INNOVATIVE ROAD INFRASTRUCTURE FINANCING IN JAMAICA AND THE DEVELOPING COUNTRIES

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The implementation of innovative road infrastructure financing in Jamaica is of paramount importance, mainly due to the existing insufficient and untimely sources of financing generated through budgetary allocation. The budgetary allocation derived from annual tax revenue has failed to meet the needs of road infrastructure management over a number of years and left road infrastructure in poor condition; resulting high socio-economic costs, including high vehicle operating cost, extended travel time, decline in infrastructure asset value and long term high infrastructure management cost to the public-sector, tax-payer and road-user. Through a critical review of existing financing models, this paper introduces most suitable innovative private financing business model for Jamaica, which could be implemented through the creation of Pooled Road Fund Bank (PRFB) with a commercial nature. The fund would be pooled from domestic and overseas sources, including road-user charges, grants, soft loans and bond, and implemented through Public-Private-Partnership (PPP) scheme. This would result the public-sector, tax-payer and road-user obtaining value-for-money (VfM) based on whole-life-cycle costing.

Keywords: developing countries, innovative financing, Jamaica, Public Private Partnership, road infrastructure.

INTRODUCTION

Innovative financing business model for PPP road infrastructure management in Jamaica is presented, as part of an on-going PhD study. Through an extensive literature review, the financing of road infrastructure management in Jamaica and other countries have been identified. The findings that have emerged so far, from the analysis and alternative model in attaining VfM are presented.

In Jamaica, the implementation of sustainable road infrastructure financing has proven to be a challenge. This is manly due to the traditional financing models adopted; which are built on the general tax revenue of the Ministry of Finance and Planning (MFP). The main weaknesses of this model involves its: inadequate and untimely nature. The annual commitment and actual disbursement figures are far less than what is needed (up to 50 percent less); and delayed disbursement. As a result, the condition of road infrastructure is a deplorable, resulting high socio-economic costs including: cost to road users (vehicle operating cost and extended travel time), general public (extended travel time and cost of transporting goods and services), and public sector (inefficient utilization of resources in planning, monitoring and implementing, high long term cost).

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Mulu, T and Smith, N J (2008) Innovative road infrastructure financing in Jamaica and the developing countries. *In:* Dainty, A (Ed) *Procs 24th Annual ARCOM Conference,* 1-3 September 2008, Cardiff, UK, Association of Researchers in Construction Management, 197-206.

The paper begins by synthesizing the perceptions that surround road infrastructure management in Jamaica; providing the fundamentals of road infrastructure management, which are then used as a basis for designing the most suitable private financing business model. A detail and critical analysis of road infrastructure management in Jamaica is presented and a number of issues highlighted that concern traditional financing models. The paper also assesses the strengths and weakness of innovative financing models such as State Revolving Funds (SRFs) in the US. The paper identifies the critical parameters that constitute innovative road infrastructure financing, and designs the most suitable innovative private financing business model for Jamaica.

Begin the paper with statements introducing the general area and the reason that this work is important. Explain what was important about the particular approach and how this work relates to previous work in the field.

SIGNIFICANCE OF INNOVATIVE FINANCING IN JAMAICA

The significance of innovative financing for road infrastructure management has been established as one of the key policy priority areas of the Government of Jamaica (GoJ) (MTW 2007); in order to facilitate the dynamics of economic growth. This is also supported by several researchers; that the primary key factor contributes to rapid economic transformation of developing countries is sustainable infrastructure management (Meetings and Ouagadougou 16 May 2006; Bank 2003; World Bank 2004; World Bank 2006; TRB 2007; IRF 2007).

As part of the effort in creating sustainable road infrastructure management, over the last two decades similar to many developing countries, Jamaica has implemented various forms of financing models, including, public, private and forms of PPPs (Kim 2005). For example, the implementation of first generation road fund model, which is based on the earmarking of general tax revenues; and second generation road fund model, which is partially based on a dedicated road user charge based revenue directly channelled into a dedicated account (Zietlow 2004).

In spite of the various attempts made to create sustainable road infrastructure management all has failed to meet the needs of road infrastructure management. The main reason for the failure is that the continuous reliance of the models, either fully or partially, on revenue derived from the general tax. This source has proven itself to be unsustainable and unable to satisfy the key characteristics of road infrastructure management, including high early capital cost and long gestation period associated with the cost recovery and socio-economic benefits (World Bank 2002).

AN OVERVIEW ON FINANCING MODELS IN JAMAICA

Road infrastructure management financing models Jamaica have been based on two main sources: international and domestic (MFP 2007). International sources largely (90 percent) constitute loans from multilateral and bilateral financial institutions; and domestic sources constitute: revenues generated through the general tax and through dedicated annual motor vehicle licensing fees. The financing from all sources are consolidated by the MFP and disbursed to road infrastructure management through annual budgetary allocations.

The annual budgetary allocation is categorized into three main headings (MoFP 2006) Recurrent expenditure- finances staffing, administration and overhead costs; Capital A expenditure- finances planning and implementation of routine and periodic

maintenance works, certain overheads for supporting services and disaster management expenses; and Capital B expenditure- finances planning and implementation of rehabilitation, reconstruction/up grading works, and international debt servicing. Recurrent and Capital A are financed from domestic source, and Capital B is financed from overseas sources of loan.

The respective share of annual financing allocated to the Ministry of Transport and Works (MTW) by the two main sources, the MFP and Road Fund Board (RFB), between 2001 and 2006 is outlined in Table 1. The average annual allocation through RFB (from road user charge) amounts US$ 8.9 million, and the MFP through Capital A (from the general tax revenue) amounts US$ 17.4 million and through Capital B (from loan) amounts US$21.35 million (MoFP 2001).

Table.1 Annual funding allocations for the MTW (MoFP 2007).

Expenditure type	**2001-2002 US$ million**	**2002 -2003 US$ million**	**2003-2004 US$ million**	**2004-2005 US$ million**	**2005-2006 US$ million**
RFB	N/A	8.9	8.9	8.9	8.9
Capital A	12.4	6.9	11.4	20.5	30.8
Capital B	15.8	15.1	17.8	23.2	29.3
Total	28.2	30.9	38.1	52.6	69

Road fund contribution accounts for 18.68 percent, Capital A 36.52 percent and Capital B 44.80 percent of the total average annual allocation of US$ 47.65 million, which constitutes only less than 50 percent of the average annual needs of road infrastructure management (MoFP 2006). The main reason for the shortfall is weak revenue base of the MFP. Given the financing shortfall of the budgetary allocation in 1997 the MFP had introduced Private Financing model. This model is discussed in detail in the succeeding section.

Private Financing Model

In 1997 private financing model was introduced in an effort to establish sustainable road infrastructure management, with the primary objective of taping into domestic private sources of financing. The process of accessing private financing involves private contractors secure financing from domestic commercial banks at a market rate (direct lending by private commercial banks), in respective to road infrastructure management contracts awarded. On successful completion of contracts, given the expenditure amount conforms to the contract document, the loan is assumed by the MFP (IMF 2002; JIS 2005).

In this process road sections are packaged in accordance with their geographic location and tenders are invited for qualified contractors. Based on a competitive bid tenders are awarded and contracts are signed between the private contractors and the MTW, under a condition that the contractors would secure their own financing and present a commitment letter from banks during contract signing.

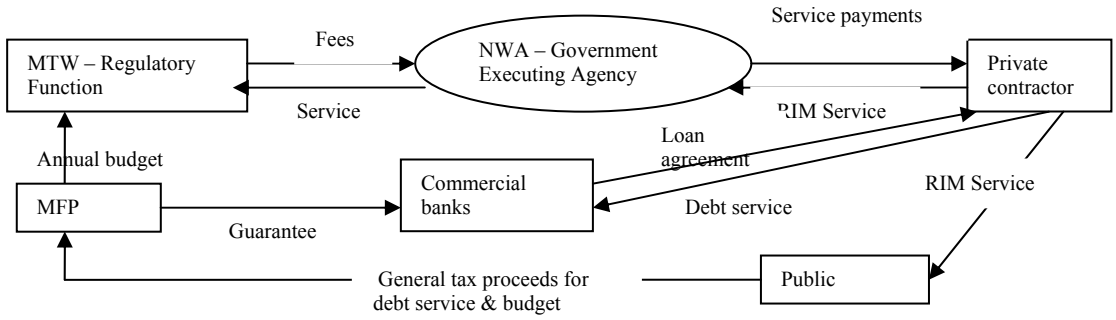

Figure 1: Private Financing Model (Author 2007)

Figure 1 illustrates private financing model, involving the key players, in which private contractors obtain loan from their choice of local commercial bank up to 100 percent of the amount stipulated in the contract document. The loan facility had no especial arrangement in terms of payment terms and interest rate. It was structured in line with the market rate and banks treat it as any other commercial loan, and apply all lending conditions used in the open market.

The loan facility (domestic currency) had no grace period, 4 years disbursement period and no amortization period, with variable market interest rate of 15 – 20 percent per annum. The loan was disbursed by the bank based on contractual agreement between the MTW and contractors. Disbursements were carried out by the banks for mobilization payment of 10 percent at the start of projects and subsequent claims made by contractors, based on certificates approved by the NWA for work completed in accordance with the contract.

Credit enhancement tool in the form of comprehensive guarantee is provided by the MFP, which is meant to mitigate the risk in debt transaction between banks and private contractors. The risk that the banks faces in lending money to contractors associated with fundamental credit (default) risk, inflation and interest rate risk, lack of liquidity of investments thus the NWA fails to pay the contractors in a timely manner. The MFP provides guarantee in the form of commitment for the 100 percent of the loan obtained by contractors and 100 percent interest accrued on the loan. This approach was taken by the MFP to encourage private sector participation and to improve its poor credit rating. The MFP assumes debt servicing subject to successful completion of projects. When the loan amount is due for servicing, the total debt amount including interest is built in the overall MTW's budget and deducted from the annual budgetary allocation as it due for payment.

The guarantee provided by the MFP does not cover the construction period. It applies on the issuance of completion certificate for work carried out by the NWA. However during the construction phase contractors obtain guarantees such as performance bond (mostly from commercial banks) amounting 10 percent of the total contract sum.

The comprehensive guarantees provided by the MFP are instrumental in helping the private contractors ultimately achieve high rating by the banks. This ensures the banks in recovering their investments (from past experience possible delay in payback period is anticipated, but compensated). If the MFP defaults to service debt in time additional charges apply, which allows the banks to maximize their return in the long term. As indicated in the previous section the Jamaican financial sector has relatively high liquidity, therefore such defaults would be in the interest of the banks.

The MFP's inability to service debt in a timely manner is due to government's weak revenue base resulted from inability to collect projected tax based revenues coupled with the occurrence of unforeseen expenditures for various socio-economic activities. This has placed a huge burden on the MFP and incapacitated its timely debt servicing ability. As a result meeting financial commitments become difficult and spread over years. As at 2007/08 financial year a total of US$240million (at 2002 constant price) in principal payments and US$59.6 million in interest are included in the MFP's Estimates of Expenditure to take care of debt repayments of road infrastructure management projects completed under the model (JIS 2005; JIS 2007).

The model has created financial contingent liabilities for the MFP for some years to come as it potentially increasing the level of internal debt. As a consequence the overall budgetary allocation to the MTW is reduced until the existing debt is fully serviced, making matters more difficult to the already insufficient financing for road infrastructure management. Therefore, the model had failed in addressing the main problem of other traditional models, in creating sustainable road infrastructure management including taping into sustainable sources of private financing.

DISCUSSION OF THE PROBLEM

The problem of inadequate and untimely financing in road infrastructure management is not unique to Jamaica; many countries are faced with similar problem. Some countries are in the process of identifying the most suitable solution for the problem and some has already implemented innovative financing models. Fore example (Kehew, Matsukawa *et al.* 2005), the US has implemented the concept of State Revolving Funds (SRFs). These federal seed grants, which were matched by 20 percent state contributions, were dedicated to setting up restricted revolving funds for loans and other credit enhancements, popularly known as the SRFs.

Various state financial entities, including bond banks, may operate revolving funds. These funds support loans (usually subsidized) to local borrowers; the ensuring loan repayments to the fund are then re-lent to other borrowers over time. Any loan repayments or other earnings on the seed capital were dedicated to reinvest in future projects. Thus, there is a permanent capital base, and finance in the loan fund constantly revolves to new projects.

The broad parameters of the SRF program left great discretion to the states and they have come up with a variety of programs. The 20 percent state match, for example, could be raised however the state selected, either through annual appropriation or through the sale of bonds. States, likewise, have used a variety of approaches in setting the terms for the loans made from the revolving funds. Loans made directly from the SRF grant may not have a maturity of greater than 20 years. However, longer terms can be given on that share of funds that are recycled from earlier issues or that are derived from leveraged borrowing.

In 2000, about 57 percent of all the state SRF programs had used direct loan programs without leverage and 43 percent had used leveraging. As of 2001, 23 states had issued bonds secured on SRF funds. Combined with other sources, this means that the total amount of funds lent or available for lending ($34.3 billion) is about 1.9 times the $18.3 billion in federal capital seed grants made as of that date. Overall, the use of leveraging has been modest, although it is substantial in some cases. Annual new borrowing from the SRF funds is in the range of $3 to $4 billion, which is about the size of the federal construction grant program that it replaced.

Generally speaking, leveraging of the SRF fund accelerates the amount of funds available for projects, but the payment of interest and principal on borrowed funds ultimately can reduce the size of the fund. The rate of attrition in the fund depends heavily on the re-lending rates and maturity structure of the sub-loans as compared to that of capital borrowed in the market. Most SRFs have opted to keep their lending rates below those in the markets in order to subsidize certain borrowers on the basis of hardship, and to keep up demand for the funds.

National survey work indicates that the average SRF loan rate is typically 300 basis points below the going market rate. This means that SRF loans are attractive to even highly rated borrowers in many states, although many states do allocate more favorable treatment to hard-pressed borrowers. Overall, because of the great flexibility afforded the states by the underlying federal program, there have been a broad range of applications and experience.

SRFs has achieved its aim of creating sustainable financing source for day to day public infrastructure needs in the US. In spite of its strengths (including consolidate many smaller loans into a size that is more readily marketable and adaptable to the credit markets; economies of scale in financial transactions that can lower the cost-per-unit of amount borrowed; provide loans below market rate- since inception average interest rate is 2.5, while the market ranges between 2 and 8). Although this model is proven to be a success in achieving its aim, it has some weaknesses including its failure in achieving VfM through whole life costing and transfer of risk to the private sector.

The innovative financing model for Jamaican road infrastructure management adopts the strengths of the SRF and other innovative financing models and builds up on their weakness to develop innovative private business model. Some of the strengths of various models may not be applicable in the Jamaican situation. For example, given the financial constraints it is impossible for the MFP to provide the seed capital needed for road infrastructure management, as the case in SRF model. Therefore the model has to generate its own seed capital and adequate revenue to service debt through various viable commercialized funding source involving road users, private investors, multilateral and bilateral institutions and the central government.

The concept of this paper is emanated from observations made on failures and successes of financing models implemented in Jamaica and other countries; hence to influence the development of most suitable innovative private financing business model. The model would address the financing gap, which the traditional models failed to address in Jamaica.

INNOVATIVE FINANCING MODEL

Given the political, economical and social complexity of sourcing adequate financing for road infrastructure management, the implementation of most suitable innovative private financing business model in Jamaica is of paramount importance. The model would be implemented through the creation of PRF with a commercial nature. The fund would be pooled from domestic and overseas sources, including road-user charges, grants, soft loans and bond, and implemented through PPP scheme. This would result the public-sector, tax-payer and road-user obtaining VfM based on whole-life-cycle costing. The model facilitates the creation of synergy between existing sectors and institutions in effectively utilizing resources and gain value-for-

money in the long term. This would result significant savings to the public sector and road user and profit to the private sector.

Administrative structure

The administrative structure of innovative financing model involves a 30 years concession contract for road infrastructure management, between PRFB and an SPV. The SPV is owned by bidding consortium and possibly third-party institutional investors. The SPV would enter into contracts with: a road infrastructure management joint venture- on a fixed-price basis, whereby the road infrastructure would be managed at the required standard; debt provider - PRFB, where by the loan agreement would be entered into by the SPV. The banks' requirements would flow through the SPV, not directly to the road infrastructure management joint venture; and a concession agreement with the government of Jamaica for 30 years.

The financing model would apply to prioritized main road network. The main reason is that the relative socio-economic benefit of the main road network would make it financially viable to attract private sector investment. The main road network comprises 5000 kilo meters including urban roads (5%), and class A-844kilometers (16.3%), B-717kilometers (13.9%) and C-3,225kilometers (64.8%). The MLG is responsible for the remaining 12,000kilometers of parochial road network and a further 5,000km of estate and farm roads (IADB 2004).

To ensure the sustainability and adequacy of financing the 5000kilometers of main road network is classified in to four categories of priority. The prioritization is carried out based on the weighted average of vehicular traffic and accesses provision to/from main socio-economic activity centres including tourism, schools, hospital, market and other major centres. Each category is comprised of 25 percent, 1,250 kilo meters, of the total main road network. Each category would have its own independent upgrading, periodic maintenance and routine maintenance cycle.

The management and coordination of the road infrastructure management (finances and operation) is carried out by PRFB. This bank is structured to have a commercial nature, with the ability to identify sources of financing and investment opportunities. It operates under the guidelines and supervision of the MFP/ Bank of Jamaica (BOJ), to ensure the interest of road users and the policy positions of the government of Jamaica are maintained. The establishment of the bank assists in achieving efficiency and gaining value-for-money through economy-of-scale. A single bond offering involving multiple administrative processes represents a more efficient way to process bond offering, thereby reducing overheads and administrative costs. Moreover this would facilitate the access to better guarantee and other support commitments from international and domestic institutions.

Financing structure

The financing structure is outlined in Figure 2, and comprised of two main sources: international and domestic. International sources include multilateral and bilateral financial institutions, and private investors. Multilateral and bilateral financial institutions play a major role in providing soft loan to PRFB. The loan is provided at a concessionary rate with 30 years of maturity and 5 years of grace period. International private investors invest in the form of bond proceedings, which is marketed through intermediary financial agency.

The domestic sources include: private bond investors and road user charges. Private bond investors invest through local intermediary financial agency. Road user based

financing is generated through direct and indirect road user charges. Direct road user charges are applied through fuel levy, annual motor vehicle licensing fees and axel load charges. Indirect road user financing sources include tourist charge (applied per head on arrival), commercialized land use of road reservation and the surrounding area (billboard, development/commercial activity contribution, parking in the Kingston city centre, accident and traffic violation charges).

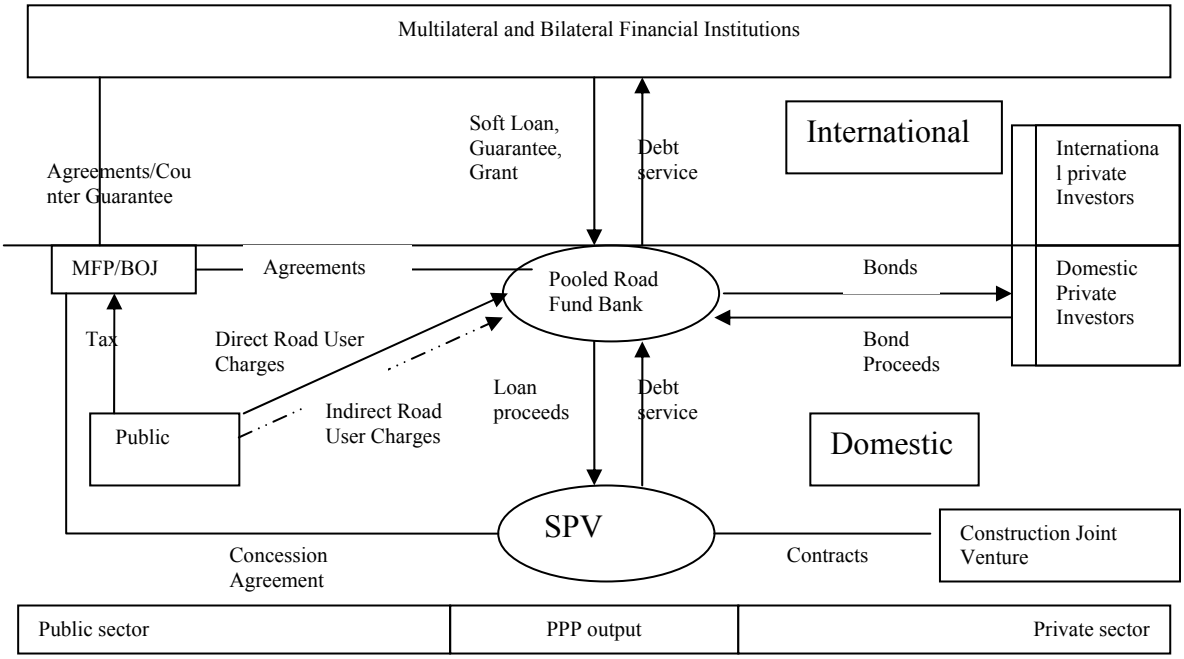

Figure 2: Innovative financing model (Author 2007).

Credit enhancement structure

Credit enhancement tool in the form of guarantee is provided by the multilateral and bilateral financial institutions, which is meant to mitigate the risk in debt transaction between PRFB and private investors. The risk that the private sector is facing associated with fundamental credit (default) risk, inflation and interest rate risk, lack of liquidity of investments thus the PRFB fails to pay investors in a timely manner. The MFP/ (Bank of Jamaica) BOJ provides counter guarantee for the guarantee/loan obtained by PRFB. The guarantee is instrumental in improving the credit rating of PRFB and enhances private investor confidence.

Guarantees provided by the multilateral and bilateral institutions, assists in overcoming the biggest challenge to securitization non-toll road infrastructure, lacking defined revenue sources. Private investors would need to be convinced that the reduction in long-term costs of road infrastructure management and preservation could generate sufficient savings to more that offset the debt service costs associated with the offering. Although expenditure is higher in the short term, compared to the traditional approaches, significant life-cycle cost savings will accrue over the long-term due the ability to vastly extend the service life of the road infrastructure. Moreover the establishment of road user charges also assures private investors that debt servicing obligations are addressed in a timely manner.

The combination of the financial structure and credit enhancement structure of the model are key elements in ensures the creation of sustainable road infrastructure management in Jamaica. This is achieved through pulling together the strengths, as

outlined above, of the public sector, private sector and multilateral and bilateral institutions.

FINDINGS

Accounting for the traditional models outlined above, it is clear that there is a need for innovative, most suitable private financing business model for Jamaican road infrastructure management. Hence, the establishment of the innovative financing model has required an approach that has created synergy between PPP and multilateral and bilateral resources, with the objective of achieving value-for-money based on whole-life-costing and risk transfer.

The model addresses the critical problem of traditional financing models; the erratic nature of flow of financing. The model ensures the availability of financing in a sustainable manner for the prioritized road sections, through accessing international soft loan facilities, international and domestic bond market, road user charges and grants. The unused funds are invested and generate cash flow towards building the capital base of the bank. The bank receives a dedicated, on-going revenue stream from the road user charges to support capital outflow and debt servicing obligations on a sustainable basis Thus, creating a permanent capital base.

The beneficiaries of innovative financing model are: public-sector, tax-payer and road-user, obtain value-for-money with improved quality and quantity for each dollar invested based on whole-life-cycle costing; and public-sector transfers risks of infrastructure performance to private-sector.

Finally, the paper shows that the alternative is worth further detailed consideration in the investigation of a long term sustainable solution to funding the management of roads in Jamaica. The author's PhD studies are continuing and welcomes any comments or suggestions on the ideas expressed in the paper.

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