State Gas Tax
9	APPLING	0.24%	3	CHEROKEE	1.11%	1	FANNIN	0.20%
11	ATKINSON	0.10%	5	CLARKE	1.01%	3	FAYETTE	0.66%
11	BACON	0.12%	8	CLAY	0.11%	1	FLOYD	1.34%
10	BAKER	0.14%	3	CLAYTON	1.56%	2	FORSYTH	0.54%
6	BALDWIN	0.72%	11	CLINCH	0.04%	2	FRANKLIN	0.98%
2	BANKS	0.12%	3	COBB	7.09%	3	FULTON	6.82%
5	BARROW	0.42%	11	COFFEE	0.67%	1	GILMER	0.25%
1	BARTOW	1.31%	10	COLQUITT	0.49%	7	GLASCOCK	0.05%
11	BEN HILL	0.18%	7	COLUMBIA	0.83%	12	GLYNN	1.84%
11	BERRIEN	0.14%	11	COOK	0.10%	1	GORDON	0.68%
6	BIBB	1.91%	4	COWETA	0.98%	10	GRADY	0.53%
9	BLECKLEY	0.24%	6	CRAWFORD	0.04%	5	GREENE	0.28%
11	BRANTLEY	0.39%	8	CRISP	0.78%	3	GWINNETT	4.31%
11	BROOKS	0.13%	1	DADE	0.62%	2	HABERSHAM	0.46%
12	BRYAN	0.74%	2	DAWSON	0.22%	2	HALL	1.83%
12	BULLOCH	1.12%	10	DECATUR	0.49%	7	HANCOCK	0.16%
7	BURKE	0.27%	3	DEKALB	2.86%	1	HARALSON	0.90%
4	BUTTS	0.92%	9	DODGE	0.30%	8	HARRIS	0.18%
10	CALHOUN	0.02%	8	DOOLY	0.22%	2	HART	0.28%
12	CAMDEN	1.55%	10	DOUGHERTY	1.35%	4	HEARD	0.07%
9	CANDLER	0.49%	3	DOUGLAS	0.75%	3	HENRY	1.16%
4	CARROLL	1.49%	10	EARLY	0.10%	6	HOUSTON	1.28%
1	CATOOSA	0.75%	11	ECHOLS	0.00%	11	IRWIN	0.08%
11	CHARLTON	0.19%	12	EFFINGHAM	0.37%	5	JACKSON	0.84%
12	CHATHAM	3.00%	5	ELBERT	0.29%	5	JASPER	0.12%
8	CHATTAHOOCHEE	0.00%	9	EMANUEL	0.35%	9	JEFF DAVIS	0.16%
1	CHATTOOGA	0.42%	9	EVANS	0.15%	7	JEFFERSON	0.42%

Table A5 continues next page...

TABLE A5 (CONTINUED). ESTIMATED COUNTY SHARE OF THE STATE GAS TAX

Region	Name	Est. Percent of State Gas Tax	Region	Name	Est. Percent of State Gas Tax	Region	Name	Est. Percent of State Gas Tax
7	JENKINS	0.21%	5	OCONEE	0.30%	9	TELFAIR	0.32%
9	JOHNSON	0.10%	5	OGLETHORPE	0.08%	10	TERRELL	0.14%
6	JONES	0.12%	1	PAULDING	0.78%	10	THOMAS	0.58%
4	LAMAR	0.09%	6	PEACH	0.68%	11	TIFT	0.85%
11	LANIER	0.12%	1	PICKENS	0.42%	9	TOOMBS	0.37%
9	LAURENS	0.95%	11	PIERCE	0.23%	2	TOWNS	0.18%
10	LEE	0.27%	4	PIKE	0.12%	9	TREUTLEN	0.11%
12	LIBERTY	0.72%	1	POLK	0.56%	4	TROUP	2.02%
7	LINCOLN	0.09%	6	PULASKI	0.13%	11	TURNER	0.13%
12	LONG	0.07%	6	PUTNAM	0.34%	6	TWIGGS	0.13%
11	LOWNDES	2.14%	8	QUITMAN	0.08%	2	UNION	0.37%
2	LUMPKIN	0.18%	2	RABUN	0.15%	4	UPSON	0.22%
7	MCDUFFIE	0.35%	8	RANDOLPH	0.01%	1	WALKER	0.71%
12	MCINTOSH	0.23%	7	RICHMOND	3.18%	5	WALTON	0.53%
8	MACON	0.11%	3	ROCKDALE	0.38%	11	WARE	1.41%
5	MADISON	0.39%	8	SCHLEY	0.03%	7	WARREN	0.03%
8	MARION	0.03%	12	SCREVEN	0.22%	7	WASHINGTON	0.54%
4	MERIWETHER	0.45%	10	SEMINOLE	0.09%	9	WAYNE	0.44%
10	MILLER	0.10%	4	SPALDING	0.71%	8	WEBSTER	0.06%
10	MITCHELL	0.53%	2	STEPHENS	0.37%	9	WHEELER	0.07%
6	MONROE	0.30%	8	STEWART	0.09%	2	WHITE	0.31%
9	MONTGOMERY	0.07%	8	SUMTER	0.41%	1	WHITFIELD	1.71%
5	MORGAN	0.65%	8	TALBOT	0.10%	9	WILCOX	0.17%
1	MURRAY	0.45%	7	TALIAFERRO	0.02%	7	WILKES	0.24%
8	MUSCOGEE	2.18%	9	TATTNALL	0.35%	6	WILKINSON	0.25%
5	NEWTON	0.70%	8	TAYLOR	0.09%	10	WORTH	0.17%

FIGURE A1: ROAD BUILDING COST INDEX, 1970 TO 2001 (BASE YEAR 1987)



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Gasoline Taxes in Georgia

Publisher(s): Fiscal Research Center of the Andrew Young School of Policy Studies

Author(s): Robert J. Eger III; William J. Smith

Date Published: 2006-04-01

Subject(s): Community and Economic Development; Government Reform; Transportation