

FINANCING TRANSPORTATION INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT – PUBLIC SECTOR CHALLENGES

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TECHNICAL COMMITTEE 1.2 FINANCING ROAD SYSTEM INVESTMENT

INTRODUCTORY REPORT

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EXECUTIVE SUMMARY

A critical issue for all countries is financing a transportation infrastructure that supports sustainable development. Traditionally funding for roads and motorways was provided through public financing with some private sector resources that were defined by the structure and challenges of individual countries. Today countries are facing difficulties in allocating their financial resources among critically needed maintenance, the desire to secure new infrastructure to increase network capacity and the preservation of existing roadways.

Finding appropriate and viable financing mechanisms presents a challenge for the public sector. A framework for viewing the topic of financing from a multi-country perspective is through a discussion of financial procurement strategies, cost management for long term investment and the role of public private partnerships (PPPs). One can analyze the types of organizations that manage road networks, allocation of funds, revenue and financing mechanisms and consider future trends in administration and funding. Road network management is conducted through governmental administrations, local administrations, public agencies or public companies and private companies. These agencies are responsible for a myriad of activities such as maintenance, capital investment, safety control, and traffic operations. The authority of these organizations is derived from legislation, administration and contract or agreement. Several methods for funding the responsibilities of these organizations include general taxes, contributions from other levels of government, user charges or tolls, loans and private parties. Implementation of some of these funding mechanisms can be difficult. From developing an understanding on how countries administer and fund their road budgets, it is important to recognize how decisions are made on the allocation of funds for various components of the road program.

Several issues arise pertaining to cost management for long term investment. Budget or economic constraints, allocations for maintenance, new development and other operations, methods of value or accounting of road assets, road infrastructure investments or projects and innovative procurement methods all affect cost management. Using cost management techniques is an effective tool in the allocation of funds for construction, maintenance and operations.

An important linkage with the identification of financial procurement strategies and the definition of cost management strategies for allocation of funding for long term investment is the role of public private partnerships in financing road system investment. Public private partnerships are viable options for delivery and financing of road infrastructure projects. Several models exist which provide a continuum from public responsibility to private responsibility. A challenge for the public sector is to develop projects that lead to sustainable development where the public interest is protected. The effectiveness of PPPs is determined by how well they meet the objectives for the country and the project. The allocation of risk between the public and private sector needs to be balanced to ensure a sustainable long term relationship. The public interest is best protected through a strong, consistent and clear regulatory framework that discourages an inequitable distribution of risk and provides for transparency and accountability.

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1. STRATEGIC ISSUES

1.1. Introduction

A modern infrastructure is vital to the quality of life, environmentally sustainable development and global competitiveness for all countries. Road transport is part of the infrastructure that contributes to the attainment of these goals. A critical issue is financing that infrastructure. Traditionally funding for roads and motorways was provided through public financing with some private sector resources that were defined by the structure and challenges of individual countries. Today countries are facing difficulties in allocating their financial resources among critically needed road maintenance, the desire to secure new infrastructure to increase network capacity and the preservation of existing roadways. Current sources of funding such as motor fuel taxes are now being threatened by the future of alternative fuel sources, better fuel economy and the increasing cost of fuel as an input to production. At the same time industry and communities are placing increasing expectations on the providers of road infrastructure to deliver a safe, state-of-the-art system.

There are many challenges in trying to develop a framework to view financing road system investment from a multi-country perspective. One way is to explore financial procurement strategies, consider cost management for long-term investment and review the role of public-private partnerships (PPPs). Within the context of this discussion, one can analyze the types of organizations existing in various countries that manage the road networks, the financing mechanisms to support these activities and consider future trends in administration and funding.

1.2. Financial Procurement Strategies

An exploration of financial procurements strategies focuses on an investigation of historical and innovative financial procurement methods employed in various countries (types of taxes, earmarked funds, etc.) The analysis includes different forms of user charges (including road tolls) through a review of objectives, revenue potential and allocation methods.

To understand financing strategies, it is necessary to consider several factors such as the existing and potential road network, the management of that network, and the nature and organization of road administrations. One should also identify existing and potential sources of funding road infrastructures (traditional and non-traditional) and how these methods are applied. The sufficiency and viability of these sources of financing for construction, maintenance and operational activities is another critical element. In addition to reviewing and describing existing systems, potential trends can be analyzed.

Road networks can be classified into three categories:

- Main networks – including trunk roads and motorways;
- Local networks – including regional and other roads; and
- Private networks.

Studies of existing road administrations result in the following models: governmental administrations, local administrations, public agencies or public companies and private companies. These agencies manage the road networks in different ways. Main networks are often administered through public authorities (national/local), agencies or public companies, or private companies (concessions). Local networks can be managed by local authorities, agencies or public companies, or private companies (concessions). The mandate for management of these road networks is based on legislation, administration and contract or agreement. Road management encompasses many responsibilities such as maintenance, capital investment, safety control, traffic operations, and funding or financing. Recent organizational trends include new centralization in Switzerland; a large decentralization in France; and countries with defined main axes which are managed by a central structure for such reasons as economic, management efficiency, political, national defense.

Among the methods for funding the previously mentioned responsibilities are:

- general taxes (state budget), special earmarked taxes (fuel tax, etc.), land value taxes;
- contributions from other levels of government;
- revenues from associated services (restaurants, gas stations);
- special levies on fuel, etc.;
- vignettes;
- user charges or tolls based on frequency of use, distance, time, place or vehicle type;
- loans – domestic and/or international; and
- private parties.

Whether traditional or non-traditional funding is applied, there still remains a significant gap in resources versus the needs of individual countries. Therefore countries are pursuing different funding perspectives. Traditional budgets are being shared between national and local needs. Earmarked taxes are placed on vehicles, fuel, axels, and weight. Tolls and user charges can also be difficult to implement for technical, judicial, political and social reasons. However, they are being discussed on different types of networks (motorways, trunk roads, local roads and an entire network. Tolls and user charges can also be applied, in addition, to different types of vehicles (heavy vehicles), to different types of criteria (pollution, dynamic, weight or for other different purposes (environment, congestion, demand management, intermodality). Consideration is also being given to charging of externalities. Off-budget funding can be designed to allocate costs to the users. Depending upon the structure of off-budget financing, it can be less complicated than the legal framework for a public private partnership and there can be cheaper financing costs due to state guarantees. User charges can enable cuts in general taxation and in taxes on vehicle ownership. They can be used to cover increasing capital costs and costs arising from the adverse effects of traffic. In addition they can be used for transport demand management.

After understanding how countries administer and fund their road budgets, it is important to better understand how decisions are made on the allocation of these funds to various components of their road programs. Particularly critical is how to best manage road system costs for the long term.

1.3. Cost Management for Long Term Investment

Cost management for long term investment can be reviewed from three perspectives:

- An examination of cost estimate and management methodologies for long term road infrastructure investment;
- An investigation of cost management methods based on appropriate appraisal methods of road assets; and
- An examination of strategies for allocation of funding for new development and maintenance projects.

Results from this review can include the identification of cost estimates, management methodologies and how they are applied to various road projects. In addition best practices and lessons learned can be ascertained for allocation of investment new development and maintenance projects.

In determining strategies or best practices that make better funding allocations of road management, the relevant issues include:

- Cost management for road systems within budget or economic constraints on network or state level;
- Allocation of funding for maintenance, new development and other operations;
- Cost management methods based on valuation or accounting of road assets;
- Cost management for road infrastructure investments or projects; and
- Cost management based on innovative procurement methods.

Cost management within budget or economic constraints on network or state level, considers the source of funding in use. If there is off budget funding what is the percentage and what is an appropriate level of funding of the road system? Several scenarios can be defined: (1) the road budget is a percentage of the state budget; (2) off-budget funding is a percentage of the road budget; (3) the road budget is a percentage of the GDP of a country; or (4) the road budget is based on kilometres or vehicles per kilometre. Among the categories in which countries allocate their funding are maintenance, new development and other operations.

A question arises about the appropriate allocation of funding between maintenance and capital investments. There are several aspects of maintenance such as maintenance to keep the existing level of service; daily maintenance; periodic maintenance; rehabilitation (to preserve the present level of service) and emergency maintenance. Funding is also set-aside for reconstruction, design and planning, traffic operations/ traffic management, other activities and administration. What are the trends among these allocations - are they increasing or are they decreasing? In many countries maintenance and investment costs are a percentage of the total road funding, with maintenance taking a larger percent of the funding. In a few cases such as Belgium (Wallonia) and Finland investment costs are almost equally or slightly higher than maintenance costs. Another element is the process for deciding on how funds are allocated. Some countries rely on asset management systems, formulas, political decisions, etc. Again the framework of the road administration and of the government play a significant role in this process.

Another perspective is cost management methods based on value or accounting of road assets. Queries were made to determine how road asset accounting or asset valuation is utilized in cost management. Is there are relationship between maintenance costs and annual depreciations? Methods to calculate asset value, asset values and the utilization of asset accounting in funding allocation were studied. Road asset value considers such items as pavements, road structure, road beds, bridges, tunnels, drainage and other engineering structures and land areas. Maintenance costs and road funding can be a percentage of asset value. Asset value can also be viewed from the perspective of GDP and kilometres.

In looking at cost management for road infrastructure investments or projects, the question arises as to how to develop good cost estimates for projects and how to optimize lifecycle cost or calculate life cycle cost for projects. One can analyze existing systems in use to plan cost estimates and the budgets for capital investment projects. Rehabilitation and reconstruction are conducted under various strategies. Competitive tendering is used by countries such as the United States, Sweden, Spain, Norway and Mexico. Austria uses a combination of delegated management and competitive tendering with the largest percentage being competitive tendering. Belgium's work is done by the road authority, while Bangladesh uses competitive tendering 100%. Iceland uses a combination of delegated management, competitive tendering and road authority forces. Hungary does 90% of its rehabilitation and reconstruction work through competitive tendering and 10% through delegated management.

Another issue is cost management based on innovative procurement methods. Are innovative procurement methods related to cost management and how? Contracting out, risk sharing, PPPs and financial procurement are areas of consideration for innovative procurement.

Examples of some of the aforementioned cost management issues can be found in the following countries:

- Budget or economic constraints on network or state level – Netherlands;
- Allocation of funding for maintenance, new development and other operations – Hungary;
- Valuation or accounting of road assets – Finland; and
- Innovative procurement methods – Sweden.

An important linkage with the identification of financial procurement strategies and the definition of cost management strategies for allocation of funding for long term investment is the role of public private partnerships in financing road system investment. Many countries view PPPs as important tools toward achieving their sustainable development objectives.

1.4. Public Private Partnerships for Roads and Road Transportation Administrations

Public-private partnerships are viable options for delivery and financing of road infrastructure projects. For the public sector this means looking to the private sector to participate in the delivery of services and the construction, maintenance, operation of assets which involve the transfer of management, and financing responsibility to the private sector. While such a transfer can be accomplished through a variety of approaches, including: deregulation, concessions, franchises, contracting (public-private partnerships or ventures), and various forms of Build-Operate-Transfer schemes, the focus is on PPP arrangements. PPPs allow each sector to do what it does best. Risks are borne by those best able to manage them.

1.4.1 Public Private Partnerships Models

Several different PPP models exist including

- Special purpose vehicle – Responsibility for operations and maintenance and/or capital procurement from public sector to private sector to achieve efficiencies.
- Mixed public-private – Operations & Maintenance (O&M) and/or capital procurement is under mixed public-private ownership/control.
- Private concession (O&M) – Responsibility for in-house O&M now under fee-for-service contract, based on competitive process.
- Build-Operate-Transfer (BOT) – Design, construction and O&M done by private sector. Asset remains public.
- Build-Own-Operate (BOO) – Ownership rights to private sector to develop, finance, design, build, own, operate and maintain facility.

Along this continuum from public responsibility to private responsibility are: DBB – Design, Bid, Build; private contract fee services; DB – Design Build; BOT; DBFO – Design, Build, Finance, Operate; and BOO. Factors affecting the PPP model include scope, type of financing, and payment type/revenue, contractual arrangements, and risk allocation, type of delivery and performance characteristics. Historically, only 55% of proposed projects reach the financing stage. Therefore road administrations are challenged to develop projects that lead to sustainable development and where the public interest is protected.

Public private partnerships are considered due to the complexity and financial needs of the projects. The application of PPPs is directly related to a country's development and specific needs for the road and transport sector. The effectiveness of public private partnerships is derived from country and project specific drivers and the extent to which the drivers are achieved through implementation of a PPP.

1.4.2 Drivers and Effectiveness of PPPs

One of the principal drivers for PPPs is the lack of current budgets to meet the road transport needs. Other critical drivers include lack of capacity from an institutional and managerial perspective in the public sector as well as lack of knowledge and innovation. Financing and managerial/institutional and private sector capacity seems to be equally important in most developing countries. Another element is the need to realize accelerated benefits to stimulate economic growth. PPPs have also been sought for efficiency, effectiveness and value for money. The private sector is oftentimes seen as a better manager of assets where greater efficiencies are captured and more value for money is created. In addition stronger accountability and better performance outcomes are other drivers for private sector involvement.

How can effectiveness of PPPs be defined? One response is did the PPP achieve the objectives of the drivers for the project. What is necessary to achieve a driver or combination of drivers given the country specific environment, be it funding and equality balance, performance and quality balance or capacity/human capital. There are certain pre-requisites to developing a PPP including the political will to create an enabling regulatory environment; public acceptance and a minimum resource base to develop PPPs. Factors to consider are: (1) institutional understanding and ability to procure and maintain a PPP; (2) country, institutional and project creditability to raise necessary finance; and (3) sustainable application (can it be viable, will it meet revenue projections). From lessons learned it is important to clearly define the needs, what is the objective the PPP is trying to achieve? Anticipate an achievable and enabling environment. Select the PPP model that best fits the objectives. Consider methods to enhance and optimize the PPP model and the enabling environment Expose the project to sustainability tests – project viability, is value for money being created, etc.

1.4.3 Legal and Institutional Issues

The public sector can pursue an enabling environment for PPPs through the appropriate legal framework and institutional structure. A successful legal framework is based on:

- Stability and consistency applied to project;
- Public authority decisions made under straightforward, transparent and unambiguous procedures;
- Formal PPP contract based on equilibrium between contracting party, investor-operator and user; and
- Public authority PPP regulatory mechanisms to guarantee neutrality/fairness for the private party; and enable public authority to ensure public policy objectives and conditions are met.

Conditions for an effective public private partnership institutional structure include: (1) procurement procedures are efficient; (2) incentives to concessionaire or private operators to operate without abusing potentially monopolistic position; and (3) PPP will not negatively impinge on other important issues such as wider benefits infrastructure provides to society; distributive effects. In addition, contract terms must outline controls and incentives to ensure that all interests – public and private – are being achieved.

1.4.4 Risk Allocation

The allocation of risk is important in the development and performance of PPPs. Areas of risk for the public and private sector include: political, completion, operation, commercial, financial, legal and others. From a country perspective these issues are legal, regulatory and political. Contract specific risks relate to performance – design, construction completion, O&M and overloading. Contract risks also relate to traffic and commercial (franchise requirements). Risks change dependent upon the type of PPP that is to be put in place. The mitigation of these risks is critical to both the public and private sectors. Project specific risks can often add to the cost of projects which may make some projects unreasonable to be undertaken by the private sector. These risks occur at any stage of the project from development to operation. There needs to be a realistic understanding between the public and private sector in order for the projects to move forward. Risks borne by the private sector include design, technical construction, finance, environmental migration and operating. As noted previously, public sector risks can include regulatory approval and political change, and the bulk of force majeure phases and events. Shared risk includes demand/traffic/revenue, project default activities and events.

Even with a PPP, the travelling public still perceives the project is under governmental control which means the public sector is still held accountable for the facility.

As risks are better defined there should be a balance between the allocation of risk and mitigation and regulation. While there is the need to protect the public sector, the project must retain its attractiveness for the private sector. In addition, there is the need for a sustainable long-term relationship. The objective is to optimize efficiency gains.

In some cases the private sector has accepted risk for debt financing, operations and maintenance, construction and future expansions. Environmental, risks resulting from future expansions and land acquisition are the responsibility of the public sector. Without an evaluation and acknowledgement of risk, the financial viability of a project cannot be adequately assessed.

1.4.5 Public Sector PPP Interests

The right choice between conventional competitive procurement and procurement through PPP is important. Emphasis has shifted from allocated budget driven procurement of road transport (where government assumes most of the risk) to investment driven procurement where the private sector assumes the role and most of the risk of the public sector.

One can look at an entire system to determine if the funding for the system achieved the quality and balance that was sought. From a project base determine how well the project is performing as well as the quality and balance of the project. Also examine administrative objectives such as building the resource capacity of road administration to manage and operate its system. Is the road investment leveraging more dollars for a country through economic growth as well as lessening the pressure on the overall budget for a country? More specifically – is the project meeting the revenue projections? Is there truly value for money being created?

Measuring the effectiveness of public private partnerships can be seen in the outcomes produced through these projects. Case studies provide a contextual discussion on success factors and negative outcomes. In reviewing the literature, case studies and other information one can see that PPPs can be subsidized to a point of financial viability, but may not render required socio-economic returns for long term sustainability. It is critical to understand the roles of different players in PPPs. Ideally PPPs should be transparent, i.e. where parties have full knowledge of each party's motives/incentives and where no can maximize, but only optimize their interests.

With the fast development of PPPs globally, the protection of the public sector through appropriate regulation has become increasingly important. The relationship between PPP risks and project viability should be considered as an indicator of PPP application limitation. The public interest is best protected through a strong, consistent and clear regulatory and legal framework that discourages an inequitable distribution of risk. Without these protections the area of transparency and accountability can suffer. For partnership and managing the contract, poor performance measure and monitoring can lead to an increased workload in managing projects. Again, the issue of value-for-money and risk transfer is raised. Financial reporting and accountability can be difficult as private sector organizations use complex structures that involve "close company" status and financial reporting is done within the private sector opaque. This can produce little information for the public as taxpayers and users.

As noted from the preceding discussion, prior to engaging in a PPP, it behoves public authorities to consider what have been referred to as the “conditions for PPP success”. These include:

- Motivation to improve public service delivery;
- Clearly defined set of measurable goals;
- Properly assigned risks and rewards and incentives;
- Risks that accrue in direct proportion to the partners’ abilities to benefit from them;
- Relinquishment of control by public sector over design/input choices and different approach to standards for accountability; and
- Political will to loosen bureaucratic/political control.

From this discussion one can see the need for several elements to successfully develop structure and deliver a project using the PPP approach that ensures an adequate protection of the public interest. A broadly based political/public debate regarding project/procurement design is most important during PPP development and procurement. Keeping procurement/concession/financing stable is also critical major changes in any one of these components will be costly for the public sector. Obtaining major approvals, environmental assessment, and land acquisition prior to PPP contract award prevents unnecessary cost/delay/uncertainty and risk. These of course, translate to increased costs. The public sector must ensure that an adequate competition occurs during procurement and that a transparent approach is most important to a successful outcome. The government/owner must have a dedicated PPP unit with appropriate procurement/financial skills and political direction/decision-making capacity. Often, the public sector wants to engage in PPPs but lacks staff with requisite skills and knowledge which proves to be both frustrating and wasteful to both the public and private sectors resulting in extra costs, poorly designed transactions and lack of success. Where a bankable project (i.e. in the case of roads one with real tolls), the only form of public subsidy should be “in-kind” public works ancillary to the project as well as management of approvals process and land acquisition. Where there is not a “bankable” project, then the public sector should carefully consider any subsidy. The assumption by private sector of risks must be assessed against risk allocation principle of assign to party best suited to manage it—risks unfairly assigned will result in increased costs of project development and delivery.

BIBLIOGRAPHICAL REFERENCES

- Evaluation and Funding of Road Maintenance in PIARC Members Countries. PIARC Reference 09.08.B, 2005.
- The Role of Economic and Socio-Economic Models in Road Management. PIARC 09.05, B-2003.
- Presentations from Financing Road System Investment, PIARC Technical Committee 1.2. Kananaskis, Alberta, Canada, December 2004.
- The World Bank's Infrastructure Business: An Overview. 2006.
- Off-budget Highway Network Funding in Austria. 2006.
- Innovations in Project delivery and Financing for Surface Transportation: The British Private Financing Initiative. 2006.
- Successful Examples of Public-Private Partnerships and Private Sector Involvement in Transport Infrastructure Development. Virtuosity Consulting under contract with OECD/ECMT Transport Research Centre. May 2005.
- "Is there "value for money" in transportation PPPs? The case of Macquarie and Sydney International Airport", Cameron Gordon, Mark Hughes, Andrew Read, TRB 2007 Annual Meeting. January 2007.
- "Risk Management for Public Private Partnerships (PPP): Using Scenario Planning and Valuation Methods", Christy Mihyeon Jeon, Adjo A. Amekudzi, Ph.D., TRB 2007 Annual Meeting. January 2007.

DRAFT CONCLUSIONS

Several conclusions can be derived from this examination.

- There continue to be significant gaps in revenues versus country needs.
- Financial procurement strategies used by different organizational structures are heavily dependent upon a country's objectives in road transport and the system that it is trying to support.
- Without a strong road network, the opportunity to achieve the economic sustainability sought by countries will be unachievable.
- Centralization and decentralization of road network management continue to evolve according to a country's objectives.
- There is a broadening of the use of tolls and user charges.
- Cost management for long term investment is a tool that can determine how funds are allocated among maintenance, operations and construction.
- In cost management network issues are paramount. How is the system defined and who controls that system?
- The valuation of the asset and criteria for allocation of funds are important. Allocation methods can vary from asset management systems to political will.
- Public private partnerships can be effective tools to assist countries in the management and financing of their road system. In considering the drivers for PPP, it is important to balance the needs that occur between public and private interests.
- The allocation of risk remains a major hurdle that can be addressed through a clear understanding of roles, the implications of those responsibilities and a willingness to have an equitable distribution of risk.
- The public interest needs to be protected through a strong legal and regulatory framework that encourages transparency and accountability.

Some of the areas for continued research are:

- The continuing difficulty in finding necessary funding resources to build and maintain road infrastructure encourages further study of alternative financing options.
- Some have noted there is a decline in private sector investment for transport. The truth of this premise should be determined and if it is occurring, what are the factors behind this issue.
- The role of international financial institutions in funding transport infrastructure – past, present and future.
- The relationship of private sector involvement to political will. How willing are politicians to change regulations and laws to be more beneficial to the private sector?
- In Europe regional roads are not able to attract sufficient private finance. These roads cannot be effectively tolled. A review should be made on how the public sector can keep these roads from disappearing without significant public sector investment.
- New procurement laws are in effect in the EU and countries are trying to respond to these new laws without needlessly delaying the procurement process. A look at various country experiences could provide guidance to other EU countries for the future. This review could prove beneficial to other countries outside the EU as they consider potential changes to their laws to implement PPPs.

- How willing is the political sector to move to a completely user pays environment? In all parts of the world, lack of maintenance and lack of investment in the road system are being impacted by increasing levels of traffic. Some countries are going to off-budget financing and others are moving toward user pays. A look at the political and institutional issues from the perspective of various countries could provide additional input on this issue.
- The need to explore costs in terms of private sector risk/reward resulting from government oversight or regulation over various aspects of contractual agreements to protect public interest.

Financing road system investment will continue to have importance for all countries as they strive to obtain the economic sustainability continued vitality and strength. Adequate funding is necessary to build, maintain and operate a network that serves the needs of a country. There can be a mixture of financial procurement strategies including public private partnerships to meet this need, but without clear objectives, understanding of risks and realistic expectations, the drive to sustainability will continue to be a difficult one.