

Critical Factors Affecting the Viability of Using Public-Private Partnerships for Prison Development

Tingting Liu, Ph.D.¹; and Suzanne Wilkinson, Ph.D.²

Abstract: Building, managing, and operating prisons is essential for sustaining a country's criminal justice system. The provision of prison services usually incurs large capital expenditures and high operating costs, requires hybrid types of operational services, and involves multi-group stakeholders. Internationally, public-private partnerships (PPPs) were introduced by governments to bring forward prison projects. This research aims to evaluate PPP experiences in the prison sector, extract critical factors affecting the viability of PPPs and recommend strategies and measures for improved use of PPPs for prison development. Comparative case studies of two prison projects were adopted as the main research method with semi-structured interviews and focus group as primary data collection instruments. The research shows that the critical factors leading to the success of prison PPP are (1) relevant business case development, (2) robust and streamlined project development, (3) effective contract administration and management, (4) effective governance structures, (5) enhanced private consortium, and (6) equitable risk allocation. The research findings add to the international PPP best practice frameworks by showing that the critical factors for specific sectors vary. DOI: [10.1061/\(ASCE\)ME.1943-5479.0000324](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000324). © 2014 American Society of Civil Engineers.

Author keywords: Public-private partnerships; Prisons; Correctional services; Australia; New Zealand.

Introduction

Correctional services are an important part of a country's judicial system. The delivery of correctional services requires the building, upgrading, maintaining, and operating of prisons (Department of Corrections 2012; Grimsey and Lewis 2004). The provision of prisons and associated services is therefore a critical component of government policies and practices.

Prison development usually involves relatively large upfront capital investment and high ongoing maintenance and operating expenditures, resulting in significant budgetary allocation from governments' general tax incomes (NAO 2003). The prison services cover a wide range of aspects, including accommodation, security, estate and information systems management, and custodial services, requiring multidisciplinary expertise and skills from the service provider (Grimsey and Lewis 2004). Facing the ongoing budgetary burden and hybrid nature of correctional services, governments have sought alternative procurement methodologies to obtain better outcomes from building, management and operation of prisons.

Public-private partnerships (PPPs) have been introduced for prison development in some countries (e.g., the United Kingdom, United States, and Australia) due to advantages, such as better risk allocation, improved service quality and whole-life cost savings (Baldino 2010; Carrillo et al. 2008; Dixon et al. 2005). Despite the growing use of PPPs, little is known about the critical factors that would affect the viability of PPPs for prison development.

Although there is extensive literature investigating critical factors affecting the PPP implementation in general and in specific sectors, such as land transport, urban rail, event venues, and schools, few studies have been undertaken with a particular focus on prisons. Specific issues such as unique policy regimes, hybrid types of services and considerable humanitarian concerns have not been sufficiently addressed. This research therefore aims to evaluate PPP experiences in the prison sector, extract critical factors affecting the viability of PPPs and recommend strategies and measures for improved use of PPPs for prison development.

After the introduction, the paper will review the relevant literature to draw the special characteristics with prison development. This is followed by a comprehensive literature review of the PPP concept, drivers for using PPPs for prison development and existing experiences. By extracting and categorizing critical factors drawn from existing literature, the conceptualization for the research is achieved. The paper then goes on to describe the case study research methodology. Comparative case studies of two recent prison PPP projects, based in Australia and New Zealand are described. After a brief description of the background information of the case study projects, the "Results and Discussion" section presents the research findings, which are to be discussed with respect to prior theories and best practices, and compared with PPP implementation in other sectors. The paper recommends strategies and measures for improved use of prison PPPs and concludes with a brief summary of the research purpose and main findings, the limitations, the overall contributions, and a further discussion of theoretical and practical implications.

Special Characteristics with Prison Development

Compared to other social infrastructure projects, like schools, the building of prisons needs large capital grants. Unlike capital-intensive projects, such as land transport, in which the operating costs are relatively small compared to initial capital outlay, prison development has a large operation component and ongoing operation expenditures take a high proportion in project life-cycle costing

¹Lecturer, School of Economics and Management, Beijing Jiaotong Univ., Siyuan East Building, Haidian District, Beijing 100044, China (corresponding author). E-mail: t.liu@bjtu.edu.cn

²Professor, Dept. of Civil and Environmental Engineering, Univ. of Auckland, Private Bag 92019, Auckland 1061, New Zealand. E-mail: s.wilkinson@auckland.ac.nz

Note. This manuscript was submitted on June 6, 2013; approved on June 20, 2014; published online on July 23, 2014. Discussion period open until December 23, 2014; separate discussions must be submitted for individual papers. This paper is part of the *Journal of Management in Engineering*, © ASCE, ISSN 0742-597X/05014020(11)/\$25.00.

(Jefferies and McGeorge 2009). A whole-life, integrated approach is therefore preferred for prison development. Organizations should take operational and maintenance features into account when planning, designing and building prisons (National Infrastructure Unit 2010).

Prison services consist of core services (e.g., custodial, industries, education and training program) and ancillary services (e.g., facility management) (Grimsey and Lewis 2004). The primary objective of the services is to increase community safety and reduce reoffending and subsequent criminal activities through in-prison programs, such as rehabilitation programs, education, and job training. Whether the objective can be achieved largely relies on the performance of prison asset delivery and management. Also, the spectrum of prison services contains components that have the potential to be managed by the business sector (e.g., industries, facility management) (Blank 2000), resulting in the emergence of a number of international prison operators and many privately run prisons in the United States and the United Kingdom. The diversity of service types determines that multidisciplinary expertise and skills are needed to operate and manage prisons, posing considerable challenges to the service providers.

Diverse groups of stakeholders are involved in prison development, including businesses, prisoners, humanitarian reformers, and affected communities. As opposed to sectors such as land transport, urban rail, water and wastewater, where end-users, wholly or partly, pay for the services, the funding for prison services is solely from general tax, necessitating the focus on value for money (Solino and Vassallo 2009). The end users—prisoners—are not free and cannot make choices about most activities in their daily life, leading to concerns about their health, safety, and human rights. The way in which correctional services are delivered usually raises public concern, and therefore subjected to political debate, complicating the decision-making process for developing prison projects (Camp et al. 2001).

Prison facilities are part of a nation's social infrastructure networks. The delivery of correctional services is an important policy regime due to its close relevance to community safety and citizens' well-being (National Infrastructure Unit 2010). Given the strategic importance of the corrections system, prison operation is subjected to comprehensive and strict legislative, regulatory, and policy requirements. For instance, in New Zealand, the correctional services delivered by the Department of Corrections conform to the relevant legislation, such as the *Corrections Act 2004* and a series of *Amendment Acts*, international obligations such as the *United Nations Standard Minimum Rules for the Treatment of Prisoners 1955* specifying basic standards for facilities and management of prisoners, and regulatory and policy requirements such as the *Operations Manual* (Department of Corrections 2012). Organizations involved in the delivery of prison assets and services should be aware of the legal, regulatory, and policy requirements, and if necessary, take actions to address the concerns in activities, such as selecting delivery models, developing service specifications and risk allocation.

PPP Application for Prison Development

PPP Concept

Despite the worldwide use of PPPs, there is no unified definition of this term (Jefferies and McGeorge 2009; Garvin 2010). PPPs have been defined from both broad and narrow perspectives. In a broad sense, PPPs refer to any type of venture embracing both public and private sectors. Some cite a narrow definition, referring to the involvement of the private sector in the financing, design,

construction, operation, and maintenance in the provision of assets and associated services.

This paper adopts the definition given by the National Infrastructure Unit (NIU) in New Zealand, which explains PPPs from the narrow perspective. According to the NIU, PPPs refer to long-term contracts for the delivery of a service, the provision of which requires the construction of a facility, or the enhancement of an existing facility. The private sector finances and builds the facility, operates it to provide the service, and usually transfers the control of it to the public sector at the end of the contract (National Infrastructure Unit 2009).

Why PPPs for Prison Development?

A number of drivers are identified for adopting PPPs in prisons. PPPs provide an alternative mechanism to meet the expanding prison population, especially during a period of fiscal constraints (Camp et al. 2001). Through the use of private finance for initial capital investment, PPPs allow governments to pay for services over time (Martins et al. 2011). Under PPPs, the private sector is incentivized to offer an integrated approach toward the design, building, maintenance, and operation of projects (Dixon et al. 2005). Whole-life cost savings are likely to be achieved. Also, better service quality may be obtained as PPP payments are based on service availability and performance with reward and abatement mechanisms, the private sector is motivated to provide better prison services (Carrillo et al. 2008).

PPP Practices in Prisons

Given the varying extent to which the private sector is involved in service delivery, PPP models applying to different prison projects vary. In the United Kingdom and United States, the commonly used model is the design, build, finance, and operate (DBFO) arrangement, wherein the private sector provides full-package services connected with prison operation, including custodial services, such as at the Bridgend and Fazakerley Prisons. A number of Australian prison PPPs, such as the Metropolitan Remand Centre and Margoneet Correctional Centre, adopted a design, build, finance, and maintain (DBFM) approach, under which the public sector retains responsibilities for providing core services, such as billets, industries, and custodial services (Grimsey and Lewis 2004).

Critical Factors Identified from Literature

A review of the body of knowledge in relation to PPPs identifies a series of critical factors affecting PPP implementation, which may apply to prison PPPs. For example, Zhang (2005b), Li et al. (2005b), Chan et al. (2010), Mahalingam (2010), Birnie (1999), Qiao et al. (2001), and Dulami et al. (2010) derived a number of critical factors leading to the success of PPPs for general practices. Such research findings provide useful reference for practitioners to engage with PPPs and contribute to directing the future research. However, some studies of this kind (Chan et al. 2010; Qiao et al. 2001) were country-specific, the findings of which may not fit the prison practices as in some countries, such as China, where few if any prison PPP projects have been undertaken to date. The results were built on PPP experiences in other sectors, and therefore may not be relevant to prisons.

Another group of PPP research targeted specific sectors, such as land transport (Kalidindi and Thomas 2003), urban rail (De Jong et al. 2010; Solino and de Santos 2010), event venues (Jefferies et al. 2002), and schools (Reeves and Ryan 2007). However, the findings of the sector-specific research may not be suitable for prison development. For example, the economic viability was of

Table 1. Overview of Critical Factors Identified from Literature

Number	Critical factors for general practices	Critical factors for specific sectors			
		Land transport	Urban rail	Event venue	School
1	Legal framework (Zhang 2005b; Chan et al. 2010)	✓	✓	✓	Not emphasized
2	Business case development (Li et al. 2005b; Qiao et al. 2001)	✓ (economic viability)	✓ (economic viability)	✓ (economic viability)	✓ (affordability)
3	Project development (Chan et al. 2010)	✓	✓	✓	✓
4	Contract administration and management (Chan et al. 2010; Li et al. 2005b)	Not emphasized	Not emphasized	Not emphasized	✓
5	Governance structures (Li et al. 2005b)	✓ (emphasized at precontract phase)	✓ (emphasized at precontract phase)	✓ (emphasized at precontract phase)	✓ (emphasized throughout project life)
6	Private sector capability (Birmie 1999; Chan et al. 2010)	✓	✓	✓	Not emphasized
7	Risk allocation (Qiao et al. 2001; Li et al. 2005b)	✓ (emphasis on demand risk)	✓ (emphasis on demand risk)	✓ (emphasis demand risk)	✓ (no emphasis on demand risk)

Note: Check marks indicate critical factors pertaining to the sectors.

particular importance for land transport PPPs (Kalidindi and Thomas 2003). However, it seemed to be less of a concern for prisons, as relatively stable revenue streams are guaranteed as long as the service standards are met. It is therefore necessary to conduct research exploring the critical factors affecting the viability of PPPs unique to prisons. An overview of the critical factors identified from literature is presented in Table 1, corresponding to general practices and specific sectors.

Research Methodology

This research evaluates PPP experiences in the prison sector, extracts critical factors affecting the viability of PPPs, and recommends strategies and measures for improved use of PPPs for prison development. Comparative case studies were used in this research as they offer a useful means to identify themes and patterns emerging from the cases, which can be applicable elsewhere by adjusting to individual contextual situation (Eisenhardt 2007). Also, case studies enable the use of multiple data collection methods, including in-depth interviews, document analysis, and direct observation, to investigate the PPP implementation (Yin 2009). A qualitative approach is adopted because it captures experts' in-depth insights and perspectives on a research topic, which is desirable for this research (McNeill and Chapman 2005). Since the introduction of PPPs, only a limited number of prison projects have been delivered. Practitioners who can comment on the implementation of PPPs in prisons are limited. A quantitative approach, such as large-scale survey, is therefore excluded when selecting research methods.

Two recent PPP prison projects, Ararat Prison (currently named Hopkins Correctional Centre) and Wiri Prison, based in Australia and New Zealand, respectively, were selected (see Table 2 for background information). The case selection was based on their relevance to the research topic and field accessibility. In addition, both projects were initiated under each country's recent PPP frameworks and the contracts were let in 2010 and 2012, respectively. An in-depth investigation of processes and organization of the two projects allowed the researcher to map the PPP development in the prison sector. The case selection was also determined by the intention to understand the variations arising from different policy environments for PPPs, in which prison projects are built and delivered. Because different PPP models were used for the Ararat (DBFM) and Wiri projects (full-package), comparative case studies offer insights into the suitability and applicable conditions of varied PPP models for prison development.

The main data collection instrument was semi-structured interviews and focus group (used for interviewing Participants AP1–AP7). Extensive construction management studies have employed interviews to solicit participants' comments on the subject matter, as such techniques allow in-depth interpretations of the topic (Fellows and Liu 2008; Lu et al. 2013; Javernick-Will 2012), which was essential for this research. The focus group method was applied due to the desire to elicit information that represents combined perspectives from the public-sector side (Krueger and Casey 2000). Stakeholders selected for the research include experts from central/state coordinating authority, public agencies, construction contractors, facility managers, and legal/commercial advisors.

Table 2. Background Characteristics of Case-Study Projects

Name	Ararat Prison	Wiri Prison
Infrastructure type	Social	Social
Sector	Prison	Prison
Project type	Expansion of existing facilities	Greenfield
Location	West of Melbourne, VIC, Australia	Wiri, South Auckland, New Zealand
Capacity	358-bed prison and 40-bed transitional facility	Maximum 1,060 prisoners
PPP model	DBFM	Full-package services
Current status	Construction	Preferred bidder appointed
Contract value	AU\$394 million (about US\$383.8 million)	Approximate NZ\$840 million (about US\$677.4 million)
Year of contract award	2010	2012
Concession period	25 years	25 years
Cost performance	Cost overruns	Not applicable
Time performance	Time delays	Not applicable
Procurement duration	14 months	19 months

Participants were selected through a purposeful sampling procedure, allowing the selection of participants to be narrowed down to specific groups of people who can provide rich information on the subject matter. The research targeted practitioners familiar with the project development, procurement, and execution of Ararat and Wiri and the policy environment of PPPs in their respective jurisdictions. All participants held middle or upper management positions in their organizations. The detailed profile of the participants is presented in Table 3.

A face-to-face interview instrument was used as it allows a deep understanding and the use of probing questions to delve deeper into the subject matter (Liamputtong and Ezzy 2005). A semi-structured questionnaire was adopted to solicit comparable qualitative data and allow follow-up discussions. A list of interview questions and related discussion areas is shown in the appendix. The key themes of the interview questions include:

- Desired outcomes for adopting PPPs for prison development and whether they have been achieved so far;
- Key facets of the PPP arrangements for prisons including procurement processes, contractual and financial arrangements, and payment mechanisms;
- Main issues/concerns encountered in project development and contract management and initiatives taken to address any challenges and their effectiveness; and
- Strategies and measures proposed to improve the use of PPPs for prison development.

The researcher first approached the interviewees through e-mails or telephone calls. Fieldtrips to Melbourne (April–May 2011) and Auckland and Wellington (January–May 2011) enabled the researcher to conduct interviews and discussions. The interviews ranged from 45 min to 1 h, and the focus-group discussion lasted one and a half hours. Because it is difficult to gather seven participants together for the focus-group interview, the session was relatively fast-tracked, with three of them (most familiar with the subject areas) mainly commenting on the issues and others providing complementary perspectives. In order to capture important ideas and insights during a short period of time, the participants were first provided the background information about the intended research and interview questions, so that they could be prepared in advance.

The interviews were audio-recorded and transcribed. The transcripts were imported to the software, *NVivo 9*, in which the qualitative data was managed, coded, and analyzed. Keywords extracted from the literature review were initially used for preliminary coding. Progressive categories or themes emerged, which were incorporated in the coding for subsequent interviews. Key procedural and organizational themes and patterns were identified,

corroborated, and coded in *NVivo 9*. The establishment of codes helped to track the identified themes across individuals, formulating the basis for extracting the *critical factors*. NVivo can also extract comments and quotations from interviewees. For example, by submitting a *coding query on business case development*, similar comments and quotations would be displayed and arrayed, which were then compared and synthesized. Some examples, comments, and suggestions provided by the interviewees were presented in the “Results and Discussion” section to substantiate the points.

Description of Case Study Projects

Ararat Prison

Australia is viewed as a country with a mature and developed PPP market. Duffield (2005) was of a view that PPP development in Australia can be divided into two generations with the establishment of *Partnerships Victoria* in 2001, and the release of a suite of policy documents were seen as a watershed (Jefferies and McGeorge 2009). In 2008, Infrastructure Australia was set up to coordinate PPP activities at a federal level, which were previously conducted within various states under individual policies. PPP policy and guidelines have been issued, enabling a consistent approach toward PPPs across states.

The Ararat Prison project was initiated as a response to the projected growth in the number of prisoners. It includes (1) construction of a new medium-security prison facility adjacent to the existing Ararat Prison, and (2) development of a 40-bed transitional facility for persons subject to extended supervision orders (Department of Justice 2010). It was procured under a PPP, under which the state entered into a project agreement with an equity provider-led consortium, Aegis Correctional Partnership Pty Ltd. The private consortium was responsible for the design, construction, and finance of the new facility and facility management services over 25 years. The detailed contractual arrangements are shown in Fig. 1.

Expected to be completed by the end of 2012, construction on the project was halted in May 2012 because the consortium was in financial trouble, and the payments to subcontractors were delayed (Sexton and Butler 2012). After negotiation between the government and two domestic banks, a new PPP deal was set up with the consortium being led by the Commonwealth Bank, featuring a restart of the project (Sexton and Millar 2012).

Wiri Prison

In New Zealand, experiences with PPPs are limited with few activities undertaken to date. The scarcity of PPP practices was partly

Table 3. Background of Participants

Case studies	Date of the fieldtrip	Interviewee code	Main role of the organization in PPPs	Designation	Years of PPP experience
Ararat	April–May 2011	AP1–AP7 (focus group)	Public agency	Policy analysts	Ranges from 2 years to about 10 years
		AS1	State coordinating authority	Policy advisor	About 10 years
		AC1	Construction contractor	Executive	≥ 10 years
		AF1	Facility manager	Engineer	≥ 5 years
Wiri	January–May 2001	WT1	Treasury	Senior advisor	≥ 10 years
		WP1	Public agency	Director	≥ 10 years
		WC1	Construction contractor	Executive	≥ 15 years
		WC2	Construction contractor	Senior engineer	No PPP experience
		WA1	Commercial advisor	Partner	≥ 15 years
		WA2	Legal advisor	Manager	≥ 5 years
		WA3	Commercial advisor	Executive director	≥ 15 years
		WA4	Commercial advisor	Senior manager	About 10 years

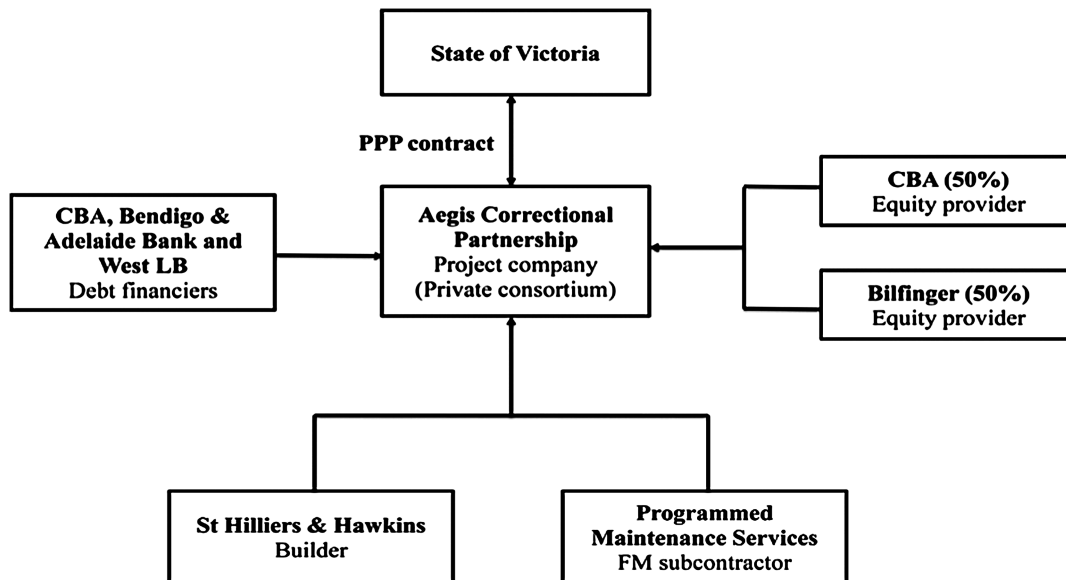


Fig. 1. Contractual arrangement of the Ararat Prison project (adapted from Department of Justice 2010, © State of Victoria)

due to the government's skeptical view toward the adoption of PPPs (Ascari Partners Ltd 2005). The government's approach to PPPs has changed under the current policy. Proposals with whole-life costs more than NZ\$25 million (about US\$20.4 million) are required to include a PPP option in the choice of procurement route (New Zealand Treasury 2011). A central coordinating authority—National Infrastructure Unit (NIU)—was set up within the Treasury, acting as a center of excellence for PPP programs. Policies and guidelines on PPPs have been published by the NIU, including *Guidance for Public Private Partnerships (PPPs) in New Zealand* (National Infrastructure Unit 2009), *Draft Public Private Partnership Standard Contract, Version 2* (National Infrastructure Unit 2011).

The Wiri Prison project was the New Zealand government's first PPP attempt under the current policy. The project uses a custodial PPP approach under which the department engages with an operator-led consortium to design, build, operate, finance, and maintain the prison for the duration of the contract. The prison will revert to the department 25 years after it becomes operational (Department of Corrections 2011). The private consortium SecureFuture was appointed as the preferred bidder in March 2012.

Results and Discussion

An investigation into processes and organization used for two prison PPP projects—Ararat Prison and Wiri Prison—identifies the critical factors affecting the viability of PPPs for prison development. The information was used to collate main interventions used or proposed to improve prison PPPs.

Relevant Business Case Development

Undertaking a clearly identified service need is important. Participant AP1 and AP2 argued that the Ararat project was initiated in response to a projected growing male prisoner population, resulting from a series of policy decisions to increase community safety, such as tougher sentences and increased prosecution of sexual assault (Department of Justice 2010). In addition, Participant WT1, WP1, and WA3 stated that at the planning phase, the public doubted the need to build a new prison in light of reduced projected offender

numbers. The project was, nonetheless, brought forward due to the Department of Corrections' overall strategic development scheme to better equip the prison facilities to facilitate rehabilitation and current conditions of the nation's wider prison network with some aging prisons close to ending their viable life. A program-level analysis led to the decision to proceed with building the Wiri Prison.

Prior literature has shown that many PPP projects were not meeting the expected outcomes because the service need was not sufficiently justified (Askar and Gab-Allah 2002; Kalidindi and Thomas 2003). This research reinforces this point that the initiation of new projects needs to be based on an accurate estimation of prisoner numbers, which are influenced by relevant policies to enforce penalties. Conducting a program-level service need analysis affirms Mahalingam's (2010) finding that adopting a programmatic approach is an important strategy enabling PPPs. Specific to prison PPPs, the proposed investment must be aligned with the department's and overall infrastructure development plan and existing organizational strategic position.

All participants mentioned the critical role of careful quantitative analysis in the selection of a preferred delivery model. For example, in the case of Wiri, the net present cost of the service payments to be paid to SecureFuture is 10% lower than the public-sector comparator (PSC, an estimate of the risk-adjusted, whole-life cost of the intended project if procured via the traditional approach), indicating the cost efficiency of a PPP (English and Tolly 2012). Although admitting uncertainties embedded in the calculation of PSC, a quantitative value-for-money assessment provided a systematic and methodical approach, giving the government confidence toward the PPP process.

A comprehensive qualitative analysis on the suitability of PPPs is also essential. As reported by the builder of Ararat, the main reason for the cost overruns and time delays was that the inflexible feature of PPP arrangements is incompatible with the nature of a redevelopment project (Gibson 2012b). Projects with a good level of certainty and clear objectives are suited to be procured through PPPs. However, in this case, building a new prison facility in an existing operating prison gave rise to scope change and access and workforce interfaces, creating difficulties to the execution of PPPs (Gibson 2012a). The selection of PPPs, especially the choice

between separation or integration of ancillary and core services, needs to take into consideration the government's policy objectives. Given Victoria's policy approach to PPPs, in which the private sector is excluded from providing core services in PPPs, a DBFM model was utilized for Ararat. Opting for the full-fledged PPP model in the Wiri project is consistent with the government's policy directions to achieve operational innovations and better value for money. As maintained by Participant WT1, WP1, and WA2, considering New Zealand's environment for PPPs, without including the operation component in the PPP model, it is difficult for a PPP prison like Wiri to ensure value for money due to the differentials of cost of finance and high transaction costs. Also, the government intended to apply the private sector expertise and innovations in prison operation to wider prison network from undertaking a PPP. A full-fledged model encourages the private sector to use their technical and managerial strengths.

International PPP practices place emphasis on using quantitative methodology to assess the value for money of a PPP proposal (Garvin 2010; Grimsey and Lewis 2005). Such PSC-based assessments were exercised in the two cases examined. While acknowledging the merits of PSC calculations, this research further reinforces the need to take other qualitative factors into account (e.g., the nature of the project, whether it is greenfield or brownfield, and the alignment with the government's policy objective). Unlike other social infrastructure sectors, such as schools and hospitals, where a DBFM model is commonly used, both full-fledged and non-core services PPP models can be selected for prison development. As such, an extended analysis on whether to bundle the services is required to be undertaken on the basis of the government's policy objectives for embarking on PPPs.

An assessment of affordability is concerned with examining the implications of proposed projects on governments' fiscal position over the appraisal period. Five participants of Wiri emphasized the necessity of undertaking an accurate affordability analysis during business case development. As stated by Participant WA3, "affordability implications that are created for building new prisons matter the success of PPPs." He reiterated that, if financial costing indicates PPPs are unaffordable, potential remedies such as adopting a different design solution and altering the scope of the option may apply to close the affordability gaps. Similarly, participants of the focus group mentioned that the affordability of Ararat was tested and budgetary allocations were obtained before proceeding with a PPP. AS1 further explained that the current capital asset management guidance and practices determined that awareness for affordability issues is required prior to progressing PPPs.

This research confirms the previous assertion that the government's fiscal position over the appraisal time needs to be examined to ensure the sustainability of PPPs (Carrillo et al. 2008; Akintoye et al. 2003). The affordability issue is not specific to PPPs, but it has great bearing on public-sector capital projects in general (Burger 2008). However, for usage-based PPPs (e.g., toll roads, urban rail), where the payment is predominately determined by demand (e.g., traffic volume) and toll rate, the affordability analysis is mainly centered on the demand estimates, and designing commensurate compensation mechanisms if revenues generated from operation cannot offset the expenses (Yescombe 2007; Hayllar 2010). In comparison, for social infrastructure, performance-based PPP projects, such as prisons and schools, the government is ultimately responsible for the capital costs, operating spending and a certain level of profit. The affordability issue is especially relevant. Furthermore, as opposed to school projects, with relatively small capital size, the affordability implications are of particular importance for prison PPPs, especially for projects using an integrated approach due to the government's higher fiscal liabilities (Reeves and Ryan 2007).

Robust and Streamlined Project Development

Eight participants (two for Ararat and six for Wiri) underscored the critical role a high-quality output specification plays in realizing effective contract management and driving design and operational innovations. For example, Participant AC1 and WC1 suggested that clear specifications that can be coherently interpreted by different individuals are crucial. Relevant documents (e.g., output specification, service specifications) should be consistent to give prospective bidders unambiguous instructions regarding the clients' requirements. However, in both projects' tendering practices, the interpretations of output specification varied among different people, as observed by the participants, and had some contradictions. Only through involving diverse stakeholders (e.g., prisoners, custodial staff, and training providers) in developing and reviewing the specifications at different stages, their needs could be well captured and the quality of the documents could be ensured.

Participant WP1, WA1, and WA3 stated that the government's emphasis was on accomplishing better operational results. As such, much effort was made to incorporate a wide range of operational outcomes, such as enhancing rehabilitation and reintegration with communities, into the service specifications. Participant WP1 highlighted the trade-off the project team face, maximizing private sector innovations and requiring the private operator to comply with the existing *Operation Manual* enforced across the prison network. As a response to the government's policy to encourage service innovations, the preferred bidder of Wiri proposed a series of measures, including investing in prison facilities for rehabilitation and reintegration activities and providing follow-up services accessible to prisoners after release.

Providing quality tender documents for prison PPPs confirms research findings that clear project briefs and client requirements are critical factors leading to a successful PPP (Akintoye et al. 2003). For economic infrastructure PPPs, such as toll roads, featuring third-party or end-user payments, providing output and service specifications is comparatively easy as the service operation is relatively simple. Clearly and coherently specifying the service performance standards, nonetheless, seems to be of particular importance for social infrastructure PPPs, like prisons, due to its large operation component with a high degree of uncertainty and complexity (Reeves and Ryan 2007). Without quality specifications, the service performance cannot be well evaluated, rendering the incentive and penalty mechanisms useless, hindering private-sector compliance with the PPP contract. Differences also exist between non-core services PPP models and full-fledged PPP prisons, as the former focus on specifying facility management performance, while the latter incorporate operational indicators in the specifications.

Effective Contract Administration and Management

All participants felt that effective contract administration and management determine the sustainability of a PPP. As maintained by the participants of Ararat, the non-core services model gives rise to interface issues at the contract management stage due to the interdependence of parties (operating staff employed by the public sector and the private-sector partner) in the provision of correctional services. This issue arose from the institutional arrangements of Victoria's justice and corrections system that different divisions within the Department of Justice are responsible for the provision of prison facilities and services. As elaborated by Participant AC1, "the government's operation manager has different philosophies with the Department (of Justice) and intends to enforce changes." Participant AF1 added that the department tends to procure the prison project according to their policy objectives, which might

differ from the ways in which the operating staff provide the security and correctional services. The interface issue was not highlighted by the participants of Wiri. This may be attributed to the fact that the private-sector partner will be responsible for providing the correctional services and facility management.

In addition to the main PPP contract, a PPP involves multiple contracts, such as those signed between the project company and construction contractors, architects, facility managers or operators, as well as a wide range of subcontractors. In the Ararat Prison project, two construction companies, St Hilliers and Hawkins, were appointed as the contractors. CBA, Bilfinger acted as equity providers and Programmed Maintenance Services Ltd. were contracted to provide the 25-year facility management services. As for Wiri, the project company signed contracts or agreements with Fletcher, Serco, and Spotless Facility Services respectively, to build, operate, and maintain the prison facility (English and Tolly 2012). It is notable that the management of multiple contracts have posed challenges, impeding the success of PPPs. For example, the Ararat project got into financial trouble in mid-2012, and St Hilliers entered voluntary administration. Because St Hilliers did not make payments to subcontractors and suppliers, the construction work was halted. Sexton and Butler (2012) attributed the failure to the mismanagement of subcontractors and suppliers, such as the purchase of Chinese doors and windows that did not fit. The government had to step in to make sure that the payments were made and the project could continue.

With respect to challenges with contract administration and management, the participants suggested that it is essential to keep constant and effective communication between parties involved, especially in situations where changes to the contract occur. When changes occur, "the private sector partner should be able to sustain constant communication, to explain the intent behind the contract, and to convince them how the services are delivered in accordance with long-term interests". Participant AF1 further explained that in Ararat, based on past experiences with running prison PPPs, the Department of Justice has endeavored to create an efficient communication channel throughout the project implementation process. He believed that the channel would be useful to avoid disconnections between the contract, prison operator, and the private-sector partner. Clear lines of interorganizational communications need to be set up and maintained to ensure that emerging issues in contract administration are promptly responded to and tackled.

A distinguishing feature of PPPs is the long concession period focusing on contract administration and management. In comparison with third-party or end-user pay PPPs, in which the private-sector partner's revenues are largely dependent on the service quality and end-user satisfaction (Jefferies et al. 2002), it is essential for governments to perform effective contract monitoring and management in prison development due to the reliance on evaluating the performance standards and therefore enforcing incentive and penalty mechanisms.

Effective Governance Structures

All participants stressed the necessity of establishing effective governance structures within the public sector throughout the planning, preparation, and execution process. In the two projects studied, responsive in-house teams at different levels were set up. Focus-group participants of Ararat claimed that a four-level governance structure, consisting of commercial/legal, technical, and services specialists, project steering committee, Minister for Corrections and cabinet subcommittee was in place. The participants believed that such governance structure was conducive to ensuring an efficient procurement process by giving timely approvals at various decision-making points. In the case of Wiri, a steering committee

was formulated at the outset and met on a monthly basis. A core project group comprising experts from the NIU and representatives from the Department met on a weekly basis so that any existing or potential barriers could be quickly addressed.

Sustaining effective governance structures in the contract administration stage is of equal significance for prison PPPs. Based on the Victoria State's past experience with prison PPPs, Participant AP2, AP3, and AP7 contended that simplifying the governance arrangements at the operational stage would facilitate timely reporting and avoid duplication of responsibilities within the public sector, such as the contract administrator and the operating staff.

Effective governance structures suggested in this research is consistent with the previous research findings recognizing the dominant influence of good governance in PPPs (Martins et al. 2011). For prison PPPs or maybe school PPPs, the implications extend from precontract phase to contract management given the focus on operational efficiency and long-term viability. As reflected in Ararat, if lines of communication between the private-sector partner, operational staff of the existing prison, and the public sector's contract management team were explicitly and effectively defined and maintained, the access and workforce interface issue during the construction stage could have been better solved.

Enhanced Private Consortium

Six participants (two for Ararat and four for Wiri) claimed that a properly structured private consortium is vital. The participants agreed that there is no one-approach-fits-all private-sector structure for prison PPPs. The organization of the consortium needs to be in compliance with general market conditions and the project's special characteristics. In the case of Wiri, an operator/contractor-led structure was adopted, whereas the Ararat project used a financier-led approach. The organization of private consortia differs partly because of the varied levels of market maturity. When the Wiri project was initiated, the PPP development in New Zealand remained at an initial stage, lacking enough competitive financiers capable of being project sponsors. Nonetheless, by the time the Ararat project was envisaged, the financier-led approach had been commonly used for forming consortium in Australia. As commented by Participant AS1, in Victoria, due to much experience with running PPP projects, the financiers have been familiar with the design, construction, and management aspects of a PPP project and are used to leading bids.

All participants from the private-sector side mentioned that it is critical to maintain a long-term partnering relationship between private entities acting as different roles in a private consortium. The participants reported that there has been a lack of project sponsors, equity providers, facility managers, and world-leading prison operators. Given the unbalanced number of various market players, they should sustain long-term partnership built on trust and mutual understanding. When the financier-led approach is used, long-term relationships would assist equity providers with gaining a broader and more practical service delivery. With enhanced understanding of service delivery, the equity providers are better incentivized to provide optimum design and operational solutions for prison PPPs.

A properly structured private consortium and enhanced partnering relationship among the various entities underpins Birnie's (1999) finding that a strong private consortium and good partners' relationship are critical success factors for PPPs. The research shows that it is also the case for prison PPPs, as shown in Ararat, that if lacking a strong private consortium, the success of a PPP cannot be guaranteed. As opposed to non-core services social infrastructure PPP, such as schools and hospitals, full-fledged prison PPP poses high requirements on the capability of prison operators,

given the limited number of relevant players worldwide (Jefferies et al. 2002). This explains why the core criteria for partner selection in the Wiri project was the commercial, technical, financial, and managerial capabilities of the prison operators in the consortia.

Equitable Risk Allocation

In the Ararat project, risks in relation to design, building, financing, and maintenance are transferred to the private sector, while core services are retained by the public sector. Three participants (AS1, AC1, and AF1) stated that there was a tendency for the government to transfer more risks at the operating stage. For example, the private sector was requested to employ prisoners to engage in services relating to facility management and being partly responsible for energy volume risk associated with electricity and gas consumption. Participant AS1 maintained that such a risk-transfer scheme offers greater opportunities to enhance rehabilitation and prisoners' reintegration on release. It provides an incentive for the architect, builder, and facility manager to use innovative technologies to achieve energy saving. However, from the private sector's perspective, the increased risk profile poses challenges to accomplishing their organizational objectives. For example, Participant AF1 commented:

The Department of Justice are very keen for us to use prison labour to help us maintain the facility. The prisoners can be engaged in cleaning, etc. That requires us to think of what are the risks associated with that. If they damage something belongs to us? How difficult to supervise them?

We cannot necessarily influence the operational parameters. If the prisoner decided to turn the heater on throughout the night instead of turning it off, that would have an impact on the usage of utilities.

As for Wiri, where risks in relation to prison operation are transferred to the private sector, the public sector needs to retain or share the risks beyond the control of the private sector, such as political risks and risks in relation to obtaining relevant approvals. The concerns for potential political risk were raised by the bidders at the interactive dialogue stage. The government therefore retained the risks by promising to compensate the bidders to a capped amount if the project is cancelled due to a change of government. The participants of Wiri also highlighted the risk of obtaining resource consent and other processes as required by the Resource Management Act (RMA) 1991. In New Zealand, the environmental impacts of activities are assessed and controlled by the requirement to apply for resource consents. When initiating a construction project, a resource consent is needed as it gives permission to undertake an activity provided that the conditions attached to the consent are complied with (Environmental Defence Society 2013). In some cases, a resource consent may be waived if the activity is expressly authorized by the regional or district plan. For example, when a designation, a provision in a district plan, is granted, the requiring authority (e.g., the Department of Corrections) is authorized to undertake work or project on the site without the need to obtain land consent (one type of resource consent) from territorial authorities. A requiring authority can use the designated land for a *designation purpose* as set out in the district plan. However, when alterations to designation are needed, the requiring authority should lodge another application for resource consent, as specified in the RMA (Ministry for the Environment 2009). In the case of Wiri, according to Participant WT1, a designation was initially granted to a women's prison at the intended site of Wiri. The change of purpose resulted in another resource consent application, leading to a prolonged process. Participant WA1 and WT1 pointed out that

for following PPP projects, it is essential for the government to complete the designation process before approaching the market.

Equitable risk allocation was stressed in much of the literature due to its key role in achieving value for money in PPPs (Li et al. 2005b; Mahalingam 2010; Garvin 2010). However, the implications of risk allocation vary among different infrastructure sectors and countries. As for sectors, such as toll roads and venues, the demand risk is the main concern. Prison PPPs nonetheless focus on providing the services to meet the required standards given the foreseeable stable revenue streams. Governments tend to transfer more risks to the private sector, such as employing the prisoners in the facility management and energy usage, as is the case for Ararat, although it is too early to judge the effectiveness of such risk transfer (the project has not yet reached the operational stage). In countries like New Zealand lacking attractiveness to potential players, governments need to retain more risks (e.g., site investigation, obtaining approvals) aiming at sustaining a dynamic PPP market.

It is notable that the factor *legal framework* identified from prior literature was not particularly highlighted by interviewees in this research. However, the availability of a favorable legal framework may be a concern for future prison PPP attempts in New Zealand. This is due to the instability of the legislation concerning private-sector participation in delivering correctional services. For example, the passing of *Corrections Act 2004* excludes the possibility for managing prisons by the private sector, while the following *Corrections Amendment Act 2009* allows private prison management again (New Zealand Parliament 2009). The inconsistency in legislation gives the market a high level of uncertainty toward the prospects of New Zealand PPP market, hindering smooth PPP application.

Recommended Strategies and Measures for Improved Use of Prison PPPs

To improve the successfulness of using PPPs for the prison sector, the public procuring authority should conduct an accurate projection of prison population and estimation of growing trend, with an emphasis on a program view toward the analysis. The selection of delivery models needs a methodical quantitative assessment, along with qualitative considerations. In particular, when a PPP option is confirmed, the choice between a full-fledged or non-core services model must consider the alignment with governments' policy objectives. Given governments' considerable fiscal liability for prison PPPs, where performance-based payments are adopted, a well-elaborated affordability analysis needs to be conducted.

With respect to the difficulty in providing quality tender documents, it is vital to involve diverse stakeholders in project development. Through thorough and detailed consultations with relevant stakeholders, such as the Department's operating staff, unions, prisoners, and relevant communities, potential service needs and desired outcomes are better captured. In terms of the likely conflicts between the innovative solutions proposed by the bidders and current prison operational practices, this research recommends that as long as the solutions are in compliance with the legislation and public interests, other barriers will be removed.

In light of the likely interface issued faced at the contract administration stage, this research suggests that clear lines of inter-organizational communication should be established to ensure effective and efficient communication, especially when changes occur. Monitoring, auditing, and management of contract administration could be better executed by utilizing appropriate documentation with traceable computer systems. The documentation includes keeping a contract administration manual and documenting the

analysis and rationale for any variations and the corresponding actions in terms of payment reductions.

Effective governance structures featuring clearly defined roles and responsibilities and reporting lines are desirable throughout the life cycle of a prison PPP. A four-level governance structure, set up for Ararat, may be applied for future endeavors, if appropriate.

As for the private-sector partner, this research suggests that a properly structured consortium should be adopted by considering the maturity of PPP market and characteristics of a specific project. Private-sector stakeholders including the construction sector, financial institutions, facility managers, and prison operators are encouraged to maintain strategic long-term partnerships to increase the chance for winning PPP bids, and also effectively execute a PPP contract.

When developing or negotiating the risk-allocation scheme, the public and private sector are required to allocate the risks with regard to the nature of PPP models adopted, the maturity of PPP markets, and project-specific features. Only through equitable risk allocation may the desired outcomes of using PPPs be achieved.

Conclusions

This study evaluates the experiences of PPPs in prison development and extracts critical factors specific to prison PPPs and recommends strategies and measures for improved use of PPPs for prison development. By examining two prison PPP projects from a comparative perspective, the research finds that the critical factors affecting the success of prison PPPs deviate from those of general practices and other sectors, as a result of the special characteristics of prison development.

The complexity of correctional services determines that clear and coherent output and services specifications need to be developed based on which effective contract management and administration can be performed. Also, with respect to the large operation

component, effective governance structures need to be maintained at both the development and operating phases. Given the complicated and multidisciplinary nature of correctional services, a properly structured private-sector partner with the participants being long-term business partners is preferred to ensure that the desired outcomes can be gained. Due to exposure to much public examination, a well-articulated service identification and value for money assessments need to be undertaken before proceeding with a PPP. The important role of an affordability analysis is highlighted for prison development, owing to the large capital and considerable operating costs for the provision of prison services.

It is important to acknowledge the limitations of this research. The two cases studied do not exactly mirror the population of prison projects in which PPPs are used, raising concerns about the generalizability of the critical factors identified from this research. Also, neither project examined has reached the operational stage. It is difficult to evaluate the operational performance of PPPs and it is possible that the interviewees' perspectives may evolve. For example, uncertainties, such as whether the utility risk should be transferred to the private sector, may be answered in a few years, after Ararat has entered into operation.

Despite the limited number and early stages of cases studied, the research extends the international debate on the suitability of PPPs for the provision of public assets and services. It also adds to the PPP best-practice frameworks by showing that critical factors for special sectors vary. The findings provide practical implications for public authorities intending to initiate new prison projects or upgrade existing prisons. The development of a country's judicial system requires the provision of high-quality correctional services. PPPs provide viable options. By implementing the recommended strategies and measures derived from this research, governments would be in a better position to use PPPs for prison development.

Appendix. Interview Questions and Discussion Areas

Interview questions	Discussion areas or probes	Purpose
Given the role of your organization or your research experience, how do you describe the main initiatives to adopt or step into PPPs? Have the desired benefits achieved so far based on your experience or observation (Martins et al. 2011; Dixon et al. 2005; Yescombe 2007; Carrillo et al. 2008)?	Utilize the private sector skills and expertise Alleviate budgetary constraints Achieve whole-life cost saving Encourage innovations and enhance service quality	To evaluate the PPP experiences in the prison sector
Could you describe the arrangements regarding the key facets of the PPP transaction (Grimsey and Lewis 2004; Yescombe 2007)?	Decision-making and procurement process Contract management and progress achieved so far Contractual arrangements Financial arrangements Payment mechanism	To ensure the accuracy of the background information about case study projects, derived from document analysis
What are the key issues/concerns encountered when initiating, planning, delivering and operating prison PPPs? What are the initiatives taken to address the issues/concerns emerged? How do you evaluate their effectiveness (Zhang 2005b; Mahalingam 2010; Aziz 2007; Qiao et al. 2001; Li et al. 2005a; Loosemore 2007; Chan et al. 2010)?	Legal framework Business case development Project development Contract administration and management Governance structures Private sector capability Risk allocation	To identify critical factors affecting the viability of prison PPPs
Could you suggest additional strategies and means to facilitate the implementation of PPPs in prison development and increase the likelihood for achieving success?	Open-ended questions	To recommend strategies and measures for improved use of PPPs for prison development

References

- Akintoye, A., Hardcastle, C., Beck, M., Chinyio, E., and Asenova, D. (2003). "Achieving best value in private finance initiative project procurement." *Constr. Manage. Econ.*, 21(5), 461–470.
- Ascari Partners Ltd. (2005). "The environment for public-private partnerships in New Zealand." New Zealand Council for Infrastructure Development, Auckland, New Zealand.
- Askar, M., and Gab-allah, A. (2002). "Problems facing parties involved in build, operate, and transport projects in Egypt." *J. Manage. Eng.*, 10.1061/(ASCE)0742-597X(2002)18:4(173), 173–178.
- Aziz, A. (2007). "Successful delivery of public-private partnerships for infrastructure development." *J. Constr. Eng. Manage.*, 10.1061/(ASCE)0733-9364(2007)133:12(918), 918–931.
- Baldino, D. (2010). "The privatisation of prisoner transfer services in western Australia. What can we learn from the Ward case?" *Aust. J. Public Administration*, 69(4), 418–430.
- Birnie, J. (1999). "Private finance initiative (PFI)—UK construction industry response." *J. Constr. Procurement*, 5(1), 5–14.
- Blank, R. (2000). "When can public policy makers rely on private markets? The effective provision of social services." *Econ. J.*, 110(462), 34–49.
- Burger, P. (2008). "Public-private partnerships: Affordability, risk sharing and value for money." *OECD Meeting*, Univ. of the Free State, Zurich, Switzerland.
- Camp, S., Gaes, G., and Saylor, W. (2001). "Quality of prison operations in the U.S. federal sector: A comparison with a private prison." Washington, DC (<http://www.bop.gov>) (Apr. 10, 2012).
- Carrillo, P., Robinson, H., Foale, P., Anumba, C., and Bouchlaghem, D. (2008). "Participation, barriers, and opportunities in PFI: The United Kingdom experience." *J. Manage. Eng.*, 10.1061/(ASCE)0742-597X(2008)24:3(138), 138–145.
- Chan, A. P. C., Lam, P. T. I., Chan, D. W. M., Cheung, E., and Ke, Y. (2010). "Critical success factors for PPPs in infrastructure developments: Chinese perspective." *J. Constr. Eng. Manage.*, 10.1061/(ASCE)CO.1943-7862.0000152, 484–494.
- De Jong, M., Mu, R., Stead, D., Ma, Y., and Xi, B. (2010). "Introducing public-private partnerships for metropolitan subways in China: What is the evidence?" *J. Transp. Geog.*, 18(2), 301–313.
- Department of Corrections. (2011). "Approval for new men's prison at Wiri." Wellington, New Zealand, (<http://www.corrections.govt.nz>) (May 12, 2012).
- Department of Corrections. (2012). "Corrections vision." Wellington, New Zealand, (<http://www.corrections.govt.nz>) (May 2, 2012).
- Department of Justice. (2010). "Project summary: Partnerships Victoria Ararat Prison project." Melbourne, Australia, (<http://www.partnerships.vic.gov.au>) (Sep. 10, 2011).
- Dixon, T., Pottinger, G., and Jordan, A. (2005). "Lessons from the private finance initiative in the UK—Benefits, problems and critical success factors." *J. Property Investment Finance*, 23(5), 412–423.
- Duffield, C. F. (2005). "Public private partnerships: Opportunities and challenges." *PPPs in Australia*, Univ. Hong Kong, Centre for Infrastructure and Construction Industry Development, Hong Kong.
- Dulaimi, M. F., Alhashemi, M., Ling, F. Y. Y., and Kumaraswamy, M. (2010). "The execution of public-private partnership projects in the UAE." *Constr. Manage. Econ.*, 28(4), 393–402.
- Eisenhardt, K. (2007). "Theory building from cases: Opportunities and challenges." *Acad. Manage. J.*, 50(1), 25–32.
- English, B., and Tolly, A. (2012). "Next steps for new public-private prison at Wiri." Wellington, New Zealand, (<http://www.beehive.govt.nz/release/next-steps-new-public-private-prison-wiri>) (May 10, 2013).
- Environmental Defence Society. (2013). "Resource management act for the community: Resource consents." Auckland, New Zealand, (<http://www.rmaguide.org.nz>) (Feb. 23, 2014).
- Fellows, R., and Liu, A. (2008). *Research methods for construction*, Blackwell, Oxford, U.K.
- Garvin, M. J. (2010). "Enabling development of the transportation public-private partnership market in the United States." *J. Constr. Eng. Manage.*, 10.1061/(ASCE)CO.1943-7862.0000122, 402–411.
- Gibson, A. (2012a). "Aussie project learning curve but building boss still positive." *New Zealand Herald*, (<http://www.nzherald.co.nz>) (Apr. 8, 2013).
- Gibson, A. (2012b). "NZ builder downs tools on Aussie prison work." (<http://www.nzherald.co.nz>) (Apr. 8, 2013).
- Grimsey, D., and Lewis, M. (2004). *Public private partnerships: The worldwide revolution in infrastructure provision and project finance*, Edward Elgar Publishing, Northampton, MA.
- Grimsey, D., and Lewis, M. (2005). "Are public private partnerships value for money?: Evaluating alternative approaches and comparing academic and practitioner views." *Accounting Forum*, 29(4), 345–378.
- Hayllar, M. R. (2010). "Public-private partnerships in Hong Kong: Good governance the essential missing ingredient?" *Aust. J. Public Administration*, 69(1), S99–S119.
- Javernick-Will, A. (2012). "Motivating knowledge sharing in engineering and construction organizations: Power of social motivations." *J. Manage. Eng.*, 10.1061/(ASCE)ME.1943-5479.0000076, 193–202.
- Jefferies, M., Gameson, R., and Rowlin, S. (2002). "Critical success factors of the BOOT procurement system: Reflection from the Stadium Australia case study." *Eng. Constr. Archit. Manage.*, 9(4), 352–361.
- Jefferies, M., and McGeorge, W. D. (2009). "Using public-private partnerships (PPPs) to procure social infrastructure in Australia." *Eng. Constr. Archit. Manage.*, 16(5), 415–437.
- Kalidindi, S. N., and Thomas, A. V. (2003). "Private sector participation road projects in India: Assessment and allocation of critical risks." *Public-private partnerships: Managing risks and opportunities*, A. Akintoye, M. Beck, and C. Hardcastle, eds., Blackwell Science, Oxford, U.K.
- Krueger, R. A., and Casey, M. A. (2000). *Focus groups: A practical guide for applied research*, 3rd Ed., Sage, Thousand Oaks, CA.
- Li, B., Akintoye, A., Edwards, P. J., and Hardcastle, C. (2005a). "The allocation of risk in PPP/PFI construction projects in the UK." *Int. J. Proj. Manage.*, 23(1), 25–35.
- Li, B., Akintoye, A., Edwards, P. J., and Hardcastle, C. (2005b). "Critical success factors for PPP/PFI projects in the UK construction industry." *Constr. Manage. Econ.*, 23(5), 459–471.
- Liamputtong, P., and Ezzy, D. (2005). *Qualitative research methods*, Oxford University Press, South Melbourne, VIC, Australia.
- Loosemore, A. (2007). "Risk allocation in the private provision of public infrastructure." *Int. J. Proj. Manage.*, 25(6), 579–588.
- Lu, W., Ye, K., Flanagan, R., and Jewell, C. (2013). "Developing construction professional services in the international market: SWOT analysis of China." *J. Manage. Eng.*, 10.1061/(ASCE)ME.1943-5479.0000144, 302–313.
- Mahalingam, A. (2010). "PPP experiences in Indian cities: Barriers, enablers, and the way forward." *J. Constr. Eng. Manage.*, 10.1061/(ASCE)CO.1943-7862.0000130, 419–429.
- Martins, A. C., Marques, R. C., and Cruz, C. O. (2011). "Public-private partnerships for wind power generation: The Portuguese case." *Energy Policy*, 39(1), 94–104.
- McNeill, P., and Chapman, S. (2005). *Research methods*, Routledge, London.
- Ministry for the Environment. (2009). *An everyday guide to the Resource Management Act Series 4.1: The designation process*, Wellington, Ministry for the Environment, (<https://www.mfe.govt.nz>) (Nov. 21, 2013).
- National Audit Office (NAO). (2003). "The operational performance of PFI prisons." London, U.K., (<http://www.nao.org.uk>) (Nov. 10, 2011).
- National Infrastructure Unit. (2009). *Guidance for public private partnerships (PPPs) in New Zealand*, New Zealand Treasury, Wellington, New Zealand.
- National Infrastructure Unit. (2010). "National infrastructure plan 2010." Wellington, New Zealand, (<http://www.infrastructure.govt.nz/plan/mar2010/nip-mar10.pdf>) (Apr. 10, 2012).
- National Infrastructure Unit. (2011). *Draft public private partnership (PPP) standard contract—Version 2*, New Zealand Treasury, Wellington, New Zealand.
- New Zealand Parliament. (2009). "Corrections (contract management of prisons) amendment bill—First reading." Wellington, New Zealand (<http://www.parliament.nz>) (Nov. 21, 2011).
- New Zealand Treasury. (2011). "Better business cases for capital proposals toolkit: Indicative business case." Wellington, New Zealand.
- NVivo 9 [Computer Software]. QSR International, Doncaster, Australia.

- Qiao, L., Wang, S., Tiong, R., and Chan, T. (2001). "Framework for critical success factors of BOT projects in China." *J. Proj. Finance*, 7(7), 53–61.
- Reeves, E., and Ryan, J. (2007). "Piloting public-private partnerships: Expensive lessons from Ireland's schools' sector." *Public Money Manage.*, 27(5), 331–338.
- Sexton, R., and Butler, B. (2012). "Builder collapse halts Ararat prison." (<http://www.theage.com.au/victoria>) (Apr. 8, 2013).
- Sexton, R., and Millar, R. (2012). "Ararat prison plan revived." (<http://www.theage.com.au/victoria>) (Apr. 8, 2013).
- Solino, A. S., and de Santos, P. G. (2010). "Transaction costs in transport public-private partnerships: Comparing procurement procedures." *Transp. Rev.*, 30(3), 389–406.
- Solino, A. S., and Vassallo, J. M. (2009). "Using public-private partnerships to expand subways: Madrid-Barajas International Airport case study." *J. Manage. Eng.*, 10.1061/(ASCE)0742-597X(2009)25:1(21), 21–28.
- Yescombe, E. R. (2007). *Public-private partnerships: Principles of policy and finance*, Elsevier, Butterworth-Heinemann, Burlington, MA.
- Yin, R. K. (2009). *Case study research: Design and methods*, Sage Publications, Los Angeles, CA.
- Zhang, X. (2005b). "Paving the way for public-private partnerships in infrastructure development." *J. Constr. Eng. Manage.*, 10.1061/(ASCE)0733-9364(2005)131:1(71), 71–80.