The Role of the Public and Private Sector in Transport Infrastructure

Infrastructure Finance and the Challenges of Improving Transport Infrastructure and Services

Transport Forum 2005

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World Bank Group Lending in Transport

World Bank Transport Infrastructure Commitment ($ bn)

- Committed Loan Amount

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- East Asia
- Russia
- Brazil
- Argentina
The Role of the Private and Public Sector

The Economics of Transport Infrastructure

- Infrastructure investments are inherently “lumpy” (involve huge sunk costs and create assets that are long-lived and location-specific).
- Creation of Infrastructure has economics both of scale and scope (i.e., minimum size of facilities, inelastic adjustment of capacity to demand, long term project completion, etc.).
- Transport supply systems contain elements of natural monopoly (competition).
- Demand is wide spread (difficult to target).
- Revenues are usually in local currency (mismatch if foreign debt financing).
- Services have an essentiality component that raise legitimate public policy concerns of affordability.

However ..........

- Sound transport infrastructure allows countries to integrate to the global economy and increases competitiveness (together with telecom these sectors are the highest contributors to a country’s competitiveness)
- Transport services is one of the sectors with greatest impact on poverty alleviation and MDGs.
MDGs: Impact of Transport Infrastructure

Transport: village to town center and transport trunk beyond.

- **Agriculture.** Access to inputs (seeds, fertilizers, technology) improvements in productivity. Access to national and international markets (value added). Decrease in transaction costs. (Poverty)

- **Health.** Access to professional health services & drugs, better water services. Evacuation in case of emergencies (infant mortality)

- **Education.** Increase school enrollment (girls). Increase quality of teachers and educational systems (primary education, gender)

Transport and The Millenium Development Goals (Africa Union, UN, AFD, IBRD and EU, February 2005)

- Rural transport access indicators for selected group of SSA (IDA) countries has an average of only 37% compare with 94% for a group of IBRD countries (Chad was 5% and Mali was 51%)
The Role of the Private and Public Sector

The Service Delivery Gap

- There is limited affordability in the provision of most of the transport services (when including the costs of the required infrastructure facilities), specially when considering low income end-users.
- Affordability is determined by household income levels and the cost of delivering the transport service.
- Transport services have strong characteristics as a public good and create major positive externalities.
- Full cost recovery is only possible in some situations (i.e., air transport). Most of the public mass transportation system have strong limitations to reach full cost recovery even in developed markets.
- There is a role for the provision of “smart” subsidies to make possible the delivery of the service.
- The financing gap is a function of the gap between cost recovery and affordability.
The Role of the Private and Public Sector

The Roles

- **Shift from ideology to pragmatism** (our country clients are different - MIC versus IDA, etc.)
- **Public Sector** driven by the optimization of public welfare (efficient provision of transport related services to the general public - quality standards at lowest cost of provision)
- **Private Sector** driven by financial incentives

- **Public Sector**
  - Role in the design, development and enforcement of transport sector policies. In particular in the definition of cost recovery and affordability issues in the context of financial sustainability of the sector.
  - Role in the establishment of smart regulation (i.e., rules of the game that creates level playing field for efficient provision of public services)
  - Role in the provision of transport services where externalities and sector constraints do not provide adequate incentives for private sector engagement.

- **Private Sector**
  - Capital Financing (i.e., equity and debt)
  - Construction and Operations of Transport Facilities
  - Operations of Transport Services (efficiency)
The Role of the Private and Public Sector

Criteria for deciding between pure public sector infrastructure investment and some forms of investments involving private sector participation (PPPs):
(test how different options affect sector performance)

Transport Infrastructure (facilities)  →  Provision of Transport Services

- Access to the Service
- Quality of the Service
- Affordability of the Service (vs. willingness to pay - use of targeted subsidies)
- Nature of the service (i.e., competition vs. monopoly)
- Financial Sustainability (i.e., tendency towards cost recovery)

An additional important consideration ............
- **Fiscal Space.** Infrastructure investment needs (catch up with pending investments - upgrade and rehabilitation - plus new investments to keep up economic growth) are likely to exceed available public sector resources (public money)
Private Public Partnerships: Leveraging Public Money

- Need to **reconcile** transport infrastructure **development needs** with criteria for **fiscal prudence** (i.e., public sector resources available for infrastructure investments will be limited - *financing gap*).
- Need to **mobilize additional private capital** to match the gap if infrastructure development is to keep its pace sustaining economic growth.
- Need to maximize private capital mobilization **per unit of public sector contribution** (e.g., direct investment, subsidies, guarantees, etc.).
- Need to develop PPPs approaches as a **procurement tool** for better and efficient allocation of scarce public sector resources (the concept of value for money).
- Need to develop an adequate **risk management framework** to manage contingent liabilities arising for public money support to PPPs development.

“PPP hold the promise of increasing the supply of infrastructure without overburdening a country’s public finances. An infusion of private capital and management can ease fiscal constraints and boost efficiency ...”
IMF, Finance & Development, December 2004
The Value for Money Concept (when to use PPPs instead of pure public investments)

PPP projects should be able to provide equivalent or better value for money than a 100% public sector project approach

- develop base case with which to assess incremental benefits of the PPP approach
- Incremental Benefits may accrue from:
  - speedier implementation (fiscal constraints)
  - total long-term costs (life costs) of the operation
  - Better service (cost & efficiency) and coverage
- Adequate distribution of risks:

Too little: no Value For Money

Optimal: efficient sharing of risks

Too much: project failure

Public Sector Contribution
- Investment
- Guarantees
- Subsidies

Risk Transfer
PPPs are contractual arrangements between the public sector and a private sector party for the private delivery of public infrastructure services or other basic services. PPPs are complex structures, involving different parties, long and demanding negotiations and relatively high transaction costs.

PPPs are a procurement tool where the focus is payment for delivery of services rendered (outputs - outcomes). Transfer of the performance risk.

Project related risks (i.e., technical, performance, market and financial risks are transferred (to a great extent) to the private entity. Political, regulatory and macro-economic risks should be allocated to the party best suited to deal with them (government, international financial institution, private insurers).

Contract payments are usually structured in such a way that the public authority and / or users pay only for services rendered satisfactorily and not for assets, which are inputs to service provision. Revenues are generated via: (i) user fees, (ii) government payments (subsidies) and (iii) multilateral / donor grant funding and or (iv) a combination of all of the above.
PPPs: Spectrum of Options

Transport Infrastructure (Facilities)  Provision of Transport Services

Public Private Partnership

Woks & Services Contracts  Management & Maintenance Contracts  Operation & Maintenance Concessions  Build Operate Transfer Concessions  Full Privatization

Low  High

Extent of private sector participation
**PPPs in Transport Infrastructure Financing: Risk Assessment**

**Project Related Risks**
- Completion Risk (engineering & construction cost / time cost control)
- Operational Performance Risk (technical & operational know-how)
- "Market Risk" (Traffic)
- Financial Risk (Exchange Rate and Interest Rate Fluctuations)
- Environmental Risk (past and future liabilities, project delays, costs overruns)

**Non-Project Related Risks**
- Political Risk (expropriation, political violence, currency convertibility & transfer)
- **Contractual Risk** [Regulatory Risks]. (Government’s default on contractual obligations, i.e., pricing formulas, right of way)
- Macroeconomics Environment -- **Volatility Risk** (changes in macro balance in relatively short periods, i.e., exchange rate, inflation, etc...)
- Legal Environment (rule of law, i.e., judicial system, regulatory procedures and arbitration)

Best possible mitigation is to Match local revenue generation With local currency financing
Leveraging Public Money : Case of Toll Roads

Consider a case, in which the privately financed firms sells to end users, not the government or SOE, and, to simplify, consider three types of risk.

- Construction, operating, and maintenance cost risks: private sector normally has most influence over these costs, so government does not benefit from bearing them.

- Price risk: if government controls the toll, it probably benefits from bearing price risk (that is, from agreeing to compensate if it doesn’t increase toll according to concession contract).

- Demand risk (given price): appropriate policy is less clear.
  - Neither firm nor government may have much influence.
  - Decision needs to consider other aspects of “managing” risk: who can best forecast and anticipate demand to determine whether to build road? Who can best absorb the risk?
Demand risk in toll roads

Whether government should bear demand risk in toll roads is therefore controversial

- Chile, Colombia, Korea, and Spain, for example, have provided revenue guarantees (often in return for upside risk sharing).
- (Italy and Turkey gave revenue guarantees for privately financed railways in the nineteenth century: “PPPs” are not new.)
- Australia, Canada, United States have not.

Target any guarantee to the real problem:

- Is total demand risk the issue or is it whether government will build a competing road or complete a planned complementary road or port?
- Is risk the problem, or is it just that government doesn’t want to set tolls high enough to consider costs? If so, a subsidy may be better.
Valuing revenue guarantees

- Step 1. Develop model of traffic revenue that allows for random fluctuation (that is, risk) as well as trend rates of growth.
- Step 2. For the trend, take forecasts traffic-revenue growth developed for tendering the toll road.
- Step 3. Estimate the expected size of traffic revenue fluctuation (risk), from previous local or international experience.
- Step 4. Estimate consequent expected payments by government (see next slides).
- Step 5. Discount those expected payments at the risk-free rate to get the value of the guarantee.

(Possible addition to Step 4: adjust expected cash flows for an estimate of risk, using the capital-asset-pricing model).
Forecast and guaranteed revenue on hypothetical toll road

- Forecast revenue
- Guaranteed revenue

Estimated Initial Investment: $500 MM
A possible good outcome
A possible bad outcome

![Graph showing revenue and payment forecasts]

- **Payment**
- **Forecast revenue**
- **Actual revenue**
- **Guaranteed revenue**

$ million

Infrastructure Economics & Finance

February 2005
Valuation: Frequency distribution of government payments in 2016 (10,000 possible outcomes)

Average payment in 2016 is $4.19 million
Assume risk free rate is 5%
Approximate value of 2016 component of guarantee is \[ \frac{4.19}{(1.05)^{11}} = \$2.45 \text{ million} \]
Repeat for all years. (illustration purposes = $75.0 million)

This calculation will allow providing a value to the Fiscal impact of this option. This is a necessary first step in the decision-making process for public sector options for infrastructure development.
Transport Infrastructure: Developing Local Capital Markets

There is no best substitute for **foreign exchange risk mitigation** than matching the currency revenue generation with the currency of debt payment services (matching assets and liabilities).

- Financing transport facilities and services (local currency based) in the foreign debt markets adds **substantial risk** to the structuring of adequate PPPs creating the need for additional public money support.
- Local institutional investors (i.e., pension funds, insurance companies, life annuities, etc.) have a **natural demand** for long-term local currency debt instruments to match their liabilities.
- In most cases, local capital markets initiate their development via the creation of a **sovereign bond market** (long-term yield curve). After the establishment of such market, investors develop a need to diversify the risk profile of their investments and the return mix, providing the incentives for the development of a private bond market, creating the opportunity for the introduction of **infrastructure or utilities bonds** (long-term annuities).
- It is in the government’s best interest to stimulate, via **adequate securities regulation and institutional investors overseeing**, the development of local capital markets as a source of long-term local currency funding for needed PPPs infrastructure projects.
By the early 1990s, a sizable infrastructure gap had emerged in Chile, and significant investment was needed to prevent transportation and other bottlenecks from becoming a major obstacle to future growth.

A challenge for the government was to close this gap while maintaining fiscal discipline that had placed public debt on a rapidly declining path. The solution lay in promoting private sector involvement in the provision of public infrastructure through public-private partnerships (PPPs). Chile thus embarked on an ambitious concessions program in 1994, centered around a number of projects to develop the highway network.

The concessions program in Chile covers 44 contracted projects with a total value of US$5.7 billion (about 6¼ percent of 2004 GDP). These include: 8 projects to rehabilitate and upgrade the Route 5 highway which runs the length of Chile, with financing from tolls (US$2 billion); 11 other highway projects for connecting roads to Route 5 (US$1.3 billion); 10 airport projects (US$240 million); 6 urban road projects (US$1.8 billion); and 9 other projects (including prisons, public buildings, a reservoir, for US$360 million). Approximately 75% was funded in the local capital markets via local currency infrastructure bonds.

The government provides guarantees to concession operators. A minimum revenue guarantee is provided for highway and airport concessions, under which concession firms are compensated when traffic or traffic revenue falls below an annual threshold. In return for the minimum revenue guarantee, the concession firm enters into a revenue sharing agreement in which it shares a percentage of revenue with the government once a threshold is exceeded.
Using Performance Based Subsidies (OBAs) in Transport PPPs: Road Asset Management

Output-based aid (OBA) is a strategy for supporting the delivery of infrastructure services that depends—at least in part—on public funding where payment is linked to service delivery. At the core of the OBA approach is contracting out service provision to a third party—usually the private sector—with payment tied to the actual delivery of services.

- Road rehabilitation and maintenance traditionally done through input-based payments to private contractors.
- Increasingly, output-based approaches, for example the Performance-based Maintenance and Management in Roads (PMMR), being introduced in Europe, Asia and Africa, and similar KREMA contracts, functional for several years in Latin America (Argentina, Brazil, Uruguay).
- Expand private sector’s role from simple execution of works to include maintenance, rehabilitation and management of road assets.
- Operator paid after outputs delivered and quality standards met (per KM or similar).
- Multi-year and consumer-driven outlook, shifting performance risk to operator, and allowing for innovation and efficiency.
Transport : Engaging with the Public Sector

The World Bank strongly encourages transport infrastructure solutions that involve the private sector (i.e., economic development, incentives and efficiencies, fiscal space. Etc.).

However …. It recognizes the difficulties and challenges of establishing adequate policy and regulatory environment supporting private sector solutions (plus private sector risk aversion to some situations) while having at the same time to satisfy immediate infrastructure needs in order to restore economic growth and improve living standards (avoid the poverty trap).

World Bank intervention supporting public entities, particularly in the rehabilitation and development of needed infrastructure (facilities) is in many cases necessary and if carefully targeted and supported by adequate policies could have a positive impact in attracting further private sector involvement.

Intervention could have better results if provided to public entities run on a commercial basis (corporatized), and moving towards cost recovery management systems, even if there is still a need for transparent government subsidies.
Transport : Engaging with the Public Sector

Preference to engage (provide financing support) **directly with the project entity** responsible for managing the facility [infrastructure] or providing the service (passenger or cargo).

- Better accountability (governance) and easier measure and monitor of performance
- Improves chances of corporatizing the transport public utility
- Reduces risk of lack of focus in the implementation of Bank intervention

- Need to use a **transparent mechanism** for dealing with the gap between cost recovery and affordability (output or performance based subsidies). Need to developed schemes for the **long-term financial sustainability** of the entity (long-term planning of the use and transition of subsidies).

- Initiates path for self-financial sustainability and **independent access** to financial markets (public transport entity).
Transport: Spectrum of Bank interventions across Subs-sectors

Access

Quality

Affordability

Competition

Sustainability

Pure Public

Air Navigation (ATC)

Sea Navigation

Road Network and Rural Roads.

Subways (metro)

Integrated Railways Network

Toll Roads (motorways, bridges, highways)

Dedicated Mass Transit System

Pure Private

Airport Terminal

Port Terminal

Freight and Passenger Railways Services

Airlines

Shipping

Urban Transport Services (bus, taxis, etc.)

Port Services

Airport Services

WBG Support: Policy Dialogue / Technical Assistance / IBRD, IDA, IFC Investment Loans and Guarantees / MIGA Guarantees

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Transport Infrastructure: Upcoming trends

- Increasing importance of the provision of transport services and regional linkages and interconnectivity as key contributor to economic growth and MDGs and as a key driver of country’s competitiveness.

- Broader use of PPP schemes as a way to maximize public money leveraging for infrastructure development.

- Increasing use of output based subsidies as a way to utilize better private sector resources via effective allocation of performance risks (PPPs to deliver services to poorer communities).

- Development of local capital markets (local currency debt instruments) as a mechanism for improving effective access to infrastructure financing by transport PPPs.

- MLAs and Donors direct engagement with sub-national entities (well run public utilities) without sovereign support in the transport sector.
Thanks

World Bank Group
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