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MISSOURI'S CHANGING TRANSPORTATION PARADIGM

By David C. Stokes, Leonard Gilroy, and Samuel Staley, Ph.D.

EXECUTIVE SUMMARY

Successful societies and growing economies have always depended on efficient transportation. Witness the roads of the Roman Empire, the canals of the Ming Dynasty, the ships of the British Empire, and the railroads that connected the American frontier. The Interstate Highway System, which began to be developed in the United States more than 50 years ago, parallels those earlier achievements. It helped facilitate the tremendous economic growth of the post–World War II era.

Will Missouri meet its future transportation needs by adapting to new demands and technologies, as it did during the 20th century? As cars have become more efficient, the fuel taxes used to fund the state's highways have leveled off — but the transportation needs of the state have not. Other states have looked to the private sector to provide transportation infrastructure, as a means of augmenting gas taxes. The people of Missouri would be well-served if officials were to give this new paradigm strong consideration as the economy evolves.

The use of private companies to provide public assets, such as a new highway or bridge, is called a "public-private partnership." This study describes the ways in which such partnerships can be used to address Missouri's transportation needs. Although state toll roads are currently unconstitutional in Missouri, other methods of tolling are not, including privately operated — but publicly owned — toll roads, high-occupancy toll lanes that waive fees for cars meeting passenger requirements, truck-only toll lanes that allow extra carrying capacity, and competitively contracted mass transit services. These options are worthy of careful examination as officials address the state's infrastructure needs.

Public roads, funded by gas taxes, will be the primary model for transportation in Missouri far into the foreseeable future. However, the options that public-private partnerships facilitate should be a part of the discussion for future transportation projects and plans. The authors hope that this study will help to enable such conversations.

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I. INTRODUCTION

The global environment for transportation policy is entering a new paradigm. Like many states, Missouri finds itself at the convergence of two intersecting trends that demand attention. First, growing transportation needs are outstripping available capacity, and second, the need for maintenance and renovation of existing systems is eating up available financial resources. A failure to address these twin challenges will lead to even greater congestion, in various forms, and lowered reliability of service in the future. By any measure, these realities impact Missouri's economic competitiveness and its citizens' quality of life.

State officials are attempting to deal with the important transportation issues they face without many of the options available to other states. Missouri's highway system, among the nation's largest, is in great need of expansion and repair to keep pace with increasing traffic demand. As a state defined by its rivers, Missouri is also home to thousands of bridges that are falling behind in capacity and condition. The mass transit systems in the state's two largest cities, Saint Louis and Kansas City, are in constant need of greater funding, support, and ridership. These transportation challenges confront a state that is not able to deal with them outside the traditional means of gas taxes, vehicle fees, and government subsidies, which diminishes Missouri's ability to keep the state's overall transportation system ahead of the curve.

To get the state moving again, and positioned to work well with the modern economy, Missouri may need to adopt successful transportation strategies from other states and strive to innovate in ways that will best serve the state's residents. The challenge is not as difficult as some may perceive, but fundamental reforms and innovative thinking will be necessary to help Missouri achieve these desired ends. How do we determine which course will provide the most beneficial results? If we take a global perspective, the answer becomes clear: Government officials should strongly consider the exciting possibilities offered by partnerships with the private sector.

Although the vast majority of transportation projects around the country continue to be funded from traditional sources — gas and vehicle taxes — a new funding paradigm is rapidly emerging: State and local transportation agencies are increasingly looking to supplement traditional sources with private investment. Public-private partnerships are just one "tool in the box," but this promising and valuable option available to policymakers has been relatively untapped in Missouri. Public-private partnerships take many forms and may be utilized for several types of public projects, including the building of new infrastructure, the maintenance of existing infrastructure, and the operation of existing services. Public-private partnerships will never completely replace traditional means of funding transportation, but they are a promising method for augmenting that system, providing more transportation options and cost savings to Missourians.

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offered by public-private partnerships in meeting the transportation needs of Missouri and other states. Public-private partnerships are a means of leveraging private capital and expertise to provide a public service, and states are increasingly using them to deliver needed new transportation capacity while stretching limited taxpayer dollars.

What is a public-private partnership? According to the National Council for Public-Private Partnerships:

> A Public-Private Partnership is a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility.[1]

While Missouri currently lacks broad enabling legislation for these partnerships, the state has recently embarked on one of the most innovative projects in the nation, through its Safe and Sound Bridge Program. In this project, the state will contract with a private-sector team to repair and rehabilitate 802 bridges during a five-year period. The private team will finance the half-billion dollar project up front, and will subsequently maintain the bridges throughout a 25-year term. It is highly doubtful that the state could undertake such a large-scale project on its own using traditional procurement methods and revenue sources, without private sector financing.

The Safe and Sound Bridge Program offers a shining example of the kinds of benefits that public-private partnerships offer for Missouri transportation. This report will provide an overview of the types of public-private partnerships that can be utilized for transportation projects, including their benefits and best practices, and responses to common concerns. The report also explores how public-private partnerships can be used not only to upgrade, modernize, and expand Missouri's road and bridge network, but also to improve the delivery of transit services.[2]

II. THE HISTORY OF TRANSPORTATION FUNDING IN MISSOURI

Historically, Missouri has relied almost exclusively on motor fuel taxes to fund road improvements. Toll roads, or turnpikes, had never been a part of transportation in Missouri prior to the establishment of the Interstate Highway System — unlike in many other states. The state's fuel tax was first instituted in 1924, at a rate of $0.02 per gallon.[3] The current rate is $0.176 per gallon, which is quite low in comparison to other states. Over time, motor vehicle sales taxes and various license fees have been added to the pool of money available to fund roads, but fuel taxes remain the primary state source of road funds.

In 1967, the Missouri General Assembly and Gov. Warren Hearnes passed legislation authorizing the establishment of state toll roads, an action

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that was ruled unconstitutional by the Missouri Supreme Court the next year in *Pohl v. State Highway Commission of Missouri.* The Court's essential legal reasoning was that toll roads are not one of the legal uses of state highway funds, as stipulated by the Missouri Constitution. As such, they ruled, state highway funds cannot be used to build, operate, or maintain a toll road.[4] In both 1970 and 1992, supporters of toll roads attempted to amend the state Constitution to authorize state toll roads, but voters soundly rejected both attempts, by large margins.

The state Constitution does not explicitly forbid all toll roads. The Supreme Court decision applies to state highway funds only; county and city highway departments — and private entities — are allowed to build and operate toll roads and bridges. In certain circumstances, state funds used in conjunction with toll bridge approaches are also legal. However, no local governments or private entities have attempted to implement toll roads, and the effect of the Court's ruling has been to eliminate tolling as a part of the transportation system in Missouri, except for a small number of bridges — none of which has been operated by the Missouri Department of Transportation (MoDOT).

MoDOT has an unusual governing structure for a state agency. It is run by a bipartisan commission of six members, who are nominated by the governor and confirmed by the state Senate. The commission is completely independent of Missouri's elected officials, though, outside of the appointment process: Neither the executive branch nor the legislature directs the MoDOT Board of Commissioners. The majority of the board's funds are constitutionally routed from the gas tax and other sources, so elected officials do not have any control over MoDOT's money, either. As demonstrated by the recently initiated New I-64/US 40 project, MoDOT is fully empowered to launch even those projects that face significant opposition from elected officials. While there have been concerns about the commission's lack of direct responsibility to citizens, the existing setup has long allowed MoDOT to make its decisions based on transportation needs and engineering, rather than political pressure or electoral politics.

There is a legitimate debate about whether MoDOT should be more responsive to citizens through direct control by elected officials. However, the changes that need to be made to the ways in which Missouri funds, operates, and maintains our transportation network are far more fundamental than could be achieved by simply altering the agency's leadership structure. Putting MoDOT under direct control of elected officials — without also passing wide-ranging enabling legislation for public-private partnerships, changing statutes to allow high-occupancy and truck-only toll lanes, amending the state Constitution to allow tolls, and more — would fail to address Missouri's primary transportation needs.

A. State and Local Transportation Funding

MoDOT is funded by dedicated taxes, primarily the gas tax, which is currently set at 17.6 cents per gallon — the sixth-lowest rate in the nation.[5] In 2004, voters approved an amendment to the

state Constitution that tightened the law governing use of tax money intended for transportation, limiting its use for other projects. Amendment 3, as the initiative was designated, eliminated the practice of using certain tax and fee monies, originally designated for roads, as part of the general fund. This change resulted in a one-time surge in tax money for MoDOT, allowing the agency to embark on its Smooth Roads Initiative, which has dramatically improved pavement quality and safety on Missouri's highways. According to an analysis by the Reason Foundation, this initiative is correlated with an increase in the quality of Missouri's highways, moving from an overall cost-effectiveness ranking of 28th in the country in 2004 to 17th the following year.[6]

Every county in Missouri levies a tax on real estate and personal property to pay for roads within that county, through the County Road and Bridge Fund. Clay County, outside Kansas City, had attempted to fund all of its government needs through a sales tax, but a recent lawsuit brought by special road districts forced the county to return to property taxes to fund its roads and bridges. Counties can collect additional transportation funds upon voter approval, which can take the form of either sales or property taxes, and which can be used for roads or transit operations. Saint Louis County, to give one major example, has a Special Road and Bridge Fund property tax rate of 10.5 cents per hundred dollars of assessed valuation, and two separate transportation sales taxes. The county also has a half-cent general transportation sales tax, of which the county generally keeps half for its highway fund and gives half to Metro, the region's mass-transit agency, and a quarter-cent sales tax — which was approved by voters for MetroLink light rail — that goes directly to Metro. Saint Louis city has a similar tax structure to fund roads and bridges, except that it gives all of its half-cent sales tax collections to Metro. Jackson County has a half-cent sales tax that funds bus operations, and an additional three-eighths-of-a-cent sales tax that funds general transit operations, including buses. Kansas City's citizen light-rail initiative would have required this latter tax to go toward funding light-rail expansion, until the City Council overturned the measure in November 2007. Light rail supporters are currently challenging that Council vote, so the future of this tax remains to be seen.

Other cities in Missouri, outside Saint Louis and Kansas City, are authorized by state statute to levy a half-cent transportation sales tax, if approved by voters, to fund their own local transit operations and to build and maintain roads. These smaller, local transit systems also receive support from the federal and state governments.

MoDOT's need for new funding can be demonstrated by a comparison to adjacent states. MoDOT maintains 32,464 miles of state roads, far more than any of Missouri's eight neighboring states,[7] and a portion of the state's fuel tax is returned to counties and cities. Kentucky is closest to this figure, with 27,510 miles of roads maintained by its state department of transportation. Only Oklahoma, which has toll roads, has a lower gas tax — and just a half-cent lower, at that. The combination of so many miles of roads and a low gas

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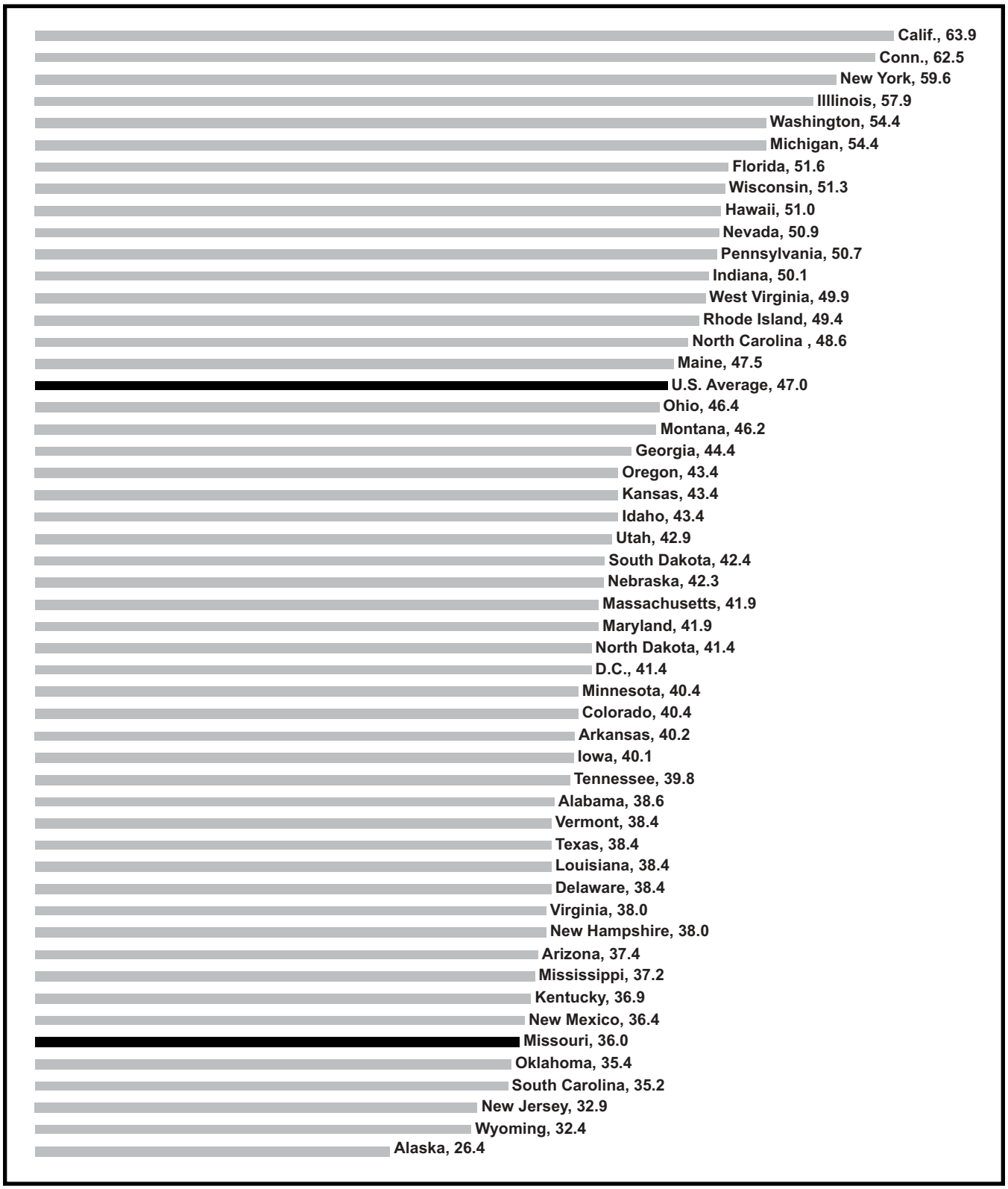
Figure 1: Motor Fuel Gasoline Taxes as of July 2007



Tax rates shown in cents per gallon. Figures include both federal and state gas taxes.
Source: American Petroleum Institute, motor fuel taxes summary report, January 2008. Online here: tinyurl.com/28c3w2

Table 1: Urban Transit Agencies in Missouri, 2000

TRANSIT AGENCIES	MODES PROVIDED	URBANIZED AREA	ANNUAL UNLINKED PASSENGER TRIPS (THOUSANDS)	AVERAGE WEEKDAY UNLINKED TRIPS (THOUSANDS)	OPERATING FUNDS EXPENDED ($ MILLIONS)	CAPITAL FUNDS EXPENDED ($ MILLIONS)	VEHICLES AVAILABLE FOR MAXIMUM SERVICE
Bi-State Development Agency	Bus, demand responsive, light rail	St. Louis, MO-IL	52,137	168	127	134	678
Kansas City Area Authority Transportation	Bus, demand responsive, vanpool	Kansas City, MO-KS	15,193	51	49	14	435
City Utilities of Springfield Transit Services (The Bus)	Bus, demand responsive	Springfield, MO	1,262	4	4	4	28
Southwest Missouri State University (SMSU)	Bus	Springfield, MO	663	2	1	1	16
St. Joseph Transit Managament	Bus, demand responsive	St. Joseph, MO-KS	482	2	2	<1	21
Columbia Area Transit System	Bus, demand responsive	Columbia, MO	480	2	2	0	22

Source: U.S. Department of Transportation, Bureau of Transportation Statistics. State transportation statistics compiled from Federal Transit Administration, National Transit Database.
Online here: tinyurl.com/24nhzr

tax has resulted in Missouri's DOT being ranked 44th nationally in revenue per mile of road.[8] Add into this mix MoDOT's lack of authority to use tolling, and its very limited authority to use public-private partnerships, and Missouri's difficulties in funding the maintenance and expansion of its transportation system become clear.

B. Transit Funding in Missouri

Public transportation and mass transit in Missouri have historically been funded by local governments, with significant aid from the federal government for large capital projects. The state has not traditionally funded public transit, but began to do so at a low level in 1996. State government currently budgets funding of just $6.6 million per year for mass transit throughout Missouri.[9] By comparison, in 2007, the Illinois House of Representatives approved mass transit funds throughout the state to the amount of $452 million. Last session, Missouri's General Assembly and Gov. Matt Blunt passed legislation exempting transit agencies from paying the gas tax on diesel fuel, which will save an agency such as Metro approximately $1 million per year in the future.

In contrast with the state's limited funding of transit, in 2006, Saint Louis County budgeted $85.7 million and Saint Louis city budgeted $26.1 million for funding Metro[10] — this despite the fact that only 1.76 percent of commuters in the Saint Louis area use transit, according to calculations by Wendell Cox.[11] While that number is likely to increase during the next two years as major portions of I-64 are closed for construction, the fact remains that the vast majority of people

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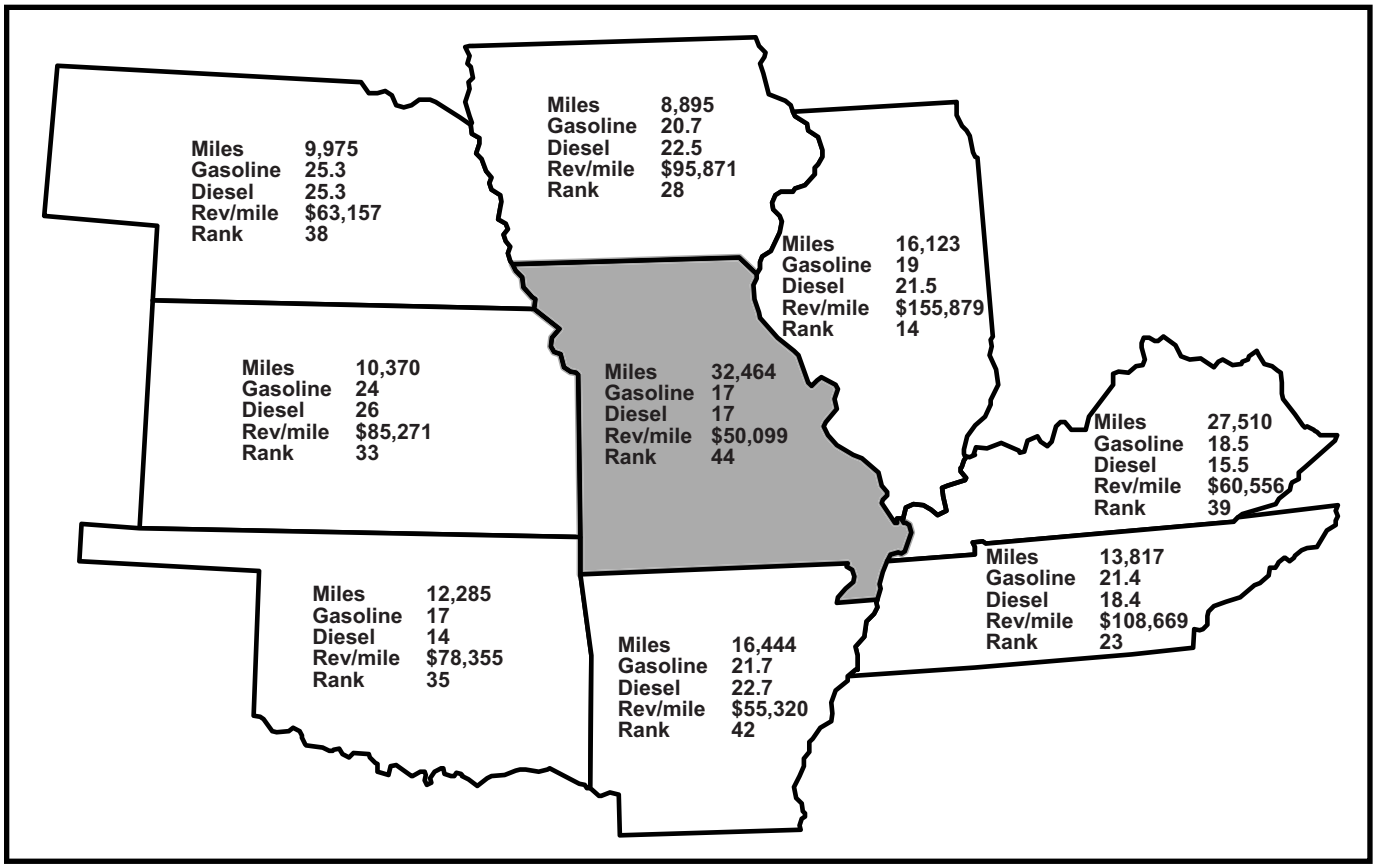
Figure 2: Gax Tax Comparison, Missouri and Neighboring States



Gasoline and diesel shown in cents per gallon. All states listed above use the same rate for gasohol as gasoline, except Iowa and Tennessee.
Source: MoDOT map compiled from 2005 federal highway statistics — rates as of November, 2006. Online here: tinyurl.com/2cbdun

In 2003, the federal government provided 16 percent of operating funds and 84 percent of capital funding for transit in Missouri.

in Saint Louis do not regularly use mass transit. The numbers in Kansas City are similar, with local governments subsidizing two-thirds of the $40.5 million KCATA bus budget, and the federal government contributing 12 percent.[12] All of this funding is designated for transit systems that have low market shares of metropolitan-area transportation — 0.67 percent in Saint Louis and an even lower share, 0.24 percent, in Kansas City.[13]

In 2003, the federal government provided 16 percent of operating funds and 84 percent of capital funding for transit in Missouri.[14] This last number quickly declined, though, as Metro, Saint Louis County, and Saint Louis city paid for MetroLink's recently opened Cross-County Extension entirely with local funding. This extension project, which connected downtown Saint Louis with Clayton — the Saint Louis County seat and business hub — was $126 million over budget and more than a year behind schedule. Disputes about who was responsible for that overrun spurred legal action, leading to a major lawsuit between Metro and its former contractors in 2007. The jury found in favor of the contractors, and held Metro responsible for the cost overruns. Despite the contention surrounding the construction, ridership levels have exceeded projections since the extension opened, and light rail

will be an important alternate route for commuters during the New I-64 highway construction shutdowns.

Ultimately, Metro, Saint Louis city, and Saint Louis County paid for the $676 million light-rail extension entirely with local funding.[15] This should serve as a sobering warning to supporters of light rail in Kansas City, where the plan approved by the voters but overturned by the City Council mandated that the process had to move forward without any guarantee they would receive the $473 million in federal funding and $94.5 million in state funding they were counting on.[16] Additionally, in August 2007, consultants to Kansas City informed the City Council that the light-rail plan's funding proposals were at least $500 million short of the projected cost.[17] Although the Council voted to overturn the plan, a new referendum reapproving the project may still be on the November 2008 ballot.

C. The Use of Tolls in Missouri

The only examples of tolls in Missouri are those used for bridges — and only one of those is currently in use as a tolled facility. The McKinley Bridge operated over the Mississippi River since 1910, connecting Saint Louis and Venice, Ill. The City of Venice owned the bridge and operated it as a toll bridge beginning in 1958. It was closed for various reasons, including a tax dispute with the city of Saint Louis in 2001, but after a major repair project by the Illinois Department of Transportation, the bridge was reopened in late 2007. Now, however, it no longer has a toll. Other Saint Louis bridges, including the Martin Luther King Bridge and the famous Eads Bridge, were constructed before the Interstate Highway System and were tolled at one time, but now connect Missouri to Illinois as "free" bridges.[18]

Farther north from Saint Louis, the Saint Francisville Bridge used to connect Missouri to Vincennes, Iowa, across the Des Moines River. For many years, it was a toll facility operated by the Wayland Special Road District of Clark County, Mo. It closed in 2004 after a new, untolled four-lane interstate bridge opened nearby. Kansas City also at one time had several toll bridges crossing the Missouri River, such as the Broadway Bridge and the Platte Purchase Bridge, but all are now toll-free structures.

The only toll bridge or road currently operating in Missouri is the Lake of the Ozarks Community Bridge, which opened in 1998. It is operated by the Lake of the Ozarks Community Bridge Corporation, under authority granted by the Missouri Transportation Corporation Act of 1990.[19] This legislation allowed private, non-profit groups to build toll roads and bridges in Missouri, upon voter approval. The Ozarks area had long needed a bridge across the lake, connecting U.S. Business Route 54 with Shawnee Bend, Mo., and the only financially feasible manner to build it involved making it a toll bridge. The toll amount for this popular tourist area is adjusted seasonally, set at $2.50 per car from April 1 to Oct. 31, and at $1.50 during the other five months of the year. This community partnership will operate the bridge as a toll road until the bonds are paid off, which is scheduled to happen in 2026. At that point, MoDOT will assume

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The Lake of the Ozarks Community Bridge has been a success, although not without flaws. It has experienced lower traffic levels than were originally forecast, and Fitch Ratings downgraded the project's debt rating in 2004 to "negative." Other strengths of the corporation, however — including strong financial liquidity — have kept the project in generally sound financial condition. All debt payments have been made on time, including both principal and interest, and the debt rating was increased to "stable" in 2006. The current bond rating is BBB-,[20] considered investment grade by Fitch, which is an indication of an overall successful project.

The new bridge has dramatically reduced driving distance around the lake, turning a 30- to 50-mile trip into a 10-mile route.[21] It has also spurred economic development in the area it connects, and it has met all of its financial demands and commitments, if not all of its forecasts. According to Joe Roeger, treasurer of the Lake of the Ozarks Community Bridge Corporation, the bridge has "absolutely had a positive impact" on economic development in the area.[22] It has enhanced retail growth on the east end of the bridge in Lake Ozark, and increased residential growth on the west end in Shawnee Bend.[23]

While the Lake of the Ozarks Community Bridge uses a manual toll-collection system, it is important to note that any new tolled assets built for Missourians by public-private partnerships would implement electronic tolling. The thought of long waits and dangerous backups at toll-collection plazas might frighten Missourians, but toll plazas have long been replaced by new technology. Any new toll-collection system would use electronic collection only, primarily with an appropriate EZ pass system for regular commuters, or bills mailed to users based on the registration addresses associated with their license plates, which would allow travelers to drive by without stopping. Please see the appendix at the end of this study for a more detailed discussion of technological progress in toll collection.

III. ASSESSING MISSOURI'S TRANSPORTATION NEEDS

A. Major Transportation Needs

Improvement and expansion of the two cross-state interstate highways, I-70 and I-44, are the most crucial long-term projects in the state according to state transportation leaders, including the leadership of both the Senate and House transportation committees. I-70 is considered to be the nation's first interstate highway, and it is the focus of transportation in Missouri. It cuts right through the heart of the state — running parallel with the Missouri River — connecting Saint Louis, Kansas City, the University of Missouri, the state capital, and much more. Its overall condition had long been regarded as a dangerous embarrassment, infamously mentioned by Gov. Kathleen Sebelius of Kansas in 2001.

Just as important to Missouri is I-44. It connects Saint Louis to Springfield, the state's third-largest city, and leads to the popular tourist destination of Branson. Like I-70, I-44 carries a significant amount of cross-country truck traffic and needs major repair work just to keep safety and mobility up to basic standards.

Another major transportation need for Missouri is improving the capacity of the bridges over the Mississippi River, connecting Saint Louis and Illinois. Currently, the Poplar Street Bridge lies on one of the only routes in the country to carry three interstate highways over the same bridge (I-70, I-64, I-55, and — by some accounts — I-44). Predictably enough, the traffic backups on that bridge can be substantial. Long-term forecasts predict a 25-percent increase in total bridge crossings between Saint Louis and Illinois by 2020, with many of those drivers projected to use the Poplar Street Bridge.[24] Missouri and Illinois have been in continuing discussions about meeting this need since the early 1990s, but to date no final agreement has been reached, despite great efforts from elected leaders and transportation officials in both states.

Closely related to the expansion of bridge capacity is the improvement of bridge quality and safety. The General Assembly recently gave final approval, during a special session, to an innovative MoDOT proposal — the Safe and Sound Bridge Program. This program, which is the first of its kind in the nation, will competitively bid out a contract to finance, design, repair, and maintain 802 substandard Missouri bridges. The winning private-sector team will have to complete all repairs or replacements on the 802 bridges included in its contract within five years, and maintain them in good condition for 25 years. The selected team will be paid by MoDOT from future federal bridge dollars, also known as availability payments, once the initial repairs are completed.

One major undertaking that has already started is the reconstruction of I-64/US 40 through central Saint Louis city and County. Funded mainly by federal dollars, this $535 million project is the first design-build project that MoDOT has participated in. Construction began in 2007, with major sections of the highway scheduled to close during 2008 and 2009. The project's plans call for reconstructing numerous bridges, lengthening entrance and exit ramps, adding lanes and capacity to sections of the highway, and, most importantly, adding direct connections to the intersection of I-64 and I-170. The project has aroused controversy in Saint Louis because it necessitates that entire sections of the metropolitan area's central highway be shut down. It is scheduled for completion in the fall of 2010, although major road closures will cease in 2009.

Missouri also has significant mass transit funding problems. Both Kansas City and Saint Louis have large-scale bus transit systems. Saint Louis also operates a light-rail line, MetroLink, while Kansas City is giving strong consideration to building one. As is the case with mass-transit across the nation, the subsidies and funding necessary to build and operate these systems are consistently a matter of dispute. In 2006, Kansas City voters approved a tax transfer to build a light-rail system with an estimated cost of $945 million, although, as previously

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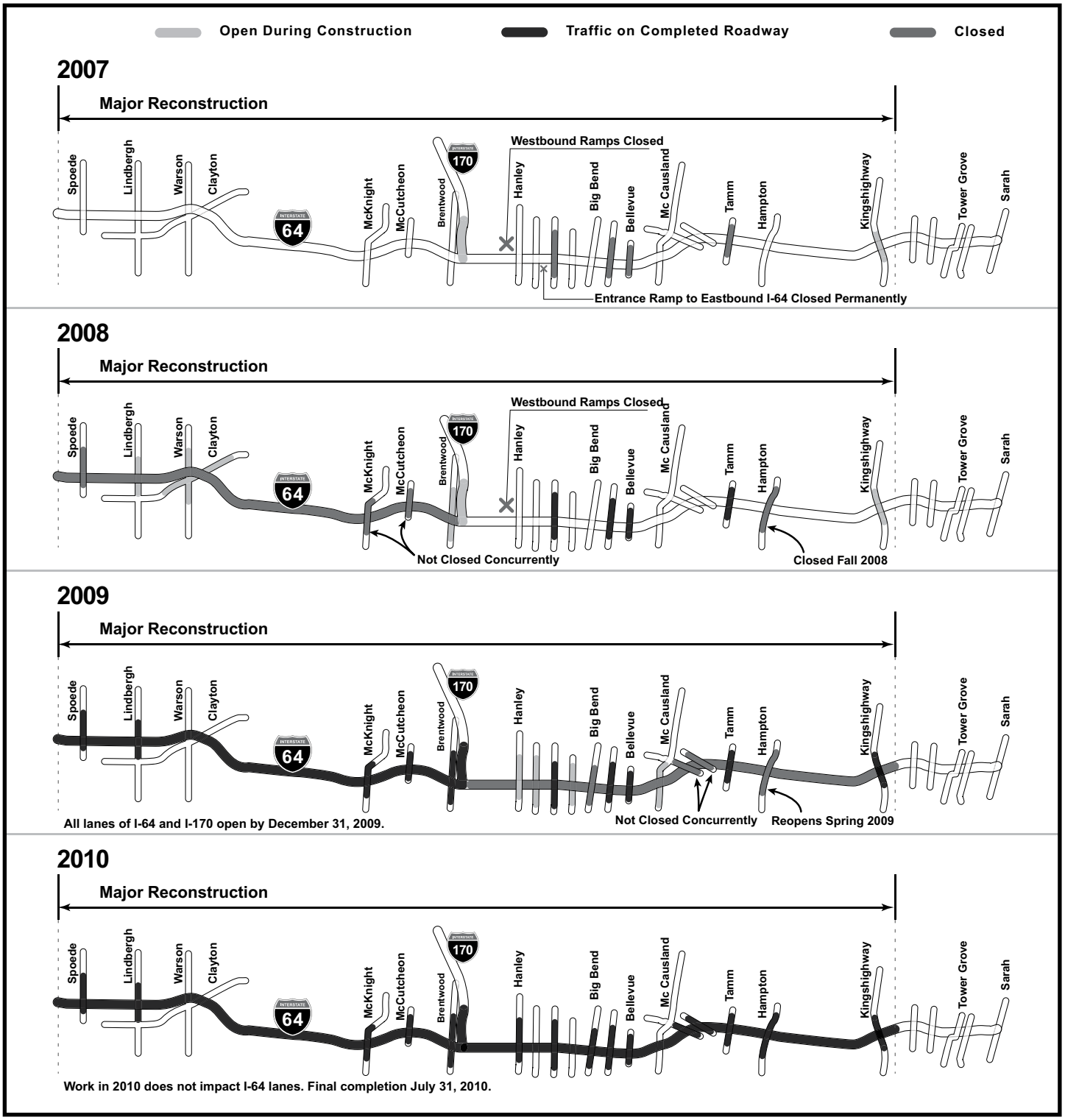
Figure 3: New I-64 Construction Schedule



Source: Gateway Constructors and MoDOT. Online here: tinyurl.com/39tcor

mentioned, that vote was overturned by the City Council. The tax money that would have been used to build light rail in Kansas City would have been diverted from money previously used to support the bus system. It is uncertain how the Kansas City Area Transportation Authority (KCATA) will continue to operate its bus system if a significant portion of its tax dollars are eventually devoted to light rail.

Missouri needs a transportation funding plan that will address critical, immediate needs, and effectively fund a long-term plan. Pete Rahn, Director of MoDOT, stated in a meeting on July 31, 2007, that MoDOT projects it will need $37 billion to meet Missouri's most critical transportation needs during the next 20 years.[26] If Missouri continues to fund transportation the way it has in recent decades, MoDOT projects it will receive only $19 billion in funding during that period. Clearly, a shortfall of $18 billion, almost half of MoDOT's projected needs, will have an effect on quality of life for Missouri residents, and on the ability of companies to do business within the state. Rahn has made this argument before. In his 2007 State of Transportation address to the Missouri General Assembly, he said that Missouri "must find a way to direct more dollars to our roads and other modes of transportation."[27]

How will MoDOT obtain the money it needs to fund its highway construction and maintenance needs? Where will Metro find or raise the operating capital necessary to avoid the substantial cuts it predicts will come without increased funding? When will the new bridge over the Mississippi be built? How will Kansas City fund its proposed light-rail plan without destroying its bus system? These are only some of the larger examples of Missouri's transportation needs and goals meeting hard fiscal realities.

While all of the above examples could be answered simply by increasing state or local taxes, the current political reality is that Missouri's legislature cannot substantially increase taxes without a vote of the citizens, and is unlikely to approve anything more than a minor increase in funding for urban mass transit — nothing near the $20 million Metro claimed in 2007 that it would need. With regard to Kansas City's planned light-rail system, there is no guarantee that voters will approve a tax increase to support the buses that may potentially lose their funding to light rail, or that the state will increase its transit funding. If Saint Louis' light-rail experience is any guide, the final cost of the Kansas City light-rail system could climb much higher than the $945 million projected in the voter-approved plan — not that the current estimate sounds cheap.

These and other challenges facing the state's transportation needs call for a new funding paradigm. Missouri needs innovative ways to fund and maintain a transportation system that is central to economic life in its cities, suburbs, and rural areas. To its credit, MoDOT has been at the forefront in calling for changes to Missouri law that would allow new modes of funding. In the same speech quoted previously, Pete Rahn said, "I know that legislation has been introduced that will allow for thoughtful debate about funding highways, bridges and other modes [of transportation]. That is a crucial first step." As part of that speech, Rahn called for allowing dedicated truck lanes

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on highways and requested innovative solutions (i.e., tolls) for funding a new Mississippi River bridge in Saint Louis. At a minimum, MoDOT sees the tremendous needs facing Missouri transportation and realizes that fundamental change is required in how the state funds, builds, operates, and maintains infrastructure.

B. The New Mississippi River Bridge Project

Missouri took a major step forward in transportation financing in 2006 with the "Missouri Public-Private Partnerships Transportation Act," which the General Assembly passed and Gov. Blunt signed.[28] For the first time in MoDOT's history, the legislature authorized the agency to contract with private entities to construct and operate a transportation facility. This legislation aimed to allow the construction of a new interstate bridge connecting downtown Saint Louis and Illinois, which would relieve pressure on the crowded Poplar Street Bridge and improve the mobility of interstate truckers, travelers, and local commuters. The legislation allowed MoDOT, in conjunction with the Illinois Department of Transportation, to contract with a private company to build and operate the proposed structure as a toll bridge. Despite this legislative approval, a number of factors have prevented Missouri from proceeding with the plan.

Although Illinois makes extensive use of tolls in its Chicago-area highway system, the state's officials have staunchly opposed a new toll bridge over the Mississippi. They believe their state's citizens would be disproportionately affected by the tolls. Because residents of Metro East (the common term for the Illinois part of metropolitan Saint Louis) cross the Mississippi River much more often, on average, than Missouri residents, this concern is not without merit. However, a toll bridge plan could easily include discounted monthly passes for all Metro East residents, other frequent bridge-crossers, or similar categorical discounts. As this study's appendix demonstrates, new electronic tolling technologies offer substantial flexibility for transportation (and transit) agencies, and provide the opportunity to tailor pricing to the needs of specific types of commuters — including peak-hour drivers, regular users, occasional users, transit riders, commercial operators, etc.

At the time of this study's publication, Missouri and Illinois have not agreed upon a final plan for the new bridge, although it appears the possibility of a toll bridge —whether publicly or privately operated — is dead. Current discussions involve funding the bridge through traditional gas taxes, with costs shared by the two states and the federal government. The sticking point is the bridge's size, and cost.

The East-West Gateway Council of Governments hired InfraConsult LLC, a transportation consulting firm based in Arizona, to study the proposed alternatives for a new Mississippi River bridge. The firm determined that a toll bridge would not be financially viable, because there would not be enough traffic with drivers willing to pay the toll — except possibly for a much smaller bridge proposal. The report concluded that the presence of four non-toll bridges located in close proximity to the area planned for

the new bridge is the primary reason there would be little market for a tolled facility.[29]

Officials also considered the use of tolls in 2001 during discussions about how to improve I-70. These discussions are still ongoing. One of the strategies considered was the construction of an entirely new toll road spanning Missouri, parallel to I-70. For a variety of reasons, including environmental impact, officials decided that widening I-70 and maintaining its status as a freeway was the preferred alternative.[30] However, the fact that this project has not moved forward in several years could be viewed as evidence that the funding options provided by public-private partnerships and tolling merit renewed consideration.

In October 2007, Rasmussen Reports — a respected national polling firm — conducted a wide-ranging poll of Missourians that covered topics ranging from political races to taxes. Three of the 16 questions specifically covered transportation.[31] When asked whether money for improvements to highways and bridges should come from tolls or from higher state sales taxes, 53 percent of Missourians chose tolls. Only 15 percent approved of higher taxes, with 25 percent choosing neither. When asked whether they would favor a higher state sales tax that would fund the widening of I-70 from four to six lanes, only 18 percent responded favorably, with 67 percent opposed. A question that proposed increasing the state sales tax to fund bridge repairs prompted favorable responses from only 28 percent, with 51 percent opposed. While attempts to amend the state Constitution to allow tolls have failed by wide margins in past decades, this poll suggests that Missourians may now support tolling as a means to fund the state's transportation needs.

Figure 3: Selected Questions From Poll of 500 Likely Missouri Voters, Oct. 10, 2007

Would you favor or oppose an increase in the Missouri State Sales Tax to fund bridge repairs?

- **28% Favor**
- **51% Oppose**
- **21% Not sure**

Would you favor or oppose an increase in the Missouri State Sales Tax to fund expanding Interstate 70 to six lanes?

- **18% Favor**
- **67% Oppose**
- **15% Not sure**

Should money for highway and bridge improvements come from tolls or higher state sales taxes?

- **53% Tolls**
- **15% Higher taxes**
- **25% Neither**
- **6% Not sure**

Source: Rasmussen Reports, Missouri Toplines, Oct. 10, 2007. Online here: tinyurl.com/ywqwvy

C. Missouri's First Innovative Public-Private Partnership: The Safe and Sound Bridge Program

The tragic 2006 collapse of the I-35W bridge in Minneapolis focused nationwide attention on the conditions of infrastructure. At that time in Missouri, before the collapse, MoDOT had already begun planning a new "Safe and Sound Bridge Program" to repair or replace 802 of the state's most worn-out bridges. Missouri currently has 10,224 bridges in its state highway system, and 1,046 of those are rated as being in "poor" or "serious" condition. Even more alarming is the number of "deficient" bridges in the state. Missouri has a total of 23,972 bridges maintained by local and state

Officials considered the use of tolls in 2001 during discussions about how to improve I-70. These discussions are still ongoing.

By leveraging the capital and expertise of the private sector, the state will be able to address its most pressing bridge modernization challenges without resorting to tax increases or diverting resources from other needed transportation projects.

governments. Of that total, 7,545 — 31.5 percent — are considered deficient, according to information compiled by the Reason Foundation. Using a slightly different measure, a 2006 report by the Federal Highway Administration stated that there are 4,595 deficient bridges in Missouri, more than in all but three other states.[32]

The MoDOT Safe and Sound Bridge program intends to use an innovative public-private partnership project model that will involve having a private-sector team finance, design, build/upgrade, and maintain 802 bridges during a 30-year period. This team will finance the five-year, $500 million project up-front, and will then maintain the bridges during a 25-year term. The state will pay nothing during the initial five years of construction work; this period will be followed by 25 years or more of annual payments to the private firm, which the state will treat as an operating expense through the use of a portion of its federal bridge funds.

It is highly unlikely that the state could implement this project on its own using traditional "pay-as-you-go" funding, based on gas taxes, a system that is particularly ill-suited to massive projects of this scale. By leveraging the capital and expertise of the private sector through an innovative procurement method, the state will be able to address its most pressing bridge modernization challenges without resorting to tax increases or diverting resources from other needed transportation projects.

The original plan included selecting the contractor by the summer of 2007, but the work stalled over questions about the state law requiring project performance bonds. The legislature met in a special session in August 2007, and quickly revamped the bonding requirements for projects and contracts of this length. With these changes, the bid process and negotiations have started again and the work on these 802 bridges should start this year.

D. Two Proposed Legislative Plans

During the 2007 legislative session, the Missouri General Assembly heard two competing proposals to fund the needed transportation improvements, although neither of them garnered significant support. The first proposal came from the chairman of the Senate Transportation Committee, Sen. Bill Stoufer, who proposed a one-percent increase in the state's general sales tax for a period of 10 years. That tax would have generated approximately $8 billion, and would have been used solely for highway improvements to I-70 and I-44, including dedicated truck lanes.[33]

The other proposal was filed by Rep. Neil St. Onge, chairman of the House Transportation Committee. His plan involved raising the state's gas tax by 4 cents and the diesel tax by 6 cents. His proposal would have further levied a 2-percent sales tax on fuel, which is currently not subject to the state sales tax. Representative St. Onge's plan would also have raised vehicle fees and increased the state's general sales tax by 0.5 percent. This plan had a six-year sunset, and would not have been devoted solely to interstate highways. This plan would have raised an estimated $4.1 billion, to be used for highways, transit, and ports.[34]

Both Sen. Stouffer and Rep. St. Onge introduced their proposals as legislation in order to facilitate discussion and debate about the future of transportation funding in Missouri. This is likely to be a major issue during the 2008 legislative session, and the final proposal — which will have to be placed before the state's voters — is far from determined. At present, the legislature hopes to place a transportation tax increase proposal on the ballot in late 2008 or 2009, although the latest proposal would aim to place it on the ballot through an initiative petition. In the same manner that Missourians have proven resistant to allowing tolls, though, voters rejected the last fuel tax increase proposal, Proposition B, by a 3-1 margin in 2002.[35]

E. Public-Private Partnerships: An Alternative Approach to Funding Missouri's Transportation Needs

During an era of high gas prices, resistance to increased fuel taxes should be expected. Not only do citizens tend to oppose higher gas taxes, but many politicians are generally hesitant to support tax increases of any kind.

Rather than relying solely on traditional revenue sources — fuel and vehicle taxes — elected officials and state transportation agencies throughout the United States are increasingly looking to supplement those sources with private investment through public-private partnerships, which can build new infrastructure, maintain existing infrastructure, and operate existing services — including mass transit. The following section of this study explores these options for funding and managing Missouri's transportation infrastructure by considering the public-private partnership experiences of other cities and states. Public-private partnerships are just one "tool in the box" of options available to policymakers, but they constitute a promising and valuable tool that, to date, has seen limited utilization in Missouri transportation policy. Many of Missouri's recent major transportation projects would have benefited from the public-private partnership option. For example, the Page Avenue Extension connecting Saint Louis and Saint Charles counties could certainly have been financed by commuters paying a toll, aside from the obvious constitutional issues this would entail. This is not to say that every highway or bridge project in Missouri should suddenly be undertaken through partnerships and tolls.

The point is that the potential for private capital investment deserves careful consideration for every large transportation project in Missouri's future. This solution will not be right for all of them, but for certain projects public-private partnerships would allow Missouri to address its transportation needs in a cost-effective, responsible, and equitable manner.

Public-private partnerships are just one "tool in the box" of options available to policymakers, but they constitute a promising and valuable tool.

IV. ECONOMIC LITERATURE REVIEW OF PUBLIC-PRIVATE PARTNERSHIPS

Most of the economic literature on public-private partnerships relates to their implementation outside of the United States, because these partnerships are

The potential for private capital investment deserves careful consideration for every large transportation project in Missouri's future.

more common in other parts of the world. The papers we have reviewed have mixed opinions of public-private partnerships in general, although they agree that in the appropriate circumstances, and with proper application, they can be a positive public asset.

In a paper for the *South African Journal of Economics*, economists P. Burger and F.C. Fournie provided an economic analysis of all types of public-private partnerships, not just those relating to transportation. They concluded, "PPP's do have the potential to improve the efficiency and effectiveness of delivery of certain government services. However, the scope for PPP's should not be overestimated." They continued, "PPP's do not constitute a magical panacea for social service delivery in times of budgetary constraints."[36]

The article reviewed public-private partnerships in all aspects of government services, citing mass transit and inter-city toll roads as examples of suitable areas for provision via public-private partnership, while concluding that areas such as education, health, and local road systems are not. The most important factor in an effective public-private partnership that truly benefits the public, according to the authors, is ensuring that the private partner takes on enough risk in the project, "because risk is the driver of efficiency."[37] A lack of risk removes the incentive for efficiency that is the primary benefit of private participation.

Graeme Hodge and Carsten Greve published "Public-Private Partnerships: An International Performance Review" for *Public Administration Review*.[38] They took a very critical look at public-private partnerships in general, offering examples of successful partnerships as well as similar citations of failure and opposition. They concluded, "A range of PPP experiences in terms of successes and failures can be seen around the globe, and there is little doubt that some of the glowing policy promises of public-private partnerships have been delivered. Equally, though, evaluations of PPP's … have, in reality, delivered contradictory evidence as to their effectiveness."

Even amid this highly questioning analysis of public-private partnerships, though, the authors stated, "Some sectors (such as roads and bridge infrastructure) appear to have experienced less trouble than other sectors."[39] Like the authors of the prior paper, they went on to cite health and education as areas where public-private partnerships have been "surrounded by some doubt."

Elsewhere in this paper, the authors argue that public-private partnerships do not relieve pressure on government budgets, instead simply replacing, "a large, once-off capital expenditure" with, "a series of smaller, annualized expenditures." Even in this criticism of public-private partnerships, though, the authors admit to one exception: when "government enters into an infrastructure deal requiring users … to pay directly, such as tolls on a new road."[40] In these cases, the authors agree that "Such an arrangement does reduce pressure on public sector budgets." In a paper such as this, with its many criticisms of public-private partnerships in general, it is striking that the authors admit the evidence is positive regarding the benefits of public-private partnerships in transportation.

There have also been more theoretical studies that specifically analyze toll roads. Engel, Fischer, and Galetovic[41] demonstrated that as the number of toll roads increases, the competition between them yields benefits to the public at large, in the form of competitive toll pricing. In cases where a toll road has no competition, however, the government must regulate the toll rate. De Palma and Lindsey[42] concluded that variable pricing on toll roads works best to guarantee efficient movement, which leads to more drivers choosing to use the toll roads.

These studies each offer additional conclusions that are more relevant to the potential issues facing Missouri, which has no toll roads at present and is unlikely ever to have a significant number. One toll route that is discussed elsewhere in this paper and given consideration by MoDOT is a new route across Missouri, parallel to I-70. De Palma and Lindsey wrote, "A single, private (tolled) road competing with a free-access road tends to be most efficient if the two roads have approximately equal capacities and if the private road does not suffer a significant travel time disadvantage."[43] Something very close to this was proposed for I-70.

Indeed, this is one of the most important lessons from the 91 Express Lanes in Southern California. The express lanes are tolled, and run parallel to non-tolled lanes for 10 miles along State Route 91. The toll rates are set every four months to ensure free-flow travel at 65 mph, regardless of the time or day of the week. Thus, as traffic in the untolled lanes sits in "gridlock," those willing to pay the toll are guaranteed unimpeded travel and significant time savings. The express lanes pay for themselves, as well as generating additional revenue for other transportation services (including transit) with tolls ranging from $1.20 in the early morning off-peak times to $10.00 at peak travel times.[44]

Engel, et al, in discussing a situation similar to the I-70 parallel toll road, state: "It is interesting to note that a similar situation holds for a toll road that is a substitute of a public untolled road. The owner of the tolled road will be able to exact a positive toll, given sufficient congestion on the alternative road. A decrease in congestion in the untolled road hurts the private road. Hence its owner will oppose all attempts to increase the capacity of the untolled road." [45]

The authors then cite examples of opposition to expanded free facilities. This is why it is imperative for governing bodies to carefully negotiate with private entities about the future expansion of free roads in competition to toll roads, before entering public-private partnerships. This is discussed in more detail in Section IX.

Phineas Baxandall published a paper for the U.S. Public Interest Research Group titled "Road Privatization: Explaining the Trend, Assessing the Facts, and Protecting the Public."[46] The paper expresses a generally negative opinion of public-private partnerships and private toll roads, citing 21 toll road projects in developing countries that were subsequently taken over by the government.[47] But the fact that governments took over the roads does not indicate that those projects failed entirely. In fact, the Orange County (CA) Transportation Authority voluntarily acquired the 91 Express Lanes from a

The 91 Express Lanes in Southern California pay for themselves, as well as generating additional revenue for other transportation services.

The merits of public-private partnerships must be debated on a case-by-case basis, for all of the different fields discussed by the selected scholars reviewed here.

private company — despite the project's clear financial success — because the agency needed to obviate a part of its lease agreement in order to meet other transportation goals.[48] In most cases, a government takeover means that the private part of the deal failed, but at least the people end up having a road where none existed before. The economies of poorer countries simply don't allow for their governments to meet many of their infrastructure needs, so many of these roads could not exist at all without a public-private partnership to build them in the first place. In wealthier counties like the United States, the government can, in principle, meet infrastructure needs through higher taxes, or through bonds that are paid off by taxes. Public-private partnerships are a valuable "tool in the box," allowing government more flexibility in meeting transportation and mobility needs without harming the economy through higher taxes and fees every time a project is needed.

Even though Baxandall is generally opposed to public-private partnerships in transportation, his paper lists seven guidelines that must be followed for them to responsibly address the public's needs. Baxandall's conditions are: 1) public control; 2) fair value; 3) no deal lasting longer than 30 years; 4) state-of-the-art maintenance and safety standards; 5) complete transparency (in the selection process); 6) full accountability, with elected officials approving any final deals; and, 7) no budget gimmicks.[49] We agree with every guideline except for numbers 3 and 6, which are discussed in depth later in this study — in Sections VIII and V, respectively.

This study focuses exclusively on public-private partnerships in the area of transportation. The quotes we have selected from studies that criticize the use of public-private partnerships in many fields, but which agree that these arrangements seem to work best in transportation projects, should be taken as strong evidence of their potential for public benefits in transportation. However, the authors of this study wish to emphasize that because we have quoted scholars who believe public-private partnerships do not work well in many other areas does not mean that we share that opinion. The merits of public-private partnerships must be debated on a case-by-case basis, for all of the different fields discussed by the selected scholars reviewed here. We believe there are strong arguments to be made for the benefits of public-private partnerships in many other areas of public interest, but it is beyond the scope of this paper to debate them here.

V. THE ROLE FOR PUBLIC-PRIVATE PARTNERSHIPS IN DELIVERING 21ST CENTURY INFRASTRUCTURE

Without serious attention, road and highway conditions in Missouri will only continue to deteriorate. As the state's population grows and expands, increased demands will continue to be placed on an aging network of roads and highways. At the same time, state and local government entities are faced

with uncertain fiscal conditions and the challenge of trying to do more with less. Tax dollars are already stretched thin, and preventive maintenance is often put off for another day. Given these constraints, public-private partnerships offer a viable alternative that can supplement current transportation funding sources and deliver the infrastructure Missouri needs to thrive in the 21st century.

A. What is a Public-Private Partnership?

Public-private partnerships are contracts formed between public agencies and private companies that facilitate greater private-sector participation in the delivery of a public function. While these partnerships may take relatively simple forms — such as a design-build procurement process and competitive contracting for highway maintenance — long-term partnerships are increasingly being used for new road construction and the modernization of existing roadways. Such partnerships typically involve the investment of private risk capital to design, finance, construct, operate, and maintain a roadway for a specific term during which a private toll company collects toll revenues from the users. When the contract expires, the government can take over the facility at no cost.

Public-private partnerships leverage the capital and expertise of the private sector with the management and oversight of the government to provide public services. Public-private partnerships are an effective way of financing, managing, and operating roads while minimizing taxpayer costs and public financial risks. These partnerships have been used for decades in Europe, and more recently in Australia and Latin America, for complex, multi-billion dollar transportation projects. In fact, public-private partnerships have become the conventional way to provide major new highway capacity in many countries. The private sector is financing, building, and operating most of the major new highways in countries as diverse as Great Britain, France, Spain, Italy, Greece, Poland, China, India, Indonesia, South Africa, Australia, Argentina, Brazil, Chile, and Jamaica. Large urban toll projects in excess of $1 billion are in operation or under construction in Melbourne, Sydney, Paris, Israel, Santiago, and Toronto. During the 1990s, public-private partnerships began in the United States and Canada as well. Public-private partnership toll projects are in operation in California, Texas, and Virginia, as well as in several Canadian provinces.

B. How Do Public-Private Partnerships Work?

Like anything else, public-private partnerships can be done well or poorly. This is true of each type of partnership, from simple operational contracts to concession agreements for new and existing roads. Fortunately, while these arrangements may be relatively new to Missouri, they are not new to the rest of the world. A long history has established best practices and guidelines to ensure that quality is delivered and that taxpayers are protected.

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The model that has worked best to deliver new transportation capacity around the world is the use of a *long-term concession* (or lease) agreement as the basis for protecting the interests of both parties in the partnership. In exchange for a long-term lease, an investor-owned company will finance, design, build, operate, modernize, and maintain a highway or bridge project, financing its expenditures from the toll revenues it is allowed to charge. However, the state or local government still owns the roadway and protects the public interest through negotiating and enforcing the terms of the concession contract. Essentially, this model extends the investor-owned utility concept from network industries, like electricity and telecommunications, to highways. Just as those industries are vital to the public interest, so too are highways.

The concession should be structured to mitigate any citizen concerns, and adequate protections for the public interest must be detailed in the terms of the agreement. These agreements tend to be several hundred pages long, spelling out all kinds of "what-ifs" and establishing well-defined performance levels that the contractor is legally required to meet or face a penalty. These standards dictate everything from future maintenance and road condition expectations to the time it takes to remove dead animals. The contract also establishes toll rates and possible increases during the term — tolls are usually capped and indexed to some inflation measure — as well as any revenue sharing or limits on the concessionaire's return on investment.

C. Benefits of Public-Private Partnerships

Toll financing can help Missouri close the financing gap for new infrastructure. In addition, the public-private partnership model offers several advantages over the traditional model of transportation financing.

DELIVERING TOMORROW'S INFRASTRUCTURE TODAY

Public-private partnerships enable needed new capacity to be delivered much faster than is possible under the current pay-as-you-go funding system, which is often ill-suited to delivering large-scale projects in a timely manner. In a pay-as-you-go system, projects are held off until enough gas taxes have been collected to pay for the project. Virginia, now a leader in the use of public-private partnerships in transportation, was long known for its absolute refusal to go into any debt for road projects. The funding system established by former governor and longtime senator Harry F. Byrd was one where projects only began when Virginia had collected enough gas taxes to pay for them.

While Missouri has long had a willingness to use bonds to pay for transportation projects, there are limits to the amount of money that can be raised from bonds, not the least of which is the requirement for voter approval in many cases.[50] Public-private partnerships offer a way to finance and build needed capacity now, when it's needed, versus decades from now or possibly never. This method also frees up resources to deliver other projects that will not have

to wait for funding to become available. This is a win-win for taxpayers, drivers, and businesses, as partnerships deliver projects to strategically connect the state and enable greater mobility of goods and people.

ACHIEVING COST SAVINGS

Achieving cost savings is always a leading driver behind public-private partnerships in transportation. Considerable cost savings are seen throughout the long history of public-private partnerships because they have the proper incentives and greater flexibility to innovate. Using more innovative financing, such as finding ways to reduce risk premiums — something only the private sector has an incentive to do — has reduced the gap between the public and private costs of capital, to make private financing cost-competitive. Private builders only start to make money when projects are complete; in contrast, no government agency loses revenue when projects come in late. Private companies often bring in better and more specialized management and equipment, which helps cut down expenses. Private contractors are also unburdened by state government requirements for hiring, and can hire a more flexible and specialized work force, or part-time workers in conjunction with higher-skilled workers when necessary. Also, many private companies offer incentive-pay packages that encourage managers to deliver projects at lower costs. There are numerous avenues for cost savings in public-private partnerships; which one dominates depends on the type of partnership.

The evidence of cost savings for highway projects is substantial. A report by the Federal Highway Administration found numerous examples of cost savings in a wide range of public-private partnership types.[51] The Pocahontas Parkway in Virginia, which used a design-build-finance contract, came in $10 million under budget thanks to innovative private partners. In Denver, the E-470 Toll Road, another design-build-finance contract, cost only $408 million to make. It would have cost nearly $600 million using state construction.[52] In another example, Florida's public-private partnership initiatives for highway maintenance have generated cost savings between 15 percent and 20 percent, while highways built with public-private partnerships saw a 300-percent reduction in cost overruns and 400-percent savings in time overruns, relative to public construction.[53] In other states, public-private partnerships of various contract types saw an average construction time savings between five months and three and a half years, according to the Federal Highway Administration.

The cost savings of new roads extend even beyond the construction phase. Drivers save time, fuel costs, and money by wasting less time on congested roads. Contracts that require warranties on the quality of private work have also saved money in the long run, as seen through reduced maintenance fees on New Mexico Corridor 44, where a 20-year warranty saved $89 million over 20 years. As these different examples show, cost savings are apparent both in building roadways and during the course of operating roads; savings on only one

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Study after study shows that a competitive system is more efficient and effective than traditional single-provider systems.

side of this equation, let alone both, is often enough to justify public-private partnerships.

ACCESS TO CAPITAL

In addition to saving money, public-private partnerships can allow the state to tap into new sources of capital, never used before, to deliver transportation infrastructure in Missouri. For example, the concession model is attractive to many different types of investors, including private equity investors and institutional investors (such as pension funds and insurance companies). Literally billions of dollars of private investment is available, as seen recently with the concession agreements for the Chicago Skyway and the Indiana Toll Road, as well as a number of new roads under way in Texas, California, Virginia, Georgia, and Florida, among others.

GREATER EFFICIENCY

The traditional design-bid-build procurement process completely separates a project's planning from its construction. The project is designed by an engineering contractor, or the transportation department itself, and then put out for bid by various construction contractors. The design-build model that is gaining in popularity includes the same contractor team in both the design and construction work. The benefits of this model are in the time and cost savings that result from having one contractor team responsible for the entire project. While it is still too early in the New I-64 project to make a full judgment, the surprising lack of traffic problems resulting from the initial highway shutdown and the speed of early construction are a positive indication of the potential for design-build in Missouri.

Closely related to saving money, some agencies seek public-private partnerships to explicitly gain the "maximum utility from tax dollars"[54] and improve overall system efficiency — achieved through competition and specialization. Study after study shows that a competitive system is more efficient and effective than traditional single-provider systems. For example, when Massachusetts turned to competition for its highway maintenance, nearly half of the contracts were won by employee groups who competed. For the first time, efficiency and effectiveness were introduced systemwide, producing tremendous improvements. The state was able to lower labor input costs and receive greater productivity in return. Furthermore, the introduction of competition freed up resources that could be allocated to higher priority needs. Simply put, a "competitive system improves the status quo … [where] the fundamental goal is to turn out the best product possible."[55]

ACHIEVING PERFORMANCE OR QUALITY IMPROVEMENTS

The contractual mechanism in public-private partnerships increases the incentive to produce high-quality work and ensure high performance. Indeed, the level of performance is firmly established in the contract. Generally, contracts can (and should be) performance-based (focusing on outputs or outcomes) and can include quality assurances or quality-control assurances.[56] Enhancing accountability and performance are also

prime considerations for many public officials in their role of protecting the public interest. Partnerships require strong contracts with performance requirements. In many cases, this adds an additional level of transparency to the operations.

CHANGING THE INCENTIVE STRUCTURE

Similar to improvements in performance or quality, public-private partnerships effectively change the incentive structure at work in transportation projects by offering a situation in which quality service and hard work are naturally rewarded. These partnerships alter traditional governmental business practices, making them more flexible, innovative, transparent, and customer-focused, which leads to more projects being finished on-time and under-budget. Ultimately, taxpayers benefit significantly when their money is spent in a manner that encourages customer satisfaction and accountability.

ENHANCING RISK MANAGEMENT

Public-private partnerships allow government agencies to shift major risks from taxpayers to contractors — risks such as construction cost overruns and higher-than-expected life-cycle operations and maintenance costs. With the power of a contract at hand, governments can build quality assurance and/or quality controls into project delivery as a means of managing risk. An increasing trend is the employment of warranty concepts, whereby contractors place long-term guarantees on their work, which further shields taxpayers from risk. As discussed in Sections IV and V, an assumption of risk by the private partner is one of the most important aspects in a successful public-private partnership.

In addition, public-private partnerships diverge from traditional procurement requirements, allowing both the state and the private partner to use innovative financing to make additional capital readily available, as well as reducing common delays in project completion.

SPURRING INNOVATION

Public-private partnerships produce innovative solutions. The freedom to invent "allows old processes to be discarded in favor of entirely new ones."[57] In non-competitive systems, the incentive structure does not reward innovation, providing little motivation to "swim upstream" and advance a new idea — a problem endemic to government agencies. At all levels, private firms have more opportunity and incentive to encourage innovative ideas.

FLEXIBILITY

Governments seek public-private partnerships for many reasons, and to achieve a number of different goals. One of the undervalued benefits of public-private partnerships and concession arrangements is that they are customizable and able to fit the needs, goals, and desired outcomes of a community. Put simply, governments can tailor each particular initiative or project to meet their goals.

The concession model has been adapted in a variety of ways to build new capacity and address difficult challenges. In Texas, for example, the private sector is developing a 40-mile extension of State

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Highway 130 from Austin to San Antonio, and will share revenues with the state during the life of the 50-year agreement. Without the private sector, this road would not have been built — the state could have generated only half of the project's $1.35 billion cost on its own.

Similarly, a concession can be structured to add new capacity to an existing roadway. For example, in return for a 75-year concession, the private sector is adding the first new lanes to the I-495 Capital Beltway in Northern Virginia, which is something government had been unable to implement through traditional funding approaches.

The partnership for the new South Bay Expressway, recently opened in San Diego, was tailored to meet a number of environmental and economic development goals. This roadway has been on the books since the late 1950s, but without sufficient funding to advance. The state partnered with a private firm to deliver the road through a 35-year concession. The private partner not only financed the $635 million project, but also undertook an extensive public involvement process that led to the integration of features designed to meet several environmental and community goals, such as preserving 1,000 acres of habitat, restoring area wetlands, and building a number of parks and recreation facilities. Aside from the road's award-winning environmental innovations,[58] it will fill in a major gap in the regional road network with a new north-south corridor, much-needed to reduce congestion and improve mobility.

Another example of the flexibility found in public-private partnerships is the increased interest in availability payment concessions that several states are seeing. In these projects, a private firm designs, builds, finances, and maintains a road, but the public sector actually collects all of the tolls — reimbursing the private company during the life of the deal, in return for having made the road "available." Some officials view this as a more politically attractive structure than one in which the private partner collects tolls and retains revenues. Texas is currently exploring this model for 87 potential toll projects, and the proposed Port of Miami toll tunnel in Florida would use the same approach. The aforementioned Missouri Safe and Sound Bridge Program is also based on this availability model, although no tolls are being proposed as part of that plan.

The above examples — all of which are under way today — offer just a few examples of the types of approaches being used by innovative policymakers to capitalize on the flexibility inherent in public-private partnerships. These projects are excellent examples of the potential that public-private partnerships have to greatly benefit the people of Missouri in meeting the state's transportation needs.

D. Broad Enabling Legislation Needed

The modern use of public-private partnerships in the transportation arena originated more than 15 years ago with California's enactment of AB 680, and adoption of the model by the Commonwealth of Virginia through its Public-Private Transportation Act of 1995. Today, approximately two dozen states have adopted legislation authorizing

the use of public-private agreements for the design, construction, financing, and operation of transportation facilities.

Workable legislation is generally needed to entice private-sector investment. The reality is that transportation projects are going to those states that have created the right conditions — states where the law facilitates public-private partnerships, and where private investment and participation is embraced. Texas, Virginia, Georgia, and Florida are generally regarded as offering the best models, evidenced by the fact that they are reaping the most interest and investment from the private sector. As long as Missouri lacks the proper legal framework, these other states will continue to reap the benefits of private-sector investment at the potential expense of Missouri's economy and business climate.

Despite the state's current lack of broad enabling legislation, the Missouri General Assembly has shown an increasing willingness to expand state authority to enter into partnerships. In 2006, it passed the state's first public-private partnership legislation,[59] although it was very narrow in scope — authorizing a public-private partnership only for the proposed Mississippi River Bridge project, using the common legal designation of "city not within a county," which limits the legislation's scope to Saint Louis. More recently, the General Assembly passed similar legislation facilitating the Safe and Sound Bridge Program.[60]

Despite its restrictions on toll financing, MoDOT believes that the use of public-private partnerships to build toll roads is consistent with the Missouri Constitution.[61] However, if Missouri wants to expand its use of such partnerships, specific pieces of legislation would have to be passed on a project-by-project basis — or the legislature could move to pass comprehensive legislation enabling public-private partnerships. Without a comprehensive enabling statute, the unpredictability of the legislative process would likely preclude many potentially worthwhile projects from being given serious consideration.

Such legislation could certainly require final legislative approval for individual project agreements negotiated by MoDOT and a private partner. However, while legislative approval of each project may be seen as desirable from the viewpoint of the public and elected officials, this level of oversight might also have the undesirable effect of limiting private-sector interest in Missouri projects, because a legislative approval process would inject a high degree of political risk into any project. That risk could be minimized with properly written enabling legislation that aims to ensure the public's interest in fair partnership agreements, while giving MoDOT and any private partner enough flexibility to negotiate the fine points and final details at the project level. The states that have been the most progressive in advancing public-private partnerships to date — notably Virginia, Texas, Florida, and Georgia — have established strong procurement rules through comprehensive enabling legislation, but have opted not to pursue legislative approval of individual public-private partnership projects.

Despite the General Assembly's recent willingness to embrace certain public-private partnerships, it remains to be seen how far the legislature will be

Without a comprehensive enabling statute, the unpredictability of the legislative process would likely preclude many potentially worthwhile projects from being given serious consideration.

willing to go in this area. The state's strict term limits for legislators will soon replace today's supporters of public-private partnerships with new transportation leadership, with or without a change of party control in the statehouse.

VI. MODERNIZING AND EXPANDING MISSOURI'S ROAD AND BRIDGE NETWORK THROUGH PUBLIC-PRIVATE PARTNERSHIPS

In addition to adding new lanes to existing assets, such as I-70, public-private partnerships can underwrite the development of new roads.

In addition to adding new lanes to existing assets, such as I-70, public-private partnerships can underwrite the development of new roads. The Reason Foundation first suggested in 1988 that the private sector could build supplemental congestion-relief lanes, using electronic toll collection to charge market prices, which would keep lanes flowing free even during the busiest of rush hours.[62] The first such lanes were developed in Orange County, Calif., as part of a private franchise awarded in 1991 under California's Assembly Bill 680's public-private partnership legislation. Opened to traffic in December 1995, in the median of SR-91, the "91 Express Lanes" demonstrated that electronic variable pricing works well to keep traffic flowing smoothly. The toll revenues also proved sufficient to pay for the construction, operation, and maintenance of the new lanes.

Because the 91 Express Lanes were built where high-occupancy vehicle (HOV) lanes[63] had originally been planned, the concession agreement required that the concessionaire permit three-person carpools to use the lanes at no charge. The concept of such limited-access lanes, to which one could gain access either by meeting an occupancy requirement or by paying a toll, was dubbed High Occupancy Toll (HOT) lanes in a 1993 Reason Foundation paper.[64] HOT lanes can be created either via new construction or by converting existing, underutilized HOV lanes into HOT lanes. The next three HOT lane projects to emerge during the 1990s — on I-15 in San Diego, and on I-10 and US-290 in Houston — were all HOV conversions. A private firm was hired to manage the I-15 Express Lanes, illustrating another role for the private sector.

The early years of the 21st century have seen a proliferation of proposals for more congestion-relief lanes in heavily populated urban areas. Denver recently completed a conversion of existing HOV lanes to HOT lanes, with private-sector management. The Virginia Department of Transportation (VDOT) has received private-sector proposals to add two HOT lanes in each direction to the southwest quadrant of the Washington Beltway (I-495), and to add HOT lanes to I-95 approaching the Beltway and the Shirley Highway (I-395) within the Beltway.

VDOT, in fact, announced in September 2007 that the I-495 HOT lane project is moving forward as a public-private partnership with a private-sector team financing approximately 75 percent of the $1.7 billion project and undertaking extensive repairs of the existing roadway. Indeed, the toll lanes currently being

negotiated on I-495 rescued a traditional road-widening project from collapsing under a barrage of local opposition. The concessionaire came up with a proposal that nearly eliminated the need to acquire extra right-of-way for the road, saving hundreds of homes from eminent domain condemnations and reducing the project cost by approximately one-third. This vital project has not gone unnoticed in neighboring Maryland, where the State Highway Authority has requested a private-sector assessment of the feasibility of similar partnerships to add Express Toll Lanes to the Maryland portion of the Capital Beltway (I-495), the Baltimore Beltway (I-695), and several other major highways in the area.

This model can benefit bus transit riders as well. Indeed, there can be real synergy between HOT or express toll lanes and bus–rapid transit (BRT). The BRT concept has attracted a significant amount of recent attention as a way of achieving service quality akin to that of rail transit, but at much lower capital cost — thanks to the ability of buses to use already-existing infrastructure. Kansas City has effectively used BRT in its transit system, and that is one of the reasons KCATA has until now done such a good job of holding down costs. However, for the long-haul portions of express bus service, BRT proponents much prefer exclusive busways, in order to guarantee reliable high-speed service (giving BRT a speed advantage over driving). However, except in very rare cases (where one or two buses per minute can be justified), an exclusive busway is enormously wasteful of the costly exclusive right-of-way. Some time-savings can be achieved by operating express buses in HOV lanes (as in Houston and on the El Monte Busway in Los Angeles), but because successful HOV lanes tend to fill with traffic, the speed and reliability gains for buses using these lanes are not sustainable over the long-term.

A much better solution is to operate BRT service on HOT lanes, as proposed in the Reason Foundation's 2003 report.[65] Electronic market pricing can ensure that the number of vehicles per lane, per hour, is limited to an amount compatible with free-flow conditions (typically no more than 1,700 vehicles/lane/hour). Hence, the HOT lane becomes a "virtual exclusive busway." From the transit operator's perspective, it attains the service quality of an exclusive busway, but does not have to pay for that quality, thanks to the premium tolls paid by the automobiles that share the use of these lanes.

A number of metro areas are currently studying the possible creation of a network of such managed lanes, serving as both congestion-relievers for drivers and as BRT infrastructure. They include Dallas, Houston, Miami, Atlanta, and the greater Washington, D.C., area. Minneapolis–St. Paul has recently moved forward with such a plan. All the states involved have public-private partnership laws in place that would permit such projects under their auspices. Before Missouri could move forward with any such innovative ideas, the state's laws would have to be changed, and the state Constitution likely amended, in order to allow various types of HOT or HOV lanes on the state highway system.

Another type of specialized toll project is a set of new lanes designed for exclusive use by trucks. Such lanes

In HOT lanes, electronic market pricing can ensure that the number of vehicles per lane, per hour, is limited to an amount compatible with free-flow conditions.

Truckway projects in California and Texas, though now at a nascent stage, appear to have trucking industry support.

would be designed with heavy-duty, longer-lived pavement, less-steep grades, etc., to better match the physical features of heavy trucks. These lanes would be separated from general-purpose lanes by concrete barriers, increasing highway safety by reducing the likelihood of often-deadly collisions between cars and trucks. Historically, the trucking industry has staunchly opposed tolls and toll roads, considering it "double taxation" to pay both tolls and fuel taxes for the same highway. However, one concept of a toll truckway has won significant support in trucking circles. The Reason Foundation has proposed that long double- and triple-trailer rigs be allowed to operate on such barrier-separated lanes in states where these types of rigs are otherwise forbidden by federal law.[66] These larger rigs can, in many cases, allow a truck to haul double its usual payload for very little increase in operating cost, making it worth the operator's while to pay a fairly hefty toll.

MoDOT is giving strong consideration to the inclusion of truck-only lanes as part of any expansions to I-70 and I-44. The agency recently received a $2-million grant from the Federal Highway Administration to study truck-only lanes. Other states along the I-70 route are also participating in the study, which could one day lead to a multi-state network of truck-only lanes across the heart of the country. Giving larger rigs permission to operate in the tolled, truck-only lanes may be the perfect compromise to allow public-private partnerships and tolling to be used, making both highways safer and more efficient for everyone.

Truckway projects in California and Texas, though now at a nascent stage, appear to have trucking industry support. The Southern California Association of Governments has included in its new 2030 long-range plan a $16 billion system of toll truckways to link the ports of Los Angeles and Long Beach with the Inland Empire and Barstow. Its financing plan is based on the high toll rates justified by the operation of double- and triple-trailer rigs.

As part of its Trans-Texas Corridor program, the Texas Department of Transportation is working with a private-sector team to develop a plan for a new north-south corridor running the length of the state, parallel to I-35, which would include both toll lanes and dedicated toll truckways. The Trans-Texas Corridor, with its planned statewide use of newly constructed toll roads operated by private partners, is an interesting possibility to consider for Missouri. This project will be discussed and analyzed in detail in future Show-Me Institute studies.

A. Additional Public-Private Partnership Opportunities

In many ways, public-private partnerships have always been utilized in transportation. Dozens of states, including Missouri, already contract with private companies for services related to the delivery of highways and roads, including design and engineering. Nearly every function currently handled by departments of transportation has been successfully contracted or outsourced in one state or another.

HIGHWAY MAINTENANCE

At least 22 states, including Missouri, contract for highway maintenance at

some level.[67] The Florida Department of Transportation (FDOT) administers several contracts for highway maintenance; nearly three-quarters of its maintenance is under contract. According to "Asset Management Program Summary," April 2005, the state has saved $105 million, or 17 percent, throughout the life of the contracts.[68] An additional six contract awards for highway maintenance are planned. By July 2008, Florida expects to have 28 active asset management contracts. At the local level, the two major toll operators in Orlando and Miami also successfully contract out road maintenance. The contracting agency states that the contractor is "performing at better levels and the quality is at least the same if not superior."[69]

In 1997, Virginia awarded a total asset management maintenance contract. The initial contract was for six years, with a value of $131.6 million covering 251 miles of interstate, including state highways in urban Richmond, rural western Virginia, and the southwestern part of the state. The contractor is responsible for determining how it will maintain the road — i.e., what type of materials, techniques, and procedures it will use. An annual audit is conducted, and a report card is issued describing the contractor's progress toward the contract goals. In 2000, Virginia Tech conducted an independent assessment for VDOT, finding cost savings between $16 million and $23 million during the five-year period.[70] Virginia's experience with contract maintenance has been so successful that the Virginia General Assembly passed legislation in 2006 requiring VDOT to contract out all highway maintenance.

MoDOT has long utilized the private sector for outsourcing, including contracts for road construction, traffic surveys, environmental impact studies, database management, and project engineering.[71] If private companies can work with MoDOT to perform so many of these important functions, the next logical step is for MoDOT to contract with them to operate and maintain the roads as well, in the form of public-private partnerships.

DESIGNING AND ENGINEERING

A 1991 study published in *Professional Services Management Journal* showed that states that contract out 50 percent to 70 percent of their engineering services have the lowest overall engineering costs, whereas those contracting out less than 10 percent have the highest engineering costs.[72] As is the case in Missouri, private contractors currently perform the majority of FDOT's activities.[73] Many functions within FDOT tend to be commercial in nature, making them readily suited for competition. Indeed, in March 2001, the Office of Program Policy Analysis and Government Accountability (OPPAGA) suggested that private contractors "can handle additional work" and called for the expedited contracting of toll collection operations.[74]

B. Bonds Compared To Public-Private Partnerships

A common objection to public-private partnerships is that the state, or another government entity, can accomplish the same desired ends through the traditional use of bonds. Tax-exempt government

At least 22 states, including Missouri, contract for highway maintenance at some level.

Public-private partnerships generate up-front cash for the government, with the private sector assuming the project's risk.

bonds have financed important transportation projects for state and local governments for decades. Why do we need a new way to finance transportation? To start with, public-private partnerships will never be used for all, or even most, projects. Many transportation projects are simply too small to make a public-private partnership realistic or feasible. Some large projects, such as the proposed New Mississippi River Bridge project in Saint Louis, are also not well suited for public-private partnerships or tolls, for a variety of reasons. In the case of the bridge, as we have discussed elsewhere in this paper, the presence of numerous existing free bridges so close to the planned location of a new bridge made the possibility of a toll unworkable, according to an analysis by consultants.

However, public-private partnerships are well suited to many other projects, and here the benefits of partnerships over traditional bonds must be carefully considered. Bonds are debt taken on by the government and public to build new assets, or improve existing ones; this debt will be paid off by all taxpayers. Public-private partnerships generate up-front cash for the government, with the private sector assuming the project's risk. Indiana took the billions it received from leasing its toll road and put it into interest-bearing accounts that will fund much of the state's transportation program for years. The choice between bonds and public-private partnerships could be understood as a choice between public debt for everyone, or private capital investment and private risk for transportation assets that are ultimately owned by the public in either case.

VII. ADDRESSING MISSOURI'S MASS TRANSIT CHALLENGES THROUGH PUBLIC-PRIVATE PARTNERSHIPS

A. Missouri's Urban Mass Transit Challenges

Larry Salci, who was until December 2007 director of the Saint Louis-area public transportation agency, Metro, had repeatedly warned that the agency is facing a serious fiscal crisis in coming years. That crisis was, surprisingly, averted in fiscal year 2007 because of stronger-than-expected ridership and effective cost-cutting.[75] Metro had requested a one-time appropriation from the Missouri General Assembly of $20 million for help in addressing the agency's needs during the I-64/US 40 reconstruction project. That request was not granted, although some mitigating steps were taken by the state, such as eliminating gas taxes for public transit agencies.

Metro and its supporters intend to ask the voters of Saint Louis County for a tax increase in order to maintain the current light-rail and bus system, and to expand light rail farther into Saint Louis County. The plan by local leaders is to ask county voters to approve a half-cent countywide sales tax increase for operations and expansion of MetroLink and the bus system in 2008, although the vote's exact timing has not been decided. This tax-increase proposal was rejected

once before by county voters, in 1997, and has no guarantee of succeeding now. If it were to pass, however, the increase would also apply to Saint Louis city, whose voters passed the proposal back in 1997 but have not yet been affected because of the proposal's defeat at the county level. The possibility of putting two different transportation-related sales tax increases (one state, one local) before the voters of the state's largest county, in such close proximity with each other, will certainly affect the dynamics of voter decisionmaking and the chances of each proposal's passage.

What can Missouri policymakers do to rescue Kansas City's Area Transportation Authority, Metro, and other transit systems? First, many transit officials and advocates must come to grips with the fact that no mass transit system, no matter how lavishly funded or extensive in service, will displace privately owned automobiles as the dominant means of transportation for the vast majority of commuters. Still, mass transit can play an important role in Missouri. To that end, a policy successfully embraced by many cities in the United States, like San Diego, Denver, Los Angeles, San Francisco and Boston, as well as many foreign cities, such as Tokyo, involves "competitive contracting" of transit services. This is a variation on public-private partnerships, in which private contractors take over the operation of transit services through a government contract.

Several of the world's largest transit systems are operated in this manner, under contractual arrangement. London's entire bus and tube system is competitively contracted, as is Melbourne's. London has reduced bus costs by approximately 50 percent since it began competitive contracting in 1985. In New Zealand, a 1990 act of Parliament required that all public transit services be provided commercially or through a "competitive pricing procedure." The cities of Copenhagen, Stockholm, and Helsinki also have significant experience with contracting out transit. Each of these cities has received high-quality transit services for lower costs. Stockholm has reduced bus, subway, and commuter rail costs by approximately 20 percent since the early 1990s.[76]

Missouri could certainly utilize both public-private partnerships and "competitive contracting" in its mass transit systems. Missouri's two major public transit agencies, Metro and KCATA, often face financial difficulties. At each agency, the financial issues are driven by costs rather than revenues, a situation that is particularly true for Metro, which has seen its operating expenses increase by 92 percent since 1991. KCATA has seen its expenses rise by 75 percent during that same time frame.[77]

Kansas City's mass transit is facing both an unusual problem and a unique opportunity. In November 2006, Kansas City voters approved a ballot initiative mandating the construction of a 27-mile, $945 million light-rail system. The initiative was long on design, intended funding, and hope, but woefully short on engineering, guaranteed funding, or alternatives — so the fact that it passed came as a surprise. To provide just one example, the ballot language mandated that much of the existing tax money used for the bus system, a three-eighths-of-

London's entire bus and tube system is competitively contracted, as is Melbourne's. London has reduced bus costs by approximately 50 percent since it began competitive contracting in 1985.

To the detriment of Missouri's public transit policies, transit agencies in Missouri have generally ignored innovative, competitive alternatives from across the United States and around the world that have improved mass transit services and lowered costs.

a-cent sales tax, be diverted to light rail without any plan to replace the funds for the bus system. Furthermore, the cost estimates for construction of the line are considered optimistic[78] even by those strongly inclined to support mass transit and light rail.[79] The Kansas City Area Transportation Authority (KCATA) has done a good job of keeping the growth of its operating expenses at reasonable levels, especially when compared to Metro and other major transit systems. However, that fiscal discipline would be tested and jeopardized if supporters of the light-rail plan succeed in their lawsuit contesting the City Council's decision last fall to overturn the 2006 vote.

One way for this project to become a reality, and for the will of Kansas City voters to be heard, is for mass transit supporters in Kansas City to embrace public-private partnerships, competitive contracting, and other funding innovations in the delivery of mass transit. If Kansas City were to follow the examples of cities such as Las Vegas, Denver, and San Diego, it might be able to provide its citizens with the mass transit system they desire and deserve, at a reasonable cost to taxpayers.

C. An Alternative to Raising Taxes: Public-Private Partnerships and Mass Transit

Public-private partnerships have the potential to be utilized as a fiscal and management tool for mass transit, for reasons similar to those we observe with bridges and highways. Mass transit's revenue problems can hardly be attributed to a lack of taxpayer funding. Simply increasing sales taxes or diverting them from one fund to another will do little to address the core reasons for the financial woes these systems face.

To the detriment of Missouri's public transit policies, transit agencies in Missouri have generally ignored innovative, competitive alternatives from across the United States and around the world that have improved mass transit services and lowered costs. For too long, Metro has been trapped in a vicious cycle of service cuts, fare increases, and pleas for higher taxpayer subsidies — mostly from non-transit users. KCATA has done a good job of holding the line on costs and budgets, but new demands to build light rail in Kansas City will place enormous pressure on the agency to build transit systems for which it simply does not have the funding.

None of the preceding alternatives are viable as long-term solutions for mass transit in Missouri. Raising sales taxes across the board to provide more transit funding would be yet another drag on Missouri's economy, and would provide a perverse incentive to transit agencies — rewarding them for an inability to live within their means, and allowing them to avoid difficult decisions about how to better allocate the resources they already receive.

As governments — and taxpayers — around the world tire of the escalating costs of mass transit systems, they are responding by inviting private companies to submit proposals to operate all or part of their service. Public agencies determine and administer the level of services, routes, fares, etc., and the private sector fulfills the terms of the contract for a

specified period of time. Public agencies can contract for some or all transit needs, including operations, maintenance, planning, marketing, customer information, technology, and security, as well as establish both incentives and severe penalties for safety, employee turnover, cleanliness, information, on-time arrivals, and ridership. Contracts go to the lowest, most qualified and responsible bidder, and that bidder is monitored throughout the contract to ensure compliance. This idea is not new to Missouri — many government entities use competitive contracting to provide a number of services to the public, including Saint Louis County's pharmacy services.[80]

Competitive contracting has produced positive results for transit agencies in the United States and abroad. The quality of competitively bid transit has been found to be equal to or better than that provided previously, and ridership has generally risen as cost savings allow for expanded service. According to Wendell Cox, direct savings from competitive contracting have ranged from 14 to 52 percent, with an average of 30 percent, over the former non-competitive service in cities that have competitively contracted out at least 10 percent of their service.[81]

Of course, it will not be easy for Metro and KCATA to change how they do business and to embrace competitive contracting on a scale that could significantly reduce overall costs and improve service. This is in large part because many powerful interests benefit from the current, predominately non-competitive system — not the least of which are the public employee labor unions representing transit workers.

To surmount the obstacles blocking real reform of public transit operations, Missouri can begin by looking to Colorado, which enacted a law mandating competitive contracting in 1988. Between 1988 and 2002, Denver's Regional Transportation District (RTD) achieved both a unit cost savings of 30 percent and a 90 percent increase in service levels — in marked contrast to the 33-percent cost increase and 13-percent decline in service levels for the 10 years prior to contracting.[82]

Missouri policymakers must break the cycle of subsidy and failure that has ensnared Metro, KCATA, taxpayers, and transit commuters. But instead of raising taxes on everyone in Saint Louis County through an increased sales tax, the boards of directors at Metro and KCATA should carefully study employing those same competitive models to reduce the cost and improve the quality of public transit service in Missouri. Correctly understood, Missouri's mass transit does not have a funding problem — it has a cost problem. Rather than increasing taxpayer subsidies and fares, or cutting services, Metro and KCATA could utilize "competitive contracting" in the provision of transit services.

D. The Potential of Competitive Contracting for Metro and KCATA

Once again, semantics are important. Competitive contracting is not privatization in the sense that the public entity divests itself of the responsibility of providing mass transit services for citizens. Competitive contracting is a public-private

Missouri policymakers must break the cycle of subsidy and failure that has ensnared Metro, KCATA, taxpayers, and transit commuters.

A recent Transportation Research Board survey notes that out of transit managers who chose contracting, when asked if they had to do it over again roughly 80 percent said they would stick with it a second time.

partnership that draws upon the strengths of both the private and the public sectors, but helps to minimize their individual weaknesses. In considering the potential for public-private partnerships in mass transit, some facts are important to keep in mind. Importantly, despite the fact that only 1.76 percent[83] of all travel in Saint Louis is undertaken via mass transit, the mass transit system receives half of all transportation subsidies in Saint Louis County and all of the available transit money in Saint Louis city. The notion that mass transit has been under-subsidized by non-transit users is baseless.

If Metro's cost increases had been held to the consumer price index between 1991 and 2006, Metro's 2006 operating expenses would have been 23 percent lower ($40.5 million less), while KCATA's would have been 15 percent lower ($10.6 million less).[84] If Metro had controlled costs as well as the San Diego Metropolitan Transit System has done since 1996, its 2005 operating costs would have been 9 percent lower ($15 million less). As an indication of how well KCATA has controlled costs — at least before the recent votes on light rail — it actually had a growth rate lower than San Diego's overall transit system, which is often used as an example of well-managed mass transit. However, the desire of the people of Kansas City for light rail in some form should compel KCATA to consider every possible innovation in funding and provision of services. If the cost problem in mass transit is not adequately addressed, Missouri's transit systems will continue to lurch from funding crisis to funding crisis, just as Metro has, and taxpayers will see no relief from the agencies' ever-increasing demands.

A recent Transportation Research Board survey notes that out of transit managers who chose contracting, when asked if they had to do it over again roughly 80 percent said they would stick with it a second time.[85] In 1988, the Colorado Legislature passed Senate Bill 164, which required the Denver Regional Transportation District (RTD) to contract out 20 percent of its bus service. The primary purpose of this legislation was to improve RTD's cost effectiveness. Between 1989 and 1998, RTD achieved cost savings of 40 percent — saving at least $101 million.[86] Wendell Cox further notes that "the financial benefit to the community is even more, since RTD's private contractors pay state and local taxes, fuel taxes and license fees, unlike RTD."[87]

In addition, cost savings continue to escalate as Denver RTD continues to encourage competition and pursue efficiencies. Indeed, competitive contracting produced a "ripple" effect and has even induced better cost performance within RTD. Before competition, RTD bus system costs per hour rose 24 percent, but have fallen 22 percent during competitive contracting.[88] And, for many measures of safety and quality of service, the contractors performed as well as or better than RTD.

Las Vegas also has used competitive contracting to deliver bus transit services. In fact, the fast-growing city is home to the largest U.S. system that has been fully contracted out. Costs per service hour are among the lowest in the nation — approximately 30 percent below the average of systems of similar size.[89] And it's not only buses that are contracted out.

Approximately 15 percent of commuter rail services in the United States are competitively tendered, including systems in Baltimore, Boston, Los Angeles, San Diego, San Francisco, and Washington.[90] In the United States and Europe, competitive contracting has reduced operating costs from 20 to 51 percent, with savings of about 35 percent being the norm. Houston saw savings of 26 percent, San Diego of more than 30 percent, and Denver of 46 percent.[91]

VIII. BEST PRACTICES AND GUIDELINES FOR PUBLIC-PRIVATE PARTNERSHIPS

Not all public-private partnerships are created equal. Public-private partnerships can be crafted and implemented well, and they can be crafted and implemented poorly. This is true of each type of public-private partnership, from simple operational contracts to concession agreements for new assets, and, of course, a major lease agreement for a new Mississippi River Bridge, or new road capacity connecting Branson to Springfield and I-44. Fortunately, while these arrangements may be new to Missouri, they are not new to the rest of the world. A long history has established best practices and guidelines for such partnerships, to ensure that quality is delivered and that taxpayers are protected.

The public sector's key role is in setting the agenda — outlining expectations, goals, and desired outcomes. In an operational contract, the public entity establishes standards and performance requirements. Once a private partner has been selected through a competitive, open process and a contract is signed, the role of the public sector shifts from planning to that of oversight and evaluation. The public entity does not sign a contract and walk away. Rather, strong reporting, evaluation, and auditing components must be put in place to strictly monitor the contract and performance.

For new public-private partnership transportation projects, the public sector is typically responsible for defining the route and the nature of the project, land acquisition, the environmental review process, and preliminary design. Of course, the oversight and evaluation component remains as well. Given the tremendous importance of a potential new, parallel toll road to I-70, a new bridge over the Mississippi River, or a new light rail system in Kansas City, careful examination is warranted. While there are general guidelines as to how these deals are completed, it is important to note that each is unique in its own way. Indeed, one of the undervalued benefits of public-private partnerships and concession arrangements is that they are customizable to fit the needs, goals, and desired outcomes of a community or a state. In addition, the concession should be structured to mitigate any concerns, and adequate protections for the public interest must be incorporated into the binding terms of the concession agreement.

There are many components of a concession agreement: length of concession, toll schedule, and performance requirements, to name a

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Depending on the goals or needs of the public interest, the public entity can increase or decrease the value of the contract to both the public and the private contractor.

few. Depending on the goals or needs of the public interest, the public entity can increase or decrease the value of the contract to both the public and the private contractor. One way to view this is that each component of the contract — length of agreement, toll schedule, performance requirements, etc. — is an individual dial that can be adjusted up or down. For example, "dialing down" the length of the concession term will lower the concession price while "dialing up" the ability of the concessionaire to raise tolls will increase the price. The governing body will have to balance its need for raising revenue with the needs and rights of users. The public sector will be responsible for identifying and specifying the best mix of outcomes — and adjusting the dials accordingly — to satisfy the public interest and ensure appropriate protections for users and taxpayers. Clearly, the governing body has tremendous control and power to set the terms of the agreement.

Concession Length

To put it simply, the longer the term, the higher the bids are likely to be, increasing the size of the up-front payout (all other things being equal, of course). Generally speaking, the minimum term to make most investments worthy is approximately 35 years. Recently, the global trend has been toward longer terms. Chicago signed a 99-year lease for the Skyway and Indiana choose a 75-year lease for the Indiana Toll Road. Texas has focused on 50-year terms for many projects in its pipeline. Terms of this length and nature are similar to investor-owned utilities in the United States, where franchises are granted for similar periods of time. The concession term must realistically be considered against other competing goals. In fact, Missouri's interests may be best served by asking for bids that consider multiple terms — 35 years, 50 years, 75 years, or 99 years, for example — to make a more fully informed decision about which term presents the best value to taxpayers.

Tolling Schedule

The ability for the concessionaire to set and/or raise tolls has a significant impact on the price investors are willing to offer. Most concession agreements allow increased toll rates on an annual basis, according to inflation.[92] Many European toll concessions use a formula with a maximum toll rate. Again, dialing this component up or down will reveal the trade-offs that must be considered. While it is contrary to free-market theory to use a concession agreement to control toll rates, it is a necessary component for political considerations. The greater the flexibility and/or ability for the concessionaire to set toll rates, and increase them over time, the greater the initial payout will be. "Dialing down" or limiting the ability of concessionaires to raise tolls will likely result in lower bid prices. The goals and needs of the state will have to be weighed in this context, as will reasonable incentives for the concessionaire to continue investing capital in the infrastructure.

Revenue Sharing

Revenue sharing provisions are also something to consider. Essentially, these provisions state that the concessionaire

would share profits with the state beyond a certain rate of return. The South Bay Expressway, recently opened in the San Diego area, has this provision.[93] More recently, the 99-year lease of the Pocahontas Parkway in Richmond, Va., included a profit-sharing mechanism. In fact, rather than receiving an up-front concession fee, Virginia will receive 40 percent of gross revenues once the road becomes profitable. That number increases to 80 percent at higher rates of return. Thus, the deal could potentially add millions in revenue to state coffers during its 99-year life.

Maintenance And Performance Requirements

Any agreement should, of course, require the proposed facility to be kept in good and safe physical condition throughout the term of the concession. However, the concession agreement presents a unique opportunity to establish standards and performance requirements as specific conditions in the contract. Failure to meet these contract provisions should result in significant consequences for the private partners.

The Indiana Toll Road lease, for example, is governed by a detailed 263-page concession agreement that is designed to protect the public's interests. The contract details many "what if" scenarios and establishes well-defined performance levels that the contractor is legally required to meet, or face a penalty. Dead animals in the roadway, for example, need to be cleared within eight hours, and potholes must be filled within 24 hours. Many of the standards in the contract exceed the standards applied to roads under the control of the Indiana Department of Transportation. Most importantly, Indiana can revoke the contract at any time for breach of contract. The concession agreement sets the conditions for the state to cancel the contract and resume operations of the road should the contractor fail to perform. In any event, the state keeps the $3.85 billion up-front payment, meaning that the contractor has assumed all the risk, rather than the taxpayers.

Maximizing And Protecting New Transportation Funds

The prospect of a multi-billion-dollar "windfall" for the state can present problems for public officials who all believe they could best spend the new money. This could happen in Missouri if a private company were to pay for the right to operate an existing transit system, or for the opportunity to build a new, tolled highway. The following are some useful guidelines for consideration in how to maximize these potential new transportation funds:

1. The majority of the corpus should be placed in a trust fund that would provide annual interest payments to fund ongoing maintenance and operations.
2. Any debt on existing assets should be paid off — this smaller debt service will, in the long run, create a stream of future benefits.
3. Monies should be dedicated to one-time capital expenses in need of immediate attention. For example, MoDOT has identified many structurally deficient bridges that need repair.

The concession agreement presents a unique opportunity to establish standards and performance requirements as specific conditions in the contract.

Drafted properly, these deals are truly partnerships, in which the state maintains responsibility for what it does best while the concession company handles the things that it does best.

IX. ANSWERS TO COMMON CONCERNS ABOUT PUBLIC-PRIVATE PARTNERSHIPS

Despite the increased utilization of public-private partnerships, and the enormous benefits to taxpayers and the public sector, reasonable concerns have been expressed by policymakers, economists, and the general public. Some of these concerns were discussed in Section IV.

"Sale" Vs. "Lease"

Public-private partnerships do not involve the sale of any facilities. Some partnerships involve short-term contracts to design, build, and possibly finance a road or bridge. The most dramatic form, the long-term toll concession, still involves only a long-term lease — not a sale. The government remains the owner at all times, with the private-sector partner carrying out only those tasks spelled out within the concession agreement, and according to the terms set by the state. Drafted properly, these deals are truly partnerships, in which the state maintains responsibility for what it does best (right of way, environmental permitting, policymaking, enforcement of performance requirements, etc.) while the concession company handles the things that it does best (design, finance, construction, operation, marketing, customer service, etc.).

Foreign Companies

A common concern about any public-private partnership is the likelihood that a foreign company will become the state's partner in operating a toll road, bridge, or mass transit system. The potential is high that a foreign company would win the bid because foreign companies have the most experience with public-private partnerships. Roads in Australia, New Zealand, France, Italy, and Spain have utilized public-private partnerships for years. Therefore, it is not surprising that the private-sector role in the provision of transportation services is more developed and mature outside of the United States. However, a domestic market is rapidly emerging in America. Investment firms, including Goldman Sachs and the Carlyle Group, have created their own infrastructure investment groups. During the bidding for a recent public-private partnership proposal in Colorado, several bids came from domestic firms. When Pennsylvania requested bids for a public-private partnership to operate the Pennsylvania Turnpike, 14 teams representing 32 different financial and engineering companies responded with heavy international, Canadian, and U.S. representation.[94]

Missourians should not be too concerned if a foreign company from Australia or Spain (like the consortium currently operating the Indiana Toll Road) wins the bid to build a new privately operated highway here, such as a parallel I-70 route. In practice, there is little difference between international and domestic concessions. First, any potential roads would remain the property of Missouri. Second, the terms and

conditions of the contract would empower the state to seize control of the road should the company violate its contractual agreements. Third, a road is a fixed asset. It is not as though a foreign company will be able to take this asset and "go back home." Finally, many foreign companies are represented in the pension portfolios of many Missourians — including labor union workers. The fact that Americans are investing substantial amounts of money in these companies, such as the Australia-based Macquarie, effectively blurs the line between foreign and domestic interests.

It is important to remember that even deals involving 100 percent non-U.S. companies are very good for our economy. Attracting billions of dollars in global capital (and expertise) to modernize vital highway infrastructure is a large net gain for this country. Rather than investments and jobs going overseas, foreign entities are willing to invest their money here, creating jobs in the United States. The further build-out and investment in our transportation infrastructure only makes the United States more competitive in the global marketplace. In effect, foreign investment in our nation's infrastructure represents the reverse of outsourcing — it's more properly viewed as "insourcing." The opportunity to "insource" significant amounts of foreign cash into Missouri should be embraced rather than rebuffed.

Toll Increases

There are concerns that public-private partnership deals will lead to sky-high toll rates in future years, leaving the impression that tolls are uncontrolled. However, this is not the case. Most concession agreements to date have incorporated annual caps on the amount that toll rates can be increased, using various inflation indices. As discussed in the previously cited paper by Engel, Fischer, and Galetovic, until a transportation system has enough toll roads in operation that the various roads compete with each other, it is preferable for governments to regulate the toll amounts to preserve the interests of the public. Because the few routes that have been considered for a toll so far in Missouri would not have competition from other toll roads — at least for any foreseeable future — it will be necessary for the state to include toll rate caps as part of any public-private partnership agreement.

It is important to note that those caps are ceilings; the actual rates a company will charge depend on market conditions. Before entering into any toll road project, a company (or a toll agency) undertakes detailed and costly studies of traffic and revenue. A major goal of such studies is to determine how many vehicles would use the toll road, and at what price — too high a toll rate means fewer would choose to use the toll road, which generally results in lower total revenue. The toll road's operators must select the rate that maximizes total revenue. That rate may well be lower than the caps provided in the concession agreement.

There are some cases, such as with high-occupancy toll (HOT) lanes or express toll lanes, where the main purpose of value-priced tolling is to manage traffic flow. In those cases, pre-defined limits on toll rates defeat the purpose. Those rates must be allowed to vary, as needed, to keep traffic flowing

Foreign investment in our nation's infrastructure represents the reverse of outsourcing — it's more properly viewed as "insourcing." The opportunity to "insource" significant amounts of foreign cash into Missouri should be embraced rather than rebuffed.

Contractual clauses designed to protect toll road operators from the construction of new, parallel "free" roads have evolved significantly over the years.

freely at the performance level specified. When such value-priced lanes are operated under a concession agreement, instead of limiting the toll rates, the agreement should limit the rate of return the company is allowed to make — with any surplus revenues going into a state highway or transportation fund. That is how California's original pilot program for long-term concessions dealt with the issue, and similar deals have been contracted in Texas and Virginia.

Bankruptcy

What if the concessionaire goes bankrupt? Fortunately, the lease payment is an up-front fee. In the event of a corporate bankruptcy, the asset would revert to the state, which could lease it again to a different firm. Should the concessionaire need to sell, get out of, or modify the contract for any reason, final approval rests with the state.

"Non-Compete" Clauses

Whether a road is public or privately developed, its bond investors will not buy bonds for assets with unregulated competition from entities with the power to tax and build competing facilities. Contractual clauses designed to protect toll road operators from the construction of new, parallel "free" roads have evolved significantly over the years. The approach has changed from an outright ban on competing facilities to a wider definition of what the state may build — generally, everything in its current long-range transportation plan — without compensating the toll road developer/ operator. For new roadways (generally freeway / expressway-standard roads) the state builds that are not in its existing plan, and which fall within a narrowly defined competition zone, the current approach is to spell out a compensation formula. The idea is to achieve a balance between, on one hand, limiting the risk to toll road finance providers (of potentially unlimited competition from taxpayer-provided "free" roads) and, on the other hand, maintaining the state's freedom to respond to the public interest.

Two recent long-term lease transactions provide a useful illustration. For the Chicago Skyway concession, there were no protections for the private-sector lessee. Given that the roadway is located in a highly developed area of Chicago, it is highly unlikely that any competing, parallel freeways will be developed in the future. In the case of the Indiana Toll Road lease, the concession agreement set up a narrow competition zone alongside the toll road. The state may add short, limited-access parallel roads (e.g., local freeways), but if it builds a long-distance, freeway/ expressway-standard road greater than 20 miles long within a 10-mile competition zone, there's a formula for compensating the private sector for lost toll revenue if the concessionaire can prove the new road is causing a financial loss.[95]

Losing Control

The widely expressed fear that states will either fail to protect the public interest or lose control of vital highways reflects a misunderstanding of the

true partnership created by long-term concession agreements. The use of concession agreements is a common practice that has been improved during decades of use. Concession agreements typically run to several hundred pages, and may incorporate other documents (e.g., detailed performance standards) by reference. The public interest is protected by the incorporation of detailed provisions and requirements into the contract, to cover such guidelines as:

- who pays for future expansions and rebuildings;
- how decisions on the scope and timing of those projects will be reached;
- what performance will be required of the toll road and the concessionaire;
- how the contract can be amended without unfairness to either party;
- how to deal with failures to comply with the agreement;
- provisions for early termination of the agreement;
- what protections (if any) will be provided to the company from state-funded competing routes; and,
- what the limits on toll rates or rate of return will be.

X. CONCLUSION

Business as usual will not deliver the infrastructure Missouri needs to meet the mobility and goods-movement needs of the 21st-century economy. Missouri policymakers need to embrace the considerable potential of this new paradigm for highway funding and operations. Public-private partnerships have proven to be valuable tools in leveraging private capital, improving efficiencies, and both developing and managing the transportation infrastructure and services that are the foundation of our economy. Thus far, Missouri has failed to utilize the power of public-private partnerships to help solve the state's transportation problems. Part of the reason for this is constitutional, but it can also be attributed to a failure of past policymakers and elected officials to embrace innovation. The choice for Missourians now is clear: higher taxes and fees, or partnerships with the private sector.

Policymakers are no longer forced to choose between increasing costs to taxpayers or reducing services to motorists. Public-private partnerships, when implemented properly and carefully, can benefit both the state and its citizens. This new paradigm is emerging, and Missouri's leadership must choose whether to utilize it. Missouri policymakers have approved public-private partnerships for bridges, and expanding this practice will likely better position the state for future economic development and growth. Numerous opportunities for public-private partnerships exist in Missouri, in every facet of transportation. These include constructing new highways, building new bridges, operating various transit systems and functions, and contracting for additional local and state road maintenance and operations. Each represents a new way of thinking for Missouri — and that's where our future lies.

Policymakers are no longer forced to choose between increasing costs to taxpayers or reducing services to motorists. Public-private partnerships, when implemented properly and carefully, can benefit both the state and its citizens.

APPENDIX

Why Privatizing Roads Makes Sense

Despite their importance, most observers believe that the private sector has not historically provided roads at a high enough level to meet rising demand, triggering government efforts to build roads and highways.

Economists have traditionally viewed roads as "public goods." These are goods and services that are usually, if not exclusively, provided by government. In some cases, such as a legal system where laws are applied universally on the national or state level, the private sector cannot provide the product or service. In other cases, the government has decided that it should be the exclusive provider of the service, either for ideological or practical reasons. During the early 20th century, for example, progressivism instilled a belief that government should provide core services such as electricity, water, and telephones, and numerous cities and state governments took over private utilities so they could be run by the public sector. The classic example of a public good is national defense, but roads are a close second (along with police and fire services).

The economic rationale for public goods is straightforward. Government provides a good or service because the private sector cannot, or will not, provide it through traditional means even though it has important social benefits. To be successful, entrepreneurs must be able to charge a price high enough to offset the costs of production. With public goods, the private company sometimes cannot charge a price high enough to generate revenue that covers its costs.

Traditionally, roads have provided the textbook case of a public good. An efficient and well-functioning road system is a fundamental building block of the economy. Roads provide mobility to citizens and businesses, access to workers and jobs, and reduced production costs resulting from lower transportation costs.[96] Roads play an even more critical role in a service-based economy where commutes and work schedules are flexible and increasingly dynamic. Commercial and service-based economies rely on the automobile as the primary mode of transportation for workers, commerce, and industry.[97] Yet, despite their importance, most observers believe that the private sector has not historically provided roads at a high enough level to meet rising demand, triggering government efforts to build roads and highways to meet the needs of a growing and diversifying economy.

The private sector might fail to provide public goods such as roads for several reasons:

First, if users cannot be "excluded" from consuming the product or service, that would make it impossible for the producer to charge a fee that would cover the costs of providing the service. In the case of defense, once a firm provides services that protect the national borders, every citizen benefits, regardless of whether they voluntarily pay for it. Even if Microsoft, General Electric, General Motors, and other corporations were willing to fund the entire military effort, "free riders" would undermine their willingness to pay for a service that benefits everyone. Thus, defense is usually provided by the government and funded through general taxes.

A second obstacle occurs if consuming the good (or service) is "non-

rival," i.e., one person's consumption of a resource does not limit the ability of someone else to consume it, too. Breathing air, for example, does not affect how much another person can breathe. Air does not need to be rationed, because air is abundant; everyone can breathe it, and it is everywhere.

Third, if the costs of negotiating, enforcing, and implementing contracts with suppliers and consumers — the transaction costs — are high enough, the private sector will not produce the good even though large social benefits would result from its provision. Railroads used this argument in the 19th century to justify the use of eminent domain to seize private property to build rail lines as did mill operators in the 17th and 18th centuries. The same arguments are used to justify the government provision of roads.

Roads have typically been characterized by two of these three conditions — non-excludability and transaction costs —in contemporary times, at least. Most roads, particularly local ones on a local grid network, have multiple access points, which makes exclusion impractical for most towns and cities. Any attempt to price a specific road to cover its costs would thus be doomed to failure because the availability of unpriced alternative roads are freely available, and few mechanisms exist to prevent drivers from avoiding payment by diverting to unpriced roads. The transaction costs of assembling land are also thought to be prohibitive for the private sector, justifying the use of eminent domain to compel the acquisition of property for new roads.[98]

But roads *are* characterized by "rivalness." Roads occupy a defined amount of space. As more people use a road, the ability of other drivers to maneuver and use it at free-flow speeds becomes impaired. If the space available for vehicles is not increased — by building new roads, widening existing roads, or reconfiguring existing road networks — travel becomes congested, limiting mobility and the road's usefulness (and discouraging additional use or demand).

Thus, traditionally, excludability and transaction costs have been the primary obstacles to the private provision of roads.

Despite these problems, early highway construction was characterized by substantial private-sector initiative, particularly during the early years of urbanization and industrialization in Europe and the Americas. During the 18th and 19th centuries, between 2,500 and 3,200 companies operated toll roads in the United States, according to economists Daniel Klein and John Majewski.[99] These companies built and operated between 30,000 and 52,000 miles of highway, the rough equivalent of the current Interstate Highway System. Unfortunately, most of these companies also operated at a loss.[100] By 1900, the private sector's role in building, operating, and maintaining U.S. roads had largely disappeared — except for a number of toll bridges.

While the role of private road companies lessened, tolling continued to be an important means of financing new roads throughout the 20th century. Tolling began to diminish significantly during the construction of the Interstate Highway System because federal law required state and local governments to eliminate tolls as a condition for obtaining

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Consumers value roads for the mobility and access to destinations they provide. In principle, they would be willing to pay for these services.

federal funds for new road construction. One of the goals of the program was to create a national system of limited-access highways, and policymakers at the time believed this should be a national function. Financing and maintaining new roads was the responsibility of federal and state gas taxes, although some existing toll roads — such as the Pennsylvania Turnpike — were grandfathered. Unfortunately, the long-run implication was to significantly diminish the role of tolling as an important financing tool for road construction, maintenance, redesign, and reconstruction.

Thus, the consequence of relying predominantly on taxes rather than user fees was to limit funds for expanding highway capacity as demand increased. Since the effective end of new interstate highway construction in 1980, travel demand has more than doubled while new road capacity has increased by about 4 percent.[101] Not surprisingly, traffic congestion has increased dramatically in almost all major urbanized areas as new capacity failed to keep pace with burgeoning demand, particularly in fast-growing cities.[102] Based on current trends, a dozen more urban areas will face traffic congestion equivalent to today's Los Angeles by 2030, in large part because they will not add sufficient road capacity to handle rising travel demand.[103]

Paradoxically, rising traffic congestion and limited tax revenue for new road facilities stimulated investment in new technologies that are laying a foundation for the effective and practical privatizing of roads. The higher levels of traffic congestion intensify the consequences of unregulated access to a facility that is subject to rivalness. In extreme cases, the road simply cannot perform its core function of providing mobility as traffic slows to a crawl.

Naturally, entrepreneurs would see these conditions as an opportunity — consumers value roads for the mobility and access to destinations they provide. In principle, they would be willing to pay for these services. If entrepreneurs could figure out ways to eliminate, or significantly mitigate, the problems of excludability and transaction costs that limit the private provision of roads, they could exploit a market opportunity and "monetize" the value by building new road facilities that guarantee mobility, allowing users to pay for the service. The key is to capture this market value. Indeed, technology and innovation have dramatically changed the economic landscape for roads and highways, suggesting that roads may be making an important transition from public to *private* goods. Three major road projects symbolize this transition.

First, Canada's Highway 407 ETR (electronic toll road) opened in 1997, providing the world with its first look at a 21st-century highway. This east-west limited-access highway runs for 67 miles just north of Toronto. What makes this road different is how it is paid for. It's a toll road, but toll collection is completely electronic. Overhead gantries identify cars and trucks going underneath, at every entry and exit point, and drivers are charged for the number of miles they drive on Highway 407. More than three-quarters of the daily travelers use electronic transponders that allow the 407 ETR Concession Company (owned by Spanish

company Cintra) to bill users to permanent accounts, similar to debit or credit cards. The other users are identified visually and billed; video cameras photograph license plates and cross-match the plate number with motor vehicle records. Thus, the toll road is boothless, allowing vehicles to travel the entire distance at free-flow speeds with minimal interruption. More importantly, the facility is self-financing because the toll acts as a true user fee.

The 407 ETR Concession Company operates on a 99-year concession (long-term lease) with the Ontario provincial government using technology developed by the former Hughes Aircraft (now Raytheon). The system has been so successful that the roadway has already been widened several times. The highway started as a road with two lanes going in each direction (2 x 2). It was then expanded to 3 x 3 and in some places 4 x 4. Some sections are now even 5 x 5.[104]

While the 407 ETR's boothless system, dubbed "open-road tolling" or ORT, was unique in its application to an entire roadway, the use of concession agreements with private companies to finance, build, operate, and maintain such facilities was not. Numerous nations have used these agreements to add new road capacity to their systems.[105] In fact, all of France's major limited-access highway system is currently managed and operated by private companies under long-term concessions. Outside Paris, a private company, Cofiroute, proposed to build, operate and finance the long-delayed 5.2-mile missing link of the A86 ring road. The private debt and operating costs are funded completely through toll revenues. Australia is another notable case where private companies have successfully financed and built expressways while pioneering tunneling technology to ease traffic congestion in the major cities (Brisbane, Melbourne, and Sydney).

Almost all these facilities relied on private equity to fund their construction and pay off the debt through toll financing. They didn't have much choice: The federal and provincial governments simply did not have the money to finance large infrastructure projects. These projects and dozens of others have demonstrated that new road facilities, whether they are highways, tunnels, or bridges, can be privately funded, built, operated, and maintained from a sustainable, customer-based funding source. In short, they made revolutionary strides toward solving both the excludability and the transaction costs barriers to the private provision of roads.

On the demand side, ORT technology helped eliminate a significant impediment to a user-fee-based system for funding new roads: the delays and safety concerns associated with traffic slowing and merging, to accommodate manual revenue collection at toll booths. Indeed, the safety risks associated with toll booths was an important consideration in the elimination of tolls on several roadways, particularly in the northeast. Open-road tolling has effectively eliminated these dangers.

Electronic tolling also has the potential to substantially lower the costs of collecting tolls on existing toll roads. While transponders and license plate recognition technology requires substantial up-front capital costs, the potential for reducing operating costs is significant because the collection costs per transaction are often

Numerous nations have used concession agreements to add new road capacity to their systems.

50 to 80 percent lower than collecting tolls using traditional toll booths.[106]

Another technological breakthrough may have even greater potential for privatizing roads. Most highway tolls are flat rates: one price regardless of the time of day or traffic volume, although the toll level is commonly adjusted for the length of the trip. This rate structure reflects the historical role tolls have played to finance the initial construction of roads, rather than manage them, and pay off the resulting debt. Travelers, however, value the service the road provides — quick, reliable access to preferred destinations. Thus, while flat-rate tolls might generate revenues to pay off debt, they do not serve to regulate traffic flow so as to maintain a specific level of service. In other words, they are not used as a means of enhancing the product's value to the consumer.

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Historically, this made sense for most roads. The technology didn't exist to allow for toll rates to change within a window sufficient to influence driver behavior. Automated coin tollbooths and metal strips for toll cards were implemented in the 1960s. Most toll collections were manual, and little thought was given to measuring the actual volume of the traffic on the roadway. New technology, however, has given road managers more flexibility for setting toll rates based on the volume of traffic at specific times of the day, as well as the ability to change the price as traffic patterns change. Electronic tolling provides the technological foundation to implement *variable* rate pricing to guarantee a constant level of service.

The global pioneer in open-road, variable tolling as a way to manage roads — fusing the need to raise revenue to pay for the new capacity *and* manage it effectively — is the 91 Express Lanes project in Orange County in Southern California. This 10-mile stretch of limited access highway was originally added to a highly congested freeway (SR 91) by a private company, but sold to the Orange Country Transportation Authority several years later. Like the private company did, the OCTA sets the toll rates based on the traffic volume to ensure free-flow traffic 24 hours a day, seven days a week. (In fact, tolls are refunded at the end of the trip if the vehicle doesn't travel at the speed limit.) The peak toll recently was raised to $10 ($1 per mile) to achieve this goal.[107] While criticized by the public, OCTA notes that it needs to set the price to maintain free flow, or it has "nothing to sell." Moreover, during times with lower demand, prices are substantially lower; at night, for example, prices can be as low as 12 cents per mile. Currently, with toll rates adjusted based on traffic volume, users of the 91 Express Lanes shorten their time on that stretch of road from 40 minutes to less than 10 minutes.

Down the road on I-15 in San Diego, high occupancy vehicle (HOV) carpool lanes were converted into high occupancy toll (HOT) lanes. Solo drivers were given access to the lanes for a fee. This fee can change in real time based on current traffic volume and conditions. Thus, in addition to using variable rates, tolling on the I-15 HOT Lanes is *dynamic*, allowing road managers to regulate the volume and level of traffic to maximize the road's value to its traveling consumers. The program has been so successful that the transportation authority is now expanding the HOT lanes to accommodate additional traffic.

Table A1: Largely Self-Funded Toll Roads

PROJECT	DESCRIPTION	EST. COST	% SELF-SUPPORT (EST.)
South Pasadena Tunnel	4.5 mile, 4 lanes each direction	$1.5 B	100%
Palmdale-Glendale Tunnel	21 miles (5 miles at grade); double decked	$3.7 B	100%
Riverside-Orange County Tunnel	14 miles	$7.4 B	59%
LA HOT Lane network	1,009 lane-miles (385 of them new)	$13.5 B	92%
San Bernardino-Riverside HOT Lane network	410 lane-miles (320 of them new)	$5.8 B	72%
Atlanta Congestion Mitigation strategy	Four major infrastructure projects including regional HOT Lane network, truck toll lanes, and new tunnel	$25 B	78%

Source: Reason Foundation

Similar technology is being used on I-394 in Minneapolis, where rates are adjusted every three minutes to ensure at least 50 mph speeds on its managed lanes.

Importantly, these are examples of new highway facilities that "pay their way." While the San Diego HOT Lanes are operated by a regional public-sector transportation authority, the 91 Express Lanes and the 407 ETR were built and are successfully operated by private companies. Combined with several other international examples, they demonstrate that the private sector is capable of providing road facilities in a competitive environment.

In the long run, of course, privately provided roads can only be sustained if users completely pay their way. Few road systems are capable of achieving this goal now, but the environment is changing. The most important challenge facing privately provided roads is their competition — nearby roads and routes with free access.

Nevertheless, self-funded roads are more viable than many people have thought in the past. In the fall of 2006, the Reason Foundation released a comprehensive road-based congestion mitigation strategy for the Atlanta metropolitan area that included tunnels and new highway capacity.[108] The free flow travel would be guaranteed through a self-funded HOT Lane network generating substantial additional revenues, which could help fund the construction of a new north-south tunnel, to divert through traffic away from Downtown Atlanta, as well as a truck-only tollway. A few relevant projects — and their potential for costs to be covered through toll-based user fees, based on research by the Reason Foundation — are summarized in Table A1.

These facilities, of course, are limited-access highways. They restrict entry and exit through entrance and exit ramps, giving travelers or users little opportunity to avoid the toll. The primary innovation in solving the excludability problem that has plagued the private provision of roads in the past has been technological — lowering the costs and increasing the practicality of collecting tolls — rather than based in new road designs. Improvements in toll collection technology

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Because GPS technology provides a means for levying fees based on the specific location and time a car is driving, revenues can be raised directly from users and prices can be used to manage traffic flow.

have created an economic environment in which private-sector investment becomes feasible and sustainable. Improvements in toll collection technology — both video and electronic tags — have substantially reduced the transaction costs of collecting tolls and improved enforcement capabilities.

Local and regional roads provide a more difficult economic environment for private provision. Local roads typically involve multiple points of entrance and egress, as vehicles are provided frequent access to local destinations such as restaurants, offices, residents, shopping, and entertainment. Levying a toll at the point of entry and exit is impractical, although the recent success of implementing a cordon charge around central London suggests that many of the hurdles are now political rather than technical.

Technology is once again providing new ways to charge road users, eroding both excludability and transaction costs as significant barriers to the private provision of road facilities. The most promising U.S. experiment is a mileage fee pilot project undertaken by the Oregon Department of Transportation. Like nearly all states, Oregon was faced with a substantial erosion in transportation funding, as increased fuel economy reduced gasoline tax revenues per mile driven, accompanied by strong political resistance to increasing gasoline tax rates. This dramatically reduced the state's ability to raise revenues for highways and roads. Using state-of-the-art GPS technology, the state experimented with levying a charge on drivers based on the miles they traveled rather than the gas they consumed. In the pilot project, the state levied a mileage charge that differed based on whether the driver was traveling in state, out of state, or at peak periods.[109]

Conceptually, this is a much more efficient funding system, because mileage is a much better indicator of impact on the road system than is the amount of fuel consumed. More importantly, with a mileage charge that varies by time of day, drivers would be given stronger and more direct information about the economic cost of traveling on particular roads at particular times. Because GPS technology provides a means for levying fees based on the specific location and time a car is driving, revenues can be raised directly from users (eliminating the problems of excludability) and prices can be used to manage traffic flow (addressing the public good problem of rivalness). In short, technology is helping shift roads from the classic case of a public good to a private good.

Technology is also providing a more competitive environment on the supply side. While road networks still may need to be designed in a holistic context, specific elements and segments of the road network should probably not be managed or operated through a monopoly. By allowing multiple providers to choose different levels of service and quality, regions can more effectively tailor services to specific categories of travelers. For example, operators specializing in meeting the needs of commercial truck traffic may be better owners, operators, and managers of commercial roads, with stronger incentives to create and maintain facilities such as truck-only toll lanes.

Similarly, other operators may specialize in providing road facilities for commuter traffic.

The possibility of differentiating road facilities based on a diversity of providers is not as far-fetched as it might seem. Public transport services — whether rail, trolley, ferry, or bus — have a long tradition of relying on multiple providers with varying ownership interests and types. In Santiago, Chile, four independent toll road companies manage 97 miles of urban toll roads using electronic, open-road tolling technology to achieve systemwide interoperability. The system is seamless for consumers, who may never even realize their travel has involved roads maintained and operated by different private companies.[110] Because the toll road network is an open-road system, the firms had an incentive to create a seamless and user-friendly billing system to minimize toll avoidance, adapting and applying to their toll road systems software that was already used by utilities.

Combined with GPS technology, which allows road operators to charge drivers based on their location, time of day, and traffic volume, roads can be managed and operated by both small and large companies. Indeed, within the industry of road infrastructure investment and management, companies frequently combine with their competitors to jointly manage different facilities. The Spanish infrastructure company Cintra and the Australian firm Macquarie, for example, are global competitors that joined forces to successfully bid for the Chicago Skyway concession in 2005, and the Indiana Toll Road concession in 2006.

Complete privatization of roads is unlikely within the next decade or two. Nevertheless, with open-road tolling, the potential for privatizing the management — if not ownership — of limited-access highways already exists. Moreover, some estimates indicate that as much as half of the new limited-access highway capacity added in recent decades has used tolling to finance the expansions. The expanded use of public-private partnerships in harnessing the efficiencies of private management, as well as tapping into private equity markets, clearly demonstrates that the private sector recognizes the economic value of road facilities. As national, state, and local governments fine-tune and refine their PPP agreements, the full privatization of select limited-access highways is conceivable by the middle of this century. With additional modifications and innovations in GPS technology, even the privatization of local roads could be feasible by the turn of the century.

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