

# How Public Private Partnerships Impact Managerial capacity for Infrastructure Management in Developing Countries

A Proposal Submitted to the Presidential Fund  
for Innovation in International Studies (PFIS)

by

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**PFIS Theme:** Reforming & Improving Governance at All Levels of Society

**Type of Application:** Project Grant

**Submission Date:** December 14, 2007

**Proposed Research Period:** July 2008 to June 2010

## 1 Detailed Project Description

### 1.1 Introduction and Problem Statement

Infrastructure development has alternated between private and public provision over time, depending on sector and country conditions. In many locations, particularly for water and roads, it has recently been the responsibility of the public sector. However, public sector capacity constraints in emerging markets, and governments' inability or reluctance to raise taxes in developed countries, have led increasingly to sets of arrangements involving differing degrees of private participation in financing, developing and managing of infrastructure assets. These kinds of contractual arrangements, termed Public Private Partnerships (PPPs), entail government and private companies assuming shared responsibilities for delivering infrastructure services. They represent an interesting—and thus far understudied—form of “ad-hoc devolved governmental authority for delivery of basic services.” (Heller 2005)

In terms of infrastructure provision, these arrangements aim at overcoming two major public sector constraints:

1. **Lack of public capital:** Many countries lack the ability to access financial markets, either because their formal economies and polities are underdeveloped, or because they lack the required creditworthiness to finance themselves in the international capital markets for a variety of other reasons including economic and political instability and lack of transparent legal systems that afford protection to property rights. Moreover, even the governments of wealthy OECD countries frequently lack the political will to collect adequate taxes to fund sustainable development, operation and maintenance of infrastructure. PPPs can be a mechanism to access private capital in exchange for a “project company’s” right to charge user fees (e.g., utility tariffs or tolls on roads or bridges), or to receive “availability payments” (shadow tolls, subsidies or rental payments from the public sector for free public use of the facility).
2. **Lack of managerial capacity:** In this context we define managerial capacity as the specialized financial and managerial expertise to finance, develop, manage and operate infrastructure assets. Public institutions often have lower levels of managerial capacity than is available in the private sector. PPPs therefore may also allow public agencies to tap private-sector technical and managerial resources, including innovative technology and specialized financial and managerial expertise.

These constraints can be observed in both developed and developing countries, but they are clearly much more limiting for the latter. Furthermore, managerial capacity can be just one of a number of factors<sup>1</sup> that affect a developing country’s “creditworthiness.” A possible link therefore exists between the two public sector constraints: a lack of managerial capacity can impact the “creditworthiness” of the public authority and therefore contribute to limited access to infrastructure finance in the global financial marketplace.

For this reason public entities in developing countries usually undertake PPPs to address both constraints, to varying degrees, in the short-term. However, as PPPs increasingly deliver functions traditionally provided by the public sector, they could have the net effect of diminishing domestic human capital in service provision (e.g. by replacing managers with expatriates). This long term reliance on expatriate PPP managers can lead to growing dependence on the private sector for providing managerial capacity. This expands the notion of a “dependency trap” as identified in development literature in the context of development assistance by multinationals (for example see Wright (1997)).<sup>2</sup> An alternative hypothesis is that PPPs, if set up to involve and train government officials appropriately in the course of the project/s, could increase human capital, transfer standard operating procedures and otherwise increase a host government’s managerial capacity related to infrastructure provision. Of course, this would require keeping turnover of governmental employees at low levels,

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<sup>1</sup> Creditworthiness is affected by the current and future dimensions of each country’s governance regime, including the extent to which property rights are enshrined in its legal framework, the perceived fairness and transparency of its legal system, and its historical and expected future economic and political stability.

<sup>2</sup> Another critical aspect of institutional capacity that relates to PPPs is the public sector’s expertise in bargaining and contract negotiation. It has been suggested that, due to the private party being more knowledgeable in these matters, the public sector has often “lost out” when PPP contracts have been set up. Although this undoubtedly profits the private party in the short term, in the long term this leads to renegotiation (once the public authority realizes they are on the losing end). This topic lies outside the scope of our current proposal, and will be explored in a future CRGP study.

so that the hard-won governmental expertise does not walk out through a revolving door to the private sector. So, the relationship between the increasingly common use of PPPs to deliver infrastructure, and the long-term managerial capacity of the host government, is not straightforward.

## **1.2 Research Questions**

We hope to explore the linkages between PPPs and managerial capacity, specifically in response to the problem stated above. We propose the following four broad research questions:

Question 1: *Does managerial capacity for delivery of infrastructure affect a government's decision to use PPPs?*

Question 2: *Can we observe a correlation between managerial capacity and creditworthiness?*

Question 3: *What is the long term effect of PPPs on managerial capacity?*

a. *Can PPPs be structured to build managerial capacity, and if so, under which conditions?*

b. *Do we observe an erosion of managerial capacity arising from the long term use of PPPs?*

## **1.3 Theoretical Background**

We have identified the following preliminary literature as a starting point in framing our research:

Vives et al (2006) provide a thoughtful assessment of the sustainability of PPPs in the Latin American water sector. The authors identify managerial capacity as one among eight dimensions of a host country's environment which influence the sustainability of various PPP project modalities. The authors identify four aspects of managerial capacity that affect PPP success: the existence of a reliable regulator; its capacity to implement the regulatory framework; the quality of sector authorities to provide technical support to water firms; and the prevalence of corruption in the country and sector. Although this paper is a good starting point for exploring the issues surrounding water sector PPPs in developing countries, the paper does not address the impact of these projects on the countries in which they are implemented.

A number of studies have explored the impact of private participation on various outcomes, most prominently service delivery and cost. Davis (2005) reviews private-sector participation in the water supply and sanitation sector, and shows that the gains achieved by these PPPs are achieved through unpopular strategies such as retrenchment and tariff increases. Another relevant study by Galliani et al (2002) reviews the impact of privatization of the Argentinean water industry on infant mortality rates (as a proxy for water quality). The study finds that private participation had a large positive impact on the reduction of infant mortality (and enhancement of the water quality) in Argentina. Although these studies explore the direct impact of private participation in infrastructure (availability, service level, tariffs, cost, etc.), they do not address the indirect impacts (such as on managerial capacity).

Grindle (1997) identifies three focus areas for capacity-building initiatives: human resource development, organizational strengthening, and institutional reform. Franks (1997) identifies three similar components of capacity building: increasing capability, the enabling environment and institutional development. Two frameworks for understanding and designing capacity building interventions are also useful: Hilderbrand and Grindle (1995) provide an assessment framework based on five levels of analysis, while Trostle et al (1997) base their framework on the dynamic interaction of actors, actions and events. Although these studies are useful as steppingstones in our development of a managerial capacity metric, they do not explicitly address the delivery and management of infrastructure as a function of the public sector.

Saleth and Dinar (2004) build further on the capacity-building literature by analyzing institutional reform and performance of the water sector using institutional economics and political economy perspectives. The authors evaluate water sector institutions in terms of legal rules, policy rules and organizational rules, and identify the stages involved in institutional change in the water sector. A cross-sectional review of institutional change in the water sector is used to identify best-practices from the sample countries. We believe this invaluable study will provide much input to our Managerial Capacity Metric, but it does not explore any linkages with PPPs.

A sizeable literature has explored the changing nature of public sector responsibilities in response to private participation (from "rowing" to just "steering"). Examples include Brooks et al (1984), Hanrahan (1983), Fortin and Hassel

(2000), and Salamon (2002). Many of these studies have suggested the need for expanding public sector contract management expertise; we hope to add to this literature by exploring if the public sector can still have a “rowing” role in future.

The institutional design and performance of infrastructure regulatory agencies has been widely covered in the literature. Brown et al (2006) develop a broad methodology for evaluating these regulatory agencies. Building on this, Andres et al (2007) develops a framework specific to electricity regulators in Latin America, and shows in a subsequent study (Andres, Gausch and Azumendi, 2007) that regulatory performance is positively correlated with overall sector performance within a country. Although these studies are helpful in their examination of the regulatory capacity of the public sector, they do not address the long term impacts of changing the public sector from a deliverer to a regulator of infrastructure.

From the above we can identify a number of gaps in the literature in relation to this study: Firstly, previous studies on public sector capacity have focused mainly on the governing and regulating functions of the public sector; the capacity of delivering and managing assets (specifically infrastructure) has not been adequately addressed. In particular, no viable metric exists to assess managerial capacity as we define it. Secondly, although the impacts of private participation on service delivery and cost have been explored, the impact on managerial capacity has not received similar attention. Lastly, although the development literature has identified the possibility of a “dependency trap” in terms of multi-national assistance, this concept has not been broadened to consider the effects of private participation. We have positioned our study to contribute to addressing these knowledge gaps .

## **1.4 Research Design and Data Sources**

We propose that our research methodology will consist of two separate but complementary approaches.

### **1.4.1 Empirical Study**

First, we propose to conduct an empirical study on the linkages between long-term managerial capacity and PPPs. For this we hope to use data obtained from a comprehensive study on the performance of PPP water projects in developing countries over the last 15 years, currently being undertaken by the World Bank. We have specifically engaged Dr. Antonio Vives, Consulting Professor of Civil & Environmental Engineering in this project to gain access to this information and data from the Inter American Development Bank (IADB), his previous employer, on PPP activity and the dimensions of the MCM for all of the Latin American countries that IADB serves.

Although our exact research design will depend on the characteristics of the World Bank and IADB data we are able to obtain, we tentatively propose to include the following steps:

1. Conduct a thorough review of the available literature with the aim of developing an overarching managerial capacity metric (MCM). Although it is too early to confirm what this new managerial capacity metric might look like, we expect it would be built up as a composite score of metrics such as: percentage of sector under public control (not in PPPs), quality of public service delivery, average public sector education level, public sector staff turnover, etc.
2. Analyze time series data of the MCM for each of the countries in which PPP projects in the World Bank and IADB datasets were undertaken at different time periods (pre-PPP, during PPP, post-PPP). Evaluate changes in the MCM over time, versus the timing of any PPP projects in that country's water sector, with respect to changes to the MCM in countries without PPP project experience in that same time period. The goal of this time series data analysis will be to explore whether changes in MCM over time are positively, negatively or neutrally correlated with PPP activity in that country's water sector, for different time lags from the time that PPP projects were started or finished.
3. Investigate correlations between the MCM and creditworthiness. To this end, we hope to utilize existing CRGP contacts within Moody's (an international credit rating agency) to obtain the ratings of general obligation bonds and revenue bonds (used for project financing by the state) for each of the countries in the study.
4. Mine the World Bank dataset further with the goal of determining linkages between the MCM and factors such as PPP prevalence, PPP modality (e.g. BOT, Concession, Lease, Franchise, Management Contract, Outsourcing, etc.)

5. Expand the findings of the World Bank study in terms of relating PPPs and changes in MCM to local civil service organizational variables (such as employee turnover in local water agencies, pay rates, number of employees, etc.).
6. Examine the linkages between the two types of public constraints identified above, by reviewing linkages between Foreign Direct Investment (FDI) in projects in the water sector and a country's MCM score.

#### **1.4.2 Exploratory Case Studies**

To complement the findings of the PPP project data analysis, we propose to conduct a small number of detailed case studies of PPP implementations in the water sectors of developing countries. These case studies will be exploratory in nature, aiming to deepen and explicate the findings of the "large N" time series study. Utilizing the extensive experience of our project team (specifically that of Dr Vives and Professor Davis) and the information available through the World Bank study, we hope to identify 6 to 8 cases that will be relevant to our study. The exact design of our study will depend on the data available, but at this preliminary stage we hope to include projects with clear links to public sector capacity building, including the following:

- Cases where managerial capacity building was an explicit part of the PPP agreement; and
- Cases where the public authority had capacity building as a strategic aim of undertaking the PPP.

Specifically we hope to identify projects where capacity building has been a positive externality of undertaking a PPP, and use them to inform future PPP modality choice.

#### **1.5 Alignment with PFIS Objectives**

We believe this study is well aligned with the PFIS objectives:

- The study supports the **second PFIS theme** of: "Reforming and improving governance at all levels of society." Our research will extend the current literature surrounding private participation and capacity building in development. We hope to contribute to improving governance by informing future decisions about the use of PPPs, and where they are used, about PPP modality choice. This will help governments to avoid erosion of their capacity during private participation, and escape a possible long term "dependency trap."
- Our study clearly has an **international focus**. Building on the work of Vives et al (2006) we propose to focus on the water sector in developing countries. The water sector is of particular interest as it is "more complex given the wide ranging political implications of the service and the fact that many projects tend to be developed at a sub-national level where complications are larger" (Vives et al, 2006:4). We anticipate that our contributions will also be applicable to the energy and transportation sectors.
- We plan to pursue the collaborative research approach envisioned by the PFIS with a **multi-disciplinary research team**. The inclusion of Dr. Vives is an attempt to ensure that the study is well-grounded and based on solid experience in the field, while building on his and others' previous theoretical research in this area.

#### **1.6 Building on existing CRGP research**

This study will build on a number of current and recently completed research projects conducted in Stanford's Collaboratory for Research on Global Projects (CRGP). We believe it will serve as a critical link between the following studies:

##### **1.6.1 Exploratory research into Public Private Partnerships**

**Started:** February 2007

**People:** Ryan Orr, Michael Garvin, Christine Farugia, Tim Reynolds

**Purpose:** This exploratory research project is headed by Ryan Orr in collaboration with KPMG. The project, which entails research into various aspects of PPPs, will culminate in three separate complementary papers. The first paper (KPMG LLP, 2007) explores the history of the US infrastructure strategy, and concludes that PPPs are not a modern phenomenon, but actually date back more than a hundred years. The second paper (currently under review) examines the rationale for recent PPP transactions in the U.S. market. The third and final paper (research currently underway) explores the role,

structure, and evolution of PPP coordination agencies across a number of developed countries. The multinational Public Private Infrastructure Advisory Facility (PPIAF) has expressed interest in supporting an extension of this PPP study.

### 1.6.2 NGOs & Governance

**Started:** Jan 2006

**People:** Jenna Davis, Raymond Levitt, Doug McAdam, W.Richard Scott, Pi-Chu Chiu, Richard Burt, Ryan Orr, Hilary Schaffer, DC (Dilanka) Jayasundera, Amanda Sharkey, Dongtao Qi, Meg Waltner

**Purpose:** The objective of the ongoing study is to model the activation and mobilization of transnational, national, and sectoral NGOs, and local political groups in infrastructure development projects, and to make recommendations to improve the governance of these projects when interests and institutions are conflicted. The study will initially focus on two project sectors: water projects, and trans-national pipeline projects.

### 1.6.3 Institutional Conflict & Its Costs on Global Projects

**Started:** 2002

**People:** Antti Ainamo, Yan Jin, Tapio Koivu, Raymond Levitt, Douglass North, W.Richard Scott, Risto Tainio, Marc Ramsey, Dana Gavrieli, Tamaki Horii, Ashwin Mahalingam, Johanna Nummelin, Ryan Orr, John E. Taylor, Sampo Tukiainen

**Purpose:** This research aimed to understand how institutional differences between the participants of large, complex, global projects lead to misunderstandings, conflicts and costs and to identify how firms that enter global projects can avoid these unanticipated outcomes.

## 2 Project Organization

We propose to bring together a team from diverse scholarly disciplines and professional backgrounds, who together provide a complementary mix of relevant expertise. Principal members of the research team will include:

- **Dr. Raymond Levitt (Co-PI)**, civil and environmental engineer, with more than two decades of experience in studying and modeling the organizational aspects of international infrastructure projects. He founded, and serves as Director of, Stanford's Collaboratory for Research on Global Projects (CRGP), which aims "to equip leaders in government and industry with models, tools and strategies to improve the outcomes of large, complex, global projects." His research focuses on organization design and governance of projects and project-based businesses.
- **Dr. W. Richard Scott (Co-PI)**, organizational sociologist, is a professor of sociology, emeritus, called back to active duty, with courtesy appointments in the Schools of Business, Education, and Medicine. He is a distinguished researcher and writer in the field of organizational studies, with special expertise in institutional influences on organizational forms and functions, including changes in political regimes and policies. His recent focus has been on Transnational Project Organizations.
- **Dr. Jenna Davis (Investigator)**, Fellow, Woods Institute for the environment, focuses on the intersection of economic development and environmental protection, and is a highly regarded researcher on the sustainability of alternative governance approaches for delivery of water supply and sanitation services in developing countries.
- **Dr. Antonio Vives, (Investigator)**, Consulting Professor of Civil & Environmental Engineering, is the recently retired Manager of the Sustainable Development Department of the Inter-American Development Bank, where he spent 28 years involved in countless private infrastructure projects across Latin-America. He is the author of numerous books and articles on financial management and private infrastructure, most recently "Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects". Dr. Vives will be a consultant to this project.
- **Stephan Jooste (PhD student and research assistant for this project)**, is originally from South Africa, where he participated as a consultant to the transaction advisory team for two PPP projects. He also worked on a number of infrastructure projects in other African countries, most recently in Mozambique.

### 3 Research Timetable

During the first year, we will focus on conducting the large-n time series survey of countries that have used PPP financing for infrastructure. In the second half of the 1<sup>st</sup> year, we will line up our 6-8 in-depth case studies. In year two, we will conduct and analyze the in-depth case studies and write up our findings. We will then work to define and scope follow-on studies aimed at further understanding and enhancing governance regimes for different kinds of infrastructure projects in developing and developed countries. IN parallel with these efforts, we hope to develop a large proposal to the The Public-Private Infrastructure Advisory Facility (PPIAF) for more substantial funding of this program of research on infrastructure project governance.

### 4 Detailed Budget

		Period 1		Period 2		All Periods	
		07/01/08 -	6/30/2009	07/01/09 -	6/30/2010	07/01/08 - 06/30/10	
		%	Amount	%	Amount	Total Amount	
<b>Senior Personnel</b>							
Levitt, Raymond (Prof)	acad	0		0			
	smmr	16.7		16.7			
Davis, Jennifer (Asst Prof)	acad	0		0			
	smmr	16.7		16.7			
Scott, Richard (Prof Emeritus)	cal	5		5			
<b>Graduate Students</b>							
Research Assistant	acad	50	23,138	50	23,832	46,970	
	smmr	0	0	0	0	0	
<b>Contingent Staff</b>							
Vives, Antonio (Prof, Consulting)	cal	5		5			
<b>Total Salaries</b>			50,931		52,459	103,390	
<b>Benefits</b>							
Faculty			5,961		6,140	12,101	
Graduate			926		953	1,879	
Contingent			584		602	1,186	
<b>Total Salaries and Benefits</b>			58,402		60,154	118,556	
<b>Travel, Foreign</b>							
Travel to conduct case study research					16,000	16,000	
<b>Other Costs</b>							
Tuition for RA			16,096		16,579	32,675	
<b>Total Direct Costs</b>			74,498		92,733	167,231	
<b>Modified Total Direct Costs</b>			74,498		92,733	167,231	
<b>University IDC Costs</b>							
IDC Costs on MTDC			5,960		7,419	13,379	
<b>Total IDC Costs</b>			5,960		7,419	13,379	
<b>Annual Amount Requested</b>			80,458		100,152	180,610	
<b>Rates Used in Budget Calculations</b>							
<b>Benefit Rates</b>							
Faculty:		UFY08	29.65%;	UFY09	29.65%;	UFY10	29.65%;
Graduate:		UFY08	04.00%;	UFY09	04.00%;	UFY10	04.00%;
Contingent:		UFY08	07.60%;	UFY09	07.60%;	UFY10	07.60%;
<b>Indirect Cost Rate</b>							
Special Rate:		UFY08	08.00%;	UFY09	08.00%;	UFY10	08.00%;
<p>The budgeted salary amount is comprised of the direct effort for the project plus 8.85% vacation accrual/disability sick leave (DSL) for exempt employees and 7.50% for non-exempt employees. These amounts do not exceed total salary. The vacation accrual/DSL rates will be charged at the time of the salary expenditure. No net salary will be charged when the employee is on vacation, disability or worker's compensation.</p>							

### 5 Teaching & Research Products

Our ongoing program of research, to be significantly expanded under the present proposal, will contribute to the creation of several new research and teaching products.

## 5.1 Research Products

- The first contribution will be the development of a new Managerial Capacity Metric (MCM) that measures the capacity of governmental organizations in a developing countries to finance, develop and deliver civil infrastructure such as water supply and sanitation
- Second, we hope to compose a database of MCM over time for multiple countries
- We expect to publish the results of the study in a journal like *Public Administration and Development* or *Studies in Comparative International Development*.

## 5.2 Teaching Products

- We anticipate that the findings of our research will continue to trickle into our current course offerings. For example, current courses taught by our team that could be enhanced with the case studies and analysis assembled under this proposal, include the following:
  - Levitt, CEE 242: Organizational Design for Projects and Companies
  - Levitt, CEE 246: Managing Construction Companies
  - Davis, CEE 265D: Water & sanitation in developing countries
  - Davis, IPER 320: Design of environmental research
  - Davis, New course: Sustainability in theory and practice
  - Orr, CEE 245a: Global Construction Projects
  - Orr, CEE 245c: Project Finance
  - Scott, SOC 367, Institutional Analysis of Organizations
- We also expect significant diffusion of our research findings to industry through executive education channels such as the Advanced Project Management Program, and the CRGP annual Summer Program.

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## **7 SU-42 Form (Begins on following page – originals to follow)**

## STANFORD UNIVERSITY PROPOSAL ROUTING FORM (SU-42)

<b>Section A</b>		SPO#: _____	
Internal Due Date: <u>12/14/07</u>	Exception Required: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If Yes, please attach copy of approval/request.	
Sponsor Due Date: <u>12/14/07</u>	Submission Method: <u>Electronic</u>	# Copies: _____	Submitted By: <u>Department</u>
PI/Contact PI: <u>Raymond E. Levitt</u>	Dept/Div: <u>CEE</u>	Phone: <u>3-2677</u>	Email: <u>ray.levitt@</u>
Dept/Div Contact: <u>Susie Stone</u>	Dept/Div: <u>CEE</u>	Phone: <u>3-3922</u>	Email: <u>susie@</u>
Institutional Official: <u>Marie Mui</u>	Dept/Div: _____	Phone: _____	Email: _____
Select Role -> <u>Co-PI</u> <u>W. Richard Scott</u>	Dept/Div: <u>Sociology</u>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>*Each additional Stanford Faculty member devoting committed effort (with or without salary) must be listed and complete and certify Section C of this SU-42.</p> <p>If Stanford Faculty are part of Multiple PI Leadership Plan (as defined by NIH policy), please select role of PI</p> </div>	
<u>Other</u> <u>Jennifer Davis</u>	Dept/Div: <u>CEE-Woods Institute</u>		
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<b>Sponsor Name &amp; Address:</b> Presidential Fund for Innovation in International Studies 616 Serra Street, C100 Stanford, CA 94305-6055		<b>Title:</b> How Private Participation in Infrastructure Affects the Development Institutional Capacity for Infrastructure Development and Management in Developing Countries	
<b>Sponsor Contact (if known):</b> Name: <u>Ronda Fenton</u> Phone: <u>650-725-2564</u> Email: _____		<b>RFA/RFP/Program Title:</b>  <b>Grant/Contract #:</b> _____	
Please select from the below drop-down menus:			
Sponsored Project Category: <u>Research</u>		Agreement Type: <u>Grant</u>	
		Proposal Type: <u>New</u>	
Period covered by this proposal: From: <u>Oct 1 2008</u> To: <u>09/30/10</u> Total Budget: <u>\$240,000</u>			
<b>Effort:</b>			
PI/Contact PI: <input type="checkbox"/> Calendar      PI Effort _____      or      -      person months <input type="checkbox"/> Academic      PI Effort _____      or      -      person months <input checked="" type="checkbox"/> Summer      PI Effort <u>17%</u> or <u>0.50</u> person months			
Project Location(s):      BUILDING: <u>Yang and Yamazaki E&amp;E Building</u> ROOM: <u>241</u> OTHER: _____			
YES      NO <input checked="" type="checkbox"/> <input type="checkbox"/> Is all of the above space assigned to you or otherwise approved for your use? (If not, attach explanation from Chair.) <input type="checkbox"/> <input checked="" type="checkbox"/> Is rental space, construction or renovation required to house project? New rental space or renovations must be approved by Facilities Planning & Management.			
YES      NO or N/A <input type="checkbox"/> <input checked="" type="checkbox"/> PI Waiver Required		YES      NO or N/A      YES      NO <input type="checkbox"/> <input checked="" type="checkbox"/> F&A Waived - If Yes, On SU Waiver List <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input checked="" type="checkbox"/> Faculty Effort Waiver Required		F&A Cost Rate or Amount: _____ <i>On-Campus</i>	
<input checked="" type="checkbox"/> <input type="checkbox"/> PI Training Completed		<input checked="" type="checkbox"/> <input type="checkbox"/> Infrastructure Charge (ISC) Applies. If Yes, check one of the following:	
<input type="checkbox"/> <input checked="" type="checkbox"/> Subawards included in this proposal		<input checked="" type="checkbox"/> <input type="checkbox"/> ISC is in proposal budget	
<input type="checkbox"/> <input checked="" type="checkbox"/> Sponsor Salary Cap applies		<input type="checkbox"/> <input type="checkbox"/> ISC is covered by PTA#: _____	
<input type="checkbox"/> <input checked="" type="checkbox"/> Cost Sharing <i>If yes..covered by PTA#</i> _____			
<input type="checkbox"/> <input checked="" type="checkbox"/> This submission requires coordination with the Office of Faculty Foundation Relations or the Office of University Foundation Relations If Yes, approval has been obtained      Additional information @ <a href="http://www.stanford.edu/dept/foundationrelations/coordination/">http://www.stanford.edu/dept/foundationrelations/coordination/</a>			
<input type="checkbox"/> <input type="checkbox"/> This is a Major Project as defined by A-21 allowing administrative and clerical expenses to be charged (Federally-Funded Projects only).			
Remarks: _____			

## STANFORD UNIVERSITY PROPOSAL ROUTING FORM (SU-42)

<b>Section B</b>		Please answer the questions below for the ENTIRE project, regardless of site (including subawards & other participating departments)	
<b>RESEARCH FOCUS</b> (Check only if highly relevant to the research proposed in this application. <u>Check maximum of two.</u> )			
<input type="checkbox"/> AIDS	<input type="checkbox"/> Addition, Pain, Anesthesia	<input type="checkbox"/> Aging	<input type="checkbox"/> Bioengineering
<input type="checkbox"/> Chemistry/Biochemistry	<input type="checkbox"/> Children	<input type="checkbox"/> hESC	<input type="checkbox"/> Human Genetics
<input type="checkbox"/> Immunology, Transplantation, Infectious Diseases	<input type="checkbox"/> Neuroscience	<input type="checkbox"/> Omics	<input type="checkbox"/> Satellite
			<input type="checkbox"/> Bioterrorism <input type="checkbox"/> Cancer <input type="checkbox"/> Cardiovascular
			<input checked="" type="checkbox"/> None of the above
YES	NO		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Human Subjects	<i>If Yes, all required Stanford personnel must complete Human Subjects Training before an award is made.</i>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	.....Clinical Trial/Study	<i>If yes, requires registration before patient enrollment @ <a href="http://clinicaltrials.stanford.edu">http://clinicaltrials.stanford.edu</a></i>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	.....Cancer Related Research	<i>If Yes, Stanford Comprehensive Cancer Center's Scientific Review Committee (SRC) must review protocol before an award is made.</i>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Human Stem Cells	<i>If research involves embryonic stem cells, complete hESCRT Form: <a href="http://med.stanford.edu/rmg/forms.html#human">http://med.stanford.edu/rmg/forms.html#human</a></i>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Human Blood or Body Fluids	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vertebrate Animals (Including Custom Antibody Production)	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Radiological Hazards	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Recombinant DNA Molecules	YES    NO
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Infectious/Biohazardous Agents	<i>If Yes, Select Agents</i> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Proposal/project includes the use of proprietary information or carries restrictions on participation, access to data or dissemination of results	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	All participating researchers who are currently identified, including postdocs, students and visiting scholars, signed Stanford's Patent & Copyright form (SU-18 or SU-18A)	
YES	NO		
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Do you* OR anyone* involved in this research who has responsibility for the design, conduct or reporting of the research have a relationship or receive payment for services or have stock or stock options in the proposed sponsor, vendor(s), or subcontractor(s) or in a company that would be interested in the study results but is not sponsoring the study?	
<b>How to Determine Disclosure Requirements</b>			
1. Any relationship such as unpaid consultant, founder, or employee;			
2. Payment for services such as consulting, service on an advisory board, or giving talks;			
3. Stock or stock options;			
4. Gift funds.			
<b>Who must disclose?</b>			
1. Principal investigator*			
2. Any other participant* in the research who has responsibility for design, conduct, or reporting of the research, or in other words anyone who has independent responsibility for the research or research results;			
* (this includes spouse/domestic partner, and dependent child(ren);			
<b>When must it be disclosed?</b>			
1. When the relationship or financial interest is related to the company sponsoring the study (i.e. consulting for a company sponsoring the research);			
2. When the relationship or financial interest is indirectly related to the study:			
a. the company is supplying a product being studied;			
b. the study will be purchasing materials, supplies or equipment from a company in which there is a relationship;			
c. or the results of the research would be of interest to the company in which there is a relationship;			
3. At application or renewal, or when there is a new reportable interest.			
<b>What happens?</b>			
All reported financial interests will be reviewed by the appropriate Dean's office or designated school committee to determine whether action is necessary to manage, reduce or eliminate a conflict of interest. Additional information @ <a href="http://www.stanford.edu/dept/DoR/Resources/coi.html">http://www.stanford.edu/dept/DoR/Resources/coi.html</a>			
<b>P.I. CERTIFICATION</b>			
I certify that the statements herein are true, complete and accurate to the best of my knowledge. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of this application. Furthermore, I certify that I will direct this project in compliance with Stanford University policies, with the terms and conditions of Stanford's agreement with the sponsor and with all applicable laws and regulations, and I will uphold the responsibilities of P/ship.			
Raymond E. Levitt	<div style="border: 1px solid black; padding: 2px;">                 Signature <i>Raymond E. Levitt</i> Date <i>12-7-07</i> </div>		
<b>DEPARTMENT APPROVALS</b>			
I have reviewed and approve the financial commitments for this proposal, including any cost sharing, any salary in excess of the sponsor's salary cap, or infrastructure charges.			
I have also reviewed and approve the proposed effort and space commitments.			
<b>DIVISION CHIEF</b> (if applicable):	<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>	<b>DEPT. ADMIN. MANAGER:</b>	<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>
<b>DEPT. CHAIR or IND. LAB DIRECTOR:</b>	<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>		
<b>SCHOOL APPROVALS (if applicable)</b>			
<b>SCHOOL:</b>	<div style="border: 1px solid black; padding: 2px;">Signature <i>Blanca Retmeida</i> Date <i>10/10/07</i></div>	<b>SCHOOL DEAN:</b>	<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>
<b>DEAN OF RESEARCH (if applicable):</b>	<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>		
<b>INSTITUTIONAL OFFICIAL:</b>	I have reviewed this proposal with the Principal Investigator and certify that all necessary reviews and approvals have been received or are currently in the review process.		<div style="border: 1px solid black; padding: 2px;">Signature _____ Date _____</div>

## STANFORD UNIVERSITY PROPOSAL ROUTING FORM (SU-42)

Section C		SPO#: _____	
PI/Contact PI: <u>Raymond E. Levitt</u>		Sponsor <u>Presidential Fund for Innovation in Internat</u> Sponsor Due Date: <u>12/14/07</u>	
Title: <u>How Private Participation in Infrastructure Affects the Development Institutional Capacity for Infrastructure Development and Management in I</u>			
Jennifer Davis		Dept/Div: <u>CEE-Woods Institute</u>	Role: <u>Other</u> Project/Task Budget: _____
<input type="checkbox"/> Calendar	Effort	_____	or _____ person months
<input type="checkbox"/> Academic	Effort	_____	or _____ person months
<input checked="" type="checkbox"/> Summer	Effort	<u>17%</u>	or <u>0.50</u> person months
Project Location(s): BUILDING: <u>Yang and Yamazaki E&amp;E Building</u> ROOM: <u>235</u> OTHER: _____			
YES NO <input checked="" type="checkbox"/> <input type="checkbox"/> Is all of the above space assigned to you or otherwise approved for your use? (If not, attach explanation from Chair.) <input type="checkbox"/> <input checked="" type="checkbox"/> Is rental space, construction or renovation required to house project? New rental space or renovations must be approved by Facilities Planning & Management.			
YES NO or N/A		YES NO or N/A	
<input type="checkbox"/>	<input checked="" type="checkbox"/> PI Waiver Required	<input type="checkbox"/>	<input checked="" type="checkbox"/> Subawards included in my portion of this proposal
<input type="checkbox"/>	<input checked="" type="checkbox"/> Faculty Effort Waiver Required	<input type="checkbox"/>	<input checked="" type="checkbox"/> Cost Sharing <i>If yes, PTA#: _____</i>
<input type="checkbox"/>	<input type="checkbox"/> PI Training Completed (For PI role only)	<input type="checkbox"/>	<input checked="" type="checkbox"/> Sponsor Salary Cap applies
YES NO Do you* OR anyone* involved in this research who has responsibility for the design, conduct or reporting of the research have a relationship or receive payment for services or have stock or stock options in the proposed sponsor, vendor(s), or subcontractor(s) or in a company that would be interested in the study results but is not sponsoring the study? <input type="checkbox"/> <input checked="" type="checkbox"/>			
<b>How to Determine Disclosure Requirements</b> 1. Any relationship such as unpaid consultant, founder, or employee; 2. Payment for services such as consulting, service on an advisory board, or giving talks; 3. Stock or stock options; 4. Gift funds.			
<b>Who must disclose?</b> 1. Principal investigator* 2. Any other participant* in the research who has responsibility for design, conduct, or reporting of the research, or in other words anyone who has independent responsibility for the research or research results; * (this includes spouse/domestic partner, and dependent child(ren));			
<b>When must it be disclosed?</b> 1. When the relationship or financial interest is related to the company sponsoring the study (i.e. consulting for a company sponsoring the research); 2. When the relationship or financial interest is indirectly related to the study: a. the company is supplying a product being studied; b. the study will be purchasing materials, supplies or equipment from a company in which there is a relationship; c. or the results of the research would be of interest to the company in which there is a relationship; 3. At application or renewal, or when there is a new reportable interest.			
<b>What happens?</b> All reported financial interests will be reviewed by the appropriate Dean's office or designated school committee to determine whether action is necessary to manage, reduce or eliminate a conflict of interest. Additional information @ <a href="http://www.stanford.edu/dept/DoR/Resources/coi.html">http://www.stanford.edu/dept/DoR/Resources/coi.html</a>			
<b>FACULTY CERTIFICATION</b>			
I certify that the statements herein are true, complete and accurate to the best of my knowledge. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of this application. Furthermore, I certify that I will direct this project in compliance with Stanford University policies, with the terms and conditions of Stanford's agreement with the sponsor and with all applicable laws and regulations, and I will uphold the responsibilities of PIship.			
Jennifer Davis		Signature <u>J. Davis</u>	Date <u>12-7-07</u>
<b>DEPARTMENT APPROVALS</b>			
I have reviewed and approve the financial commitments for this proposal, including any cost sharing, any salary in excess of the sponsor's salary cap, or infrastructure charges. I have also reviewed and approve the proposed effort and space commitments.			
Signature by one of the following is required: DIVISION CHIEF (if applicable);		_____	
DEPT. CHAIR/IND. LAB DIRECTOR; DEPARTMENT MANAGER:		Signature	Date
<b>SCHOOL APPROVALS (if applicable)</b>			
SCHOOL: _____	Signature	Date	SCHOOL DEAN: _____
	Signature	Date	Signature
DEAN OF RESEARCH (if applicable):		Signature	Date
Remarks: _____			
If form separated, return to:			
Institutional Official: Marie Mui		Dept/Div:	Phone: Email:

### STANFORD UNIVERSITY PROPOSAL ROUTING FORM (SU-42)

Section C SPO#: \_\_\_\_\_  
 PI/Contact PI: Raymond E. Levitt Sponsor: Presidential Fund for Innovation in Intern Sponsor Due Date: 12/14/07  
 Title: How Private Participation in Infrastructure Affects the Development Institutional Capacity for Infrastructure Development and Management in I

W. Richard Scott Dept/Div: Sociology Role: Co-PI Project/Task Budget: \_\_\_\_\_

Calendar Effort 590 or \_\_\_\_\_ person months  
 Academic Effort \_\_\_\_\_ or \_\_\_\_\_ person months  
 Summer Effort \_\_\_\_\_ or \_\_\_\_\_ person months

Project Location(s): BUILDING: Yang and Yamazaki E&E Building ROOM: 239 OTHER: \_\_\_\_\_

YES NO  
  Is all of the above space assigned to you or otherwise approved for your use? (If not, attach explanation from Chair.)  
  Is rental space, construction or renovation required to house project?  
 New rental space or renovations must be approved by Facilities Planning & Management.

YES NO or N/A	YES NO or N/A	
<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	PI Waiver Required <span style="margin-left: 100px;">Subawards included in my portion of this proposal</span>
<input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	Faculty Effort Waiver Required <span style="margin-left: 100px;">Cost Sharing <span style="float: right;">If yes.. PTA#: _____</span></span>
<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input checked="" type="checkbox"/>	PI Training Completed (For PI role only) <span style="margin-left: 100px;">Sponsor Salary Cap applies</span>

YES NO Do you\* OR anyone\* involved in this research who has responsibility for the design, conduct or reporting of the research have a relationship or receive payment for services or have stock or stock options in the proposed sponsor, vendor(s), or subcontractor(s) or in a company that would be interested in the study results but is not sponsoring the study?

**How to Determine Disclosure Requirements**

- Any relationship such as unpaid consultant, founder, or employee;
- Payment for services such as consulting, service on an advisory board, or giving talks;
- Stock or stock options;
- Gift funds.

**Who must disclose?**

- Principal investigator\*
- Any other participant\* in the research who has responsibility for design, conduct, or reporting of the research, or in other words anyone who has independent responsibility for the research or research results;  
 \* (this includes spouse/domestic partner, and dependent child(ren);

**When must it be disclosed?**

- When the relationship or financial interest is related to the company sponsoring the study (i.e. consulting for a company sponsoring the research);
- When the relationship or financial interest is indirectly related to the study:
  - the company is supplying a product being studied;
  - the study will be purchasing materials, supplies or equipment from a company in which there is a relationship;
  - or the results of the research would be of interest to the company in which there is a relationship;
- At application or renewal, or when there is a new reportable interest.

**What happens?**  
 All reported financial interests will be reviewed by the appropriate Dean's office or designated school committee to determine whether action is necessary to manage, reduce or eliminate a conflict of interest. Additional information @ <http://www.stanford.edu/dept/DoR/Resources/coi.html>

**FACULTY CERTIFICATION**  
 I certify that the statements herein are true, complete and accurate to the best of my knowledge. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of this application. Furthermore, I certify that I will direct this project in compliance with Stanford University policies, with the terms and conditions of Stanford's agreement with the sponsor and with all applicable laws and regulations, and I will uphold the responsibilities of PIship.

W. Richard Scott Signature W.R. Scott Date 12-7-07

**DEPARTMENT APPROVALS**  
 I have reviewed and approve the financial commitments for this proposal, including any cost sharing, any salary in excess of the sponsor's salary cap, or infrastructure charges.  
 I have also reviewed and approve the proposed effort and space commitments.

Signature by one of the following is required: DIVISION CHIEF (if applicable);  
 DEPT. CHAIR/IND. LAB DIRECTOR; DEPARTMENT MANAGER: Signature \_\_\_\_\_ Date \_\_\_\_\_

**SCHOOL APPROVALS (if applicable)**

SCHOOL: _____	SCHOOL DEAN: _____
Signature _____ Date _____	Signature _____ Date _____

DEAN OF RESEARCH (if applicable): Signature \_\_\_\_\_ Date \_\_\_\_\_

Remarks: \_\_\_\_\_

If form separated, return to:  
 Institutional Official: Marie Mui Dept/Div: \_\_\_\_\_ Phone: \_\_\_\_\_ Email: \_\_\_\_\_

## Biographical Sketch—Raymond E. Levitt, Ph.D.

### (i) PROFESSIONAL PREPARATION

Univ. of Witwatersrand Civil Engineering BS(cum laude), 1971  
Stanford University Civil Engineering/Construction Engrg. & Mgt. MS, 1973  
Stanford University Civil Engineering/Construction Engrg. & Mgt. PhD, 1975  
(Ph.D. Dissertation Title: “The Effect of Top Management on Safety in Construction”)

### (ii) APPOINTMENTS

#### ***Stanford University: Department of Civil and Environmental Engineering***

Sep 1987-present, Professor of Civil & Environmental Engineering  
Sep 1999-Aug 2005, Professor by Courtesy, Medical Informatics  
June 1980-August 1987, Associate Professor of Civil & Environmental Engineering

#### ***Stanford University: Collaboratory for Research on Global Projects***

April, 2003-present: Director.

#### ***Stanford Center for Professional Development***

Oct. 1999-present: Academic Director, Stanford Advanced Project Management Program.

#### ***Stanford University: Center for Integrated Facility Engineering***

Oct. 1987-Aug 2001: Associate Director and Director.

#### ***Mass. Institute of Technology, Department of Civil Engineering***

June 1979-June 1980: Associate Professor & Associate Division Head  
Aug. 1975-May 1979: Assistant Professor

### (iiia) RELATED PUBLICATIONS

1. Mahalingam, Ashwin, and Raymond E. Levitt, (2007). “Institutional Theory as a Framework for Analyzing Conflicts on Global Projects” *ASCE Journal of Construction Engineering and Management*, **133**(7), 517-528
2. Levitt, Raymond E., Tamaki Horii, Ashwin Mahalingam, Ryan Orr and John E. Taylor, (2004), “Understanding and Managing the Effects of Institutional Differences on Global Projects,” *Proceedings of ASCE Specialty Conf. on Management & Leadership in Construction*, Hilton Head Island, SC; March 2004.
3. Horii, Tamaki, Yan Jin and Raymond E. Levitt, (2004). “Modeling and Analyzing Cultural Influences on Project Team Performance,” *Journal of Computational & Mathematical Organization Theory* **10** (4): 305-321.
4. Levitt, Raymond E., Jan Thomsen, Tore R. Christiansen, John C. Kunz, Yan Jin, and Clifford Nass, (1999), “Simulating Project Work Processes and Organizations: Toward a Micro-Contingency Theory of Organizational Design,” *Management Science* **45** (11): 1479-1495.
5. Jin, Yan, and Raymond E. Levitt, (1996), “The Virtual Design Team: A Computational Model of Project Organizations,” *Journal of Computational and Mathematical Organization Theory* **2** (3): 171-195.

### (iiib) OTHER SIGNIFICANT PUBLICATIONS

6. Levitt, Raymond E. (2007). “CEM Research for the Next 50 Years: Maximizing Economic, Environmental, and Societal Value of the Built Environment,” *Journal of Construction Engineering & Management*, ASCE, September 2007, **133** (9): 619-628.
7. Mahalingam, Ashwin, and Raymond E. Levitt (2007). "Safety Issues on Global Projects" *ASCE Journal of Construction Engineering and Management*, in press.
8. Levitt, Raymond E., (2004). “Computational Modeling of Organizations Comes of Age,” *Journal of Computational & Mathematical Organization Theory*, **10** (2): 127-145.
9. Nissen, M.E. and Levitt, R.E., (2005). “Knowledge Management Research through Computational Experimentation,” in: D. Schwartz (Ed.), *Encyclopedia of Knowledge Management*, Hershey, PA: Idea Group (forthcoming 2005).
10. Jin, Yan and Raymond E. Levitt, (1993), “i-AGENTS: Modeling Organizational Problem Solving in Multi-Agent Teams,” *Intelligent Systems in Accounting, Finance and Management*, **2**,: 247-270

## Biographical Sketch—Raymond E. Levitt, Ph.D. (ctd.)

### (iv) SYNERGISTIC ACTIVITIES

1. **Founded Collaboratory for Research on Global Projects** < <http://crgp.stanford.edu> >  
In 2003, Dr. Levitt founded, and serves as Director of, Stanford's *Collaboratory for Research on Global Projects*. *CRGP* conducts research together with research partners from Finland, India and South Africa, and in partnership with private and public organizations engaged in developing global projects.
2. **Co-Founded Center for Integrated Facility Engineering.** < <http://cife.stanford.edu> >  
In 1988, Dr. Levitt co-founded the Center for *Center for Integrated Facility Engineering* in Stanford's School of Engineering and served as its initial Director, and later as its Associate Director until 2001. *CIFE* conducts research on ways in which emerging information technology can be used to enhance automation and integration of work processes and organizations in the construction industry.
3. **Founded Stanford Advanced Project Management Exec. Ed. Program** < <http://apm.stanford.edu> >  
In 1999, Dr. Levitt founded, and serves as Academic Director of, The *Stanford Advanced Project Management Program*. *SAPM* offers a unique postgraduate certificate program that trains managers from multiple industries to achieve organizational mastery of projects, so that their organizations can reliably execute their strategies. *SAPM* operates in three modes: on-campus, twice per year; on-company-sites, by arrangement; and global on-line digital delivery, 7x24. The researchers will use this global continuing education platform to deliver results of our research on global infrastructure governance to practitioners.

### (v) SIGNIFICANT HONORS AND AWARDS

- **Walter S. Huber Research Prize**, American Society of Civil Engineers 1982
- **Marksman Award**, Engineering News Record 1985
- **Commitment to Life Award**, National Safe Workplace Institute 1987
- **Computing in Civil Engineering Award**, American Society of Civil Engineers 2000
- **Distinguished Non-Credit Program Award**, Association for Continuing Higher Education 2005
- **Peurifoy Construction Research Award**, American Society of Civil Engineers 2006

### (vi) COLLABORATORS AND OTHER AFFILIATIONS

#### a. Collaborators and Co Editors

Kathleen Carley, CMU;  
Janet Fulk, Peter Monge, Yan Jin, USC;  
Noshir Contractor, Andrea Hollingshead, Stanley Wasserman, U. of Illinois.

#### b. Graduate Advisors

James G. March, Stanford University  
Henry W. Parker, Stanford University  
Nancy Morse Samelson, Stanford University (emeritus)  
Clarkson H. Oglesby, Stanford University (deceased)

#### c. Thesis Advisor and Postgraduate-Scholar Sponsor to:

Nabil Qaddumi, *U. of Kuwait*; Adnan Darwiche, *UCLA*; Geoff Cohen, *Consultant, Australia*;  
Tore Christiansen, *Norwegian Technical National University*; Hiroshi Harasawa, *Harasawa Construction, Japan*; Jan Thomsen, *Det Norske Veritas, Norway*; Gaye Oralkan, *McKinsey Consultants*; Katsuro Sugihara, *Shimizu Corp.*; Samuel Miller, *HP Laboratories*; Jolin Salazar Kish, *Dartmouth Medical Center*; Douglas Fridsma, *U. of Pittsburgh Medical School*; Carol Cain, *US Dept. of Health and Human Services*; Yan Jin, *USC*; Walid Nasrallah, *American U. of Beirut*; Roxanne Zolin, Douglas MacKinnon, Raymond Buettner, *Naval Postgraduate School*; Ashwin Mahalingam, *IIT Madras*; Tamaki Horii, *Obayashi Corp.*; Ryan Orr, *Stanford U.*, John Taylor, *Columbia U.*; Monique Lambert, *Intel R&D*; Rahinah Ibrahim, *U. Putra, Malaysia*.

## Biographical Sketch—W. Richard Scott, Ph.D.

### (i) PROFESSIONAL PREPARATION

University of Kansas	Sociology	BA. 1954 (Honors in Sociology)
University of Kansas	Sociology	MA 1955
University of Chicago	Sociology	Ph.D. 1961

### (ii) APPOINTMENTS

#### STANFORD UNIVERSITY, DEPARTMENT OF SOCIOLOGY

Assistant Professor, 1960-65

Associate Professor, 1965-69

Professor, 1969-1999

(courtesy appointments in Graduate School of Business, 1977-99; School of Education, 1977-99; Department of Health Research & Policy, School of Medicine, 1976-99)

Emeritus Professor, 1999- (recalled to active duty)

Senior Scholar, John W. Gardner Center for Youth & their Communities, 2002-

Senior Researcher, Stanford Collaboratory for Research for Global Projects (CRGP), 2003-

### (iii) RELATED PUBLICATIONS

1. *Institutions and Organizations: Ideas and Interests* 2008. Sage.
2. *Organizations and Organizing: Rational, Natural and Open System Perspectives* (with Jerry Davis) 2007. Prentice Hall.
3. "Ingredients for Conducting Comparative Institutional Analysis," 2007. *Peking University Education Review* 5:2-14.
4. "Prefatory Essay: Institutions and Social Innovation," in *Social Innovations, Institutional Change and Economic Performance*, viii-xxi. Timo J. Hamalainen and Risto Heiskala, ed. Edward Elgar, 2007.
5. "The changing world of Chinese Enterprise: An Institutional Perspective" 2002. In A. S. Tsui and C.M. Lau, ed. *The Management of Enterprises in the People's Republic of China*. Kluwer Academic Publishers.
6. "Institutional exceptions on global projects: Ignorance, sensemaking, and response" (with Ryan J. Orr), forthcoming, *Journal of International Business Studies*.
7. *Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care*. (with Martin Ruef, Peter J. Mendel, and Carol A. Caronna), 2000. University of Chicago Press.

### (iv) OTHER SIGNIFICANT PUBLICATIONS

8. "The adolescence of institutional theory," 1987. *Administrative Science Quarterly*, 32:493-511.
9. "The organization of societal sectors," (with John W. Meyer), 1991. In *The New Institutionalism in Organizational Analysis*, ed. W. W. Powell and P.J. DiMaggio. University of Chicago Press.

10. "Institutional theory and institutional change," (with T. Dacin and J. Goodrich), 2002. *Academy of Management Journal* 45:45-56.
11. "Reflections on a half-century of organizational sociology," *Annual Review of Sociology*, 30:1-21 (2004).

**(iv) SYNERGISTIC ACTIVITIES**

1. Director, Stanford Center for Organizations Research, Stanford University, 1988-96.
2. Director, Research Training Program on Organizations and Mental Health, Stanford University, 1972-89.
3. Faculty member, Public Policy Program, Stanford University, 1972-99.

**(v) COLLABORATORS AND OTHER AFFILIATIONS**

**a. Collaborators and Co-editors:**

- Otis Dudley Duncan, U. Chicago
- Peter M. Blau, U. Chicago
- Sanford Dornbusch, Stanford U.
- John W. Meyer, Stanford U.
- Gerald F. Davis, U. Michigan
- Robert E. Cole, U. of California, Berkeley
- Craig Calhoun, Social Science Research Council
- Milbrey McLaughlin, Stanford U.

**b. Graduate Advisors**

- Otis Dudley Duncan, U. Chicago
- Peter M. Blau, U. Chicago
- Everett C. Hughes, U. Chicago

**c. Thesis Advisor and Post-graduate Scholar Sponsor**

I have chaired more than 50 doctoral theses at Stanford University and served on more than 200 doctoral committees. In addition, as Director of the Research Training Program and SCOR, I advised and worked with over 100 post-doctoral scholars.

**(vi) SELECTED HONORS AND AWARDS**

1. Phi Beta Kappa, 1954
2. Social Science Research Council Fellow, 1958-19
3. Elected, Institute of Medicine, 1974
4. Distinguished Scholar Award, Management & Organization Theory Div., of Academy of Management, 1988.
5. Fellow, Center for Advanced Study in Behavioral Sciences, 1989-90
6. Richard D. Irwin award for Distinguished Scholarly Contributions, Academy of Management, 1996.
7. "W. Richard Scott Award" created to recognize best article published each year in soc. of organizations by the American Sociological Association, 2000.

## BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME <b>Jenna Davis</b>	POSITION TITLE <b>Asst. Professor</b>		
eRA COMMONS USER NAME			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of North Carolina, Chapel Hill	PhD	1998	Envr. Mgmt. & Policy
University of North Carolina, Chapel Hill	MSPH	1994	Public Health
University of Texas, Austin	BS	1988	Plan II

**NOTE: The Biographical Sketch may not exceed four pages. Follow the formats and instructions on the attached sample.**

**A. Positions and Honors.** List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

2006-present Assistant Professor, Stanford Institute for the Environment and Department of Civil & Environmental Engineering, Stanford University.

2005-present Research Affiliate, Massachusetts Institute of Technology Department of Urban Studies and Planning.

2005-2006 Visiting Assistant Professor, Stanford Institute for the Environment, Stanford University.

1998-2004 Assistant Professor, Massachusetts Institute of Technology Department of Urban Studies and Planning. Appointment to the International Development & Regional Planning and Environmental Policy groups. Recipient of the Ford Professional Development Chair.

Fall 2004 Visiting Professor, Stanford University Department of Civil & Environmental Engineering.

1990-1992 Senior program associate, The Rockefeller Foundation Global Environmental Program.

2007: Eugene L. Grant teaching Award, Stanford University

2006: Irwin Sizer Award for the Most Significant Improvement to MIT Education

2005: MIT IDEAS award (supporting "innovative projects with the potential to make a positive change in the world")

2005: Research award, Mellon-MIT Program on NGOs and Forced Migration

2005: Service Learning award, MIT Public Service Center

2001: Salzburg Fellow, Salzburg Seminar, Austria.

1998-2002: Ford Professional Development Chair, Massachusetts Institute of Technology.

1996-1998: Office of Research and Development STAR Fellow, United States Environmental Protection Agency

1996: North Carolina Governor's Award for Outstanding Service to the Community.

1995-1996: Foreign Language/Area Studies Fellow. Institute of Latin American Studies, University of North Carolina at Chapel Hill.

1994: Frank Porter Graham Honor Society award. University of North Carolina-Chapel Hill.

1993-1994: Florence Schepp Fellow. Leopold Schepp Foundation, New York, NY

**B. Selected peer-reviewed publications (in chronological order).** Do not include publications submitted or in preparation. For publicly available citations, URLs or PMC submission identification numbers may accompany the full reference. Note copies of these publications are no longer accepted as appendix material.

2005 Davis, J. Private-sector participation in the water and sanitation sector. *Annual Review of Environment and Resources* **30**: 1-39.

Principal Investigator/Program Director (Last, First, Middle): PI Name

- 2004 Davis, J., and D. Whittington. "Challenges for water sector reform in transition economies." *Water Policy* **6**(4): 1-15.
- 2003 Davis, J. Scaling up slum upgrading efforts: Where are the bottlenecks? *International Development Planning Review* **26**(3): 301-319.
- 2003 Davis, J. Corruption in public services: Experience from South Asia's water and sanitation sector. *World Development* **32**(1): 53-71.
- 2002 Davis, J. Assessing community preferences for development initiatives: Are willingness-to-pay studies robust to mode effects? *World Development* **32**(4): 655-672.
- 2001 Davis, J., A. Kang, J. Vincent, and D. Whittington. How Important is Improved Water Infrastructure to Microenterprises? Evidence from Uganda. *World Development* **29** (10): 1753-1767.
- 1999 Whittington, D., J. Davis, H. Miarsono, and R. Pollard. Designing a "neighborhood deal" for urban sewers: A case study of Semarang, Indonesia. *Journal of Planning Education and Research* **19** (3): 297-308.
- 1999 Whittington, D., J. Davis, and E. McClelland. Implementing a demand-driven approach to community water supply planning: A case study of Lugazi, Uganda. *Water International* **23**(3): 134. Reprinted in Saleth, R.M., ed., *Resources and Economic Development* (Cheltenham, UK: Edward Elgar Publishing).
- 1998 Davis, J., and D. Whittington. "Participatory" research techniques for development projects: A comparison of the contingent valuation and community dialogue methods. *Economic Development and Cultural Change* **47**(1): 73.

**C. Research Support.** List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

Ongoing support

Water, sanitation, and environment: Child health in Tanzania

This project combines in-depth household surveys with microbiological testing of water supplies and household members' hands in order to model contamination. It also evaluates the impact of microbial test information on respondents' perceptions, attitudes, and risk-averting behaviors regarding water- and sanitation-related disease.

September 2006 – August 2008

Woods Institute for the Environment, Stanford University

Co-PI

Improving access to water supply and sanitation in urban India: Microfinance for water and sanitation infrastructure development

This is a case-control study whose objective is to estimate the impact of providing microcredit (loans) on access to improved water supply and sanitation infrastructure.

June 2007-May 2010

PI

## **ANTONIO VIVES**

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Fax (703) 759-2694

antoniov@cumpetere.com

### **Education**

- Ph.D., Corporate Finance and Capital Markets. Carnegie Mellon University, Pittsburgh, 1975.
- Master of Science, Industrial Administration (MBA). Carnegie Mellon University, Pittsburgh, 1972.
- Chemical Engineer, Universidad Central de Venezuela, Caracas, 1968.

### **Professional Background**

#### **At the Inter-American Development Bank in Washington D.C**

##### **Highlights**

- Manager in a policy, strategy and research department on sustainable development in developing countries.
- Vice-Chairman, Investment Committee of the Staff Retirement Plan (over US\$2.5 billion in assets). Member since 1984, Vice-Chairman since 1997.
- Task Leader for Corporate Social Responsibility and Business Climate Initiative
- Chair of the Organizing Committee of the series of Inter-American Conferences on Corporate Social Responsibility.
- Led the preparation of the Sustainable Energy and Climate Change Initiative
- Led the preparation of the first and second Sustainability reports
- Author or co-author of the Energy Policy, Private Sector Development Strategy, Financial Markets Development Strategy, Financial Intermediation Policy and International Trade Finance Facility for the IDB. Negotiated approval with the Board of Executive Directors.
- Lead teams of researchers in the production of strategies, policies, books and papers on best practices on international development of financial markets, infrastructure and small and medium enterprises and in the development and dissemination of lessons learned in the design and execution of projects.
- Author of many papers (some listed at the end), one financial analysis textbook (used in several MBA programs in Latin America) and a book on Corporate Social Responsibility in SMEs.
- Member of the Camdessus' and Gurria's international panels on Water Finance.
- Lead Task Forces on Trade Finance and on the revamping of the independent Evaluation and Oversight system of the Bank.
- Speaker in over 100 international conferences and meetings. Highly regarded public speaker.

- Organized no less than 20 international conferences.
- Organized 6 Western Hemisphere Ministerial meetings on Financial Markets and Infrastructure issues.

### **Managerial Positions**

- **Manager**, Sustainable Development Department, Dec. 2005-June 2007. Technical department in charge of research on best practices and preparation of Bank-wide strategies and policies for activities in the countries of Latin America and the Caribbean on most issues related to development. Also responsible for quality enhancement of Bank operations, representation in international fora and international institutions, production of publications on best practices, advice to the rest of the Bank and to governments on policy and project preparation, among other technical activities. Over 150 professionals, expenditure budget of over US\$20 million.
- **Deputy Manager**, Infrastructure, Financial Markets and Private Enterprise. Sustainable Development Department. Sept. 1997-Dec. 2005. Areas of direct responsibility were Infrastructure (Project Finance), Financial Markets and Micro, Small and Medium Enterprises (two Divisions). Since January 2002 also supervise the Environment Division.
- During all of 2000, **Manager, *ad interim***, Sustainable Development Department.
- **Division Chief**, Infrastructure and Financial Markets. Sustainable Development Department. September, 1994-September, 1997.

Led the preparation of the Financial Market, Capital Markets, Small and Medium Enterprises strategies and the Public Utilities Policy of the Bank. Led the preparation of many international conferences, applied research and publication and quality enhancement of operations in private infrastructure and financial markets.

- **Division Chief**, Country Operations. Operations Department. March, 1991-September, 1994 and March, 1989-December, 1989.

In charge of preparing and processing loans and grants in all sectors and developing the Bank strategy in given countries. Countries covered in this time frame included Argentina, Panama, Paraguay, Mexico, Chile and Peru.

- **General Consultant (Chief of Staff)**. Operations Department. January, 1990-March, 1991.

Coordinated IDB operations programming and the production and interpretation of IDB's operational policies. Also in charge of the Office of the Manager (Chief of Staff) and the Procurement Unit of the Bank (policy, procedures and dispute resolution for procurement under Bank projects),

## Professional Positions

- **Country coordinator.** Operations Department. January 1983-March 1989.  
In charge of managing the country program (preparation, processing, management) of loans and grants in Argentina (1984-1989) and Nicaragua (1983-1984).
- **Investment Officer.** Operations Department. June 1979-December 1983.  
In charge of preparation, processing and management of equity investments in small enterprises (venture capital).

## Academic institutions

- Adjunct Professor. MBA Programs of Virginia Tech (in Northern Virginia, Sept.1981- May 1984) and George Washington University (Sept. 1979-May 1981). Taught Corporate Finance, Investments, Capital Budgeting.
- Visiting Professor. Carnegie Mellon University. January-June 1979. Taught Cases in Corporate Finance and Working Capital Management.
- Assistant and Associate Professor. *Instituto de Estudios Superiores de Administración*, (Graduate School of Business) in Caracas, Venezuela. September 1975-December 1978. Taught Decision Theory, Quantitative Methods, Corporate Finance, Accounting, Capital Markets, Portfolio Theory and Capital Budgeting.
- Assistant Professor. Universidad Simon Bolívar in Caracas, Venezuela. September 1972-July 1973 and September 1975-July 1976. Taught Corporate Finance and Capital Budgeting.
- Teaching Assistant at Carnegie Mellon University. September 1974-June 1975. Taught Corporate Finance.

## At other institutions

- Consultant to the Caracas Stock Exchange, Insurance Companies, Industrial Corporations in Venezuela. 1975-1978.
- Refinery Engineer. Royal Dutch Shell, Cardón Refinery, Venezuela. 1968-1970.

**Recent Major Publications** (since 1996, not including newspaper articles and other minor publications). For a copy of most of them see my website <http://www.cumpetere.com/>

“Corporate Social Responsibility in Emerging Markets”. Book in preparation.

“Corporate Social Responsibility: The Role of Law and Markets”. Forthcoming in the *Chicago-Kent Law Review*.

“Un buen negocio para todos”. Proceedings of the IV Inter-American Conference on Corporate Social Responsibility, Inter-American Development Bank, 2007. With Estrella Peinado.

“Financial Structuring of Infrastructure Projects in Public-Private Partnerships: A tool for designing feasible structures”. In *Public-Private Partnerships*, Euromoney Books, 2007.

“El papel de la RSE en America Latina: Diferente al de Europa?” Forthcoming in a book published by Fundacion Carolina, Madrid, 2007.

“Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects”, Inter-American Development Bank, 2006. With several co-authors.

“Who is Responsible for Responsibility?”, Proceedings of the III Inter-American Conference on Corporate Social Responsibility, Inter-American Development Bank, 2006. With Estrella Peinado.

“Social and Environmental Responsibility in Small and Medium Enterprises in Latin America”, *Journal of Corporate Citizenship*, Number 21, January 2006

“Deeds not Words”, Proceedings of the II Inter-American Conference on Corporate Social Responsibility, Inter-American Development Bank, 2006. With Estrella Peinado.

“The Role of Multilateral Development Institutions in Fostering Corporate Social Responsibility”, *Development*, Vol. 47, number 3, October 2004.

“CSR as a Competitiveness Tool: Proceedings of the Inter-American Conference on Corporate Social Responsibility”, Inter-American Development Bank, 2004. With Estrella Peinado.

“Alliances for Development: Proceedings of The Americas Conference on Corporate Social Responsibility”, Inter-American Development Bank, 2003. With Amy Heinecke.

“Private Infrastructure Investment at the Sub national Level: Challenges in Emerging Economies“, with Paulina Beato. *The Journal of Project Finance*. Summer 2000.

“El Sector Energético en el umbral del Siglo XXI: Tendencias y Retos?”, with Jaime Millán, in *Energía en el Nuevo Milenio*, Club Español de la Energía, Madrid, 2000.

“Pension Funds in Infrastructure Project Finance: Regulations and Instrument Design“, *The Journal of Project Finance*, Summer 1999.

“Infrastructure Finance Directory 1999”, published by the IDB. Most downloaded publication on our internet site during 1999. Also published the 1997 and 1998 issues.

“Private Infrastructure: Ten Commandments for Sustainability“, *The Journal of Project Finance*, Spring 1997. One of their best selling reprints. Spanish version reprinted in three books.

“Financial Intermediation and Policy-based Lending: Policy Recommendations for Latin America and the Caribbean”, with Kim Staking, in *Policy-based Finance and Market Alternatives*, Inter-American Development Bank, 1997.

“Roles for the Private Sector, Governments and Multilateral Creditors in Latin American Private Infrastructure”, with Martin Chrisney. *Project Finance International*, Americas Market Report, Spring 1996.

Private Sector Participation in Infrastructure: Risk, Fiscal and Efficiency Issues in Public-Private Arrangements for the Provision of Services”, with Paulina Beato, Spring 1996 issue of *Infrastructure*. Reprinted in *The Economics of Public Private Partnerships*, Edward Elgar Publishing, 2004. Reprinted as “Esquemas publico privados para la provision de servicios de infraestructura” in *Presupuesto y Gasto Publico*, Vol. 45, number 4, Madrid, 2006

## **Books**

*Responsabilidad Social de la Empresa en las PyMEs de Latinoamérica*. Inter.-American Development Bank, 2006.

*Evaluación Financiera de Empresas: El impacto de la devaluación y la inflación*. Editorial Trillas. Sixth Edition, 1998. Textbook for upper-level undergraduate and MBA programs on financial analysis of corporations. In print for 20 years.

## **Languages**

Fluent English and Spanish (speak, read, write), good Italian and Catalan (speak and read) and understanding of Portuguese and French.

## **References**

Upon request.

# STEPHAN F. JOOSTE

Doctoral Candidate  
Dept. of Civil & Environmental Engineering  
Stanford University

Date of Birth : 30 June 1978  
Profession/Specialisation : Infrastructure design, Project Management  
Nationality : South African  
Years experience : 6

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## **KEY QUALIFICATIONS**

Mr Jooste completed his B.Eng degree in 2000 at the University of Pretoria. In 2002, he obtained an honours degree in the Management of Technology at the University of Pretoria, after participating on an exchange program to the Technische Universiteit, Eindhoven in the Netherlands. He completed his Masters in engineering (Technology Management) in 2005 at the University of Pretoria.

Until recently he was working as an engineer and project manager in the infrastructure unit of Africon Engineering Intl – a South African based consultancy. His most recent focus was on the municipal infrastructure design and project management of various residential and industrial developments.

Prior to that he was on a ten month secondment contract with BHP Billiton in Mozambique, where he acted as an in-house consultant on the planning and feasibility study of the development of the Corridor Sands Titanium Mine. His role was focussed on assisting with the planning of the resettlement of approximately 800 households off the mining lease area. This included development of the resettlement process, drafting tender documents (for each of the 8 separate contracts involved), and the tendering of these contracts.

He has further been involved with a PPP feasibility study for the Western Cape Department of Health, where he was responsible for compiling detailed output specifications for all facility services. Mr Jooste also played a key role in terms of project and contract management on the Repair and Maintenance Project (RAMP) of various prisons in Gauteng, South Africa. Mr Jooste was also involved on the Abu Dhabi Municipality's Building Maintenance, Renewal and Rehabilitations Project in Abu Dhabi (where he spent a year). As assistant Project Manager he was entrusted with the facilities management program design for over 400 buildings, developing a maintenance strategy and compiling tender documents for corrective maintenance contracts.

His aviation experience includes a tariff-structure study for Air Traffic Navigation Services, a study on the management options of the Tempe Airport for the Mangaung Local Municipality, and a Cargo facility planning study of the South African Airways Cargo facility at Johannesburg International airport.

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## **EMPLOYMENT RECORD**

Feb 2001 – Jul 2005	Africon, Engineer
Jul 2005 – Apr 2006	BHP Billiton, Consultant
May 2006 – Sep 2007	Africon, Project Leader

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## **SELECTED PROJECTS**

***Euphoria Golf Estate Development (Naboomspruit, South Africa) Apr 2006 – date. Civil Infrastructure Design Coordinator.*** Design and supervision of the Euphoria Golf Estate Hydro, including overseeing design of all services infrastructure, borehole systems, irrigation dam, and main road access intersection (Euphoria Golf Estate Hydro).

***The Rua Vista Township Development (Tshwane, South Africa) Apr 2006 to date. Project Manager.*** Design and documentation of municipal infrastructure for 500 stands. (Midrand Real Estates).

***Louwardia extensions 11, 22, 46 and 47 development (Tshwane, South Africa) Apr 2006 to date. Project Manager.*** Design and documentation of municipal infrastructure for 10 industrial stands. (Zenprop).

***Corridor Sands Titanium Mine Development Feasibility Study (Maputo, Mozambique) Jul 2005 – Apr 2006. Seconded Consultant on Resettlement Planning.*** Project planning and feasibility study for the community resettlement project part of the development of the Corridor Sands Titanium Mine in Chibuto, Mozambique (BHP Billiton).

***JIA SAA Cargo Facility Scoping Study (Johannesburg, South Africa) Dec 2004 – Jun 2005. Project Manager.*** Study into the possible short and long term upgrading solutions for SAA's Cargo facility at JIA. (SAA Cargo).

***Tempe Airport Future Management study (Bloemfontein, South Africa) Jun 2004 – Feb 2005. Project Manager.*** Status Quo and Options Analysis of future management of Tempe Airport, in line with applicable legislation for external municipal service delivery. (Mangaung Local Municipality).

***Tswane Stormwater Masterplan Study (Pretoria, South Africa) Jul 2004 – Sept 2004. Technical Analyst.*** Stormwater modelling of tertiary catchment areas using Hydrosim in order compile Stormwater Master Plans. (City of Tswane Metropolitan Municipality).

***Air Traffic Navigation Services (SA) Tariff Structure Review (Johannesburg, South Africa) Mar 2004 – Jun 2004. Technical Analyst.*** International comparative study of other service providers, assessment of movement volumes, review of Activity Based Costing model, and calibration of tariffs. (ATNS).

***Lanseria Airside Upgrade (Johannesburg, South Africa) Jan 2004 – Mar 2004. Assistant to the resident engineer.*** Contract management / supervision of the Upgrade of airside facilities at the Airport, including extension and widening of the main and parallel runways, and upgrade of taxiways. (Lanseria Management Company).

***Western Cape Department of Health PPP feasibility study (Cape Town, south Africa) Sept***

**2003 – Dec 2003.** *Assistant.* Condition Assessment, compilation of output-specs of various facility services, inputs to financial model. (WC DoH).

**Abu Dhabi Municipality - Building Maintenance, Renewal and Rehabilitation Project (Abu Dhabi, United Arab Emirates) Aug 2002 – Jan 2004.** *Assistant Project Manager.* Facilities Management of over 400 buildings, including a maintenance strategy, and compiling tender documents for corrective maintenance. (Abu Dhabi Municipality).

**Fire Proofing of the Zonderwater Archive and construction of pharmacy at One Military Hospital (Pretoria and Cullinan, South Africa) Jan 2002 - March 2002.** *Project Manager.* Project management / supervision of the fire proofing of the Archive at Zonderwater prison, and the construction of a new pharmacy at One Military Pharmacy. Managing an Affirmative Business Enterprise Contractor (Department of Public Works).

**Project for the Acceleration of Cashflow Expenditures (PACE) (Pretoria, South Africa) Aug 2001 - March 2002.** *Documentation Manager.* Management of the government's departmental expenditures and the production of monthly progress reports, comparing past and present costs and predicting future trends. (Department of Public Works).

**Repair and Maintenance of Zonderwater, Baviaanspoort, Diepkloof and Leeuwkop Prisons (Gauteng, South Africa) Feb 2001 - March 2002.** *Assistant Resident Engineer.* Contract management / supervision of the rehabilitation of the buildings and services at various Prison Complexes. (Department of Public Works).

## **EDUCATION**

2005 : Masters of Engineering (Management of Technology), University of Pretoria, South Africa  
 2002 : Honours (Management of Technology), University of Pretoria, South Africa and Technische Universiteit Eindhoven, Netherlands  
 2000 : B.Eng (Civil), University of Pretoria, South Africa