

# The Shortfall in Funding Nevada's Roads and Highways

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*Prepared in the Public Interest*

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## **Executive Summary**

In 2012, the Nevada State Highway Fund ran a deficit of \$136.3 million. If Nevada expects to maintain its current level of service with its roads and highways as the state's population grows, current tax policies will result in a larger deficit. We project the deficit increasing to \$220 million in 2020, \$284 million in 2025, and to \$377 million dollars in 2030.

The current and growing deficit in Nevada's State Highway Fund owes to how Nevada taxes gasoline sales and the improving fuel efficiency of motor vehicles. Nevada taxes its motor fuel sales on a per gallon basis, which means that tax revenues have not kept and will not keep pace with inflation. In addition, the increased fuel efficiency of motor vehicle travel means that less gasoline is sold and will be sold for a given amount of road usage.

Closing the funding gap with motor fuel taxes will require about a 2.8-fold increase of the Nevada tax rate on motor vehicle fuels by 2030. Such an increase can be accomplished by adjusting the per gallon tax for inflation and fuel efficiency. Alternatively, the state may want to consider adopting a mileage tax on vehicles registered in the state or increasing fees for motor vehicle registration.

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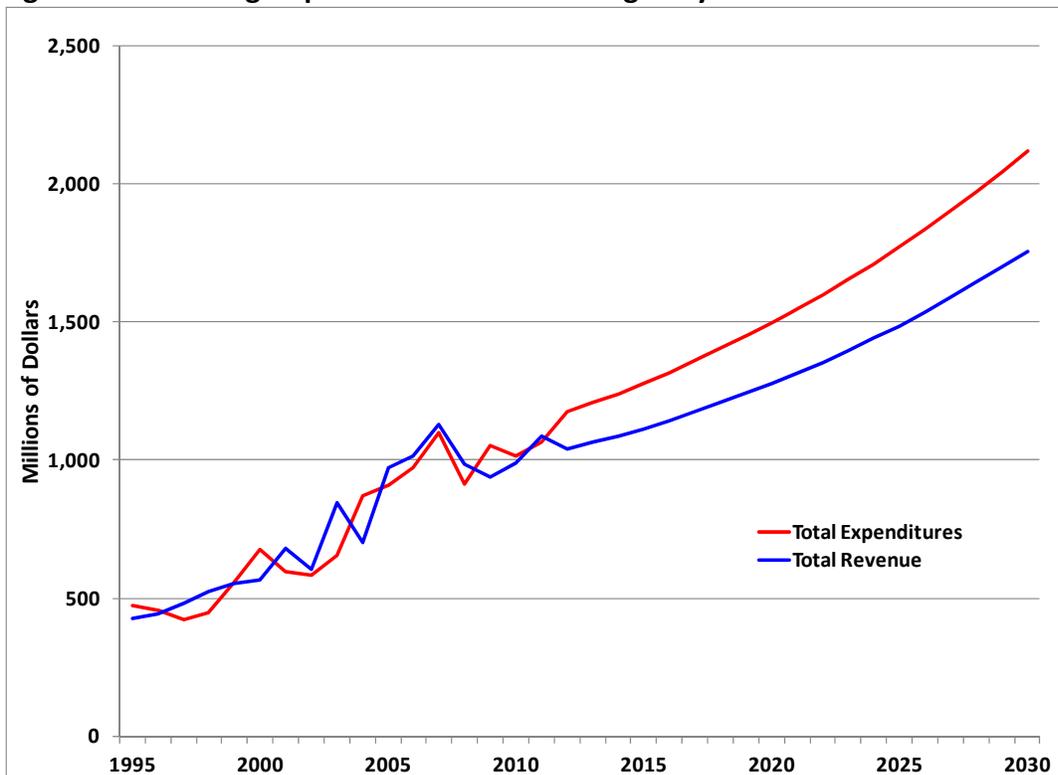
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## 1. Introduction

In 2012, the Nevada State Highway Fund ran a deficit of \$136.3 million. If state funding of roads and highways keeps pace with projected road usage and current tax policies remain in place, the deficit will grow larger over time (Figure 1). We project the Nevada State Highway Fund will have an annual deficit of \$220 million by 2020, \$284 million by 2025, and \$377 million by 2030. A number of factors contribute to the outlook for an increased funding gap. These factors include expected growth in population and vehicle miles traveled, improved fuel efficiency, expected inflation, and Nevada’s current tax policies for motor vehicle fuels.

**Figure 1. A Growing Gap in the Nevada State Highway Fund**



In basic terms, the projected shortfall in the Nevada State Highway Fund owes to the demand for roads and highways growing faster in the state than the revenue needed to build

and maintain the state's roads and highways. As Nevada's population grows, vehicle miles traveled will increase. The demand for roads and highways will increase with traffic. If Nevada is to maintain the same level of service for its motor vehicle traffic, the state will need to build and maintain more roads and highways, which will require funding to grow with the traffic.

One of the principal sources of revenue for the Nevada State Highway Fund is the state gasoline tax. As demand for the state's roads and highways grow, the state gasoline tax, as it is currently applied, will be unable to keep pace with the funding needs. The tax is levied on a per gallon basis without any adjustment for inflation or fuel efficiency. Inflation will mean increasing costs for constructing and maintaining Nevada's roads and highways but without commensurate increases in the rate at which revenue is obtained from each gallon of gasoline of diesel fuel that is sold. In addition, increased fuel efficiency (and the growing use of electric vehicles) will mean that the gallons of gasoline and diesel fuel sold will grow more slowly than vehicle miles traveled.

Closing the funding gap with motor fuel taxes will require boosting the Nevada tax rate on motor fuels by about 2.8 times the current rate by 2030. Such an increase can be accomplished by adjusting the per gallon tax rate for inflation and fuel efficiency. Alternatively, the state may want to consider using other means of raising the revenue, such as adopting a mileage tax on vehicles registered in the state or increasing fees for motor vehicle registration.

The sections that follow examine the factors shaping the demand for Nevada roads and highways, the expected growth of revenue sources for funding Nevada roads and highways, and policy options for closing the funding gap. The conclusion pulls together the analysis and suggests which policy option may be best.

## **2. Growing Demand for Nevada Roads and Highways**

As the Nevada economy improves, the state's population can be expected to resume growing. The Nevada State Demographer forecasts a steady growth in the state's population through 2030. A growing population will result in more vehicle registrations, more vehicles on the road, and an increase in vehicle miles traveled. In addition, increased fuel efficiency can be expected to stimulate increased driving as the cost per mile traveled declines. If Nevada is to sustain the same level of service for its motor vehicle traffic that is currently provided, the state will need to build and maintain more roads and highways. Otherwise, the state will see a considerable increase in congestion on its roads and highways.

### **2.1 Population Growth and Vehicle Miles Traveled**

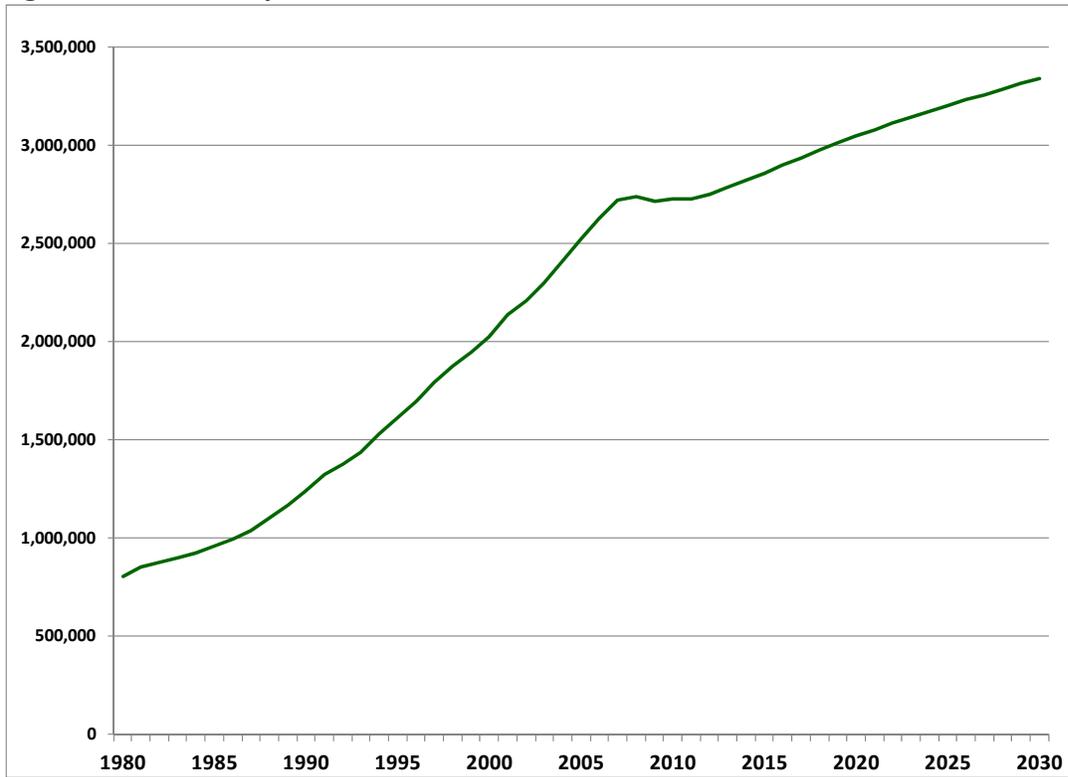
In 2011, Nevada had a population of 2.7 million people, and the annual vehicle miles traveled in the state totaled 22.4 billion.<sup>1</sup> The Nevada State Demographer forecasts the state population will increase at annual average rate of 1.08 percent through 2030, with the Nevada population reaching 3.0 million by 2020 and 3.3 million in 2030 (Figure 2). If we combine these population forecasts with projections made by the U.S. Energy Information Administration (2012) that U.S. vehicle miles traveled will increase by 0.39 percentage points faster than population, we can expect Nevada's vehicle miles traveled to grow at an annual rate of 1.47 percent. With that rate of growth, we will see vehicle miles traveled of 25.2 billion in 2020 and 29.8 billion in 2030 (Figure 3).<sup>2</sup>

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<sup>1</sup> The estimated population and vehicle miles traveled for 2011 are provided by the Nevada State Demographer and Nevada Department of Transportation, respectively.

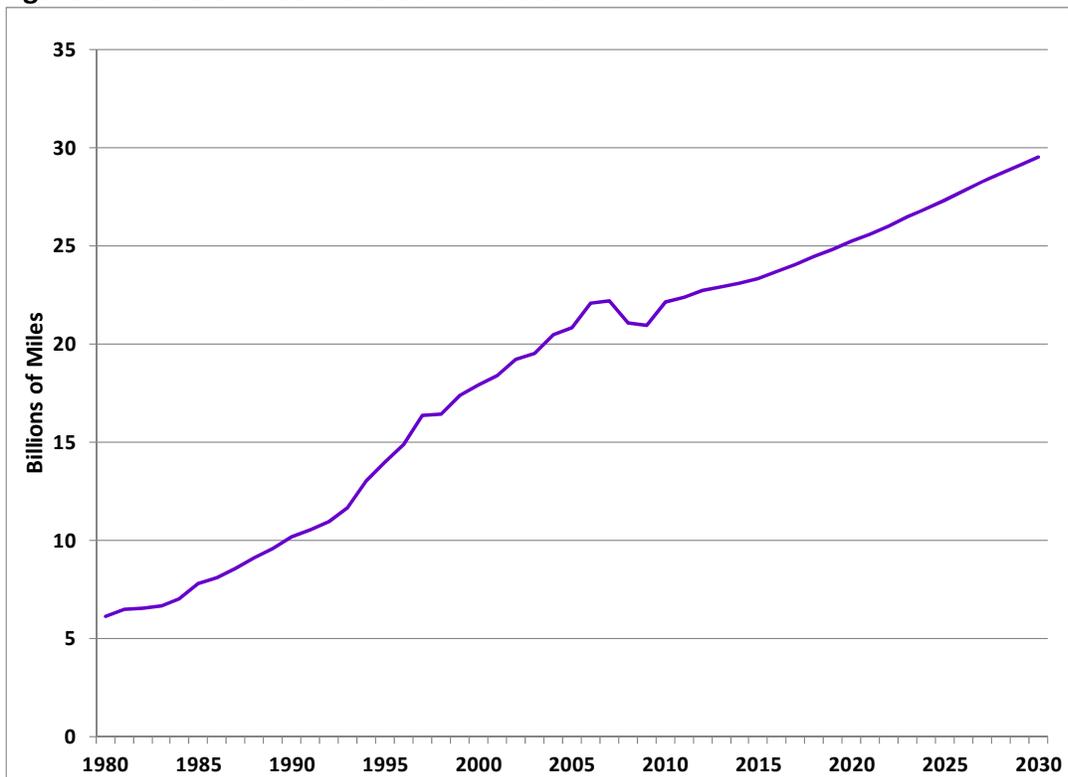
<sup>2</sup> In the absence of a Nevada-specific projection, we use the Energy Information Administration's U.S. projections for the growth of vehicle miles traveled relative to population.

**Figure 2. Nevada Population Forecast**



Source: Office of the Nevada State Demographer

**Figure 3. Vehicle Miles Traveled in Nevada**



## **2.2 Increasing Demand for Expenditure on Roads and Highways**

In 2010, Nevada had 35,061 miles of road and highway. As vehicle miles traveled increases in Nevada, the demand for new construction and maintenance of the roads and highways in the state also will increase. By 2030, the total miles of roads and highways in Nevada will need to increase to 47,781 if the state is to have the same level of service from its roads and highways as it had 2010.

For the Nevada Department of Transportation (NDOT) and the Nevada State Highway Fund, the increased demand for roads and highways will mean increased expenditures in a number of categories. In 2012, NDOT spent \$748.1 million on construction and engineering. With increased road demand and inflation, this figure is expected to reach \$1.3 billion by 2030.<sup>3</sup> Maintenance and equipment costs are projected to increase from \$132.9 million to \$244 million in 2030. As the number of vehicle miles traveled and miles of roads increase, the expenditures of the Department of Public Safety (DPS) will increase as well. In 2012, DPS spent \$76.1 million dollars. By 2030, this figure can be expected to increase to \$136.1 million.

## **2.3 Growth of Other Expenditures from the Nevada State Highway Fund**

Other spending categories in the Nevada State Highway Fund that are unrelated to vehicle miles traveled will also see increases. The Department of Motor Vehicles (DMV) is one such category. In 2012, DMV expenditures accounted for \$89.7 million of the Nevada State Highway Fund. With a growing population and inflation, that figure is projected at \$149.8 million in 2030.

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<sup>3</sup> The figures for we use for expected inflation show an annual average increase of 1.9 percent from 2010 to 2030. Although the budget estimates may change with different assumptions about inflation, any policies that we examine that are indexed to inflation are robust with respect to changes in inflation.

Another NDOT category that will see increased expenditures is Administrative and Support Services. In 2012, expenditures in this category totaled \$43.8 million. With growth in proportion to the total budget, a figure of \$139.5 million is expected in 2030. Finally, the Nevada State Highway Fund will see an increase in monetary transfers to other agencies. Transfers in 2012 equaled \$4.3 million and are expected to grow to \$7.9 million in 2030.

## **2.4 Total Expenditures from the Nevada State Highway Fund**

In 2012, expenditures from the Nevada State Highway Fund totaled \$1.175 billion. By 2030, the figure can be expected to grow to \$2.117 billion. The growth represents an increase by more than 3.3 percent annually. The timing of construction of new roads and highways accounts for the gains in spending that are a little stronger than would be suggested combining inflation with the growth of vehicle miles traveled.

## **3. Revenue for the Nevada State Highway Fund**

In 2012, the Nevada State Highway Fund had total revenues of \$1.039 billion. Of these funds, revenue from taxes on gasoline and other motor fuels accounted for \$185.2 million. Other major sources of revenue included federal aid and motor vehicle registration fees.

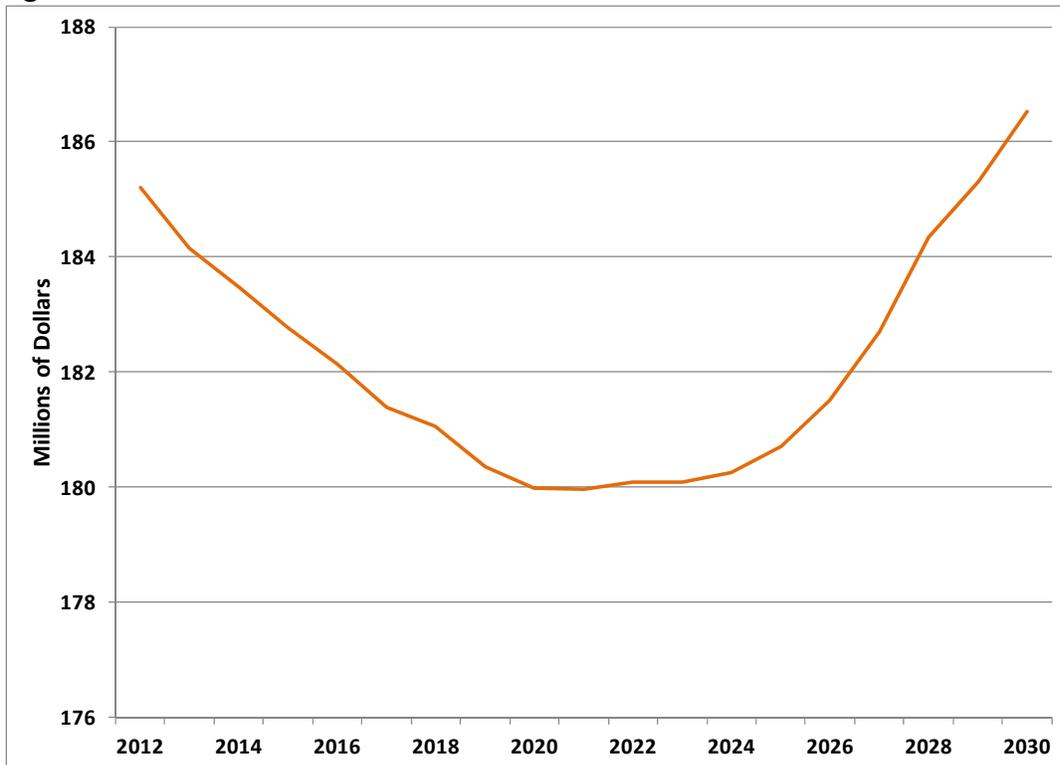
Under current policies and practices, we project total revenue for the Nevada State Highway Fund to reach \$1.322 billion in 2030. The growth represents an increase of only 1.4 percent annually. The shortfall in revenue can be expected to come from Nevada gasoline and motor fuel taxes.

### **3.1 Gasoline and Motor Fuel Taxes**

In 2012, the Nevada State Highway Fund brought in \$185.2 million of revenue from taxes on gasoline and other motor vehicle fuels. With the Nevada population reaching 3.3

million and vehicle miles traveled in the state increasing to 29.8 billion miles by 2030, revenue from motor fuel taxes will also increase, but not at nearly the same rate as vehicle miles traveled. By 2030, the revenue from the gasoline tax is projected at \$186.5 million (Figure 4). Vehicle miles traveled shows an expected gain at a 1.47 percent annual rate over the next 18 years, but revenue from the gasoline tax shows a gain at only a 0.04 percent annual rate. In fact, we project revenue from the state gasoline tax will fall through 2021.

**Figure 4. Revenue from State Gasoline Taxes in Nevada**



Increased fuel efficiency and the growing use of electric vehicles are the reasons we expect Nevada state taxes on gasoline and other motor fuels will not increase with vehicle miles traveled. According to our estimates, the average fuel efficiency of the fleet of all motor

vehicles operating in Nevada will increase from 16.5 miles per gallon in 2012 to 18.8 miles per gallon in 2020 and 21.2 miles per gallon in 2030.<sup>4</sup>

In addition, the state portion of the gasoline and motor fuel tax is applied at the rate of \$0.1765 per gallon with most going to the Nevada State Highway Fund. This tax rate is not adjusted for inflation or increases in the price of gasoline. As a result, the revenue from the tax will not keep pace with inflation.

### **3.2 Other Revenue Sources**

The Nevada State Highway Fund obtains revenue from two other principal sources—federal aid and motor vehicle taxes. Federal funds are allocated to states as reimbursements of expenditures on approved highway projects. In 2012, federal aid revenue amounted to \$466.7 million and made up approximately 45 percent of total revenue. Assuming federal aid revenue increases at the same rate as highway projects funded by the Nevada State Highway Fund, this revenue source will reach \$840.7 million by 2030 for an annual growth rate of 3.4 percent.

Motor vehicle taxes yielded \$236.5 million in revenue in 2012. If motor vehicle taxes increase with registrations, registrations keep pace with population growth, and the value of vehicles increases with inflation, revenue from this tax is projected to gather \$432.3 million in 2030. The expected growth from 2012 to 2030 is at a 3.4 percent annual rate.

## **4. Closing the Funding Gap in the Nevada State Highway Fund**

In 2012, the Nevada State Highway Fund had total revenues of \$1.039 billion. Under current policies and practices, we project total revenue for the Nevada State Highway Fund to reach \$1.322 billion in 2030. At the same time, we project the demand for funding from the

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<sup>4</sup> To arrive at these estimates we use projected fuel efficiency gains from the U.S. Energy Information Administration (2012).

Nevada State Highway Fund to increase from \$1.175 billion in 2012 to \$2.117 billion in 2030. With revenue projected to grow at only a 1.4 percent annual rate and the demand for funding expected to grow at a 3.3 percent annual rate, the funding gap in the Nevada State Highway Fund can be expected to grow under current policies and practices.

With federal aid and motor vehicle taxes increasing at about the same rate as expenditures, the growth in the expected shortfall is coming from the state gasoline and motor fuel taxes. A shortfall in the state highway fund is not unique to Nevada. Other states are facing the same problem and are beginning to discuss the various policy options to close the shortfall. Among the policies under consideration are using general revenues, increasing motor fuel taxes, introducing mileage taxes on motor vehicles, and increasing motor vehicle taxes.

#### **4.1 Using General Revenue**

One option for closing the shortfall in the Nevada State Highway Fund is to use the state's general revenue. We estimate that closing the shortfall in the Nevada State Highway Fund with general revenue would require the state legislature to allocate nearly \$300 million for the 2013-14 biennial budget. For the 2019-20 and 2029-30 biennial budgets, the estimated figures are about \$430 million and \$705 million, respectively.

The principal objection to using general revenues to close the shortfall in the Nevada State Highway Fund is that it shifts the state's funding of roads and highways from pay for service to a general obligation of the Nevada taxpayers. Other than federal transfers, the current system of funding the Nevada State Highway Fund relies very heavily on the idea that those who use the state's roads and highways pay for the provision of those services. Such

funding is considered one of the principals of public finance. In addition, planned use of the general fund will not automatically adjust revenue if there are errors in forecasting demand.

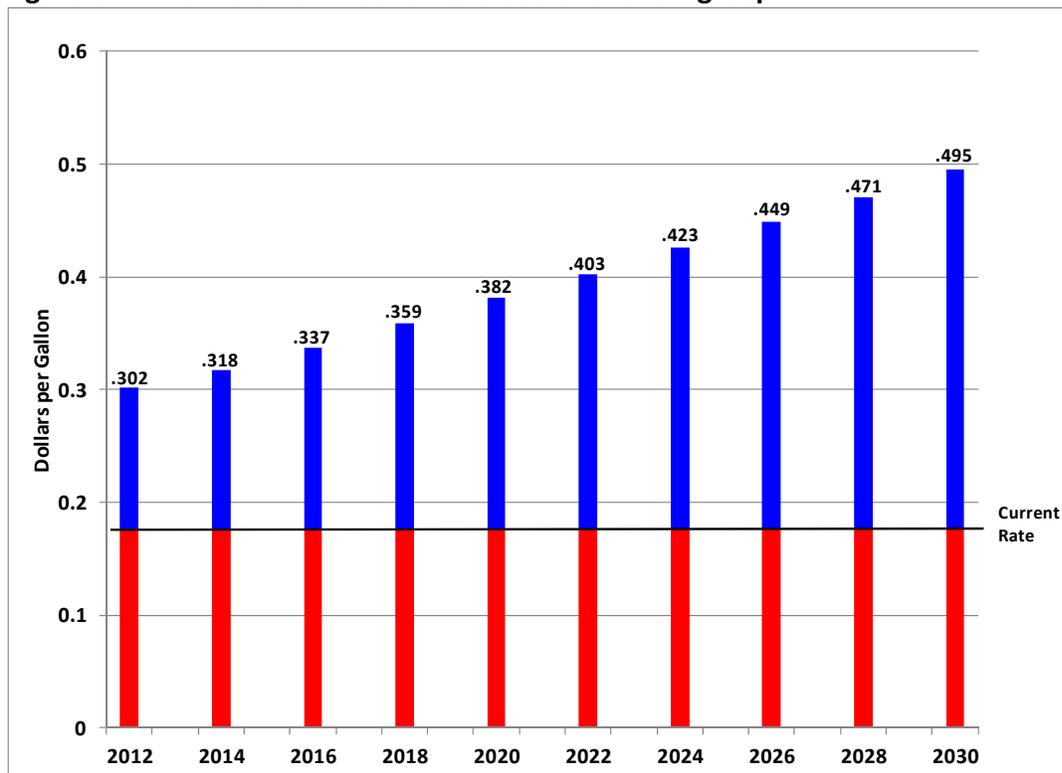
#### **4.2 Increasing Motor Fuel Taxes**

An obvious option for boosting revenue is to increase the state motor fuel taxes. In 2011 (the last year in which the Nevada State Highway Fund was balanced), the state motor fuel tax accounted for 17.2 percent of the Nevada State Highway Fund. With current policies, we project the state motor fuel tax will account for 12.0 percent and 8.8 percent of the required funding in 2020 and 2030, respectively. The share of expenditures covered by the state's motor fuel tax erodes as fuel efficiency improves and inflation boosts the cost of building and maintaining Nevada's roads and highways.

Increasing the state motor fuel tax would better approximate the idea that those who use the state's roads and highways are paying for the construction and maintenance of those roads and highways. Currently, the state gasoline tax is \$0.1765 per gallon. In 2012, closing the funding gap with this tax alone would have required a rate of \$0.3015 per gallon (Figure 5). By 2020 and 2030, the required rates to close the funding gap would be \$0.3815 per gallon and \$0.4955 per gallon, respectively. With these rates, the share of expenditures covered by the state's motor fuel tax would be 26.7 percent and 25.9 percent in 2020 and 2030, respectively.

One approach to setting the state motor fuel tax would be to close the current gap by increasing the current rate applied from \$0.1765 to \$0.3015 per gallon. Future adjustments could also be legislated, so that the tax rates automatically adjust with increased fuel efficiency and inflation. Switching to an ad valorem tax on gasoline may approximate the effects of inflation, but such a tax would amplify gasoline price volatility and lead to volatile revenues.

**Figure 5. Motor Fuel Tax Needed to Close the Funding Gap**



Increasing the fuel tax to close the funding gap in the Nevada State Highway Fund has many advantages. It approximates a fee for use of the state’s roads and highways. The revenue will adjust to changes in demand. Visitors to the state will pay their share of the tax for use of the roads and highways in Nevada. The administration of such a tax is already in place, and the tax has a low potential for fraud.

The major disadvantage to boosting the state tax on motor fuel is that such action will require legislation. Boosting motor fuel taxes could be unpopular.

### **4.3 Adopting Mileage Taxes**

Another possibility for closing the funding gap in the Nevada State Highway Fund is to implement a tax in which vehicles registered in Nevada pay according to their mileage driven. Many analysts have recommended such a tax because it better approximates a fee for service than a tax on motor fuels. Options for collecting such taxes include annual odometer readings or equipping cars with GPS devices to track mileage. Other states, such as Washington, are already taking steps toward implementing a mileage tax.

In order to have closed the 2012 funding gap with a mileage tax, Nevada motorists would have had to have paid \$0.006 per mile. Although the mileage rate is quite low, the annual revenue from an automobile that traveled 15,000 miles would have been \$90.00 per year in 2012. If such taxes were instituted at registration time, the owner of the vehicle would have had to have paid an additional \$90 to register the vehicle on top of the current fees. In areas of Nevada where annual motor vehicle inspections are required, the inspector could note the odometer reading and input it into the system along with other information about the vehicle.

To keep pace with inflation, Nevada residents would need to pay increased mileage tax rates over time. For 2020 and 2030, the tax rates would be \$0.0087 per mile and \$0.0122 per mile, respectively. For 15,000 miles of annual travel, the mileage tax collected on a vehicle would amount to \$130.50 and \$183.00 in 2020 and 2030, respectively.

A mileage tax has some advantages. Revenues are collected for actual road usage rather than fuel usage. The revenue would adjust with changes in demand. Owners of electric vehicles also would pay.

In comparison to motor fuel taxes, however, mileage taxes also have some major disadvantages. Out-of-state visitors who use Nevada roadways would not have to pay for their usage. If fees were assessed at registration time, owners would be hit with higher registration fees. If they were assessed monthly, a new bureaucracy would be required to administer the tax by collecting relatively small monthly fees.

The policy also has a higher potential for fraud because motorists may disconnect their odometers to avoid taxation. Using a system of sealed, inspector-checked odometers would increase administrative costs. Equipping cars with GPS devices to track mileage is likely to raise concerns about privacy and citizen rights.

#### **4.4 Increasing Registration Fees**

Increasing registration fees for all vehicles is another way to close the funding gap in the Nevada State Highway Fund. Currently, owners of automobiles, recreational vehicles, and motor homes must pay an annual registration fee of \$33. Motorcycles must pay \$39 and travel trailers must pay \$27. Trucks, truck tractors, and buses that weigh 6,000 to 80,000 pounds pay anywhere from \$12-\$48 depending on weight and other characteristics. To have closed the budget gap in 2012, annual registration fees would have needed to have been \$73.17 higher. By 2020, we project that current registration fees would need to be boosted by \$104.12. By 2030, another \$41.80 would be required.

The principal advantage of increased registration fees is that the system for administering the fees is already in place. The disadvantage is that registration fees are weakly connected to the use of Nevada's roads and highways in comparison to mileage or motor fuel taxes.

## 5. Conclusions

In 2012, the Nevada State Highway Fund had a shortfall of \$136.3 million. Our projections show the shortfall in the state highway fund gradually increasing through 2030. As Nevada's population grows, so will its traffic and the demand for roads and highways in the state. With projected inflation of 1.9 percent per year, increasing the miles of Nevada's roads and highways to keep pace with the expected growth in traffic will require funding that grows by about 3.3 percent annually. In contrast, revenue is projected to grow by only 3.0 percent annually, which will push the shortfall to an estimated \$361 million by 2030.

With federal aid and motor vehicle taxes increasing at about the same rate as projected expenditures from the Nevada State Highway Fund, motor fuel taxes account for the growth of the shortfall. Because the state motor fuel tax is not adjusted for inflation or fuel efficiency, its ability to generate revenues erodes with inflation and increased fuel efficiency.

The funding gap in the Nevada State Highway Fund can be closed through reliance on general revenues, an increased motor fuel tax (adjusted for inflation and increased fuel efficiency over time), the introduction of a mileage tax (adjusted for inflation over time), or an increased registration fee. If the state wishes to take an approach that is practical and generally accepted by the public, increasing the state motor fuel tax and adjusting it for inflation and increased fuel efficiency over time is probably the best choice. Neither increased registration fees nor the use of general revenues to fund the state's roads and highways links payment to usage of the roads and highways.

The introduction of a mileage tax approximates a user fee, but it faces practical problems in implementation, and out-of-state motorists would not pay. The motor fuel tax

approximates a usage fee for the state's roads and highways, and a system for collecting the revenues is already in place. Out-of-state motorists also will pay when they buy gasoline or diesel fuel in the state.

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## **Appendix: Forecasting the Nevada State Highway Fund: Expenditures and Revenues**

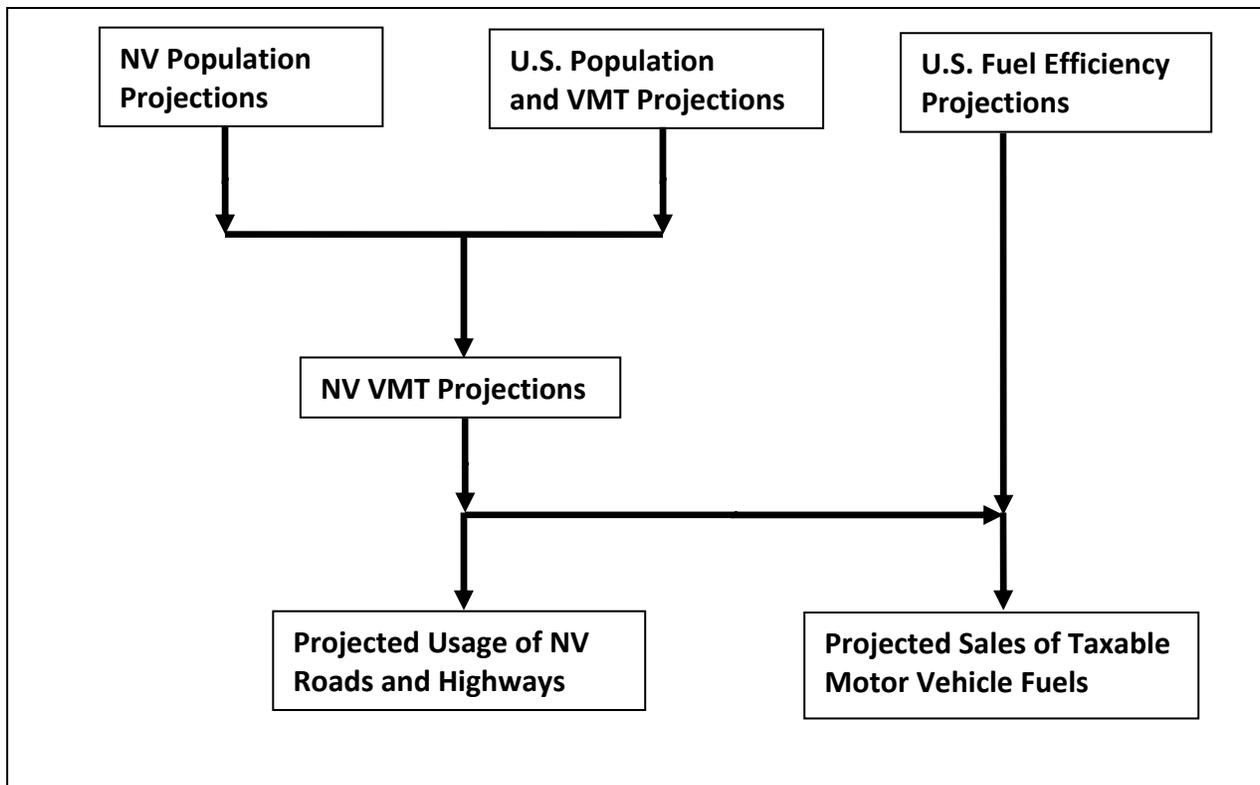
The first step in our forecasting process is to obtain or develop forecasts of Nevada's population, Nevada's vehicle miles traveled, Nevada's sales of taxable motor fuels, and U.S. inflation. With these four basic forecasts, we use historical data from the Nevada Department of Transportation (NDOT) to develop forecasts of the expenditures and revenues for the Nevada State Highway Fund. Sources of information used in the forecasts include the Nevada State Demographer, the U.S. Energy Information and Administration, Global Insights, and NDOT.

As shown in Table A.1, we adopt the population forecast from the Nevada State Demographer (2013). We also adopt forecasts from the U.S. Energy Information Administration (2012) for U.S. fuel efficiency and the relationship between U.S. population growth and vehicle miles traveled. We combine data for historical vehicle miles traveled in Nevada with the Nevada population forecast and the forecast relationship between U.S. population and vehicle miles traveled to obtain a forecast of Nevada vehicle miles traveled (Figure A). We use the forecast of fuel efficiency to translate the forecast of vehicle miles traveled into one for sales of taxable motor fuels. For consistency with our assumptions about fuel efficiency and the relationship between vehicle miles traveled and population, we adopt the long-term inflation forecast made by Global Insights (2011), as used and reported by the U.S. Energy Information Administration (2012).

**Table A.1. Basic Elements of the Forecasts**

Forecasted Element	Forecast Information Sources
Population	Nevada State Demographer
Vehicle Miles Traveled (VMT)	Nevada State Demographer U.S. Energy Information Administration Nevada Department of Transportation
Sales of Taxable Motor Fuels	Nevada State Demographer U.S. Energy Information Administration Nevada Department of Transportation
Inflation	Global Insights via U.S. Energy Information Administration

**Figure A. Modeling Nevada Vehicle Miles Traveled and Sales of Taxable Motor Fuels**



**A.1 Forecasting Expenditures**

We forecast expenditures from the Nevada State Highway Fund in five categories: NDOT, bond payments, Department of Public Safety (DPS), Department of Motor Vehicles (DMV), and transfers to other agencies (such as county transportation agencies). The NDOT

expenditures themselves are forecast in three categories, including construction and engineering, maintenance and equipment, and administrative and support services.

We use a variety of methods to forecast these expenditures (Table A.1). For NDOT expenditures, construction and engineering are forecast as needed to build new roads and highways to maintain proportion to vehicle miles traveled. Maintenance and equipment are forecast in proportion to vehicle miles traveled. The administrative and support portion of NDOT expenditures are forecast in proportion to other NDOT expenditures. We adjust all these expenditures for expected inflation.

**Table A.2. Expenditure Forecasting Methods**

<b>Expenditure</b>	<b>Forecasting Method</b>
Nevada Department of Transportation (NDOT)	
Construction and Engineering	As needed to build new roads and highways according to vehicle miles traveled
Maintenance and Equipment	In proportion to vehicle miles traveled
Administrative and Support Services	In proportion to other NDOT expenditures
Bond Payments: Principal and Interest	As needed to pay for outstanding bonds
Department of Public Safety (DPS)	In proportion to vehicle miles traveled
Department of Motor Vehicles (DMV)	Proportional to population
Transfers to Other Agencies	Proportional to other expenditures

For the other expenditures from the Nevada State Highway Fund, we use similar forecasting methods. Bond payments are forecast as needed to pay for the outstanding bonds sold to support the Nevada State Highway Fund. DPS expenditures are forecast to grow in proportion to vehicle miles traveled. DMV expenditures are forecast to grow in proportion to motor vehicle registrations and drivers' licenses, both of which are forecast in proportion to population. Transfers to other agencies are forecast to grow in proportion to other NDOT expenditures. We adjust all these expenditures for expected inflation.

## A.2 Forecasting Revenue

We use a variety of related methods to forecast revenues for the Nevada State Highway Fund in four categories: taxes on motor fuels, bond sales, federal aid, and motor vehicle taxes. Taxes on motor fuels are forecast to rise in proportion to sales of taxable motor fuel, which are a function of vehicle miles traveled and fuel efficiency. Bond sales are forecast to grow in proportion to the construction of new roads and highways. Federal aid is forecast to grow in proportion to total NDOT expenditures. Revenues from motor vehicle taxes are forecast to grow in proportion to motor vehicle registrations, which are assumed to grow in proportion to vehicle miles traveled.

**Table A.3. Revenue Forecasting Methods**

<b>Revenue</b>	<b>Forecasting Method</b>
Taxes on Motor Fuels	In proportion to sales of taxable motor fuels
Bonds	In proportion to expenditures on new road and highway construction
Federal Aid	In proportion to total expenditures
Motor Vehicle Taxes	In proportion to motor vehicle registrations

We adjust the revenue from taxes on motor vehicles for expected inflation because automobile prices can be expected to rise with inflation. Because bond sales are forecast to grow in proportion to expenditures for the construction of new roads and highways, and federal aid is forecast to grow in proportion to total NDOT expenditures, both are automatically adjusted for inflation. Because Nevada levies a motor fuel tax of \$0.1765 per gallon, we do not adjust that revenue source for inflation.



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