



IN-KIND INFRASTRUCTURE INVESTMENTS BY PUBLIC PENSIONS: THE QUEENSLAND MOTORWAYS CASE STUDY

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ABSTRACT

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OECD countries require billions in infrastructure investment for new projects and the rehabilitation of old assets. Public pensions are likewise underfunded and in need of stable, inflation-linked investment opportunities uncorrelated with the rest of their portfolio, making infrastructure a seemingly strong fit. This has led to calls to facilitate more direct investment by public pension funds in infrastructure. In truth there are many impediments to such programs. Under the right policy and institutional conditions, however, direct public pension investments can yield considerable value for taxpayers and retirement beneficiaries alike, in part by overcoming the market inefficiencies and valuation problems inherent to infrastructure investment. This paper uses the case of a toll road network in Queensland, Australia to examine the potential for direct public pension investments in infrastructure. In 2011, the Queensland Government transferred a 40-year concession to operate Queensland Motorways to the Queensland Investment Corporation (QIC) – a government-owned company that manages that state's defined benefit public pension.

Keywords: Infrastructure Investment, Public Pensions, Public-Private Partnerships, In-Kind Contributions, Value for Money.

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1) Introduction

Public administrations globally face challenges in both managing the investment liabilities associated with defined benefit public pensions and investing in and maintaining the critical infrastructure that undergirds their local economies. These two seemingly disparate challenges are related in that they are both the responsibility of state and local governments, and thus dependent on the limited availability of public capital. They are also both growing liabilities of those governments, as opposed to assets. In many western economies, aging public infrastructure assets are reaching the end of their useful lives, and significant reinvestment is necessary. More importantly, new models for investment and management of infrastructure are sorely needed. At the same time, defined-benefit public pension liabilities for local governments have ballooned in the years following the Global Financial Crisis. Additional public contributions are necessary for administrations to continue supporting their current and future pensioners, and the need for public pensions to innovate and improve returns on investment is more important now than ever before.

These two problems are related beyond the fact that they are both the liabilities of local governments. They also share a joint, potential solution: the in-kind contribution of economic infrastructure assets to pension funds. This form of asset transfer has precedent in privately managed corporate pensions and has generated some debate in the public pension space. To be sure, the concept is certainly not without its challenges, but it also creates an opportunity for governments to ‘kill two birds with one stone’ by funding a pension plan via an infrastructure transfer, which, in turn,

incentives the pension to upgrade and optimize the infrastructure to maximize the value of the asset. The transfer of Queensland Motorways Ltd. (QML) to the Queensland Investment Corporation (QIC) is an example of such an asset transfer. In this case, the local, defined benefit superannuation fund of the state received QML from the local government.

The QML/QIC case offers a unique opportunity to observe the policy and institutional conditions in which local governments can take advantage of the inherent synergies between public assets and investment funds. The purpose of this case is to study: 1) the decision by the local government to transfer to QIC the QML system, 2) QIC’s subsequent operation and monetization of the system, 3) the benefits of the transaction to both the pensioners and drivers of Queensland, and 4) the conditions that made this innovative transaction possible. We also consider whether such a model is replicable in other jurisdictions, particularly in the United States.

This case study is organized in the following sections: First, we provide a literature review and background information on private investment in infrastructure and pension allocations to the asset class. Second, we review previous research on public-pensions and in-kind contributions, and policy proposals involving infrastructure programs and public pension investments. Third, we review the policy and institutional context of both infrastructure and public pension management in Australia at the time of the QML transaction. Fourth, we give a detailed timeline of the transaction from its inception through its monetization by QIC. Finally, we provide an assessment of the applicability of this unique transaction in other contexts globally, and the

policy or institutional changes that would be required to do so.

2) Private Infrastructure Investment and Institutional Allocations

A review of relevant research and industry precedent of both private participation in infrastructure development and various topics related to the management and investment policies of public defined-benefit pensions are necessary to understand the implications of a transaction like QML.

Public-Private Partnerships and Private Investment in Toll Roads

Most water, transportation, and social infrastructure assets are financed and owned publicly. In some cases, governments have solicited private investment in infrastructure via Public-Private Partnerships (P3s). As an alternative delivery model for infrastructure, most P3s involve a solicitation for private investor to finance, develop, operate, and maintain an infrastructure asset for a long-term concession, while ownership is retained by the public. In exchange for the long-term management and maintenance of the system, the private investors are remunerated by regular performance payments or (in the case of revenue-generating infrastructure such as toll roads) access to toll revenues, usually subject to rate limits (Guasch, 2004). The modern form of P3 began being used by governments in Australia in the late 1980's and in the United Kingdom in the early 1990's under the Private-Financing Initiative (Esty & Sesia, 2010). The practice later spread to Europe, Canada, and more recently the United States.

As a policy option, P3s are primarily used by governments to transfer the risks of infrastructure development and management to private investors, or perhaps to utilize any innovative or more efficient operations those investors could bring to a project. Infrastructure projects and systems are risky enterprises. In particular, large and complex new projects often significantly exceed their construction budgets and timelines. During operation, increased maintenance costs or budget cycles can result in the deferral of critical maintenance, which can lead to accelerated system deterioration. For user-fee funded projects like toll roads, there is the added risk that, either due to overly-optimistic traffic projections (Bain, 2009) or changes in driver trends, there could be lower than expected system revenues once the asset starts operating (Liu, Bennon, Garvin, & Wang, In Press). Well-structured P3s transfer some or all of these risks to a private concessionaire by making them responsible for absorbing cost overruns during construction or requiring assets to be well-maintained for the life of the concession irrespective of maintenance costs or system revenues (Arthur Andersen, 2000). Several studies have found a statistically lower risk of construction cost over-runs, for instance, for P3 procurements when compared to traditional procurement (Blanc-Brude & Makovsek, 2013).

While P3s are more commonly used for the development of new infrastructure projects, referred to as greenfield projects, the contracting model has also led some governments to implement procurements for brownfield infrastructure, which involves the sale of a concession on an existing asset (Monk & Dixon, 2013). In the case of the Indiana Toll Road in the United States, for instance, the state sold a long-term concession to operate an existing toll road, and placed the proceeds of the

sale in a trust to maintain and re-invest in new transportation infrastructure in the state (Akintoye & Beck, 2009). In New South Wales and Victoria, Australia, this practice has been formalized into an “asset recycling program” to sell concessions on existing infrastructure projects and to transparently re-invest the proceeds in new projects (Nowacki, Levitt, & Monk, 2016).

Institutional Allocations to Infrastructure

Allocations to infrastructure investments by public pensions and other institutional investors have grown roughly in tandem with the use of P3s as a procurement model globally, though it is still a relatively small percentage of portfolios. Estimates of actual infrastructure allocations have ranged between 0.5% and 3.3% of total assets (Della Croce, 2012) (Bradbrook, 2012). Institutions vary widely in how they classify infrastructure in their investment portfolio – some have a separate allocation for infrastructure, while others include it in their private equity or real assets components (Beeferman, 2008).

Institutional investors allocate capital to private infrastructure assets for a variety of reasons. Often the large, illiquid, quasi-monopolistic assets provide diversification benefits from the rest of the portfolio in that they are not correlated to broader market activity (Inderst, 2010). Once built and in operation, many infrastructure assets also provide steady cash flows that are in some cases even linked to inflation. This provides an added benefit for pension funds, which often have liabilities that are tied to an inflation metric (OECD, 2011).

It is important to note that, as an asset class, the characteristics that make private infrastructure investments attractive for pension funds typically

only apply to brownfield, or already operational, assets and less so for new greenfield projects. Greenfield investments, for their part, often entail a multi-year development and construction period in which default risk is considerably higher and in which the investments often do not yield any cash flows (Sharma & Knight., 2014). In practice this has been mitigated in some cases for Availability Payment (AP) projects, which have a guaranteed revenue stream once development is complete, by partnering with infrastructure developers that shoulder all design and construction risk. However, for infrastructure investments exposed to revenue risk, such as toll roads, pure greenfield investments also do not have the benefit of an observable track record of demand, making revenue forecasting considerably more difficult (Liu, Bennon, Garvin, & Wang, In Press). Survey data indicates that, because of these issues, many pension fund managers are wary of investing their infrastructure allocations in greenfield projects (Belt & Nimmo, 2013). This has created a bit of a “mismatch” in the asset class today, as the majority of the institutional capital allocated to infrastructure is oriented towards brownfield assets, while the majority of governmental need for private finance is for new greenfield projects (Bennon, Monk, & Nowacki, 2015).

Beyond defining the types and risk/return characteristics of the infrastructure that they will be targeting, pension funds and other institutional investors also vary considerably in how they get their allocated capital actually invested in assets. The vast majority of pensions invest their capital through external management companies into pooled infrastructure funds. These external fund managers then source, evaluate, and manage investments. The fund managers are compensated by a management fee, usually calculated as a

percentage of the capital in the fund, and a performance fee, which is usually defined as a percentage of fund profits should certain performance metrics be met. This is referred to as the Indirect Model for institutional investment (Clark & Monk, 2013), and according to surveys the majority of institutional capital is invested this way (Bradbrook, 2012), including the vast majority of allocations from US public pensions. Several notable exceptions do exist, however, as some larger international pension funds have opted instead to hire investment professionals as internal staff to manage and invest their infrastructure allocations. This is commonly referred to as the Direct Model of investment (Clark & Monk, 2013) and is used by several, larger pension funds in Canada, Europe, and Australia including QIC – the pension manager we study herein.

Valuation Problems for Public Infrastructure Assets

Whether for the use of an in-kind contribution or simply a public tender for a concession, the valuation of publicly owned infrastructure assets is no simple task. These assets are often complex operating enterprises with varying degrees of information available. Anecdotal evidence exists that valuations for assets can vary widely. When the city of Chicago, for instance, sold a 99-year concession to operate the Chicago Skyway, an existing toll bridge, in 2004, the winning consortium paid the city \$1.83 billion, more than \$1 billion higher than the second and third bidders (Engel, Fischer, & Galetovic, 2014). This difficulty in assessing a fair value for these assets can lead to financial distress for private investors. Indeed, in the United States over the last 20 years a dozen transportation assets leased or developed as P3 concessions have underperformed or entered into bankruptcy (Reinhardt, 2015). In the other

extreme, mispricing the assets can also lead to public outcry when people perceive that the government sold an asset for too low a price. For example, the city of Chicago later sold another 99-year concession, this one to upgrade and operate its city parking meter system, which included the rights to increase parking rates according to a fixed schedule. In this case, the concessionaire successfully upgraded the system and the increased parking rates did not lead to lower demand for parking in the city, and the investment turned profitable. This led to some ex-post public criticism and an assessment by Chicago's Inspector General that the city had sold the concession at too low a price (Chicago OIG, 2009).

Extreme cases like these indicate that, without the benefit of the 20/20 hindsight enjoyed by Chicago's Inspector General, the valuation of public infrastructure assets is difficult. This is obvious for concessions to develop new greenfield projects, but it is also an issue for existing systems for several reasons. First, complex systems managed by a public agency in some cases provide less-standardized and transparent conditions for the reporting of both its financial position and maintenance spending. This problem is compounded by the fact that clear conditions assessments are often difficult to perform on infrastructure networks, many of which include buried assets or other difficult-to-inspect components (Leigland, 2008). Finally, the amount of operating value that the private concessionaire can create is often highly uncertain. Will the new private operator be able to improve system operations by using new management practices? Will they be able to reduce maintenance costs by installing new technologies? If so, how much could the concession itself increase the operating value of the asset?

In practice, governments overcome this valuation problem by undergoing a lengthy, rigorous procurement process when considering a concession for a new infrastructure asset or when offering a concession on an existing system. Technical Advisory firms are hired to evaluate the system and associated risks. Financial Consultants assess the viability of the proposed concession and in some cases draft a rigorous assessment to determine whether the transaction is in the taxpayer's best interests (these are referred to as Value for Money studies, or VfM, in industry parlance) (Infrastructure Ontario, 2015). Specialized law firms are also hired to draft and negotiate a lengthy project agreement on behalf of the government (Guasch, 2004). These transaction costs can, depending on the scale of the project, amount to 5-7% of the total costs of the concession itself (Reeves, Flannery, & Palcic, 2015). While that percentage is often considerably lower for very large projects, those costs account for only one half of the costs of the process – the private concessionaires that are pursuing a particular project often spend millions as well evaluating the project, negotiating, and drafting their own proposals (Dudkin & Valila). To mitigate transaction costs while maintaining a competitive procurement, governments often select 2-4 private consortia based on their qualifications early in the procurement process, then review complete proposals from that smaller competitive set (Guasch, 2004). Timelines for this procurement process vary widely, and average between 18 and 24 months, though some have been completed in as little as 7 months while others have lasted 3 years or more (Reeves, Flannery, & Palcic, 2015).

3) Public Pensions and Shared Liabilities with Governments

Many state and local governments maintain defined benefit pension systems for their retired public employees. In exchange for contributions throughout an employee's career, the employee receives guaranteed payments during retirement. Unlike defined contribution pensions, defined benefit programs can create a liability for the states and cities that sponsor them as guarantors, should the investment returns of the pension be insufficient to make retirement payments. To determine the extent of the government liability, actuaries add projected employee contributions to the existing capital in the pension fund. They then forecast the future retirement payments required (based on the life expectancies of retired employees) and pensions' return on investment (based on investment projections) to estimate the pension's Unfunded Liability. In the United States, actuaries also develop an Annual Required Contribution (ARC) for governments to bring their pensions back to fully funded status. In practice, state and local governments vary in the amount of their ARCs that they actually contribute, with some governments making all of their required contributions and some notably less so (Brainard & Brown, 2015).

Estimates of the size of unfunded pension liabilities for governments vary widely, primarily because future investment returns for pensions are unknown. A common practice for public pensions in the United States is to discount future retirement payments at an assumed rate of return on investment for the pension fund. The discount rates assumed vary, with median rates for US state plans declining from 8% to 7.65% between 2012 and

2014 (Bonafede, Foresti, & Walker, 2015). This assumed discount rate has an outsized impact on any estimate of the total liability for sponsoring governments. Because pension benefits are a fixed obligation, some economists have proposed that those benefits should be discounted at a lower risk-free rate, as opposed to the assumed investment return of the pension (Novy-Marx & Rauh, 2008). One study of 126 US state and local public pensions estimated that accounting for benefit payments using a discount rate of 5% would have increased reported unfunded liabilities from a total of \$0.7 trillion to \$2.7 trillion nationally (Munnell, Aubry, & Quinby, 2011). While some debate over the accounting of benefits continues, the 2008 global financial crisis generally exposed unfunded pension liabilities as a growing and serious liability for many state and local governments.

In-Kind Pension Contributions

One idea for funding a public pension that has been raised involves a government using an in-kind contribution to the pension. We define an in-kind pension contribution as the contribution of an asset, in lieu of a cash payment, by a sponsor into the pension fund that it is responsible for, to meet an unfunded pension liability. In-kind contributions have been relatively common for private pensions with corporate sponsors. In the United States, such contributions for corporate pensions are governed by the Employee Retirement Income Security Act of 1974 (ERISA). A common form of in-kind contribution involves the transfer of some real property owned by the corporation to its pension fund, which the corporation then leases back from the pension (Irving, 2016). To make in-kind contributions, corporations in the US may request exemptions, which are reviewed by the Department of Labor for

specific criteria, including an independent valuation of the proposed asset (Cohen & Levine, 2012). While relatively common for corporate pensions, in-kind contributions for public pensions are extremely rare. In the US, they have not been used or discussed beyond some high-level proposals (AI-CIO, 2011), some of which include proposals involving infrastructure assets (Glasgall, 2014).

Policy Proposals to Induce Public Pension Investments in Infrastructure

Because of the characteristics of infrastructure investments discussed above, and the need for solutions to address both infrastructure funding gaps and unfunded public pension liabilities, the idea of public pensions investing in infrastructure has been raised several times around the world. In 2013 the Dutch government created a pilot program to utilize local pension capital via tailored long-term financing for infrastructure projects in the Netherlands (Benyon, Monk, & Nowacki, 2015). In 2012, the California Public Employees' Retirement System (CalPERS), the largest public pension in the US, hosted a series of roundtables with state and local agencies in California to identify opportunities and challenges for more direct participation, though no formal investment program was ever adopted (California Public Employees' Retirement System, 2012). In 2013, the Milken Institute hosted a roundtable to address policy impediments to increased public pension investment in the US (Belt & Nimmo, 2013). In Canada, the province of Quebec has created a partnership program with its public pension – Caisse de dépôt et placement du Québec (CDPQ) to finance major new infrastructure projects (CDPQ Infrastructure, 2017).

Perhaps the most notable attempt at creating a formal investment program for public pensions in the US came as a component of Economically Targeted Investment (ETI) programs in the 1980's and 1990's. ETI's as a concept were born from the idea of social investing, and have been proposed or implemented in asset classes as diverse as local venture capital programs and housing and property development in addition to local infrastructure (Hagerman, Clark, & Hebb, 2007). The concept initially involved a local investment by a pension fund that would have additional economic benefits for the local area. The idea was that there may be investments that are unable to attract capital from the market but that could still be attractive to a local pension fund, because the economic benefits of the investment would also be captured by the plan's beneficiaries (Watson, 1994). Future, official definitions of ETI's evolved, though, to clarify that ETI's did not entail a pension fund having to accept a lower risk-adjusted return on investment than what could be achieved in the market. The Clinton administration first introduced ETIs via Department of Labor Interpretive Bulletin (IB) 94-1, which stated that ETIs could meet a pension's fiduciary standard so long as the pension determines that they achieve market, risk adjusted rates of return. Since then the Department of Labor has reversed itself multiple times under different administrations, removing ETIs as an acceptable investment under President Bush with IB 08-01. This was again reversed under the Obama Administration with IB 2015-01, which effectively reinstated IB 94-1 (Department of Labor, 2015). In 1993 The Commission to Promote Investment in America's Infrastructure highlighted the potential of ETI programs to invest pension capital more directly in local infrastructure in a report to congress (The Commission to Promote Investment in America's Infrastructure, 1993).

Debate over the effectiveness of ETI programs has continued in academia ever since. From the outset, economists have cited the inherent paradox that investment opportunities could exist that cannot be financed by the market but that would still provide a pension adequate risk-adjusted returns (Zelinsky, 1995). That paradox simply cannot coexist with an efficient market. Thus, proponents of ETI programs have highlighted the importance of inefficient markets as a premise for the viability of ETI's (Watson, 1994). The paradox is fairly simple: if the marketplace for an asset is efficient, any local pension that invests in a project through an ETI program must be taking a lower risk-adjusted return than what could be achieved from the marketplace. This creates a natural "market for lemons" for ETI programs. As long as markets are efficient for a given set of projects, only the worst projects will be selected as ETI opportunities (Nofsinger, 1998).

That market for lemons is supported by most empirical research on ETI programs, generally, though no studies of ETI's applicability to infrastructure exist because ETI's for US infrastructure were never put into practice. Empirical studies of pensions have found a correlation between the use of ETI programs and below-average returns (Nofsinger, 1998). Other studies have highlighted particularly bad investments as indicative of the potential conflicts of interest inherent in ETI's and other social investing programs, even labeling the programs Politically Targeted Investments (Romano, 1993). Despite some continued debate, ETI investments have decreased significantly in the years since IB 08-01, though part of this decline could be explained by the global financial crisis and ensuing recession (Woelfel & Dixon, 2016). It remains unclear whether the concept will be revisited by

public pensions in the wake of IB 2015-01. The majority of existing ETI programs are oriented towards local community development and real estate, or private equity funds for local businesses. The concept has never been applied for infrastructure in the US as the 1993 commission report initially envisioned.

The ETI debate in the US highlights the significant barriers to increased public pension investments in infrastructure. At the core of the debate is the need for public pension trustees to maintain their fiduciary responsibility to plan beneficiaries above all else. This is a concern for any public pension investing in a non-market security that is difficult to value, including a public infrastructure asset. Yet ETI's are premised on the idea that an investment opportunity could be underserved by capital markets due to valuation difficulties or other market inefficiencies. Long term concessions for infrastructure conceptually fit that requirement.

The basic concepts that make ETI programs attractive but problematic as a policy proposal also apply to potential programs for in-kind contributions of assets to public pensions. If public pensions can fill an "infrastructure gap," can infrastructure assets be contributed to underfunded public pensions? In-kind contributions conceptually just inverse the logic behind ETI proposals for infrastructure.

The value created by programs that sell operating concessions on public assets is largely driven by the procurement itself, or any operational efficiencies that the winning concessionaire is able to implement. Most political resistance to those programs is thus driven by concerns around the difficulty of valuing the concessions and market inefficiencies of private infrastructure transactions.

This drives the fear that most of the additional value created from the transaction will be captured by the private concessionaire instead of taxpayers. These same basic drivers of value creation and value capture would thus be in play for the transfer of a concession on an infrastructure asset to the public pension fund in-kind. Will the public pension be able to increase the operational value of the asset? And will more of that increased value be captured by taxpayers through the transaction? Given the valuation difficulties discussed above, will the transaction be structured in a way that allows the public pension to keep its fiduciary responsibilities paramount to all other considerations?

4) Infrastructure and Institutional

Investment in Australia

Infrastructure Australia and Queensland

According to the OECD, Australia invested more than AUD\$15bn in infrastructure in 2014, making it the third largest investor in infrastructure that year (Australian Government Department of Infrastructure and Regional Development, 2014). Much of that investment was in line with increasing demand due to both population growth and depreciated existing assets. In response to demand, the national and state governments injected large amounts of capital into renovating core infrastructure assets, particularly those in economic hubs. For instance, the federal government currently plans on investing billions in Western Sydney infrastructure, including AUD\$2.9bn over ten years in order to upgrade five major transportation networks and local roads (Australian Government Department of Infrastructure and Regional Development, 2016),

and more than AUD\$5bn for a new airport in the region (Commonwealth of Australia, 2017).

Australia also has a long track record of using private capital to finance critical infrastructure. Australia has a National P3 Policy Framework that requires the consideration of the P3 model for any project with a capital cost in excess of \$AUD50mm (Infrastructure Australia, 2008). More recently, the national government in Australia created an incentive program for states to sell concessions on existing infrastructure assets and to use the proceeds to fund new projects (Commonwealth of Australia, 2014), and several provincial governments have also created special agencies to assess and manage alternative procurements for infrastructure such as P3s. In 2016, the private sector contributed more than 50% of the total domestic infrastructure investment (Australian Government Department of Infrastructure and Regional Development, 2016). As Australia's public sector developed P3 programs for infrastructure, Australian investors developed a strong global competence in the infrastructure investment sector. According to Private Equity International, 6 of the 30 largest global infrastructure investors are based in Australia, and combined have accumulated more than \$47.86bn in capital over the last five years (PEI, 2016).

QIC History and Organization

Queensland is the third-largest state in Australia with a population of more than 4.7 million. Brisbane, the capital of Queensland, is one of the Australia's major trading hubs. The Port of Brisbane handles over 1 million TEUs annually, and Australia TradeCoast, an 8,000 hectare industrial complex, is responsible for 1,500 businesses and 60,000 jobs, acting as a key driver

for regional economic growth (Port of Brisbane, 2016). Due to its commerce-oriented economy, infrastructure has been a critical issue in sustaining Brisbane's long-term competitiveness.

Still, the state of Queensland struggled financially and in meeting its infrastructure needs in the wake of the global financial crisis and ensuing recession. In 2011, the Queensland government reported a net operating loss of AUD\$233mm and an accumulated deficit of AUD\$3bn (Queensland Government, 2012). In 2009, the state government met immediate public opposition when Andrew Fraser, then State Treasurer, unveiled a plan to spend AUD\$18bn on infrastructure improvement (Moore & Hurst, 2009).

QIC is one of the largest superannuation managers in Australia with over AUD\$79bn in assets under management (AUM). It is owned by the Queensland government and was initially established to exclusively manage the state's Defined Benefit Superannuation Fund (the DB Fund) and defined contribution fund (QIC, 2016). Since then, QIC has grown to a commercial fund manager representing over 100 other institutional investors in addition to the DB Fund. QIC, on behalf of the DB Fund, invests in a wide range of assets ranging from real estate and infrastructure market securities and private equity. The Global Infrastructure group at QIC has over AUD\$9.5bn in assets under management and has made twelve direct investments in infrastructure projects to date (QIC, 2016).

Unlike many defined benefit pension funds investing in infrastructure, QIC Global Infrastructure, on behalf of the DB Fund, built a team of investment professionals and developed the in-house capability to assess and manage

infrastructure assets directly. The fund thus employs the direct model of institutional investment for its infrastructure allocation, and competes with fund managers and other investors to source and evaluate investment opportunities, and operate assets efficiently. Over the last decade, QIC has used its investment and operational capabilities to serve as an active investor in the Queensland infrastructure sector and globally. The Global Infrastructure Group acquired the Brisbane Airport in 2007, the Port of Brisbane in 2010, Queensland Motorways in 2011, and more recently has invested in assets such as the Port of Melbourne and the Powering Australian Renewables Fund. QIC has also invested in infrastructure assets in the US, Canada, the UK, Spain and India.

5) Queensland Motorways Case Study

The coincidence of the professionalization of the Queensland government in developing alternative procurement programs for infrastructure assets, and the professionalization of its local defined benefit pension's infrastructure investment capability, laid the groundwork for the QML transaction. In 2011, Queensland transferred QML to QIC under a long-term concession which valued the asset at AUD\$3.088bn. QIC made operational improvements and added to the system over the following four years, eventually selling QML to a private consortium in 2014, at a valuation of AUD\$7.057bn. Details of the transaction and valuation of QML are provided in the section below.

Project History

QML is an approximately 70 km road network consisting of the Gateway Motorway and the

Logan Motorway. Since its opening in 1986, QML has served as a key East-West link in Southeast Queensland, and provides a strategic connection to the Australian TradeCoast. Under public ownership, QML undertook several major system upgrade projects from 2007 to 2009, including the development of a new Gateway Bridge and the introduction of a free flow electronic tolling system in 2009, but the upgrades, combined with the impacts of the global recession, necessitated increased tolls for users. Tolls on the system increased at compound annual rates of more than 7% on Gateway and 6% on Logan during the period 2005 to 2009 (QML, 2009). In July 2010, the state government also announced that toll increases would increase 30% system-wide (RACQ, 2010) as part of the Gateway Upgrade Project. In 2010, QML reported an aggregate deficiency of total equity of more than AUD\$500mm from its major shareholder – the state government (QML, 2010).

At the same time, the Queensland state government's finances were deteriorating. In 2009, ratings agencies downgraded the state's credit rating and the state budget forecasted a deficit of AUD\$1.9bn (RACQ, 2010). In mid-2009 the state announced that it would pursue the sale or lease of five government assets to address shortfalls, with QML as one of the assets identified.

Public opposition to the privatization program emerged quickly, particularly for the sale or lease of QML. Public unions were particularly vocal in their opposition, and a "Queensland Not For Sale" political campaign was launched. The proposed program took a turn for the worse in 2010, when the Royal Automobile Club of Queensland (RACQ), the largest motorist organization and largest advocacy club of any type in Queensland,

voiced its opposition to a sale or lease of QML (RACQ, 2010).

Arguments against the sale or lease were largely those common to debates on concessions for brownfield infrastructure and privatization. RACQ stated that privately-owned transportation networks “prioritize financial returns over economic performance, so they reduce the benefits to society.” They were also unconvinced by the government’s promise that tolls under the concession would be capped to increase by no more than inflation (RACQ, 2010). A study, commissioned by RACQ, by Professor Ross Guest, assessed the proposed lease arrangement and found that public value from the arrangement would be driven by the ability of the private concessionaire to operate the system considerably more efficiently than its current governance allowed. Professor Guest’s logic was relatively straightforward – the government as an owner is able to capture the many economic externalities created by a transportation network, as opposed to a concessionaire, which can only capture user-fees. Thus, unless the concessionaire is able to somehow operate the system more efficiently, it would need to toll the network at a higher rate than that which would be economically optimal. Professor Guest also cited valuation issues as a concern for QML, as the system was just completing major capital investments that were not yet fully operational. Professor Guest also included his own valuations of QML using some high-level assumptions of the system’s return on investment and revenue growth rates over a 30-50 year concession, discounted at various real discount rates associated with Queensland’s real cost of borrowing before its ratings downgrade, and determined that the system’s value could range from AUD\$3.6bn to as high as AUD\$6bn. The critical issue of any

concession arrangement would thus be for Queensland to capture the asset’s full value through the proposed transaction (Guest, 2010).

Unfunded Liability and Early Decision Making

While the public debate over the proposed lease of QML was underway, the State Actuary was also completing its three-year review of the state’s defined benefit superannuation pension for public employees (Fraser, 2011). Completed in June 2010, the actuary found that the fund’s liabilities exceeded its assets, inclusive of the state’s reserve funds, by more than AUD\$1.4bn, which would normally necessitate a contribution by the state to support the fund (QSuper, 2011). Given the state’s other financial obligations in the wake of the economic recession, and at the prompting of QIC, the state began to consider the transfer of a concession of QML to the pension in lieu of an open tender. On an initial review, the transaction could mitigate most, if not all, of the political and financial issues associated with the transaction, based on several assumptions:

1. *The downside risks of a competitive bidding process:* It remained unclear whether Queensland would be able to capture the full value of QML through a bidding process with outside investors. Under the shared end goal to serve the residents of Queensland, QIC and the government would have mutual incentives to close the transaction in a win-win setting.
2. *Balancing the budget via an in-kind contribution:* Transferring the concession of QML to QIC would allow the state to meet its financial obligations to the defined benefit fund by replacing a traditional capital contribution with a form of in-kind contribution. For QIC, the acquisition would add a low-risk, long-term investment to their portfolio.

3. *Managing stakeholder relations by keeping QML ownership under a public entity.* By putting the asset into their pension fund, the government could ease public opposition to a brownfield concession arrangement. An acquisition by QIC would mitigate concerns around the incentives of private investors in a long-term concession.

Valuation and Initial Sale

In late 2010, the Queensland government began an exclusive negotiation with QIC on the transfer of a concession for QML. Anna Bligh, the former Premier of Queensland, championed the process by arguing that the transfer to QIC will keep the asset under public ownership (Hurst, Queensland Motorways to Remain in Public Hands After All, 2010). The shared liabilities between QIC and the government mitigated concerns regarding the valuation for the public. QIC remained at arm's length to ensure it was acquiring the asset at a valuation that would support its beneficiaries, but any benefit to the fund from an under-valuation of QML would ultimately be captured by the retirees of Queensland.

The valuation and due diligence process was benefited by QIC's prior experience evaluating infrastructure investments globally and also investing locally in Queensland via its investments in Brisbane Airport and the Port of Brisbane. Following due diligence with external advisors and auditors, QIC and the state finalized the transfer of QML on May 10, 2011. The two entities agreed on a market value of QML at AUD\$3.088bn for a 40-year concession (Hurst, Qld Motorways Transferred in \$3bn Deal, 2011). For its part, the board of the defined benefit fund also commissioned a separate, independent valuation of the concession which produced their own range of

values, the high end of which was AUD\$3.1bn, prior to approving the transfer (Israel, Moorhead, & Carmichael, 2015).

QML Operations Under QIC

After the transfer of QML, QIC began making operational changes to the system and added to the network. QIC's assessment of QML as an investment opportunity identified the following attractive features:

1. *Demand Fundamentals:* Both the Logan and Gateway Motorways are strategically positioned to benefit from the economic growth of the Brisbane region, including the Australia TradeCoast and the South West Industrial Gateway.
2. *Long-term, Inflation-linked investment:* The concession capped tolls to only increase with inflation over the 40-year term, but the inflation increases were linked to local CPI, which is the same metric used to determine increases to the benefit liabilities of the pension fund. The asset thus perfectly matched the pension's liabilities.
3. *Upside potential from operational efficiencies:* At the time of acquisition, the EBITDA margin of QML was considerably lower than those of comparable transportation assets. Based on their prior investments, the leadership at QIC identified potential changes to improve management practices.
4. *Option Value:* QML's strategic position would enable the network to potentially acquire other new and existing toll roads in the region to add to the system (Israel, Moorhead, & Carmichael, 2015).

Based on these findings, QIC implemented a transition plan for the system. Over a three-year

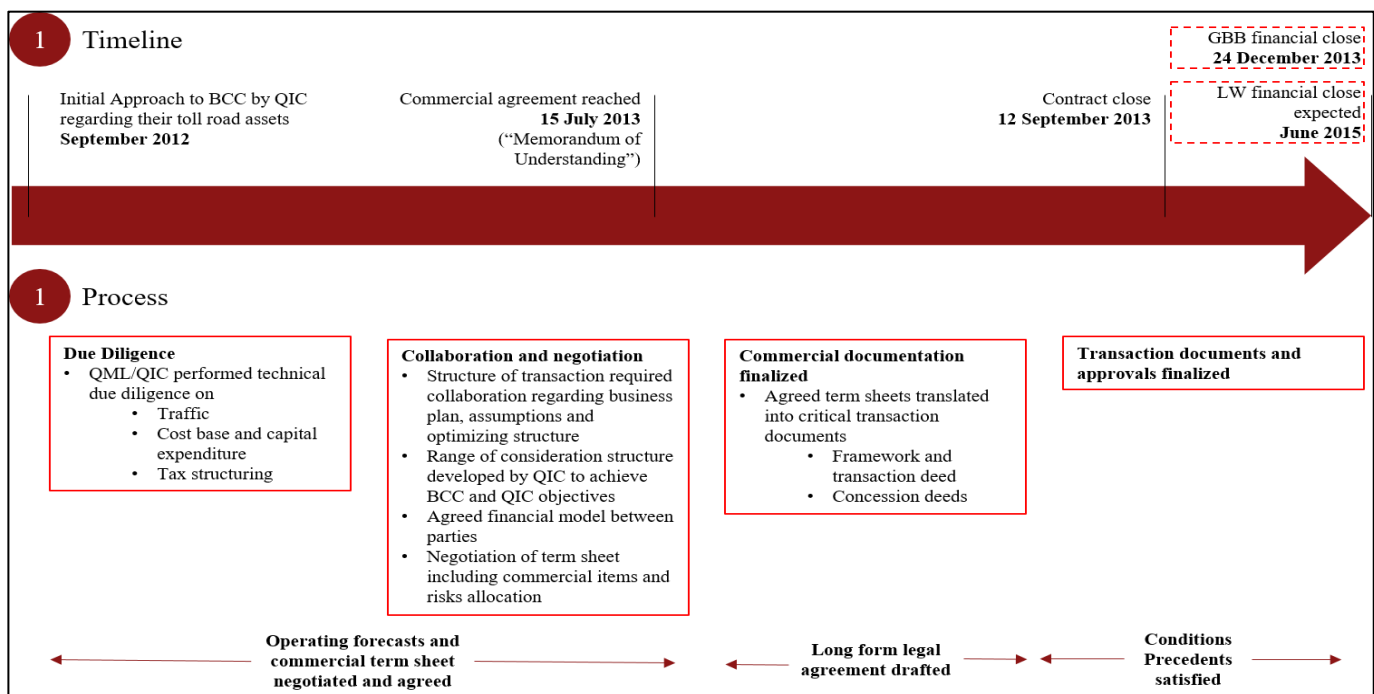
period, QIC implemented various operational changes including:

1. The creation of a new governance framework for the company
2. Recruitment of new senior management for QML
3. A new ownership structure, with leadership compensation tied to performance
4. An overhaul of QML's finance and operations reporting
5. The creation of a concession compliance program to ensure QML was maintaining and operating the system according to the terms of its concession
6. Improved monitoring of capital investment and maintenance procurements by QML
7. Proactive stakeholder engagement and public outreach (Israel, Moorhead, & Carmichael, 2015).

In addition to the changes above, QIC added three additional toll roads to the QML network via acquisition. The CLEM7 was a 6.8km tolled motorway cross city bypass of Brisbane. The

project was developed as a greenfield concession signed in 2006, but the project began experiencing financial difficulties almost immediately after it was partially opened in 2010. Traffic volumes were significantly lower than originally forecast, and in February 2011 the multi-billion dollar project slid into bankruptcy (PPB Advisory, 2014). As project lenders assessed options for CLEM7 in bankruptcy, QIC identified the project as an opportunity to add a connecting asset to QML under favorable market conditions. QML was also advantaged in that the system could take advantage of operational synergies that other potential investors in CLEM7 could not, simply because the project was already connected to their existing network. In late 2013, QIC's bid was selected by the project's lenders over other bidders to acquire CLEM7 for AUD\$618mm, significantly lower than the costs to build the project (O'Sullivan, 2013).

Figure 1: Timeline for QML's Acquisition of Go Between Bridge and Legacy Way



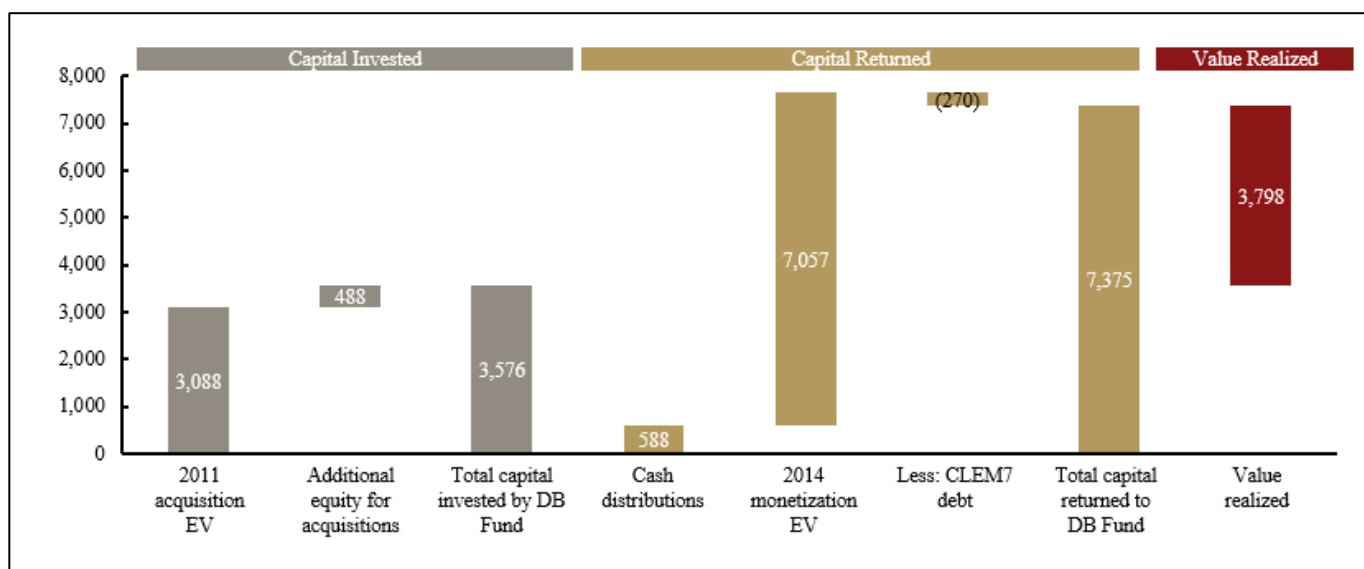
At the same time, QIC identified two additional toll roads, the Go Between Bridge and Legacy Way tunnel, that connected into QML in Brisbane. Both assets were owned and operated by the Brisbane City Council, with the Go Between Bridge open in 2013 and Legacy Way scheduled for opening in 2015. In late 2012, QIC made an unsolicited proposal to the Council to purchase an operating 50-year concession in exchange for up-front payments of AUD\$112mm and AUD\$131mm for the bridge and tunnel, respectively, with further deferred payments linked to actual traffic performance. Following an assessment, the Council agreed to enter into exclusive negotiations with QIC and eventually approved the transaction. The Council's stated reasons for accepting the offer included saving millions in valuation and transaction costs associated with running a competitive tender, the natural synergies of the roads with QML's operations given that it was operating other roads in the region, and the fact that the assets would be extremely difficult to value in a competitive tender given the lack of reliability

in traffic forecasts. The Council also aimed to reinvest the up-front payment from QML to finance another major transportation project. Again, any upside benefits of under-valuation would be captured by the retirees of Queensland (MacDonald, 2013).

QIC's Decision to Divest and the New Valuation

In late 2013, the board of directors of the pension were presented with a unique challenge regarding QIC's regular updated valuations of the QML system – the valuation was getting too high. Like all defined benefit pensions, one of the board's responsibilities was to establish and maintain a diversified investment portfolio, and by late 2013 QIC's valuation of the system had increased to the point at which that single investment was becoming an over-weighted component of the total pension portfolio. The decision was made to have QIC assess the divestment of all or part of the system to re-diversify the pension (Israel, Moorhead, & Carmichael, 2015).

Figure 2: Capital Investment and Value Realized from QML Transaction



QIC refined its existing business plan for QML as a going concern and prepared due diligence materials and management presentations for potential acquirers. It quickly determined that in order to maximize value for any divestment of the system, the concession on the entire system should be sold as a complete package. Public response to QIC's decision to explore the sale was relatively muted. Premier Campbell Newman notably stated "I would like to see these continue to be held ultimately by Queenslanders but QIC have got to make the best financial decisions. They've got a duty to make sure that they pay pensions and superannuation entitlements to Government and former government employees" (ABC News, 2013).

The operational characteristics of QML had changed considerably since QIC's initial acquisition. In addition to adding the three additional toll roads, EBITDA margins on the original network had increased by more than 8%. QML had a new board of directors and implemented new accounting and reporting procedures. It had a maintenance management plan for the entire length of the concession, and many of the senior executives for the system had been replaced under a new incentive structures to align performance. Over a five month period, QIC completed its assessment and solicited the market for bids to acquire the system. As an operational, brownfield infrastructure asset, QML attracted considerable competition from domestic and international investors alike (Australian Financial Review, 2014).

In July 2014, QIC selected a consortium of Transurban, AustralianSuper, and the Abu Dhabi Investment Authority (ADIA) to acquire QML at a purchase price of AUD\$7.057bn, or approximately 26.5x its FY2013 EBITDA (Remeikis, 2014). When

accounting for all of QIC's capital invested in the system, inclusive of its expansions, along with QML's cash distributions while under QIC's management, QIC realized a profit of nearly AUD\$3.8bn for the pension over a four year period (Israel, Moorhead, & Carmichael, 2015).

6) Conclusions and Recommendations

Governments are responsible for separate programs to invest in and maintain capital intensive projects that undergird the local economy and manage defined benefit investment programs on behalf of retirees. The QML transaction highlights many of the opportunities and challenges of programs to procure private concessions for infrastructure management, monetize existing public assets and finally support public pensions via in-kind contributions. It also highlights the potential of in-kind contributions to effectively monetize publicly managed economic infrastructure assets in a way that avoids some of the potential pitfalls of direct tenders for concessions to private investors. We describe some of the benefits and essential elements of these in-kind programs below.

Costs and Opportunities of an Inefficient Market

Government procurements of concessions for the management of infrastructure have the telltale signs of an inefficient market. The programs entail complex, idiosyncratic, and opaque assets. Transaction costs for valuation are high, and the investments involve difficult to assess political risks and uncertainties. This renders the industry theoretically a very strong fit for the investment programs envisioned by proponents of ETI's. A key impediment to ETI programs continues to be

concern around the ability of the public pension to remain an arm's length investor and keep its fiduciary responsibilities paramount. When that impediment is overcome by the professionalization of public pensions, value-added transactions like that for QML become possible. This applies to both the public pension's *governance* and its internal *capability*. The requisite governance would entail a transparent decision making process and professional management at the board level free from undue political influence by the sponsoring government. The requisite capability would also entail the internal resources and staffing to assess, structure, and then manage direct infrastructure investments.

The operational improvements at QML were possible only due to the rare capability at QIC as a state-level pension fund manager to directly invest in and manage infrastructure assets. This internal capability is rare in public pensions. It is thus noteworthy that a transaction like QML was first completed by a state with that unique internal investment capability. Without QIC's dedicated infrastructure team, QML would also likely not have realized the same level of operational turnaround.

It is unclear whether a similar transaction could be replicated in which the public pension uses some form of external management contract with a service provider to assess and operate the in-kind asset without losing the competitive advantages that QIC's internal team enjoyed. We highlight this as an additional area for research or industry experimentation. It is feasible that a public pension that lacks the internal expertise to effectively manage an infrastructure asset could outsource it directly through a services contract to replicate a

transaction like QML, albeit while paying a management fee of some kind.

Problems with Monetizing Public Assets

If the incremental *value created* by concession tenders for managing existing public infrastructure assets is largely driven by the investor's ability to more effectively manage the costs and risks of the system, then the incremental *value captured* by local taxpayers is largely driven by the local government's ability to manage a competitive procurement for the concession. Programs to monetize existing public assets, whether to meet pension obligations or fund new investments in other infrastructure, are often met with considerable political resistance. There are many reasons cited by opponents of these programs, but a core driver of resistance is clearly the difficulty and complexity of valuing the concession itself, and the transaction costs which limit open competition. This undergirds concerns that much of the additional value created by the concession could wind up as profits for investors as opposed to funding for the public. In practice these concerns are often exacerbated when the concessionaire is a foreign company or financial intermediary.

An additional concern with proposals to monetize public assets through infrastructure concessions stems from the government's ability to re-invest the proceeds wisely. Those programs that do exist have been most successful when they clearly identify liabilities of the government that will be funded by the proceeds, such as the prioritized list of new infrastructure projects that will be funded by concession proceeds in New South Wales, Australia (Nowacki, Levitt, & Monk, 2016). Without this clearly identified prioritization, programs that result in large up-front

contributions of capital invite a lack of accountability and, potentially, wasteful spending.

In-kind contributions to public pensions appear to resolve both of these concerns with asset monetization programs. The political concerns stemming from valuation difficulties of infrastructure assets are mitigated, on the upside, because any “profits” from undervaluation simply offset additional unfunded pension liabilities. Likewise, the transaction clearly allocates proceeds to a single large liability of the sponsoring government.

Differentiating ETI's from an In-Kind Contribution like QML

The early proponents of ETI programs for infrastructure correctly observed that, due to their shared liabilities, local pensions, local governments and local economies are inextricably tied. A concern with those programs was that they (explicitly or implicitly) concluded that a pension could concede on the risk-adjusted returns of a local investment because they will also capture some of the broader economic benefits of that investment. This would require pension managers to subjugate their fiduciary responsibilities to plan beneficiaries, and could lead to undue investment decision making especially for hard to value, complex investments. Programs to facilitate direct local pension investments in infrastructure must enable the pension to remain at arm's length and keep its fiduciary responsibilities to beneficiaries transparently paramount.

In-kind contributions for public pensions essentially reverse this logic. Pension managers stay at arms-length and keep fiduciary responsibilities paramount. For the government granting the

concession, valuation is still difficult, but the risk of under-valuation during the transaction is mitigated because benefits still accrue to the retirees of the state.

It is important to note here that an optimal valuation process for an in-kind contribution would be the same as that for any other negotiated corporate transaction. Independent valuations like the one commissioned by the board of directors of the defined-benefit pension in this case should be used to supplement those developed by the parties to the transaction to ensure transparency and fairness.

A Framework for In-Kind Contributions

Given these limitations, under what conditions could an in-kind contribution of a public infrastructure system to a public pension be possible? We build on the debate above by proposing a simple, limiting framework:

1. The public pension must be able to keep its fiduciary responsibility to plan beneficiaries paramount to all other considerations. This applies both to their independence and technical capability. The plan must be able to approach any transaction at arm's length, without political influence. The plan must also have the professional capabilities necessary to value and manage the asset in question.
2. The sponsoring government, for its part, and without becoming a formal guarantor of the pension, must identify and accrete value for its citizens in the transaction in its own right through the transfer of operating risk to the pension investor. The government in question must also have the institutional capability to transparently manage procurements for infrastructure concessions.

3. Process transparency, supported by independent valuations, must be maintained throughout the transaction and into the project's operations under the concession.
4. The driver of the success of any such program or transaction must be the public's ability to capture additional value from a project or asset through the management of the public pension. This can only be achieved through either the management practices used or by overcoming the valuation problems inherent in public infrastructure systems.

The above criteria will severely limit the global opportunity for in-kind pension transactions like

QML, primarily because few public pensions, at least in the US, have the internal capability to assess and manage infrastructure investments. At the same time, many governments do not have dedicated programs or agencies to assess and procure concessions for new and existing infrastructure assets. Both of those programs are required to transparently undertake an in-kind transaction for infrastructure. Both of those programs would also require governments to make investments in the professionalization of their pension investment capability and public infrastructure institutions, respectively.

REFERENCES:

- ABC News. (2013, November 7). *QIC considers selling toll road division Qld Motorways*. Retrieved from Australia Broadcasting Corporation: <http://www.abc.net.au/news/2013-11-08/qic-considers-selling-toll-road-division-qlld-motorways/5078440>
- AI-CIO. (2011, July 21). *Are in-Kind Contributions for Public Pensions an Overlooked Opportunity?* Retrieved from [www.ai-cio.com](http://www.ai-cio.com/channel/NEWSMAKERS/Are-in-Kind-Contributions-for-Public-Pensions-an-Overlooked-Opportunity-/): <http://www.ai-cio.com/channel/NEWSMAKERS/Are-in-Kind-Contributions-for-Public-Pensions-an-Overlooked-Opportunity-/>
- Akintoye, A., & Beck, M. (2009). *Policy, Finance and Management for Public-Private Partnerships*. West Sussex: Wiley-Blackwell.
- Arthur Andersen. (2000). *Value for Money Drivers in the Private Finance Initiative*. London: UK Treasury Taskforce Limited.
- Australian Financial Review. (2014, April 22). *Printers in overdrive as bids for QML race in*. Retrieved from Australian Financial Review: <http://www.afr.com/opinion/printers-in-overdrive-as-bids-for-qml-race-in-20140421-j79h3>
- Australian Government Department of Infrastructure and Regional Development. (2014, February). *Trends: Infrastructure and Transport to 2030*. Retrieved from Infrastructure Australia: https://infrastructure.gov.au/infrastructure/publications/files/Trends_Infrastructure_and_Transport_to_2030.pdf

- Australian Government Department of Infrastructure and Regional Development. (2016, September). *Western Sydney Infrastructure*. Retrieved from Infrastructure Australia: https://infrastructure.gov.au/infrastructure/western_sydney/.
- Bain, R. (2009). Error and optimism bias in toll road traffic forecasts. *Transportation*, 469-482.
- Beeferman, L. W. (2008, Dec). Pension Fund Investment in Infrastructure: A Resource Paper. *Capital Matters*(3), -.
- Belt, B. D., & Nimmo, J. (2013). *Catalyzing Pension Funds Investment in the Nation's Infrastructure, A Roundtable Discussion*. Washington DC: Milken Institute.
- Bennon, M., Monk, A., & Nowacki, C. (2015). Dutch Pensions Paving the Way for Infrastructure Development. *The Journal of Structured Finance*, 45-54.
- Blanc-Brude, F., & Makovsek, D. (2013). *Construction Risk in Infrastructure Project Finance*. Lille, France: EDHEC Risk Institute.
- Bonafede, J., Foresti, S., & Walker, R. (2015). *2015 Report on State Retirement Systems: Funding Levels and Asset Allocation*. Santa Monica, CA: Wilshire Consulting.
- Bradbrook, E. (2012, July). Pension Funds Investing in Infrastructure. *Infrastructure Spotlight*, 1-4.
- Brainard, K., & Brown, A. (2015). *The Annual Required Contribution Experience of State Retirement Plans, FY 01 to FY 13*. National Association of State Retirement Administrators.
- California Public Employees' Retirement System. (2012). *CalPERS Infrastructure Investment Outreach Review*. Sacramento: CalPERS.
- CDPQ Infrastructure. (2017, April). *CDPQ Infra*. Retrieved from <https://www.cdpqinfra.com/>
- Chicago OIG. (2009). *An Analysis of the Lease of the City's Parking Meters*. Chicago: Chicago Office of the Inspector General.
- Clark, G., & Monk, A. (2013). Transcending Home Bias: Institutional Innovation through Cooperation and Collaboration in the Context of Financial Instability. *SSRN Electronic Journal*.
- Cohen, D. A., & Levine, D. N. (2012). In-Kind Contributions to Defined Benefit Plans - An Introduction. *Tax Managemtn Compensation Planning Journal*.
- Commonwealth of Australia. (2014). *Building Australia's Infrastructure*. The Commonwealth of Australia.

- Commonwealth of Australia. (2017). *Budget 2017-18: Stronger Growth to create more and better paying jobs*. Sydney: Commonwealth of Australia.
- Della Croce, R. (2012). Trends in Large Pension Fund Investment in Infrastructure. *OECD Working Papers on Finance, Insurance and Private Pensions*(No. 29).
- Department of Labor. (2015, October 26). Interpretive Bulletin Relating to the Fiduciary Standard under ERISA in Considering Economically Targeted Investments. *29 CFR Part 2509*. Washington D.C.
- Dudkin, G., & Valila, T. (n.d.). Transaction Costs in Public-Private Partnerships: A First Look at the Evidence. *EIB Economic and Financial Report 2005/03*. Luxembourg: European Investment Bank.
- Engel, E., Fischer, R., & Galetovic, A. (2014). *The Economics of Public-Private Partnerships*. New York: Cambridge University Press.
- Esty, B. C., & Sesia, A. (2010). *An Overview of Project Finance and Infrastructure Finance*. Harvard: Harvard Press.
- Fraser, A. (2011, July 12). *Media Release: Queensland Superannuation Scheme Remains Envy of the World*. Retrieved from The Queensland Cabinet and Ministerial Directory: <http://statements.qld.gov.au/Statement/Id/75640>
- Glasgall, W. (2014, March 5). *Are Pension-Funding Windfalls Sitting Beneath City Streets?* Retrieved from The Volcker Alliance: <https://www.volckeralliance.org/blog/2016/jun/are-pension-funding-windfalls-sitting-beneath-city-streets>
- Guasch, J. (2004). *Granting and Renegotiating Infrastructure Concessions: Doing it Right*. Washington D.C.: World Bank.
- Guest, R. (2010). *The Privatization of Queensland Motorways: An Economic Briefing Paper*. RACQ.
- Hagerman, L., Clark, G., & Hebb, T. (2007). Investment Intermediaries in Economic Development: Linking Public Pension Funds to Urban Revitalization. *Community Development Investment Review*, 45-66.
- Hurst, D. (2010, November 25). Queensland Motorways to Remain in Public Hands After All. *The Sydney Morning Herald*.
- Hurst, D. (2011, May 10). Qld Motorways Transferred in \$3bn Deal. *The Sydney Morning Herald*.
- Inderst, G. (2010). Pension fund investment in infrastructure: What have we learnt? *Pensions*, 89-99.
- Infrastructure Australia. (2008). *National Public Private Partnerships Policy Framework*. Infrastructure Australia.
- Infrastructure Ontario. (2015). *Assessing Value for Money: An Updated Guide to Infrastructure Ontario's Methodology*. Toronto: Infrastructure Ontario.

- Irving, A. (2016). *Making In-Kind Contributions of Real Property Work for Pension Plans and Participants*. Arthur J. Gallagher & Co.
- Israel, R., Moorhead, L., & Carmichael, T. (2015). The Commercialization of Queensland Motorways in Australia. In J. Altman, *Managing Risk in Infrastructure Investments* (pp. 269-278). London: PEI.
- Leigland, J. (2008). *The Rise and Fall of Brownfield Concessions: But Some Signs of Recovery After a Decade of Decline*. Washington D.C.: World Bank Public-Private Infrastructure Advisory Facility.
- Liu, T., Bennon, M., Garvin, M., & Wang, S. (In Press). Sharing the Big Risk: An Assessment Framework for Revenue Risk Sharing Mechanisms in Transportation Public-Private Partnerships.
- MacDonald, R. (2013, July 14). Opinion: Brisbane City Council's decision to sell Legacy way and Go Between Bridge tolling rights makes sense but QIC is the real winner. *CourierMail*.
- Monk, A., & Dixon, A. (2013). *Should Pension Funds Become Involved in Greenfield Infrastructure?* Pacific Pension Institute.
- Moore, T., & Hurst, D. (2009, June 16). Queensland State Budget Deficit to Last Eight Years. *The Sydney Morning Herald*.
- Munnell, A. H., Aubry, J.-P., & Quinby, L. (2011). Public Pension Funding in Practice. *Journal of Pension Economics & Finance*, 247-268.
- Nofsinger, J. R. (1998). Why Targeted Investing Does Not Make Sense! *Financial Management*, 87-96.
- Novy-Marx, R., & Rauh, J. (2008). The Liabilities and Risks of State-Sponsored Pension Plans. *Journal of Economic Perspectives*, 191-210.
- Nowacki, C., Levitt, R., & Monk, A. (2016). The Financier State as an Alternative to the Developmental State: A Case Study of Infrastructure Asset Recycling in New South Wales, Australia. *Engineering Project Organization Conference*. Cle Elum, Washington: Engineering Project Organization Society.
- OECD, R. D.-A. (2011). *Pension Funds Investment in Infrastructure, A Survey*. OECD. -: OECD.
- O'Sullivan, M. (2013, September 27). Turning \$3b into \$618m: Brisbane's failed Clem7 tunnel sold off. *The Sydney Morning Herald*.
- PEI. (2016). *Infrastructure Investor 30*. London: Private Equity Investor Alternative Insight.
- Port of Brisbane. (2016). *Port of Brisbane Business Review*. Brisbane: Port of Brisbane.
- PPB Advisory. (2014). *RiverCity Motorway Group, Report By Administrators*. Brisbane: PPB Advisory.

- QIC. (2016). *QIC Annual Report*. Brisbane, Australia: Queensland Investment Corporation.
- QML. (2009). *Queensland Motorways 2009 Annual Report*. Brisbane: Queensland Motorways.
- QML. (2010). *Queensland Motorways 2010 Annual Report*. Brisbane: Queensland Motorways.
- QSuper. (2011). *Annual Report of the QSuper Board of Trustees 2011*. Brisbane: QSuper Board of Trustees.
- Queensland Government. (2012). *2011-12 Report on State Finances of the Queensland Government*. Brisbane: Queensland Government.
- RACQ. (2010). *Position Paper: Sale of Queensland Motorways Ltd*. Brisbane, Australia: Royal Automobile Club of Queensland.
- Reeves, E., Flannery, D., & Palcic, D. (2015). PPP Procurement in the United Kingdom: An Analysis of Tendering Periods. *19th Annual Conference of the International Society for New Institutional Economics*. Harvard University.
- Reinhardt, W. (2015, January). US Transportation P3s. *Public Works Financing*.
- Remeikis, A. (2014, April 23). \$7 Billion Queensland Motorways Makes Healthy Profit for QIC. *Brisbane Times*.
- Romano, R. (1993). Public Pension Fund Activism in Corporate Governance Reconsidered. *Columbia Law Review*, 795-853.
- Sharma, R., & Knight, E. (2014, January). *The Role of Information Density in Infrastructure Investment*. Stanford University: Working Paper.
- The Commission to Promote Investment in America's Infrastructure. (1993). *Financing the Future*. Washington D.C.: The Commission to Promote Investment in America's Infrastructure.
- Watson, R. D. (1994). Does Targeted Investing Make Sense? *Financial Management*, 69-74.
- Woelfel, T., & Dixon, L. (2016). *A Catalog of Economically Targeted Investments by Pension Funds: Trends, Analysis, and Reflections*. InSight at Pacific Community Ventures.
- Zelinsky, E. A. (1995). ETI, Phone the Department of Labor: Economically Targeted Investments, IB 94-1 and the Reincarnation of Industrial Policy. *Berkeley Journal of Employment & Labor Law*.