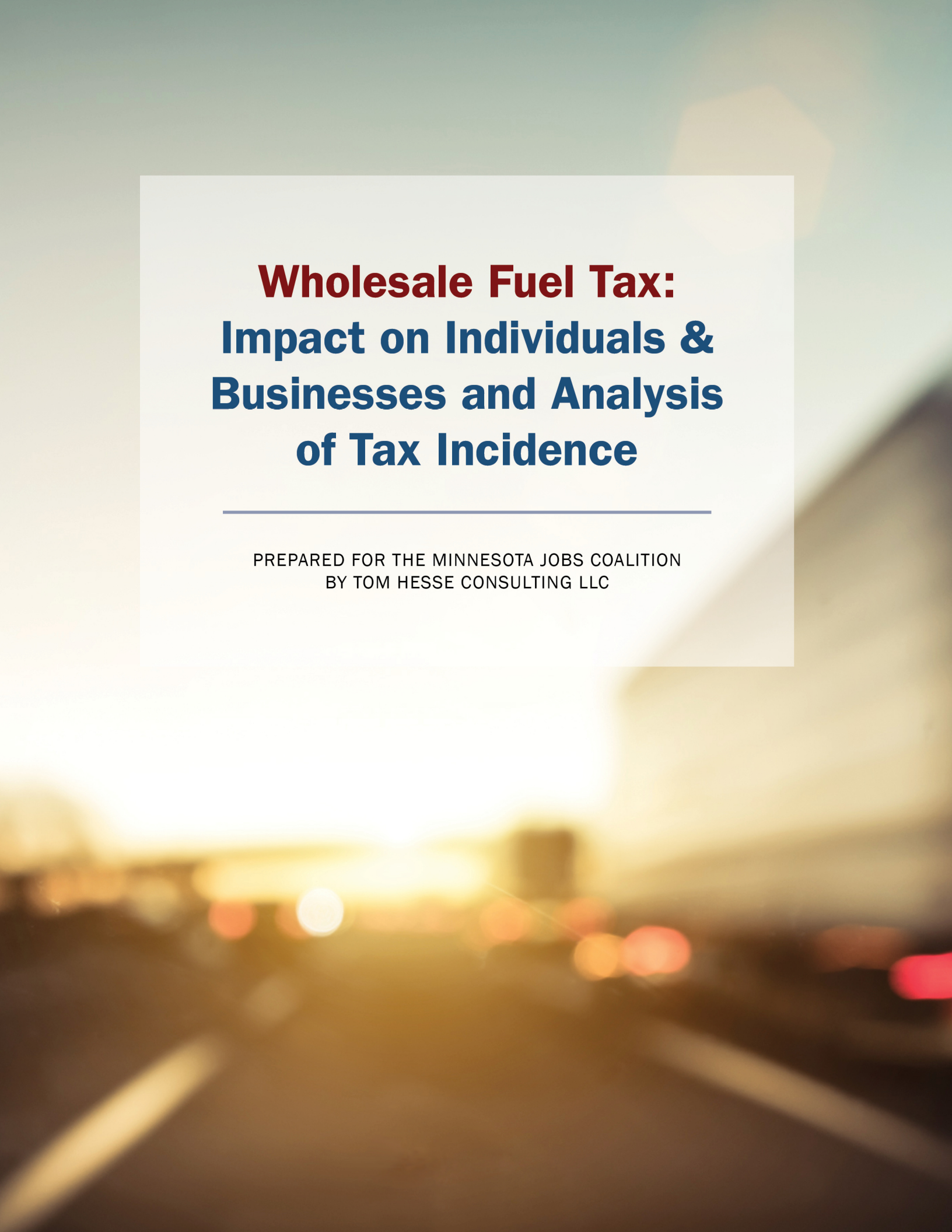


Wholesale Fuel Tax: Impact on Individuals & Businesses and Analysis of Tax Incidence

PREPARED FOR THE MINNESOTA JOBS COALITION
BY TOM HESSE CONSULTING LLC

EXECUTIVE SUMMARY

I. ***Minnesota's Transportation Funding System***: Minnesota has a traditional transportation funding system. It relies on the motor fuel excise tax, motor vehicle registration tax, and motor vehicle sales tax. All of the revenue is constitutionally dedicated to transportation purposes. Transportation revenue growth is slowing from around 4% in FY 2014-15 to less than 2% in FY 2019. This is primarily due to essentially no growth in fuel tax revenue. Motor vehicle registration tax revenue and motor vehicle sales tax revenue are expected to grow over that same period of time.

II. ***2015 Transportation Funding Proposal***: In 2015, a new funding mechanism was proposed for transportation – a 6.5% sales tax on gasoline at the wholesale level (wholesale fuel tax). The rationale for the new tax was that transportation revenue was not growing fast enough to meet the needs of the system and construction inflation. By switching from an excise tax to a wholesale tax, revenues would fluctuate as the wholesale price of gasoline increases or decreases. The proposal protected transportation funding from decreasing fuel prices by including a $2.50 wholesale price floor. This provision guaranteed a minimum tax increase of 16.2 cents per gallon ($2.50 x 0.065). At 44.7 cents per gallon, Minnesota's fuel tax would be the second highest in the nation.

    Wholesale fuel prices are expected to be below the $2.50 price floor until 2022 under the October 2015 World Bank forecast of crude oil prices, U.S. Energy Information Administration research on the relationship between crude oil prices and wholesale prices and Tom Hesse Consulting calculations. There are two ways to look at the impact of the price floor. First, it results in consumers paying more than would otherwise occur if no floor existed and, second, the effective tax rate of the wholesale fuel tax will be greater than 6.5% until 2022.

III. ***Impact of Proposed 6.5% Wholesale Fuel Tax on Individuals and Businesses***: To estimate the impact of the proposed 6.5% wholesale fuel tax on individuals, a commonly purchased compact car, midsize car, minivan, SUV and pickup truck was selected and three mileage options were used. To check the sensitivity of the analysis to the age of the vehicles, model years 2015, 2010 and 2005 were used. Data for each vehicle's fuel economy was taken from the respective U.S. Department of Energy's Fuel Economy Guides. The table below shows the range of tax increase that would result from the proposed wholesale fuel tax on the five vehicles.

Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline

	10,000 Miles	15,000 Miles	20,000 Miles
Compact: Ford Focus	$54.00 - $57.86	$81.00 - $86.79	$108.00 - $115.71
Midsize: Toyota Camry	$64.80 - $70.43	$97.20 - $105.65	$129.60 - $140.87
Minivan: Dodge Carivan	$77.14 - $85.26	$121.50 - $127.89	$162.00 - $170.53
SUV: Ford Explorer	$90.00 - $101.25	$135.00 - $151.88	$180.00 - $202.50
Pickup: Ford F-150	$85.26 - $101.25	$127.89 - $151.88	$170.53 - $202.50

Source: U.S Department of Energy, Fuel Economy Guide various years and Tom Hesse Consulting calculations

To estimate the direct impact on businesses, a similar analysis was performed using a delivery truck, dump truck and class 8 truck (semi-trailer truck) and two mileage options around an estimated annual miles traveled per year for these vehicle types. The age of the vehicle likely has a significant impact on this analysis. There are more hybrid options being introduced into the marketplace that have substantially better fuel economy. The table below shows the estimated direct impact of the 6.5% wholesale fuel tax on the three types of trucks.

Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline

	10,000 Miles	13,116 Miles	20,000 Miles
Delivery Truck – 6.6 mpg	$245.45	$321.94	$490.91
Hybrid – 10.7 mpg	$123.36	$198.58	$246.73

	50,000 Miles	60,000 Miles	70,000 Miles
Dump Truck – 6.2 mpg	$1,306.45	$1,567.74	$1,829.03
Hybrid – 10.7 mpg	$757.01	$908.41	$1,059.81

	60,000 Miles	68,155 Miles	80,000 Miles
Class 8 Truck – 5.3 mpg	$1,833.96	$2,083.23	$2,445.28
Hybrid – 10.7 mpg	$908.41	$1,031.88	$1,211.21

Source: Federal Highway Administration, Equipment World and Tom Hesse Consulting calculations

While the table above estimates the direct impact of the proposed wholesale tax on fuel, there are also indirect impacts of the tax. One of them is that the tax is passed through to consumers through higher prices of goods. A recent U.S. Department of Agriculture study (How Transportation Costs Affect Fresh Fruit and Vegetable Prices) analyzes the impact that higher energy prices have on food prices. It concluded that a doubling of diesel fuel prices would increase the wholesale price of fruits and vegetables by 20% to 28%.

IV. ***Tax Incidence of Proposed 6.5% Wholesale Fuel Tax***: The Minnesota Department of Revenue's Tax Incidence Study concludes that the current fuel tax is very regressive. Only the state's tobacco taxes, gambling taxes and solid waste taxes were more regressive. The study also concluded that the tax on business inputs like gasoline would likely be shifted to consumers in the form of higher prices and that the burden of a business tax increase is less likely to fall on capital and more likely to fall on labor and consumers.

A 2012 study titled Gasoline Taxes and Consumer Behavior from economists at Harvard University concluded that fuel tax increases have a much greater impact on consumption than market price increases. Consumers appear to view tax increases as permanent price increases while market price increases are viewed as temporary in nature.

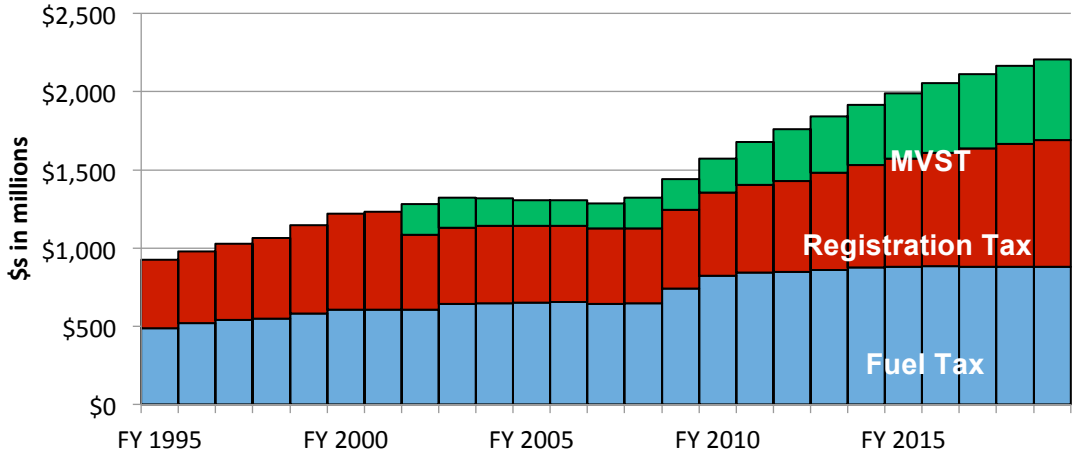
A 2002 study titled Estimates from a Consumer Demand System: Implications for the Incidence of Environmental Taxes concluded that the gas tax is regressive but there is a way to mitigate the regressive nature of the tax. If the dollars raised are annually used to provide a lump-sum payment to households, the combination of changes is somewhat progressive.

I. Minnesota's Transportation Funding System

Minnesota has a traditional transportation funding system for roads and bridges. It relies on three revenue sources for the vast majority of its dollars – the fuel tax, the motor vehicle registration tax, and the motor vehicle sales tax (MVST). In FY 2015, these three revenue sources raised $1.99 billion while other revenue accounted for only $3 million.[i] Chart 1 shows how the major revenue sources change over time. Federal transportation revenue is not included in this analysis.

CHART 1

Minnesota Highway User Tax Revenue
FY 1995 - FY 2019 est.



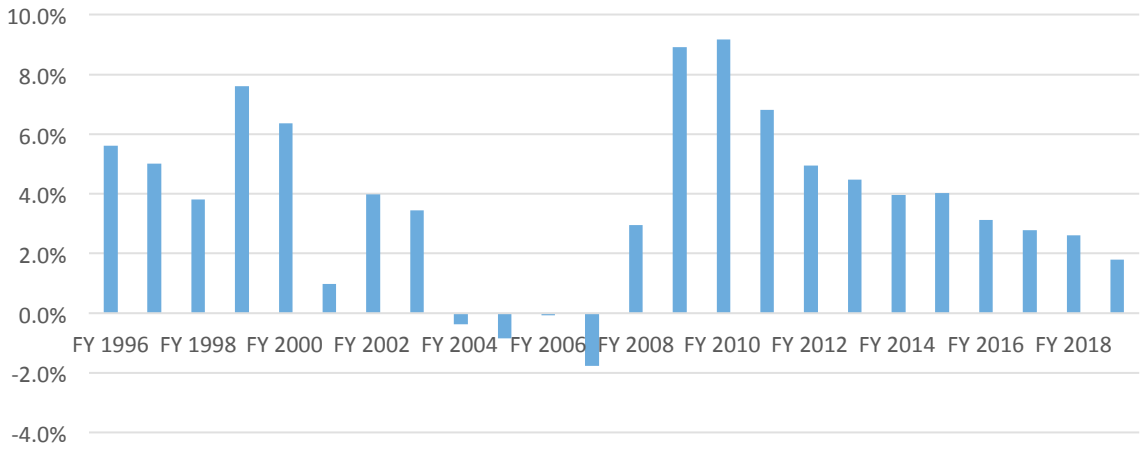
Source: MN Department of Transportation

Transportation revenue has steadily increased since the 2008 transportation funding bill became law. The increase is due to changes to the motor vehicle registration tax and growing motor vehicle sales. The fuel tax has been relatively constant and is expected to remain so through FY 2019. Chart 2 shows the annual change of Highway User Tax Revenue over the same period of time. Annual growth has slowed considerably since the 2008 law changes took effect. Revenue growth is expected to be 1.8% in FY 2019.

A brief analysis of each tax follows.

CHART 2

Change of Minnesota Highway User Tax Revenue from Previous Year



Source: MN Department of Transportation and Tom Hesse Consulting calculations

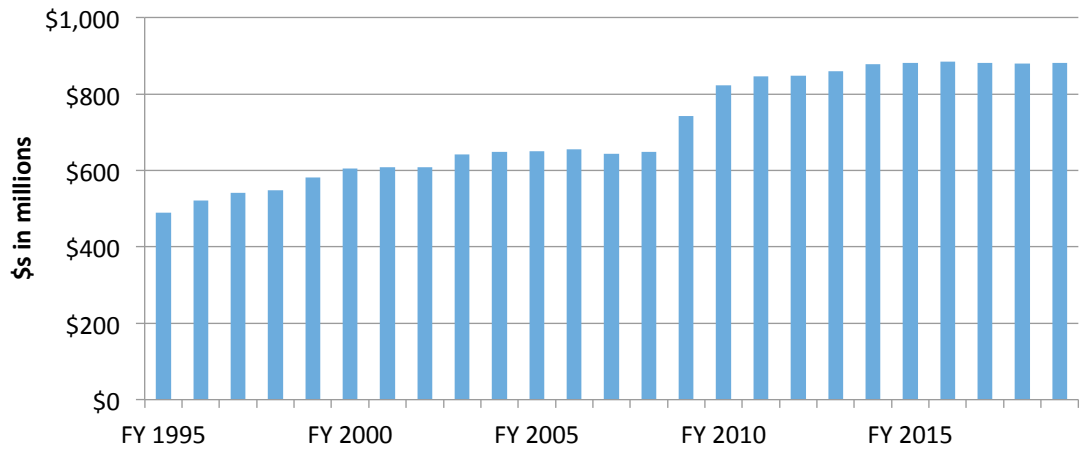
Motor Vehicle Excise Tax

For many years, the motor vehicle excise tax (fuel tax) was by far the largest revenue source for transportation funding. During the 1980s, the fuel tax rate increased on four separate occasions. It began the decade at 9 cents per gallon and after increases in 1980, 1981, 1983, and 1988 it ended the decade at 20 cents per gallon. Between 1988 and April 2008, the rate did not change.[ii] Chart 3 shows the fuel tax dollars dedicated to roads and bridges between FY 1995 and the estimate for FY 2019.

The 2008 transportation funding law began a series of rate increases from 20 to 28.5 cents per gallon. The last increase was on July 1, 2012. Five cents per gallon of that amount was a general tax increase and not dedicated to any specific road funding purpose. The remaining 3.5 cents per gallon was a debt service surcharge and will be used to pay the debt service on bonding authorized in the 2008 legislation.[iii] Presumably, the debt service surcharge will blink off when the bonds are paid off.

CHART 3

Motor Fuel Tax
FY 1995 - FY 2019 est.



Source: MN Department of Transportation

While the rate of the fuel tax did not change from FY 1995 to FY 2003, the dollars generated from the tax increased from $490 million to $642 million due to higher fuel consumption – a 3.4% annual increase. However, fuel consumption stagnated beginning in FY 2003 and five years later the tax only generated $6 million more ($648 million). Fuel tax revenue is expected to be stagnant between FY 2014 and the estimate for FY 2019.

There are several ways to rank Minnesota's fuel tax nationally. Two methods are represented in Tables 1a and 1b. Table 1a shows state excise taxes plus state wholesale taxes. This method was chosen because some states have eliminated their excise taxes on fuel and replaced them with a wholesale tax on fuel and other states have chosen to add a wholesale tax on fuel to their existing excise tax. Minnesota has the 14th highest fuel tax by this measure. This method doesn't capture state sales taxes on fuel, local taxes, and miscellaneous fees. Table 1b shows all state and local taxes and fees on fuel. Minnesota ranks 24th highest by that measure.[iv]

TABLE 1A

State Excise and Wholesale Taxes on Fuel

Rank	State	Tax Rate
1	Pennsylvania	55.3
2	Washington	44.5
3	Connecticut	37.51
4	North Carolina	36.0
5	West Virginia	34.6
6	Rhode Island	33.0
7	Maryland	32.1
8	Idaho	32.0
9	Iowa	31.0
10	Wisconsin	30.9
11	California	30.0
	Maine	30.0
	Oregon	30.0
14	**Minnesota**	**28.5**
15	Ohio	28.0
	South Dakota	28.0
17	Montana	27.0
18	Nebraska	26.1
19	Georgia	26.0
20	New York	25.85
21	Kentucky	24.6
22	Utah	24.5
23	Kansas	24.0
	Massachusetts	24.0
25	DC	23.5
26	Delaware	23.0
	Nevada	23.0
	North Dakota	23.0
	Wyoming	23.0
30	New Hampshire	22.2
31	Colorado	22.0
32	Arkansas	21.5
33	Louisiana	20.0
	Tennessee	20.0
	Texas	20.0
36	Virginia	19.83
37	Illinois	19.0
	Michigan	19.0
39	Arizona	18.0
	Indiana	18.0
	Mississippi	18.0
42	Hawaii	17.0
	Missouri	17.0
	New Mexico	17.0
45	Alabama	16.0
	Oklahoma	16.0
	South Carolina	16.0
48	New Jersey	14.5
49	Vermont	12.1
50	Alaska	8.95
51	Florida	4.0

Source: American Petroleum Institute

TABLE 1B

Total Taxes & Fees on Fuel

Rank	State	Tax Rate
1	Pennsylvania	55.3
2	Washington	44.5
3	New York	44.27
4	Hawaii	43.15
5	California	40.92
6	Connecticut	37.51
7	Florida	36.42
8	North Carolina	36.25
9	West Virginia	34.6
10	Rhode Island	34.0
11	Nevada	33.85
12	Michigan	33.84
13	Illinois	33.47
14	Indiana	33.3
15	Wisconsin	32.9
16	Georgia	32.62
17	Maryland	32.1
18	Idaho	32.0
	Iowa	32.0
20	Oregon	31.09
21	Vermont	30.73
22	Maine	30.01
23	South Dakota	30.0
24	**Minnesota**	**28.6**
25	Ohio	28.0
26	Montana	27.75
27	Nebraska	27.0
28	Massachusetts	26.54
29	Kentucky	26.0
30	Utah	24.51
31	Kansas	24.03
32	Wyoming	24.0
33	New Hampshire	23.83
34	DC	23.5
35	Delaware	23.0
	North Dakota	23.0
37	Virginia	22.33
38	Colorado	22.0
39	Arkansas	21.8
40	Tennessee	21.4
41	Alabama	20.87
42	Louisiana	20.01
43	Texas	20.0
44	Arizona	19.0
45	New Mexico	18.88
46	Mississippi	18.79
47	Missouri	17.3
48	Oklahoma	17.0
49	South Carolina	16.75
50	New Jersey	14.5
51	Alaska	12.25

Source: American Petroleum Institute

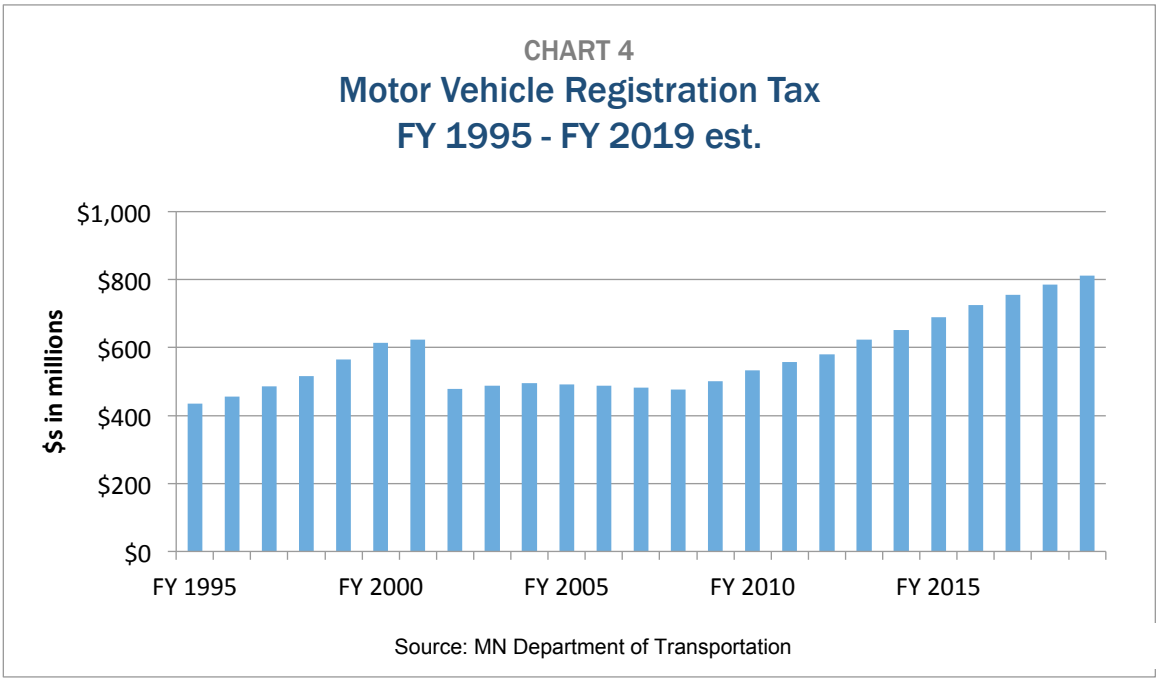
Motor Vehicle Registration Tax

The motor vehicle registration tax is commonly referred to as license tab fees. It is the annual tax vehicle owners pay to license their vehicles. The tax is $10 plus 1.25% of the value of the vehicle. The value of a new car is the manufacturer's suggested retail price plus any destination charge. The value depreciates over time by 10 percentage points per year. The value in year 2 is 90% of the year 1 value. Similarly, the value in year 3 is 80% of the year 1 value and the value in year 10 is 10% of the year 1 value. In year 11 and subsequent years, the amount is a flat $25.[v]

The tax has undergone two significant changes over the last twenty years. In 2000, a new law capped the registration tax for the first renewal at $189 and the second and subsequent renewals at $99. In 2008, the caps were removed and the depreciation schedule was changed to its current form. The law also grandfathered in all currently registered vehicles so that no one would pay more than the previous year.[vi]

Chart 4 shows the impact of these changes. First, the amount of tax drops significantly once the caps kick in (FY 2002) and stays relatively constant for several years. Second, removing the caps allows the registration tax to grow beginning in FY 2009. The growth is expected to decelerate from FY 2015 to FY 2019 but it will still be greater than 3% per year.

CHART 4



Source: MN Department of Transportation

Motor Vehicle Sales Tax

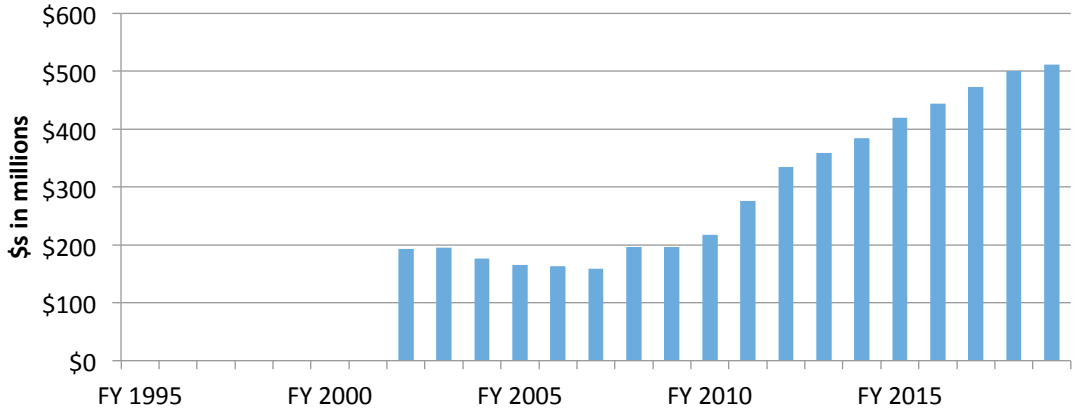
The Motor Vehicle Sales Tax (MVST) has had an interesting history in transportation finance. Initially, the tax was a general fund revenue source. In 1981, the legislature statutorily dedicated a portion of the tax to transportation and transit. Due to persistent

general fund budget shortfalls in the early 1980s, future planned transfers of MVST dollars to transportation were cancelled. Between 2000 and 2003, the Legislature reduced vehicle registration taxes and eliminated transit-related property taxes causing another statutory dedication of MVST dollars to transportation and transit. In 2006, Minnesota voters approved a constitutional amendment that dedicated not less than 40% of MVST dollars to transit and no more than 60% to roads and bridges. The constitutional dedication was phased in over a five-year period.[vii]

Chart 5 shows the portion of the motor vehicle sales tax that is dedicated to road and bridge funding. The motor vehicle sales tax will be a growing component of transportation finance in the coming years. The growth rates from FY 2016 through FY 2019 are expected to be between 2.4% to 6.5%.

CHART 5

Motor Vehicle Sales Tax for Transportation
FY 1995 - FY 2019 est.



Source: MN Department of Transportation

II. 2015 Transportation Funding Proposal

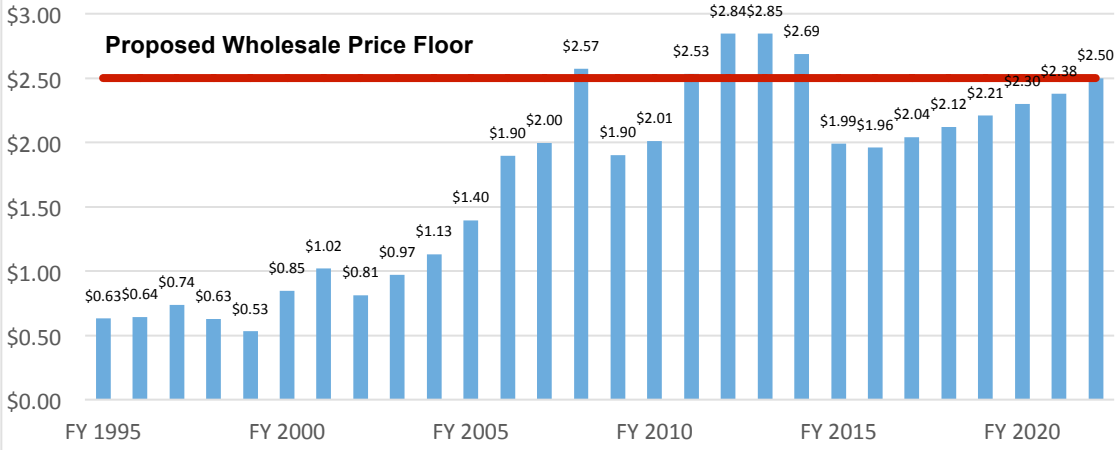
In 2015, there were multiple proposals for a significant increase in transportation investment. One proposal created a new 6.5% wholesale tax on gasoline. It was expected to raise $4.4 billion over a ten-year period. The tax would be imposed on the wholesaler of fuel to be used in Minnesota. The tax is calculated as the greater of: (1) 6.5% of $2.50 or 6.5% of the prior fiscal year's average wholesale price of gasoline in Minnesota for all grades and rounded to the nearest tenth of a cent per gallon.[viii] The wholesale price floor of $2.50 is designed to insure that the new tax never falls below the equivalent of a 16.2 cents per gallon increase in the fuel tax. At a minimum, Minnesota's fuel tax would increase from 28.5 to 44.7 cents per gallon – a 57% increase. At 44.7 cents per gallon, Minnesota would have the second highest tax on fuel in the nation.

The impact of the wholesale price floor will be significant over the next several years. According to the U.S. Energy Information Administration, the average wholesale price for gasoline for all grades in Minnesota for fiscal year 2015 was $1.99 per gallon.[ix] If there was no wholesale price floor in the proposal, the 6.5% wholesale tax would be a 12.8 cents per gallon increase (45%) rather than a 16.2 cents per gallon increase (57%).

In the future, the gap between the average wholesale price and the $2.50 price floor will likely continue. According to the World Bank's crude oil price forecast, the average spot price for 2015 is $52.50 per barrel. The price is expected to decline slightly to $51.40 per barrel in 2016 before rebounding to $54.60 in 2017, $57.90 in 2018, $61.50 in 2019 and $65.30 in 2020.[x] In addition, U.S. Energy Information Agency research estimates that, other factors being equal, a $1 per barrel change in the price of crude oil will result in a 2.4 cents per gallon change in the wholesale and retail price of gasoline.[xi] That means crude oil prices would have to increase to $73.75 per barrel before the wholesale price reaches $2.50 per gallon. Under the World Bank forecast, the price of crude oil doesn't reach that level until 2022. Chart 6 shows a historical view of the wholesale price of gas and estimates of the price through 2022 in relation to the $2.50 price floor.

CHART 6

Minnesota Average Annual Wholesale Price of Gasoline for All Grades by Fiscal Year



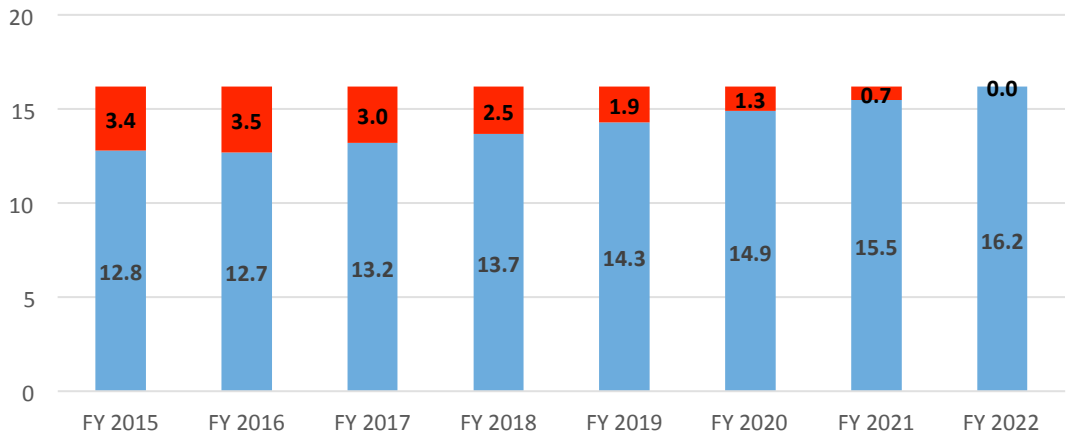
Source: US Energy Information Administration and Tom Hesse Consulting calculations

Chart 7 shows the tax rate generated from 6.5% of the estimated wholesale price under the World Bank's forecast and the EIA's analysis (blue columns). The excess tax rate generated by the $2.50 wholesale price floor is represented by the red columns. The estimated wholesale price of gasoline in FY 2016 through FY 2022 was calculated as follows:

$$Wholesale\ Price_{Year} = \$1.99 + (Crude\ Oil\ Price_{Year} - \$52.50)\ x\ \$0.024$$

The FY 2015 wholesale price of $1.99 is an actual fiscal year number derived from monthly data. No fiscal year data exists for crude oil prices. Calendar year crude oil price estimates were used in the calculation.

CHART 7

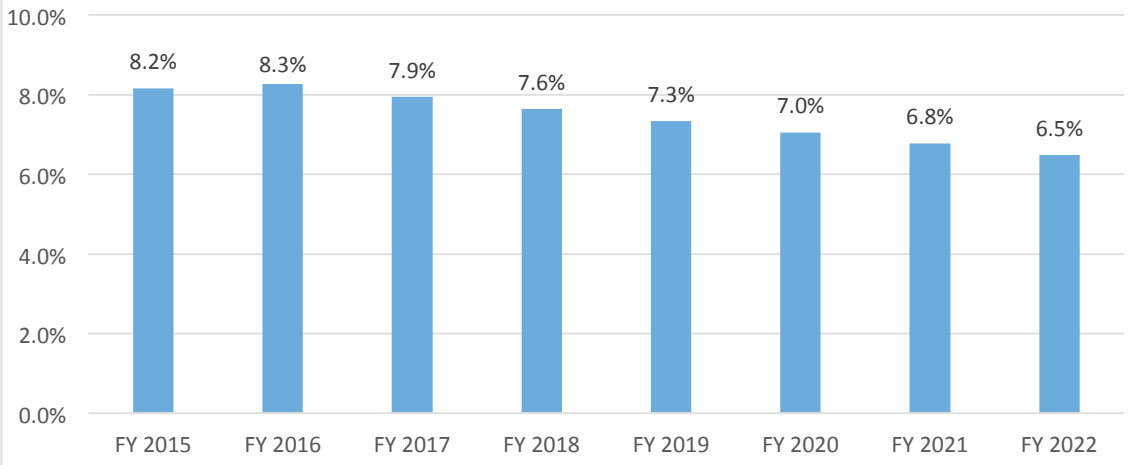


Source: MN Department of Transportation

Another way to look at the impact of the $2.50 wholesale price floor is it increases the effective rate of the tax. For FY 2015, the wholesale price of gasoline was $1.99 per gallon. The tax rate needed to generate the equivalent of a 16.2 cent per gallon fuel tax is 8.15%. Given the current crude oil price projections, the effective rate will be higher than the stated rate of 6.5% until FY 2022. Chart 8 shows the effective tax rates under those projections.

CHART 8

Effective Tax Rate of Wholesale Fuel Tax



Source: Tom Hesse Consulting calculations based on World Bank & U.S. Energy Information Agency data

Comparison with Other States: Currently, 18 states and the District of Columbia have a variable rate gas tax – one that is based on the wholesale or retail price of gasoline. Of those, 10 states and the District of Columbia have taxes that are similar to the Minnesota proposal, e.g. based on the wholesale price of gas. The other eight states either have retail sales taxes or other taxes that are based on the retail price of gasoline. A brief summary of the 11 laws similar to the Minnesota proposal follows.[xii]

- Connecticut: The state imposes an 8.1% wholesale fuel tax. It has a wholesale price cap of $3 per gallon which was necessary to avoid conflicting with Connecticut's price gouging law. Connecticut continues to impose a 25 cent per gallon excise tax.[xiii]
- District of Columbia: The District of Columbia imposes an 8% wholesale tax on gasoline. It maintains a $2.94 price floor and limits the change in the wholesale price to 10% from the previous period.[xiv]
- Kentucky: The state imposes a 9% wholesale fuel tax. Kentucky maintains a $2.177 per gallon price floor and limits the increase in the wholesale price to 10% per year.[xv]
- Maryland: The state imposes a 3% wholesale fuel tax.[xvi] Maryland also continues to impose a 24.6 cents per gallon excise tax that is annually adjusted for inflation.[xvii]
- Nebraska: The state imposes a 5% wholesale fuel tax. Nebraska also continues to impose a 10.3 cents per gallon excise tax.[xviii]
- New Jersey: The state imposes a 2¾% petroleum products gross receipts tax which currently equates to 4.0 cents per gallon. New Jersey continues to impose a 10.5 cents per gallon fuel tax.[xix]
- New York: The state imposes a petroleum business tax at a rate of 7.2% of the gross receipts from petroleum sales. This tax is also annually adjusted for inflation. New York continues to impose an 8 cents per gallon excise tax.[xx]

- North Carolina: The state imposes a wholesale tax that is the greater of 3.5 cents per gallon or 7% of the average wholesale price of motor fuel. The tax is capped at 37.5 cents per gallon. North Carolina continues to impose a 17.5 cents per gallon excise tax.[xxi]
- Pennsylvania: The state imposes an oil company franchise tax (wholesale tax). Currently, the tax generates the equivalent of 55.3 cents per gallon. Pennsylvania eliminated its excise tax on gas.[xxii]
- Virginia: The state imposes a 5.1% wholesale tax on gas. The rate increased from 3.5% to 5.1% in 2015 because a 2013 law provided for the rate increase if Congress failed to overturn the U.S. Supreme Court's *Quill* decision that prohibits states from compelling remote sellers to collect and remit the sales tax on remote sales. Virginia eliminated its excise tax on gas.[xxiii]
- West Virginia: The state imposes a 5% wholesale tax on gasoline. West Virginia has a $2.34 price floor making the minimum wholesale tax on 11.7 cents per gallon. West Virginia continues to impose its 20.5 cents per gallon excise tax.[xxiv]

Tax Policy Evaluation: The Minnesota Department of Revenue published "A Model Revenue System for Minnesota" in 1992. It outlined five tax policy principles that can be used to analyze the state's tax system. A tax system should be:

- Understandable: Taxpayers, public officials and revenue administrators can and do understand the revenue system.
- Fair: Taxpayer revenue burdens are progressive; revenue burdens on taxpayers with equal incomes, consumption or wealth are approximately equal; tax bases are broad and rates are low as a result of minimal exclusions; and enforcement is consistent and adequate.
- Competitive: Minnesota's ability to compete with other states and nations as a location of economic activity is maximized.
- Reliable: The revenue system is stable, sufficient and certain.
- Efficient: Compliance costs are kept to a minimum for taxpayers and revenue administration and there is maximum compliance, neutrality between different forms of economic activity, and clarity and accountability in state and local relationships.

Table 2 evaluates the proposed 6.5% wholesale tax on fuel with respect to these tax policy principals.

TABLE 2

Analysis of Wholesale Fuel Tax with Respect to Tax Policy Principles

Tax Policy Principle	Analysis	Evaluation
Understandable: The tax system is easy to understand for taxpayers, public officials and revenue administrators.	The proposed 6.5% wholesale tax on fuel makes the tax system less understandable. Under the proposal, there would be two separate fuel taxes, one based on the amount of fuel purchased (the current excise tax) and one based on the price of fuel (the proposed 6.5% wholesale tax). In addition, taxpayers might have difficulty understanding that the 6.5% tax rate results in a minimum of a 16.2 cent per gallon increase in the fuel tax. A further complication is the $2.50 floor for the wholesale price of fuel. In the near term as the wholesale price of fuel remains below $2.50 per gallon, taxpayers might not understand why they are paying tax based on the $2.50 amount. Taxpayers understand the current fuel tax. They know it is solely based on the amount of fuel they purchase.	↓
Fair: The tax system has broad bases and low rates with minimal exclusions, is progressive, imposes similar tax burdens on taxpayers with equal incomes, consumption or wealth, and has consistent and adequate enforcement.	The proposed 6.5% wholesale tax on fuel has minimal exclusions and would likely have consistent and adequate enforcement. It treats individuals with equal consumption the same, but individuals can impact their tax burden by their choice of vehicle. Those positive characteristics are offset by the very regressive nature of the tax.	–
Competitive: The tax system should maximize the ability of Minnesota to compete for the location of economic activity.	The proposed 6.5% wholesale tax on gasoline with a wholesale price floor of $2.50 would, at a minimum, increase the tax on fuel by 16.2 cents per gallon bringing the total to a minimum of 44.7 cents per gallon. That would make Minnesota the 2nd highest fuel tax in the nation no matter which method from Table 1 is selected. Only Pennsylvania (which has a substantial wholesale tax) would have a higher tax on fuel.	↓
Reliable: The tax system is stable over the business cycle, grows with the economy over time, and not changing frequently or significantly so that taxpayers and administrators are better able to plan.	The proposed $2.50 per gallon wholesale price floor provides some stability in the short run. The wholesale price of fuel has been very volatile over the last few years. Once the wholesale price increases beyond $2.50 per gallon, the tax will be more volatile than Minnesota's current excise tax.	–

TABLE 2

Analysis of Wholesale Fuel Tax with Respect to Tax Policy Principles

Tax Policy Principle	Analysis	Evaluation
Efficient: The tax system has minimal compliance costs for taxpayers and administrators, is neutral between different forms of economic activity, and the relationship between state and local governments is clear and accountable.	The proposed wholesale tax on fuel has minimal compliance costs. There will be only a small number of taxpayers required to remit the tax and for the Department of Revenue to audit. The tax does not impact the relationship between state and local governments. The tax impacts some industries more than others. For example, the agriculture, construction, manufacturing and transportation sectors consume more fuel and will be impacted more heavily than the service sector; however, that relationship currently exists with the excise tax.	↑

↑ = Improves tax system; – = Does not improve tax system or make it worse; ↓ = Makes tax system worse.

III. Impact of 6.5% Wholesale Fuel Tax on Individuals and Businesses

To estimate the impact of the proposed 6.5% wholesales tax on individuals, five typical vehicle types were chosen – a compact car midsize car, minivan, sport utility vehicle (SUV) and pickup truck. The selected vehicles were either top sellers in Minnesota or the U.S. in their respective categories. The compact car is a Ford Focus which ranked fourth in Minnesota car sales in 2014.[xxv] The midsize car is a Toyota Camry which ranked first in Minnesota car sales in 2014.[xxvi] The minivan is a Dodge Carivan and the SUV is a Ford Explorer. The Carivan and Explorer ranked second and first in the U.S. for 2014 minivan sales[xxvii] and larger SUV sales[xxviii] respectively. The pickup truck is a Ford F-150 which ranked first for Minnesota light duty truck sales in 2014.[xxix]

Each vehicle's fuel economy was found from the U.S. Department of Energy's Fuel Economy Guide for 2015. The Ford Focus 2.0L, 4 cylinder, with a six speed automatic transmission has an estimated combined fuel economy of 30 miles per gallon (mpg). The Toyota Camry 3.5L, 6 cylinder, with a six speed automatic transmission has an estimated combined fuel economy of 25 mpg. The Dodge Carivan 3.6L, 6 cylinder, with a six speed automatic transmission has an estimated combined fuel economy of 20 mpg. The Ford Explorer 3.5L, 6 cylinder with a six speed automatic transmission has an estimated combined fuel economy of 18 mpg. Finally, the Ford F-150 3.5L, 6 cylinder, with a six speed automatic transmission has an estimated combined fuel economy of 19 mpg.[xxx]

Three mileage options were selected to show how the tax increase will impact different drivers. Mileage amounts of 10,000, 15,000 and 20,000 were selected because it likely encompassed the driving habits of most Minnesotans. Table 3 shows the estimated annual cost of the proposed 6.5% wholesale tax on gasoline for the four selected vehicles and the three mileage amounts.

TABLE 3
Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline for 2015 Vehicles

	10,000 Miles	15,000 Miles	20,000 Miles
Compact: Ford Focus	$54.00	$81.00	$108.00
Midsize: Toyota Camry	$64.80	$97.20	$129.60
Minivan: Dodge Carivan	$81.00	$121.50	$162.00
SUV: Ford Explorer	$90.00	$135.00	$180.00
Pickup: Ford F-150	$85.26	$127.89	$170.53

Source: U.S Department of Energy, Model Year 2015, Fuel Economy Guide and Tom Hesse Consulting calculations

Using only 2015 vehicles for the analysis will underestimate the cost of the tax increase since not everyone in Minnesota has a new vehicle and average fuel economy has improved slightly over the years. Data on these vehicles for years 2010 and 2005 are

included in Tables 4 and 5 respectively. The engine that most closely matched the engine in the 2015 vehicle was used so the comparisons over time would be more meaningful. The U.S. Department of Energy's Fuel Economy Guides for these years do not report combined fuel economy data; however, its methodology indicates that the combined miles per gallon figure equals 55% of the city mpg plus 45% of the highway mpg.

TABLE 4

Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline for 2010 Vehicles

	10,000 Miles	15,000 Miles	20,000 Miles
Compact: Ford Focus	$57.86	$86.79	$115.71
Midsize: Toyota Camry	$70.43	$105.65	$140.87
Minivan: Dodge Carivan	$85.26	$127.89	$170.53
SUV: Ford Explorer	$101.25	$151.88	$202.50
Pickup: Ford F-150	$95.29	$142.94	$190.59

Source: U.S Department of Energy, Model Year 2010, Fuel Economy Guide and Tom Hesse Consulting calculations

TABLE 5

Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline for 2005 Vehicles

	10,000 Miles	15,000 Miles	20,000 Miles
Compact: Ford Focus	$55.86	$83.79	$111.72
Midsize: Toyota Camry	$64.80	$97.20	$129.60
Minivan: Dodge Carivan	$77.14	$115.71	$154.29
SUV: Ford Explorer	$95.29	$142.94	$190.59
Pickup: Ford F-150	$101.25	$151.88	$202.50

Source: U.S Department of Energy, Model Year 2005, Fuel Economy Guide and Tom Hesse Consulting calculations

As previously illustrated in Chart 7, under current crude oil price forecasts, the wholesale tax would generate less than 16.2 cents per gallon every year until 2022 if the $2.50 price floor did not exist. Table 6 estimates the extra tax that individuals would pay between FY 2015 and FY 2021 due to the price floor. For example, in FY 2016, the price floor results in a tax that is 3.5 cents per gallon greater than it otherwise would be. These annual differences are combined in Table 6.

TABLE 6

Extra Tax Due to 6.5% Wholesale Tax Floor on Gasoline for 2015 Vehicles FY 2015 – FY 2021

	10,000 Miles	15,000 Miles	20,000 Miles
Compact: Ford Focus	$54.33	$81.50	$108.67
Midsize: Toyota Camry	$65.20	$97.80	$130.40
Minivan: Dodge Carivan	$81.50	$122.25	$163.00
SUV: Ford Explorer	$90.56	$135.83	$181.11
Pickup: Ford F-150	$85.79	$128.68	$171.58

Source: U.S Department of Energy, Model Year 2015, Fuel Economy Guide and Tom Hesse Consulting calculations

To estimate the direct impact on businesses, data on the average annual fuel use of major vehicle categories from the Federal Highway Administration were used. The analysis looks at three vehicles types, a delivery truck, dump truck and class 8 truck (semi-trailer truck). Unlike passenger cars and trucks, each of these vehicles have much different driving patterns so they will be looked at separately.

- Delivery Truck: According to Federal Highway Administration data, the average annual fuel use for a delivery truck is 1,974 gallons. In addition, delivery trucks average about 6.6 miles per gallon and travel about 13,116 per year.[xxxi]

- Dump Truck: According to a 2010 article in Equipment World, class 8 model dump trucks will typically get about 6.2 miles per gallon for highway driving and drive between 50,000 and 70,000 miles per year.[xxxii]

- Class 8 Truck: According to Federal Highway Administration data, the average annual fuel use for a class 8 truck is 12,889 gallons. In addition, class 8 trucks average about 5.3 miles per gallon and travel about 68,155 miles per year.[xxxiii]

The proposed 6.5% wholesale tax has the same impact on diesel fuel as it does on gasoline. Table 7 shows the additional tax cost for a delivery truck driven 10,000, 13,116, and 20,000 miles; a dump truck driven 50,000, 60,0000 and 70,000 miles; and a class 8 truck driven 60,000, 68,155, and 80,000 miles. The additional tax cost is likely dependent on age of the vehicle though. More fuel efficient options are available. For example, newer diesel engines can get up to 10.7 miles per gallon.[xxxiv] Table 7 also shows the increased cost for the newer diesel engine vehicles.

TABLE 7

Estimated Annual Cost of 6.5% Wholesale Tax on Gasoline

	10,000 Miles	13,116 Miles	20,000 Miles
Delivery Truck – 6.6 mpg	$245.45	$321.94	$490.91
Hybrid – 10.7 mpg	$123.36	$198.58	$246.73

	50,000 Miles	60,000 Miles	70,000 Miles
Dump Truck – 6.2 mpg	$1,306.45	$1,567.74	$1,829.03
Hybrid – 10.7 mpg	$757.01	$908.41	$1,059.81

	60,000 Miles	68,155 Miles	80,000 Miles
Class 8 Truck – 5.3 mpg	$1,833.96	$2,083.23	$2,445.28
Hybrid – 10.7 mpg	$908.41	$1,031.88	$1,211.21

Source: Federal Highway Administration, Equipment World and Tom Hesse Consulting calculations

To estimate the indirect impact of the tax, academic research regarding how business taxes are shifted to individuals and imbedded in the costs of goods was reviewed. The U.S. Department of Agriculture has a study that specifically look at how energy prices impact the cost of food. It is summarized on the next page.

How Transportation Costs Affect Fresh Fruit and Vegetable Prices[xxxv]

This study analyzes the impact fuel prices had on wholesale produce prices from 2000 to 2009. The authors chose fresh produce because fruits and vegetables typically have few processing and other non-transportation expenses. The study used U.S. Department of Agriculture Agricultural Marketing Service data on wholesale fresh fruit and vegetable prices for 13 wholesale market locations. The study makes the following conclusions:

- Fuel prices are a statistically significant factor in determining the difference between farm and wholesale prices.
- Fuel price volatility can lead to substantial geographic variation in produce prices.
- On average, a 100% increase in diesel prices would lead to a short-term wholesale produce price increase of 20% to 28%.
- The impacts of imported produce would likely be much smaller.

The study estimated the percentage increase in the average market price for certain fruits and vegetables that would be expected from a doubling of fuel prices. Table 8 shows the estimated price increases for the Midwest (Chicago, Detroit and St. Louis).

TABLE 8

Percent Price Increase in Fruit and Vegetable Prices in Midwest from a Doubling of Fuel Prices

	California	Florida	Mexico	Central America
Asparagus	20.5	--	15.1	--
Cantaloupes	17.4	--	--	3.9
Peppers	20.9	20.5	7.1	--
Grapes	21.3	--	--	25.0
Oranges	16.1	21.4	--	--
Tomatoes	2.9	21.3	6.1	--

Analysis: According to the U.S. Department of Energy, Energy Information Administration, the average retail price of gasoline in Minnesota for December 2015 was $1.95.[xxxvi] The proposed 6.5% wholesale fuel tax would add 16.2 cents per gallon to the price which would be an increase of 8.3%. Converting the results from Table 8 to an 8.3% increase would lead to a 1.7% price increase for California grown asparagus, a 1.4% price increase for California grown cantaloupes, a 1.7% price increase for California grown peppers and a 1.7% price increase for Florida grown peppers, 1.8% price increase for California grown grapes, 1.3% price increase for California grown oranges and 1.8% price increase for Florida grown oranges, a 0.2% price increase for California grown tomatoes and a 1.8% increase in Florida grown tomatoes.

IV. Tax Incidence of Proposed 6.5% Wholesale Fuel Tax

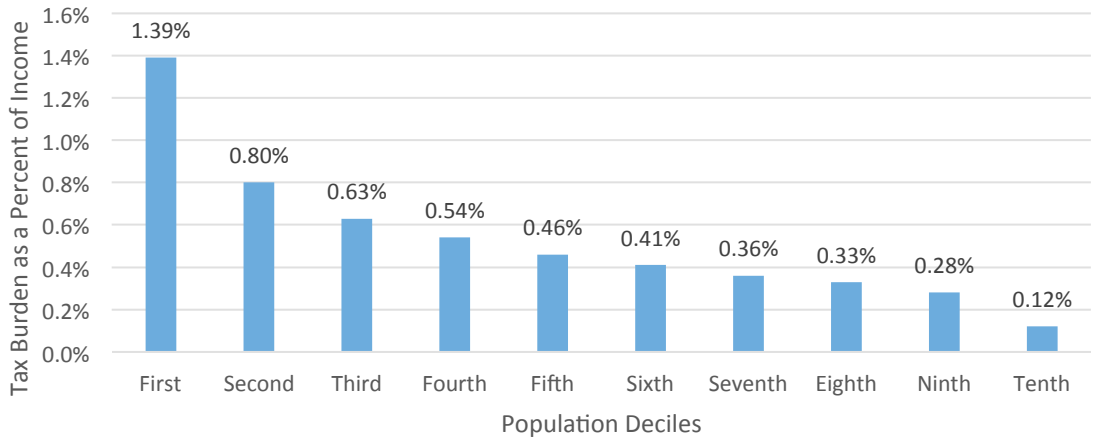
Every two years, the Minnesota Department of Revenue produces its Tax Incidence Study. The purpose of the study is to estimate how Minnesota's state and local tax system impacts Minnesotans over various income categories. It evaluates specific taxes and determines if the taxes are progressive (higher income individuals pay more as a percent of income), proportionate or regressive (lower income individuals pay more as a percent of income). It not only looks at the initial impact of a tax (impact on the taxpayer that is legally obligated to pay it) but also the final tax burden after tax shifting occurs. The tax shifting refers to how businesses shift the burden of taxes to individuals. There are three possible ways businesses shift taxes – to consumers in the form of higher prices, to labor in the form of lower wages, and to owners of capital in the form of lower returns.

With respect to the existing fuel tax, the study concludes that it is highly regressive. The Suits Index is the statistical measure of how progressive or regressive a tax is. A Suits Index of 0 is a perfectly proportionate tax. Progressive taxes have values between 0 and 1 while regressive taxes have values between -1 and 0. For 2012, the Suits Index for the fuel tax was -0.370. Only tobacco taxes (-0.602), gambling taxes (-0.517) and solid waste taxes (-0.422) were more regressive. As a comparison, the general sales tax has a Suits Index of -0.272, the corporate income tax has a value of -0.197, and the residential property tax has a value of -0.275.[xxxvii]

Chart 9 shows how the fuel tax is distributed over the ten population deciles. (The first decile represents the lowest 10% of household income and the tenth decile represents the highest 10% of household income.) The Department of Revenue cautions readers from drawing conclusions from data on the first decile. It includes households that have temporarily low incomes and income tends to be understated.[xxxviii] Nevertheless, the tax burden as a percent of income declines in every decile. The tax burden for the second decile is almost three times the tax burden of the ninth decile.

CHART 9

2012 Effective Tax Rates for Motor Fuels Excise Taxes



Source: Minnesota Department of Revenue

The study also reports that the tax on "short-lived intermediate business inputs like gasoline" would likely be shifted forward to consumers in the form of higher prices – 25% to Minnesota consumers and 75% outside of the state. In addition, it concludes that the burden of a business tax increase "is less likely to fall on capital and more likely to fall on labor and consumers."[xxxix]

Analysis: The proposed 6.5% wholesale fuel tax is different than the current fuel tax. It is imposed on the distributor based on the gross receipts derived from the first sale of fuel at the wholesale level rather than imposed on consumers at the retail level. However, the

Minnesota Department of Revenue believes that the tax would be fully passed on to consumers through higher prices, the incidence of the tax shouldn't change.[xl]

In addition to the Department of Revenue's study, summaries of two academic studies on the incidence of fuel taxes are included below.

Gasoline Taxes and Consumer Behavior[xli]

This study looked at how consumers respond to changes in gas taxes and "tax-exclusive" gas prices, e.g. the price of gas without federal and state taxes. It measured how changing gas prices effect gas consumption, vehicle miles traveled and vehicle choices. The study concluded the following:

- Gas tax changes are associated with larger changes in consumption and vehicle choices than are identical changes in the tax-exclusive price of gas.
- A 5 cent per gallon increase in the gas tax reduces gas consumption by 1.3% in the short term. This reduction is much greater than the 0.2% reduction expected from a 5 cent per gallon increase in the tax-exclusive price.

Analysis: The conclusion that fuel tax increases impact consumption more than price increases due to market conditions is important given the volatility of gasoline prices over the last few years. Consumers appear to view tax increases as permanent price increases while market price increases are viewed as more temporary in nature.

Estimates from a Consumer Demand System: Implications for the Incidence of Environmental Taxes[xlii]

This study analyzed whether increasing the fuel tax is always regressive depending on how the dollars are used. It concluded:

- Increasing the gas tax will generally be regressive.
- Increasing the gas tax but using the revenue to reduce taxes on wages is also regressive.
- Increasing the gas tax can become somewhat progressive if the additional revenue is used to provide a lump-sum payment to households.

Analysis: If policymakers are concerned about the regressivity of the fuel tax, there is a method to address that. If the dollars are used to annually provide a lump-sum payment to households, the combination of changes is somewhat progressive.

[i] Minnesota Department of Transportation, MnDOT Financial Management and Legislative Briefing 2015, June 2015 Enacted Budget Update, p. 17.
[ii] Minnesota Department of Transportation, Financial Management and Legislative Briefing, Enacted Budget Update – June 2015, page 15.

[iii] Minnesota Department of Transportation, Financial Management and Legislative Briefing, Enacted Budget Update – June 2015, page 17.
[iv] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[v] Minnesota Statutes 168.013, https://www.revisor.mn.gov/statutes/?id=168.013
[vi] Minnesota Department of Transportation, Financial Management and Legislative Briefing, Enacted Budget Update – June 2015, page 15.
[vii] Minnesota House of Representatives Research Department, Short Stories, Motor Vehicle Sales Tax, http://www.house.leg.state.mn.us/hrd/pubs/ss/ssmvst.pdf
[viii] Senate File 87, First Engrossment, Article 3, Section 2.
[ix] U.S. Energy Information Administration, Minnesota Total Gasoline Wholesale/Resale Price by Refiners, http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EMA_EPM0_PWG_SMN_DPG&f=M.
[x] World Bank, "World Bank Commodities Price Forecast," October 20, 2015
[xi] U.S. Energy Information Administration, "What Drives U.S. Gasoline Prices?", October 2014
[xii] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xiii] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[xiv] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xv] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[xvi] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xvii] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[xviii] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xix] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[xx] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xxi] Ibid.
[xxii] American Petroleum Institute, State Motor Fuel Taxes: Notes Summary, Rates Effective 10/1/2015.
[xxiii] Ibid.
[xxiv] American Road & Transportation Builders Association and Transportation Makes America Work, "Variable-Rate State Gas Taxes, A Resource Guide of Current Laws," February 2015.
[xxv] Minneapolis/St. Paul Business Journal, "Minnesota's top-selling cars and light trucks for 2014," May 7, 2015, http://www.bizjournals.com/twincities/gallery/189901?r=http%3A%2F%2Fwww.bizjournals.com%2Ftwincities%2Fnews%2F2015%2F05%2F08%2Fminnesotas-best-selling-cars-and-trucks-list.html
[xxvi] Ibid
[xxvii] "Minivan Sales in America – December 2014 and Year End," January 5, 2015, http://www.goodcarbadcar.net/2015/01/usa-minivan-sales-figures-december-2014-year-end.html
[xxviii] "2014 Year End U.S. SUV and Crossover Sales Ranking," January 7, 2015, http://www.goodcarbadcar.net/2015/01/complete-2014-usa-suv-crossover-sales-figures.html
[xxix] Minneapolis/St. Paul Business Journal, "Minnesota's top-selling cars and light trucks for 2014," May 7, 2015
[xxx] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, "Model Year 2015 Fuel Economy Guide," https://www.fueleconomy.gov/feg/pdfs/guides/FEG2015.pdf
[xxxi] U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Alternative Fuels Data Center, June 2015, http://www.afdc.energy.gov/data/.
[xxxii] Equipment World, "The owning and operating costs of dump trucks," October 6, 2010, http://www.equipmentworld.com/owning-and-operating-costs-8/.
[xxxiii] U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, Alternative Fuels Data Center, June 2015, http://www.afdc.energy.gov/data/.
[xxxiv] U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, "Super Truck Making Leaps in Fuel Efficiency," February 19, 2014, http://energy.gov/eere/articles/supertruck-making-leaps-fuel-efficiency
[xxxv] Volpe, Richard, Edward Roeger, and Ephraim Leibtag. "How Transportation Costs Affect Fresh Fruit and Vegetable Prices, ERR-160, U.S. Department of Agriculture, Economic Research Services, November 2013.
[xxxvi] U.S. Energy Information Administration, Weekly Retail Gasoline and Diesel Prices, http://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_smn_m.htm.
[xxxvii] Minnesota Department of Revenue, Tax Research Department, Tax Incidence Study, March 9, 2015, http://www.revenue.state.mn.us/research_stats/research_reports/2015/2015_tax_incidence_study_links.pdf.
[xxxviii] Ibid
[xxxix] Ibid
[xl] Minnesota Center for Fiscal Excellence, Fiscal Focus, "Roads Out of Perdition," January – February 2015.

[xli] Li, Shanjun, Joshua Linn, and Erich J. Muehlegger. 2012. Gasoline Taxes and Consumer Behavior. HKS Faculty Research Working Paper Series RWP12-006, John F. Kennedy School of Government, Harvard University.
[xlii] West, Sarah E., and Roberton C. Williams III, Estimates from a Consumer Demand System: Implications for the Incidence of Environmental Taxes, NBER Working Paper No. 9152, September 2002.