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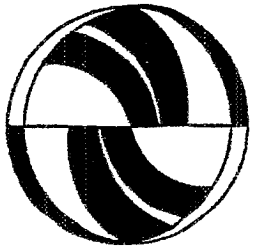

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Jeffrey Ang-Olson
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The University of California
Transportation Center

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Inflation and increased fuel economy have reduced the buying power of the revenues collected from state and federal motor fuel taxes. Because fuel taxes are almost always collected on a per-gallon basis, in most states they must be raised by specific acts of the legislature and it is becoming increasingly difficult to find the political support necessary to raise them. A number of states have experimented with fuel taxes that adjust automatically by being indexed to the price of gasoline, to the consumer price index, or to some indicator of highway construction and maintenance costs.

This article reviews experience with indexed motor fuel taxes in the United States, and finds that in many cases indexed taxes have failed to produce the anticipated results because declines in fuel prices often cause declines in indexed fuel taxes Indexing gas tax rates to the Consumer Price Index appears to be the best way of insuring that fuel tax revenues keep pace with inflation

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by Jeffrey Ang-Olson, Martin Wachs, and Brian D. Taylor

Fuel taxes are the mainstay of transportation finance in the United States—the federal government and every state levy taxes on gasoline and diesel fuel. Motor fuel taxes have much to recommend them fiscally, politically, and administratively. First, as a "user fee," this tax is widely regarded to be inherently fair. It can be assumed that we benefit from the transportation system in proportion to the extent to which we use it, and motor fuel taxes charge us roughly in proportion to our use of the road and highway system. Furthermore, the tax is paid by motorists in small increments and is relatively hidden in the sales price of motor fuel This has tended to minimize organized public opposition to it The tax is also easy to administer and collect from both the taxpayer's and the government's point of view. The motor fuel tax is usually collected from fuel distributors rather than from retailers or consumers. This minimizes opportunities for evasion and reduces the cost of collection to an historical average of one-half of 1% of tax proceeds. By contrast, prior to the advent of electronic toll collection, highway tolls could often involve collection and administrative costs that amounted to as much as 20% of the proceeds.[1] As motor fuel consumption has soared over the past eight decades, so have tax proceeds, enabling users of the nation's highway system to finance its construc-

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tion and maintenance

Threats to Fuel Tax Revenues

At the federal level and in most states, the fuel tax is charged at a per gallon rate that changes only when Congress or the state legislature makes a statutory revision Faced with population growth and an expanding economy, transportation officials expect significant increases in the need for new highway and transit capacity At the same time, the extensive infrastructure built over the past 50 years is aging, so maintenance and rehabilitation needs are growing Just as increased revenues may be needed to keep pace with the growing use of the highway system, three trends limit the ability of motor fuel taxes to cover costs They include increasing fuel efficiency, the fact that per gallon fuel taxes usually do not increase with inflation, and the addition of new fuel tax funded mandates and programs Collectively, these call into question the future financial stability of the transportation finance system and suggest that changes may be required to sustain the nation's vitally important transportation networks

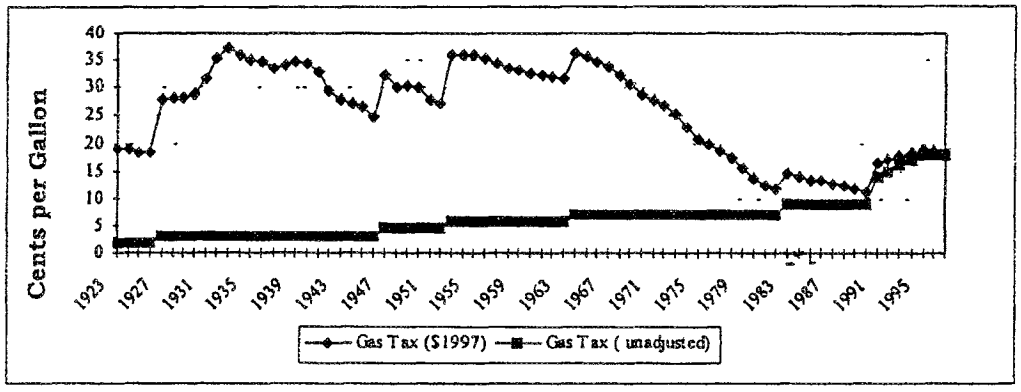
Vehicle fuel efficiency has increased significantly over the past few decades As measured by overall passenger car fuel economy, national vehicle fuel efficiency has improved from 14.3 miles per gallon in 1960 to 22.6 miles per gallon in 1995 [2] The growing popularity of larger and heavier vehicles, such as sport utility vehicles, has recently slowed the rate of improvement, but overall fuel economy has continued to rise as older gas guzzlers are retired from the fleet Newer automobiles drive approximately twice as many miles per gallon of fuel as did cars 15 or 20 years ago, and thus drivers pay much less per vehicle mile traveled than they once did, unless the tax rate per gallon is specifically raised to correct for improved fuel economy

Looking ahead, plans to promote conversion of the automobile fleet to alternative fuels or electric powered vehicles further threaten these revenues. Electric vehicles, for example, use roadways to the same extent as gasoline and diesel-powered vehicles, but they do not produce fuel tax revenues

Second, inflation has diminished the purchasing power of the motor fuels tax. Many other taxes, such as sales, property, and income taxes, maintain their productivity in the face of inflation because the tax base rises with inflation, this means that revenues from these taxes increase with rising costs. When motor fuels taxes are levied on a per gallon basis, however, their proceeds do not respond to inflation To make matters worse, the cost of materials used in transportation projects and the cost of land for transportation facilities have typically risen faster than the general rate of inflation, so the buying power of fuel tax revenues is actually eroding even faster than the rate of inflation Between 1947 and 1963, for example, the federal gasoline tax was raised three times during a period of relatively low inflation After 1963, however, it was not increased again for nearly 20 years, until 1982, when it was raised by 5¢ Similarly state gasoline taxes have failed to keep up with inflation. Figure 1 shows, for example, the gasoline tax rate in California in both current dollars (unadjusted for inflation) and in constant dollars (adjusted). Despite several statutory increases in the gasoline tax rate, the inflation-adjusted state gasoline tax in 1996 was essentially at the same level as the mid-1920s.

Taking together the effects of increased fuel economy and inflation, the buying power of the motor fuel tax has declined significantly relative to the growth in vehicle travel In California, for example, the current state gasoline tax stands at 18¢ per gallon. To restore

Figure 1
California Gas Tax Rate



that tax to its 1950 purchasing power per vehicle mile of driving, the tax would have to be raised to 43¢ per gallon, an increase of 25¢ per gallon. An increase of this magnitude would be a political impossibility.

The two structural shortcomings of fuel taxes have been exacerbated by government's tendency to add new programs and mandates without adding new taxes to support them. Even as inflation-adjusted gas tax proceeds have fallen, the highway finance system as a whole has been asked to absorb new program financing responsibilities, such as subsidizing public transit and expanded environmental mitigation, with few corresponding adjustments in motor vehicle tax rates. The problem is not necessarily the addition of these programs, which certainly may benefit society, but legislative reluctance to raising fuel tax rates to pay for them. This has tended to stretch the highway tax dollar very thin in many states.

One way in which the purchasing power of the motor fuel taxes could keep pace with changing conditions might be by indexing gasoline taxes so that they adjust automatically with changing rates of inflation or fuel economy. Several states have adopted variable-rate gasoline taxes that are worthy of study because they can provide insights that are useful when considering possible adjustments to the federal motor fuels tax and those of many other states.

Currently four states have gas taxes that vary automatically: Florida, Nebraska, North Carolina, and Wisconsin. Several other states, including Kentucky, Massachusetts, Ohio and Rhode Island have statutes that allow for variable rates, but the effective per gallon rate has remained constant in recent years. A number of other states have repealed earlier variable gas tax statutes, including Indiana, Maryland, Michigan, New Mexico, Virginia, and Washington, as well as the District of Columbia.

Before 1977, all state motor fuel taxes were structured as a fixed per gallon rate. In the late 1970s and early 1980s, a number of states altered the structure of their fuel taxes in response to revenues that were lagging behind expenses. Gasoline consumption in the United States dropped sharply in 1978, caused in part by a steep rise in gasoline prices and improved vehicle fuel efficiency. After 1981, gas prices fell for five straight years, and consumption began to increase again. This volatility disrupted the revenue flow of state high-

way programs In the late 1970s, when consumption fell and prices rose, some states responded by adopting gasoline taxes that, like sales taxes, are levied as a percentage of the fuel price This scheme backfired in the early 1980s, when gasoline prices started falling and revenue collections also fell. Since that time, some states have gone back to the fixed per gallon levy and periodic statutory increases Others have experimented with variable gas taxes linked to the consumer price index, a highway cost index, or to budgeted revenue needs In general, variable-rate gas taxes have taken three forms.

1 The tax rate is adjusted based on the change in gasoline prices
2 The tax rate is adjusted based on a cost index like the Consumer Price Index
3. The tax rate is adjusted by state officials based on revenue needs

In recent years there has been renewed interest in indexing fuel taxes as statutory rate increases become more difficult to achieve amidst partisan struggles over taxation in many state legislatures States are also increasingly allowing local governments to impose their own fuel taxes

Adjustment Based on Gasoline Price

The first type of variable gasoline tax to appear, and the one tried most frequently, is a rate indexed to a measure of gasoline price. The State of Washington adopted such a tax in 1977, in which the per gallon levy was calculated as 10% of the average retail price of motor vehicle fuel sold in the state The rate was recalculated every six months Other states soon followed suit New Mexico adopted a variable-rate gas tax in 1979 which allowed for automatic increases based on a rate schedule linked to wholesale fuel prices [3] In 1980, Massachusetts and Kentucky adopted gas taxes based on 10% of the average wholesale fuel price. In both states, the rate was to be recomputed quarterly The same year, Indiana based its gas tax on 10% of the average retail price, with semi-annual recalculations In 1981, Rhode Island adopted a gas tax based on 11% of the average wholesale fuel price, adjusted quarterly The following year, Maryland adopted a gas tax based on 10% of the average wholesale price, not to take effect until 1985 [4]

It should be noted that gasoline taxes structured in this manner are generally not pure ad valorem taxes in that they are not levied directly as a percentage of the sales price [5] Rather, the tax is a per gallon rate which is adjusted based on average price data from a previous period A gas tax levied as a percentage of the sales price at the time of purchase was deemed too difficult to administer It also has been argued that the gas tax rate, as a user charge, should be the same across that state for equity reasons, and thus based on average state prices [6]

It is no coincidence that, during the late 1970s and early 1980s, a number of states elected to revise their gas taxes and that the preferred indexing factor was the sales price As shown in Figure 2, United States gasoline consumption fell from 117 billion to 103 billion gallons between 1978 and 1982, a 12% decline. Most state's highway revenues, directly linked to consumption by the per gallon gasoline tax, fell correspondingly. As shown in Figure 3, state motor fuel tax receipts fell sharply in 1973 and again in 1978, reaching their lowest point in real terms in 1982.

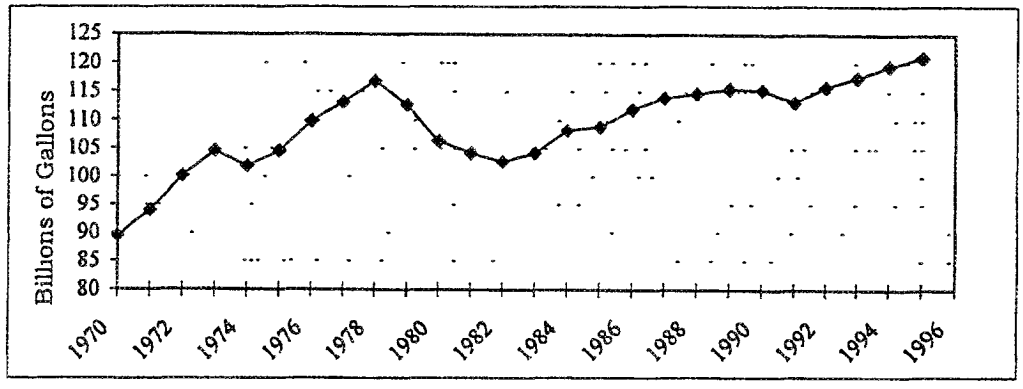
The drop in gasoline consumption was partly brought on by a sharp rise in the price of gasoline. As shown in Figure 4, the second OPEC oil embargo in 1978 drove the average retail pre-tax price of gasoline from $0.53 per gallon

in 1978 to $1.17 in 1981. Since gasoline prices had been fairly steady or rising since World War II, there was no reason at that time to expect a significant drop in prices Linking gas taxes to the sales price seemed a convenient and reliable way to check the erosion of revenues due to reduced consumption and inflation [7]

Tax Performance

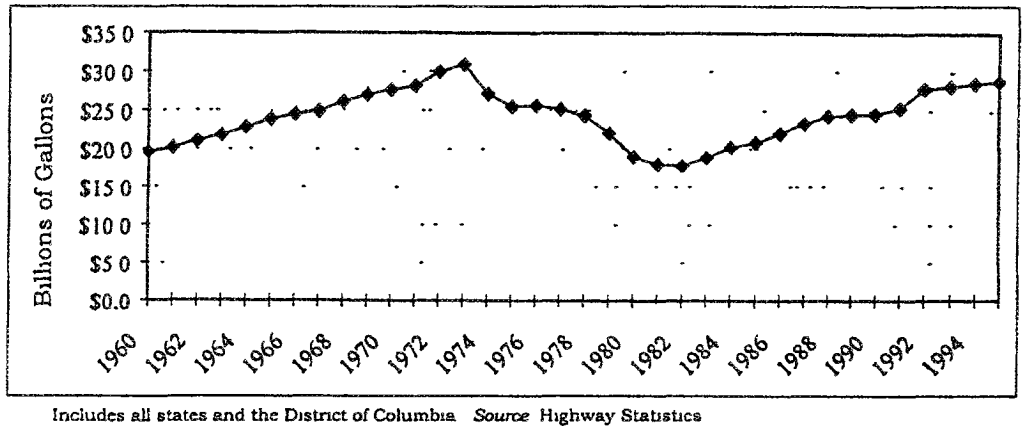
The variable-rate gas taxes did rise, as expected, until 1981, when prices began to fall Kentucky's tax rate went from 9.0¢ to 10.4¢ per gallon the year after it was adopted The gas tax rose from 10.0¢ per gallon to 11.6¢ in Massachusetts, from 11.0¢ to 12.0¢ in Washington, and from 7.0¢ to 10 0¢ in

Figure 2
California Gas Tax Rate



Includes all states and the District of Columbia *Source American Petroleum Institute, 1997*

Figure 3
Gross Motor Fuel Tax Receipts ($1997)



Includes all states and the District of Columbia *Source* Highway Statistics

New Mexico [8] By mid-1981, however, U S gasoline prices entered a five-year decline Between 1981 and 1986, the average retail gasoline price dropped from $1 17 per gallon to $0.63

Consumption did begin to increase, but not as rapidly as the drop in prices The variable-rate gas taxes indexed to price led to falling revenues In Massachusetts, the variable per gallon rate was adjusted downward for six consecutive quarters, from 11 6¢ to 9 9¢ per gallon. Kentucky and Rhode Island saw declining rates as well

States responded by altering price-indexed gas taxes in one of two ways Indiana, Maryland, New Mexico, and Washington eliminated variable rates by adopting legislation to re-institute the fixed per gallon levy [9] Kentucky, Massachusetts, and Rhode Island adopted rate floors Thus, the gas tax in Massachusetts continued to be based on 10% of the wholesale price, but could not go below 11 0¢ per gallon The minimum was 13 0¢ per gallon in Rhode Island and 9 0¢ in Kentucky

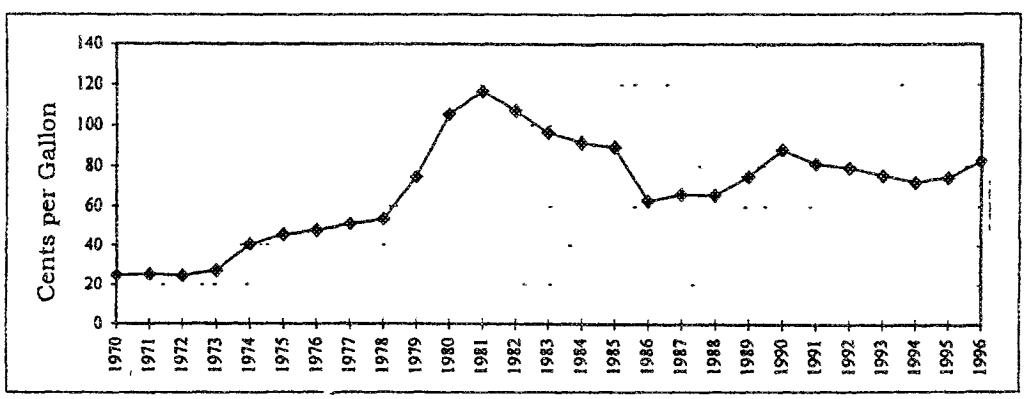
Since the early 1980s, Rhode Island and Massachusetts have both made statutory changes in their gas taxes by raising both the percentage rate and the per gallon minimum In both cases, the effective rate has always been determined by the per gallon floor. The current tax in Massachusetts is 19 1% of the wholesale price, with a 21 0¢ per gallon minimum In Rhode Island, the tax is 13.0% of the wholesale price, with a 28.0¢ minimum [10]

Combination Percentage and Fixed Rate Taxes

Several states have adopted a related form of gasoline tax in which one portion is a fixed per gallon levy and another portion varies with the sales price North Carolina adopted such a tax in 1986, raising the fixed per gallon levy to 14.0¢ per gallon and adding a supplemental tax indexed to 3 0% of the average wholesale price. Legislators hoped that this variable supplement would eliminate the need for periodic statutory increases [11] It did not, and three years later the gas tax was raised again to 16 0¢ per gallon plus 7 0% of the wholesale price.[12]

Contrary to lawmakers' expectations, the gas tax rate in North Carolina has changed very little since 1990 While the

Figure 4
Average US Retail Gasoline Price (excluding taxes)



Source American Petroleum Institute, 1997

per gallon levy is adjusted every six months based on wholesale price changes, the result has been only small fluctuations in the total tax rate around 22¢ per gallon and no general increase.[13] Georgia levies an excise tax on gasoline of 7.5¢ per gallon and a "second motor fuel tax" of 3 0% of the retail sales price This is the only current case of a variable gasoline tax based on the current sales price

Petroleum Gross Receipts Taxes

Virginia used a related gas tax structure for a period of time beginning in 1982 To the existing 11.0¢ per gallon tax, the state added a 3 0% tax on the gross receipts of oil companies from the sale of gasoline It was believed that the tax would "respond to inflation and fluctuations in fuel sales" and would "relieve[s] some of the responsibility in the future "[14] There were initial estimates that the tax would be a 4 0¢ supplement to the gas tax, but by 1986, the tax was adding only 2 6¢ per gallon. The gross receipts tax was repealed that year in favor of statutory rate increases.[15]

A number of other states have taxes on the sale of petroleum products in general, or on the gross receipts of petroleum companies. New York, for example, has a "petroleum business tax" which is adjusted every year based the producer price index The tax is made up of gasoline, diesel, and residual petroleum product components. The gasoline component is currently 14.6¢ per gallon.[16] New Jersey has a petroleum gross receipts tax calculated as 2.75% of the average retail price of gasoline, with a 4 0¢ per gallon minimum These types of taxes, while clearly related to variable gasoline taxes, are beyond the scope of this paper. Most are levied on more than just gasoline and diesel fuel, and the taxes fall to varying degrees on motorists

Adjustment Based on a Cost Index Formula, Highway Costs and Fuel Sales

In the early 1980s, several states experimented with indexing gas taxes to more direct measures of inflation like the Consumer Price Index (CPI) or a highway cost index In 1981, Ohio adopted a gas tax that was directly proportional to the percentage change in the Federal Highway Administration's highway maintenance and construction cost index, and inversely proportional to the percent change in state fuel sales [17] Michigan adopted a similar formula in 1982, and Wisconsin followed in 1984 [18] It was hoped that this type of formula would link fuel taxes to highway costs while maintaining stable revenues in the face of fluctuating consumption A drop in consumption, reducing gas tax revenue, would be offset by a higher tax rate, and vice versa [19]

In Michigan, under the indexing formula, the gas tax rate rose from 11.0 to 13 0¢ per gallon in 1983, and from 13.0 to 15.0¢ in 1984 [20] The indexing provision was due to expire that year, and after such a sharp price increase there was no political will to renew it In Ohio, the formula increased the tax from 10.3¢ per gallon to 12 0¢ in two years. Consumption began rising steadily after 1983, however, and this soon held down automatic increases under this type of indexing formula Ohio passed statutory rate increases in the late 1980s, ahead of indexed adjustments, to bring the tax up from 12 0¢ to 20 0¢ in 1990 [21] Automatic formula increases then brought the tax up by one cent in both 1991 and 1993. In 1993, the formula had to be altered because the FHWA stopped releasing its cost index The Ohio formula is now based on the CPI and fuel sales However, since 1993 formula adjustments have not been permitted without

authorization by the state legislature. The tax remains at 22 0¢ per gallon [22]

Formula Based on CPI Alone

Wisconsin has maintained its gas tax indexing formula since adoption in 1984. The tax consists of a fixed 2.0¢ per gallon portion and a variable component recalculated every April. Until 1998, the variable component was directly proportional to the percent change in the CPI of the previous year, and inversely proportional to the percent change in the state fuel sales of the previous year As of 1998, the tax varies with the CPI alone [23]

Wisconsin's indexed gas tax has survived several challenges. The formula raised the tax rate from 16 0 to 18 0¢ in the three years after adoption [24] In 1987, the legislature voted to raise the tax by an additional 2¢, but to suspend the indexing formula A gubernatorial veto saved the formula, while maintaining the 2¢ increase [25] The following year there were more unsuccessful attempts to repeal indexing, as Wisconsin's gas tax was now among the highest in the nation Then in 1992, with the economy in a recession, the state blocked the automatic increase for one year [26]

As in Ohio, rising fuel sales in Wisconsin tended to hold down automatic increases in the late 1980s and 1990s The gas tax rate rose from 20 0¢ to 23.3¢ per gallon between 1987 and 1993, but grew by a total of only 0 5¢ between 1993 and 1997.[27] By 1997 a consensus had formed that the formula was not providing enough rate increases to keep pace with inflation. The formula was altered for 1998 and is now based on the change in CPI alone While the old formula was projected to augment the gas tax rate by 0 4¢ over the next two years, the revised formula should provide an increase of 1 3¢ [28]

The District of Columbia also tried indexing its gas tax to the CPI alone First applied in 1982, the formula brought the gas tax rate up from 13 0¢ to 15 5¢ in three years There were repeated concerns, however, that District of Columbia service stations were losing business to nearby competitors in Maryland and Virginia, both of which had lower gas taxes The District had imposed an 8.0¢ per gallon gas tax increase in 1980 that was quickly repealed after protests by service station owners. These protests continued during the period of formula increases, and the mayor recommended several times that the DC Council block the increases [29] In 1985, the indexing formula was scrapped, and statutory rate adjustments resumed [30]

Combination of Fixed Rate Tax and a Portion Linked to CPI

Florida has a complex system of gas taxes, portions of which are indexed to the CPI The base tax rate is 4 0¢ per gallon A supplemental tax, currently 9.0¢ per gallon, is adjusted annually based on the change in the CPI. This tax has risen 2 1¢, or 30%, since its adoption in 1990.[31] Another Florida supplemental gas tax applies only to counties that have local gas taxes, and is also indexed to the CPI. This tax, approved by the state in 1990, is the result of a novel compromise between the state legislature and the governor [32] Because of the governor's opposition to a statewide tax increase, the legislature adopted a gas tax that was effective only in counties with local gas taxes. This effectively raised gas tax rates in 64 of the state's 67 counties.[33] In most counties, the tax has grown from 4.0 to 5.0¢ per gallon since adoption Thus, Florida's indexing formula has increased the total state gas tax from 14 9¢ to 18 0¢ per gallon over the last eight years

On top of state taxes, most Florida counties have local gas taxes equal to 7 0¢ per gallon. A few have local rates

that are 5 0 or 6.0¢, and five have local gas taxes of 12.0¢ per gallon, the maximum rate allowed In these five counties, the system of state and local gas taxes brings the total rate to 30.0¢ per gallon, one of the highest in the nation [34]

Adjustment Based on Revenue Needs

The gasoline tax structure in Nebraska is unlike that in any other state in the country. It consists of a fixed portion of 12 5¢ per gallon, plus two variable portions. The first of these is a per gallon levy set annually by the State Board of Equalization and Assessment at a rate sufficient to meet the payment requirements of any highway improvement bonds [35] This tax is then automatically adjusted every quarter based on the statewide average cost of fuel, and is currently 11 6¢ per gallon Established in 1980, the variable tax rose from 1 8¢ to 10 3¢ in 1990. Since that time, the tax has remained fairly steady, fluctuating around 11¢ per gallon [36]

The second variable portion, currently 0.5¢ per gallon, is set quarterly by the Tax Commission to cover tax revenue that is not collected due to ethanol credits. It has recently varied between 0 5 and 1 0¢ per gallon.[37]

Despite the fact that state law in Nebraska requires the Board of Equalization to set the gas tax rate to meet revenue needs, gas tax increases have not been without controversy The state's Road Department recommends rate adjustments to the Board, which includes the governor, auditor, treasurer and tax commissioner Occasionally, members will vote against a recommended increase, and they have incurred accusations of law breaking from others There have also been instances when the Board raised the tax by an amount less than that called for by the state Road Department [38]

Recent Proposals for Indexing

Although no state has adopted a variable gasoline tax since 1990, a number of states have recently considered doing so. In Utah, a Republican-led "Growth Summit" held in 1995 recommended linking the gas tax to inflation as a way to insure adequate road improvements The state was experiencing rapid growth and planning for the 2002 Olympics.[39] The Utah Taxpayers Association argued against indexing, claiming that it would be an automatic tax increase without public input and that it might set a precedent for other taxes Utah Democrats opposed the gas tax increase in general, claiming that it was regressive After the 1996 elections, a 5 0¢ gas tax increase was passed, but it was not indexed.[40]

The Michigan legislature considered a proposal in 1995 that would have raised the gas tax by 7¢ per gallon and indexed the tax to inflation, but the proposal failed.[41] In Colorado, the governor announced in September 1997 that he would like to see the state's gas tax linked to inflation [42] Prospects for such action seem dim in the near future, however Recent gas tax revenues have been higher than anticipated, and a ballot initiative to raise the gas tax was soundly rejected by voters.

Washington is again considering a variable-rate gas tax, 15 years after eliminating its gas tax indexed to retail prices Late in 1996 the governor and a group of legislators proposed a gas tax supplement that would be readjusted annually based on population change and inflation. The Republican-controlled legislature vowed to block any vote on the bill [43] In California, a recent report by the nonpartisan Legislative Analyst's Office suggested indexing the state gas tax to inflation as an alternative to periodic statutory increases [44] A bill was introduced into the California Assembly in 1998 that would have indexed the state gas tax to the CPI, but it failed in the Assembly

Transportation Committee

Statutory Rate Increases

Renewed interest in gasoline tax indexing is probably related to a recent decline in the number of states adopting statutory rate increases Throughout the 1980s and early 1990s, an average of 15 states per year increased their gasoline tax rate by legislative action without indexing As shown in Figure 5, however, the number of states adopting rate increases has dropped sharply since 1993 Since then, an average of only four states per year have passed gas tax increases [45]

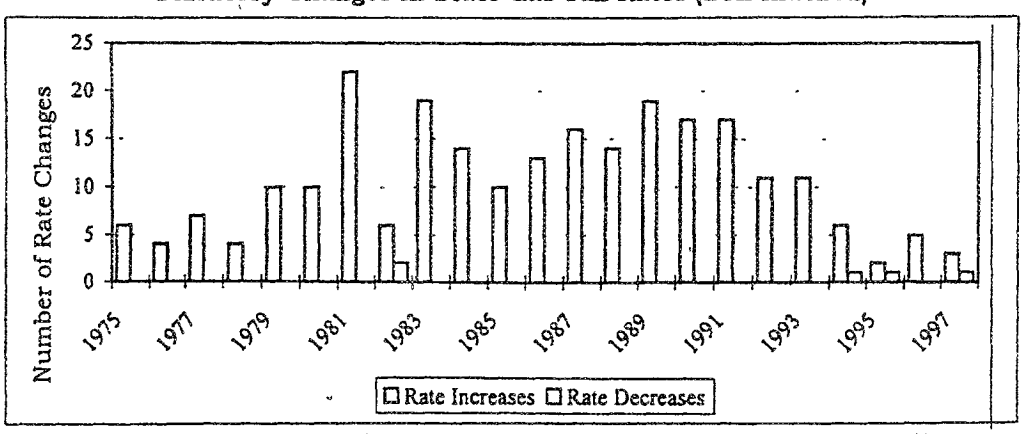
This trend is reflected in a leveling-off of the average state gas tax rate, which had been rising steadily since the early 1980s. As shown in Figure 6, the mean state gasoline tax rate rose from 8 9¢ per gallon in 1980 to 18 1¢ in 1991 Since then, the mean has risen only 1 7¢, to 19.8¢ per gallon

This trend may be caused in part by a leveling-off in revenue needs The national recession in the early 1990s may have reduced the need for road projects, while rising consumption due to the popularity of larger vehicles may have contributed increased revenues from fuel taxes But it is likely that another cause is a strong and growing anti-tax sentiment among legislators and voters In such a political climate, rate adjustments to parallel rising costs and increasing travel are viewed by many simply as tax increases

Local Gas Taxes

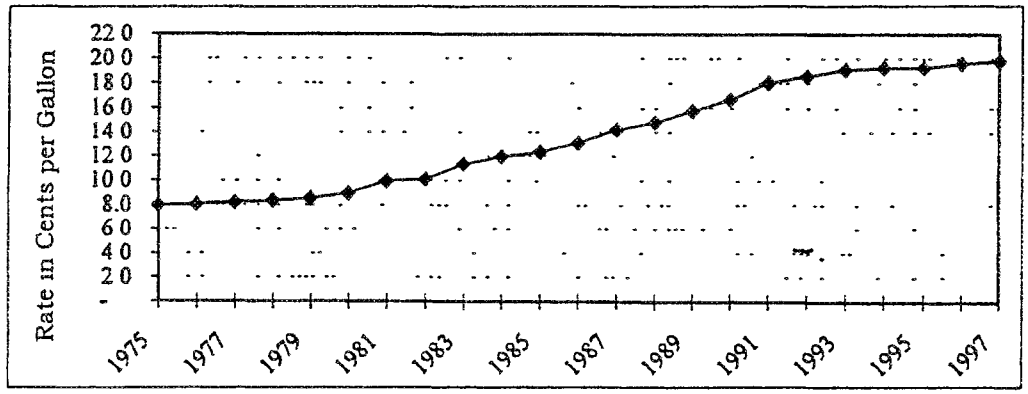
At least 15 states allow local governments to impose fuel taxes in some capacity As described earlier, Florida makes extensive use of local gas taxes, with rates ranging from 5 0¢ to 12 0¢ per gallon. County gas taxes in Hawaii can be substantial, ranging from 10 0¢ to 16 5¢ per gallon Every county in Nevada has a local gas tax, ranging from 5.0¢ to 10.0¢ per gallon In other states, however, local gas taxes are generally smaller and less common They are levied in some counties in Alabama, Illinois, Mississippi and Oregon, and authorized in at least seven other states. No state appears to have a multi-county or regional gas tax, but the California Legislature has authorized the nine-county San Francisco Bay Area to hold a local referendum on whether or not to enact such a regional gasoline tax Counties

Figure 5
Statutory Changes in State Gas Tax Rates (non-indexed)



Includes all states and the District of Columbia *Source* Highway Statistics, *Bowman & Mikesell, 1983*

Figure 6
Mean State Gasoline Tax Rate



Includes all states and the District of Columbia *Source* Highway Statistics, *Bowman & Mikesell, 1983*

in northern Virginia have long had a 2% gasoline surcharge to fund the DC-area Metro system [46]

Conclusions

Over the past two decades, at least 15 states have tried some form of variable-rate gasoline tax In most cases, the variable-rate taxes have been rescinded or effectively discontinued because they did not work as expected These experiences offer some lessons for those considering such a gas tax system

- Indexing gas tax rates to fuel prices has, over the past 20 years, not produced rate increases to keep pace with needs, and has some enormous political liabilities. In some cases, a drop in fuel prices caused a decline in gas tax revenue when an increase in revenue was very much needed for programmatic reasons. Indexing the gas tax to fuel prices also proved enormously unpopular because it compounded and exaggerated the impact on consumers of increases in the retail price of gasoline

- Indexing gas tax rates to the Consumer Price Index appears to be the best way to ensure that revenues keep pace with inflation Other indexing formulas that account for both inflation and fuel use have generally been discontinued

- An alternative to indexing the entire state gasoline tax is to index only a new gas tax supplement. Although this may provide less revenue than a fully indexed tax structure, it may provide a more incremental approach that is more politically acceptable

- A maximum annual increase limiting changes in variable-rate gas taxes contributes significantly to political and programmatic stability. Automatic increases of several cents in one year have caused political backlash that contributed to the discontinuation of several variable rate gas taxes
- Indexed gas taxes are inevitably subject to some of the political pressures that accompany tax increases of any kind In particular, legislators have been pressured to suspend or eliminate indexing in times

of recession or high gas prices Similarly, high growth rates and a backlog of road projects may lead to statutory rate increases ahead of the indexing formula

Indexed gasoline taxes are certainly not required in order to maintain the stability of transportation revenues Some states continue to approve statutory rate adjustments, which outpace the rate of inflation. But relying on statutory increases leads to an unpredictable flow of highway revenues An indexed gas tax structure can maintain long-term real revenue without the political battles and uncertainty that accompany tax legislation.

Endnotes

1 F Crawford *Motor Fuel Taxation in the United States* Baltimore Lord Baltimore Press, 1939, and *Highway Statistics*, 1945-1995, published by the U S Bureau of Public Roads and later by the Federal Highway Administration

2 M Gross and R N Feldman *National Transportation Statistics*, 1997 Washington, DC Bureau of Transportation Statistics, U S Department of Transportation

3 The price/tax schedule was as follows 1-45¢ / 7¢, 45-55¢ / 8¢; 55-65¢ / 9¢, 65-75¢ / 10¢, over 75¢ / 11¢, J H. Bowman and J L Mikesell, "Recent Changes in State Gasoline Taxation An Analysis of Structures and Rates, *National Tax Journal*, 26 (1983), pp 163-182

4 Ibid

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7 Many other states responded with statutory rate increases A total of 22 states raised their gas taxes in 1981 alone, far more than in any previous year; Bowman and Mikesell, Ibid

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