Public-Private Partnerships: Lessons from the Roads Sector

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The World Bank
Overview

- Typical Concession Structures
- Private Finance Structures
- Financing mechanisms
- PPP Project Cycle
- Examples from Europe
- Performance Based Maintenance Contracts
- Discussions
Alternative PPP Approaches

1. Traditional Public Sector Procurement
   - Design-build
   - Design-build-operate-transfer
   - Turnkey Delivery

2. Build-Operate-Transfer (BOT)
   - EU National Govt
   - Local Govt
   - IFI Debt
   - Commercial Debt

3. Design-Build-Finance-Operate (DBFO) Concession
   - EU National Govt
   - Local Govt
   - IFI Debt
   - Commercial Debt

4. Public Owner
   - Operator
   - Contractor
   - Engineer

5. Private Owner
   - Operator
   - Contractor
   - Engineer

6. Divestiture
   - EU National Govt
   - Local Govt
   - IFI Debt
   - Commercial Debt
   - Private Equity
A Typical Concession Structure

Government
The Principal

The Concession Agreement

The Lenders
**Debt Finance**

The Promoter
*The Concessionaire*
Special Project Vehicle

The Shareholders
*Equity Finance*

- Design Contracts
- Construction Contracts
- Operations Contracts
- Maintenance Contracts
Toll Financing

- Financing mechanism
  - private investors are rewarded through toll revenues
  - tolls collected directly from road users

- Build Own Operate Transfer – BOOT/BOT
  - the scheme reverts to public ownership, at some future date

- Build Own Operate – BOO
  - the scheme remains in private ownership
Shadow Tolls, Lane Rental & Availability Payments

- **Design Build Finance Operate (DBFO)**
  - Investors rewarded through a shadow toll
  - Investors take, or share, the traffic risk

- **Design Build Operate Maintain (DBOM)**
  - Investors rewarded through a rental scheme
  - Limited or no traffic risk

- **Availability Payments**
  - Investors paid according to “availability” of facility
  - Penalties for closures & disruptions to traffic
Who Provides the Funds?

- Private Finance Schemes can be:
  - exclusively privately financed, or
  - private - public partnerships

- Public funds should:
  - only be for a well defined purpose
  - represent social benefits which cannot be captured through toll revenues

- Private funds:
  - equity – shareholders’ funds
  - debt – from the financial markets
  - usually a combination, typically
    - 70% to 90% debt
    - 30% to 10% equity
**PPP Project Cycle**

PPP project require careful design, effective support structures and a good understanding between partners.

### Time Line

<table>
<thead>
<tr>
<th>Stages</th>
<th>Preliminary Stage</th>
<th>Project Identification</th>
<th>Project Appraisal</th>
<th>Design &amp; Agreement</th>
<th>Procurement</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>EVALUATION</td>
<td>MONITORING</td>
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</tbody>
</table>

### Requirements

- Legal context
- Institutional capacity
- National policy
- Integration of projects into EU harmonisation and priority funding strategies
- Desired gains
- Obstacles and constraints
- Private sector interest
- True cost of services
- Cost and benefits of PPP
- Needs assessment
- Risk allocation
- PPP components
- Budgeting
- Expectations of a PPP
- Integration of PPP into design
- Procurement procedure selection & design
- Funders requirements
- Financial and socio-economic appraisal
- Open and transparent process
- Detailed recordings
- Effective implementation structures
- Effective working relationship
Examples from Europe
Initiation of DBFO for the road sector in 1997

- Mixture of real toll & shadow toll concessions
  - Real tolls on existing roads/bridges
  - Shadow tolls paid by government during road construction, changed to real tolls paid by user after completion

- Comprehensive regulatory and institutional approach
  - Standardized procedures and competitive bidding; appraisal through Public Sector Comparator; PPP unit in MOF

Lessons learned

- Rapid infrastructure development (14 concessions/6 yrs)
- Transparent procurement attracted large scale private investment
- Significant budgetary impact of shadow tolls
<table>
<thead>
<tr>
<th><strong>Vasco da Gama Bridge</strong></th>
<th><strong>Concession structure (1993)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of concession</strong></td>
<td>DBFO concession for second bridge across Tagus rivers</td>
</tr>
<tr>
<td></td>
<td>Length: 18 km including access roads (12 km bridge only)</td>
</tr>
<tr>
<td></td>
<td>Concession included operation of existing Tagus toll bridge</td>
</tr>
<tr>
<td><strong>Concession period</strong></td>
<td>Maximum of 33 years</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>Shadow toll scheme for new bridge</td>
</tr>
<tr>
<td></td>
<td>Real tolls on existing bridge</td>
</tr>
<tr>
<td><strong>Concessionaire</strong></td>
<td>24.8% English company (Trafalgar Square)</td>
</tr>
<tr>
<td></td>
<td>24.8% French company (Campenon Bernard S.A.)</td>
</tr>
<tr>
<td></td>
<td>50.4% Five Portuguese companies</td>
</tr>
<tr>
<td><strong>Traffic levels</strong></td>
<td>New bridge: AADT 43,000 (1999)</td>
</tr>
<tr>
<td></td>
<td>Old bridge: AADT 147,000 (1999)</td>
</tr>
<tr>
<td><strong>Government support</strong></td>
<td>Shadow tolls on new bridge</td>
</tr>
<tr>
<td><strong>Total project cost</strong></td>
<td>Approx. $883 million</td>
</tr>
<tr>
<td><strong>Financial structure</strong></td>
<td>1) Approx. $294 million from EU Solidarity Fund</td>
</tr>
<tr>
<td></td>
<td>2) Approx. $294 million EIB loan</td>
</tr>
<tr>
<td></td>
<td>3) Approx. $192 million commercial bank loan</td>
</tr>
<tr>
<td></td>
<td>4) Approx. $103 million equity</td>
</tr>
</tbody>
</table>
Concession Act approved in 1991
- First motorways (M1/M15); 100% private toll road concession, defaulted due to high toll rates and traffic/revenue shortfalls; state taken over
- M5 motorway; toll road concession with significant government contribution and lower toll rates than M1; financially sustainable, but re-negotiated as availability fee scheme due to public resistance against tolls
- M3 toll motorway built by state, lower toll rates than M5, public finance
- Vignette system introduced for public road financing
- M6 motorway; availability fee concession

Lessons learned
- Some form of government support is required to attract sustainable private finance
- Toll roads are risky in a low traffic and untested policy environment
- Availability payment schemes reduce traffic/revenue risk and increase access to private finance due to security of cash flows and increased creditworthiness of concessionaire
# Hungary M5 motorway

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>Type of concession</strong></td>
<td>BOT concession for 57 km motorway (including existing 27 km and 30 km half-motorway section)</td>
<td>BOT concession for M5 motorway including a 47 km extension</td>
</tr>
<tr>
<td><strong>Concession period</strong></td>
<td>35 years</td>
<td>35 years</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>Toll road (Toll: €0.07/km/car)</td>
<td>Availability payment scheme</td>
</tr>
<tr>
<td><strong>Concessionaire</strong></td>
<td>Private consortium (incl. Bouygues, Strabag)</td>
<td>40% government stake in consortium with private partners</td>
</tr>
<tr>
<td><strong>Traffic levels</strong></td>
<td>35-40% below projections AADT 8,400-14,700 (2002)</td>
<td>Significant increase</td>
</tr>
</tbody>
</table>
| **Government support**                | ➢ Minimum revenue guarantee through stand-by operational subsidy from Road Fund in case of traffic shortfall  
➢ Subsidy amounts capped on a six-monthly basis for first six years  
➢ Dividends to be paid into Road Fund  
➢ Government in-kind and financial contribution = 45% of total cost | ➢ Annual availability payment of €80 million  
➢ Monthly performance payments based on average coverage ratios and agreed return  
➢ In case of non-performance, deductions from payments based on penalty point system |
| **Total project cost**                | €370 million                          | €919 million                            |
| **Financial structure**               | Debt/equity: 80/20% Syndicated bank loan of ECU204 million with EBRD guarantees | Debt/equity: 82%/18% €750 million syndicated bank loan 20-year maturity Pricing: LIBOR + 120-160 bps |
| **Other**                             | Strong public resistance against high toll levels | Highly successful refinancing and syndication to 24 banks (incl. EBRD) |
Poland

Toll Motorway Act and Agency for Motorway Construction and Operation established in 1994

- First concession awarded for tolling and operation of A4 motorway; abandoned after 2 years of operation
- Private finance for second BOT concession (A2 motorway) could not be raised without government support; subsequently, concessionaire obtained EIB loan with sovereign guarantee
- Negotiations for third concession (A1 motorway) are stalled over legal disagreements

Lessons learned

- Access to private financing depends on reliable government track record
- A functioning legal system and dispute resolution mechanism is key to a successful concession process
### Poland A2 Motorway

<table>
<thead>
<tr>
<th><strong>Poland A2 Motorway</strong></th>
<th><strong>Concession structure (2000)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of concession</td>
<td>BOT concession for construction, maintenance and management of 149 km motorway between Nowy Tomsyl and Konin. 88km new construction, 48 km upgrade of existing motorway.</td>
</tr>
<tr>
<td>Concession period</td>
<td>40 years</td>
</tr>
<tr>
<td>Structure</td>
<td>Private finance with loan guarantee by government.</td>
</tr>
<tr>
<td>Concessionaire</td>
<td>Autostrada Wielkopolska S.A. (AWSA) 77% Polish strategic and financial investors (e.g. Elektrim) 23% international construction companies (Kulczyk, Strabag, NCC, Egis).</td>
</tr>
<tr>
<td>Traffic levels</td>
<td>Approximate AADT 12,000</td>
</tr>
<tr>
<td>Government support</td>
<td>Loan guarantee for EIB loan</td>
</tr>
<tr>
<td>Total project cost</td>
<td>€875 million</td>
</tr>
<tr>
<td>Financial structure</td>
<td>1) €115 million equity from sponsors  2) €123 million subordinated debt from sponsors  3) €235 million senior bank debt, 17-year flexible maturity  4) Subordinated €358 million zero coupon bond from EIB, 17-yr maturity  Innovative cash sweep: borrower makes 6-monthly payments into a debt reserve account from excess cash flows to repay early after 13 years  Part of the bank loan can be drawn in local currency  Pricing: LIBOR + 180 – 235 bp</td>
</tr>
</tbody>
</table>
**Croatia**

**Approach taken**
- Concession for Bina-Istra motorway awarded as a partly tolled road with innovative shadow toll support; financed and operated successfully
- Remaining motorways and semi-motorways managed by state-owned Croatian Motorway Company
- Ongoing motorway development financed through temporary ‘Petrol Tollar’ (dedicated fuel tax) and significant sovereign borrowing

**Lessons learned – a specific case**
- Tolling is successful due to high traffic from tourism as well as established and accepted direct tolling system
- Sovereign borrowing for motorway development may not be the most efficient use of fiscal space if other alternatives are available
- A segmented approach towards motorway financing and innovative forms of government support can raise significant private finance
# Croatia Bina Istra Motorway

<table>
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<tr>
<th>Croatia Bina Istra Motorway</th>
<th>Concession structure (1995)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of concession</strong></td>
<td>BOT concession for construction, maintenance and management of 145 km semi-motorway in Istria</td>
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<tr>
<td></td>
<td>Section 1A: Umag-Pula (80km), constructed and open to traffic</td>
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<tr>
<td></td>
<td>Section 1B: Kanfanar-Pazin-Matulji (65 km), under construction</td>
</tr>
<tr>
<td><strong>Concession period</strong></td>
<td>32 years</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>Partially tolled road with innovative form of shadow toll support</td>
</tr>
<tr>
<td></td>
<td>Toll collection at Ucka Tunnel (east branch), viaduct Mirna (west branch)</td>
</tr>
<tr>
<td><strong>Concessionaire</strong></td>
<td>51% Bouygues</td>
</tr>
<tr>
<td></td>
<td>44% HAC (Croatian Motorway Company)</td>
</tr>
<tr>
<td></td>
<td>6% Two other Croatian sponsors</td>
</tr>
<tr>
<td><strong>Traffic levels</strong></td>
<td>AADT 11,630 (for total Croatian motorway network)</td>
</tr>
<tr>
<td></td>
<td>Widening from single to dual carriageway when AADT reaches 10,000 during one year or 16,000 during two months summer period</td>
</tr>
<tr>
<td><strong>Government support</strong></td>
<td>Replenishing Debt Service Reserve Account</td>
</tr>
<tr>
<td></td>
<td>Government contribution calculated based on the difference between annual costs and projected project revenues, not traffic volume</td>
</tr>
<tr>
<td><strong>Total project cost</strong></td>
<td>€500 million (refinancing of phase 1A and financing of phase 1B)</td>
</tr>
<tr>
<td><strong>Financial structure</strong></td>
<td>1) €210 million high yield bond (first € project finance bond in CEE)</td>
</tr>
<tr>
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<td>Coupon: 8%</td>
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<tr>
<td></td>
<td>Maturity: 20 years (2022)</td>
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<td></td>
<td>Rating: BB+</td>
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<td>2) €72 million commercial bank loan</td>
</tr>
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<td>Maturity: 20 years (2022)</td>
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PPPs for Road Rehabilitation and Maintenance

Performance Based Contracts
**Objective:**
- Reduce costs of road maintenance and rehabilitation and improve road condition through more efficient contract

**Concept:**
- Phased payments over the life of the contract (4-10 years) to contractor based on pre-defined performance standards and penalties for non-performance (output-based contract)

**Typical performance indicators:**
- Roughness (IRI); absence of potholes, cracks and rutting; friction; obstruction to drainage system; clarity of road signs and markings etc.

**Lessons learned:**
- Need for carefully planned pilot schemes and tailored contracts
- Contract period should include at least one periodic maintenance and might require rehabilitation at the beginning
- Proper performance monitoring and strict application of clearly defined penalties for non-compliance are important
- Capacity of contractors, inspectors and road administration agency is key
Argentina – CREMA contracts

- Phase I: 55% of non-concessioned national paved road network (11,700 km), of which 25% in poor condition, 750 vehicles per day
- Contracts for rehabilitation and maintenance awarded for 5 years for a lump sum amount, based on competitive bidding
- Payments: 60% by end of year 1, rest in equal monthly installments
- Regular monitoring or road condition
- Results of Phase I:
  - Reduced risk of cost overrun through fixed-price contract
  - Effective incentives - penalties applied to only 1% of total contact amounts
  - Innovation in work execution - technical design is left to the contractor
  - Need for capital investment reduced by 30% at the end of 5-year contract
  - Share of roads in poor condition reduced to 5%
- Similar approach for Phase II and in other Latin American countries (Uruguay, Brazil, Chile, Colombia, Ecuador, Guatemala, Peru)
Discussions