

Public infrastructure finance: symposium introduction

Introduction and overview

Infrastructure is the foundation of modern economies and societies. A robust, efficient, and well-maintained infrastructure system is critical to support and sustain the nation's economy, improve quality of life, and strengthen global competitiveness. However, as widely publicized, the US public infrastructure system is facing serious challenges including insufficient capacity, deteriorating physical conditions, delayed maintenance, and declining fiscal resources (Chen, 2014, 2016a, 2017; Chen *et al.* 2016; US Government Accountability Office, 2008; American Society of Civil Engineers (ASCE), 2013, 2017). In fact, the latest 2017 Report Card for America's Infrastructure continued to give the nation's critical infrastructure an overall poor grade of D+. According to ASCE (2017), one out of every five miles of highway pavement is in poor condition; one in nine of the nation's bridges is rated in structurally deficient condition; and more than two out of every five miles of America's urban interstates are congested.

The declining quality and poor performance of public infrastructure system impose huge costs on US businesses and individuals and create bottlenecks that constrain economic development. ASCE (2017) estimated an infrastructure investment gap of \$2.1 trillion between 2016 and 2025 and failure to closing this gap could cost the nation almost \$4 trillion in GDP and a loss of 2.5 million jobs through 2025. There are many factors contributing to current infrastructure finance challenge. On the demand side, due to population growth and urbanization, government spending on infrastructure has not kept pace with the investment demands of an aging and deteriorating American infrastructure system (Bartle and Chen, 2014). ASCE (2013) estimated that maintaining the nation's highway systems at their current conditions will require an annual capital investment of \$101 billion between 2008 and 2028. Moreover, an additional \$79 billion annually will be needed to improve highway conditions and performance. The US Environmental Protection Agency (2013) has identified a total capital improvement need of \$384 billion for investing in public water infrastructure systems over the next 20 years. On the supply side, rising capital construction costs, shrinking public infrastructure funding sources, and constrained public sector budgets due to rising health care and pension costs threaten the future sustainability of infrastructure finance (Chen and Bartle, 2017).

The well-documented infrastructure funding shortfalls call for scholarly research focused on the finance and maintenance of critical public infrastructure systems. In this context, this symposium is designed to introduce the complexity and challenges of funding and financing public infrastructure. This introduction paper first provides a review of important background issues related to infrastructure finance, and then offers brief summaries of main findings of the four articles included in the symposium. The discussion of key contributions of this symposium is presented. The final section concludes with three broad suggestions for future research.

The author would like to thank the symposium authors for their excellent work in creating the symposium's content and refining their papers. The author is also very grateful to the outstanding JPBAFM editorial team (Howard A. Frank, Milena Neshkova, and Hai Guo) for their individual support and encouragement of this symposium. Finally, the author would like to extend a sincere thank to the anonymous manuscript referees. The author hopes that this symposium will provide the impetus for more research on infrastructure finance. This paper forms part of a special section "Public Infrastructure Finance Symposium".



Infrastructure finance: research background

What is infrastructure?

In general, there is no standard or agreed-upon definition of infrastructure according to the current usage of the term. Two approaches to define infrastructure exist in the literature. One approach is a narrow definition and refers to infrastructure as economic physical assets to support private business development. For example, the 2016 Economic Report of the President defines infrastructure as “fixed capital assets that are consumed jointly in various production processes that facilitate and support economic activities” (US Council of Economic Advisers, 2016, p. 252). Under this definition, infrastructure consists of economic infrastructure, which comprises roads, bridges, tunnels, airports, transit, ports, railways, energy production facilities and distribution networks, telecommunication systems, water and sewer systems, and solid waste management (see Table I).

Another approach is a broader definition that regards infrastructure as a wide array of physical assets required to support both private economic activity and social services (US Congressional Budget Office, 2008; US Congressional Budget Office and Joint Committee on Taxation, 2009). According to this definition, infrastructure not only contains economic infrastructure but also encompasses social infrastructure that is essential for a society to function. Social infrastructure includes schools, universities, hospitals, courts, prisons, parks and recreational facilities, libraries, community housing, public safety building and facilities, city halls and facilities, and the like (see Table I).

Governmental role in the provision of infrastructure

The traditional rationale for the public provision and regulation of infrastructure is built upon the economic concepts of public goods and market failure. Infrastructure assets often produce public goods that are non-rivalrous in consumption, non-excludable in use, or both; typically exhibit natural monopoly; and often yield positive spillovers that are hard to monetize (Weimer and Vining, 2011)[1]. Due to these characteristics, private markets will underprovide the socially desirable levels of infrastructure. This provides a rationale for public provision. In addition, governments may also provide infrastructure for other reasons, such as equity considerations.

Economic infrastructure	Social infrastructure
<i>Transportation sector</i>	<i>Education sector</i>
Surface transportation (e.g. roads, bridges, railroads, parking)	Elementary school buildings and facilities
Public transit (e.g. rail, bus rapid transit)	University buildings and facilities
Aviation (airports, navigation aid systems)	<i>Public health</i>
Water transportation	Health care facilities
<i>Environmental sector</i>	Hospitals
Water supply and treatment (drinking)	<i>Judicial and correctional facilities</i>
Wastewater treatment (sewerage)	Prisons and jails
Solid waste management	Court houses
Pollution control facilities	<i>Housing and Community development</i>
<i>Utility sector</i>	<i>Government buildings and facilities</i>
Electric power systems	Government buildings
Gas supply	Public safety and welfare facilities
<i>Telecommunication sector</i>	<i>Civic and cultural buildings</i>
Telephone lines and networks	Libraries, convention centers
High-speed internet	Parks and recreation

Source: Chen and Bartle (2017)

Table I.
Types and components of Infrastructure

Figure 1 shows the varying roles of the public and private sectors in the provision of different kinds of infrastructure assets in 2014. The public sector is the sole source of infrastructure investment for passenger railroads and public safety. It accounts for over three-quarters of infrastructure investment on mass transit and highways and streets. The public sector also supplies over half of infrastructure investment in educational facilities and buildings, aviation, and water transportation. In contrast, the private sector provides all investment in freight railroads and telecommunications and funds most of the investment in energy, health care facilities and hospitals, and amusement parks and recreational facilities.

Fiscal federalism in infrastructure finance

In the USA, infrastructure finance is a shared responsibility across different levels of government. As indicated in Figure 2, state and local governments are the main provider and operator of core economic infrastructure; they fund the vast majority of the nation's roads, highways, transit systems, drinking water, and wastewater systems. In addition, they play a dominant role in funding several social infrastructure sectors such as public safety, educational facilities and buildings, health care, and amusement and recreation. The federal government is solely responsible for passenger railroads and accounts for a relatively large role (over one-third) in funding aviation, water transportation, and water resources (e.g. dams, levees, and reservoirs).

Fundamentals of infrastructure finance

Infrastructure projects have two key features that make the funding and financing of them somewhat different than daily operations of governments. The first feature is large, up-front investments that require significant capital outlay. The second feature is the long economic life of the infrastructure assets. Due to the large capital outlay and the long time horizon, infrastructure projects often involve higher risks – making efficient and prudent funding and financing of infrastructure critical.

There is a difference between infrastructure funding and financing. Funding refers to a revenue stream or money that pays for an infrastructure project (US Department of Transportation, 2010). It may consist of a revenue source from local tax receipts or grants, or it may refer to proceeds of debt financing. A large infrastructure project typically involves multiple sources of funding, including federal, state, and local sources. Financing refers to

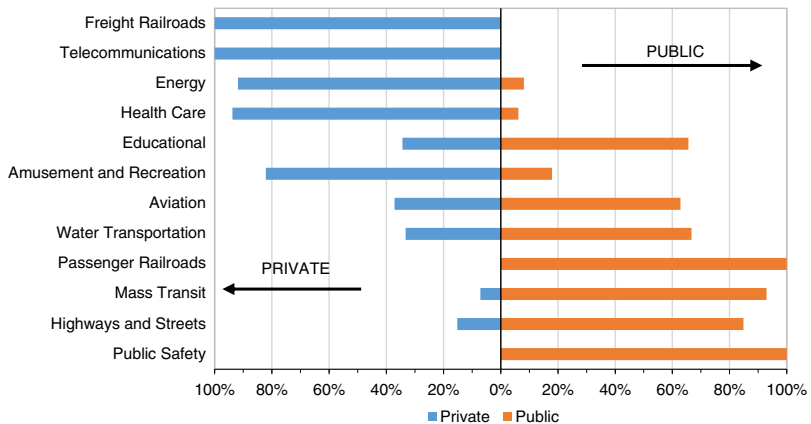
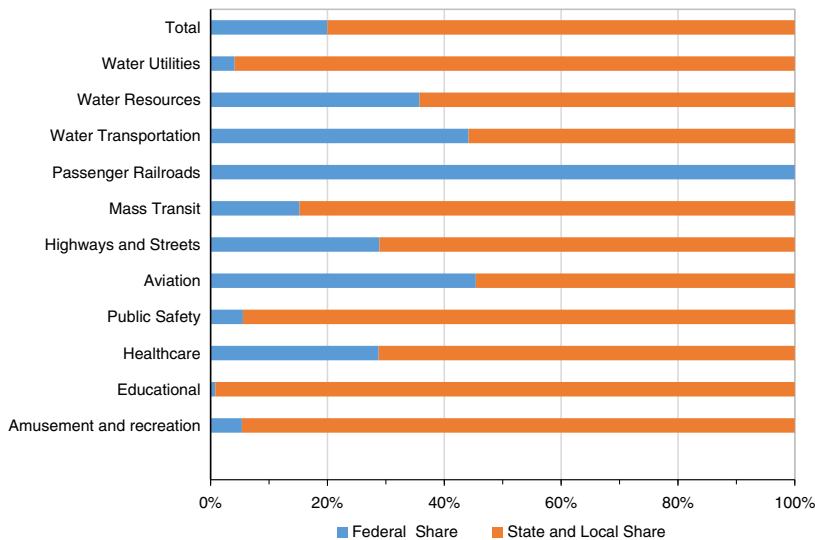


Figure 1. Public and private share of investment in infrastructure (2014)

Source: US Bureau of Economic Analysis (2015)



Source: US Bureau of Economic Analysis (2015)

Figure 2. Share of infrastructure investment by levels of government (2014)

borrowing money to pay for an infrastructure project, typically through a bond, but also through loans or other debt mechanisms such as a line of credit (US Department of Transportation, 2010). Similar to a home mortgage, debt must be paid back over time with interest. A source of revenue must be secured to repay the debt, whether it is future federal and state grants, local taxes, or other sources.

In general, governments rely on two methods of financing infrastructure: pay-as-you-go (pay-go, or cash) and pay-as-you-use (pay-use, or debt) (Chen and Bartle, 2017; Marlowe *et al.*, 2009). Pay-go capital financing refers to using cash or other current assets rather than debt issuance to fund capital projects. It is most commonly used in cases when capital project sizes are small, project sponsors have limited access to debt, state, and local governments are closely approaching their debt limits, or there are prohibitions on use of debt. Pay-use capital financing means issuing long-term debt in the form of general obligation bonds or revenue bonds to fund capital projects. Infrastructure projects often involve large or lumpy investments and benefit both current taxpayers and future generations. The use of debt financing is justified in part by the rationale of spreading out the costs of public infrastructure investments throughout the period of bond repayments.

Whether the choice is pay-go or pay-use capital financing, sources for funding local infrastructure generally come from local general taxes, special funds such as dedicated user fees and earmarked taxes, intergovernmental grants, bond proceeds, or some combination of these sources. For example, local sources for funding highways primarily include federal and state highway aid, general fund appropriations, tolls, and bond proceeds. Municipal wastewater and drinking water infrastructure projects have largely been funded by local wastewater and water supply user fee charges and private market debt, with the remainder of funding from federal and state grants. Table II provides a list of these financing methods and funding sources.

Summary of the articles in this symposium

Brief summaries of the four articles included in this symposium are provided next. Individually, these four articles discuss different aspects of infrastructure finance, including

equity of state transit subsidy, willingness-to-pay (WTP) tolls, public preferences for allocating urban transportation spending, and effects of infrastructure accounting and reporting standards.

Equity and finance issues in the state subsidy of public transit

State governments play an important role in transit finance, even though it is normally thought of as a local activity and responsibility (Bartle and Chen, 2014). In this article, Hudspeth and Wellman explore the equity issue in state transit finance and how state transit funding affects the fiscal health of local transit agencies. In their study, the fiscal condition measure of transit agencies is operationalized as a budgetary solvency, which is the fiscal balance (total operating revenues minus total operating expenditure) as a share of total operation expenditure. Hudspeth and Wellman also develop an equity index in state transit funding, which is defined as the share of total state expenditures for transit that a transit agency received minus the share of total transit ridership than a transit agency provided. Based on a panel data analysis of 37 of the largest public transit agencies in the USA from the period of 1991 to 2009, they find that there are significant inequities in state transit funding that are related to over-reliance on passenger fares. Furthermore, a transit agency's fiscal health is positively related to dedicated tax revenues and negatively related to its share of a state's total transit ridership.

Getting the toll story about WTP tolls

Tolls are a direct user fee imposed on motorists for their use of transportation infrastructure. Toll roads have a long history in the USA dating back to the Philadelphia and Lancaster Turnpike built in the 1790s. In recent years, increasing population and declines in the growth of traditional public transportation funding source (e.g. fuels tax) have placed renewed interest in toll financing. In this context, Yusuf *et al.* examine drivers' expressed WTP tolls using data from a survey of 629 drivers in Hampton Roads, Virginia. They apply the theory of planned behavior to model WTP as a two-stage decision process: the first-stage decision process of drivers decide on whether, in-principle, to support paying tolls (in-principle WTP) and the second-stage decision process of drivers decide on the exact amount they are willing to pay (amount WTP). In the empirical testing, Yusuf *et al.* confirm the existence of a two-stage decision-making process regarding WTP tolls. In particular, they find that the key predictors of in-principle WTP are general attitudes toward tolls and the ability to pay. Moreover, in-principle WTP predicts amount WTP. They also note that price information makes a difference in determining amount WTP by serving as an anchor value and cognitive heuristic to moderate drivers' responses.

Table II.
Infrastructure
financing methods
and funding sources

Pay-as-you-go financing	Pay-as-you-use financing
Cash and savings	Debt financing
Taxation	Loan financing
General taxes	Private bank loans
Special dedicated taxes	Bond financing
User charges	General obligation bonds
Capital reserves and fund balance	Revenue bonds
Federal grants and aid	Private activities bonds
State grants and aid	Leasing-revenue bonds

Source: Chen and Bartle (2017)

Beyond new roads and bridges: understanding public preferences for investing in urban non-automobile transportation infrastructure

The efficient allocation of limited government resources across different spending categories is a crucial element to improve the poor performance of American transportation infrastructure system (Chen, 2017). The article by O'Connell, Yusuf, and Anuar examines the factors influencing public preferences for four options of infrastructure investment priorities: repairing existing roads, bridges, and tunnels; constructing new or expanding roads, bridges, and tunnels; expanding mass transit; and expanding bicycle routes and improving bike safety. Based on a data analysis from the 2013 Life in Hampton Roads Survey, O'Connell *et al.* observe that repairing existing infrastructure is the most popular spending priority (66 percent) and also find as much support (46 percent) for investing in non-automobile infrastructure (mass transit and bike facilities) as for investing in new roads, bridges, and tunnels. They take a further step to predict public preferences for investment in non-automobile infrastructure, and contend that self-interest variables (personal use of light rail and long commute), economic belief variable (related to light rail impact on local economic development), and political belief variable (liberal ideology) contribute to public support for non-automobile infrastructure spending.

Effects of the GASB No. 34 infrastructure reporting standards on state highway infrastructure quality: a panel data analysis

In 1999, GASB Statement No. 34 issued new standards for state and local governments to report information regarding general infrastructure assets in financial statements. There is a theoretical and practical expectation that the existence of capital asset information under GASB No. 34 could strengthen government capacity in infrastructure planning and management and result in efficient resource allocation decisions toward more capital maintenance activities. In this article, Kim, Chen, and Ebdon empirically test this expectation and explore the effects of infrastructure reporting mandates and methods on state highway infrastructure quality. Based on a panel data analysis covering 45 state governments from 1995 to 2009, Kim *et al.* find strong evidence that the implementation of GASB 34's infrastructure reporting mandates has a direct impact on improving state highway infrastructure quality via the effect of enhancing spending efficiency. Besides this direct impact, GASB 34 also indirectly improves state highway infrastructure quality through raising state spending on highway maintenance activities. Furthermore, Kim *et al.* find that the quality-enhancement effect of infrastructure reporting is greater in states with the modified reporting approach than in states using the depreciation method.

Key contributions

Although there is a growing literature on the economics of infrastructure investment, academic inquiry on infrastructure finance is surprisingly limited (e.g. Chen, 2016a; Fisher and Wassmer, 2015). The four articles included in this symposium offer a substantive contribution to state and local infrastructure finance literature in two important ways.

First, all the four papers in this symposium highlight the current challenges of funding and financing US infrastructure and advance our understanding of the various funding and financing infrastructure practices among state and local governments. In particular, Hudspeth and Wellman's study raises the concerns about equity and fiscal sustainability issues in state and local transit finance. Yusuf *et al.*'s study advances our knowledge and understanding of the factors driving citizen preferences for toll financing. O'Connell *et al.*'s research offers very insightful perspectives on citizen preferences for transportation resource allocation. Kim *et al.*'s research represents the first academic attempt to investigate the efficacy of infrastructure reporting standards and methods for preserving and improving infrastructure quality and performance.

Second, the empirical conclusions found in these articles offer numerous relevant policy implications for policy makers and infrastructure finance practitioners. Hudspeth and Wellman's study can be used to reform current state transit funding formula and strengthen the long-run fiscal sustainability of local transit agencies. Findings from Yusuf *et al.*'s study are particularly useful for policy makers who are considering the adoption of toll financing and setting up toll rates. O'Connell *et al.*'s study highlights the critical role of citizen input in the decision-making process of infrastructure investment. Public officials should incorporate citizen preferences in prioritizing infrastructure investment and strive to spend infrastructure money more wisely. Kim *et al.*'s results reveal that capital asset information mandated by GASB No. 34 infrastructure reporting standards is useful to infrastructure resource allocation and management. Furthermore, Kim *et al.* suggest that governments currently using depreciation should be encouraged to move to the modified approach because it discloses extensive details about government-wide infrastructure asset condition and estimated maintenance needs.

Moving forward: call for future research

There are three broad suggestions for future research on public infrastructure finance. First, in order to bridge the public infrastructure funding gaps, governments have turned to more creative ways of financing public infrastructure investments. In general, innovative infrastructure financing is an umbrella concept that supplements traditional infrastructure funding sources and financing methods, and embraces any strategy involving new funding sources (e.g. new taxes, new value capture mechanisms, and vehicle miles traveled) fees), new financing mechanisms (e.g. new credit assistance tools – Transportation Infrastructure Finance and Innovation Act Loans, State Infrastructure Bank Loans or alternative debt and bond finance tools – Grant Anticipation Revenue Vehicles (GARVEE) bonds, green bonds), and new financial arrangements involving private and nonprofit partners (e.g. public-private partnerships, crowdfunding) in financing public infrastructure (Chen, 2016b). Many state and local governments have been very successful in implementing innovative infrastructure financing tools to stretch limited public resources for funding and financing infrastructure projects. However, current research on innovative infrastructure financing is scant and time-consuming to find. A few public budgeting and finance scholars such as Yusuf and Liu (2008), Chen (2016b), Chen and Bartle (2017), and Greer and Lee (2016) have paid attention to creative ways of funding and financing infrastructure. However, given the future prospect of innovative infrastructure financing, more research is needed to study policy adoption and diffusion of financial innovations in the provision of infrastructure as well as the best practices of implementing innovative infrastructure financing by state and local governments. Such research will offer timely and valuable recommendations for state and local government managers who are considering the use of innovative infrastructure financing options.

Second, there is a general consensus that US infrastructure has become badly deteriorated primarily due to inadequate outlays for maintenance and the underfunding of new investment needs. But, a large increase in infrastructure funding is not sufficient to resolve the infrastructure crisis. Government efficiency in financing and providing public infrastructure services also matters. Studies have documented a significant amount of evidence of government inefficiency in supplying and providing transportation infrastructure in the USA (e.g. Geddes, 2011; Winston, 2013). These inefficiencies include inefficient infrastructure pricing, which fails to charge infrastructure users in line with the social costs they incur (Winston, 2013); the diversion of a significant amount of highway user fees for non-highway purposes, which breaks the link between highway taxes paid and benefits received from road uses (Goel and Nelson, 2003); the failure to fund projects with the highest returns due to many politically earmarked projects (Geddes, 2011; Sciara, 2012; Winston, 2013); political corruption in capital project construction (Liu and Mikesell, 2014; Yan and Oum, 2014); the inefficient allocation of investment funds between maintenance and new expansion (Chen, 2017; Winston, 2013); and the regulations that

inflate capital construction labor costs (Winston, 2013). It can be said that achieving the efficiency of public infrastructure investment is a crucial element to improve the condition and performance of the American infrastructure system. Now, the key research question is:

RQ1. How can we improve the technical and allocative efficiency of public infrastructure investment?

In this symposium, Kim *et al.* have concluded that GASB No. 34 infrastructure asset reporting rules facilitate the efficient utilization of scarce infrastructure funding sources. Future research should focus more on how to building robust political, fiscal, managerial, and institutional arrangements to enhance the efficiency of public investment across different infrastructure sectors.

Third, all articles in this symposium have focused on the transportation sector and conducted a quantitative research in the US context. However, infrastructure consists of multiple sectors such as drinking water, wastewater, and storm water. In addition, financing infrastructure is an important issue for any country in the world. This is an area where scholars could extend research opportunities to examine multi-sector infrastructure finance issues in a comparative country setting.

Can Chen

Florida International University, Miami, Florida, USA

Note

1. Public goods are, in varying degrees, non-rivalrous in consumption, non-excludable in use, or both. A good is non-rivalrous in consumption when one person benefits from it without reducing the benefits of others. A good is non-excludable in use if it is impractical or very costly for one person to maintain exclusive control over its use (Weimer and Vining 2011, p. 72).

References

- American Society of Civil Engineers (ASCE) (2013), "ASCE's 2013 Report Card for America's Infrastructure", available at: www.infrastructurereportcard.org (accessed December 15, 2017).
- American Society of Civil Engineers (ASCE) (2017), "ASCE's 2017 Report Card for America's Infrastructure", available at: www.infrastructurereportcard.org/ (accessed December 15, 2017).
- Bartle, J.R. and Chen, C. (2014), "Future issues in state transportation finance", in Willoughby, K.G. and Rubin, M.M. (Eds), *The Sustaining the States: The Fiscal Viability of American State Governments*, Taylor & Francis Group Press, New York, NY, pp. 211-234.
- Chen, C. (2014), "Measuring state highway sustainability: taking the fiscal dimension into account", *Public Works Management & Policy*, Vol. 19 No. 3, pp. 255-276.
- Chen, C. (2016a), "Effects of fiscal stress on state highway infrastructure finance: a composite index approach", *Municipal Finance Journal*, Vol. 37 No. 2, pp. 1-28.
- Chen, C. (2016b), "Bond banks, infrastructure banks, and state revolving funds – innovative infrastructure financing tools", in Smith, D.L. and Justice, J.B. (Eds), *The Encyclopedia of Public Administration and Policy*, Taylor & Francis Group Press, New York, NY, pp. 174-181.
- Chen, C. (2017), "Does money matter for infrastructure outcomes? The effects of public infrastructure finance on state infrastructure quality", *Journal of Public Budgeting, Accounting & Financial Management*, Vol. 29 No. 3, pp. 375-408.
- Chen, C. and Bartle, J.R. (2017), "Infrastructure finance: a guide for local government managers", ICMA and GFOA Policy White Paper, Washington, DC, available at: <https://icma.org/documents/infrastructure-financing-guide-local-government-managers> (accessed January 15, 2018).
- Chen, C., Kriz, K.A. and Wang, Q. (2016), "How does the health of transportation infrastructure affect state credit ratings? An empirical analysis", *Public Finance Review*, Vol. 44 No. 5, pp. 660-680.

- Fisher, R.C. and Wassmer, R.W. (2015), "An analysis of state-local government capital expenditure during the 2000s", *Public Budgeting & Finance*, Vol. 35 No. 1, pp. 3-28.
- Geddes, R.R. (2011), *The Road to Renewal: Private Investment in the US Transportation Infrastructure*, Government Institutes, Washington, DC.
- Goel, R.K. and Nelson, M.A. (2003), "Use or abuse of highway tax revenues? An economic analysis of highway spending", *Applied Economics Letters*, Vol. 10 No. 13, pp. 813-819.
- Greer, R.A. and Lee, J. (2016), "Post-recession policy diffusion: local government adoption of build America bonds", *Journal of Public Budgeting, Accounting & Financial Management*, Vol. 28 No. 2, pp. 209-229.
- Liu, C. and Mikesell, J.L. (2014), "The impact of public officials' corruption on the size and allocation of US State spending", *Public Administration Review*, Vol. 74 No. 3, pp. 346-359.
- Marlowe, J., William, C.R. and Vogt, A.J. (2009), *Capital Budgeting and Finance: A Guide for Local Governments*, International City/County Manager Association Press, Washington, DC.
- Sciara, G.C. (2012), "Financing congressional earmarks: implications for transport policy and planning", *Transportation Research Part A: Policy and Practice*, Vol. 46 No. 8, pp. 1328-1342.
- US Bureau of Economic Analysis (2015), "National income and product accounts – fixed assets", available at: www.bea.gov/iTable/index_FA.cfm
- US Congressional Budget Office (2008), "Issues and options in infrastructure investment", available at: www.cbo.gov/sites/default/files/110th-congress-2007-2008/reports/05-16-infrastructure.pdf (accessed December 15, 2017).
- US Congressional Budget Office and Joint Committee on Taxation (2009), "Subsidizing infrastructure investment with tax-preferred bonds", available at: www.cbo.gov/sites/default/files/111th-congress-2009-2010/reports/10-26-taxpreferredbonds.pdf (accessed December 15, 2017).
- US Council of Economic Advisers (2016), "2016 Economic Report of the President", available at: www.whitehouse.gov/administration/eop/cea/economic-report-of-the-President/2016 (accessed December 15, 2017).
- US Department of Transportation (2010), "Project Finance Primer", available at: www.fhwa.dot.gov/ipd/pdfs/finance/ProjectFinancePrimerREV4.pdf (accessed December 15, 2017).
- US Environmental Protection Agency (2013), "Drinking Water Infrastructure Needs Survey and Assessment", available at: www.epa.gov/sites/production/files/2015-07/documents/epa816r13006.pdf (accessed December 15, 2017).
- US Government Accountability Office (2008), *Physical Infrastructure: Challenges and Investment Options for the Nation's Infrastructure*, Government Accountability Office, Washington, DC, available at: www.gao.gov/products/GAO-08-763T
- Weimer, D.L. and Vining, A.R. (2011), *Policy Analysis: Concepts and Practice*, Longman, Harlow.
- Winston, C. (2013), "On the performance of the US transportation system: caution ahead", *Journal of Economic Literature*, Vol. 51 No. 3, pp. 773-824.
- Yan, J. and Oum, T.H. (2014), "The effect of government corruption on the efficiency of US commercial airports", *Journal of Urban Economics*, Vol. 80 No. 3, pp. 119-132.
- Yusuf, J. and Liu, G. (2008), "State Infrastructure Banks and intergovernmental subsidies for local transportation investment", *Public Budgeting & Finance*, Vol. 28 No. 4, pp. 71-89.

Further reading

- Texas A&M Transportation Institute (2012), "2011 Urban Mobility Report", available at: <http://mobility.tamu.edu/> (accessed December 15, 2017).

About the Guest Editor

Can Chen, PhD, is Assistant Professor at the Department of Public Administration, Steven J. Green School of International and Public Affairs, Florida International University. His main research interests are state and local infrastructure finance and capital budgeting. Can Chen can be contacted at: cchen@fiu.edu