# FINANCING HIGH-SPEED INTERCITY PASSENGER RAIL WITH TAX CREDIT BONDS: POLICY ISSUES AND FISCAL IMPACTS

**Prepared for the American Public Transportation Association**
**June 25, 2008**


**Prepared by:**

**Mercator Advisors, LLC**
**1629 Locust Street – Suite 100**
**Philadelphia, PA 19103**
**www.mercatoradvisors.com**

**VantagePoint Associates, Inc.**
**1500 Walnut Street – Suite 1060**
**Philadelphia, PA 19102**
**www.vpointassociates.com**

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## INTRODUCTION

This briefing paper was commissioned by the American Public Transportation Association (APTA) to present the results of a fiscal and policy analysis of utilizing a potential tax credit bond financing program to facilitate investment in high-speed intercity passenger rail. The consulting team retained by APTA to perform this analysis consisted of VantagePoint Associates, Inc. (VantagePoint) and Mercator Advisors, LLC (Mercator).

VantagePoint developed a fiscal impact model to estimate the federal and state individual income taxes that would be generated from the construction and operation of the Midwest Regional Rail Initiative (MWRRI). This project serves as an example of the type of investment that might be made with a tax credit bond financing program targeting high-speed intercity passenger rail. To date, the MWRRI has the most comprehensive underlying economic data available of the designated high-speed rail corridors, and for that reason was used for the analysis. This regional passenger network will be comprised of eight interconnecting rail corridors that emanate from Chicago and serve the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio and Wisconsin. For purposes of the analysis, the MWRRI was assumed to have a capital cost of $10.6 billion (year-of-expenditure dollars) over a 10-year construction period covering 2008 through 2017.

Mercator assessed the policy issues and estimated the budgetary costs associated with a potential tax credit bond program that could be utilized by sponsoring states to help finance intercity passenger rail corridors such as the MWRRI. Tax credit bonds are long-term debt instruments issued by state or local governments where, in lieu of receiving annual cash interest payments, the investor receives annual federal tax credits. The tax credits may be used to offset other taxable income of the investor. From the state/local issuer's perspective, tax credit bonds represent zero-interest borrowing, since the federal government effectively pays the "interest." The purpose of the analysis is to explain why this particular form of federal assistance is being considered by policy makers and assist project sponsors and other stakeholders in evaluating both the benefits and the challenges of this financing mechanism.

**RESULTS IN BRIEF**

Investment in a regional rail corridors program such as the MWRRI will result in the creation of both direct jobs related to the construction and operation of the system and additional jobs due to the regional benefits and economic activity over the long-term operating period. The analysis shows that such investment can generate income tax revenues that largely offset the cost of the proposed tax credit bond financing program. Although the federal budget scoring does not recognize the future tax revenues that would be generated, the analysis clearly demonstrates that investing in high-speed rail will generate substantial fiscal benefits to the federal and state governments, in addition to enhancing mobility and providing other public benefits.

The analysis assumes that the state sponsors of the MWRRI would finance a $10.6 billion program (year-of-expenditure dollars) by issuing 30-year tax credit bonds as needed over a 10-year construction period (covering 2008-2017) to fund the annual capital requirements. The 30-year bond term enables better matching of the financing costs with the long-term fiscal and other benefits of the infrastructure investment. The proposed Rail Infrastructure Bond (RIB) financing program would have a 10-year federal budgetary cost of about $3.1 billion (estimated tax expenditures). Over the life of the bonds (through 2047), the federal tax credits would total $19.9 billion.

The MWRRI sponsors would share the cost of the RIB financing program by using state/local revenues to repay bond principal. The issuer could make level annual payments into an escrow account or sinking fund used to secure the payment of bond principal at maturity. Those payments would total about $730 million during the 10-year construction period and nearly $4.7 billion during the full term of the bonds. Together with estimated sinking fund earnings of nearly $6.0 billion, those annual contributions would be used to repay bond principal at maturity. Alternatively, the issuer could make a single upfront deposit to a sinking fund for each series of bonds issued. In that case, the upfront contributions would total about $2.5 billion while the sinking fund earnings would total $8.1 billion during the term of the bonds. Under either alternative, the present value of the federal subsidy provided by the RIB financing mechanism would be about 76 percent of the $10.6 billion program cost.

The analysis shows that the income tax revenues expected to be generated over a 40-year period (10 years of construction and 30 years of operation) would exceed the fiscal cost to the U.S. Treasury of the tax credits and significantly offset the fiscal cost to the state sponsors of the bond payments. In the case of the federal government, the nominal income tax revenues generated would total nearly $21.0 billion over the life of the bonds (through 2047), exceeding the nominal cost of the tax credits by about $1.0 billion. In addition to the individual income taxes resulting from the MWRRI investment-related jobs, those revenues would include income taxes paid by the RIB investors, who must report the annual credits as taxable income. In the case of the MWRRI state sponsors, the nominal income tax revenues generated by the MWRRI

investment would total nearly $3.3 billion over the life of the bonds (through 2047), offsetting about 70 percent of the $4.7 billion cost of annual sinking fund payments. These results are presented in the following summary table.

**Summary Table: Comparison of Financing Costs and Income Tax Revenues Generated**

| ($ Billions) | Federal Tax Credits | Inc Taxes (Bondholders) | Inc Taxes (MWRRI Jobs) | Net Federal Revenues | State Payments | State Inc Taxes | Net State Revenues |
|---|---|---|---|---|---|---|---|
| 2008 - 2017 (Budget Window / Construction Period) | (3.116) | 0.873 | 0.698 | (1.546) | (0.728) | 0.275 | (0.453) |
| 2008 - 2047 (Full Term of Bonds) | (19.932) | 5.581 | 15.372 | 1.021 | (4.655) | 3.256 | (1.399) |

It should be emphasized that this study is not a comprehensive benefit-cost analysis; it quantifies only a portion of the income tax revenues that would be generated and does not include additional revenues resulting from the economic benefits of such investment (including corporate income taxes, sales taxes and property taxes). Nor does it examine the many broader public benefits of investing in passenger rail infrastructure. Consideration of a RIB financing program should acknowledge the very limited availability of general appropriations for passenger rail and weigh the assessed budgetary costs against the larger policy objectives in addition to the quantifiable fiscal benefits. In cases involving critical public infrastructure improvements, it may be appropriate for the federal government to utilize financial incentives like tax credit bonds to stimulate such investment.

**BACKGROUND: TRANSPORTATION INVESTMENT NEEDS AND INTERCITY PASSENGER RAIL**

All levels of government increasingly are examining, documenting and debating how to address their infrastructure investment challenges. As is the case with other sectors such as energy, housing and water resources, the nation's transportation system faces critical funding shortfalls. The recent report of the National Surface Transportation Policy and Revenue Study Commission (Policy Commission) begins with "A Call to Action" to take decisive steps to restore and sustain our transportation system as a matter of national well-being. It recommends that annual capital spending for surface transportation infrastructure more than double over the next 50 years, including major increases in highway, transit, freight rail and passenger rail investment.[1] Other national-level studies have produced a wide range of "funding gaps" in various transportation modes.[2] These highly aggregated findings have been supported by more specific assessments of needed projects or planned improvements at the state, regional or local level. Regardless of differing opinions about spending priorities and technical assumptions, there seems to be "broad agreement among transportation professionals that as a nation we are under-investing in transportation – that there is a large and growing gap between available resources and infrastructure needs."[3]

Advocates of intercity passenger rail point to the economic, environmental, mobility and safety benefits of developing and improving that aspect of the national transportation system. The existing passenger rail network is operated primarily by Amtrak, a mixed ownership government corporation that was created by Congress in 1970 to inherit the unprofitable passenger rail services of the private freight railroad companies. Except for most of the 457-mile Northeast Corridor between Washington and Boston and about 200 additional miles of track, Amtrak operates passenger service over 21,000 miles of track owned and controlled by the freight and commuter railroads.[4] In 2007, Amtrak served 25.8 million passengers. About 39 percent of its ridership occurred in the Northeast Corridor, another 46 percent in other short-

[1] *Transportation for Tomorrow*, Report of the National Surface Transportation Policy and Revenue Study Commission, December 2007.

[2] Some of the more prominent include: *2006 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance*, U.S. Department of Transportation; *Future Financing Options to Meet Highway and Transit Needs*, NCHRP Web-Only Document 102, National Cooperative Highway Research Program, Transportation Research Board of the National Academies, December 2006; *Transportation, Invest in America, The Bottom Line, 2001*, American Association of State Highway and Transportation Officials, 2001; and *Future Highway and Public Transportation Financing*, The National Chamber Foundation, 2005.

[3] *The Path Forward: Funding and Financing Our Surface Transportation System*, Interim Report of the National Surface Transportation Infrastructure Financing Commission, February 2008.

[4] Policy Commission Briefing Paper 2D-02, *Conditions and Performance of the Intercity Passenger Rail System*, Cambridge Systematics, February 2007.

distance state corridors, and about 15 percent in long-distance routes.[5] The fastest growing routes in recent years have been state-supported corridors outside the Northeast Corridor.[6]

In its report, the Policy Commission described intercity passenger rail as "a critical missing link" and called for the creation of a national rail network connecting major population centers and regions. In its vision, states would coordinate with the federal government in developing regional passenger rail plans. Implementation of the system would begin with "resolving the rail infrastructure capacity crunch… occurring in specific corridors" where intercity rail can be highly competitive with highway or air travel. The Policy Commission's Passenger Rail Working Group estimated that the long-term capital cost of developing a comprehensive passenger rail network would translate to an average annual investment of about $8 billion through 2050 (compared with current capital investment by Amtrak and state governments estimated at about $1 billion per year).[7] Other studies have estimated that the average annual investment required to properly maintain existing assets and develop a more modest system of key corridors would be about $3 billion.[8]

This briefing paper examines how a federal tax incentive could be used to help finance intercity high-speed rail infrastructure. It uses a specific regional passenger rail program – the Midwest Regional Rail Initiative (MWRRI) – as an example to illustrate some of the benefits and costs of this type of capital investment. The MWRRI was chosen because it has advanced sufficiently through the planning process to enable economic analyses to generate the data necessary to estimate likely jobs, wages and income taxes in addition to capital costs.

The MWRRI is a program jointly supported by the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio and Wisconsin. It entails the implementation of a high-speed rail network, using Chicago as a hub, with primary routes through Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin. Using existing rights-of-way shared by passenger and freight rail, the network will connect over 100 Midwestern cities, linking the region's major economic centers and 80% of the region's 65 million residents. The program includes the following component rail corridors:

1. Chicago to Detroit/Chicago to Grand Rapids/Chicago to Port Huron;
2. Chicago to Cleveland;
3. Chicago to Cincinnati;

[5] Amtrak Monthly Performance Report for September 2007.

[6] Policy Commission Briefing Paper 2D-02, February 2007, op cit.

[7] *Transportation for Tomorrow*, Volume II, Chapter 4, Report of the National Surface Transportation Policy and Revenue Study Commission, December 2007.

[8] Amtrak's 20-year capital plan calls for $50 billion to develop an efficient system utilizing its existing network. The AASHTO 2002 Intercity Passenger Rail Transportation Report identified capital investment needs of about $60 billion to develop a national high-speed corridor system by 2020.

4. Chicago to Carbondale;
5. Chicago to St Louis;
6. St Louis to Kansas City;
7. Chicago to Quincy/Chicago to Omaha; and
8. Chicago to Milwaukee to St Paul/Chicago to Milwaukee to Green Bay.

**FEDERAL FUNDING ROLE FOR INTERCITY PASSENGER RAIL**

Any discussion of cost responsibility for capital improvements begins with perceived benefits. At the national level, policy makers continue to grapple with the role of intercity passenger rail in supporting the national transportation system. The current federal vision for and willingness to invest in passenger rail are unclear. There is no dedicated source of federal funding for intercity rail. While Amtrak receives annual appropriations to help cover both operating and capital expenses, according to the Government Accountability Office "the current levels of Federal subsidies are likely insufficient to maintain the existing level of passenger rail service being provided by Amtrak."[9] There have been numerous proposals to restructure Amtrak, including the elimination of lower performing services (generally long-distance routes) and the separation of the Northeast Corridor and/or certain state-supported corridors as independent entities and/or operations.

In addition to uncertain federal appropriations for Amtrak, state and local governments invest in and subsidize service on certain intercity routes, and contract with Amtrak to operate some commuter rail services. And many states are actively involved in developing high-speed regional service in 10 high-density corridors designated by the Federal Railroad Administration (in addition to the Northeast Corridor). These state-led corridor initiatives are providing impetus for the articulation of a national passenger rail strategy, including a more coherent funding approach.

Whatever national goals and regional programs materialize in the coming years, it is clear that developing a more effective passenger rail system will require substantial investment. As with other modes, it is assumed that a significant federal funding role will be required. Many stakeholder groups have proposed a new federal grant program, modeled after existing transportation programs, that would fund up to 80 percent of the capital costs of eligible projects (with state and local sponsors providing the 20 percent match). The Policy Commission has recommended the creation of such a program to provide $5 billion annually for passenger rail, to be funded by general revenues, highway user revenues and passenger ticket

[9] *Intercity Passenger Rail: National Policy and Strategies Needed to Maximize Public Benefits from Federal Expenditures*, U.S. Government Accountability Office, November 2006.

surcharges.[10] Beyond grants, other suggestions for federal assistance have included expanding the use of financing tools (such as credit support) and providing tax incentives to subsidize the cost of capital investment.

## RATIONALE FOR USING FEDERAL TAX INCENTIVES

Governments use tax incentives to encourage spending that supports desired public policies. Federal tax code measures provide major subsidies for energy, commerce and housing, education and training, employment, social services, health care, income security, and numerous other budget functions. This policy tool, however, is only minimally used in the transportation sector.[11]

As budgetary pressures continue to grow, policy makers increasingly seek to tap private investment to supplement public funding. Sponsors of "non-traditional" projects without existing funding sources must look beyond conventional grants. Tax incentives can offer a potentially effective way for the federal government to partner with state and local governments to stimulate much-needed investment in critical infrastructure. And unlike grants, which are expensed upfront, the budgetary impact of tax expenditures is spread over a multi-year period that better matches the term over which benefits are derived from the preferred investment.[12]

This briefing paper examines the federal subsidy that could be provided for passenger rail investment through tax credit bonds. Existing tax incentives are potentially available through tax-exempt governmental and private activity bonds. While these tools support the financing of many types of infrastructure, they are not sufficient for certain investments requiring a deeper subsidy. By providing a larger financial benefit to the project sponsor, tax credit bonds can enable the financing of desired investments that generate substantial benefits but insufficient revenues to support conventional financing techniques. Qualified projects would demonstrate market discipline through co-investment by private investors assuming some credit risk. Intercity passenger rail may be an attractive potential candidate for subsidized investment

[10] *Transportation for Tomorrow*, Volume II, Chapter 5, Report of the National Surface Transportation Policy and Revenue Study Commission, December 2007.

[11] In its *Estimates of Federal Tax Expenditures for Fiscal Years 2007-2011*, the Joint Committee on Taxation estimated annual transportation-related tax expenditures of about $5 billion out of total federal tax expenditures of well over $1 trillion – only about 0.5%, whereas transportation spending comprises about 6.0% of the federal discretionary budget. Most of the transportation tax expenditures are associated with the exclusion of employer-paid transportation benefits (parking and transit passes) from individual tax liability. The estimated tax expenditures associated with issuance of recently-authorized highway and intermodal private activity bonds are negligible (less than $50 million per year).

[12] The term "tax expenditures" refers to the fiscal cost of foregone tax collections to the government arising from legislated tax deductions, exclusions and credits.

through tax credit bonds since it does not have dedicated funding from existing sources. A key challenge for project sponsors is to target any proposed financial assistance – whether through tax credits or other means – to critical infrastructure generating benefits to the public that justify the cost of the subsidy.

### EXPLANATION OF TAX CREDIT BONDS

Tax credit bonds involve the issuance of intermediate to long-term taxable debt by state and local governments for designated capital purposes. The bonds do not pay interest. Instead, an investor in the bonds receives annual tax credits that can be applied against the bondholder's federal income tax liability. The amount of annual tax credits associated with the bond is determined by the tax credit rate, which is set by the U.S. Treasury when the bond is issued.[13] The tax credits are treated as taxable investment income to the holder, therefore the after-tax yield is similar to that of conventional interest-bearing taxable corporate bonds. The state or local borrower is responsible for repaying the principal from state, local or project-generated revenue sources.

Effectively the tax credit bond is a form of zero-percent bond for which the interest cost is fully subsidized by the federal government. Since interest expense on long-term bonds may constitute 50 percent or more of the financial cost of debt service, tax credit bonds provide a much deeper subsidy to the borrower than do tax-exempt bonds – even approaching the financial benefit of some grant programs.

The issuer of a tax credit bond is responsible for repayment of principal at maturity. Many proposals structure the tax credit bonds with bullet maturities (meaning the entire principal amount is paid at maturity) to maximize the financial benefit to the issuer. It is up to the issuer to determine the funding sources and payment mechanics that secure the bond principal. To assure investors that the bonds will be repaid at maturity, it is often assumed that the issuer will establish an escrow account, called a sinking fund, to accumulate revenues over time. The issuer can make periodic contributions (or even an up-front deposit) to the sinking fund, with the balances invested at guaranteed rates.[14] In this way the issuer can avoid interest rate risk and lock in an annuity-type payment sufficient to retire the bonds at maturity.

[13] For existing programs, the U.S. Treasury establishes a daily rate according to the authorizing legislation of those programs. Ideally, the credit rate would enable the bonds to be sold without discount or interest cost to the issuer. For the Qualified Zone Academy Bond program, for example, the daily tax credit rate is based on the estimated yield of AA-rated corporate bonds with a similar maturity.

[14] The issuer could lock in rates by entering into guaranteed investment contracts with securities dealers, which would then sell the issuer Treasury securities (or possibly other high-quality investment obligations) annually at predetermined prices and yields over the term of the bonds.

As with other forms of debt, a state or local government entity may need explicit authority to issue tax credit bonds. That authority, and the restrictions it places on debt obligations, varies widely among jurisdictions. While tax credit bonds do not pay cash interest, the principal payments are debt obligations of the issuer.

**PROGRAM PRECEDENTS AND LEGISLATIVE PROPOSALS**

There are three existing tax credit bond programs. The first was authorized by Congress in the Taxpayer Relief Act of 1997 to assist state and local governments with public school modernization projects in low income areas. Under this Qualified Zone Academy Bond (QZAB) program, states receive annual formula allocations of QZAB issuance authority totaling $400 million. The states determine how to award their allocations among eligible school districts. Congress has periodically extended the QZAB program at $400 million per year since its initial two-year authorization covering 1998-1999. The cumulative program issuance volume now totals $4.0 billion through December 31, 2007.[15]

Congress enacted a second tax credit bond program in 2005 to promote investment in alternative energy sources. Under the Clean Renewable Energy Bond (CREB) program, the Department of the Treasury is authorized to allocate $1.2 billion of tax credit bonds through 2008 to sponsors of energy-generating projects utilizing hydroelectric, solar, biomass and other renewable resources.[16] A third tax credit bond authorization was included as part of the federal assistance package to help the Gulf Coast states recover from Hurricanes Katrina and Rita. It allows the states of Louisiana, Mississippi and Alabama to issue up to $350 million of short-term Gulf Opportunity (GO) Zone Tax Credit Bonds to help finance reconstruction efforts.[17] Although only three tax credit bond programs have been enacted thus far, policy makers continue to consider potential applications of this tax incentive. Legislation proposed in recent years would authorize tax credit bond financing for a variety of infrastructure purposes – including energy development, environmental remediation, school construction, and telecommunications – in addition to transportation.

Some transportation tax credit bond proposals are broad in scope, such as the "Build America Bonds Act of 2007" (S. 2021). This bill would authorize states to issue up to $50 billion of tax

[15] The last extension of the QZAB program occurred in the Tax Relief and Health Care Act of 2006. The Senate Finance Committee introduced on April 17, 2008, a tax-extender bill that would authorize the QZAB program for another two years, through 2009.

[16] The Clean Renewable Energy Bond (CREB) program was authorized in section 1303 of the Energy Tax Incentives Act of 2005 (Public Law 109-58). The Senate Finance Committee's recently proposed (April 17, 2008) tax-extender bill would increase the CREB authority by $400 million.

[17] This tax credit bond program was authorized in section 101 of the Gulf Opportunity Zone Act of 2005 (Public Law 109-135).

credit bonds through a multi-state organization over six years for a wide range of infrastructure improvements including roads, bridges, rail, transit, ports and inland waterways. Others are more narrowly targeted, such as proposals to help Amtrak finance its capital program or assist states in developing intercity passenger rail corridors. Several rail-related proposals have features in common with the "Rail Infrastructure Development and Expansion Act for the 21st Century" (RIDE-21). This bill, first introduced in April 2005 (H.R. 1631) and reintroduced in May 2008 (H.R. 6004), includes a provision that would authorize states to issue up to $12 billion of tax credit bonds (in addition to $12 billion of tax-exempt bonds, as well as other measures) to help finance high-speed rail transportation projects.

**KEY FEATURES OF A RAIL INFRASTRUCTURE BOND (RIB) PROGRAM**

The funding potential of tax credit bonds for infrastructure improvements remains largely untested. The existing programs are small and have other features that limit their usefulness. In order for this financing tool to provide meaningful assistance to sponsors of large transportation infrastructure projects, the program design must satisfy three main objectives:

1. It should be accessible to sponsors / issuers and deliver the intended subsidy as efficiently as possible;
2. It should have the size and flexibility needed to attract a broad market of potential lenders / investors; and
3. It should address certain implementation and tax policy concerns of the federal government.

This section summarizes the key features of a potential Intercity Passenger Rail Infrastructure Bond (RIB) pilot program. The program concept is based generally on RIDE-21 and subsequent proposals involving the issuance of tax credit bonds for intercity passenger rail. Authorization of such a tax incentive requires amending the Tax Code (title 26 of the U.S. Code). The following list of key features was derived from a review of the authorizing provisions of the QZAB and CREB programs as well as more recent tax credit bond financing proposals:

- *Issuers* – States or state-authorized entities would issue the bonds for eligible projects.
- *Eligible Projects / Use of Proceeds* – Bond proceeds would be used to fund capital costs (including track, structures, equipment, and potentially rolling stock in addition to developmental costs) associated with high-speed intercity passenger rail projects.
- *Issuance Volume* – The RIDE-21 proposal would have authorized $1.2 billion per year over 10 years for a cumulative amount of $12 billion. Budgetary politics aside, the proposed issuance volume for an initial pilot program should be based on cost estimates for planned projects that could reasonably be expected to advance to

construction and require funding during the proposed issuance period. Existing programs (QZABs and CREBs) have been limited to $400 million per year, which would not be sufficient volume given the size of likely RIB projects such as the MWRRI.

- *Allocation of Volume* – It is likely that the U.S. Department of Transportation would need to be involved in selecting projects and allocating issuance volume, as is currently the case with the $15 billion of highway / intermodal Private Activity Bonds (PABs) authorized in SAFETEA-LU. The shaping of such a discretionary process through legislation and regulation would be very important. A formula allocation, as is done with QZABs, does not work well for a program assisting just a few very large projects. And the Treasury Department, which is responsible for allocating the CREBs issuance volume, has stated its objection to being saddled with such program administration duties. Allocation by the Congress might be problematic given current criticisms of earmarking practices.
- *Bond Maturity* – The bonds would have a maximum maturity of 30 years in order to better match the financing costs with the long-term fiscal and other benefits of the infrastructure investment. This longer term (compared with existing tax credit bond programs) also increases the financial subsidy for the project sponsor. Long-term bonds with a single "bullet" maturity maximize the financial benefit to the issuer / sponsor because of the greater value of the federal subsidy of interest. Both QZABs and CREBs have shorter maturities that are set by Treasury so that the discounted present value of the bond principal equals 50 percent of par (effectively limiting the financial subsidy to 50 percent).[18] Furthermore, the CREBs are required to have level principal amortization (serialized by year rather than having a single bullet payment), which further dilutes the financial subsidy.
- *Credit Rate* – The credit rate should be established to enable the bonds to be sold at par, without discount or interest cost to the issuer. The Treasury sets the CREBs rate daily in this manner. It sets a daily rate on QZABs based on AA-rated corporate bonds of a similar maturity.[19]
- *Creditable Taxes* – At a minimum, the tax credits should be applied to both federal income tax liability and alternative minimum tax (AMT) liability, as is the case with CREBs. Additional offsets, such as employment and social security taxes, could be considered to broaden the appeal of the program. The QZAB credits apply only to federal corporate income tax liability
- *Eligible Investors* – To maximize the market, the program design should not limit the pool of potential investors. For example, QZAB investors are restricted to banks, insurance

[18] The maximum maturity of QZABs has ranged from 12 to 16 years since the program's inception. As of April 25, 2008, both the QZABs and the CREBs had maximum maturities of 15 years.

[19] As of April 25, 2008, the credit rate for 15-year QZABs was 5.94% and the credit rate for 15-year CREBs was 5.91%.

companies and other lending institutions. As with CREBs, legislation should expressly allow mutual funds to pass through the credits to shareholders.

- *Taxability of Credits* – The bondholder must treat the tax credits as taxable income, meaning the amount of tax credits is included in taxable income and deducted from income tax liability. Thus, the after-tax yield is the same as that of fully taxable bonds. The Treasury Department and certain other federal tax policy makers tend to favor taxable incentives since, unlike tax exemptions, taxability ensures that all of the federal subsidy benefit flows to the issuer / sponsor rather than some of it flowing to the investors.[20]
- *Allowance of Credits* – The program is structured as a "nonrefundable" credit; that is, the credit may only be used to offset a taxpayer's federal tax liability and may not be tendered to the Treasury for cash, as with the Earned Income Tax Credit. The credits should be allowed quarterly, based on 25 percent of the annual amount, to taxpayers who hold the bonds on designated quarterly dates. This is the case with CREBs, which enables better matching of tax credits to taxpayer liability. Legislation should expressly allow unused credits to be carried forward to future years. And it should allow bonds or credits to be transferred through sale and repurchase agreements.
- *Credit Decoupling* – Legislation should expressly authorize the tax credits to be detached ("stripped") from the bond principal and sold separately to different investors (similar to the Tax Code section 1286 rules that apply to Treasury STRIPS). This would significantly broaden the market by enabling investors without tax liability (such as pension funds) to purchase the principal components on a deeply discounted basis as long-term zero coupons, and allowing tax-oriented investors (such as financial institutions) to purchase the stripped credit streams.[21] This feature would help deliver the intended financial subsidy more efficiently at no additional cost to the federal government.
- *Issuer Contributions* – The RIB issuers would be responsible for repaying bond principal from state, local or project-generated revenues. The program design should allow the use of sinking funds or trust accounts to secure bond principal through either upfront contributions or annuity payments with guaranteed investment rates.
- *Arbitrage Requirements* – There is a strong tax policy preference to subject tax credit bonds to the same or similar spend-down requirements and arbitrage investment restrictions that apply to tax-exempt bonds (under section 148 of the Tax Code). Legislation should be crafted carefully so that arbitrage requirements do not undermine

[20] Equity-based tax credit programs, such as those used to stimulate private investment in energy, new markets and low income housing, often are non-taxable.

[21] U.S. Treasury obligations have been strippable since 1985; the program was designed to deepen the market for Treasury securities thereby reducing the government's cost of financing. Presently there are about $200 billion of Treasury notes and bonds held in strip form.

the delivery of the intended subsidy and otherwise are "appropriate and reasonable" for the large infrastructure improvements contemplated for the RIB program.

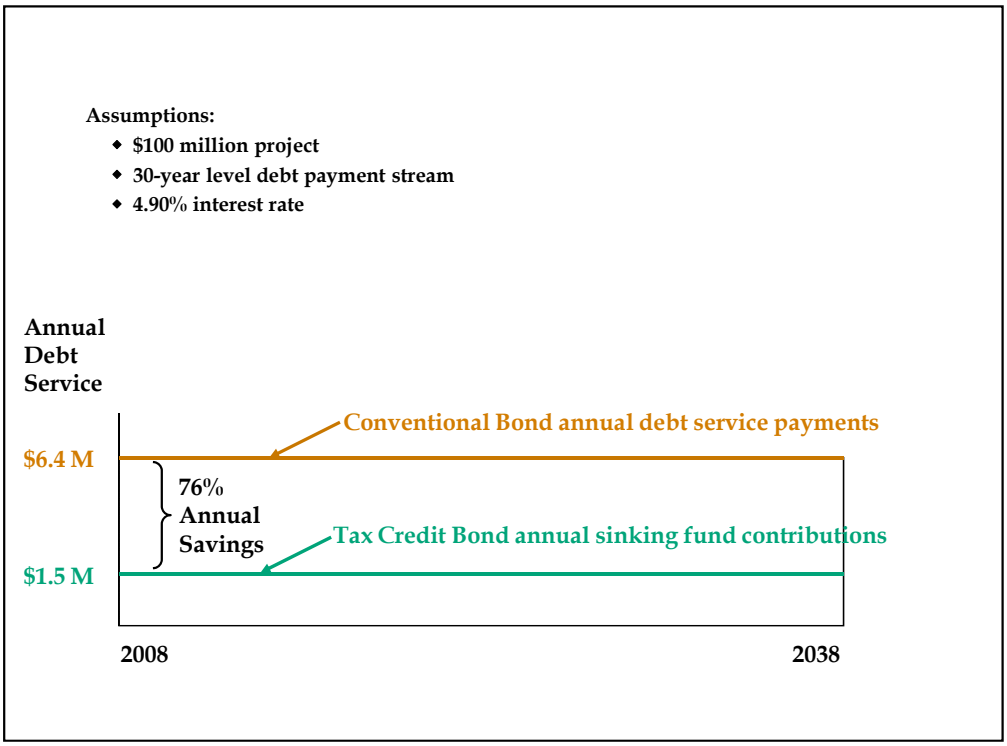
- *IRS Reporting* – It is likely that issuers of tax credit bonds will be required to submit information returns to the Internal Revenue Service similar to those presently required under section 149(e) of the Tax Code for tax-exempt state and local bonds.

**FINANCIAL BENEFIT TO PROJECT SPONSORS**

The financial benefit of zero-percent borrowing can be substantial for issuers of long-term bonds. Exhibit 1 compares the annual payment factor for tax credit bonds with that for conventional interest-bearing bonds. In this example it is assumed that the project sponsor issues $100 million of long-term bonds with level debt service to finance eligible improvements. The bonds are assumed to have a maturity of 30 years and a rate of 4.90%, paying cash interest in the case of conventional bonds and providing tax credits in the case of tax credit bonds. The annual contribution required to secure the tax credit bonds is $1.5 million, or just under a quarter of the annual $6.4 million required to pay debt service on the conventional bonds.[22]

[22] In the case of tax credit bonds, the issuer is assumed to secure the bond principal by making level annual payments to a sinking fund that earns 4.90% on its invested balances. This rate is the 30-year Treasury bond yield assumed in the President's FY 2009 Budget.

**Exhibit 1: Comparison to Conventional Borrowing**




Instead of annual payments, the project sponsor could make a single upfront deposit to a sinking fund to secure the bond principal. In this example, with a 4.90% sinking fund rate, the required upfront deposit would be $23.8 million. That initial contribution, together with $76.2 million of investment earnings over the 30-year term of the bonds, would fund the $100 million principal payment at maturity. The payment contributions necessary to secure bond principal depend on the assumed investment rate. With a 4.00% earnings rate, for example, the required upfront deposit would grow to $30.8 million. On the other hand, the upfront deposit would have to be only $17.4 million if the earnings rate was 6.00%.

The financial subsidy provided by tax credit bonds also depends on their maturity – the longer the term, the greater the value of the subsidized interest. In the example shown in Exhibit 1, the issuer's payment burden is reduced by over 76 percent if it can issue 30-year tax credit bonds instead of 30-year tax-exempt bonds. That level of federal subsidy is equivalent to a $76.2 million grant requiring a $23.8 million non-federal match. The relative subsidy would be even deeper for a corporate entity without access to tax-exempt financing.

For any given bond maturity and credit rate, the issuer will derive the greatest benefit in present-value terms if the bond comes due as a "bullet" at its final stated maturity, rather than being amortized over time as with most municipal bonds (the tax credit is granted based on the

outstanding principal balance). A large bullet maturity is commonplace among corporate borrowers, for which debt is a permanent part of their capital structure. However, most governmental issuers lack either the legal authority or the investor acceptance to structure bonds in this manner. Instead, they must provide for the orderly retirement of a balloon principal payment by making upfront or periodic contributions to a sinking fund that generates guaranteed investment earnings. The financial attractiveness of tax credit bonds diminishes to the extent the sinking fund earnings are yield-restricted or the issuer is required to annually pay down a portion of the principal balance.

Exhibit 2 summarizes the financial benefit of tax credit bonds having different maturities; the interest subsidy ranges from 51 percent with 15-year bonds to 76 percent with 30-year bonds.[23]

**Exhibit 2: Financial Subsidy under Alternative Assumptions ($100 Million Bond Issue)**

| Bond Maturity (Years) | 15 | 20 | 30 |
|---|---|---|---|
| Financial Subsidy | 51% | 62% | 76% |
| Annual Payment ($ M) | $4.5 | $2.9 | $1.5 |
| Upfront Deposit ($ M) | $48.8 | $38.4 | $23.8 |

**PERSPECTIVE OF POTENTIAL RIB INVESTORS**

In order to function efficiently, a RIB program would need to have sufficient size, flexibility and creditworthiness to attract potential investors. Marketability of the program would be enhanced by selling larger, more tradable issues to a broad investor base. This would facilitate development of an active secondary market and result in better pricing of the bonds (lower yields). Those key program features important to potential investors include:

- *Sizable Issuance Volume* – to attract large institutional investors and facilitate an active secondary market by dealers to provide liquidity for initial purchasers;
- *Expanded Range of Eligible Investors* – not limited to large financial institutions, and potentially including individuals through pooled arrangements such as mutual funds;
- *Decoupling of Credits* – to enable the bond principal and the tax credits to be sold separately to different classes of investors, depending on market conditions at the time of issuance;
- *Market-Driven Credit Rate* – to enable the bonds to be sold at par;

[23] These estimates assume the issuer secures bond principal due at maturity by making either level annual payments or a single upfront deposit to a sinking fund that earns 4.90% on its invested balances. The annual contributions have been discounted at the same 4.90% rate to calculate the present value of the tax subsidy. Using higher or lower discount rates will increase or decrease the subsidy estimate.

- *Investment-Grade Ratings* – to ensure that the issuer identifies a secure revenue stream to provide for repayment of the bonds at maturity; and
- *Wider List of Creditable Taxes* – to enable the tax credits to be applied against the AMT and possibly payroll taxes in addition to income taxes.

The potential market for tax credit bonds is much broader than indicated by the recent history of existing programs. Eligible investors in QZABs, for example, are limited to banks, insurance companies and other qualified lending institutions. In 2004 (the most recent year for which data are available), nearly 80 percent of the QZAB tax credits were claimed by only 10 large financial institutions (having assets of $100 billion or more).[24] Market experts have speculated that a wide range of institutional buyers as well as individual investors (perhaps through mutual funds) is possible, especially if the tax credits could be marketed separately from the bond principal. That would enable investors without income tax liability – such as pension funds – to invest in the stripped principal components at deeply discounted prices as "long zeroes." Because the tax credit bonds are sold at taxable yields, pension funds and other non-taxable investors would have an opportunity to invest in U.S. infrastructure—something they cannot do through buying tax-exempt municipal bonds without sacrificing yield. Other potential buyers with long investment horizons include life insurance companies, property and casualty insurers, and college savings funds. Commercial banks and other financial institutions should have greater appetite for tax credit bonds with larger issue sizes and more uniform terms.

**FEDERAL TAX POLICY ISSUES**

The Department of the Treasury has stated that "the Administration recognizes the important role that tax-preferred bond financing plays in providing a source of financing for critical public infrastructure projects and other significant public purpose activities."[25] As illustrated in this briefing paper, tax credit bonds could be a very important tool for developing intercity passenger rail. The experience of the existing programs, however, makes clear that using this tool effectively requires addressing certain tax policy issues without undermining the potential value of the financial subsidy.

Both the Congressional Budget Office (CBO) and the Treasury have expressed concerns about the use of tax credit bonds as a federal financing tool. These concerns have focused on the cost of the subsidy, the administration and regulation of such special-purpose programs, and the use of the proceeds.

[24] *Qualified Zone Academy Bond Issuance and Investment: Evidence from 2004 Form 8860 Data*, Thornton Matheson, Office of Tax Analysis, Department of the Treasury, September 2007.

[25] Statement of Eric Solomon, Acting Deputy Assistant Secretary for Tax Policy, U.S. Department of the Treasury, Testimony Before the Subcommittee on Select Revenue Measures of the House Committee on Ways and Means, March 2006.

CBO has pointed out that bonding generally is more costly than grant funding from a federal perspective, in economic if not budgetary terms.[26] And the borrowing costs associated with tax credit bonds are greater than those of other instruments due to relative illiquidity, tax risk, and potentially credit risk depending on how the principal is secured. In its analysis, CBO estimated that the present-value "economic" cost of a tax credit bond program (assuming 20-year bonds) "would be about 2 percent more costly than appropriations."[27]

While debt financing entails the additional cost of interest expense compared to pay-as-you-go grants, many policy makers understand that borrowing to finance long-term capital investments can be beneficial in avoiding construction cost inflation and accelerating the receipt of benefits. It also is more equitable, since the effective cost of long-term improvements is spread over their useful life through annual debt service payments.

And in an environment where the federal government simply cannot provide sufficient "conventional funding" (appropriations funded by general Treasury borrowing) for desired investments – especially for certain infrastructure improvements – it is prudent to consider how to supplement such funding in a reasonably cost-effective way.

CBO also criticizes tax credit bonds (and other tax incentives) as a tool not subject to annual appropriations.[28] However, as with any tax subsidy, the relative benefits and costs (in the form of tax expenditures) of tax credit bonds are considered prior to enactment. Thus, the subsidy provided by tax credit bonds is indeed within the purview of the budget process, although not subject to appropriation. Furthermore, such subsidies can attract private capital and enable critical investments producing long-lasting public benefits that otherwise would not be realized because of constraints on general appropriations.

The Treasury has expressed concerns about the inconsistent provisions of the existing tax credit bond programs and has advocated subjecting them to a uniform set of regulations. In particular, it has argued for the general application of tax-exempt bond rules to tax credit bonds to better target the federal subsidy and reduce the implementation burden.[29] Two important rules that recently have been applied to QZABs involve arbitrage investment restrictions and

[26] Grants are deemed to be funded through the issuance of U.S. Treasury obligations, so a tax credit bond that needed to be priced at a "spread" over Treasuries would be less efficient.

[27] *A Comparison of Tax-Credit Bonds, Other Special-Purpose Bonds, and Appropriations in Financing Federal Transportation Programs*, Congressional Budget Office, June 2003.

[28] *Tax-Credit Bonds and the Federal Cost of Financing Public Expenditures*, Congressional Budget Office, July 2004.

[29] Statement of Eric Solomon, March 2006, op cit.

information reporting requirements.[30] The Treasury also has commented on the need to address liquidity concerns, target the federal subsidy more carefully, and allocate issuance volume at the state or local level rather than the federal level.[31] While these recommendations are sound, their implementation must be handled carefully. The application of arbitrage investment restrictions, for example, should not unnecessarily dilute or even eliminate the use of sinking funds to secure bond principal.[32]

The Treasury also has criticized proposals involving the issuance of tax credit bonds by the Treasury or another federal entity (as opposed to state or local issuance). Obviously, any special-purpose borrowing by the federal government would have a higher cost than direct issuance of Treasury obligations. In addition, the Treasury has expressed concerns about an implied federal obligation to guarantee the principal of tax credit bonds issued by a federally-chartered entity. The Treasury has further claimed that undertaking such a special-purpose program could negatively affect the perceived soundness and costs associated with the Treasury's regular borrowing program. Structuring the RIB program as a state or local borrowing program, similar to the issuance of tax-exempt municipal bonds (albeit with a deeper subsidy), avoids this problem.

### FEDERAL BUDGETARY ANALYSIS OF TAX CREDIT BONDS

Federal discretionary spending occurs through the obligation and outlay of funds subject to the annual appropriations process. The obligations typically are scored (expensed) in the first year, and the outlays are recorded over a period of a few years (depending on the spend-out rate). This largely upfront scoring of budgetary resources occurs for the vast majority of federal spending, regardless of the nature of that spending. Unlike state / local and private-sector capital budgeting for long-term investments, the federal government's budgetary accounting does not distinguish between capital and operating expenditures.

One of the perceived benefits of utilizing tax incentives for infrastructure spending is that their fiscal impact is spread over a longer period. The cost to the federal government occurs over time through foregone revenues instead of discretionary spending that is scored upfront. In the case of tax credit bonds, these tax expenditures are recognized as the tax credits become claimable by investors throughout the term of the bonds. Their fiscal cost is reflected on the

[30] These changes were included in the QZAB program extension contained in the Tax Relief and Health Care Act of 2006.

[31] Statement of Eric Solomon, March 2006, op cit.

[32] This issue concerns the application of yield restrictions to "replacement proceeds," including pledged funds and sinking funds used to pay debt service. Temporary regulations for the QZAB program disregard the tax credit benefit to the investor and focus on the yield paid by the issuer, which is intended to be zero. Restricting the yield on sinking funds to the yield paid by the issuer of tax credit bonds (zero or a rate very close to zero) obviously dilutes the financial benefit of this mechanism significantly.

"mandatory" side of the federal budget as reductions in receipts. Unlike appropriated grants, tax incentives do not compete for funding with conventional programs that are subject to discretionary spending controls.

The Joint Committee on Taxation (JCT) is responsible for estimating the revenue effects of proposed legislation. It compares the current-law revenue baseline with the proposed-law revenue estimate for each specific tax measure over a 10-year budget window. While the JCT's tax models attempt to predict taxpayer behavior (assuming they act rationally in responding to the elasticities of supply and demand to minimize tax liability under any new law), they operate with a "fixed GNP constraint." This means that total labor supply and investment are fixed and assumed changes to tax law and behavior do not affect the overall economy and future revenues. The JCT points out that this exclusion of potential macroeconomic feedback loops is consistent with CBO's methodology for estimating appropriations and allows for consistent comparisons across thousands of proposals that must be scored each year. The JCT states that few proposals would significantly affect the overall level of the economy. And it believes that even if a well-designed tax incentive could positively affect the economy and future revenues, "such a feedback loop would take years to play out."[33]

The JCT's "fixed GNP constraint" means that any budget scoring of a tax credit bond proposal (or any other revenue measure) will not reflect the future tax revenues that might be generated by the subsidized investment. This exclusion may be particularly important for measures that support infrastructure investment likely to produce long-term economic development and other public benefits relative to alternative (current law) investment. The JCT agrees that "well-designed tax cuts have some predictable positive feedback effects on future tax revenues by increasing capital or labor supply," depending on how they are financed. It further states that "most peer-reviewed criticism of the JCT conventional estimating approach makes the more modest claim that well-designed tax cuts are not as costly as the fixed GNP constraint makes them appear." And it acknowledges that supplemental information on the potential economic effects of a proposal, while not explicitly recognized in the revenue estimate, could be meaningful to policy makers.[34]

The estimation of revenue losses due to tax credits claimed by bondholders depends on two assumptions: 1) the amount of bonds issued and outstanding; and 2) the credit rate. The Rail Infrastructure Development and Expansion Act for the 21st Century (H.R. 1631, "RIDE-21") was initially reported by the House Committee on Transportation and Infrastructure in April 2005. Among its provisions was an authorization for states to issue $12 billion in tax credit bonds over a 10-year period to finance high-speed rail projects. In its cost estimate of the bill, CBO reported

[33] *Inside the JCT Revenue Estimating Process*, Edward D. Kleinbard, Chief of Staff, Joint Committee on Taxation, January 2008.

[34] *Ibid.*

that the JCT had estimated the revenue loss associated with the tax credits as $680 million through the first five years and $3.37 billion during the 10-year budget window. Exhibit 3 illustrates the derivation of this cost estimate. Although the precise assumptions used by the JCT are not disclosed, reasonable estimates of the pace of bond issuance for such a program and the credit rate can be made (based on existing programs). For this exercise, it was assumed that each year's bonding authority is utilized evenly over a three-year period (i.e., $400 million per year) and that the credit rate is a constant 6.25%. As shown in Exhibit 3, these simplifying assumptions produced tax expenditures very similar to the JCT estimates – $775 million through five years and $3.40 billion during the 10-year budget window.

**Exhibit 3: Estimating Tax Expenditures for RIDE-21**

| ($ Billions) | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Years 1-5 | Years 1-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bonds Issued | 0.400 | 0.800 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 4.800 | 10.800 |
| Bonds Outstanding | 0.400 | 1.200 | 2.400 | 3.600 | 4.800 | 6.000 | 7.200 | 8.400 | 9.600 | 10.800 | | |
| Tax Credits | 0.025 | 0.075 | 0.150 | 0.225 | 0.300 | 0.375 | 0.450 | 0.525 | 0.600 | 0.675 | 0.775 | 3.400 |
| JCT Estimates /1 | 0.014 | 0.058 | 0.122 | 0.200 | 0.286 | 0.376 | 0.461 | 0.541 | 0.617 | 0.694 | 0.680 | 3.369 |

/1 Congressional Budget Office Cost Estimate for H.R. 1631, May 12, 2005

The annual scoring of tax expenditures spreads the budgetary cost of the federal subsidy over the term of the tax credit bonds. To the extent such assistance is used to help finance infrastructure improvements with long-term benefits, this approach can be viewed as a capital budget supplement to traditional discretionary spending. In the RIDE-21 example, the federal government could provide states with $12 billion in tax credit bonding authority at a budgetary cost of $3.4 billion. Assuming 30-year bonds and a 4.90% discount rate (the 30-year Treasury discount rate assumed in the President's FY 2009 Budget), the financial subsidy to the state sponsors would be 76 percent – equivalent to grant assistance of about $9.1 billion.

As noted by CBO, the lifetime "economic" cost to the federal government would be much higher than the 10-year scored budgetary cost of $3.4 billion. The nominal amount of tax credits over a 41-year period (assuming the RIDE-21 bonds were issued as shown in Exhibit 3 during years 1-12 and repaid during years 31-42) would be $22.5 billion. Using the 30-year Treasury discount rate assumed in the President's FY 2009 Budget (4.90%) produces a present-value cost of about $9.1 billion, identical to the financial benefit received by the project sponsors. Therefore, in lieu of unavailable grant appropriations, the federal government could provide the same $9.1 billion benefit to the state sponsors at a fraction (37 percent) of the budgetary cost. This illustrates precisely why policy makers are considering non-grant incentives like tax credit bonds as a potential supplement to increasingly scarce appropriations for long-lived public infrastructure.

## ESTIMATING THE FISCAL IMPACTS OF MIDWEST REGIONAL RAIL INVESTMENT

There are many public benefits of passenger rail infrastructure investment, including mobility improvement, safety enhancement, pollution reduction, energy conservation and economic growth. While some of these benefits are more obvious and potentially quantifiable at the local and regional level, the national network benefits may also be quite significant. Investment in high-speed passenger rail will result in economic benefits stemming from the construction of rail infrastructure and maintenance facilities, the renovation of stations, the manufacturing of passenger rail cars and locomotives, and the operation of passenger rail service. This economic benefit takes place in the form of full-time equivalent ("FTE") job creation, increased revenue and profit for businesses, property development, and personal and business spending on goods and services by these employees and businesses. In turn, these employees and businesses pay income, business, sales and property taxes to federal, state and local governments based on the FTE jobs, profits, revenues, spending and values generated as a result of the high-speed rail investment.

As part of this briefing paper, VantagePoint estimated the federal and state individual income taxes that would be generated from the construction and operation of the planned Midwest Regional Rail Initiative (MWRRI). This individual income tax revenue effect is only one component of the much larger fiscal benefit that would result from the economic benefit generated by a regional rail capital program such as the MWRRI. And the current analysis excludes any quantification of the broader benefits of such investment.

The MWRRI incorporates a capital investment program for the construction of new and improved infrastructure, stations, intermodal facilities, maintenance and engineering facilities, and state-of-the-art train fleet and equipment. Given the magnitude of the proposed system, it is anticipated that construction will occur over a period of 10 years, with operations commencing in phases as individual component corridors are completed. VantagePoint used the November 2006 Midwest Regional Rail Initiative Benefit, Cost & Economic Analysis ("MWRRI Analysis") estimates for FTE jobs, wages and capital investment to perform its tax analysis. Exhibit 4 shows the projected capital investments required by year, inclusive of all infrastructure, stations, facilities, fleet and equipment needs. The original cost estimate of $7.7 billion (in 2002 dollars) has been escalated to $10.6 billion to reflect year-of-expenditure dollars covering the period 2008-2017.[35]

[35] The capital costs were updated from the MWRRI Analysis based on the escalation factors used by VantagePoint in updating the wage estimates from the MWRRI Analysis to project future income tax revenues. This capital cost escalation is for illustrative purposes only; no assessment of actual or potential cost component inflation was performed.

**Exhibit 4: MWRRI Capital Investment Requirements**

Construction Period Capital Costs ($ Billions, YOE)

| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.270 | 0.230 | 0.737 | 1.006 | 0.937 | 1.775 | 2.175 | 2.251 | 0.959 | 0.290 | 10.630 |

VantagePoint developed a fiscal impact model to estimate both federal and state individual income tax revenues that would be generated by the MWRRI capital program. This model applies the appropriate effective tax rates to each year's wages associated with both temporary jobs during the 10-year construction period and permanent jobs during a 30-year operating period. The tax analysis projects cumulative federal individual income tax revenues of nearly $700 million by the end of the construction period (2017). The federal tax revenues would total $3.5 billion after 10 years of operation of the system, $7.8 billion after 20 years, and $15.4 billion after 30 years (2047). Similarly, the cumulative state individual income tax revenues are projected to total approximately $275 million at the end of construction and $1.0 billion, $2.0 billion, and $3.3 billion after 10, 20 and 30 years of operation. Exhibit 5 summarizes these results. The full VantagePoint income tax analysis is presented in the Appendix.

**Exhibit 5: MWRRI Cumulative Individual Income Tax Revenues**

| ($ Billions) | Federal | State |
|---|---|---|
| Year 10 | 0.699 | 0.275 |
| Year 20 | 3.544 | 1.001 |
| Year 30 | 7.795 | 1.968 |
| Year 40 | 15.372 | 3.256 |

These estimated tax revenues can be compared with the costs associated with financing the MWRRI through the proposed RIB program. Although the individual income taxes represent just a small portion of the overall benefits of the MWRRI, they can provide policy makers with a useful context for making decisions about alternative investments. For purposes of this briefing paper, it was assumed that the state sponsors of the MWRRI would finance the $10.6 billion program by issuing tax credit bonds as needed over the 10-year construction period to fund the annual capital requirements. These rail infrastructure bonds were assumed to have a 30-year maturity and a 6.25% credit rate.[36] The designated issuer would secure bond principal with one or more streams of state and/or local revenues. This analysis assumed that the issuer would

[36] The RIB financing program illustrated in this briefing paper is assumed to be generally similar to the RIDE-21 legislative proposals, except for the 30-year bond term. As noted previously, this longer maturity enables better matching of the financing costs with the long-term fiscal and other benefits of the infrastructure investment. It also increases the financial subsidy for the project sponsor.

use these revenues to make annual contributions to a sinking fund to provide for retirement of the bonds at maturity. The sinking fund deposits were assumed to earn interest at a rate of 4.90%.[37] Under these assumptions the RIB program would have a 10-year budget cost of $3.1 billion (estimated tax expenditures), as shown in Exhibit 6.

**Exhibit 6: Estimated Federal Tax Expenditures for the MWRRI Program**

| ($ Billions) | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Years 1 - 5 | Years 1 - 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bonds Issued | 0.270 | 0.230 | 0.737 | 1.006 | 0.937 | 1.775 | 2.175 | 2.251 | 0.959 | 0.290 | 3.179 | 10.630 |
| Bonds Outstanding | 0.270 | 0.500 | 1.237 | 2.243 | 3.179 | 4.955 | 7.130 | 9.381 | 10.340 | 10.630 | | |
| Tax Credits | 0.017 | 0.031 | 0.077 | 0.140 | 0.199 | 0.310 | 0.446 | 0.586 | 0.646 | 0.664 | 0.464 | 3.116 |

This cost estimate is overstated to some degree, since the tax expenditures are not offset by the tax revenues resulting from the inclusion of the tax credits as taxable income by the bondholders. The investment in taxable tax credit bonds would generate additional revenues to the federal Treasury according to the marginal tax rates of the investors. Investors with a marginal tax rate of 28%, for example, would generate about $870 million in tax revenues during the first 10 years of the MWRRI, reducing the budgetary cost of the program from $3.1 billion to about $2.2 billion. Consistent with its fixed GNP scoring approach, the JCT typically does not assume any net taxable investment and therefore does not offset the estimated "gross" cost of the tax credits.

The MWRRI sponsors would share the cost of the RIB financing program by using state/local revenues to repay the bond principal. In this example, they would make annual sinking fund contributions of about $14.60 per $1,000 of bonds outstanding, or about $155 million once the $10.6 billion bonding authority was fully issued. During the 10-year construction period the issuer payments would total about $730 million. Over the full term of the bonds, the issuer would make contributions on behalf of the state/local sponsors totaling nearly $4.7 billion while the sinking fund would earn nearly $6.0 billion. The federal government would be responsible for tax credits totaling $19.9 billion over the life of the bonds. Under these assumptions, the value of the federal subsidy provided by the RIB financing mechanism would be about $8.1 billion or 76 percent of the $10.6 billion program cost. Exhibit 7 summarizes the federal and state/local costs associated with using the RIB program to finance the MWRRI.

[37] This is the 30-year Treasury discount rate assumed in the President's FY 2009 Budget.

**Exhibit 7: Allocation of MWRRI Financing Costs**

| ($ Billions) | Federal Tax Credits | State Payments |
|---|---|---|
| 2008 - 2017 (Budget Window / Construction Period) | 3.116 | 0.728 |
| 2008 - 2047 (Full Term of Bonds) | 19.932 | 4.655 |

The MWRRI financing costs should be weighed against the potential benefits – including those that may not be readily quantifiable but are deemed important by policy makers. The VantagePoint analysis shows that the revenues expected to be generated by just individual federal and state income taxes resulting from the MWRRI economic activity would offset a significant share of the financing costs. While these revenues may not be reflected in the budgetary accounting of the federal government, they demonstrate that the economic effects of certain investments can be significant – especially for long-lived infrastructure with broad public benefits.

Exhibit 8 compares the MWRRI financing costs with the estimated income taxes. The analysis shows that the income tax revenues expected to be generated over a 40-year period (10 years of construction and 30 years of operation) would exceed the fiscal cost to the U.S. Treasury of the tax credits and significantly offset the fiscal cost to the state sponsors of the bond payments.

**Exhibit 8: Comparison of Financing Costs and Income Tax Revenues Generated**

| ($ Billions) | Federal Tax Credits | Inc Taxes (Bondholders) | Inc Taxes (MWRRI Jobs) | Net Federal Revenues | State Payments | State Inc Taxes | Net State Revenues |
|---|---|---|---|---|---|---|---|
| 2008 - 2017 (Budget Window / Construction Period) | (3.116) | 0.873 | 0.698 | (1.546) | (0.728) | 0.275 | (0.453) |
| 2008 - 2047 (Full Term of Bonds) | (19.932) | 5.581 | 15.372 | 1.021 | (4.655) | 3.256 | (1.399) |

In the case of the federal government, the nominal income tax revenues generated would total nearly $21.0 billion over the life of the bonds (through 2047), exceeding the nominal cost of the tax credits by about $1.0 billion. In addition to the individual income taxes resulting from the MWRRI investment-related jobs, those revenues include an estimate of income taxes assumed to be paid by the RIB investors, who must report the annual credits as taxable income. Such additional tax revenues could total about $870 million during the first 10 years and nearly $5.6 billion over the full term of the bonds, assuming a 28% marginal tax rate applies to the investors. In the case of the MWRRI state sponsors, the nominal income tax revenues generated by the MWRRI investment would total nearly $3.3 billion over the life of the bonds (through 2047), offsetting about 70 percent of the $4.7 billion cost of annual sinking fund payments.

It should be emphasized that the actual net benefit of the MWRRI would be even greater, however, since it would include corporate income taxes, sales taxes, and other receipts resulting from the MWRRI economic activity.[38]

**CONCLUSION: RIB PROGRAM POTENTIAL**

A successful RIB financing program would have to carefully address both tax policy and potential investor concerns in delivering a meaningful subsidy to the state and local sponsors. The existing tax credit bond programs are small and contain technical provisions that significantly limit their usefulness. As presented in this briefing paper, the financial benefit provided by tax credit bonds could be substantial – even approaching that of an 80 percent federal grant. But the corresponding cost of such a deep subsidy, measured in tax expenditures resulting from the credits claimed by bondholders, would have to be weighed against the various benefits of the preferred investment. Consideration of a RIB financing program should acknowledge the very limited availability of general appropriations for passenger rail and weigh the assessed budgetary costs against the larger policy objectives and public benefits in addition to the quantifiable fiscal benefits. In cases involving critical public infrastructure improvements, it may be appropriate for the federal government to utilize financial incentives like tax credit bonds to stimulate such investment.

[38] The quantification of those additional economic benefits, as well as the less direct but very important non-economic benefits, is beyond the scope of this briefing paper.

# APPENDIX: INDIVIDUAL INCOME TAX ANALYSIS

# TAX FORECAST FROM HIGH SPEED RAIL INVESTMENT: MID-WEST REGIONAL RAIL CORRIDORS

## OVERVIEW

### INTRODUCTION

In 1996 nine Midwest states (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio and Wisconsin) and Amtrak began assessing the feasibility of creating an enhanced, regional intercity passenger rail system. The Midwest Regional Rail Initiative ("MWRRI) Steering Committee made up of the participating states directed these studies with the advice provided by Amtrak. In its 1998 study, the MWRRI conducted a strategic assessment of the Midwest region to determine the most beneficial and affordable service, infrastructure and equipment scenarios.

The 1998 study recommended that a 110-mph top speed provides the most cost-effective strategy for improving intercity passenger rail service in the Midwest. Over the proceeding ten years, the study has continued with further refinements of underlying analysis and recommendations with committee oversight and peer reviews.

In its most recent study effort, the MWRRI conducted an independent peer review of its ridership and revenue forecasts, its capital cost estimates, and its operating cost estimates. This study also produced an updated cost-benefit analysis of the Midwest Regional Rail System which resulted in the production of The Midwest Regional Rail Initiative Benefit, Cost and Economic Analysis ("MWRRI Analysis"). The purpose of this report was to provide economic impact information associated with the implementation of the 3,000-mile system. The study provides information on increases in jobs, personal income and property values on a regional, state and local basis and is used as the underlying assumptions in this analysis.

VantagePoint Associates, Inc. ("VantagePoint") has been retained by the American Public Transportation Association ("APTA") to estimate the federal and state individual income taxes and state sales taxes that would be generated from the construction and operation of the proposed high-speed rail system within the Midwest Regional Corridors. The passenger rail network will be comprised of eight interconnecting rail corridors that emanate from Chicago and spread through the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio and Wisconsin.

In addition to this overview section, this report includes three sections that describe the components of the Midwest Regional Rail program; the data sources, approach and key assumptions used in the analysis; and the federal and state individual income tax forecasts throughout the construction and operating periods.

**RESULTS IN BRIEF**

Investment in high-speed rail will result in economic activity such as the construction of rail infrastructure, the renovation of stations, the manufacturing of passenger rail cars and locomotives, and the operation of passenger rail service. This economic activity takes place in the form of full-time equivalent ("FTE") job creation, increased revenue and profit for businesses, property development, and personal and business spending on goods and services by these employees and businesses. In turn, these employees and businesses pay income, business, sales, and property taxes to federal, state and local governments based on the FTE jobs, profits, revenues, spending and values generated as a result of the high-speed rail investment.

Using the MWRRI Analysis[1] estimates for FTE jobs, wages and capital investment, this tax analysis projects that cumulative federal individual income tax revenues will total approximately $699 million at the end of the construction period; and $3.5 billion, $7.8 billion and $15.4 billion respectively after 10, 20 and 30 years of operation. Similarly, cumulative state individual income tax revenues, for the combined states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin, are projected to total approximately $275 million at the end of the construction period; and $1 billion, $2 billion and $3.3 billion respectively after 10, 20 and 30 years of operations.[2]

[1] Although VantagePoint has been retained to estimate federal and state taxes, it has been directed by APTA to use the MWRRI Analysis to obtain the FTE jobs, wage and capital investment data in order to generate the individual income tax forecasts. The MWRRI Analysis includes, but is not limited to, all conclusions, methodologies, tables, exhibits, appendices, notebooks, and work papers. VantagePoint has not validated, audited or assessed the MWRRI Analysis or its conclusions. As a result, VantagePoint does not express an opinion regarding the MWRRI Analysis.

[2] Assumes a 5% contribution rate to defined contribution plans. See Key Assumptions section.

## COMPONENT CORRIDORS

The Midwest Regional Rail program is an initiative jointly supported by the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio and Wisconsin. It entails the implementation of a high-speed rail network, using Chicago as a hub, with primary routes through Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin. Using existing rights-of-way shared by passenger and freight rail, the network will connect over 100 Midwestern cities, linking the region's major economic centers and 80% of the region's 65 million residents. The program includes the following component rail corridors:

1. Chicago to Detroit/Chicago to Grand Rapids/Chicago to Port Huron;
2. Chicago to Cleveland;
3. Chicago to Cincinnati;
4. Chicago to Carbondale;
5. Chicago to St Louis;
6. St Louis to Kansas City;
7. Chicago to Quincy/Chicago to Omaha; and
8. Chicago to Milwaukee to St Paul/Chicago to Milwaukee to Green Bay.

## INVESTMENT AND TIMETABLE

The Midwest Regional Rail initiative incorporates a capital investment program of approximately $7.7 billion (in 2002 dollars) for the construction of new and improved infrastructure, stations, inter-modal facilities, maintenance and engineering facilities, and state-of-the-art train fleet and equipment. Given the magnitude of the proposed system, it is anticipated that the construction period will occur over a period of 10 years, with operations commencing in phases as individual component corridors are completed. Exhibit 1 reflects the projected capital investments required by state, inclusive of all infrastructure, stations, facilities, fleet, and equipment needs:

**Exhibit 1: Construction Period Capital Investment Requirements by State (2002 dollars)**
**Source: Quandel Consultants, LLC.**

($Millions)

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Total | % Share |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | $173 | $66 | $84 | $88 | $217 | $393 | $373 | $227 | $130 | $52 | $1,804 | 23.4% |
| Indiana | 1 | 27 | 78 | 62 | 58 | 449 | 390 | 427 | 8 | 0 | 1,500 | 19.5% |
| Michigan | 19 | 13 | 175 | 175 | 44 | 37 | 75 | 75 | 10 | 0 | 624 | 8.1% |
| Ohio | 0 | 16 | 39 | 28 | 29 | 263 | 206 | 219 | 4 | 0 | 804 | 10.4% |
| Missouri | 18 | 18 | 20 | 21 | 25 | 21 | 322 | 293 | 284 | 0 | 1,020 | 13.3% |
| Iowa | 0 | 3 | 18 | 22 | 59 | 60 | 59 | 112 | 60 | 0 | 392 | 5.1% |
| Nebraska | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | 0.1% |
| Wisconsin | 15 | 30 | 155 | 260 | 151 | 64 | 109 | 188 | 143 | 136 | 1,251 | 16.3% |
| Minnesota | 0 | 15 | 18 | 121 | 121 | 8 | 8 | 8 | 2 | 0 | 299 | 3.9% |
| Total Capital | $227 | $188 | $586 | $777 | $703 | $1,295 | $1,542 | $1,551 | $642 | $188 | $7,700 | 100.0% |
| | | | | | | | | | | | | |
| Annual Completion | 2.9% | 2.4% | 7.6% | 10.1% | 9.1% | 16.8% | 20.0% | 20.1% | 8.3% | 2.4% | 100.0% | |
| Cumulative Completion | 2.9% | 5.4% | 13.0% | 23.1% | 32.2% | 49.1% | 69.1% | 89.2% | 97.6% | 100.0% | | |

While the construction period for the full program is anticipated to take place over a ten-year period, over two-thirds of the spending will occur in the second half of this time span.

This direct investment in infrastructure, fleet and facilities will result in reduced travel times between city pairs, improved service quality in terms of passenger amenities, quality of ride and station conditions, and community improvements through transportation related development. Key to regional economic improvement is the reduction in travel time which will provide quicker access to business, cultural and tourism centers, and improved mobility around the region. The economic and fiscal benefits of the construction and operation of these new and/or improved passenger rail corridors will be seen in the form of new FTE jobs, earnings and associated taxes at the state and federal levels. The following section of this report describes the methodology and key assumptions used in forecasting the individual income taxes that will be generated during the construction and operation of the Midwest regional rail system.

## DATA SOURCES

The data sources that were used in this analysis include the MWRRI Analysis, Quandel Consultants, LLC, the Statistics of Income Division of the Internal Revenue Service, the Departments of Revenue for each of the nine Midwest states, and the Bureau of Labor Statistics.

### Construction FTE Jobs and Wages

For the ***ten-year construction period*** of the project, the MWRRI Analysis utilized an input-output model methodology, based on the Bureau of Economic Analysis's RIMS II Model, to determine the ***annual temporary direct and indirect FTE jobs and wages*** by industry that would be created in the Midwest region as a whole. The purpose of the RIMS II Model is to estimate the impact that one dollar of spending will have, by industry, in a specific geographic area (such as a county, state, or region). Based on the economic characteristics of the chosen geographic area, the model is designed to estimate the direct, indirect and induced impacts of this $1 investment on FTE jobs, earnings and spending. Indirect and induced impacts are often known as the multiplier effect of spending. The multiplier captures the impact of that $1 dollar investment as it ripples through the connected layers of the economy. For example, an investment in employee wages results in secondary spending by those employees for personal goods and services. Similarly, an investment in the purchase of a manufactured product results in secondary spending by the manufacturer on raw materials, employing other individuals in other businesses and contributing revenues and profits to those other businesses. Thus, the capital investment made during the construction of the Midwest high-speed rail project can be used to project total FTE jobs, earnings and spending. These FTE jobs are shown below in Exhibit 2.

**Exhibit 2: Number of Temporary FTE Jobs During the Construction Period Resulting from Assumed Federal Contribution of 80% of Total Capital Investment. Source: MWRRI Analysis**

| Industry | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Average | % Share |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Accommodation and food services | 268 | 223 | 707 | 936 | 856 | 1,550 | 1,843 | 1,792 | 715 | 222 | 911 | 6.0% |
| Administrative and waste management services | 175 | 145 | 460 | 609 | 557 | 1,009 | 1,199 | 1,166 | 465 | 145 | 593 | 3.9% |
| Agriculture, forestry, fishing, and hunting | 33 | 28 | 88 | 117 | 107 | 193 | 230 | 224 | 89 | 28 | 114 | 0.7% |
| Arts, entertainment, and recreation | 60 | 50 | 157 | 208 | 190 | 344 | 409 | 398 | 159 | 49 | 202 | 1.3% |
| Construction | 1,779 | 1,480 | 4,684 | 6,202 | 5,673 | 10,274 | 12,213 | 11,876 | 4,738 | 1,472 | 6,039 | 39.7% |
| Educational services | 66 | 55 | 174 | 230 | 211 | 381 | 453 | 441 | 176 | 55 | 224 | 1.5% |
| Finance and insurance | 135 | 112 | 354 | 469 | 429 | 777 | 924 | 898 | 358 | 111 | 457 | 3.0% |
| Health care and social assistance | 308 | 256 | 811 | 1,074 | 982 | 1,779 | 2,115 | 2,057 | 821 | 255 | 1,046 | 6.9% |
| Households | 30 | 25 | 78 | 104 | 95 | 172 | 204 | 199 | 79 | 25 | 101 | 0.7% |
| Information | 56 | 47 | 147 | 195 | 179 | 323 | 384 | 374 | 149 | 46 | 190 | 1.2% |
| Management of companies and enterprises | 54 | 45 | 142 | 187 | 171 | 310 | 369 | 359 | 143 | 44 | 182 | 1.2% |
| Manufacturing | 366 | 305 | 965 | 1,278 | 1,169 | 2,116 | 2,516 | 2,446 | 976 | 303 | 1,244 | 8.2% |
| Mining | 10 | 8 | 26 | 34 | 31 | 57 | 67 | 66 | 26 | 8 | 33 | 0.2% |
| Other services | 161 | 134 | 424 | 562 | 514 | 930 | 1,106 | 1,075 | 429 | 133 | 547 | 3.6% |
| Professional, scientific, and technical services | 200 | 167 | 527 | 698 | 639 | 1,157 | 1,375 | 1,337 | 534 | 166 | 680 | 4.5% |
| Real estate and rental and leasing | 62 | 51 | 162 | 215 | 196 | 356 | 423 | 411 | 164 | 51 | 209 | 1.4% |
| Retail trade | 452 | 376 | 1,190 | 1,576 | 1,441 | 2,610 | 3,102 | 3,017 | 1,204 | 374 | 1,534 | 10.1% |
| Transportation and warehousing | 122 | 102 | 322 | 426 | 390 | 706 | 839 | 816 | 326 | 101 | 415 | 2.7% |
| Utilities | 17 | 14 | 45 | 60 | 55 | 99 | 117 | 114 | 46 | 14 | 58 | 0.4% |
| Wholesale trade | 126 | 104 | 331 | 438 | 400 | 725 | 862 | 838 | 334 | 104 | 426 | 2.8% |
| Total | 4,480 | 3,727 | 11,794 | 15,618 | 14,285 | 25,868 | 30,750 | 29,904 | 11,931 | 3,706 | 15,206 | 100.0% |

As noted in the exhibit above, the numbers of FTE jobs that are shown represent only the FTE jobs generated by 80% of the capital investment assumed to be provided through federal funding[1]. In order to project ***all*** individual income taxes resulting from the entire capital investment (including the remaining 20% contribution from the states), all FTE jobs need to be taken into account. Exhibit 3 shows the number of FTE jobs resulting from 100% of the assumed capital investment.

[1] The purpose of this tax analysis is to assess the full value of taxes generated by the high-speed rail investment and therefore does not address regional transfer payments.

**Exhibit 3: Number of Temporary FTE Jobs During the Construction Period Resulting from 100% of Capital Investment**

| Industry | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Average | % Share |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Accommodation and food services | 335 | 279 | 884 | 1,170 | 1,070 | 1,938 | 2,304 | 2,240 | 894 | 278 | 1,139 | 6.0% |
| Administrative and waste management services | 219 | 181 | 575 | 761 | 696 | 1,261 | 1,499 | 1,458 | 581 | 181 | 741 | 3.9% |
| Agriculture, forestry, fishing, and hunting | 41 | 35 | 110 | 146 | 134 | 241 | 288 | 280 | 111 | 35 | 142 | 0.7% |
| Arts, entertainment, and recreation | 75 | 63 | 196 | 260 | 238 | 430 | 511 | 498 | 199 | 61 | 253 | 1.3% |
| Construction | 2,224 | 1,850 | 5,855 | 7,753 | 7,091 | 12,843 | 15,266 | 14,845 | 5,923 | 1,840 | 7,549 | 39.7% |
| Educational services | 83 | 69 | 218 | 288 | 264 | 476 | 566 | 551 | 220 | 69 | 280 | 1.5% |
| Finance and insurance | 169 | 140 | 443 | 586 | 536 | 971 | 1,155 | 1,123 | 448 | 139 | 571 | 3.0% |
| Health care and social assistance | 385 | 320 | 1,014 | 1,343 | 1,228 | 2,224 | 2,644 | 2,571 | 1,026 | 319 | 1,307 | 6.9% |
| Households | 38 | 31 | 98 | 130 | 119 | 215 | 255 | 249 | 99 | 31 | 127 | 0.7% |
| Information | 70 | 59 | 184 | 244 | 224 | 404 | 480 | 468 | 186 | 58 | 238 | 1.3% |
| Management of companies and enterprises | 68 | 56 | 178 | 234 | 214 | 388 | 461 | 449 | 179 | 55 | 228 | 1.2% |
| Manufacturing | 458 | 381 | 1,206 | 1,598 | 1,461 | 2,645 | 3,145 | 3,058 | 1,220 | 379 | 1,555 | 8.2% |
| Mining | 13 | 10 | 33 | 43 | 39 | 71 | 84 | 83 | 33 | 10 | 42 | 0.2% |
| Other services | 201 | 168 | 530 | 703 | 643 | 1,163 | 1,383 | 1,344 | 536 | 166 | 684 | 3.6% |
| Professional, scientific, and technical services | 250 | 209 | 659 | 873 | 799 | 1,446 | 1,719 | 1,671 | 668 | 208 | 850 | 4.5% |
| Real estate and rental and leasing | 78 | 64 | 203 | 269 | 245 | 445 | 529 | 514 | 205 | 64 | 262 | 1.4% |
| Retail trade | 565 | 470 | 1,488 | 1,970 | 1,801 | 3,263 | 3,878 | 3,771 | 1,505 | 468 | 1,918 | 10.1% |
| Transportation and warehousing | 153 | 128 | 403 | 533 | 488 | 883 | 1,049 | 1,020 | 408 | 126 | 519 | 2.7% |
| Utilities | 21 | 18 | 56 | 75 | 69 | 124 | 146 | 143 | 58 | 18 | 73 | 0.4% |
| Wholesale trade | 158 | 130 | 414 | 548 | 500 | 906 | 1,078 | 1,048 | 418 | 130 | 533 | 2.8% |
| Total | 5,604 | 4,661 | 14,747 | 19,527 | 17,859 | 32,337 | 38,440 | 37,384 | 14,917 | 4,635 | 19,011 | 100.0% |

The MWRRI Analysis also provides the average wage by industry, expressed in 2002 dollars. Exhibit 4 below reflects these average wages.

**Exhibit 4: Wages for Temporary FTE Jobs Created During the Construction Period (2002 Dollars). Source: MWRRI Analysis**

| Industry | Average |
|---|---|
| Accommodation and food services | $12,304 |
| Administrative and waste management services | 21,087 |
| Agriculture, forestry, fishing, and hunting | 13,544 |
| Arts, entertainment, and recreation | 17,956 |
| Construction | 38,515 |
| Educational services | 21,431 |
| Finance and insurance | 48,152 |
| Health care and social assistance | 33,751 |
| Households | 9,170 |
| Information | 48,631 |
| Management of companies and enterprises | 69,907 |
| Manufacturing | 45,853 |
| Mining | 55,495 |
| Other services | 21,630 |
| Professional, scientific, and technical services | 50,276 |
| Real estate and rental and leasing | 25,630 |
| Retail trade | 20,035 |
| Transportation and warehousing | 37,108 |
| Utilities | 77,397 |
| Wholesale trade | 49,719 |
| Average | $35,880 |

Effective income tax rates for the same wage bracket vary among states for both federal and state individual income taxes. Consequently, the temporary FTE jobs that would be created across the entire region during construction need to be reflected by state in order to more accurately estimate income taxes.

Since the MWRRI Analysis projects annual FTE jobs by industry for the Midwest region as a whole, an allocation of those regional FTE jobs is required to obtain state-by-state FTE job totals. The annual ten-year capital investment by state was used as the basis to allocate the number of FTE jobs to each state for each year of construction. Capital investment data by state was not provided by TEMS[2], and in the alternative, was provided by Quandel Consultants, LLC as shown in Exhibit 1 above. Each state's percentage share of the total region's capital investment for each year of the construction period was applied to the number of FTE jobs by industry shown in Exhibit 3. The resulting FTE jobs by state are shown in Exhibit 5 below.

[2] The MWRRI Analysis was prepared by Transportation Economics Management Systems, Inc. ("TEMS") in association with HNTB.

**Exhibit 5: Temporary FTE Jobs by State[3]**

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Average | % Share |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | 4,282 | 1,643 | 2,110 | 2,210 | 5,499 | 9,825 | 9,306 | 5,471 | 3,019 | 1,286 | 4,465 | 23.5% |
| Indiana | 32 | 677 | 1,959 | 1,566 | 1,468 | 11,202 | 9,717 | 10,295 | 189 | 0 | 3,711 | 19.5% |
| Michigan | 475 | 317 | 4,405 | 4,404 | 1,119 | 920 | 1,881 | 1,820 | 231 | 0 | 1,557 | 8.2% |
| Ohio | 0 | 406 | 971 | 702 | 729 | 6,570 | 5,135 | 5,281 | 98 | 0 | 1,989 | 10.5% |
| Missouri | 433 | 437 | 492 | 537 | 622 | 535 | 8,012 | 7,068 | 6,591 | 0 | 2,473 | 13.0% |
| Iowa | 0 | 65 | 449 | 540 | 1,503 | 1,487 | 1,461 | 2,698 | 1,399 | 0 | 960 | 5.1% |
| Nebraska | 0 | 0 | 1 | 2 | 14 | 14 | 14 | 27 | 14 | 0 | 9 | 0.0% |
| Wisconsin | 377 | 743 | 3,909 | 6,531 | 3,839 | 1,587 | 2,721 | 4,537 | 3,322 | 3,349 | 3,092 | 16.3% |
| Minnesota | 0 | 371 | 446 | 3,031 | 3,062 | 191 | 191 | 185 | 53 | 0 | 753 | 4.0% |
| Total Jobs | 5,599 | 4,659 | 14,742 | 19,523 | 17,855 | 32,331 | 38,438 | 37,382 | 14,916 | 4,635 | 19,009 | 100.0% |

It is worth noting that the same ratio of FTE jobs by industry and the average wages for each industry was assumed to be identical for each state.

**Operating FTE Jobs and Wages**

For the ***operating period***, the MWRRI Analysis employed a different approach from that used for construction. TEMS' internal Economic Rent model was used to determine the region's ***average annual permanent FTE jobs*** that would be created from the high-speed rail investment. The TEMS Economic Rent Model uses employment, household income, population and property value data for the purpose of estimating the increase in value in goods and services due to transportation improvements that increase accessibility to markets. The model is also designed to take into account the interdependence of communities and the relative efficiency of different modes of transportation in producing estimates of FTE jobs, household income and property values generated by transportation improvements. The MWRRI Analysis states that these estimates reflect the impact of 100% of the capital investment made.

This forecast of average annual permanent FTE jobs was prepared on a state-by-state basis without a breakdown of FTE jobs by industry. Since the MWRRI Analysis incorporated household income by state, instead of average wages by state, VantagePoint used average wages by state from the Bureau of Labor Statistics. To be consistent with the construction period values, average wages are expressed in 2002 dollars.

Exhibit 6 shows the average number of annual permanent FTE jobs generated in each state throughout the operating period along with the average wage by state. The MWRRI Analysis

[3] Differences may occur due to rounding

conservatively assumed that the number of FTE jobs would not increase throughout the 30 year operating period.

**Exhibit 6: Permanent FTE Jobs and Average Wages (2002 Dollars)**
**Source: FTE Jobs – MWRRI Analysis, Average wages – Bureau of Labor Statistics**

| State | Annual Jobs | Average Wages |
|---|---|---|
| Illinois | 24,200 | $36,410 |
| Indiana | 4,540 | 32,630 |
| Michigan | 6,970 | 37,530 |
| Ohio | 3,520 | 34,410 |
| Missouri | 5,600 | 32,980 |
| Iowa | 1,000 | 30,380 |
| Nebraska | 480 | 31,200 |
| Wisconsin | 9,570 | 33,400 |
| Minnesota | 1,570 | 37,300 |
| Total | 57,450 | $34,027 |

The average wages were applied to the average number of FTE jobs for each year to determine projected earnings. This is explained in further detail in the next section of the report.

**Effective Tax Rates**

For the forecasts of federal individual income taxes, statistical data for the 2005 tax year (the most recent available data) from the Internal Revenue Service ("IRS") was used to determine the effective tax rate by income tax bracket for each state. The federal effective tax rate is the federal income tax liability as a percentage of federal adjusted gross income ("FAGI").

Similarly, for the forecasts of state individual income taxes, statistical data for the 2005 tax year from the individual state Departments of Revenue was used to determine the effective tax rate by income tax bracket. The most recent tax data available for Illinois, Minnesota and Missouri was for 2003, 2004 and 2006 respectively. The nine states have different tax structures. Some are progressive tax structures (similar to federal income tax rate schedules) and some are flat tax structures. While state income tax structures may vary in the method of computing tax liability, ultimately state tax rates can be evaluated on a consistent basis by determining the effective tax rate. As with federal effective tax rates, effective tax rates for each state can be derived by taking the state income tax liability as a percentage of the state adjusted gross income.

The use of both the federal and state effective tax rates and how they were applied to FTE jobs and earnings to arrive at projected federal and state individual income taxes are explained in the next section of the report.

## METHODOLOGY

The methodology used to forecast federal and state individual income taxes generated by the investment in high-speed rail is based on the FTE job, wage and effective tax rate data obtained from the previously noted sources. This section describes the key steps taken in the analysis including the translation of financial data to current year dollars, the estimation of federal individual income taxes and the estimation of state individual income taxes.

### Current Year Dollars

Since the MWRRI Analysis reflected all wage data in 2002 dollars, it was necessary to establish all wage related data in 2008 dollars. In order to convert 2002 wages to 2008 dollars, the Employment Cost Index was used from the Bureau of Labor Statistics. The annual index for the last five years (2003 through 2007) is shown in Exhibit 7.

**Exhibit 7: Employment Cost Index. Source: Bureau of Labor Statistics**

| Employment Cost Index<br>12-Month Percent Changes | | | | | | |
|---|---|---|---|---|---|---|
| **Compensation Component** | **December 2003** | **December 2004** | **December 2005** | **December 2006** | **December 2007** | **5-Year CAGR*** |
| Wages & Salaries | 2.9% | 2.5% | 2.6% | 3.2% | 3.4% | 2.9% |

* Compound Annual Growth Rate

The annual growth rates shown above were used to convert wages to 2007 dollars from the wages shown in Exhibit 4 and Exhibit 6. The five-year CAGR of 2.9% was then applied to 2007 wages to reach 2008 dollars. Exhibit 8 displays wages in 2008 dollars for Year 1, by industry for the construction period. The value of average wages for each subsequent year is calculated by escalating the prior year wages by the 5-year CAGR of 2.9%.

**Exhibit 8: Construction Period Wages Indexed at 2.9% Annually (2008 Dollars)**

| Industry | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Accommodation and food services | $14,606 | $15,030 | $15,466 | $15,914 | $16,376 | $16,851 | $17,339 | $17,842 | $18,360 | $18,892 | $16,668 |
| Administrative and waste management services | 25,033 | 25,759 | 26,506 | 27,274 | 28,065 | 28,879 | 29,717 | 30,578 | 31,465 | 32,378 | 28,565 |
| Agriculture, forestry, fishing, and hunting | 16,078 | 16,545 | 17,024 | 17,518 | 18,026 | 18,549 | 19,087 | 19,640 | 20,210 | 20,796 | 18,347 |
| Arts, entertainment, and recreation | 21,316 | 21,934 | 22,570 | 23,225 | 23,898 | 24,591 | 25,304 | 26,038 | 26,793 | 27,570 | 24,324 |
| Construction | 45,722 | 47,048 | 48,412 | 49,816 | 51,261 | 52,747 | 54,277 | 55,851 | 57,471 | 59,137 | 52,174 |
| Educational services | 25,441 | 26,179 | 26,938 | 27,719 | 28,523 | 29,350 | 30,201 | 31,077 | 31,978 | 32,906 | 29,031 |
| Finance and insurance | 57,162 | 58,820 | 60,525 | 62,281 | 64,087 | 65,945 | 67,858 | 69,826 | 71,850 | 73,934 | 65,229 |
| Health care and social assistance | 40,066 | 41,228 | 42,424 | 43,654 | 44,920 | 46,223 | 47,563 | 48,943 | 50,362 | 51,822 | 45,721 |
| Households | 10,886 | 11,202 | 11,526 | 11,861 | 12,205 | 12,559 | 12,923 | 13,297 | 13,683 | 14,080 | 12,422 |
| Information | 57,731 | 59,405 | 61,127 | 62,900 | 64,724 | 66,601 | 68,533 | 70,520 | 72,565 | 74,670 | 65,878 |
| Management of companies and enterprises | 82,988 | 85,394 | 87,871 | 90,419 | 93,041 | 95,739 | 98,516 | 101,373 | 104,312 | 107,337 | 94,699 |
| Manufacturing | 54,433 | 56,011 | 57,636 | 59,307 | 61,027 | 62,797 | 64,618 | 66,492 | 68,420 | 70,404 | 62,114 |
| Mining | 65,879 | 67,789 | 69,755 | 71,778 | 73,860 | 76,002 | 78,206 | 80,474 | 82,807 | 85,209 | 75,176 |
| Other services | 25,677 | 26,422 | 27,188 | 27,977 | 28,788 | 29,623 | 30,482 | 31,366 | 32,275 | 33,211 | 29,301 |
| Professional, scientific, and technical services | 59,683 | 61,414 | 63,195 | 65,028 | 66,914 | 68,854 | 70,851 | 72,906 | 75,020 | 77,195 | 68,106 |
| Real estate and rental and leasing | 30,426 | 31,308 | 32,216 | 33,150 | 34,112 | 35,101 | 36,119 | 37,166 | 38,244 | 39,353 | 34,719 |
| Retail trade | 23,784 | 24,474 | 25,183 | 25,914 | 26,665 | 27,438 | 28,234 | 29,053 | 29,895 | 30,762 | 27,140 |
| Transportation and warehousing | 44,051 | 45,329 | 46,643 | 47,996 | 49,388 | 50,820 | 52,294 | 53,811 | 55,371 | 56,977 | 50,268 |
| Utilities | 91,879 | 94,544 | 97,285 | 100,107 | 103,010 | 105,997 | 109,071 | 112,234 | 115,489 | 118,838 | 104,845 |
| Wholesale trade | 59,022 | 60,734 | 62,495 | 64,307 | 66,172 | 68,091 | 70,066 | 72,098 | 74,189 | 76,340 | 67,351 |
| Average | $42,593 | $43,828 | $45,099 | $46,407 | $47,753 | $49,138 | $50,563 | $52,029 | $53,538 | $55,091 | $48,604 |

As shown in the exhibit above, the average salary for all industries within the nine-state region is slightly over $42,000 in Year 1. Wages for each industry are assumed to grow annually at 2.9% until the end of construction. As a result, the average annual salary for all FTE jobs in Year 10 is projected to be more than $55,000 when the project is complete.

The same approach was applied to wages for the operating period. The average wages by state shown in Exhibit 6, reflected in 2002 dollars, were indexed at the CAGR of 2.9% annually. As a result, the average salary for the nine-state region is approximately $54,000 in Year 11, the first full-year of operation for the entire system. By Year 40, the 30th year of operation, the average annual salary is projected to be over $123,000 assuming wages continue to grow at 2.9% annually. These results are shown in Exhibit 9 below.

**Exhibit 9: Average Annual Wages by State during Operating Period. 2008 dollars indexed at 2.9% annually.**

| State | 2008 Dollars | 30 Year Operations Year 11* | Year 40 |
|---|---|---|---|
| Illinois | $43,223 | | $131,799 |
| Indiana | 38,736 | 51,554 | 118,116 |
| Michigan | 44,552 | 59,296 | 135,853 |
| Ohio | 40,849 | 54,366 | 124,559 |
| Missouri | 39,151 | 52,107 | 119,383 |
| Iowa | 36,065 | 47,999 | 109,971 |
| Nebraska | 37,038 | 49,295 | 112,940 |
| Wisconsin | 39,650 | 52,771 | 120,903 |
| Minnesota | 44,279 | 58,932 | 135,021 |
| Total | $40,394 | $53,290 | $123,172 |

* Year 11 represents first full-year of operation for the entire MWRR system.

**Determining Federal Individual Income Taxes**

For the purpose of estimating federal individual income taxes, it was assumed that an individual income tax return would be filed each year for each projected FTE job, whether it was temporary or permanent. Wages were divided by income bracket as reported by the Statistics of Income Division of the Internal Revenue Service. The numbers of FTE jobs shown in the previous exhibits were then classified by wage bracket and those FTE jobs were multiplied by the average wage values to arrive at total income within each wage bracket. The effective tax rates, based on 2005 IRS compiled data, for each income bracket were then applied to the income in each tax bracket to produce the estimate of federal income taxes.

Although the federal income tax liability for all individual taxpayers is determined the same way across the country, the effective tax rate, for the same job earning the same salary can vary from state to state This is due to various types of adjustments to gross income that occur in order to arrive at FAGI. The frequency and types of these adjustments can vary from state to state. More significantly, filing status, state income taxes and other deductions (i.e. number of personal exemptions, mortgage interest, medical, contributions, etc.) can vary considerably from taxpayer to taxpayer and state to state, influencing the federal income tax liability and therefore the effective tax rate.

VantagePoint has developed an income tax model that projects federal income taxes for each state and as a result, the region. Tables have been included in the model's design that capture the federal effective tax rate unique to each state and each tax bracket. Additionally, the model applies the appropriate effective tax rate to each year's wages as wages grow in accordance with Employment Cost Index projections. This ensures that the correct effective tax rate for the next

highest wage bracket is applied when wages for a particular FTE job fall into that new bracket due to growth.

Exhibit 10 contains the wage brackets as reported by the IRS as well as the effective tax rates for each of the nine states.

**Exhibit 10: Federal Effective Individual Income Tax Rates**
**Source: Statistics of Income Division of Internal Revenue Service**

| | <======Size of Adjusted Gross Income======> | | | | |
|---|---|---|---|---|---|
| State | Under $50,000 | $50,000 under $75,000 | $75,000 under $100,000 | $100,000 under $200,000 | $200,000 or more |
| Illinois | 5.0% | 8.5% | 9.8% | 13.7% | 23.4% |
| Indiana | 5.0% | 8.2% | 9.7% | 13.6% | 22.9% |
| Michigan | 5.0% | 8.3% | 9.6% | 13.3% | 23.2% |
| Ohio | 5.5% | 8.6% | 9.8% | 13.4% | 22.6% |
| Missouri | 4.9% | 8.1% | 9.6% | 13.4% | 23.0% |
| Iowa | 5.1% | 7.7% | 9.3% | 13.3% | 22.5% |
| Nebraska | 5.0% | 7.5% | 9.1% | 13.0% | 22.9% |
| Wisconsin | 5.4% | 7.9% | 9.1% | 12.9% | 23.2% |
| Minnesota | 5.5% | 7.9% | 9.1% | 12.9% | 22.5% |

**Determining State Individual Income Taxes**

The same approach that was described to project federal individual income taxes was also applied at the state level to estimate individual income taxes for each of the nine states. It was assumed that each federal individual income tax return that would be filed for each FTE job for each year would have a corresponding individual income tax return filed at the state level. Although it is possible for a wage earner to work in one state and reside in a neighboring state, this report assumes that only one tax return for this type of wage earner would be filed with only one state – the state where the jobs are located. Exhibits 5 and 6 show this distribution of jobs.

Similar to the method used to estimate federal individual income taxes, wages were classified by income bracket in accordance to the income brackets reported by each state Department of Revenue. The numbers of FTE jobs shown in the previous exhibits were classified by wage bracket and were multiplied by the wages for those FTE jobs to arrive at total income within each wage bracket. The effective tax rate for each income bracket was then applied to the income stemming from these FTE jobs to arrive at projected state income taxes.

The income tax model that was developed to forecast federal individual income taxes also includes a component that provides a forecast of state individual income taxes. Individual tables have been included in the model's design that capture each state's effective tax rates, and applies them to the wages for each FTE job in each wage bracket. As with the federal component, the model ensures that the correct effective tax rate for the next highest wage bracket is applied when wages for a particular FTE job fall into a new bracket due to growth.

Due to the varying tax structures in each state, the sizes of the income brackets are classified differently by each state. A table showing each state's effective tax rate for each level of income is shown in Attachment A.

**KEY ASSUMPTIONS**

For both the federal and state levels, it was assumed that individual income taxes would begin to accrue immediately in the first year of capital investment as a result of the temporary FTE jobs that were created during the construction period. All states except for Ohio, Iowa, Nebraska, and Minnesota begin creating temporary FTE jobs in Year 1 of the construction period. Ohio, Iowa, and Minnesota begin investing capital and creating temporary FTE jobs in Year 2 while Nebraska begins its capital investment and creation of temporary FTE jobs in Year 3.[4] Income taxes from these temporary FTE jobs continue to accrue until each particular state ends its capital investment.

It is also assumed that operations begin the year after construction concludes for each state. Individual income taxes at both federal and state levels would immediately begin accruing with the creation of permanent operating related FTE jobs. All but two states, Illinois and Wisconsin, begin full operations in the last year (Year 10) of the system's construction and the operating related taxes for the remaining seven states are forecast to begin in this tenth year[5]. The entire system is assumed to be in full operation beginning in Year 11 with annual FTE jobs totaling 57,450 for the entire region. The MWRRI Analysis projects that this level of FTE job creation would be constant throughout the entire thirty-year operating period.

The income tax projections for each year that are provided later in this report reflect the income tax liability for the ***calendar tax year*** during which the wages were earned and not the year in which the income tax returns would be filed. These projections do not take into account cash

[4] Capital investment in a year may show a value of zero while FTE jobs are shown created in the same year due to rounding -- capital investment is expressed in millions of dollars in Exhibit 1 while FTE jobs are expressed in units in Exhibit 3.

[5] There are some component services that begin as early as Year 3. However, operating period taxes are only estimated once the full state corridor is in service.

flow implications resulting from payments made or refunds received in the year of the tax filing or for any extensions granted by the IRS or the states' Department of Revenue for any previous years.

While a majority of each state's income tax revenues is received from state residents, a portion of such revenues is received from non-residents. Since a breakdown of resident and non-resident income tax statistics was not available for all of the nine states, effective tax rates were obtained by including ***all*** tax returns, regardless of taxpayer residence.

One of the most common items across wage earners that will impact the effective tax rates for both federal and state individual income taxes is employee contributions to a defined contribution retirement plan. Examples of these plans include employer sponsored 401(K) plans and Simple IRA plans. These plans allow wage earners to contribute a percentage of their wages to these retirement plans on an income tax deferred basis subject to IRS limitations that may change annually. As an example, an individual earning gross wages of $50,000 and contributing 10% of his wages ($5,000) to his retirement plan would only be subject to income tax on earnings of $45,000.[6] Since the federal and states' income tax statistics reflect adjusted gross income net of any contributions to defined contribution plans, the resulting effective tax rates used in this analysis are also net of these contributions. Therefore, gross wages would need to be reduced by an assumed level of contributions to prevent a material misstatement.

Although individual income taxes would be deferred while wage earners were employed, distributions from retirement plans would be taxable for federal income tax purposes when received by the individual during retirement. From a state income tax perspective, the tax treatment on these distributions vary from state to state and depends entirely on which state the individual chooses to reside during retirement. These deferred taxable wages have not been included in this tax analysis and therefore represent additional tax revenues that would accrue to federal and state governments when the retirees receive their retirement distributions.

Statistics from a study[7] using 2006 data show that the overall contribution rate by wage earners across all industries, ages, and wage brackets averaged 7.0% and has remained relatively constant since 2002. The average compensation for these wage earners was approximately $79,000 which is significantly higher than the average wage in Year 1 of approximately $43,000. In 2006, the five-year participation rate of continuous eligible employees (wage earners eligible to contribute to in both 2005 and 2006) was 78%. This rate has increased seven percent over the five-year period. Since the income tax model assumes every wage earner is eligible and will

[6] Before any adjustments to gross income and deductions allowed under federal and states tax structures.
[7] Fidelity Investments "Building Futures Volume VIII, A Report on Corporate Defined Contribution Plans

contribute to a plan, the average contribute rate of 7.0% was multiplied by the participation rate of 78% to arrive at an adjusted contribution rate of 5.5%.

The study also indicates that participation and contribution rates vary among age groups and wage brackets from year to year. Trends show that both rates increase as wage earners get older and as their compensation increase. As baby boomers continue to approach retirement, both rates are expected to increase significantly for this group. Conversely, once baby boomers enter retirement, both rates could decrease. In order to capture the impact of differences between the averages wages from the study and the average wages in the model along with the impact of changes in both participation and contribution rates, the average contribution rate of 5% was assumed throughout the construction and operating periods.

As explained earlier, individual income taxes at the federal and state levels are based on effective tax rates resulting from tax structures that were in place for the years the statistical data was available. Since the most recent annual federal data was for 2005, there are five years of additional tax cuts remaining under the current federal tax plan. These additional income tax reductions expire in the year 2010. Since it is impossible to project the federal tax structure for the post-2010 period, this analysis assumes that the 2005 tax rates continue during the full construction and operating periods. Similarly, it is assumed that the state tax rates used for this analysis hold true for the full construction and operating periods.

## FEDERAL INDIVIDUAL INCOME TAXES

A forecast of federal individual income taxes by state, assuming a 5% contribution rate, is presented below in Exhibit 11. Annual and cumulative values are shown for each of the ten years of the construction phase as well as for years 20, 30 and 40. These latter intervals represent the 10th, 20th, and 30th years of full system operations.

**Exhibit 11: Federal Individual Income Tax Projections Assuming 5% Wage Deferral for Retirement Plan Contributions (2008 Dollars)**

Annual Federal Individual Income Tax Projections
($Millions)

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 20 | Year 30 | Year 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | $10.3 | $4.1 | $5.4 | $5.8 | $14.8 | $34.2 | $33.3 | $20.4 | $11.6 | $5.1 | $145.4 | $223.1 | $415.1 |
| Indiana | 0.1 | 1.6 | 4.9 | 4.0 | 3.9 | 37.9 | 33.8 | 37.3 | 0.7 | 10.8 | 23.6 | 37.1 | 69.3 |
| Michigan | 1.1 | 0.8 | 11.1 | 11.4 | 3.0 | 3.1 | 6.6 | 6.7 | 0.9 | 31.7 | 42.1 | 64.9 | 119.6 |
| Ohio | 0.0 | 1.1 | 2.6 | 2.0 | 2.1 | 23.4 | 18.9 | 20.2 | 0.4 | 15.2 | 20.2 | 30.7 | 55.8 |
| Missouri | 1.0 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 27.5 | 25.3 | 24.3 | 13.2 | 29.0 | 45.8 | 85.1 |
| Iowa | 0.0 | 0.2 | 1.1 | 1.4 | 3.9 | 4.8 | 4.9 | 9.3 | 5.0 | 2.3 | 4.5 | 7.3 | 13.9 |
| Nebraska | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 1.1 | 2.2 | 3.5 | 6.7 |
| Wisconsin | 0.9 | 1.9 | 10.1 | 17.3 | 10.5 | 5.3 | 9.3 | 16.1 | 12.1 | 12.8 | 49.0 | 75.2 | 141.8 |
| Minnesota | 0.0 | 0.9 | 1.2 | 8.1 | 8.5 | 0.6 | 0.7 | 0.7 | 0.2 | 6.7 | 9.0 | 13.8 | 26.0 |
| Total | $13.4 | $11.6 | $37.6 | $51.4 | $48.3 | $111.1 | $135.0 | $136.1 | $55.2 | $98.9 | $325.0 | $501.4 | $933.3 |

Cumulative Federal Individual Income Tax Projections
($Millions)

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 20 | Year 30 | Year 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | $10.3 | $14.4 | $19.8 | $25.6 | $40.4 | $74.6 | $107.9 | $128.3 | $139.9 | $145.0 | $1,427.8 | $3,349.8 | $6,826.8 |
| Indiana | 0.1 | 1.7 | 6.6 | 10.6 | 14.5 | 52.4 | 86.2 | 123.5 | 124.2 | 135.0 | 335.9 | $640.0 | 1,169.9 |
| Michigan | 1.1 | 1.9 | 13.0 | 24.4 | 27.4 | 30.5 | 37.1 | 43.8 | 44.7 | 76.4 | 448.3 | $1,013.9 | 2,043.7 |
| Ohio | 0.0 | 1.1 | 3.7 | 5.7 | 7.8 | 31.2 | 50.1 | 70.3 | 70.7 | 85.9 | 264.3 | $522.8 | 966.8 |
| Missouri | 1.0 | 2.0 | 3.2 | 4.6 | 6.2 | 8.0 | 35.5 | 60.8 | 85.1 | 98.3 | 345.7 | $720.5 | 1,372.5 |
| Iowa | 0.0 | 0.2 | 1.3 | 2.7 | 6.6 | 11.4 | 16.3 | 25.6 | 30.6 | 32.9 | 68.0 | $123.8 | 217.8 |
| Nebraska | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 1.2 | 18.7 | $46.1 | 93.3 |
| Wisconsin | 0.9 | 2.8 | 12.9 | 30.2 | 40.7 | 46.0 | 55.3 | 71.4 | 83.5 | 96.3 | 528.8 | $1,151.3 | 2,231.2 |
| Minnesota | 0.0 | 0.9 | 2.1 | 10.2 | 18.7 | 19.3 | 20.0 | 20.7 | 20.9 | 27.6 | 106.8 | $226.9 | 450.2 |
| Total | $13.4 | $25.0 | $62.6 | $114.0 | $162.3 | $273.4 | $408.4 | $544.5 | $599.7 | $698.6 | $3,544.3 | $7,795.1 | $15,372.1 |

The forecasts shown above estimate the amount of federal individual income tax potential. Approximately $699 million in individual income taxes would accrue by Year 10 and grow to over $15 billion by Year 40, which is the 30th year of the system's operation.

## STATE INDIVIDUAL INCOME TAXES

A forecast of state individual income taxes, assuming a contribution of 5% to retirement plans, is presented below in Exhibit 12. Annual and cumulative values are shown for each of the ten years of the construction phase as well as for years 20, 30 and 40. These latter intervals represent the 10th, 20th, and 30th years of full system operations.

**Exhibit 12: State Individual Income Tax Projections Assuming 5% Wage Deferral for Retirement Plan Contributions (2008 Dollars)**

Annual State Individual Income Tax Projections
($Millions)

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 20 | Year 30 | Year 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | $3.5 | $1.4 | $1.8 | $2.0 | $5.1 | $9.3 | $9.1 | $5.5 | $3.1 | $1.4 | $35.9 | $47.8 | $63.6 |
| Indiana | 0.0 | 0.8 | 2.5 | 2.1 | 2.0 | 16.0 | 14.3 | 15.6 | 0.3 | 4.5 | 6.0 | 8.0 | 10.7 |
| Michigan | 0.3 | 0.2 | 2.5 | 2.6 | 0.7 | 0.8 | 1.8 | 1.8 | 0.2 | 8.0 | 10.7 | 14.2 | 18.9 |
| Ohio | 0.0 | 0.4 | 1.0 | 0.8 | 0.8 | 7.9 | 6.4 | 6.8 | 0.1 | 3.7 | 4.9 | 6.6 | 8.7 |
| Missouri | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 10.9 | 10.0 | 9.6 | 5.7 | 7.5 | 10.0 | 13.3 |
| Iowa | 0.0 | 0.1 | 0.7 | 0.8 | 2.4 | 2.4 | 2.5 | 4.7 | 2.5 | 0.9 | 1.2 | 1.6 | 2.2 |
| Nebraska | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.6 | 0.8 | 1.1 |
| Wisconsin | 0.6 | 1.1 | 6.3 | 10.9 | 6.6 | 3.0 | 5.2 | 9.0 | 6.9 | 7.2 | 13.0 | 17.3 | 23.1 |
| Minnesota | 0.0 | 0.5 | 0.7 | 4.6 | 4.8 | 0.3 | 0.3 | 0.3 | 0.1 | 1.8 | 2.4 | 3.2 | 4.2 |
| Total | $4.9 | $5.0 | $16.1 | $24.4 | $23.1 | $40.4 | $50.5 | $53.7 | $22.8 | $33.7 | $82.2 | $109.5 | $145.8 |

Cumulative State Individual Income Tax Projections
($Millions)

| State | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 20 | Year 30 | Year 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illinois | $3.5 | $4.9 | $6.7 | $8.7 | $13.8 | $23.1 | $32.2 | $37.7 | $40.8 | $42.2 | $359.1 | $780.9 | $1,342.3 |
| Indiana | 0.0 | 0.8 | 3.3 | 5.4 | 7.4 | 23.4 | 37.7 | 53.3 | 53.6 | 58.1 | 111.4 | 182.3 | 276.7 |
| Michigan | 0.3 | 0.5 | 3.0 | 5.6 | 6.3 | 7.1 | 8.9 | 10.7 | 10.9 | 18.9 | 113.0 | 238.2 | 404.9 |
| Ohio | 0.0 | 0.4 | 1.4 | 2.2 | 3.0 | 10.9 | 17.3 | 24.1 | 24.2 | 27.9 | 71.5 | 129.4 | 206.6 |
| Missouri | 0.5 | 1.0 | 1.6 | 2.2 | 2.9 | 3.6 | 14.5 | 24.5 | 34.1 | 39.8 | 106.2 | 194.6 | 312.3 |
| Iowa | 0.0 | 0.1 | 0.8 | 1.6 | 4.0 | 6.4 | 8.9 | 13.6 | 16.1 | 17.0 | 27.9 | 42.5 | 61.8 |
| Nebraska | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 5.9 | 13.1 | 22.6 |
| Wisconsin | 0.6 | 1.7 | 8.0 | 18.9 | 25.5 | 28.5 | 33.7 | 42.7 | 49.6 | 56.8 | 171.8 | 324.8 | 528.4 |
| Minnesota | 0.0 | 0.5 | 1.2 | 5.8 | 10.6 | 10.9 | 11.2 | 11.5 | 11.6 | 13.4 | 34.5 | 62.5 | 99.8 |
| Total | $4.9 | $9.9 | $26.0 | $50.4 | $73.5 | $113.9 | $164.4 | $218.1 | $240.9 | $274.6 | $1,001.2 | $1,968.3 | $3,255.5 |

The forecasts shown above estimate the maximum amount of state individual income tax potential. Over $274 million in individual income taxes would accrue by Year 10 and grow to $3.3 billion by Year 40, which is the 30th year of the system's operation.

## ATTACHMENT A

State Effective Individual Income Tax Rates

| Bracket | Illinois | Indiana | Michigan | Ohio | Missouri | Iowa | Nebraska | Wisconsin | Minnesota |
|---|---|---|---|---|---|---|---|---|---|
| $0 | 2.1% | 2.5% | 0.9% | 0.0% | 0.2% | 0.4% | -0.1% | 0.5% | 1.3% |
| $10,000 | 2.1% | 2.8% | 0.9% | 0.4% | 0.8% | 1.9% | 0.6% | 0.8% | 1.6% |
| $15,000 | 2.1% | 2.8% | 0.9% | 1.0% | 0.8% | 1.9% | 0.8% | 1.5% | 1.6% |
| $20,000 | 2.1% | 3.0% | 0.9% | 1.5% | 1.8% | 2.7% | 1.5% | 2.3% | 2.5% |
| $25,000 | 2.1% | 3.0% | 0.9% | 1.9% | 1.8% | 3.1% | 1.8% | 2.9% | 2.5% |
| $30,000 | 2.1% | 3.1% | 0.9% | 2.2% | 2.7% | 3.4% | 2.2% | 3.6% | 3.2% |
| $35,000 | 2.1% | 3.1% | 0.9% | 2.4% | 2.7% | 3.5% | 2.2% | 3.6% | 3.2% |
| $40,000 | 2.1% | 3.1% | 0.9% | 2.5% | 2.7% | 3.7% | 2.5% | 4.0% | 3.5% |
| $45,000 | 2.1% | 3.1% | 0.9% | 2.6% | 2.7% | 3.7% | 2.5% | 4.0% | 3.5% |
| $50,000 | 2.1% | 3.2% | 2.3% | 2.7% | 3.2% | 3.8% | 3.0% | 4.4% | 4.2% |
| $55,000 | 2.1% | 3.2% | 2.4% | 2.9% | 3.2% | 3.8% | 3.0% | 4.4% | 4.2% |
| $60,000 | 2.1% | 3.2% | 2.5% | 3.0% | 3.2% | 3.8% | 3.0% | 4.4% | 4.2% |
| $65,000 | 2.1% | 3.2% | 2.5% | 3.1% | 3.2% | 3.8% | 3.0% | 4.4% | 4.2% |
| $70,000 | 2.1% | 3.2% | 2.6% | 3.1% | 3.2% | 3.8% | 3.0% | 4.8% | 4.2% |
| $75,000 | 2.1% | 3.2% | 2.7% | 3.2% | 3.5% | 4.0% | 3.6% | 4.8% | 4.2% |
| $80,000 | 2.1% | 3.2% | 2.8% | 3.3% | 3.5% | 4.0% | 3.6% | 4.8% | 4.2% |
| $85,000 | 2.1% | 3.2% | 2.9% | 3.4% | 3.5% | 4.0% | 3.6% | 4.8% | 4.2% |
| $90,000 | 2.1% | 3.2% | 2.9% | 3.5% | 3.5% | 4.0% | 3.6% | 4.8% | 4.2% |
| $95,000 | 2.1% | 3.2% | 3.0% | 3.6% | 3.5% | 4.0% | 3.6% | 4.8% | 4.2% |
| $100,000 | 2.1% | 3.3% | 3.0% | 3.8% | 3.5% | 1.7% | 4.0% | 5.3% | 5.3% |
| $110,000 | 2.1% | 3.3% | 3.0% | 3.8% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $120,000 | 2.1% | 3.3% | 3.1% | 3.8% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $125,000 | 2.1% | 3.3% | 3.1% | 4.1% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $130,000 | 2.1% | 3.3% | 3.1% | 4.1% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $140,000 | 2.1% | 3.3% | 3.1% | 4.1% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $150,000 | 2.1% | 3.3% | 3.1% | 4.3% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $160,000 | 2.1% | 3.3% | 3.1% | 4.3% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $170,000 | 2.1% | 3.3% | 3.1% | 4.3% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $175,000 | 2.1% | 3.3% | 3.1% | 4.5% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $180,000 | 2.1% | 3.3% | 3.1% | 4.5% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $190,000 | 2.1% | 3.3% | 3.1% | 4.5% | 4.6% | 1.7% | 4.0% | 5.3% | 5.3% |
| $200,000 | 2.1% | 3.3% | 3.2% | 4.6% | 4.6% | 1.7% | 4.2% | 5.9% | 5.3% |
| $250,000 | 2.1% | 3.3% | 3.2% | 4.8% | 4.6% | 1.7% | 4.2% | 5.9% | 6.6% |
| $300,000 | 2.1% | 3.3% | 3.1% | 4.9% | 4.6% | 1.7% | 4.2% | 5.9% | 6.6% |
| $350,000 | 2.1% | 3.3% | 3.1% | 4.9% | 4.6% | 1.7% | 4.2% | 5.9% | 6.6% |
| $400,000 | 2.1% | 3.3% | 3.1% | 5.0% | 4.6% | 1.7% | 4.2% | 5.9% | 6.6% |
| $450,000 | 2.1% | 3.3% | 3.1% | 5.0% | 4.6% | 1.7% | 4.2% | 5.9% | 6.6% |
| $500,000 | 2.1% | 3.4% | 2.9% | 4.8% | 4.6% | 1.7% | 0.8% | 6.2% | 7.0% |
| $750,000 | 2.1% | 3.4% | 2.7% | 4.3% | 4.6% | 1.7% | 0.8% | 6.2% | 7.0% |
| $1,000,000 | 2.1% | 3.4% | 0.8% | 4.0% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $1,500,000 | 2.1% | 3.4% | 0.8% | 3.5% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $2,000,000 | 2.1% | 3.4% | 0.8% | 3.0% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $3,000,000 | 2.1% | 3.4% | 0.8% | 2.6% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $4,000,000 | 2.1% | 3.4% | 0.8% | 3.0% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $5,000,000 | 2.1% | 3.4% | 0.8% | 1.9% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |
| $10,000,000 | 2.1% | 3.4% | 0.8% | 0.7% | 4.6% | 1.7% | 0.8% | 6.3% | 7.0% |