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Funding the Missouri Department of Transportation and the State Highway System

By Joseph Miller

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Funding the Missouri Department of Transportation and the State Highway System

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Transportation is critical to the Missouri economy. Every day, millions of Missourians use the state's roads, bridges, public transportation, airports, and rails to go about their daily lives. According to the latest annual estimates, Missouri's roads accommodated almost 69 billion vehicle miles,[1] public transportation saw more than 68 million boardings,[2] and almost 12 million passengers flew out of the state's airports.[3] Even for those who are not traveling, Missouri's transportation system is integral to everyday life, transporting goods and services around the state. Over a billion tons of freight moved through Missouri in 2011, allowing more than a trillion dollars of goods to reach markets in Missouri, around the country, and across the globe.[4]

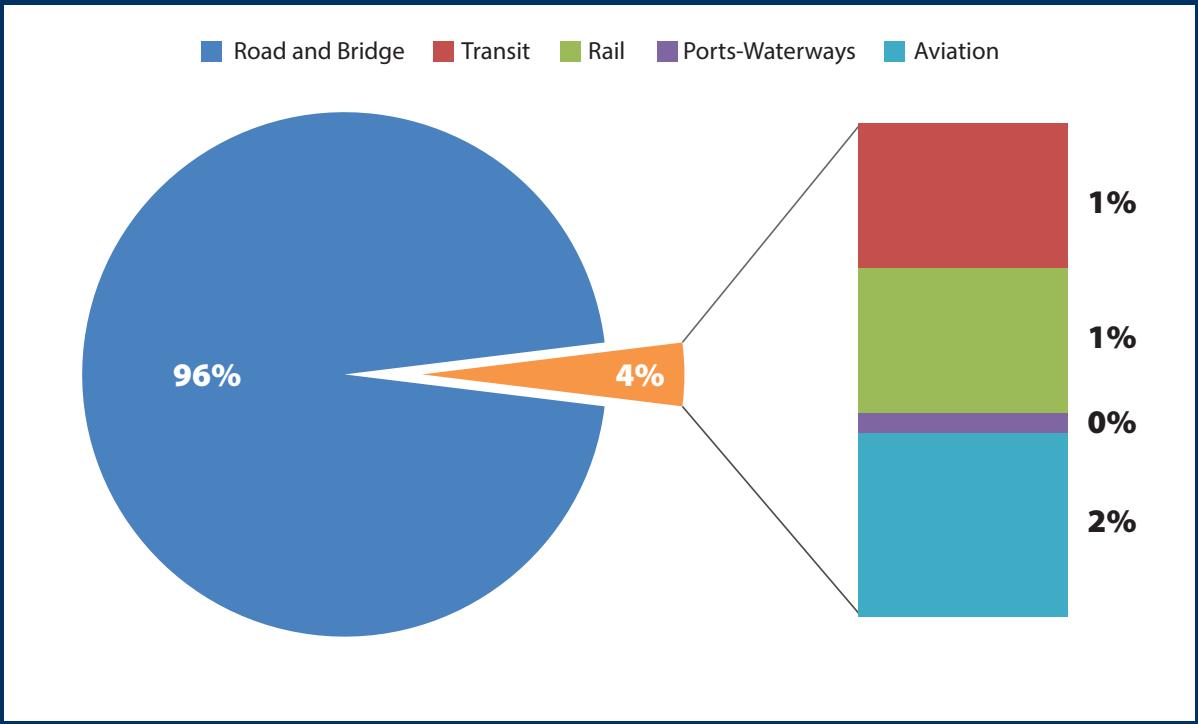
While the importance of Missouri's transportation system to the state's economy and the lives of its residents is evident, perhaps the most critical element of that system, the state's highway system, is in danger of falling into disrepair. The Missouri Department of Transportation (MoDOT), which is responsible for building and maintaining the state highways, claims that it may no longer have the funds necessary to maintain the state highway system in the near future.[5] The main problem is that the user-fee funding base originally set up to fund highways has failed to keep pace with the increasing expenditures required to build and maintain the state's most-trafficked roads and bridges.[6] The largest portion of that funding base is the state's 17 cent per gallon fuel tax, revenue from which has been in long-term decline, as drivers choose more fuel-efficient vehicles and economize on travel.[7] Past attempts to raise additional revenue, through a statewide sales tax, fuel tax increases, and the introduction of tolling, have not succeeded to this point. However, if the state's highways deteriorate, it could have a sizable negative effect on the economy and the daily lives of residents, both of which rely on state highways more than any other type of transportation infrastructure. Furthermore, many of Missouri's most important highways are aging to the point where they will soon need to be replaced altogether.[8] This nexus of immediate funding needs and multi-billion-dollar liabilities not far on the horizon make the creation of a coherent highway funding strategy more important still. As a road map to creating an effective and comprehensive funding solution, this paper will provide:

1. An exploration of the priorities and responsibilities of the state's transportation department, MoDOT. This will include a rough outline of the state highway system, and how MoDOT funds its maintenance and improvement. An explanation of the structure and funding of the state's airport network will also be discussed as a counterexample to the state highway system.

2. An explanation of how a declining user-funding base has led to a crisis in funding for MoDOT, and the state highway system in particular.

Figure 1: MoDOT Expenditures by Mode

MoDOT spends considerably more on highways than on other modes.



Source: Missouri Department of Transportation. "Financial Snapshot: October, 2014." p. 6. Available at: https://archive.org/details/2014FinSnapshot.

3. An overview of possible approaches toward ending the funding crisis, including general taxation, fuel taxes, tolling, vehicle registration fees, and mileage-based user fees. This section of the paper will also discuss the comparative merits of these approaches, in terms of revenue potential, economic effects, and taxation impact on Missourians.

THE MISSOURI DEPARTMENT OF TRANSPORTATION AND THE STATE HIGHWAY SYSTEM

Missouri created the original incarnation of the current department of transportation in 1913, initially naming it the State Highway Department.[9] However, responsibilities for overseeing and funding different parts of the state's transportation system accrued over time, and its title officially became the Missouri Department of Transportation in 1996.[10] MoDOT spent just over $2.2 billion in 2014, with money going to the state highway system, aviation, public transportation, ports, and rail. However, true to its original title, the vast majority of MoDOT's expenditures go toward roads and bridges as opposed to other forms of transportation. In fact, 96% of MoDOT's expenditures are highway related (see Figure 1).[11]

While some critics of MoDOT interpret the lack of transit and rail spending (1% for both) as proof that MoDOT does not value non-highway transportation,[12] "other" forms of transportation are the primary responsibilities of either private actors or other levels of government, as this paper will discuss later. The state highway system, on the other hand, is primarily MoDOT's responsibility. The funds it expends maintaining and building the system are legislatively bound for that purpose. To illustrate this, Table 1 shows MoDOT's revenue sources and whether the

use of those revenue sources is restricted by state or federal legislation.

As Table 1 shows, the vast majority (more than 90%) of MoDOT's revenue comes from federal support and dedicated state taxes that must, by law, be spent on highways. These include: federal highway reimbursement, fuel taxes, the motor vehicles sales tax, vehicle/driver's licensing fees, and interest and miscellaneous revenues. Only around 0.6% of MoDOT's revenue comes from Missouri's general revenue fund, which is the only regular revenue source that MoDOT can spend without restriction to certain modes. MoDOT receives dedicated multimodal funds as well, but revenue from these sources is comparatively limited because those taxes raise little revenue to begin with.

FUNDING THE STATE HIGHWAY SYSTEM

The Missouri state highway system is the system of roads and bridges that are the direct responsibility of the state government, and by extension, MoDOT. The highway system includes the interstate highways, US Routes, Missouri state highways, and state routes (letter routes). In total, it accommodates nearly 50 billion vehicle miles annually,[17] and more than $700 billion worth of freight.[18] While the federal government supports highway construction and maintenance (especially on roads considered part of the national highway system), states like Missouri are ultimately responsible for the upkeep of these roads.

Altogether, the Missouri state highway system contains over 33,000 miles of road and more than 10,000 bridges, giving Missouri the nation's 7th-largest state highway system in terms of both miles and bridges.[19-20] However, the total numbers can be somewhat misleading, because Missouri's system includes many lesser-used routes (added through state initiatives like the Takeover Program) [21] that would be considered county or local roads in other states. In Missouri, only 16% of the state's total highway miles are major roads (principal arterials or larger), much less than the national median (37%).[22] Almost two-thirds of the state highway system's bridges are on lesser-used roadways.[23]

Most of Missouri's state highways by mile are in rural areas Average daily traffic per lane on Missouri's rural highways is fewer than 1,000 vehicles; on urban highways the average is around 7,000 vehicles per lane per day.[24] That is why, although less than 20% of the state highway system by lane mile is in urban areas, 60% of daily traffic on Missouri's highways occurs there. Heavy traffic in Missouri's rural areas is confined to interstates and major US Routes. Figure 2 shows how extensive, and in general lightly trafficked, the Missouri state highway system is. Routes that carry fewer than 5,000 vehicles a day, displayed in light blue, dominate the overall mileage of the system. Only Missouri's largest cities, Saint Louis and Kansas City, have state highways that carry more than 100,000 vehicles per day (shown in dark red).

The size and composition of Missouri's state highway system present MoDOT with special challenges. Measures of the department's effectiveness are based on its ability to keep all of its miles and bridges in good condition, so MoDOT's resources must be spread across the network. With a system that covers virtually every major road in the state, MoDOT inevitably encounters criticism from all sides on how it prioritizes different regions for construction or maintenance spending.[25-26] With rural areas complaining of being ignored and urban areas arguing that too much of their money goes to rural areas, the public at large is often not confident that MoDOT works effectively for them or should receive more money. In addition, most of the lesser-used routes are not part of the National Highway System (NHS). Routes that are not part of the NHS system are less likely to receive significant federal funding.

MoDOT performs planning for state highway maintenance on a continuous basis and prioritizes expenditures based on long-term goals, physical condition needs, and functional needs. MoDOT considers its most important long-term goal to be preserving the system as it is, with other concerns—such as congestion mitigation, job creation, efficient movement of freight, and so on—as secondary concerns. Projects under consideration are ranked as high, medium, or low priority. High-priority projects are likely to be funded first, with medium-priority projects awaiting additional funds; low-priority projects are generally shelved until the priority level changes.[27]

Table 1: **MoDot Revenues: Legislative Controls and Required Usage**

Revenue Source	% of MoDOT Revenue[13]	Legislative Controls	Required Area of Use[14-16]
Federal highway reimbursement	38.760%	Federal	State highways/other roads
Fuel tax	22.797%	State	State highways
Motor Vehicle Sales and Use Tax	14.195%	State	Bond repayment/ state highways
Vehicle/driver's licensing fees	12.646%	State	State highways
Interest and miscellaneous	5.752%	State	State highways
Federal block grant reimbursement	3.042%	Federal	Airports/multimodal
Federal safety grants	1.511%	Federal	Highway safety
State general revenue fund	0.630%	None	None
Aviation Sales and Use Tax	0.467%	State	Airports/airways
Multimodal license, fees and permits	0.096%	State	Airports/multimodal
Multimodal interest and miscellaneous	0.073%	State	Airports/multimodal
Vehicle permits	0.017%	State	State highways
Aviation fuel	0.011%	State	Airports/airways
Interest and miscellaneous	0.001%	State	State highways

Once projects are selected, MoDOT contracts the construction of those projects to qualified bidders. In most cases, MoDOT designs the project in-house and then takes bids for the project's execution.[28] However, MoDOT has begun to jointly contract both the design of the project (subject to MoDOT outcome targets) and the execution of that project to a single company. This latter process is known as *design-build project delivery.*[29] Currently, eight large highway projects either have been completed or are in progress using design-build project delivery, including KCicon and the new I-64/US 40. This process has resulted in significant savings for MoDOT and has improved project delivery.

While MoDOT is ultimately responsible for maintaining and improving the state highway system, other levels of government enter the process in many different areas. The most important level is the federal government, which, as this paper will go onto explain, is deeply involved in how Missouri's highways are built and is integral to highway funding. At the local level, MoDOT works with metropolitan planning organizations (MPOs) to identify the needs of the state highway system in a given area. The federal government channels significant transportation dollars through MPOs, and MoDOT works with these groups to create aligned, if not congruous, long-term plans.[30] Counties and localities are also often involved in the planning and funding of state highways. An example of this involvement is MoDOT's cost-share program, which leverages local dollars to accelerate the delivery of state highway improvements particularly important to local governments.[31]

Missouri Highway System Funding Sources

In fiscal year 2014, revenue to MoDOT designated to all aspects of state highway system was just over $2 billion. The largest sources of revenue for this system are federal dollars, state fuel tax receipts, motor vehicle sales taxes, and permit/license fees, in that order. Figure 3 shows the full breakdown of revenue sources.[32]

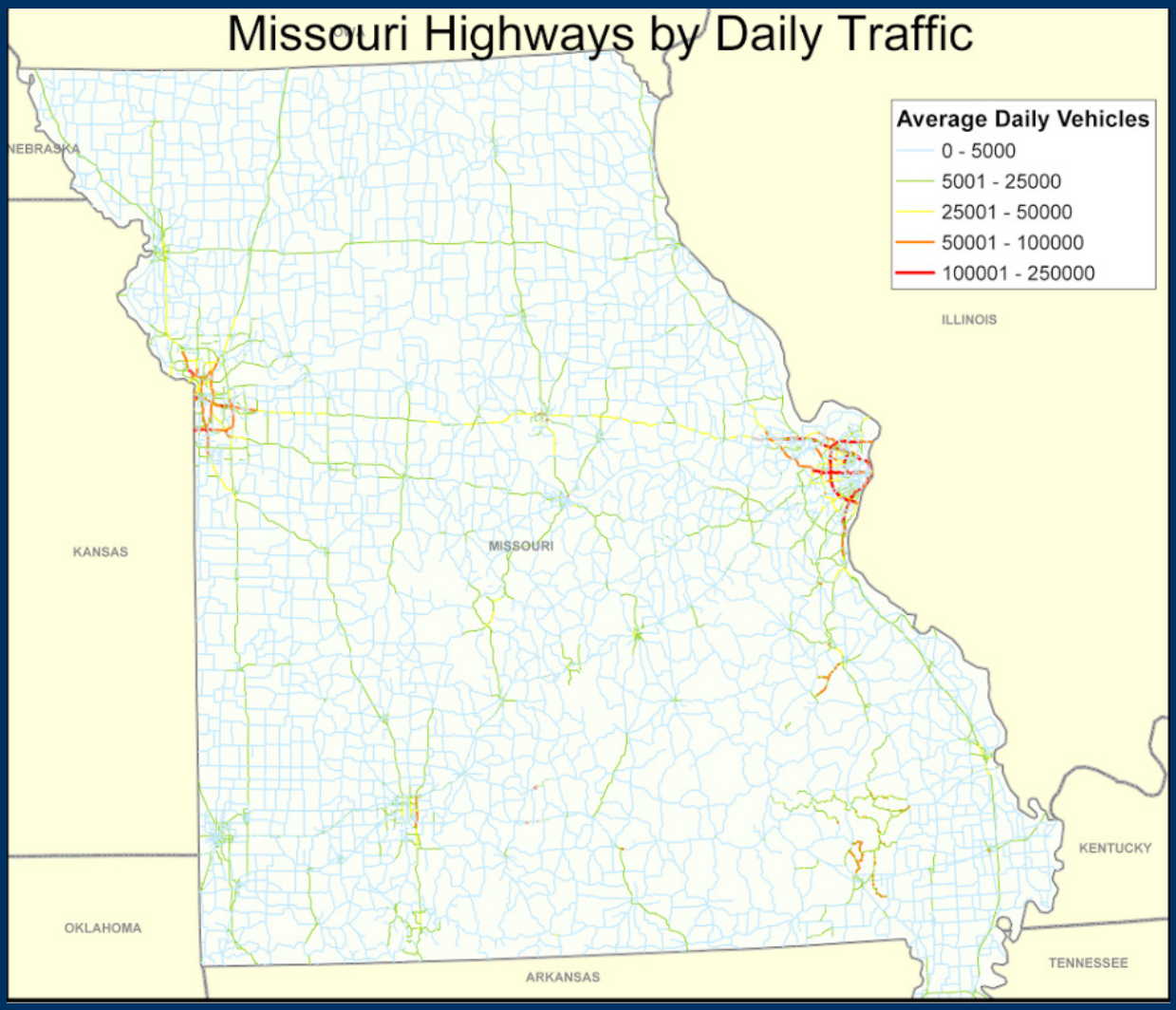
Each of these funding sources is further explained in the following sections.

Federal Dollars

Federal funds make up the largest single source of revenue for the Missouri state highway system (41%), contributing just above $850 million. The primary source of federal support is the Federal Highway Trust Fund

Figure 2: **Daily Traffic on Missouri Highways**

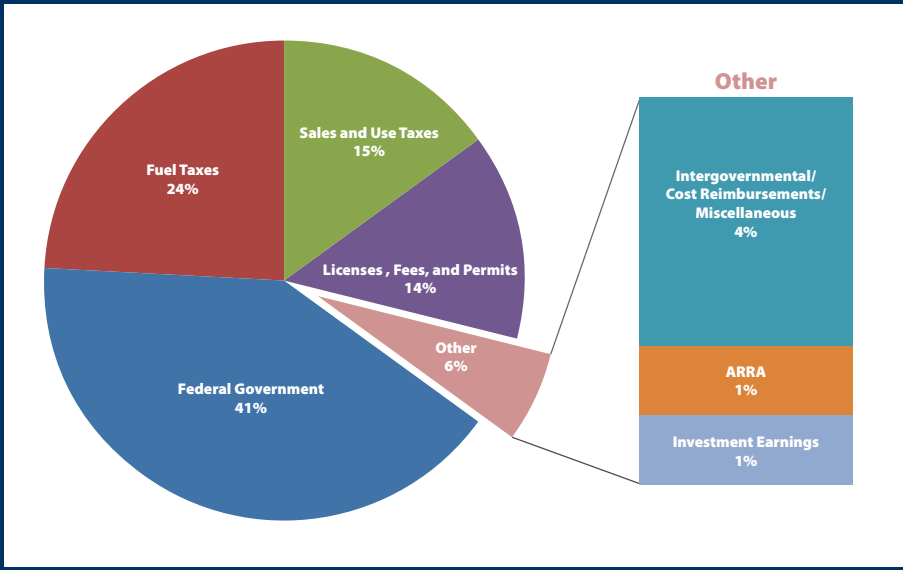
Daily traffic on Missouri's highway is concentrated in cities and on interstates.



Source: Highway Performance Monitoring System (HPMS) data available at: https://www.fhwa.dot.gov/policyinformation/hpms.cfm.

Figure 3: **MoDOT Highway Revenue**

MoDOT highway revenues are dependent on the federal government and highway users.



Source: Missouri Department of Transportation. "Financial Snapshot: October, 2014." p. 5. Available at: https://archive.org/details/2014FinSnapshot.

(FHTF), which was set up to support the construction and maintenance of the interstate highway system. Eighty percent of the fund goes to highway projects nationwide. The remaining 20% of FHTF revenue goes into a mass transit account, which supports public transportation. Historically, the FHTF has been supported through federal fuel taxes (18.4 cents per gallon regular and 22.4 cents per gallon diesel) and other fees collected from highway users.[33] However, today the federal government subsidizes the trust fund with the general fund.[34] This has meant that every state, with the exception of Texas, has received more federal money for highway projects than it has placed in the trust fund in recent years.[35]

Missouri accesses federal dollars through project reimbursement. That is, Missouri must plan projects that fall within certain federal apportionment categories. When MoDOT does so, it can be reimbursed for a percentage of the costs of the project, usually 80%.[36] The federal government has a wealth of programs a project can fall into, but the highways are mainly supported by the National Highway Performance Program, the State Transportation Program, and the Congestion Mitigation & Air Quality Program. In order to secure federal dollars, MoDOT must put up local matching funds (usually 20% of costs). Unlimited state spending, whether or not it could fit into federal programs, does not mean unlimited federal support. The FHTF has a designated obligation limitation for every state that caps the yearly support the state will receive.[37] The total federal obligation limitation in Missouri (including highways and other recipients) was just over $915 million dollars in 2013, all of which Missouri claimed.[38]

While yearly support from the federal government is limited, MoDOT is able to implement more federally supported projects in a given year than the obligation limitation would allow by using the Advance Construction (AC) program. In this program, MoDOT receives preapproval for federal funding on projects and then bonds against future federal dollars that it cannot receive that year due to federal limits. For example, in the mid-2000s MoDOT often had construction budgets for which approved federal support exceeded that year's obligation limitation. MoDOT bonded against the federal dollars that it would eventually receive for those projects and built up a positive AC balance that the federal government is obligated to reimburse in future years.[39]

Another source of federal support for highways are federal grants. These are not usually a significant source of support for the state highway system, but during the recent recession, the American Recovery and Reinvestment Act (ARRA) provided hundreds of millions of dollars in funding, peaking at nearly $400 million in total support for Missouri transportation projects in 2010 and 2011.[40]

Since that time, ARRA funds have petered out; they accounted for only 1% of revenues dedicated to the highway system in 2014.

State Dollars

After federal dollars, the next three most important sources of revenue for the state highway system are state-based highway user fees: the state fuel tax (24%), the motor vehicle sales tax (15%), and permit and license fees (14%).

The Missouri state fuel tax is 17.3 cents per gallon for both regular and diesel fuel, of which 17 cents is dedicated, by state statute, to highway and road funding.[41] Of those 17 cents, 75% goes to MoDOT to spend on the state highway system; the rest goes to cities and counties to spend on local road needs. The state fuel tax brought in about $489 million in revenue to MoDOT in 2014, about a quarter of all revenue dedicated to highways. In addition, cities and counties gained about $180 million in revenue from the fuel tax.[42] The last time Missouri increased its fuel tax was 1996, and fuel tax collections have declined since 2008.[43]

The next largest portion of revenue for the Missouri state highway system is the motor vehicle sales and use tax, about 70% of which goes to the state highway system. Motor vehicle sales tax revenue is primarily used to cover repayment of debt arising from Amendment 3, which authorized $1.7 billion of dollars of spending on the state highway system, including the "Safer, Smoother, Sooner" initiative.[44] Excess revenue is spent on current highway needs. In 2014, sales tax revenue was just over $300 million, accounting for 15% of highway revenue.

Licenses, permits, and fees for motor vehicles make up about 14% (or $288 million) of MoDOT's highway revenue. As with the fuel tax, MoDOT receives 75% of total license and fee revenue while cities and counties collect the remaining 25%. Many of the fee charges in this category are not adjusted for inflation, and total revenue from this source peaked in 2006.[45]

Local/Other Sources

Local governments often supplement highway expenditures in Missouri. For example, in 2012 local governments spent $408 million in capital outlays on highways, with maintenance, traffic services, snow removal, administration, and law enforcement accounting for hundreds of millions more.[46] Local governments raise this money from many sources, including property taxes and sales taxes, but the most important funding source is the state fuel tax.

For state highway projects, local government can put forward local dollars to get specific highway projects prioritized in state planning or completed in a manner more to the local government's liking. For instance, Kansas City contributed $10 million to the KCicon project to ensure that a specific type of interchange was built at the Kit Bond Bridge's terminus in downtown Kansas City.[47] Unfortunately, MoDOT's financial problems have caused the department to suspend its cost-sharing program with local governments. In 2014, MoDOT received about 4% of its highway revenue from reimbursements from local governments for cost-share projects.[48]

The previous sections described how MoDOT is directly responsible for planning and funding the state highway system. This, however, is not case in other areas of transportation infrastructure in the state. To illuminate the differences, the following sections will explain the structure and funding methods of the state's airports. The contrasting case will show why MoDOT is so focused on highways, and why its funding problems are analogous to highway funding problems.

FUNDING MISSOURI'S AIRPORTS

Airports are an important part of Missouri's economy, serving not only passenger travel but also cargo shipment and other commercial or recreational uses. Missouri contains 485 airports, but as with the highway system, raw numbers can be misleading. Of the 485 airports, only 128 are available for public use; the rest are private. Of the 128 public airports, only 14 have regular or semi-regular commercial passenger service.[49] The rest are general aviation airports that serve recreational fliers, agricultural support, or emergency response purposes. In fact, just two airports, Lambert St. Louis-International (STL) and Kansas City International (MCI), account for almost 96% of all passenger air travel (11.5 million total enplanements in 2013) and the vast majority of air cargo shipments in Missouri.[50]

The state of Missouri does not own airports and is not primarily responsible for their construction, maintenance, or planning.[51] Missouri's primary commercial service airports—airports whose main function is commercial air travel—are municipally owned. STL and MCI are self-sufficient at an operating level and rely on grants from the federal Airports and Airways Trust Fund for large capital projects.[52] They do not require regular state or local support. For primary commercial service airports, MoDOT is not directly involved in airport planning, construction, maintenance, operations, or finance. In fact, MoDOT acts as a pass-through agency for federal funds slated for those airports.[53] That is not to say Missouri does not make investments in its airports; indeed, hundreds of millions are spent every year on aviation. However, the vast majority of those dollars come from airport users, federal grants, and local government subsidies.

While MoDOT has little autonomous involvement in funding large airports, it does have wider impact on funding small, general aviation airports across the state. These airports are either privately or civically owned, and operating expenses come either from airport users or local governments. However, MoDOT does have sources of airport-designated revenue streams that it uses to fund capital improvement projects.[54]

The largest source of funding MoDOT has to spend on Missouri airports comes from the federal government, in the form of one block grant for non-primary airports.[55] That block grant totaled $13.5 million in 2014. MoDOT passes on a portion of those funds as entitlements (meaning that the airport does not have to meet any special grant requirements for funding), but it can also use a portion of the funds to extend grants to small airports, subject to federal restrictions.

MoDOT has two state-based sources of revenue to spend on airports: a 9 cent per gallon fuel tax on aviation gasoline and a portion of the sales tax collected on jet fuel (aviation gasoline and jet fuel are different classifications of aircraft fuel). Together, these provided just over $6 million in revenue in fiscal year 2014. MoDOT places this money in a state Aviation Trust Fund, from which it is distributed to state airports in the form of grants.[56] MoDOT gives these grants as matching funds, up to 90% of the local qualifying project. The state can also use its money to pay 50% of a local match requirement for federal aviation grant dollars, which themselves require a 10% local match.[57]

OTHER MODOT FUNDING RESPONSIBILITIES

Taking Missouri's transportation system as a whole, the state highway system stands apart as a state-owned, state-planned, state-run, and state-financed transportation system. The state's other forms of transportation infrastructure, like airports, are not the primary responsibility of MoDOT and rely mostly on other funding sources.[58] Even if MoDOT wished to take a larger role in planning and funding non-road projects, it does not have the dedicated sources of user revenue or federal reimbursements to do so.

For example, the state's freight rail system is privately owned, and train depots are the responsibility of freight companies.[59] State funding comes into play most notably for passenger rail service, where the state provides operating subsidies to the Missouri River Runner, an Amtrak route.[60] Public transportation and public river ports—like the airports—are primarily owned and funded by local governments with the help of federal subsidies for capital improvements. In all cases, significant investment takes place; it is simply not the direct purview of the Missouri Department of Transportation.

MODOT FUNDING CRISIS: SOURCES AND CONSEQUENCES

As explained in the previous section, many parts of Missouri's transportation system are primarily the responsibility of local government and private actors. Most of MoDOT's revenue sources are dedicated to the state highway system, and that system dominates the priorities of the department. It should therefore come as no surprise that the current funding crisis at MoDOT is the result of dedicated highway revenues not keeping up with the costs of building and maintaining highways. A shortfall would primarily damage the state highway system, as other modes are funded through other user fees, private investment, local government subsides, and federal subsidies. Therefore, while a funding shortfall could eventually have drastic effects on highway conditions throughout the state, rail, public

transportation, and airport infrastructure are unlikely to be significantly impacted. In short, the crisis in transportation funding in Missouri is about the lack of funds available for state highways, not the transportation system as a whole.

According to MoDOT, in the coming years the state's highway construction budget could fall below the amount necessary to keep the state highway system in the condition it is in today, much less improve it.[61] That may force MoDOT to make decisions about which highways are kept in a state of good repair and which highways will be allowed to deteriorate. It also may cause MoDOT to shelf any plans to make major congestion mitigation improvements or replace aging highways and bridges.

CAUSES

Cause I: Declining User-Fee Funding Base

The underlying source of the funding crisis is the falling purchasing power of the state highway system's user funding base. The FHWA defines any highway user tax (or user fee) as:

"A charge levied on persons or organizations based on their use of public roads."[62]

These include fuel taxes, motor vehicle sales taxes, permit fees, license fees, mileage-based user fees, and tolls. As discussed in a previous section, virtually the entirety of MoDOT's state highway revenue comes from state-level highway user fees, the most important of which are the state fuel tax, permit/license fees, and the motor vehicle sales tax. Those three sources combine for 91% of state revenue dedicated to the highway system. However, inflation-adjusted revenue from these sources is in decline. Since 2005, fuel tax revenue has declined by $29 million. Adjusting for inflation, the fuel tax has lost more than 20% of its purchasing power in the last decade.[63] Total permit and license fee revenue has stagnated, meaning it too is losing purchasing power due to inflation. Only the motor vehicle sales tax collected more revenue for MoDOT in 2014 than it did in 2005. Figure 4 shows the trends in detail.

In total, the inflation-adjusted revenue from fuel taxes, motor vehicle sales taxes, and license/permit fees was 8% lower in 2014 than it was in 2005, with the largest source of revenue (the state fuel tax) in the steepest decline.

The declining purchasing power of the user tax base has two sources: unadjusted fees and decreasing fuel consumption. The state fuel tax and most permit fees have nominal rates, as with the 17 cents per gallon fuel tax.[64] This means that if total gallons purchased remain steady or only increase at a very slow rate, real revenue will fall year after year due to inflation. The last time the state increased the fuel tax was in 1996, and the real fuel tax per gallon has decreased by almost one-third since that year. As a counterexample, the motor vehicle sales tax, which is a percentage on the price of the vehicle, automatically adjusts to the rising price of cars and thus that fee's inflation-adjusted revenue actually increased over the last decade.[65]

The second cause of the decline in user-fee revenue is decreasing fuel consumption. Total vehicle miles driven per Missourian have peaked, possibly for the long term.[66] At the same time, drivers are opting for more fuel-efficient cars that allow them to pay less fuel tax for the number of miles they drive.[67] Following the recession, there was a sharp decrease in the total number of miles driven on the state highway system. With the economy slowly recovering, total miles traveled are on the rise. However, fuel tax receipts have been in decline, at an average of 1% per year since 2007.

A third cause of declining user-fee revenue is not a reduction in revenue *per se,* but rather that a portion of future user-fee revenue has already been spent. Looking at MoDOT's bond repayment schedule, it may be appropriate to consider much of Missouri's long-term highway spending potential as already having been allocated in the 2000s. With Amendment 3, Missouri issued almost $2 billion dollars of bonds and spent the money improving the state highway system. It specifically allowed MoDOT to implement its "Safer, Smoother, Sooner" program that greatly improved road quality throughout the state.[68]

However, in implementing Amendment 3, the state did not create a large new revenue stream for the project; instead they tied motor vehicle sales tax revenue to bond repayment. Those bonds will require MoDOT to allocate more than $200 million in highway revenue (around 20% of state derived highway user-fee revenue) toward repayment from now until 2026. That means that a

significant portion of MoDOT's state and local revenue must go toward paying off Amendment 3 spending for the foreseeable future. So while motor vehicle sales tax revenue is the most stable, and in fact growing, source of revenue for MoDOT, much of it must go towards paying off debt from completed road and bridge projects. Those funds are therefore unavailable for financing new projects.

Cause II: Highway Costs

The decreasing revenues of MoDOT have been met with rising construction costs. According to MoDOT, the price of nearly all inputs for highway construction (fuel, concrete, steel, etc.) are rising faster than inflation.[69] MoDOT has attempted to save money by eliminating offices and selling unneeded buildings and vehicles, but administration makes up a very small portion of MoDOT's total budget (2% in 2014), so there is simply not much room for savings. Cutting administration costs in half would only net the department $24 million annually.[70]

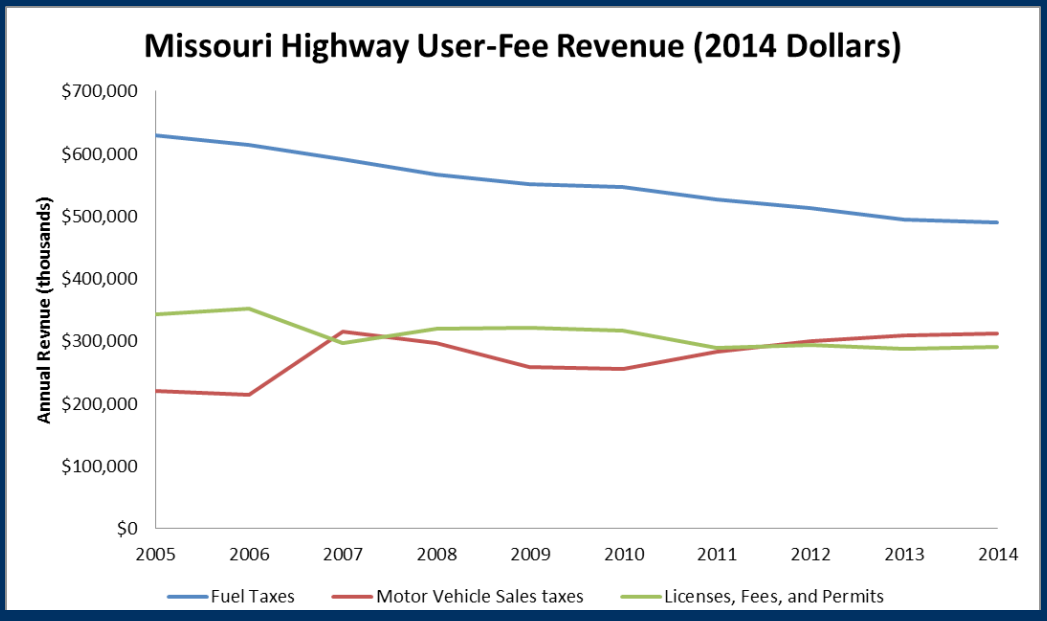
Resources Devoted to Low-Traffic Routes

Despite the lack of savings to be had by streamlining MoDOT administration, MoDOT's project choices and the very structure of the state highway system itself lead to inefficiencies in the use of taxpayer dollars. On the point of project choices, MoDOT attempts to choose projects that have the most economic impact per dollar spent. Categories that lead to a project getting top priority are job creation and congestion mitigation. However, as previously discussed, the state highway system is very extensive and mostly made up of lightly used rural and urban routes. These lanes not only consume a large part of state revenue in maintenance costs, but they also require regular capital improvements to remain in good condition. The department spends millions every year on capital improvements for roads that would be local or county routes in other states. For instance, MoDOT spent most of the money it received as part of the American Recovery and Reinvestment Act (AARA), some $685 million, to implement the Safe & Sound Bridge program. That program replaced 802 structurally deficient bridges around the state, but the vast majority of those bridges (499) were on MoDOT's least-used routes, the state letter routes.[71] Only 8 of the bridges that were replaced were on interstates, and 71 were on US routes.[72]

This level of investment in low-traffic roads and bridges may not be the most effective use of state dollars, but MoDOT cannot simply ignore the lesser-used parts of the system while it focuses on heavily-used interstates and US routes. To do so would cause the department to be accused of ignoring rural areas.

Figure 4: **Missouri Highway User-Fee Revenue (2014 dollars)**

MoDOT user-fee revenues are stagnant or declining.



Source: Missouri Department of Transportation. "2014 Comprehensive Annual Financial Report." pp. 122–123. Available at: http://www.modot.org/about/general_info/documents/FY14MoDOTCAFRFINAL.PDF

One way to increase MoDOT savings would be to place lightly used roads and bridges under local control. The advantage of this is that local residents may be better at assessing the relative values of specific improvements. And when those same residents have to pay for projects, they will be better able to weigh the costs of additional spending against the benefits. When the spending comes from the state level, it creates an incentive for local residents to lobby hard for improvements they themselves would not pay for, lest they not get their "fair share" from the state transportation department.

This impulse is not confined to rural areas. For example, in the early 2000s Saint Louis City lobbied for the state to take control of the city's non-interstate highways. City leaders argued it was unfair that Saint Louis City was the only county that did not receive state support for such routes. MoDOT warned the city that it did not have significant dollars for the improvement of these roads, but in 2004 the state legislature forced the department take over five city highways, including Gravois Road, Chouteau Avenue, and Manchester Road. Today, many residents complain about how MoDOT handles these roads and push for expensive upgrades that prioritize neighborhood improvement, not transportation. These include traffic circles, transit improvements, bike paths, and street narrowing.

Miscalculation on Major Projects

Possible misallocation of highway resources is not confined to spending on relatively empty highways. MoDOT often plans large highway improvement projects that are designed to increase metropolitan or statewide mobility and reduce bottlenecks. However, some projects come under fire for spending vast resources without resulting in sufficient mobility improvements or economic benefits to justify the expenditure.

For example, the new Stan Musial–Veterans Memorial Bridge (Stan Span) that spans the Mississippi River cost nearly $700 million. MoDOT's portion of those costs was $100 million, with the rest coming from Illinois and the federal government.[73] The bridge was designed to divert truck traffic off of other bridges such as the Martin Luther King Bridge and the very busy Poplar Street Bridge. However, the latest traffic counts show that the "Stan Span" has not met MoDOT's expectations; the expensive new bridge carries a mere 20,000 vehicles a day (the Poplar Street Bridge carries over 90,000).[74] Spending money on the Stan Musial Bridge not only prevented funds from going elsewhere in the state, but also added yet another structure that MoDOT must maintain and make improvements on in the future, further constraining its budget for years to come.

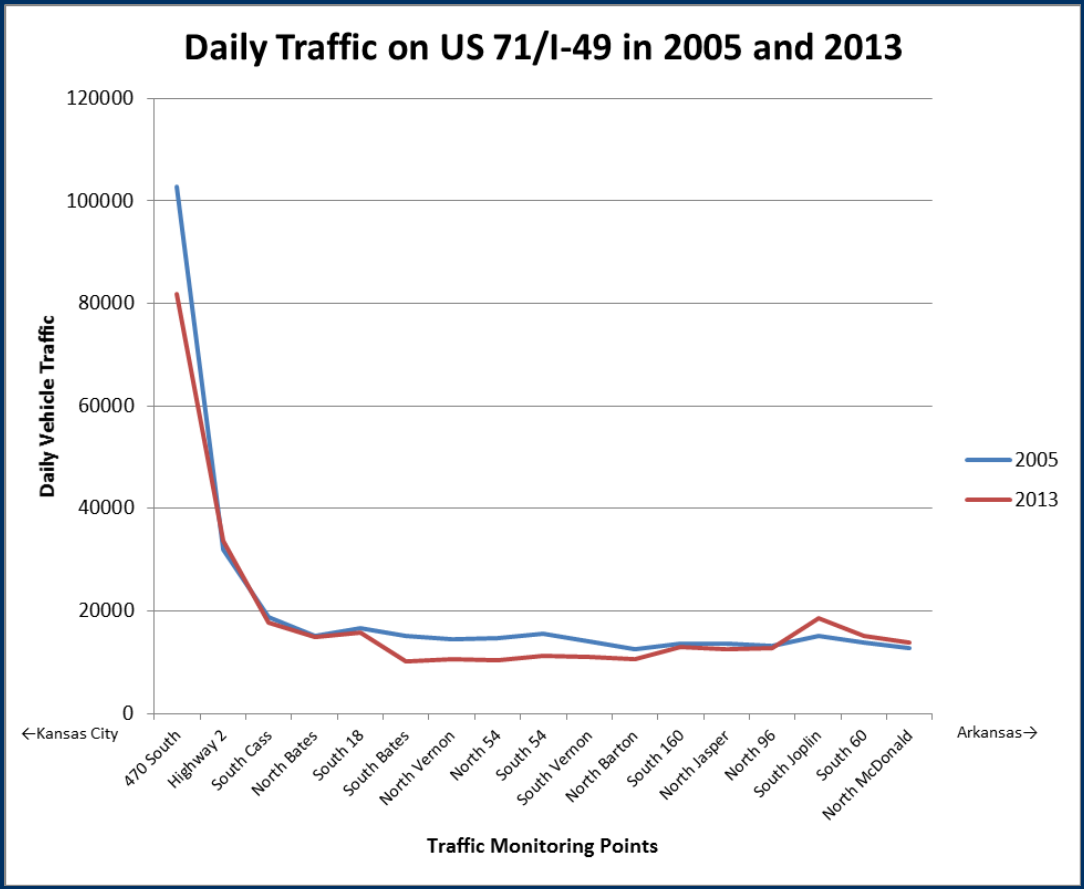
Another example may be the conversion of US Route 71 into Interstate 49 in the Kansas City area and Southwest Missouri. The necessary upgrades, made from 2009 to 2012, cost MoDOT and local governments more than $150 million.[75] And while the improvements to safety have their own value, the upgrades provided only minor time savings and congestion relief. Traffic on the new I-49 was actually less in 2013 (the year after upgrades were completed) along much of the highway's length than in 2005, before construction began. While this does not mean that the conversion reduced highway traffic, the upgrade to interstate level did not markedly change demand for the highway. Figure 5 shows average daily traffic along US 71/I-49 before and after improvements were implemented. Far from growing, traffic has actually fallen in most areas along the route. The blue line represents traffic volume in 2005, and the red line represents traffic in 2013. The chart shows that, after improvements were completed (in 2012), traffic was increased only in the Joplin area (close to the Arkansas border), and stayed the same or decreased in Kansas City, Bates County, Vernon County, and Barton County.

State Highway System Expansion

The tendency to add more miles to the highway system, whether because of federal incentives, optimistic economic projections, or local politics, has added steadily to MoDOT's responsibilities in the last 15 years. From 2000 to 2013, MoDOT increased the number of urban lane miles under its control by 75%.[76] Missouri's metropolitan areas have expanded, so one could speculate that much of the increase is the result of rural highways being reclassified as urban highways. However, for this to be true rural highway miles would have had to decrease; they have in fact increased, although to a much lesser degree than the urban system.[77]

Figure 5: **Daily Traffic on US Highway 71/I-49 in 2005 and 2013**

Daily traffic on US 71/I-49 was largely unchanged from 2005 to 2013.



Source: Missouri Department of Transportation. "Traffic Volume Maps." Available at: http://www.modot.org/safety/trafficvolumemaps.htm.

Some of those additional miles have come from MoDOT taking responsibility for roads that were once maintained by local governments, but the last decade and a half has seen lanes added to existing roads, like US 36, and entirely new sections of roads built, like the Page Avenue Extension.[78] The average utilization rate on MoDOT's highways has declined over the last 15 years, indicating a lack of latent demand for these expansions. For example, in 2000 the average daily traffic per urban lane mile was over 10,000 vehicles. In 2013, urban daily traffic per lane mile was only 6,564. Average daily traffic on Missouri's rural highways has fallen from 1,196 vehicles per lane mile per day to 917 over the same period. From 2000 to 2013, traffic per mile fell more than 10% across Missouri's highway system.[79]

From a financial perspective, a more extensive highway system can be more expensive to maintain and rebuild. As the blue bars in Figure 6 show, MoDOT's maintenance spending is 66% higher in 2014 than it was in 2002.[80] The red line on the chart shows that in most years since 2002, MoDOT's maintenance spending has increased from the previous year. MoDOT did experience decreases in highway maintenance spending in 2008, 2011, 2012, and 2014. However, these spending decreases were modest in comparison to spending increases experienced in other years, explaining the overall upward trend in spending.

While there are likely multiple reasons for the spending increases, additional highway miles add to costs. When additional miles are used less than existing miles, it means that user fees are stretched more thinly, adding to the state's funding problems. Adding more lane miles, especially in urban areas, is often justifiable when projects increase mobility and/or lower congestion. However, according to a recent traffic index of cities with more than 800,000 residents, Kansas City was the least congested city in North America, and Saint Louis was the sixth least congested.[81] Under these circumstances, the benefits of adding new lane miles to Missouri's transportation system need to be

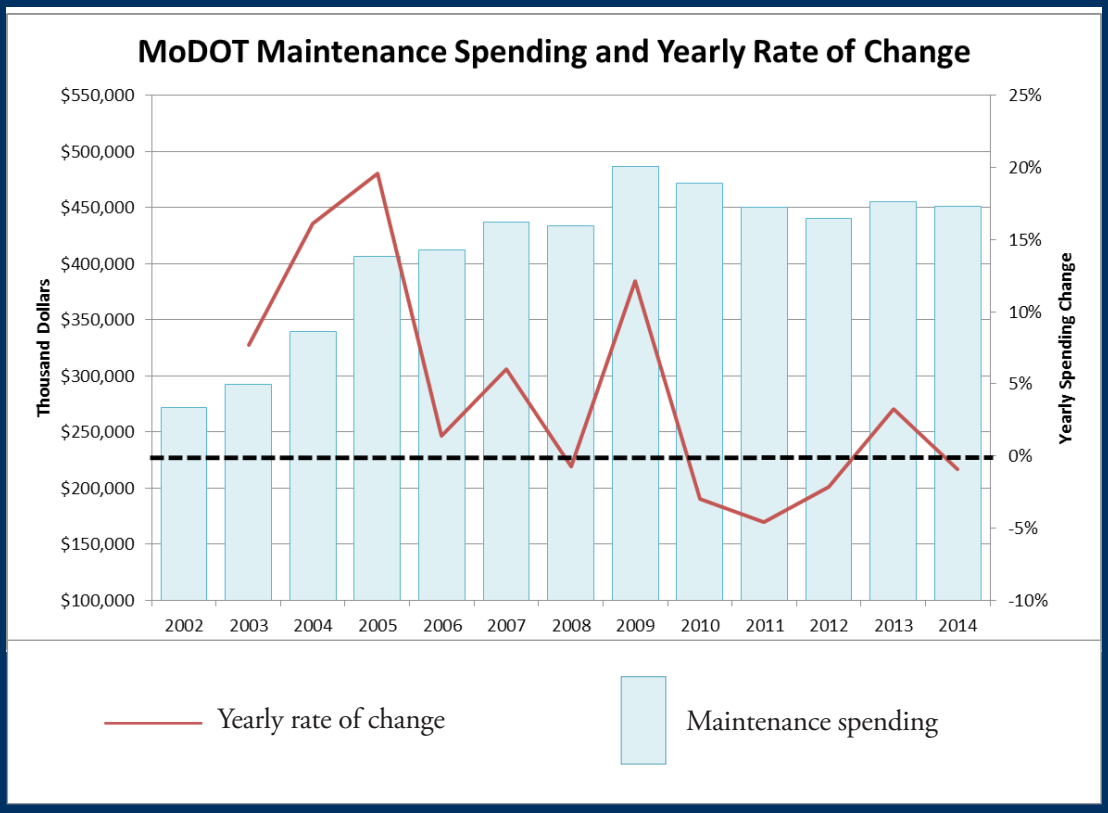
stringently evaluated and balanced by MoDOT's funding limitations.

Inappropriate Spending

Another factor that may lead to funding issues for MoDOT is inappropriate departmental expenditures. According to a recent audit of the department, millions of dollars that were supposed to be spent on the state highway system were instead spent relocating district engineers and providing safety programs for local governments. MoDOT claims these expenditures are well within its discretion, and that the measures were taken for cost-saving purposes. However, the office of the state auditor raised concerns that the department is taking too many liberties in its spending policies.[82] When MoDOT takes money from the state road fund and uses that money not on building and maintaining highways, but on staff retention and ancillary transportation purposes, it reduces the dollars going toward critical needs, sometimes undermining public confidence in MoDOT's fiscal responsibility.

Figure 6: **MoDOT Maintenance Spending and Yearly Rate of Change**

MoDOT maintenance spending has greatly increased in the past decade.



Source: Missouri Department of Transportation. "2014 Comprehensive Annual Financial Report." pp. 44–45, 120–121. Available at: http://www.modot.org/about/general_info/documents/FY14MoDOTCAFRFINAL.PDF.

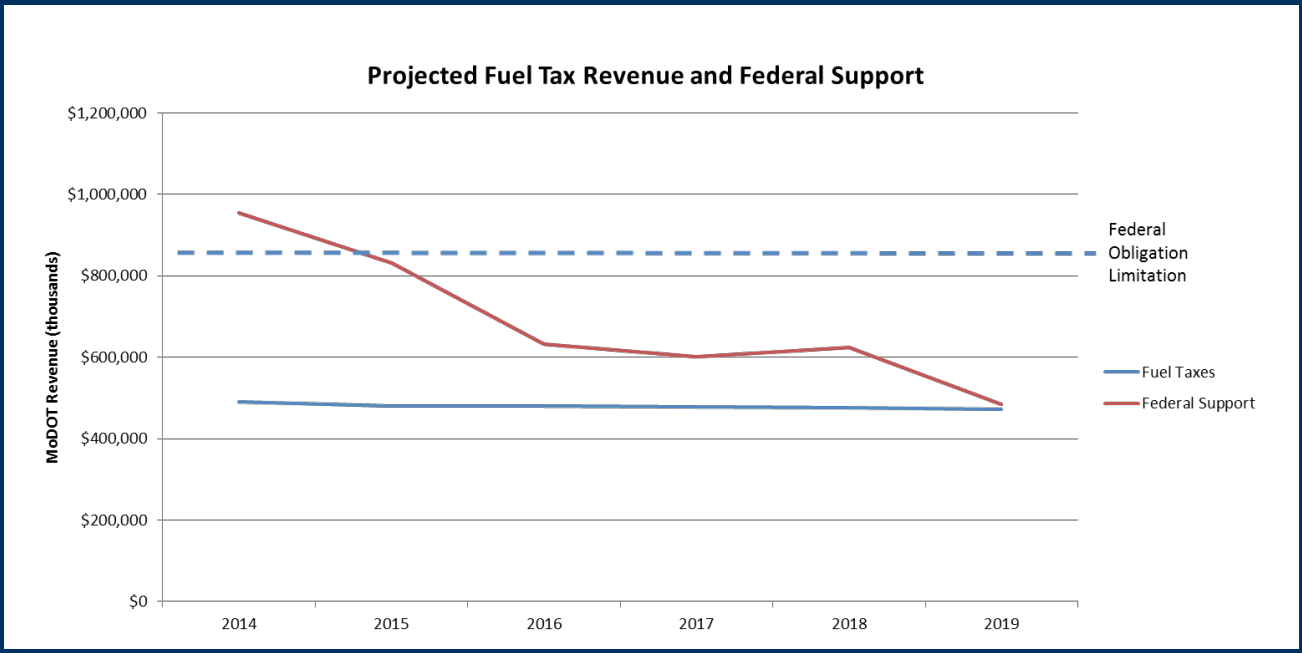
Cause III: Loss of Federal Matching Dollars

A slowly declining user-fee base, along with steadily rising costs, are the underlying causes of MoDOT's funding crisis. However, the immediate triggering factor that would cause major funding shortfalls for MoDOT is the loss of federal revenue, as Figure 7 demonstrates.

Figure 7 shows that total federal support will fall quickly in the coming years, while fuel tax receipts will continue a very slow decline. The federal support may fall below the federal obligation limitation, which is represented by the blue dotted line. This is because, as was discussed earlier, the federal government does not give federal highway payments to Missouri as a lump sum. Rather, it grants federal matching funds to approved projects. For most MoDOT projects, the federal government will provide 80% of the project's costs, meaning MoDOT must fund the remaining 20%.

Figure 7: **MoDOT's Projected Fuel Revenue and Federal Support**

Falling federal support, not user revenue, would trigger a funding crisis for MoDOT.



Source: Data from https://www.flickr.com/photos/58867268@N03/12146434293/.

In essence, Missouri needs to continue implementing road improvement projects to continue receiving its full share of federal highway money. While MoDOT has no lack of improvement projects that would fit federal criteria, it still needs to have the local match for every project. However, stagnating user-tax–based revenue, bond repayment needs, rising maintenance costs, and increasing construction costs mean that MoDOT may no longer have enough state dollars to provide matching funds for new construction projects. In fact, in 2014 MoDOT did not add any new projects to its 5-year state improvement plan (STIP).[83] The fewer federally approved projects on the STIP, the less federal revenue Missouri receives. A collapse in federal revenue would directly affect MoDOT's highway construction budget, which MoDOT has predicted will decline from the 2014 level of $700 million down to $325 million by the end of the decade, less than is required to maintain the state highway system in the shape it is in today.[84]

Missouri's constuction budget would face problems before the state starts failing to match federal dollars, which is projected to begin happening in 2020. The reason for this delayed reaction is that Missouri has already built projects on which the federal government still owes its matching portion. MoDOT built up a balance of federal money owed as part of its Advanced Construction program, which as of this year has a $1 billion balance.[85] If Missouri ever fails to add new construction projects to its state improvement plan, the state may continue to receive its full obligation limitation amount until the balance is fully reimbursed, at which point Missouri might no longer receive all federal dollars allowed.

BUDGET SHORTFALL AND ITS CONSEQUENCES:

Current Conditions

According to MoDOT, in order to keep the state highway system in its current state of repair, the department needs

to make approximately $485 million in new construction awards every year. Due to the financial constraints discussed earlier, Missouri's construction budget may fall significantly in the near future. Keeping the state highway system in a state of good repair requires regular capital improvements, which MoDOT might no longer be able to afford.

Before considering what effect a funding shortfall would have on the state highway system, it is important to know the system's present condition. Luckily for the state, in most respects Missouri's highways are in a good state of repair as compared with those of other states and with historical conditions. Take for example highway pavement and bridge conditions. In 2004, about 47.4% of Missouri's major highways were considered to be in good condition. As of 2013, 89.7% were considered in good condition, a 90% increase from 2004. Over the same period, the number of deficient bridges in the state fell by almost one-third. Figure 8 shows these improvements over the course of the past decade, with the blue line representing the percentage of highways in good condition and the bars representing the total number of deficient bridges on the state highway system.[86]

Nationally, Missouri's highways rank well against those of other states. The Missouri state system as a whole and its interstates rank 12th in the nation in terms of overall smoothness.[87] The state has consistently performed well on rankings of state highway systems by the Reason Foundation and the Chamber of Commerce Foundation.[88] One area where Missouri does not rank as well is the number of bridges in poor condition. MoDOT claims that 2,000 bridges in the state are "structurally deficient and functionally obsolete."[89] Missouri has an extensive state highway system that includes not only the high-profile bridges across major rivers, but also many lightly used bridges that cross small streams. In other states, the latter usually belong to counties or municipalities instead of the state transportation department. In Missouri, these numerous small bridges add significantly to the list of structures in need of repair and lower the state's overall ranking for highway quality.[90]

A budget shortfall could cause the state highway system to deteriorate. However, past expenditures, which Missouri is still paying for, have had the effect of improving the system. Fixing the budget shortfall will allow the progress to be cemented, while a loss of funds would likely be deleterious to the transportation system.

The 325 Plan

In response to the budget crisis, MoDOT developed a strategy for how it will allocate funds given the budget shortfall. Under the "325 Plan," so called because Missouri's construction awards budget will fall to $325 million in the near future, MoDOT would split the state highway system into two subsystems: a primary and supplementary system. The primary system would consist of the most important highways that connect communities. That does not necessarily mean the most trafficked highways, but in most areas this will be the case. For example, all of Missouri's interstates are part of the 325 Plan's primary system, as are most of the state's US routes. In addition, many of the Missouri highways are included in the primary system. Together, the 325 Plan's primary system would include 8,180 of Missouri's 33,000 highway miles. Figure 9 shows the state's primary system under the plan.[91] Under the 325 Plan, the highways and bridges that are part of the primary system would be maintained in their current condition.

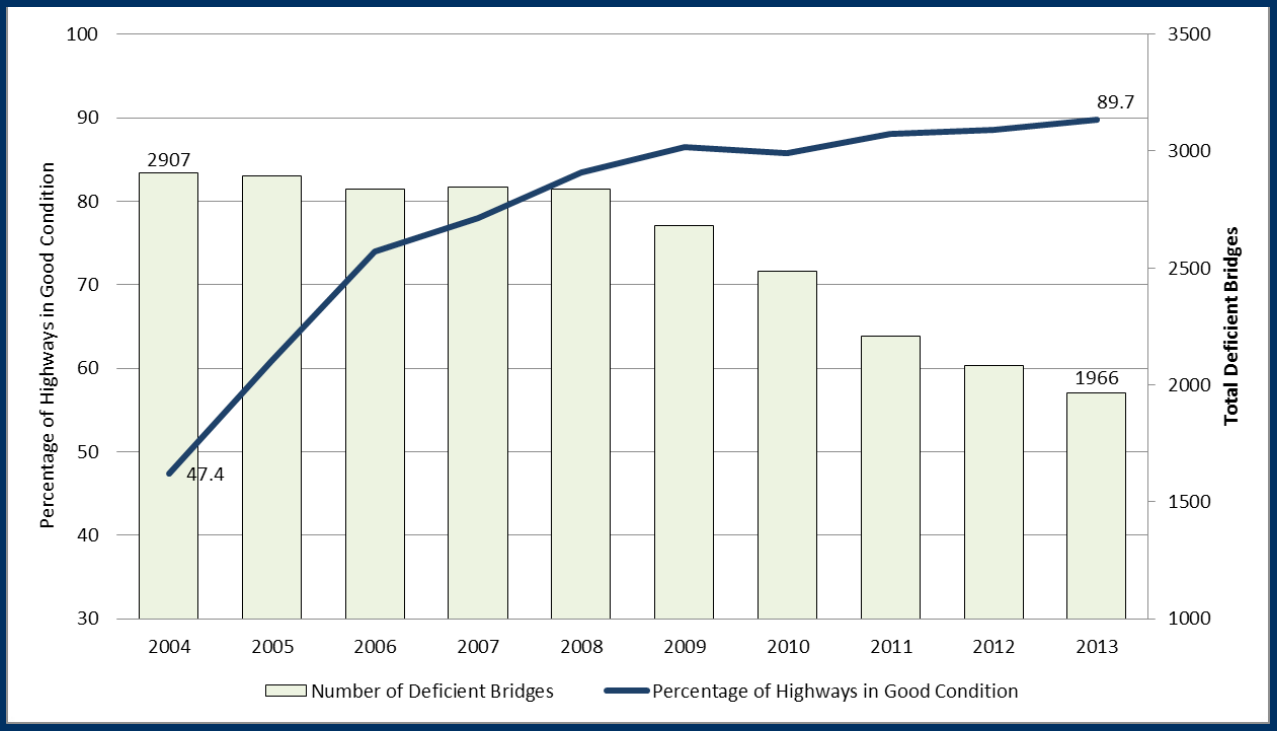
Recent increases in state revenue and the ability to find new methods to match federal funds have led MoDOT to shelve the 325 plan, although it remains the approved method of dealing with an immediate budget shortfall. Should MoDOT lack the funds necessary to maintain the state highway system as a whole in the near future, it is possible the plan may come off the shelf.

Funding Major Projects

A MoDOT budget shortfall would have immediate and medium-term consequences for the highways that Missourians currently use. However, even if Missouri is able to increase revenue (or decrease costs) such that MoDOT can properly maintain the entire existing system, there is still the problem of very expensive capital improvement projects that the system will require in the future. Those projects, which include rebuilding major highways, expanding roadways, and replacing bridges, are regular necessities for the function of the highway system as a whole and will continue to be necessary in the coming decades.

Figure 8: **Highway and Bridge Conditions in Missouri**

Bridge and Highway Conditions Greatly Improved in Missouri between 2004 and 2013.



Source: Missouri Department of Transportation. "2014 Comprehensive Annual Financial Report." pp.140–144. Available at: http://www.modot.org/about/general_info/documents/FY14MoDOTCAFRFINAL.PDF

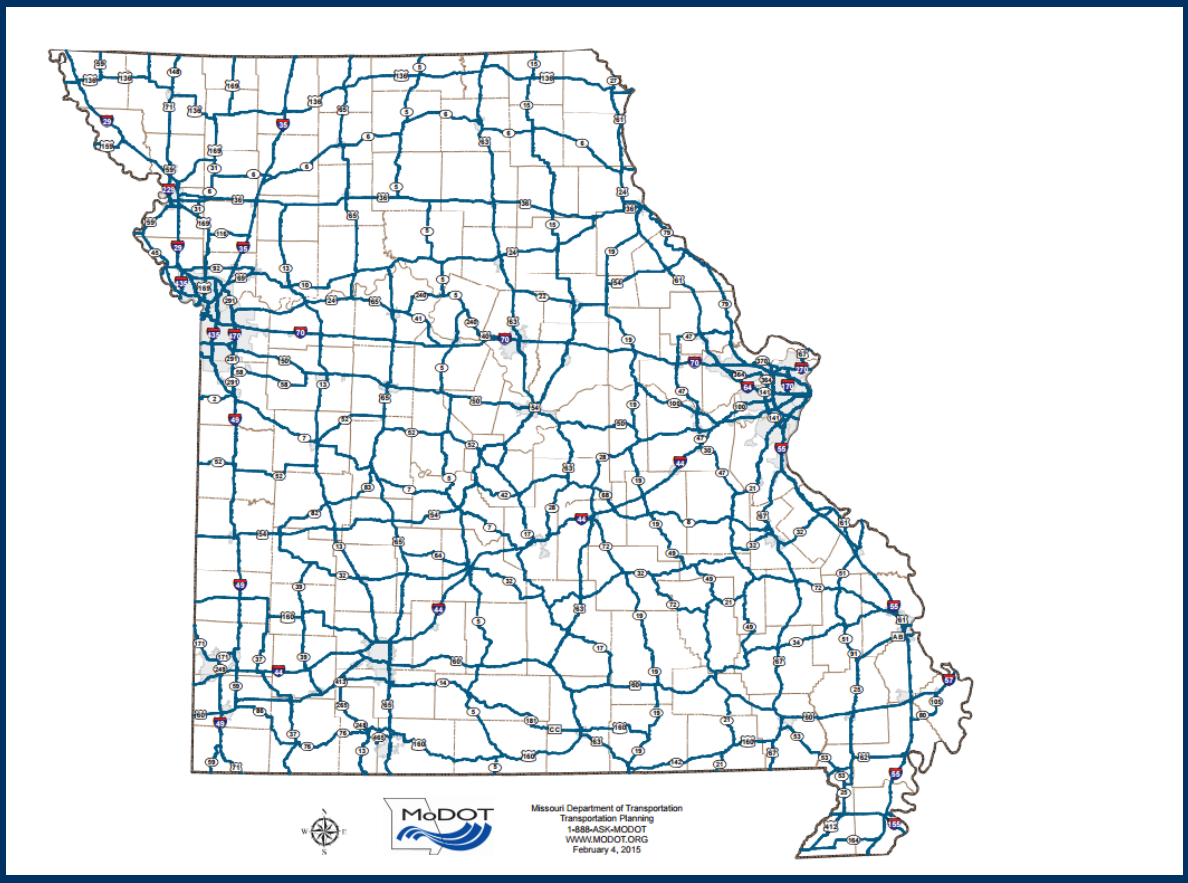
The largest looming expense for the Missouri state highway system are its interstates. Most of Missouri's interstates were built in the 1960s and 1970s (I-70 opened in the 50s) and were designed for a useful life of around 50 years. While regular maintenance prevents the road surfaces from deterioration, the subsurface pavement is slowly degraded over time. In the case of I-70, where some sections are now almost 60 years old, the subsurface conditions will require the highway to be rebuilt from the ground up, and soon. Furthermore, I-70 already experiences high traffic levels in many areas. If this traffic, and especially interstate truck traffic, grows, congestion will worsen.[92] These concerns have pushed MoDOT to recommend expanding the width of I-70 from four lanes to six lanes across the state. Unfortunately, rebuilding and expanding I-70 could cost Missouri from $2 to $4 billion dollars.[93]

But when Missouri looks past the next decade and into long-term planning, the problem is not just I-70, but most of Missouri's interstates. In the next 20 years, sections of I-55 and I-44 will also reach the end of their useful lives, requiring that sections be rebuilt from the ground up. One estimate calculated the present value of needed reconstruction at nearly $13 billion, and billions more if highways are widened.[94] When MoDOT claims it needs a $485 million construction budget to maintain highways, these long-term projects are not included.

Aside from the interstates, there are many highway projects in Missouri that may require large expenditures in the future for which there is currently no funding available. These include bridge replacements, such as Broadway Bridge in Kansas City, Grand Boulevard over I-44 in Saint Louis City, and many others.[95] Many of these bridges are

Figure 9: **The Missouri 325 System**

MoDOT's 325 system includes only major highways that "connect communities."



Source: Missouri Department of Transportaion. "Tough Choices Ahead." Available at: http://modot.org/toughchoicesahead/index.htm.

critical to local economies and the transportation system in the state as whole.

For Missouri to continue to grow, it not only needs to maintain the system it has, rebuild interstates, and replace deficient bridges, but also must expand and improve the system where necessary. Today, Missouri's state highway system has extremely low congestion, especially in its major urban centers. While that means MoDOT is not under extensive pressure to make large expenditures expanding the system, the low traffic level covers up inadequacies in the state highway system that may quickly create high congestion if Missouri's cities or rural areas experience rapid growth.[96] For the highway system to accommodate growth, resources must be available to deal with the increase in traffic that is likely to arise. As things stand, MoDOT would be unable to respond to these pressures, which could prevent Missouri from capitalizing on growth opportunities.

SOLUTIONS TO FUNDING PROBLEMS

To address the Missouri State Highway System's funding problems and the deleterious effects that a funding

shortfall would have on this critical system, the following section of the paper will outline possible solutions to the funding problem. Most solutions will include either an increase in revenues from some source or cutting spending for some areas, or both. Structural issues with MoDOT and areas of waste have been discussed previously in this paper, and MoDOT could look to long-term reform in these areas. This section will focus on revenue increase solutions. Possible solutions will be broken into two categories: (1) general taxation, and (2) taxes and fees derived from highway users. This section will also explore the comparative advantages of different approaches, in terms of economic effects, revenue generation potential, fairness, and legal limitations.

Note: Hancock Amendment

The Missouri constitution contains a provision known as the Hancock Amendment, which requires increases in state revenue to gain voter approval. The provision has exceptions for small increases of existing revenue streams. Under the amendment, as of 2015, the legislature can increase revenue in any given year as long as new revenue does not exceed $106 million ($50 million in 1980 indexed to personal income growth) or 1 percent of state revenue looking back two years ($84.2 million for last year), whichever is lower. That means that any increase of tax revenue for the state highway system, regardless of the sources, that exceeds $84.2 million would have to go before the voters.[97]

GENERAL TAXATION

General taxation refers to taxes that almost all residents will incur in their daily lives and are not connected to the provision of any specific government purpose. The most common forms of general taxation in Missouri include income taxes, sales taxes, and property taxes. In Missouri, the state collects an income tax (about 6% of annual income), a statewide sales tax (4.225%), and a small property tax (3 cents per $100 of assessed value).[98] Municipalities and counties also collect sales and property taxes, and Saint Louis and Kansas City collect an income tax (also known as the earnings tax). General taxes are already used to fund local roads in counties and municipalities. Counties and municipalities collect road and bridge property taxes and some, such as Saint Louis County, collect a transportation sales tax.[99] Transportation development districts, small ad hoc taxing areas, also collect property and sales taxes for transportation (often road) use. These local governments and taxing districts use these funds to maintain local roads, bridges, and public transportation. They can also use those funds as part of local matching funds so that MoDOT can prioritize a specific state highway improvement that benefits a municipality. These exceptions aside, general taxation is not normally used to fund state highway improvements, and no state-level general taxes are currently used for this purpose.

As a solution for the Missouri State Highway System's funding problems, perhaps the greatest "advantage" of general taxation is its ability to raise large amounts of money with a low percentage increase in any particular levy. Because the tax is spread out among all taxpayers, the additional tax burden on any individual resident becomes less noticeable. This is especially the case when the tax collection is spread among many transactions (as with the sales tax), because the total amount paid by each household per year is generally unknown. Conversely, taxpayers will be more likely to understand the absolute effect on their bottom line from a property or income tax increase, which may be paid once a year.

Statewide Sales Taxes

Missouri currently collects a statewide 4.225% general sales and use tax on all goods and purchases in the state (1.225% for groceries and drug purchases). In 2014, the state collected more than $3 billion in revenue from the general sales tax, most of which went to the state general fund with the rest mostly going to education and conservation.[100] With most end purchases in the state subject to the sales tax, it is an extremely effective way of raising large amounts of revenue for the purpose of maintaining highways.[101]

As Table 2 demonstrates, even a 0.25% increase in the statewide sales tax would bring in more than $150 million a year (assuming no changes in spending patterns), which would allow MoDOT to maintain federal matching funds for the next few years at least. A 1% increase would raise more than $631 million, which could provide significant revenue that would allow funding for some major projects

Table 2: **Expected Revenue from Sales Tax Increase**

Sales Tax Increase	0.10%	0.25%	0.75%	1.00%
Additional Revenue	$63,167,469	$157,918,673	$473,756,019	$631,674,692

Source: Missouri Department of Transportation. "Financial Snapshot: October, 2014." p. 20. Available at: https://archive.org/details/2014FinSnapshot.

like the reconstruction and widening of I-70. In addition, because sales tax revenue increases in tandem with price increases across the state, the purchasing power of a sales tax increase will better adjust to inflation over time.

These benefits, along with polling data, are the primary reasons statewide policymakers selected a statewide transportation sales tax as their preferred solution to the highway funding problem in 2014.[102] That policy, known as Amendment 7, would have raised the statewide sale tax by 0.75%, and was projected to increase state transportation revenue by $534 million. That proposal failed at the ballot box, but there is nothing to stop state policymakers from attempting the same measure once more or perhaps raising the sales tax by 0.10% or 0.25%, although these, too, would be subject to Hancock requirements.

Other states use general sales taxes to pay for highway improvements, with both Arkansas and Virginia increasing sales taxes to pay for transportation since 2012.[103]

Property Taxes

Missouri could fund transportation throughout the state by increasing the state property tax, which is currently three cents per one hundred dollars assessed valuation and provides revenue for the blind pension fund. In 2014, this tax raised about $30 million total,[104] meaning that the state could close a $150 million funding gap by instituting a 15 cent per 100 dollar assessed valuation tax and transferring those funds to MoDOT for highway use. However, the state property tax is written into the constitution as a specific amount for a specific purpose. To greatly expand both the amount levied and spend the money on roads would require a full constitutional amendment, even if the dollar amount of the increase were within the limits allowed by the provisions of the Hancock Amendment. Other states do not typically use state property taxes for state highways.

Income Taxes

Currently, Missouri levies a graduated income tax where the top marginal rate, 6%, comes into effect after $9,000 of income. This essentially means that most working Missourians are taxed at rate of 6% for most of their income. The state currently raises almost $6.4 billion through income taxes, which goes into the state's general fund.[105] As little as a quarter-percent increase in the state personal income tax would net close to $270 million annually for the state, which could bridge the budget shortfall. A 0.5% increase could raise more than $500 million annually, greatly increasing highway funding capabilities and making large capital improvements possible. Like the state sales tax, a small percentage increase in the income tax is capable of raising significant amounts of money. However, the income tax is more visible than the sales tax in that taxpayers will know the total amount that they have paid come the end of the year and may be more likely to notice a tax increase for highways. In addition, no other state with income taxes ties that revenue directly to highway funding.

Transfer Via the General Fund

Aside from statewide sales taxes, states do not tie portions of income tax revenue or property tax revenue to highway funding. However, the indirect use of general taxation to fund highways to at least some degree is common. Thirty-two states, of which Missouri is not one, spent general fund money on state highway systems in 2013.[106] For ten states (including Illinois), more than 10% of highway revenue came from the state general fund. It would be possible for Missouri to shore up the state road fund with general revenue infusions in order to maintain matching funds. This is done on an ad hoc basis in other states and has been the strategy of the federal government in dealing with its highway funding problems for the last few years.

Other Non–User-Based Taxation

A number of states tie road funding to specific taxes that cannot be described as general taxes or highway-based user fees. For example, Oregon and New Jersey use gaming and lottery proceeds to fund highways. Nevada and Massachusetts charge a tax on rental vehicles that goes to highways.[107] In all cases, these miscellaneous forms of funding are supplemental and contribute only a small percentage of overall highway funding, but Missouri could theoretically use these types of smaller dedicated taxes to help raise more revenue.

OBJECTIONS TO THE USE OF GENERAL REVENUE TO SOLVE MISSOURI'S HIGHWAY FUNDING PROBLEMS

While general revenue sources may appear to be a convenient method for raising large sums of money for the state highway system, there are a number of drawbacks to transforming MoDOT's user-funding base to a more widely funded system. These involve problems of regressivity, fairness, and negative consequences of highway subsidization.

Regressive Taxations

Some forms of general taxation are inherently regressive in that they—in percentage terms—affect those with lesser means more than those with greater means.[108] While some forms of general taxation are not regressive, such as income taxes and property taxes, statewide sales taxes in particular are considered regressive. That is especially an issue because sales taxes are generally the favored method of raising additional dollars for highways, as opposed to property and income taxes. Taxes raised in this regressive manner are then used to build highway infrastructure, which is of most benefit to certain types of businesses and residents with the higher incomes that allow for increased mobility.

Distribution Fairness

The mismatch between those who pay general taxes and those who derive specific economic benefits from state highways can also create fairness concerns.[109] For example, when sales taxes are used to pay for highways, those who pay for the system are in general Missourians and visitors to Missouri. They pay the sales tax in proportion to the amount of goods and services they purchase. However, direct beneficiaries of highways are residents who use passenger vehicles for commuting, errands, and recreational purposes, as well as commercial vehicles (mainly interstate freight trucking). While those who pay the state sales tax and those who benefit from the state highway system can have great overlap, this is not always the case. And even where sales tax payers are themselves highway users, the amount they will pay toward the construction and maintenance of those highways is not based on the amount they benefit from the roads, but on how much they spend on goods and services of any kind. Individuals who may derive little utility from the state highway system may still pay a significant amount for the system through sales taxes. Funding the highway system through sales taxes also allows heavy users of the highways to pay less than the costs they place upon highways. The most important example of the latter case is interstate trucking companies, which cause significant wear for roadways but are unlikely to pay much in the way of sales taxes.

Subsection: You Pay, Truckers Don't

It is reasonable to see the use of Missouri general taxes, including sales taxes, to fund highways as a subsidy to interstate trucking companies. Single-unit and combination trucks make up a significant portion of traffic on Missouri's roads. As Table 3 demonstrates, Large trucks make up more than 33% of traffic on Missouri's rural interstates, and more than 9% of traffic on urban instates.[110]

While passenger vehicles (including cars, light trucks, and motorcycles) make up the majority of vehicles on Missouri's principal highways (especially urban interstates), large trucks make up a significant portion of traffic. This is especially the case on Missouri's rural interstates, where large trucks make up a third of all vehicles on the road. The state's position in the middle of the country contributes to this high number, which is much higher than the national average; nationwide, 21% of rural interstate traffic is large trucks.

However, traffic volume only tells part of the story. While heavy trucks make up a minority of vehicles on Missouri's highways, they cause much more wear to the highway

Table 3: **Traffic on Missouri Highways by Vehicle Type**

Missouri Data	Rural Interstates	Urban Interstates	Rural Arterial Roads	Urban Arterial Roads
Passenger Vehicles	65.79%	90.47%	82.99%	89.21%
Large Trucks	33.45%	9.23%	16.48%	10.49%
Other	0.76%	0.76%	0.53%	0.30%

Source: Federal Highway Administration. "Distribution of Annual Vehicle Distance Traveled—2013 (1) Percentage by Vehicle Type - Rural/Urban." Available at: http://www.fhwa.dot.gov/policyinformation/statistics/2013/vm4.cfm.

infrastructure per vehicle. Nationally, heavy trucks account for 98% of pavement damage on rural interstates and 94% of pavement wear on urban interstates, as Table 4 shows. The table also shows that while passenger vehicles make up a majority of traffic on the nation's interstates, their low weight means they create little wear and tear in comparison to heavy trucks.[111]

Percentage of traffic in Table 4 refers to the percentage of total vehicles on interstate highways that fall into specific vehicle categories. A "loading" is a unit that measures the roadway wear caused by vehicles. It refers to an equivalent axle load, which is a standard unit of pavement damage based on the force applied to a road surface by an 18,000 pound axle.[112]

Table 4 contains national (not Missouri) figures. But as noted earlier, heavy trucks make up a higher percentage of traffic on Missouri's rural interstates (33%) and a similar percentage of traffic on urban interstates (9%) compared to the national highways. It is therefore reasonable to assume that the vast majority of pavement damage done to Missouri's interstates comes from heavy trucks. When general taxation is used to pay for highways, including interstates, costs will fall to consumers, while those companies and individuals who benefit from shipping freight in and through Missouri will not be forced to pay their own costs.

Some argue that it does not matter if interstate freight companies directly pay for roads, because if shipping companies are charged more they will simply pass the price of that increase in taxes off onto consumers. As virtually all Missourians buy truck-shipped goods, a tax on interstate trucking is a tax on Missourians. According to this view, it matters little whether the tax to pay for roads comes from general taxes or specific user fees.

Aside from issues of elasticity and supply chain alterations, the fact is that most truck freight that uses Missouri roads does not originate in, and is not bound for, Missouri.[113]

As Figure 10 demonstrates, 61% of freight traffic by value and 46% of traffic by weight simply passes through Missouri. Furthermore, only 26% of truck weight by value and 39% of truck freight by weight ends up in the state of Missouri (as inbound or intrastate freight).

The vast majority of damage to Missouri highways is caused by heavy trucks, but most of the benefits of heavy trucking accrue to specific sectors of the economy and producers and consumers in other states. This creates significant issues with regard to the fairness of general taxation.

Policy Consequences of Distributional Issues: Amendment 7

The problems raised in the previous section regarding the "fairness" of using general sales taxes to pay for highways caused policymakers to significantly widen the scope of the proposed Amendment 7, which failed to gain voter approval last year. In order to make sure that many, if not most, Missourians would feel personal benefit from a sales tax primarily designed to resolve highway funding issues, the amendment proposed to spend much of the

tax revenue on other forms of transportation infrastructure and general civic improvements. This included streetcars, bike trails, airport improvements, and port projects. In Kansas City, nearly half of Amendment 7 dollars were designated for non-highway projects.[114]

For St. Louis City, the majority of funds were slated for non-highway projects, including bike paths, transit-oriented development, sidewalk improvements, and a streetcar. In addition, the proposed amendment would have spent the increased sales taxes on a regional basis, with different highway districts receiving designated amounts of funds to ensure that money was spread across the state to all constituencies.[115]

Despite the efforts of policymakers and the planning of MoDOT, Amendment 7 failed to garner support among the general populace. While most organized interest groups, including the construction industry, transit enthusiasts, and regional chambers supported the measure, the Amendment failed in the vast majority of counties throughout the state, including areas that would have received significant sales tax dollars. We cannot be sure why Amendment 7 failed. Residents simply may have been opposed to tax increases in general, or they may have found it unfair that truckers would not pay. Whatever the reason, opposition groups complained of unfairness in the distribution aspects of the amendment, which, despite policymaker efforts, is inherent in using general taxation to fund state highways.[116]

Economic Consequences of Using General Taxation for Highway Funding

When general taxes, based on income or the consumption of goods and services, fund the construction of the state highway system, the costs are not borne directly by the driver on the highway. This effectively subsidizes highway use, and makes the act of driving both easier (with highway improvements) and artificially cheap. These incentives push residents and businesses to consume (drive on) more of Missouri's state highway system than they otherwise would.[117] If more personal vehicular traffic and highway-borne freight were an unadulterated public good, one could make the argument that such incentives are appropriate. However, there are in fact negative externalities to increased use of the Missouri highway system and artificially cheap driving conditions, including pollution, congestion, urban sprawl, and increased highway degradation. As some studies show that economic returns to highway expansion diminish as the volume of expansion increases, the combined negative effects of inducing more driving and more driving-centered lifestyle choices are not necessarily exceeded by positive benefits of increased mobility options.[118]

In addition, while increased mobility is generally good for an economy, highways are not the only way of transporting people and goods. Instead, they exist in competition with other modes of transportation, like rail, air, water, and even pipelines. Subsidizing the highways or any other of these modes distorts the market for transportation and can lead to less efficient supply chains and long-term consequences on development patterns.[119] For instance, while most freight shipped in Missouri goes by truck, a large percentage is

Table 4: **Percentage of Traffic and Percentage of Wear on Interstates by Vehicle Type**

National Data	Rural Interstates		Urban Interstates	
	% of Traffic	% of Loadings	% of Traffic	% of Loadings
Passenger Vehicles and Busses	79%	2%	91%	6%
Heavy Trucks	21%	98%	9%	94%

Source: Federal Highway Administration." Percentage Distribution of Traffic Volumes and Loadings on the Interstate System." Available at: http://www.fhwa.dot.gov/policyinformation/statistics/2013/tc203.cfm.

moved by rail. Freight rail in the United States is owned by private shipping companies. Their infrastructure receives little in the way of federal subsidies and virtually no state subsidies. If the state subsidizes highways, it externalizes the cost of shipping freight via highways onto the general public, lowering that mode's costs for trucking companies. That can make shipping via highways cheaper than shipping long haul via rails at the margin. If goods are then shipped on highways instead of rails due to that price difference, the state will be creating supply chains that are less efficient than they would otherwise be. The same logic holds true for air and water freight modes.

Another example is that of commuting and personal transportation patterns. People can make lifestyle adjustments or take other modes of transportation when the cost of driving becomes too great. That can mean carpooling, using public transportation, or moving to a location that requires less or no driving. When using the highways is artificially cheap for Missouri residents, they will be more likely to use personal cars and less likely to make those lifestyle adjustments that they might otherwise be. For example, many point to cheap and easy personal vehicle use as a prime factor in urban sprawl, which may have potential negative externalities associated with it, such as higher costs for government services like water, waste disposal, and public safety.

USER FEES

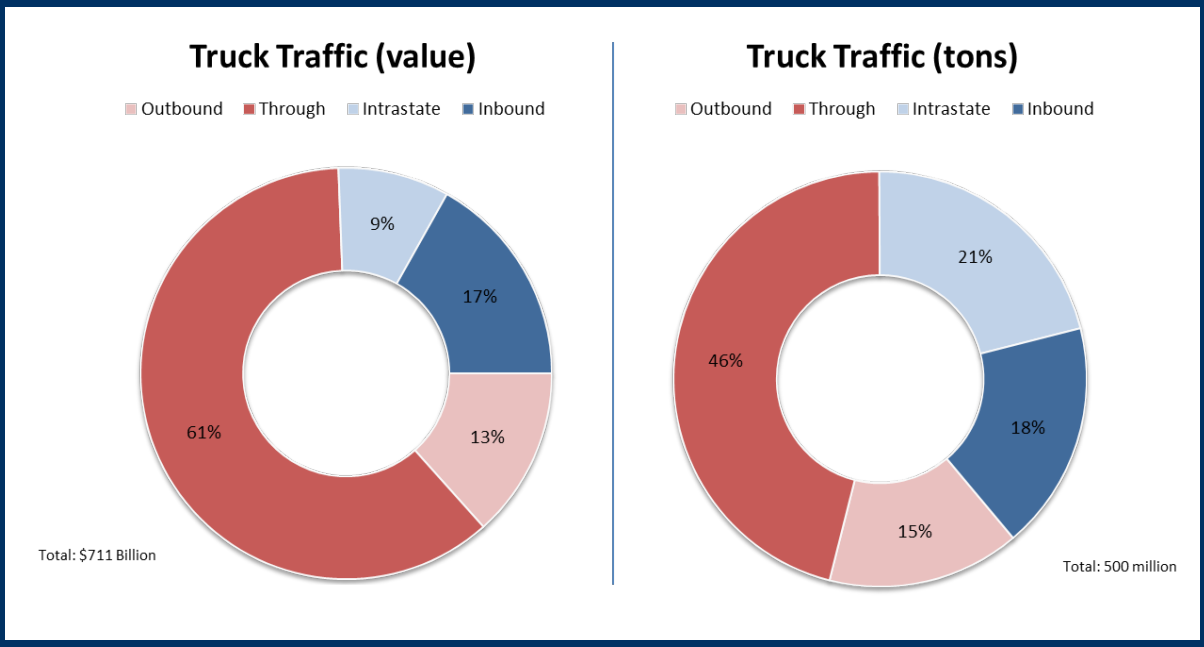
General Explanation and Advantages

User fees refer to fees or taxes charged for a specific government service. As the GAO puts it:

> "User fees assign part or all of the costs of these programs and activities—the cost of providing a benefit that is above and beyond what is normally available to the general public—to

Figure 10: **Missouri Freight Traffic by Value and Weight**

Much of Missouri's freight traffic is through traffic (i.e., neither originating in nor bound for Missouri).



Source: Missouri Department of Transportation. "Missouri State Freight Plan." pp. 3–15.

> readily identifiable users of those programs and activities…"[120]

For highway funding, user fees are generally fuel taxes (including gasoline, diesel, petroleum, and natural gas), heavy vehicle use taxes, tire taxes, motor vehicle sales taxes, registration fees, tolling, and mileage- based user fees.[121] Some of these user fees, like tolling, are direct, which means that vehicles pay a direct price to use a specific part of the state highway system. Others, like fuel taxes, are more indirect, in that fuel use does not directly correspond with highway usage—it is only correlated. As for fees like vehicle registration, these are one-time fees that give a person access to the entire road system with no regard to whether they use the highway system or how much they drive.

Many economists argue in favor of user fees for government services when possible, with caveats. Summing up the general argument, one economist (Dewees 2002) put it as follows:

> "…for some services, user fees are not only feasible but economically desirable, because they help to allocate resources to maximize the satisfaction that we receive from those resources. User fees can constrain demand at a time when it is very expensive to expand supply. User fees can help to mediate situations where users are clamoring for more service and the agency does not have the resources to meet that increased demand. User fees can even help to deal with demand that varies greatly over time, through their tempering effect on such variations…"[122]

There are a number of advantages to specifically basing highway funding on user fees:

1. User fees help to match the supply of a service with demand.[123]

When users have to pay the full cost of their use of a service, they have incentives to reduce their use of that service (in this case, highways) to only the times when they are willing to pay the cost. For highways, the reliance on user fees caps the amount of money available to spend on maintenance and expansion to the amount users are willing to pay. It also creates disincentive for wasteful spending, because users will not be willing to pay for unnecessary highway additions or improvements. Furthermore, the more that users pay for the system, the more funding that will be available for the expansion and maintenance of the highways, assuming pricing is at a sufficiently high level. In this way, user fees provide some protection against oversupply and undersupply.

2. User fees can allow the provision of government services to mimic the private market.[124]

When government agencies can only spend user fees, they are more likely to provide services that will maximize the fees they can collect while minimizing costs, similar to how the private sector operates. In addition, an asset—in this case the state highway system—with a user-based revenue stream can be leased to private companies who can provide highway infrastructure services in return for the right to collect highway user fees.

3. User fees place the burden of paying for highways on those who use the highway, and in proportion to their benefit.

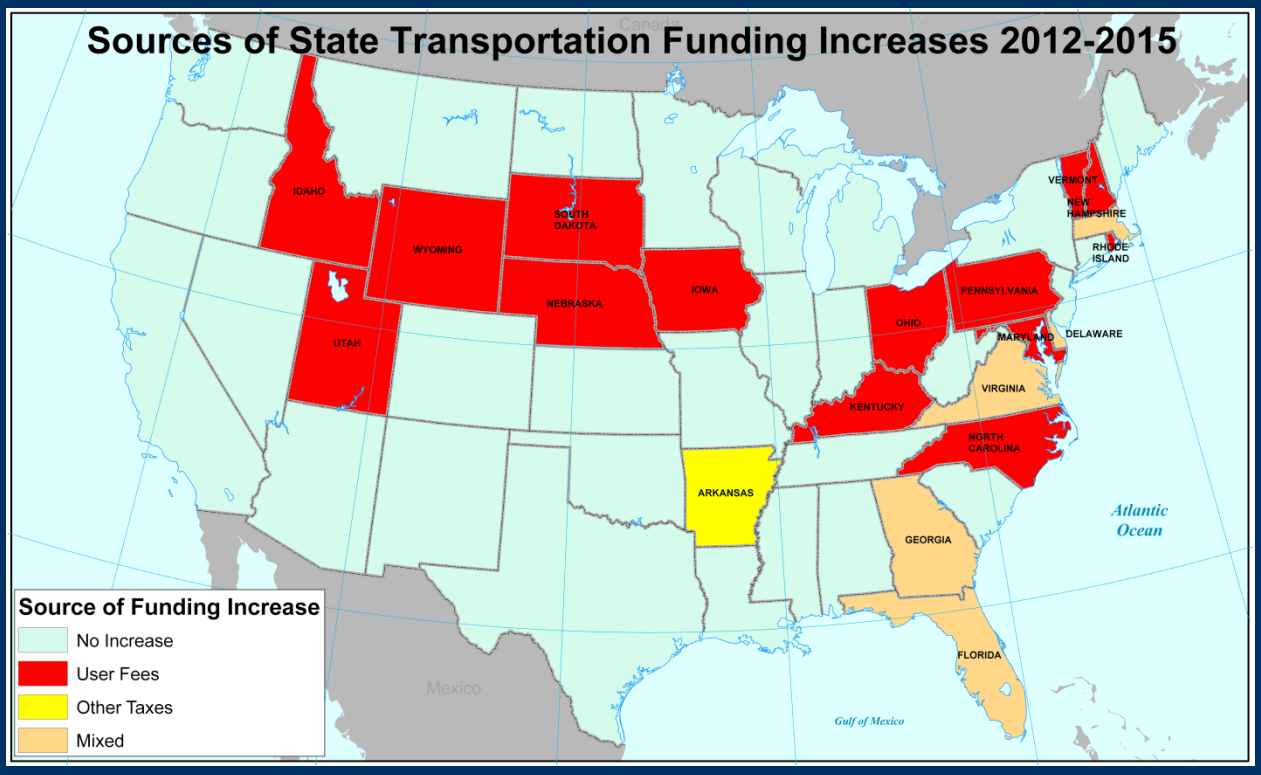
As stated earlier, much of the damage done to highways is caused by interstate trucking. When users of the highways pay for their upkeep, interstate trucking companies pay their share of the cost. Consumers and producers who benefit from this trucking would indirectly pay for the shipping through the cost of the goods shipped, meaning that shipping costs would be internalized. In this way, highways become just another part of the means of production, with its cost internalized into goods and services rather than paid by society as a whole on an unconnected basis.

4. User fees can create revenue streams for projects that might otherwise be difficult to fund.

As discussed in the section on general taxation, voters are often reluctant to approve general tax increases when they are not sure which projects will be funded and whether those projects will be of significant benefit to the wider community. With general taxation, small tax increases can raise significant money, but those small increases can be difficult to achieve politically, and have had trouble passing. For instance, in 2015, eight states increased transportation funding. Out of these eight, seven relied exclusively on fuel tax increases, with the highest

Figure 11: **Sources of State Transportation Funding Increases—2012-2015**

States generally look to user fees for highway funding.



Source: Transportation for America. "State legislation to raise transportation revenue." Available at: http://t4america.org/maps-tools/state-transportation-funding/#top.

increase being that of 10 cents a gallon in Iowa. The only state that used a mixed approach, Georgia, still relied mostly on user fees, except for a fee on short-term lodging. In fact, of the 20 states that have increased transportation funding since from 2012 to 2014, 14 relied almost exclusively on user-fees, five were a mix of user fees and general taxes, and only one state's proposal (that of Arkansas), relied solely on a general tax increase.[125] Figure 11 shows the states that have increased state funding for highways from 2012 to 2015, with the source of those funds indicated:

Furthermore, for expensive projects with local effects (like the Capital Beltway in Virginia or SR-91 in Southern California), it is common for residents who will not benefit from the improvement to oppose tax increases dedicated to that project. This can result in the project being shelved or done on a smaller scale regardless of transportation benefits. However, state policies that allow highway tolling can create a sufficient revenue stream for these projects without having to increase statewide revenue. When the revenue comes directly from the user, there is no need to argue for statewide tax increases (general or user-based) to provide large benefits to limited geographic areas.

For these reasons, user fees may be a desirable method of raising revenue to resolve MoDOT's highway funding problems. The following sections will describe the advantages and disadvantages of user fees Missouri could consider, including fuel taxes, tolling, motor vehicle sales taxes, registration fees, licensing fees, and mileage-based user fees.

Table 5: **Federal Highway Fuel Taxes**

Federal User Fee		Tax Rate (cents per GGE)	Effective Date
Gasoline		18.4	10/1/1997
Diesel and kerosene fuel		24.4	10/1/1997
Special fuels		18.3	1/1/1996
Liquefied petroleum gas		13.6	10/1/1997
Liquefied natural gas		11.9	10/1/1997
Other special fuels		18.4	10/1/1997
Neat alcohol (85% alcohol)		9.25	10/1/1997
Compressed natural gas		4.3	10/1/1993
		4.3	10/1/1997
Gasohol	10 percent gasohol made with Ethanol	13.1	1/1/2001
	7.7 percent gasohol made with Ethanol	14.319	1/1/2001
	5.7 percent gasohol made with Ethanol	15.379	1/1/2001

Source: Federal Highway Administration. "Federal Highway – User Fees." Available at: http://www.fhwa.dot.gov/ohim/hs00/fe21b.htm.

Fuel Taxes

Fuel taxes are a charge on fuel used by motorized vehicles that use roads, including regular gasoline, diesel fuel, liquid natural gas (LNG), or other special fuels. These fees can be assessed as a sales tax (or percentage of total fuel purchase price) or, more commonly, as cent-per-unit-of-volume excise tax. The fees can be charged at the retail or wholesale level. As an example, the federal government charges cent-per-volume excise taxes on a variety of transportation-related fuels, and collects these fees either at the wholesaler or distributor level, depending on the state. The types of federal fuel taxes and the current per-unit tax rates are shown in Table 5.[12]

Missouri's fuel tax is currently 17 cents per gallon for regular and diesel fuel, giving Missouri the 5th lowest regular fuel tax and 4th lowest diesel fuel tax in the nation.[127] The state also collects fuel taxes on alternative fuels that do not use per-gallon measurement and a 5 cent per gasoline gallon equivalent (GGE) on compressed natural gas and liquefied natural gas (both rates set to rise to 17 cents by 2024).[128] Missouri also has low fuel taxes compared to its neighbors, aside from Oklahoma. As of January, 2015, Missouri's gasoline fuel tax was seven cents lower than Kansas's and 13 cents lower than Illinois's.

Missouri currently generates around $660 million from its fuel taxes. As 25% of fuel purchased in Missouri is diesel fuel and 75% is regular gasoline, a one-cent increase in the gasoline tax would net about $30 million in new revenue while a one-cent increase in the diesel fuel tax would net almost $10 million. Historically, MoDOT has collected about 70% of this fuel tax revenue; meaning that a one-cent increase in both regular and diesel fuel taxes could bring MoDOT $27.5 million in additional funds.[129] If Missouri were to raise its 17 cent fuel tax 2 cents per gallon in 2017, 2018, and 2019 (and adjust the fuel tax rate to inflation thereafter) the state could generate $480 million in new tax revenue through 2020. By 2020 the state fuel tax could generate $160 million in new revenue to MoDOT. Figure 12 shows potential revenue increases from this 2+2+2 cent fuel tax increase, with the blue bars representing an estimate of the total number of gallons of fuel purchased in Missouri.

Figure 12: **Additional MoDOT Revenue with a 6-Cent Fuel Tax Increase**

A 6-cent fuel increase could raise more than $160 million annually for highways.

Source: Missouri Department of Transportation. "Financial Snapshot: October, 2014." p. 19. Available at: https://archive.org/details/2014FinSnapshot.

Aside from aiding the state highway system directly, a fuel tax increase could have indirect benefits to MoDOT's budget. Over a quarter of fuel tax revenue goes to cities and counties to spend on local road needs. Often, these local governments will use that devolved fuel tax money on state highways that communities find especially important to their economies or quality of life, such as Ozark's contribution to the widening of Third Street in downtown Ozark.[130] This local cost-sharing eases some of the burden of state highway spending for MoDOT. That means that the more than $11 million for each cent of annual fuel tax revenue that goes to localities instead of MoDOT can still benefit the state highway system as well as local roads.

Fuel Tax Advantages

1. Funding capability

Missouri's fuel consumption has been in slow decline since its total gallons purchased peaked in 2008. However, the decline has been slow, at only about 1% per year, and it is possible that the decline will cease if the state's economy experiences strong growth. Therefore, the fuel tax is likely to be a reliable source of funding for MoDOT over the short and medium terms. As was demonstrated earlier, simply increasing the fuel tax to Kansas's level (still below the national average of 30.48 cents per gallon), would eventually increase revenue by more than $160 million annually.

2. Fuel taxes have low implementation costs

Fuel taxes have the advantage, unlike some other forms of user fees, of being very cheap to collect. Only about 1% of total fuel tax revenue collected is spent on actually collecting the tax.[131] Because Missouri has traditionally relied on the fuel tax for much of its highway revenue, the infrastructure (such as is needed) and the bureaucratic systems to collect the fuel tax are already in place and need not be altered to accommodate a higher tax rate.

3. Fuel taxes are constitutionally tied to roads.

In Missouri, fuel taxes must by law be spent on the state highway system (for the state portion that goes to MoDOT) or local road and bridge improvements (for the portion that goes to the local governments).[132] These legal protections prevent most, but not all, attempts to divert fuel tax dollars to other types of projects. This means that any increase in the fuel tax will go toward fixing the problem that prompts the tax increase—namely, the state highway funding issue. The use of general taxation, along with new forms of user fees, would not automatically have such protection against revenue diversion.

4. Fuel taxes benefit the entire state highway system, along with local road and bridge projects.

Some user-fee options, specifically tolling, might only address the funding of particular heavily used highways. But as discussed earlier, the state highway system is extensive, and many of the needs are for parts on the system that are not good candidates for tolling. The fuel tax dollars that go to the state are tied to the state highway system. However, they are tied to the entire system, allowing MoDOT to put money toward problem areas that otherwise might not receive funding.

5. Higher fuel taxes can be enacted without amendments to Missouri's constitution or a statewide vote.

As mentioned earlier, the provision that forces tax increases to go to the voters, the Hancock Amendment, has exceptions for small increases of existing revenue streams. Under the amendment, the legislature can increase revenue in any given year as long as new revenue does not exceed $106 million or 1 percent of state revenue looking back two years ($84.2 million for last year), whichever is lower.

Using 1 percent of previous state revenue as a cap, the legislature can collect approximately an additional $84 million in fuel taxes next year. Missouri currently generates about $29 million for each cent of fuel taxes, meaning the state could raise fuel taxes by more than two cents without triggering Hancock requirements. Or, if Missouri followed the example of the federal government and many other states in taxing diesel at a higher rate than regular gasoline, the state could raise the diesel fuel tax rate by five cents and the regular fuel tax by one cent and remain under the cap. That would generate an additional $78 million for MoDOT next year.[133]

What's more, because state revenue has been growing and per-cent fuel receipts have been declining recently, the state legislature could raise the fuel tax in successive years without triggering Hancock requirements. In fact, this is precisely how Missouri last increased its fuel taxes in the 1990s.[134] This means raising the fuel tax would encounter fewer legislative hurdles than other options that might increase MoDOT revenue.

Fuel Tax Disadvantages

1. Declining revenue base over the long term.

As mentioned earlier, fuel consumption in Missouri has been in slow decline since 2008. While some of this decline may be attributable to poor economic conditions, it is reasonable to assume that long-term decline will continue or even accelerate. Vehicles are becoming more fuel efficient. From 2005 to 2013, the U.S. passenger vehicle fleet's adjusted fuel economy increased from 20 miles per gallon (MPG) to 24 miles per gallon. The Obama administration has also created standards that will require cars and light-duty trucks to get an equivalent of 54.5 MPG by 2025.[135] With total vehicle miles traveled growing very slowly in Missouri, increased fuel economy means lower fuel tax receipts and a lower effective tax per mile driven. In addition, the state's fleet of hybrid and electric vehicle stock, which pay little or no fuel tax per mile, is growing.[136] The recent decrease in fuel price may delay the move of Missouri's fleet toward more fuel efficiency, but in the long run it is likely that fuel tax will cease to be a stable source of revenue for MoDOT.

In addition to rising fuel economy among the fleet, there is speculation that Missouri residents will increasingly opt for fewer cars, shorter commutes, and urban living. Many point to the changing preferences of "millennials."[137] But while urban core population is growing, in Missouri the suburban population is growing faster. And although millennials drive less and have shown reluctance to purchase cars, that may be more a confluence of life cycle factors, high debt, and an anemic employment market.[138] In addition, if coming generations do drive much less than

previous ones, that will lower MoDOT's revenue at the same time it reduces MoDOT's costs, as fewer drivers will need fewer costly highway improvements.

2. Fuel tax regressivity

Opponents of fuel taxes argue that, like user fees in general, they are regressive. The working poor who drive often spend a larger portion of their income on fuel than those who are wealthier, meaning they spend a higher percentage of their income on fuel taxes than those who are wealthier. However, this assumption is not uncontested. Studies that look at annual expenditure rather than annual income, find that low-expenditure households actually spend less on fuel percentage-wise than those toward the median level of expenditures.[139] This is evidence that fuel taxes are not strictly regressive. It is also important to note that many of Missouri's poorest residents do not have access to personal vehicles and have little access to the state highway system. They rely on public transportation systems, walking to work, carpooling, and other forms of transportation much more than wealthier households. In fact, those earning less than $25,000 a year made up almost two-thirds of all commuters using public transportation in Missouri.[140] Those using public transportation or walking do not directly pay fuel taxes.

3. Fuel taxes are not direct user fees

Drivers pay the fuel tax through their purchase of fuel, but their costs to the state highway system come in the form of degradation to the highway surface and congestion costs from taking up space on state highways. However, the amount of fuel consumed is only indirectly related to the use of the state highway system. A driver might purchase fuel and use only local roads or mostly local roads, but most of the money collected from that driver would go to fund state highways. Furthermore, the use of a fuel tax makes it impossible to price congestion costs that the drivers create. For example, while the act of driving causes much greater congestion costs during rush hour on I-70 than at 1:00 a.m. on Missouri Route B, the fuel tax would be the same in both cases.

The indirect nature of the fuel tax can negate many of the positive aspects of user fees. Because the costs on the system incurred by the driver are indirectly related to the user fee, supply and demand are not well allocated by the system. Furthermore, because users pay an indirect tax that may or may not support the roads they actually use, the fuel tax is more likely to be seen simply as simply general taxation than as a payment for any kind of service.[141] It is also harder to guarantee that residents will actually see benefits from their fuel tax and that revenue is not "wasted" in other parts of the state, despite the legal guidelines surrounding fuel tax expenditure.

TOLLING

Definition and Background

The FHWA definition of tolling is:

"…the imposition of a per-use fee on motorists for a given highway facility."[142]

This definition is very broad, and it encompasses a growing list of toll collection methods. Under this definition, 36 states, including Missouri, have toll facilities of some kind. Florida has the highest total toll road/bridge mileage in the country, at 777. Missouri has only one toll bridge, at a length of .51 miles.[143]

Tolling has a long history of funding highway construction in the United States, especially in the Northeast and parts of the Midwest. Before the 20th century, government support for highway and bridge construction was limited. However, following the development of the interstate system, nearly all private toll companies went bankrupt or were bought out by local and state governments.[144] These roads and bridges were mostly turned into to freeways, but in some cases (such as the Pennsylvania Turnpike), the state simply took over toll collection and responsibility for maintaining the route.

Historically, toll roads and bridges have charged per-use fees at the time of access, usually at a toll both where motorists stopped to pay the fee. Pricing generally involved flat fees based on the total axles a vehicle had and the distances driven. In the case of bridges, the only variable would be vehicle class or number of axles.

New Technology and Open Road Tolling

Today, new technology allows for open road tolling (ORT), which eliminates the need for vehicles to stop at toll booths. Vehicles with electronic transponders are

charged when they drive under gantries set up to pick up the transponder, and are then billed the user-fee.[145] On some roads, like those in Illinois, those with cash can pay at remaining booths not eliminated when the system was upgraded in the first decade of the 2000s. However, the newest toll roads have no booths at all, and simply take a picture of the license plate and send a bill to the vehicle owner.[146]

Many toll roads now allow online payment for those who pass through toll roads without a transponder. The ability to limit infrastructure costs and other toll-collection costs has made tolling a much more effective method of raising revenue. In the past, as much as a third of toll road collections had to go toward paying for the operation of the toll road. Today, that cost is less than 15% and falling.[147]

New technology not only makes tolling a cheaper way to collect revenue for highways, but also creates policy tools that previously would have been impractical or unachievable. For instance, many states are adding capacity to congested interstates using high-occupancy toll (HOT) lanes. HOT lanes are free for those vehicles carrying a certain number of riders (high occupancy), but those driving with fewer riders pay to use the lane. The toll rate fluctuates with traffic levels to guarantee free flow. HOT lanes can allow for better use of underutilized high-occupancy vehicle lanes or congested express lanes. They can also be used to finance additional highway capacity on congested urban interstates. HOT lanes have been planned or implemented in California, Virginia, Colorado, Texas, Minnesota, Utah, Washington, Florida, and Georgia.[148]

This ability to use a variable fare to ensure a roadway's level of service is another feature of ORT. In the past, toll roads created congestion, as vehicles had to stop at toll booths to pay for the use of a particular road or bridge. Now, ORT makes impeding traffic unnecessary, so tolls no longer need create traffic. What's more, if the toll road changes prices with the level of traffic (higher prices when traffic levels increase, lower when they decrease), new toll roads can provide reliable levels of service across the day. This "congestion pricing" means that new capacity added on highways does not simply induce more traffic and leave drivers with the same low levels of service.[149] And level of service is not the only concern. When a highway's peak free-flow capacity is exceeded, traffic develops, which greatly reduces the route's per-hour capacity. Simply put, traffic makes a highway less useful, degrading the infrastructure's return on investment.[150] Pricing for the time of day that the route is used, and not just the fact that it is used, can be employed to regulate demand and ensure that the tolled highway has the maximum level of cars moving on it at any given time and that the drivers can be assured of reliable travel times.

The advantages of tolling as a method for revenue collection and congestion control, and the falling price of implementing such a system, have made ORT a popular solution for highway funding for cash-strapped transportation departments nationwide. There are currently 301 electronically tolled bridges, tunnels, and roads in the United States, making up almost 80% of all tolled facilities.[151] As of 2015, all of the 71 tolled US Interstate facilities operate using electronic tolls. There are currently 28 states with ORT systems in place, including Missouri's neighbors Illinois, Kansas, and Oklahoma. The systems are also moving toward interoperability. For instance, Illinois and fourteen other states are part of the E-Z Pass network, allowing a driver to go from Chicago to Washington, D.C., on toll roads using the same transponder.[152] Figure 13 shows the E-Z Pass network in detail. All the states shown, except for Vermont and Connecticut, are members of E-Z Pass and have interoperable transponders for the bridges, tunnels, and toll roads shown in white.

However, while most toll roads now include electronic tolling, the use of variable pricing to control congestion is still relatively limited. Only 4% of toll facilities actually use dynamic pricing; most toll facilities still use fixed rates based on weight or axles.

While some toll facilities may consider adopting variable pricing strategies in the future, for most toll roads and bridges (especially those in rural areas) congestion is not a great enough concern to warrant a variable pricing mechanism that can be difficult to implement and difficult for the average driver to understand. Only a handful of highways that serve rural areas use a variable rate of any kind (including variation across seasons instead of rush hour and non–rush hour), and no rural toll road uses dynamic toll rates. It is a policy solution that is

most applicable to urban highway infrastructure that experiences heavy congestion.

Nevertheless, tolling in its many forms is widely used across the United States. As of January 1, 2013, 36 states had a least one toll facility, including Missouri. Of those, 29 had tolls on roads or bridges that are part of the national highway system. Eight states used HOT lanes on NHS highways, not including Virginia (which added toll lanes late in 2013).[153]

Tolling in Missouri

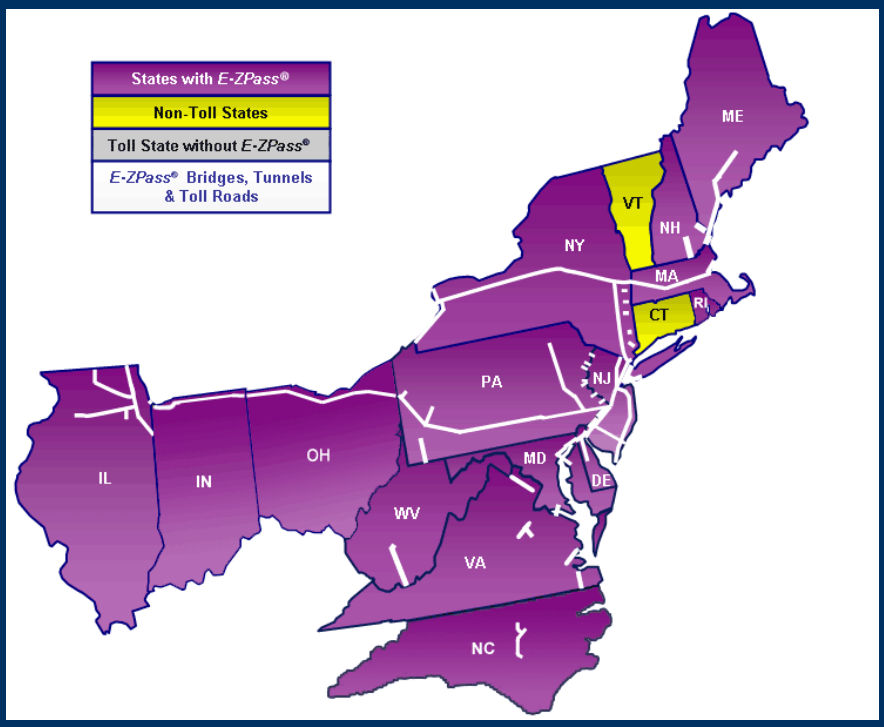
Missouri does not have a significant history of using tolling to pay for highways. However, tolls were used extensively to fund bridge construction. In fact, in 1928, 15 out of 25 bridges on the state road system were toll bridges, including almost every crossing of the Mississippi River, as Figure 14 shows.[154]

The transition to free bridges did not occur overnight, and many of Missouri's existing major bridges began as toll bridges, including the Eads Bridge, the McKinley Bridge, Broadway Bridge, the Centennial Bridge, the Cairo-Mississippi Bridge, the Lewis and Clark Viaduct, and the Cape Girardeau Bridge. In fact, as late as 1990, there were toll bridges in both St. Louis City (McKinley Bridge) and Kansas City (Broadway Bridge). The Saint Francisville Bridge was also operated as a toll bridge (carrying MO 27 across the Missouri-Iowa border), until a new free bridge was built in the early 2000s.

Today, the only toll facility in Missouri is the Lake of the Ozarks Community Bridge. The bridge is not operated by MoDOT. Instead, it is run by a transportation development district (TDD), a specially created administrative district with its own board. The bridge charges between $3.00 and $4.25 per passenger vehicle depending on the season and between $5.00 and $9.50 per tuck depending on total axles and the season. The bridge carries Business Route 54 over a section of the Lake of the Ozarks.[155]

Figure 13: **States Participating in E-Z Pass Network**

Interoperable toll networks are the norm on America's East Coast.



Source: NJ EZ-Pass. Available at: http://www.ezpassnj.com/en/about/facilities.html.

Note: Congestion Pricing

Missouri's cities could benefit from the introduction of congestion pricing via HOT lanes on urban interstates. For highways that are now or will become congested during hours of peak demand, HOT lanes can provide some or all the capital necessary to build more capacity. Furthermore, the variable tolls on these lanes may guarantee that these expansions remain free flowing at all times and do not themselves become congested. However, Missouri's major cities, Saint Louis and Kansas City,

already have significant highway capacity and among the lowest levels of traffic congestion among major cities in the United States.[156] Controlling congestion is therefore a lower priority than it would be in other states, and there are few urban highways in Missouri that would be viable candidates for HOT lanes.

Tolling as a Solution for MoDOT's Funding Problems

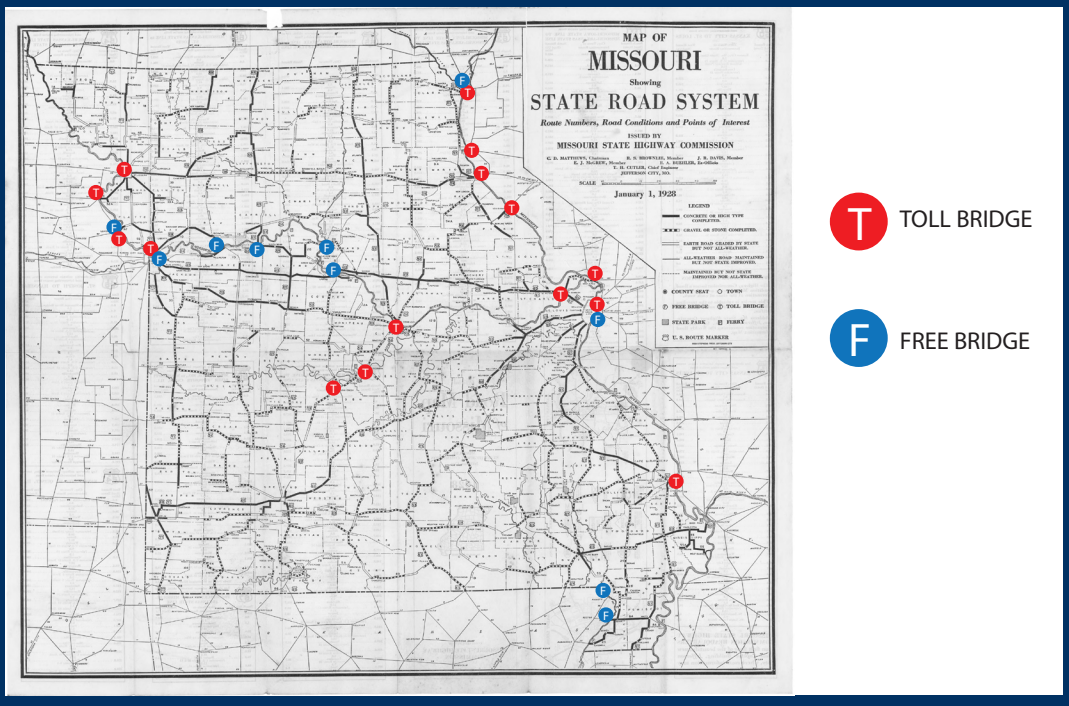
Implementing tolling on Missouri's highway system offers the possibility of funding expensive capital improvement projects, freeing revenue for other state highways, and providing immediate funds to delay major funding shortfalls at MoDOT. As mentioned earlier, tolling facilitates the raising of revenue from the users of highways to pay for the reconstruction or improvement of those highways. Where demand for the road is sufficient, toll rates can be set so that the highway can be built, maintained, and even patrolled without any state or federal support. If a major highway were to be reconstructed and maintained in this fashion, the costs associated with maintenance, capital improvements, and safety would shift from state and federal government to the toll road itself. As maintenance of an interstate costs around $5,000 per lane-mile per year in Missouri, the cost savings to the state highway system are likely to be significant.[157] The state and federal money that would have been spent on the tolled highway can be spent on the rest of the system, reducing the need to increase state or federal revenue sources.

Furthermore, the fact that a toll revenue stream from a highway may exceed the cost of building and maintaining that highway means the toll facility may have a tangible revenue stream. That would allow a state to lease the highway to the private sector for an upfront sale price. While doing so would mean the state would then be unable to directly control and reap revenue from the toll road in the future, it would place the risk of shortfalls in revenue on the private company. In addition, the sale price can be quite large. For instance, the Indiana state government leased its toll road for 75 years to a private consortium for more than $3 billion dollars.[158] That money was spent improving other parts of the state highway system. In Missouri, the lease of a sufficiently trafficked highway could provide enough funds to cover gaps in highway funding.

To illustrate how toll roads could allow Missouri to fund expensive highway projects, this paper presents two cases where

Figure 14: **Toll and Free Bridges in Missouri: 1928**

Missouri used tolls to build bridge infrastructure in the early 20th century.



Source: Missouri Department of Transportation. "Missouri Highway Map Archive." 1928 http://www.modot.org/historicmaps/.

tolling may be an appropriate method of highway finance: I-70 and Broadway Bridge.

Tolling I-70: Plans and Projections

As mentioned earlier, I-70 is Missouri's oldest interstate and will soon need to be rebuilt from the ground up. At the same time, MoDOT hopes to expand the interstate to three lanes in each direction from Wentzville (west of Saint Louis) to Independence (east of Kansas City). The additional lane would presumably allow the road to handle any increase in future traffic, as the highway is almost at capacity now. According to MoDOT, rebuilding I-70 and adding an additional lane in each direction will cost at least $2 billion.[159] This type of project would require a large increase in either statewide general taxation or user fees.

Assuming I-70 could be rebuilt as an electronically tolled highway, tolls alone could rebuild the highway. In 2014, I-70 carried almost 3.3 billion vehicle miles, about 19% of which came from trucks. For the area of I-70 that would be rebuilt with three lanes (from Wentzville to Independence), I-70 carried 1.2 billion vehicle miles, around 26% of which were trucks. Excluding the only major urban area along that route, Columbia, I-70 carried 700 million passenger miles, over 30% of which were trucks.[160]

Assuming that passenger vehicle and truck traffic grow at only 1% a year, and with a discount rate of 4%,* a $2 billion I-70 rebuild and expansion could be performed for a toll rate between 5 and 20 cents per mile for passenger vehicles and between 16 and 46 cents per mile for trucks, depending on how tolls were collected (see Table 6). The lowest cost would come from tolling I-70 river to river, with the highest cost being tolls that only capture rural traffic between Wentzville and Independence, excluding Columbia traffic. These estimates assume 10% traffic diversion (drivers avoiding the toll road) for passenger vehicles and 20% diversion for trucks at the low end, and 20% traffic diversion for passenger vehicles and 30% traffic diversion for trucks at the high end.[161] The costs of maintaining the highway, collecting revenue, and even policing the road are included:[162]

As Table 6 demonstrates, by tolling I-70 between Wentzville and Independence, toll revenue could pay off construction costs in 30 years with toll rates of 9 cents per mile for passenger vehicles and 29 cents per mile for trucks. The cost to a driver traveling the length of the state would be less than $16, with a truck paying about $50.

According to MoDOT's white paper on tolling I-70, if the state chooses to toll I-70 the plan would likely consist of tolling from Wentzville to Independence (with limited toll points that would exclude most Columbia traffic) as the most viable option.[163] Trucks would be charged a higher fee based on axles, to correct for the disproportionate damage they do to highways. This is the case with the vast majority of toll roads (around 95%) nationwide.[164] The national median passenger vehicle mile toll is approximately 30% of the truck vehicle mile toll.

Tolling Broadway Bridge: Plans and Projections

Broadway Bridge, which carries US Route 169 over the Missouri River in Kansas City, opened in 1955 as a toll bridge, and was tolled until 1991.[165] The bridge is nearing the end of its useful life, and MoDOT has looked at replacing the bridge at a cost of about $200 million (which would include improvements to the bridge's interchanges).[166] If the bridge were to be tolled, as it was from 1956 to 1991, toll revenue alone could pay for the bridge's replacement along with its regular upkeep.

Broadway Bridge carries over 15 million vehicles a year, about 12% of which are trucks.[167] Assuming the total cost to maintain, operate, and patrol the toll bridge came in at just under $12 million per year,[168] toll revenue from Broadway Bridge could pay for a $200 million rebuild in 30 years with a toll of $1.50 per passenger vehicle and $5.00 per truck (average). This assumes that placing tolls on the bridge would cause a 30% diversion of both passenger vehicles and trucks to other river crossings.

If traffic levels on the bridge warranted it, a new Broadway Bridge could include variable fare rates that would ensure traffic always flowed freely over the bridge, even in rush hour. Such a guarantee might make the bridge more attractive both to users who need a reliable travel time and those who highly value a congestion-free trip, especially when the other available options would be the Heart of America Bridge and the Paseo Bridge, both of which experience rush hour congestion.

Table 6: **Toll Rate Projections for I-70**

		Per-Mile Toll Rate for $2 Billion Expansion (Plus Toll Road Maintenance and Operating Costs)		Total Cost To Cross Missouri	
I-70 toll range	Miles	Passenger Vehicles	Trucks (Average)	Passenger Vehicles	Trucks (Average)
Statewide	250	5 cents	16 cents	$12.50	$40.00
Excluding KC STL Metro	174	9 cents	29 cents	$15.68	$50.51
Rural sections only (excludes Columbia traffic)	163	20 cents	46 cents	$32.55	$74.87

Toll Road Advantages

1. Direct user fee

Tolls on roads and bridges are direct user fees, meaning that only those who use the facility will pay for the improvements. This means that the highway can act like a business, setting prices to recover investments and regulate demand. "Profit" can be reinvested into the roadway for the benefit of the toll facility's revenue and the user. In terms of the public, no one who does not directly benefit from the highway will have to pay for the road, which eliminates many concerns over the distributional results of spending large amounts of money improving the road. It also means that non–state residents and commercial vehicles that are passing through the state will invest in the roadway to the extent that they use that roadway. The amount a vehicle pays can be tied directly to how much the highway costs, how much the driver uses the highway, and the costs that driver places on the highway system.[169]

2. Revenue generation potential

Toll faculties pay for improvements by directly tapping into the value that the asset provides. If the highway or bridge is heavily trafficked and provides significant value, direct fees on users can recoup the costs of the investment without greatly raising taxes on highway users in general or state taxpayers. In fact, likely due to their dedicated revenue streams, the average amount of funds dedicated to tolled highways nationally far exceeds the funds spent on Missouri's interstates, per lane mile, as illustrated in Figure 15.[170]

Given the hundreds of examples of functioning toll facilities in the United States, it is reasonable to expect that large projects like I-70 can more than recuperate their capital costs if they are tolled. This makes needed infrastructure improvements possible today without tax increases.

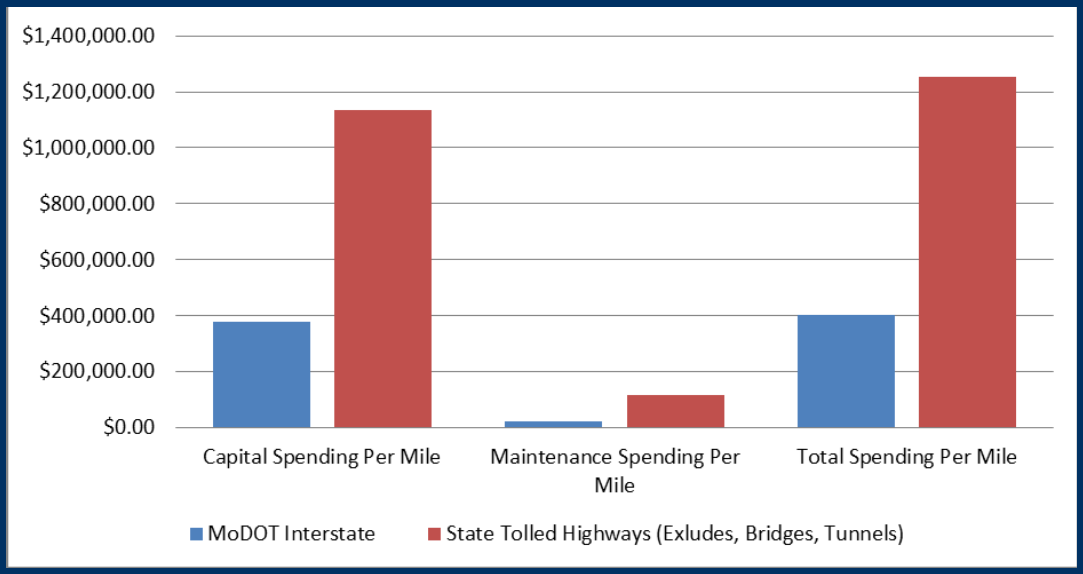
3. Toll Design Flexibility

Toll facilities can be designed in many different ways, and can achieve many different purposes. Where congestion is a major issue, as it is in many urban areas across the country, variable toll rates may be an appropriate tool. If a highway needs to be expanded but not rebuilt, HOT lanes may be

a viable option. Even when a fixed-rate, fully tolled highway is built, there are options as to where people are tolled, how much they are tolled, and how far a vehicle will need to travel before it faces a toll. Every decision affects how local traffic is treated, the impact on local businesses, and the ultimate price for drivers. The design of toll facilities can and should be tailored to best address these considerations, and the plethora of approaches nationwide demonstrates that tolls are a flexible option for complex problems arising from highway construction.[171]

Figure 15: **Spending Per Mile—Missouri Interstates vs. Tolled Highways**

Tolled interstates generally receive more investment per mile than non-tolled interstates.



Source: Federal Highway Administration. "Highway Statistics 2013: 11.4.3. Expenditures." Available at: http://www.fhwa.dot.gov/policyinformation/statistics/2013/.

4. Possibility for public–private partnerships

When highways and bridges are tolled, they create a revenue stream that may (depending on traffic, maintenance, etc.) generate excess revenue over costs for the facilities in question. This means that toll facilities can not only be operated *like* businesses, but they can be operated *by* businesses. Instead of having the state rebuild a highway and operate it as a toll highway, the state can lease the asset to a private company. These public–private partnerships (P3s), allow a state to leverage the management expertise, capital, and creativity of the private sector in the design and operation of a toll facility. Using a P3 for a new toll highway has a number of advantages for states. First, it often allows state governments and state taxpayers to push capital cost and traffic risk onto the private sector.

The private concession companies often bear most, if not all, of the risk of cost overruns or lower-than-expected revenue. In addition, since the private company often funds the initial capital costs, the state does not risk having to take on toll road debt if the project turns out to be unsuccessful. Finally, international infrastructure investment consortia are willing to pay billions of dollars for long-term leases of heavily trafficked highway facilities.[172] Those funds can be used to improve other parts of the state highway system, as was done in Indiana. Figure 16 shows P3 concessions on pre-existing U.S. highways.[173]

P3 toll concessions are an increasingly popular model for new roadway construction, especially for expensive projects. Figure 17 shows newly built highways/highways under construction that have used P3 concessions.[174]

The most expensive P3 concession completed to date is the I-495 HOT lanes project in Virginia ($2.058 billion), which serves the Washington, D.C., metropolitan area.

The largest such deal in development is the IH 635 managed lanes in Texas. That project will cost more than $2.6 billion, will include complete lane reconstruction, and will include an addition of 12 HOT lanes along the route. The private concession company, financed by international infrastructure investment companies, will design, build, finance, operate, and maintain the highway with a 52-year lease. The project is currently in limbo, with political opposition mounting in the state legislature.[175]

As these examples show, whether it is new highway construction or the rebuilding of existing roads and bridges, Missouri may benefit from considering a P3 concession.

Toll Road Disadvantages

1. Double taxation

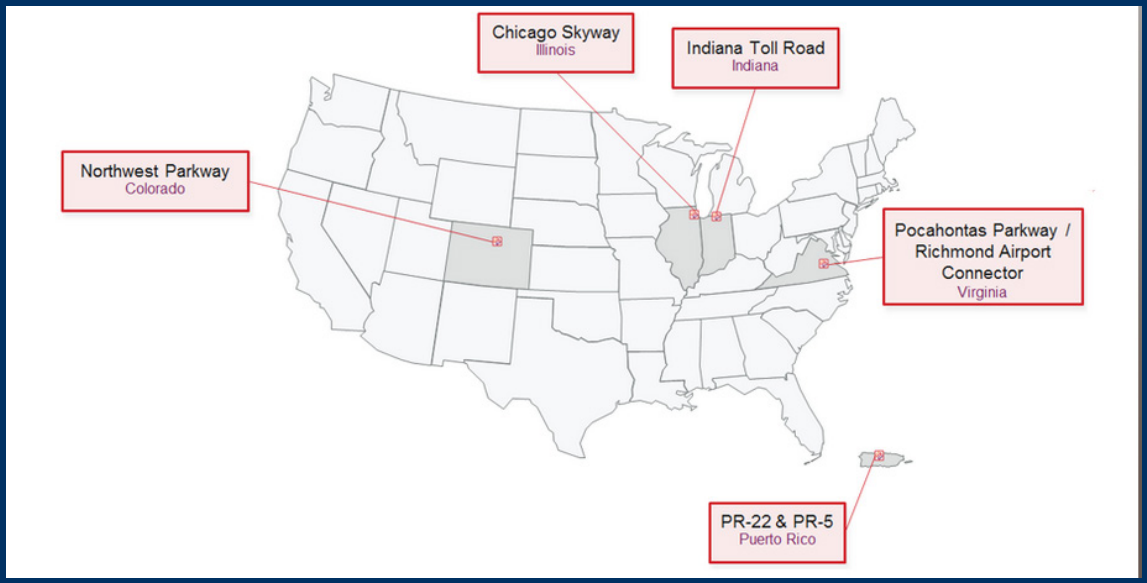
Double taxation is the concern that toll payers are charged twice for their use of highways. For instance, they pay the fuel tax and other user fees, which pay for all highways, but are also charged for their use of the toll road. Those living in areas with unpriced highways pay only the fuel tax for their incremental use of roads.[176] While this concern is valid, it overlooks the fact that highways built with tolls are in fact new highways, which can provide better mobility and a higher level of service. With congestion pricing, the vehicle is also paying for a traffic-free trip. In addition, new tolling technology allows for fuel tax rebates for vehicles that use a tolled highway. These rebates can return fuel tax money to vehicles on a cent-per-toll-road-mile basis if the car is registered and has a transponder. This essentially eliminates double taxation.

2. Concerns over "paying for the road twice"

One common complaint about toll proposals, specifically those on routes that previously had no tolls is that residents are "paying for the road twice." In essence, they argue that fuel taxes already paid for the highway, and they should not have to pay again for the same road with a

Figure 16: **P3 Concessions on Existing U.S. Highways**

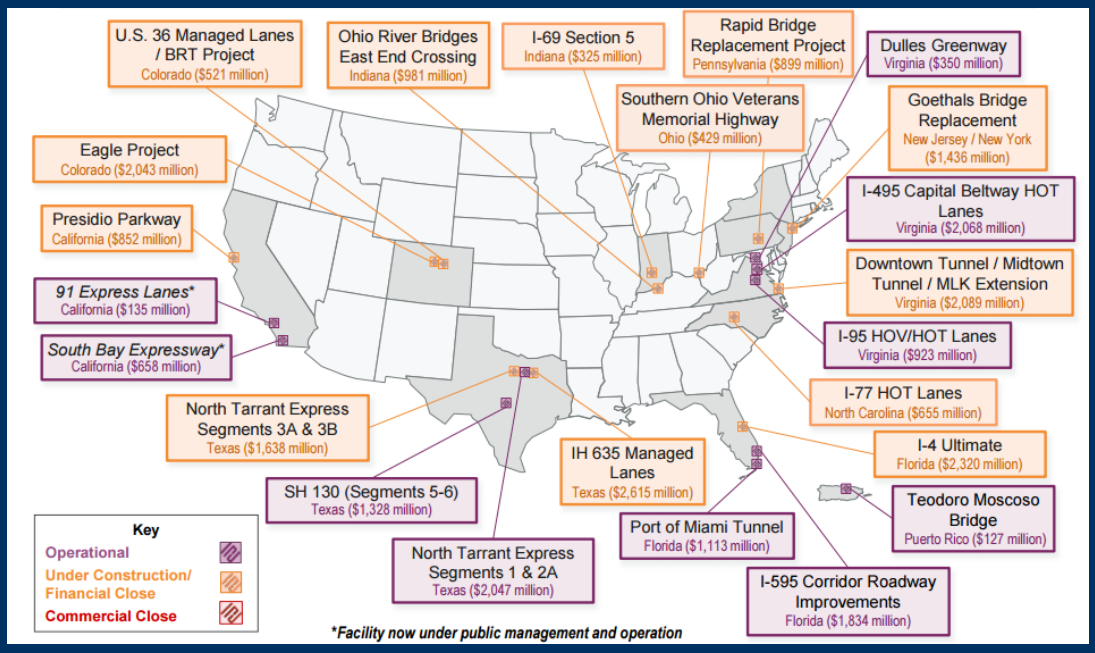
P3 concessions on existing highways is a proven, if rare way to improve infrastructure.



Source: Federal Highway Administration. "Public-Private Partnerships." Available at: http://www.fhwa.dot.gov/ipd/p3/default.aspx.

Figure 17: **Newly Built Highways/Highways Under Construction Using P3 Concessions**

States accross the country are leveraging P3s to build new highway capacity.



Source: Federal Highway Administration. "Public-Private Partnerships." Available at: http://www.fhwa.dot.gov/ipd/p3/default.aspx.

toll. However, as this paper has discussed, eventually all highways need to be rebuilt from the foundation up, and at that point they are essentially new roads that have not previously been paid for. Although they are the same routes, it is nonetheless true that highway reconstruction means a new roadway.[177] That being said, this concern is widespread and can affect the perception of toll proposals.

3. Traffic diversion

When tolled facilities are introduced on previously unpriced routes, there is generally traffic diversion onto ancillary highways as drivers attempt to avoid paying tolls. In general, diversion is lowest when tolls are lowest and/or the route provides good transportation value to drivers. When there are unpriced near-equivalent routes or the toll is very high, traffic diversion can be substantial.[178] Failure to consider traffic diversion has in the past led to overly optimistic estimates of toll facility revenue and has led some routes to become insolvent. Furthermore, diverted traffic from placing toll facilities on previously unpriced routes can create additional strain and congestion on surrounding roadways (which may or may not be designed to handle that traffic) to the detriment of previous users of those routes, along with other negative consequences. Traffic diversion, especially that of heavy vehicles, can be mitigated to some extent by the enforcement of weight limits on ancillary roadways where trucks may attempt to divert to avoid tolls. Another option is for governments to partially subsidize toll roads to reduce the toll rate so that there is less diversion onto other non-tolled public roads.[179]

4. Revenue diversion

In some states, toll road revenue is more than sufficient to pay for the tolled route, but revenue is diverted to other purposes. Often, excess toll revenue is used to fund other parts of the state highway system. Many critics of toll roads complain that toll revenue is being spent on public

Table 7: **Missouri Motor Vehicle Taxes**

Motor Vehicle Type	Registration Fee	Title Fee
Motor Vehicle	< 12 horsepower (hp): $18.50 12–23 hp: $21.25 24–35 hp : $24.25 36–47 hp: $33.25 48–59 hp: $39.25 60–71 hp: $45.25 ≥72 hp: $51.25 +$3.50 processing fee Yearly	$8.50 + $2.50 processing fee + state and local sales tax

Source: Missouri Department of Revenue. "Motor Vehicle Fees." Available at: http://dor.mo.gov/motorv/fees.php.

transportation or other state needs. However, in reality this is rare. Of the 31 state highway systems that collect tolls, only six divert revenue from tolls for purposes other than highways.[180] Only one state, New York, spends any part of toll receipts on transit. Only 5% of toll revenue raised by state highway systems was spent on anything other than highways in 2013, the vast majority of that being spent on New Yok transit. Revenue diversion issues can be alleviated through rigid rules written into toll-enabling legislation or leasing the road to a P3, which has no authority to divert funding for other state priorities.

5. Legal Issues: the Missouri Constitution and federal law

In Missouri, there is a question as to whether or not the state may toll state highways at all. In POHL, CONTRACTOR *v.* State Highway Com'n (1968), Missouri's attempt to set up a state toll authority was ruled unconstitutional by the Missouri State Supreme Court.[181] This may or may not be relevant to any future attempts to set up similar tolling authorities and may also have implications for the use of P3s on the Missouri State Highway System.

Furthermore, Missouri's options for tolling existing highways are limited. According to federal law, states may not place tolls on existing interstate routes without prior federal approval. There are exceptions to this law, including I-70, which the state has the authority to toll through a federal pilot program.[182] However, until there are changes to federal law, neither I-44, I-55, nor any other interstate in Missouri can become toll highways when they are rebuilt. Missouri may introduce tolls on other highways.

6. Tracking and Privacy Concerns

Because electronically collected toll roads use transponders to charge highway users (or bill users via license plates), some residents see tolling as a method of government tracking.[183] This concern can be met in many ways through toll design (such as adding an area where residents can pay cash) or strict controls on data privacy.

LICENSE FEES AND THE MOTOR VEHICLE SALES TAX

As was mentioned in the section on MoDOT funding, a significant portion of the state highway system's dedicated funding sources are license fees and the motor vehicle sales tax. Combined, these sources make up about 29% of the highway system funding, more than the state fuel taxes.

License Fees:

License and registration fees are not currently adjusted for inflation, and revenue from this source has remained relatively flat for the past decade. Registration fees for passenger vehicles are based on horsepower and go from a low of $18.50 to more than $51[184] (see Table 7).

Registration fees for trucks are based on weight, and fees range from $15.75 to more than $100[185] (see Table 8).

According to MoDOT, if Missouri were to increase all passenger, truck, and bus fees by $5.00, it would generate just over $25 million annually, $19 million of which would go to the state and the state highway system. An increase of $10 on all fees for all vehicles could generate as much as $50 million, $38 million of which would go to the state and $12 million of which would go to cities and counties.[186]

While increasing license fees would increase MoDOT's revenue, a very large increase would be required to ensure that MoDOT would have the funds to continue maintaining the system as it exists. At best, an increase in license fees is likely to be only part of any solution.

Furthermore, while license and registration fees are usually considered user fees, they are very indirect and sometimes not really user fees at all. A vehicle's registration can be seen as a lump-sum payment for use of the highway system (and there are higher fees for higher weight classes), but licenses themselves are often used as forms of identification, and are therefore often obtained even by those who do not drive at all. In addition, those licensed in other states would avoid paying such fees, regardless of the benefit they derive from the state highway system. From the standpoint of basing the funding solution of the state highway system on user-generated fees, license fees are therefore a suboptimal choice.

Motor Vehicle Sales and Use Tax

Because the motor vehicles sales tax is adjusted for inflation, it has been the only dedicated funding source for MoDOT that has experienced solid growth in the last decade, the recession years notwithstanding. However, the method in which the motor vehicle sales tax supports the state highway system is somewhat roundabout. The motor vehicle sales tax is simply the state's 4.225% sales tax applied to motor vehicles. As such, the revenue from this tax once went to Missouri's general fund, not the Missouri Department of Transportation. However, following the passage of Amendment 3 in 2004, most of the sales tax (about 70.1% of the 4.225%), was redirected to repay bonds issued by Amendment 3, along with other state road and bridge projects.[187] Table 9 shows the exact breakdown of the motor vehicle sales and use tax rates in Missouri.[188]

Therefore, while increasing the motor vehicle sales and use tax would increase state revenue, such an increase would require the creation of a new motor vehicle tax that would allow the total tax to be greater than 4.225%. In addition, that money would have to be dedicated to the state highway fund. That being said, increasing the motor vehicle sales tax by 1% would increase total revenue by about $100 million, $88 million of which would be expected to go to MoDOT, should the current state–local split remain in place.[189]

Given the revenue-generating potential of the motor vehicle sales tax, it is possible that an increase in this revenue source, along with other user-fee increases, could raise more than $100 million. However, like licensing fees, this sales tax is only an indirect user fee. Those who buy more expensive vehicles pay a higher tax, without regard to their total use of the state highway system. Furthermore, non–Missouri residents who use the state highway system would also be exempt from any joint investment into the state highway system, regardless of how much they benefit from it.

MILEAGE-BASED USER FEES

Given that the mostly likely trajectory of fuel tax consumption in Missouri is downward, if the state is to continue to base the funding of the highway system as a whole on user fees, over the long term the fuel tax will

Table 8: **Missouri Vehicle Registration Fees**

Gross Weight Plus Load	1-Year Fee	1-Year Processing Fee	2-Year Fee	2-Year Processing Fee
Local 6,000 lbs.	$15.75	$3.50	$31.50	$7.00
Local 12,000 lbs.	$18.25	$3.50	$36.50	$7.00
Beyond local 6,000 lbs.	$25.75	$3.50	$51.50	$7.00
Beyond local 12,000 lbs.	$38.25	$3.50	$76.50	$7.00
Local 18,000 lbs.	$20.75	$3.50	N/A	N/A
Beyond local 18,000 lbs.	$63.25	$3.50	N/A	N/A
Local 24,000 lbs.	$27.75	$3.50	N/A	N/A
Beyond local 24,000 lbs.	$100.75	$3.50	N/A	N/A

Source: Missouri Department of Revenue. "Motor Vehicle Fees." Available at: http://dor.mo.gov/motorv/fees.php.

have to be replaced. Perhaps the most prominent possible replacement is mileage-based user fees (MBUFs). MBUFs would charge a vehicle for its use of state highways based on a vehicle's actual use of the system (corrected for the type of vehicle and other factors). In essence, MBUFs would be a per-mile toll on the entire state highway system. Like a toll facility, MBUFs can charge highway users for how much highway they use and the relative damage that their vehicles do to highways (with trucks being charged at a higher per-mile rate). Also like a toll facility, MBUFs could be used to control congestion by charging vehicles more when they drive on more congested thoroughfares or at busy times of the day. However, because the system could charge for any use of any state highway, it could eliminate or greatly reduce traffic diversion onto ancillary highways that normally results from tolling any specific road.[190]

There are multiple ways to charge MBUFs to highway users. The first, and most often discussed, method is to track the car via some type of transponder or cell phone connection. That device tracks a vehicle in order to charge a set mileage rate when the car uses the state highway system; payments can be made at a later point. This method allows MBUFs to be a direct highway user fee and allows the use of pricing to relieve urban congestion.

Tracking devices are not the only way of assessing MBUFs. A simple alternative is a regular odometer check, based on which the state could charge a per-mile fee. While this means that the vehicles themselves are not tracked, it also means that a driver could be charged for driving on other roads that are not part of the state highway system or driving outside of the state.

As an example of how an MBUF system might be implemented, we can look to pilot programs completed in Oregon. There, drivers in the program could choose multiple forms of MBUF payment. A driver could have their transponder (which could also be their cell phone) on at all times, and only be charged for their time driving on Oregon roads. They could also opt to pay via regular odometer checks. Drivers could, if they desired, keep

the transponder on at some times and turned off at others, and pay the difference between mileage tracked via the transponder and the final odometer check. Finally, those who objected to any type of check could pay a large upfront fee. In this way, the Oregon program included financial incentives to opt for the most direct form of user fee, but those averse to tracking could pay slightly higher per-mile prices without subjecting their movements to any form of tracking.[191] Figure 18 shows the options available for paying MBUFs in the Oregon pilot program[192].

Mileage-based user fees, based on a model similar to that pioneered in Oregon, may provide a roadmap for future user-based funding of the state highway system. However, such a system is not in place in any other state and it may be in Missouri's interests to await the system's use in other states before it is attempted in Missouri. In addition, while MBUFs could provide a long-term replacement for state fuel taxes, MoDOT's needs are pressing and short-term, and other measures may be necessary even if MBUFs are selected as a long-term goal.

CONCLUDING REMARKS

Missouri's transportation system is critical to the state economy. Whether the mode of transportation is air, rail, highway, or inland waterway, an efficient and well-functioning transportation system is indispensable to the state's commercial activity and residents' way of life. Perhaps the most important element of that system today is the state's highways. While the current condition of Missouri's highways is in many ways salutary, the system does have serious short-term and long-term funding issues, mostly due a deteriorating user-funding base.

However, Missouri has many short-term and long-term policy options at its disposal to address this issue. Short-term options include efficiencies at MoDOT, increasing general taxation, increasing highway user fees, and implementing tolling on major projects like I-70. If we consider both the economic impact and fairness of each method, and not just the ability to raise large amounts of money, user fees are likely a preferable option, especially for the reconstruction of interstates.

Table 9: **Motor Vehicle Sales and Use Tax Rates**

State Motor Vehicle Sales and Use Taxes:	Sales	Percent	Use	Percent
State Roads & Bridges, MSHP, DOR	2.960%	70.1%	3.750%	88.7%
State-Other Transportation Modes	0.040%	0.9%	-	-
Cities	0.300%	7.1%	0.150%	3.5%
Counties	0.200%	4.7%	0.100%	2.4%
School District Trust Fund	0.500%	11.8%	-	-
Department of Conservation	0.125%	3.0%	0.125%	3.0%
Department of Natural Resources	0.100%	2.4%	0.100%	2.4%
TOTAL STATE TAX RATE	**4.225%**		**4.225%**	

Source: Missouri Department of Transportation. "Financial Snapshot: October, 2014." p. 18. Available at: https://archive.org/details/2014FinSnapshot.

Figure 18: **Plan Options for Mileage-Based User Fees in Oregon**

Mileage-based user fees are already in the development phase in other states.

Participants Selected Their Plan Options Online

Choosing your plan

To activate your account, you must choose a charging plan. Your charging plan will include a road usage charge service provider – either ODOT or a private provider, Sanef – and a method to report the miles you drive (click on the plan title in the table below).

Need help? Call toll-free 855-797-1265 or RUCPP@odot.state.or.us

Plan Options

	Miles Reported	Invoice	Payment	Online account management	Uses GPS?
ODOT Basic Plan	All	Mailed Monthly	Check	No	No, does not report where miles are driven
ODOT Flat Rate Plan	N/A	Once, at start	Check	No	No device
Sanef Basic Plan	All	Emailed Monthly	Credit/debit card	Yes	No, does not report where miles are driven
Sanef Advanced Plan	Public roads in Oregon only	Emailed Monthly	Credit/debit card	Yes	Yes
Sanef Smartphone Plan	With application running, only roads in Oregon; without application running, all roads	Emailed Monthly	Credit/debit card	Yes	Yes, when the application is running

Source: Oregon Department of Transportation. "Road Usage Charge Pilot Program 2013 & Per-Mile Charge Policy in Oregon." pp. 16–27.

Longer-term solutions for MoDOT's funding issues could include alterations to the Missouri state highway system itself, changing priorities at MoDOT, implementing a more wide-ranging tolling program, or exploring mileage-based user fees. As this paper has discussed, these solutions, too, have specific advantages and disadvantages. However, if Missouri policymakers can balance pragmatism, solid market-based principles, and legitimate concerns of Missouri residents, the state can ensure that its most important assets have a solid funding base moving forward.

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