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**Technical Document accompanying the ECE Standard on
Public-Private Partnerships in Roads****Implementing the United Nations Agenda for Sustainable Development
through effective ‘People-First Public Private Partnerships’**

Note by the secretariat

Background

The following technical document accompanying the ECE Standard on Public-Private Partnerships in Roads contains a list of projects and programmes from which lessons and experience were considered based on published information in the development and implementation of private-public partnerships in the roads sector.

It was prepared by a ECE Project Team¹ composed of international experts² with experience

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² The list of experts involved in the work of the Project Team is available at:

<https://wiki.unece.org/display/pppp/Roads#Roads-Contactsandmembers>

of Public-Private Partnerships in the roads sector and sustainable development led by Alfredo Lucente.

The Secretariat is very grateful to Alfredo Lucente for leading the Project Team; to Anand Chiplunkar for sharing his vast experience of working in this sector; and to Scott Walchak for managing the work of the Project Team.

The full list of projects and programmes from which lessons and experience were considered based on published information in the development of the Standard is available on the project team website at <http://www.unece.org/ceci/ppp.html> for governments seeking more detailed advice, experience and lessons learned from the delivery of Public-Private Partnerships. The Standard will be maintained by ECE and the Centre of Excellence in Public-Private Partnerships.

The Working Party is requested to take note of this document and ask the secretariat to update it as necessary.

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Introduction

The projects highlighted in these sections are examples of Roads PPPs, some of which have been implemented in developed countries and be capable of adaptation for low and middle-income countries. Governments can study the lessons learned from all these projects including the key risks and hopefully accelerate their own research initiatives and reduce the expenditure of the time, money and resources necessary to benchmark and better understand PPPs in the road sector.

Regardless of the examples provided here, it is widely recognized that a pragmatic approach should be adopted to PPP as opposed to an approach based on political dogma and the absolute virtues of the private sector. In fact, experience has shown that no ready-made solution exists and that the strict duplication of a project between countries can be problematic. A PPP project can only produce efficiency gains and added value to the road sector and to the people if its characteristics are designed in accordance with the constraints and bottlenecks faced by the road agency, the country framework and the capacity of the private sector. In other words, a PPP project should be carefully tailored to its environment, but also with regard to how the environment may need to change in order to maximize development gains.

Section 1. Common Project Contractual Forms and Case Studies

Part I. Common Project Contractual Forms

Section 4.1 of the Standard describes the Project Types and Examples of Road Transportation PPPs.

As suggested therein, the most typical PPP contracts for the road sector are as follows:

- B(O)OT (Build, (Own), Operate, Transfer) – the private partner carries out construction of the road, usually becomes its owner and operates it during the term of the PPP agreement, and then transfers the road to the public ownership. BOT is primarily used in greenfield PPP projects for the construction of new roads;
- BTO (Build, Transfer, Operate) – the private partner carries out construction of the road, transfers its ownership rights to the public partner and operates it during the term of the PPP agreement without being the owner of the highway;
- DBOT (Design, Build, Operate, Transfer) – a subtype of the BOT model where the private partner also is responsible for the design of the road;
- DBOM (Design, Build, Operate, Maintain) – the private partner, along with designing, building and operating the road, also carries out its technical maintenance in accordance with the requirements of the PPP agreement (technical conditions, safety, additional services for users);
- DBFO (Design, Build, Finance, Operate) – the private partner designs, builds and operates the road pursuant to the terms and conditions of the PPP agreement, while being fully responsible for its financing through the combination of its own funds (usually in the form of equity capital) and various forms of debt;
- DBFM (Design, Build, Finance, Maintain) – the private partner designs and builds the road, is responsible for attracting financing for the project and carries out the maintenance of the road in order to ensure that the road is in proper technical conditions;

- DBFOM (Design, Build, Finance, Operate, Maintain) – the private partner designs, builds and operates the road, is responsible for attracting financing for the project and carries out the maintenance of the road to ensure that the road is in proper technical conditions;
- BOO (Build, Own, Operate) – the private partner builds the road, owns and operates it during the term of the PPP Agreement without transferring it at the end to the public partner. In many countries, this model is considered not as PPP, but rather as privatization. Still, if the activities of the private partner are regulated by the government – toll rates are set by government decree, performance during operation and maintenance of the road is monitored by the state – then this model can be considered as a form of PPP.

It must be noted that these contract forms are illustrative only. Other forms exist, and it is not uncommon to see variations within even a single contract ‘type’, for example, a DBFOM that is truly privately financed, versus a DBFOM where the sponsor finances portions of the development and/or may retain significant portions of operations or maintenance even though the contract would qualify generally as a DBFOM.

In addition, these forms may or may not be consistent with the types of transactions authorized in a Civil Law jurisdiction where, for example, a Concessions law set outs the types of concession contracts that are authorized. This may also be true for common law jurisdictions that have specific PPP or Concession enabling laws that control the types of contracts that may be entered.

Part II. Case studies

Projects and programmes in the following countries may offer lessons and experience based on published information. Empirical observations of the following cases and others were considered by the team in developing the Standard.

Development of new road infrastructure

Example 1: Tuni Akanapalli Annuity Road Project – India

Tuni Anakapalli project is the extension of the NH5 (National Highway) part between Tuni and Anakapalli undertaken by the National Highway Authority of India (NHAI) which is one of the first BOT (annuity) projects in India.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Concession Length	30 years	17.5 years	To allow governance flexibility for enhanced concession in the mid-term
Procurement Process	Selection of awarded bidder based on price and quality	Two stage bidding: First stage – qualification of bidders based on technical experience and financial capability; Second stage – based on annuity amount quoted	To ensure quality criteria during the first stage and a transparent competition for the final award

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Risk Allocation	Demand risks shared at least partially by private party	Elimination of market risks and decrease of financial risks due to the fixed annuities	Effective risk allocation: construction, operation and financial-private partner; regulatory risks – public partner

Example 2: Istrian Y Motorway – Croatia

The Istrian Y Toll Motorway is a modern highway constructed in Istria in Croatia, which is: a) a part of Croatian motorway network, b) both greenfield and brownfield PPP project; c) the first PPP project in Croatia, and d) the Best European Road Deal in 2003 according to Infrastructure Journal and Project Finance Magazine.

It is a complex infrastructure as there are 48 overpasses, 55 underpasses, 18 viaducts and two bridges. The most prominent features of the Istrian Y are the Učka tunnel (the third longest tunnel in Croatia - 5.4 km), the Limska Draga viaduct (552m long and up to 120m high), as well as the Mirna bridge, constructed over the Mirna river (1,355m long and 40m high).

The project was completed in two phases. After first phase (two lane motorway) the motorway was operated based on open toll collection system. After second phase (four lane motorway) the motorway has been operated based on closed toll collection system.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Risk Allocation	The private partner is required to provide services in the most cost-effective manner and to take at least some demand risk.	Government contribution if the private partner generates insufficient revenues.	Government objective to keep project's financial terms and costs at manageable levels.

Example 3: Lekki Epe Expressway – Nigeria

Lekki-Epe Toll Road project comprises the rehabilitation and upgrade of 49km of existing two-lane dual carriageway to a three-lane highway, the introduction of three toll plazas and the construction of a new 20km highway along the south coast of the Epe peninsula. The project is Nigeria's first ever Public Private Partnership project and it was aimed at a) relieving congestion on key urban corridor between Central Business District and Victoria Island, and b) promoting economic development, with the Lekki free trade zone.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Debt – Equity Ratio	70 / 30	83 / 17 + Sovereign Guarantee from the Federal Government	Government willingness to involve commercial banks in project's financing.

Example 4: M5 Tolled Motorway – Hungary

The 157-kilometre M5 forms part of the Pan-European Transport Corridor IV (Berlin-Prague-Bratislava-Budapest-Bucharest-Thessaloniki-Istanbul). It is the main link from Budapest to Hungary’s Southern region and an important extension of the western and central European motorway network towards Belgrade and Bucharest.

The debt provided directly by the EBRD, and provided by commercial banks, arranged by Commerzbank and ING. At the time, the Loan from commercial banks was the largest non-sovereign international commercial bank loan raised by a Hungarian borrower. Repayment of the loans is in the form of annuities, calculated based on an 18-year maturity, but with final repayment due in Year 13 as a “bullet” payment. The “bullet” payment corresponds to 55% of the initial principal amount. In order to achieve acceptance of this structure amongst commercial banks, the EBRD undertook to provide a guarantee of the final repayment.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Initial Loan Maturity	20 – 30 years	13 years, based on commercial banks standards.	EBRD support helped achieving financial closing and subsequently refinancing of the project in 2003.
Risk Allocation	Demand risks shared at least partially by private party	In fact, the project triggered the transfer of unmitigated traffic risk to the private party and the lenders (beyond the Revenue Shortfall Mechanism provided by the Government).	Government willingness to transfer risks to the private parties in line with best practices vs. thorough assessment of social and market actual conditions / requirements.

Transnational link projects

Example 5: Oresund Link – Denmark/Sweden

A road and rail link across the Oresund between Sweden and Denmark, consisting of a bridge 7.8 km long and a tunnel 4 km long. The two governments signed an agreement in 1991, committing them both to form state-owned stock companies. The companies would form a consortium responsible for the financing, design, construction and operation of the link, with loans raised on the international finance market, repaid by revenues from user fees and guaranteed by the two states.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Project Selection Criteria	Both socio-economic and political / economic	Decision based on political / economic aspects*	The vision of the two government about the creation of a larger economic zone

** Controversial EIA process: Swedish National Board for Environment Protection refused planning permission and Swedish government referred the decision to the Water Rights Court instead, in order to get the project approved.*

Urban link projects

Example 6: Eurasia Tunnel – Turkey

Eurasia Tunnel is an exceptional PPP road project in that it connects two continents, Europe and Asia, in the city of İstanbul with a population of 15 million. The project consists of a 5,4 km tunnel under seabed and 14,6 km road connection. It aims to decrease the congestion on the bridges connecting the two sides of İstanbul and provide easy mobility of people. It is a user-pay project with an operation period of 24,5 years, but as the SPV has finished construction earlier, the operation period has increased to 25 years 11 months.

<i>Key feature</i>	<i>Market norm</i>	<i>Project specific variant</i>	<i>Rationale</i>
Risk and Revenue Sharing	Risks to be shared for the party best to handle it	Traffic guarantee by public, revenue sharing if over guarantee	The demand risk which is out of hands of private sector handled by public for the good of people. Revenues are shared if over the traffic guarantee to compensate the risk of public taken initially.

Further discussion of the examples

1. Tuni Anakapalli Annuity Road Project (India)

The Tuni Anakapalli project is extension of the NH5 (National Highway) part between Tuni and Anakapalli undertaken by the National Highways Authority of India (NHAI), which is:

- one of 42 projects under the NHAI's Golden Quadrilateral program.
- one of the first BOT (annuity) projects in the country

Its major goals were:

- to strengthen the 59 km Tuni Anakapalli section on NH-5 from the existing 2-lanes to a 4-lanes, and
- to reduce vehicle operating costs, provide fiscal saving for the state exchequer, and improve employment, investment in industries, and increases real estate value in the local region



PPP model: BOT (Annuity) in accordance with National Highways Act (NH Act) 1956

Parties to the PPP agreement: National Highways Authority of India – public partner, private partner - GMR Tuni Anakapalli Expressways Private Limited (GTAEPL): The GMR Group (that included GMR Power Corporation Private Limited, GMR Infrastructure Limited and GMR Technologies and Industries Limited) – 74% and UEM Group of Malaysia – 26%.

Object of the PPP agreement: Tuni - Anakapalli road with total length 59 km.

Term of the PPP agreement: 17.5 years (up to 2019), 2002 – contract award, 2004 - opening

Total funding and financing structure: INR 315 crores - about \$70 million (debt-equity ratio of 3:1)

Payment mechanism: annuity payment (The NHAI pays the concessionaire a fixed annuity semi-annually, of INR 29.48 crores from May 9, 2005 to November 9, 2019), Toll free road.

Key features of the Project were:

Public and government interest:

- development of the project within the Golden Quadrilateral project - one of the earliest initiatives of the Government of India to modernize and improve the quality of roads in India
- high government interest in the project that resulted in a State Support Agreement (March 18, 2003) between the State of Andhra Pradesh, NHAI and the SPV, under which, the Government agreed to extend continued deal support and project implementation support such as granting certain rights to facilitate the implementation and operation of the project infrastructural facilities, and arranging a dedicated team of police personnel and highway patrols

Procurement:

- Two-stage bidding process: first stage – qualification of bidders based on their technical experience and financial capability, second stage - selection of the final developer based on the annuity amount quoted

Project governance:

- disincentive for private partner in the form of annuity payment's reduction if the actual availability of carriageway in any annuity payment period is less than the assured availability
- Incentives for early completion in the form a bonus payment.

Financing:

- participation in the project of the lending consortium ICICI Bank included several public-sector banks such as State Bank of India, Union Bank of India, and Indian Overseas Bank
- issuance of preference shares
- securitization of future annuity receivables (68 per cent of annuity receivables) to be received from NHAI over a period of 15 years → increase of further debt with lower interest rate from a consortium of lenders → prepayment of the project debt

Risk allocation:

- elimination of market risks and decrease of financial risks due to the fixed annuities
- factual absence of social risk because of minimal displacement of existing road
- stabilization of the concessionaire's risks by entering into a long-term O&M contract with its own consortium partner, UEM Group of Malaysia, who bears a substantial risk of the project
- effective risk allocation: construction, operation, financial – private partner, regulatory risks – public partner.

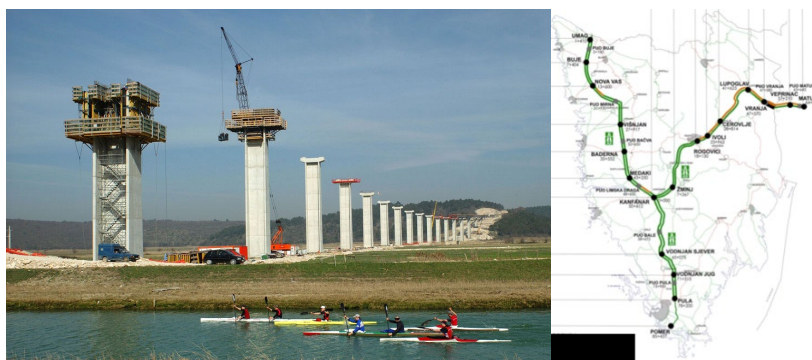
2. Istrian Y Motorway (Croatia)

The Istrian Y Toll Motorway is a modern highway constructed in Istria in Croatia, which is

- part of the Croatian motorway network
- the first PPP project in Croatia
- the “Best European Road Deal” in 2003 according to Infrastructure Journal and Project Finance Magazine
- a very complex construction as there are 48 overpasses, 55 underpasses, 18 viaducts and one bridge on and two bridges. The most prominent features of the Istrian Y are the Učka tunnel (the third longest tunnel in Croatia (5.4 km)), the Limska Draga viaduct (552m long and up to 120m high), and the Mirna bridge, constructed over the Mirna river (1,355m long and 40m high)
- both greenfield and brownfield PPP project

Its major goals were to:

- improve transport infrastructure in Croatia,
- enable road construction across the Istrian peninsula, to connect the Istrian peninsula with the A8 and A9 international motorways effectively linking Istria with continental Croatia and central Europe to the north, and Istria to Slovenia and Italy to the west.



PPP model: BTO (Build-Transfer-Operate) – in accordance with Croatian Law on Concessions, 1992.

Parties to the PPP agreement: the Government of Croatia represented by the Ministry of Maritime Affairs, Transport and Infrastructure, and the private partner BINA-ISTRA d.d. (Bina-Fincom, d.d. (67%); Bouygues Travaux Publics S.A. (16%), Hrvatske autoceste d.o.o. (14.78%), and Istarska Autocesta, d.d. (2.22%).

Object of the PPP agreement: public toll road network “The Istrian Y Motorway” (total length – 145 km).

Term of the PPP agreement: 32 years (up to 2027 - the private partner must transfer the motorway to the public authorities free of charge), 1995 – concession agreement award.

Total funding structure:

Total costs of the project are about EUR 1200 million.

Two phases of road construction have different models of financing:

Phase 1A: 85% / 15% – debt / equity ratio

Phase 1B: 65% / 15% / 20% – debt / equity / public capital (combined loan and project bonds)

Payment mechanism: direct toll mechanism (the government sets tariff, the private partner collects tolls).

Government pays a monthly financial contribution if the private partner generates insufficient revenues (on average since 2000 – EUR 17 million/year). Excess profits are shared in proportion 70% / 30% between the government and the private partner respectively (revenue-sharing mechanism is present in this project).

After 1st stage of construction (two lane motorway) - open toll collection system: toll was collected at two points - the Učka Tunnel and the Mirna Viaduct.

After 2nd stage of construction (four lane motorway) - closed system based on distance

Key features of the Project:

Public and government interest:

- critical geographical location: the area was underutilized in the past but is now developing rapidly (new industrial areas, boom of construction, rising touristic attractiveness) after the construction of the road.

Policy and planning:

- construction of the road in two phases (1A, 1B, 2A, 2B) due to the lack of sufficient financial resources for construction of the entire motorway at once, allowed the

project to adopt project funding to macroeconomic situation in the region, use the most favourable market conditions, and verify the level of traffic.

Financing:

- debt financing through large commercial banks
- some public capital contribution and financial support mechanisms
- exemption of the private partner from income tax, road tax until the 14th year, and value added tax for the entire period
- successfully implemented first refinancing (new interest rates 5.5-8% versus 7-12%) that led to reduction of debt burden

Risk allocation:

- private partner allocated construction, operation, financial risks
- public partner allocated commercial, regulatory risks
- sample risk management tools protecting the private partner: cancellation of the contract in case of severe regulatory risk and if the public partner does not make its financial contribution or does not fulfil its obligations within a short time period; cost overruns may be approved by the public partner
- sample risk management tools protecting the public partner: penalties to the private partner up to a maximum of 12.5% of the contracted construction price for each phase in case of time overruns.

Wider risk management issues:

- the private partner reduced tariffs for frequent users and tries to improve its public image.

Critical factors:

Procurement process:

- Lack of competitive procurement prevented international financial institutions from participating in structuring and co-financing the project; it also caused unnecessary delays and cost overruns;

Project governance:

- Current form of government contribution provides little incentives for the private partner to provide services in the most cost-effective manner.

3. Lekki-Epe Expressway (Nigeria)

Lekki-Epe Toll Road project comprises the rehabilitation and upgrade of 49km of existing two-lane dual carriageway to a three-lane highway, the introduction of three toll plazas and the construction of a new 20km highway along the south coast of the Epe peninsula. The project is:

- Nigeria's first ever Public Private Partnership project

Its major goals were to:

- relieve congestion on key urban corridor between the Central Business District and Victoria Island
- promote economic development, with the Lekki free trade zone

PPP model: BOT (Lagos State Roads, Bridges and Infrastructure (Private Sector Participation) Development Board Laws of 2005)

Parties to the PPP agreement: public partner - Lagos State Government (LSG), private partner - Lekki Concession Company Limited (LCC) with equity partners: Asset & Resource Management Company Ltd (ARM), African Infrastructure Investment Managers (AIIM), Hitech Construction Company Limited

Object of the PPP agreement: 49.4 km dual carriageway highway with three lanes in each direction, running most of the length of the Lekki-Epe peninsula in eastern Lagos

Term of the PPP agreement: 30 years, contract award – 2006, construction period – 2007-2012, opening of two sections and one toll plaza by 2012 (two sections and two toll plazas are under construction)

Total funding and financing structure: \$450M, debt-to-equity ratio was 83:17

Payment mechanism: direct toll (1st section) + shadow toll (2d section)



Key features of the project:

Public and government interest:

- the highway serves the relatively affluent and rapidly-expanding Lekki suburb, which is planned to be a large mixed commercial and residential area, known as the Lekki Free Trade Zone (FTZ). The Lekki FTZ is a 2006 initiative of the Lagos State Government (LSG), supported by investment from the Government of China.

Financing:

- private financing from 5 Nigerian banks was made possible by a federal sovereign guarantee on the project

Risk allocation:

- private partner allocated construction, traffic, operations and partly regulatory risks
- public partner allocated right-of-way risk with Force Majeure

Wider risk management issues:

- attempt to mitigate the social risk by indefinite postponement of tolling due to residents' concerns and the need for an alternative route (loss of LCC's revenues at this period was compensated by 'shadow' tolls) – tolling was introduced on December 18, 2011 instead of January 3, 2010
- cancellation of the tolling on the 2d section of the expressway, LSG provided shadow toll payments to LCC for lost revenue at Conservation plaza

Critical factors:

Government's interest:

- political reluctance to support tolling, lack of support to private partner

Policy and planning:

- the procurement commenced before any PPP framework was in place
- the initial documentation drafted was largely based upon traditional procurement contracts
- ARM (Asset and Resource Management Company Limited) was a Governmental advisor under a Memorandum of Understanding (MoU) who later created the SPV, Lekki Concession Company Limited (LCC) and won the tender to construct and operate the Expressway → insufficient evaluation and negotiation of best terms for the public sector, including for example termination clauses
- ‘drastically’ changed assumptions that underpinned the Concession Agreement (including devaluation of the Naira and increased construction costs), no options of the Government to influence LCC to increase tolls at the Admiralty Circle plaza and introduce tolling at the Conservation and Campus plazas → Buy-back (LCC is now owned by LSG)

Procurement process:

- the second of two tender’s participants was found by the Government’s advisor ARM, which later won this competition as SPV LCC
- lack of competition and transparency

Financing:

- time of great uncertainty in the global financial markets
- 12-year loans were obtained from local banks who had no previous experience of such long-time frames

Project governance:

- delays in resettlement of Project Affected Persons (PAP) and re-location of utilities because of the widening of the existing highway boundaries resulted in additional costs,
- delays by the Government in providing a Right-of-Way (ROW) led to increased construction costs and the delayed opening of new toll plaza with consequent loss of revenue
- high toll-fee charges

Wider risk management issues:

- much local opposition because of the imposition of tolling on a previously untolled highway, high toll rates but also because of long queues at the toll plaza

4. M5 Tolloed Motorway (Hungary)

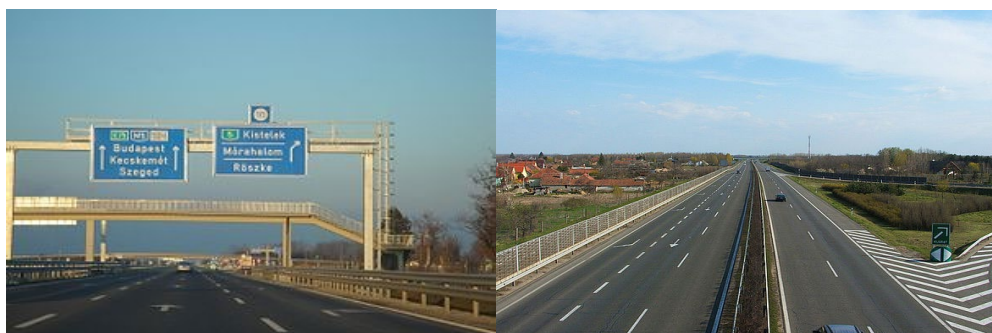
The 157-kilometre M5 forms part of the Pan-European Transport Corridor IV (Berlin-Prague-Bratislava-Budapest-Bucharest-Thessaloniki-Istanbul). It is the main link from Budapest to Hungary’s Southern region and an important extension of the western and central European motorway network towards Belgrade and Bucharest.

Pre-qualification documents were released to private sector bidders in April 1992. Following the selection of three pre-qualified bidders in September 1992, a tender was launched in 1993, leading to the selection of two preferred bidders in February 1994.

Financial close was delayed until December 1995 as a result of a requirement imposed by lending banks for a fresh traffic study. In turn, this led to a requirement to increase the revenue support arrangements available to the Project from the Hungarian authorities. The operating and maintenance services are provided to AKA by Maygar Intertoll Rt, a company fully owned by the South African toll road operator, Intertoll. The concession award was made in accordance with the local Concession Act XVI/1991.

The first Phase comprised the upgrading and rehabilitation of existing roads and the construction of approximately 90 kilometres of new highway. A semi-open tolling system was adopted with two main toll plazas and 8 toll barriers on interchange access roads. AKA was required to complete the construction of the second and third Phases of the Project by 2003. The second Phase comprises a 45 kilometre extension from Kiskunfelegyhaza to Szeged and the third a further 15 kilometre extension from Szeged to the State border.

The toll for passenger cars was set at HUF 5.00 per km in 1993 terms, and approximately at a fourfold multiple for heavy goods vehicles. Discounts for residents and frequent users were agreed. AKA is permitted to adjust toll rates in accordance with Hungarian retail price inflation and with any devaluation of the Hungarian currency, should such depreciation exceed the inflation differential between HUF and the respective foreign currency in which AKA's external indebtedness is denominated.



Financing: The debt provided directly by the EBRD, and provided by commercial banks, arranged by Commerzbank and ING. However, the EBRD extends its preferred creditor status (ranking ahead of other lending institutions in the event of rescheduling or revenue shortfall, by virtue of its multilateral status). At the time, the Loan from commercial banks was the largest non-sovereign international commercial bank loan raised by a Hungarian borrower. Repayment of the loans is in the form of annuities, calculated on the basis of an 18 year maturity, but with final repayment due in Year 13 as a “bullet” payment. The “bullet” payment corresponds to 55% of the initial principal amount. In order to achieve acceptance of this structure amongst commercial banks, the EBRD undertook to provide a guarantee of the final repayment.

A refinancing of all SPV's borrowings was undertaken in 2003, with the objective of extending loan maturity, taking advantage of lower prevailing interest rates, increasing gearing, (the amount of debt in the overall financing in relation to the equity) thereby allowing the equity rate of return to investors to be enhanced. Subject only to the support arrangements and in particular the revenue deficiency facility described below, all operational, commercial and financial risks were placed on AKA. Thus, repayment of AKA's borrowings and the payment of dividends to AKA's investors are dependent on AKA's cash flow and profitability.

Key features of the Project:

Experience to Date:

Construction was achieved on schedule, or for some sections, ahead of schedule and within budget. In 1997, the first year of operations, the average daily traffic volumes at 7,700, were significantly below forecast levels and AKA was obliged to draw on the stand-by facility (cash deficiency / revenue shortfall fund) agreed with the Government. Following a proactive marketing campaign by AKA and traffic calming measures, implemented by the Government on competing routes, the requirement availability of the revenue shortfall mechanism provided a critical safety net to AKA, without which it would have found itself in default in the same way that the M1-M15 was unable to pay its debt service obligations.

As a result of the imposition of tolls on an existing road alignment, extensively used by domestic and international heavy goods vehicles, a significant amount of traffic in the corridor, (50% or greater in the first year of commercial operation), diverted to Route No. 50, an untolled road running parallel to the M5. Traffic volumes on Route No. 50 had increased by 30% in relation to the levels prevailing before the opening of the M5. The vehicles diverting to Route 50 comprised principally local residents and cross border truck traffic, especially from the Ukraine and Turkey. The increased noise pollution and safety hazard led to protests by local residents. Subsequently, following negotiations involving the Ministry of Transport, AKA, AKA's lenders and the relevant municipalities, it was agreed to implement traffic calming measures on Route No. 50 and to build by-passes. AKA was able to resist pressures to reduce the agreed toll rates on the M5 (in contrast to a similar situation prevailing on the M1 Motorway) but did agree to a programme of more substantial discounts for frequent and local users. Some users brought legal cases against AKA concerning toll rates in force but the Courts rejected these complaints.

Government Contributions:

Revenue Shortfall Mechanism. The Government of Hungary is obliged for the first six and a half years of commercial operations (i.e. until 2006) to provide AKA with compensation in the form of a subordinated loan facility, repayable after discharge of Project indebtedness to senior lenders, in the event that AKA's actual revenues, for whatever reason, are below the levels in the Agreed Base Case.

The total amount of the shortfall facility is capped at HUF 9,000 million in 1993 terms (approximately EUR 50 million).

The Concession Agreement provided for the Government to contribute at no cost the following: the preliminary design for the Project, building permits and environmental clearance, land acquisition and such roads and motorways that are already in existence and traffic calming measures on competing roads. In return for the above in-kind and financial contributions the Government will be reimbursed through a profit sharing scheme, which is expected to account for approximately one third of the dividend stream forecast in the agreed base case.

The M5 continues as a viable PPP. The Government of Hungary provided capped, contingent, revenue shortfall support during the first nine years of commercial operations. Traffic volumes were significantly below forecast levels, but the Concession Company was able to avoid a default by drawing on the contingent Government support payments and a restructuring of its long-term borrowings.

Lessons Learned:

- The M5 experience highlights the importance of an appropriate allocation of risks between the public and private sectors and the critical requirement for avoiding the

transfer of unmitigated traffic risk to private sector investors and their lenders. This is especially important in transport corridors without previous experience of tolling.

- The early operating experience of the M5 illustrates the difficulties, which even the most experienced traffic forecasters have, in arriving at dependable forecasts of toll acceptance by drivers in a traffic corridor with no prior experience of tolling.
- Given the inherent uncertainty of traffic forecasts in such situations, the Government support arrangements, especially the revenue deficiency facility, were critical in ensuring the financial existence and viability of the Project and in avoiding the risk premia, which lenders and investors would otherwise have required.
- Experienced technical, traffic, financial and legal advisers were important to both the Government and private sectors in order to achieve a satisfactory allocation of risk and an appropriate revenue support mechanism.
- The financial viability of a capital-intensive road project is dependent on achieving loan maturities of acceptable length. The loan maturity available to borrowers in Hungary in 2003 has substantially increased in relation to the circumstances prevailing when the M5 financing was first initiated as a result of Hungary's improved economic position and EU accession status. The EBRD played a critically important role, at that time, in enabling the necessary loan maturities to be achieved.
- Even without the improvement in Hungary's overall economic position, the rate of return to investors would have been significantly improved by refinancing the initial borrowings, once construction risks had disappeared and the financial results for a number of the early operating years can be made available to lenders.

5. Oresund Link, Copenhagen-Malmö (Denmark-Sweden)

A road and rail link across the Oresundi between Sweden and Denmark, consisting of a bridge 7.8km long and a tunnel 4km long.

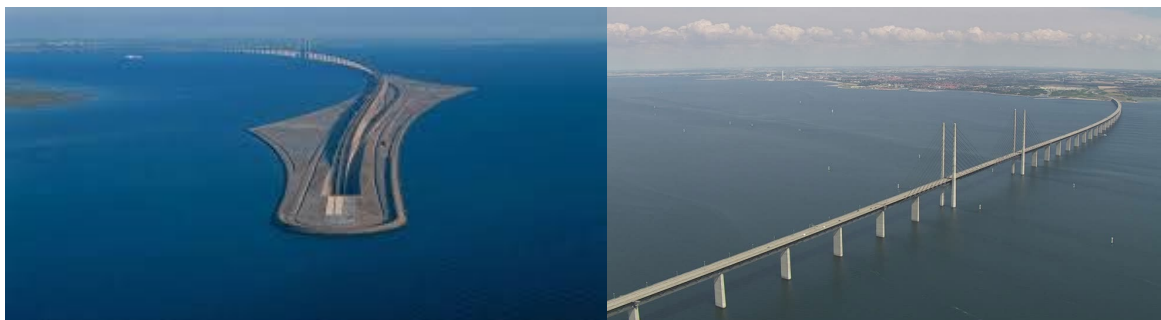
In addition to improvements to connecting transport infrastructure, associated hub development is taking place at Bridge City in Malmö and Ørestad in Copenhagen.

Proposals for a fixed link date back to the mid-19th century although technical and political feasibility was often an issue. The Swedish and Danish governments agreed to build a link in 1973, but the energy and economy crisis, Denmark's decision to join the EU and increasing environmental awareness blocked progress.

The European Roundtable of Industrialists lobbied for a link in 1984 but their proposal was perceived as a road project facilitating 'just-in-time' production and so threatening jobs at the local and national level, and met with widespread scepticism. The objective of promoting cross-border regional development emerged in the late 1980s, in the context of economic difficulties facing both cities and Sweden's decision to join the EU.

Representatives of the two governments formed the Oresund delegation in 1984. Over seven years the delegation studied and reported on options for a link and their environmental impacts (primarily effects on water flow, increased traffic and land use issues). The option of a combined road/rail bridge gained the support of Swedish and Danish parliaments in 1990.

The two governments signed an agreement in 1991, committing them both to form state-owned stock companies. The companies would form a consortium responsible for the financing, design, construction and operation of the link, with loans raised on the international finance market, repaid by revenues from user fees and guaranteed by the two states.



The project remained controversial in Sweden, particularly as the environmental impact assessment took place only after the agreement to build the link was signed. The Swedish National Board for Environmental Protection refused planning permission, but its competence was questioned and the government referred the Decision to the Water Rights Court instead. The WRC granted permission, on condition that the project had no impact on water flow: this necessitated a redesign and further approvals.

Key features of the Project:

The components of the link were defined in the 1991 agreement: a four-lane road and double track railway, starting from an artificial peninsula at Kastrup airport, Copenhagen, crossing in a tunnel to an artificial island and continuing to Limhamn, Malmö by bridge.

The Øresund Consortium (AS Øresund, Denmark and Svedab AB, Sweden) signed contracts with three consortia: Øresund Tunnel Contractors; Øresund Marine Joint Venture, for construction of the artificial island and dredging; and Sundlink Contractors, for bridges.

The cost was estimated at USD 2.96bn in 1991 (2010 prices). Maritime safety efforts, environmental protection and 'other' were amongst the reasons cited for escalating cost estimates. The final project cost was estimated at USD 4.10bn, a cost overrun of 39%.

Timeline Issues:

Wider political issues influenced the timing of the project, such as the Danish policy not to allow a link across the Øresund before one had been built across the Great Belt. The controversy over environmental impacts delayed the approval process in Sweden.

Funding:

The Øresund delegation's 1985 recommendation to fund the project entirely outside of public sector budgets was of fundamental importance to the funding structure. The use of surpluses from road tolls to finance land-based connecting infrastructure, and the payment of fixed fees by the national rail agencies to use the rail tracks, were amongst the issues covered in negotiations between the two governments.

As a result of the decision to rely on private funding, the project was appraised on the basis of economic profitability, rather than socio-economic cost-benefit analysis. However, road user fees were reduced when initial traffic was lower than expected, and the Consortium ran at a loss until 2009, despite increasing traffic.

Eurasia Tunnel-Istanbul/Turkey

The Eurasia Tunnel Project is an urban project linking European and Asian Sides of İstanbul undertaken by the Ministry of Transportation and Infrastructure, Directorate General of Infrastructure Investments. It is one of the first road PPP projects in the country.

PPP model: BOT in accordance with the BOT Law No:3996(1994)

Parties to the PPP agreement: Ministry of Transportation and Infrastructure, Directorate General of Infrastructure Investments as the public partner and Avrasya AŞ as the SPV (Yapı Merkezi from Turkey 50% and SK Engineering from South Korea 50%)

Characteristics of the Project: 5,4 km tunnel and 14,6 km road connection.

Term of the PPP agreement: Total concession period about 30 years including construction (4 year 7 months construction, 24 years 6 months operation in contract)

Financing: The project is financed by 22% equity, 78% loan (Lenders EBRD; EIB, Korean Exim, etc.)

Payment mechanism: User-paid

Procurement: Open bidding with the contract period as concession criteria

Risk allocation:

- Traffic guarantee by public partner for the whole life of the project and revenue sharing for excess of guarantee level for the whole life of the project
- Treasury Debt Assumption
- Construction risk by SPV

Key Features of the Projects:

It relieves İstanbul's transcontinental traffic pressure and serves as a fast, economic, safe, comfortable and environment friendly transportation alternative for the İstanbul Strait crossing. As İstanbul is in earthquake zone, this project is also a good example of resilient infrastructure tested against earthquake, flood, tsunami, liquefaction, etc...

This project aimed:

- reducing congestion on the bridges,
- increase easy mobility and life quality of people by reducing time in traffic (23 million hours/year),
- save fuel (30.000tons/year)
- decrease Co2 emission (18.000 tons/year),
- fast access to services.

Section 2. Additional expanded examples of PPPs in the roads sector

<i>Country</i>	<i>Examples</i>
Israel	The <u>Cross-Israel Highway</u> (Highway 6) would be an effective reference for other countries in terms of VfM and accountability driven by the private sector, Increase in efficiency, Reduction in road accidents and air pollution, Environmental awareness and Historical preservation
Senegal	Senegal's <u>Dakar-Diamniadio PPP toll road</u> is a relative success story. It opened on time and on budget in August 2013, and it has dramatically improved urban mobility around Dakar, reducing commute times between the city and its suburbs from two hours to less than 30 minutes. Main key factors for such success: a) Political

<i>Country</i>	<i>Examples</i>
	commitment; b) Consensus-building and stakeholder engagement; c) Experienced concessionaire with strong commitment to the country; d) Strong involvement of development institutions in both public and private financing; e) Clear, visible benefits.
Slovakia	<u>R1 Expressway</u> PPP Project in Slovakia is a successful partnership between the Slovak Government and a private consortium, for the improvement of mobility, safety and reliability. Also, people have reported seeing their living conditions improve, and there is an impression the infrastructure resulted as in greater freedom of movement, increase in trade and improvement of safety.
Australia	The Australian National Guidelines for Transport System Management (NGSTM), provides a comprehensive framework for planning, assessing and developing transport systems and related initiatives. There are territorial partnerships functions within Finance Departments: NSW Public Private Partnerships, Partnerships Victoria, Queensland Treasury and now over 25 PPP projects being operated or finished in transportation sector, with 11 of them road projects.
India	There are in excess of 684 PPP projects related to roads and bridges in India with an estimated total cost of 475,697.10 (in Rs Crore). National roads development occurs according to the policy of The National Highways Authority of India (NHAI) established as a statutory entity under the National Highways Authority Act 1988 for development, maintenance and management of National Highways. India Infrastructure Finance Company Limited (IIFCL) with the specific mandate to play a catalytic role in the Infrastructure sector also plays an important role by providing long-term debt.
Turkey	Turkey has 5-year Development Plans and Related Sector Strategies. The prioritized transport projects are defined in these strategic documents. Until 2018, contracts of 8 PPP Road projects with a total length of over 1350 kms have been signed with an investment cost of \$ 19 billion. These projects are implemented by BOT model under the BOT Law (Law No. 3996) dated 1994. The Eurasian Tunnel, North Marmara Motorway (including the third bridge across İstanbul Strait) and Gebze-Orhangazi-İzmir Motorway (partly) are in service while the remaining 5 projects are under construction.
Brazil	The Brazilian government has prioritized infrastructure investment and there is a specific program that covers transportation sector called the Federal Highway Concession Program and the railway concession program under the Ministry of Transport. What is more, PPP is considered as an effective mechanism in the "Logistics Investment Program in Highways and Roads" (2012). The legislation framework is well established by existing PPP law.
Philippines	The NAIA Expressway is a \$250 million project in metro Manila designed to expand the road system and provide a direct link to the international airport for the region. It is intended also to supplement existing road systems and reduce congestion on the major urban road networks of metro Manila. The project is a 30-year design, financing, construction, and operation toll facility. The private partner will collect tolls with the concession agreement providing for certain adjustments based on performance. Usage is estimated at approximately 100,000 passengers daily.

<i>Country</i>	<i>Examples</i>
Colombia	The Ruta del Sol road project consists of one 1,071 kilometre road broken into three road projects. One project involves a relatively short greenfield road construction over a mountainous route with a short 7-year concession period due to the engineering and alignment risks. The other two projects are brownfield projects that will rehabilitate and expand 528 and 465 kilometres, respectively, of existing roads under 25 year maintenance and operation obligations. The objectives are to reduce travel times, costs, and accidents along the corridor, improve linkages between economic activities in the regions affected, and improve mobility and access for upwards of 10.5 million using vehicles.

Nevertheless, Argentina is an example of a country that despite being unsuccessful in framework establishment managed to generate successful PPP project.

Section 3. Additional list of projects for reference

<i>Country</i>	<i>Project</i>
Argentina	Rosario-Victoria Bridge
Australia	M7
Belgium	A11 Brugge PPP
Brazil	BA-093
Canada	Sea to Sky Autoroute 25
China	Jiyuan-Dongming Highway
Croatia	Istrian Y Motorway
Dominican Republic	BTA Toll Road (toll road on Samaná peninsula)
Finland	E18 Koskenkylä – Kotka PPP Priority TEN E18 Motorway: Muurla – Lohja
France	TENs PPP - Marseille L2 ring road (A507) linking the A7 and A50 motorways Autoroute A63 (RN10-A63 between Salles and Saint-Geours-de-Maremne) A88 Motorway: Falaise West – Sées A19 Motorway: Courtenay – Artenay Millau Viaduct
Germany	Autobahn A-7 PPP TEN A8 Motorway Augsburg – Ulm

<i>Country</i>	<i>Project</i>
	A5 Motorway Widening
	A4 Motorway: Eisenach bypass
Greece:	Athens Ring Road
	E-K-P-P-T Motorway (from Korinthos to Patras and from Patras to Tsakona)
	K-T-K A7 Motorway: Tripoli – Kalamata
	Thessaloniki Submerged Tunnel
Hungary	M6 Motorway: Dunaujvaros – Szekszard
	M6 Motorway: Budapest - Dunaújváros
India	Tuni Anakapalli
	Four Laning of Biaora - Dewas , Madhya Pradesh, NHDP PHASE IV
	Four Laning of Fagne - Mah-Guj Border, Maharashtra, NHDP Phase IV
	Six Laning of Agra - Etawah bypass, Uttar Pradesh, NHDP Phase V
	Four Laning of Solapur - Bijapur 13, Maharashtra, NHDP Phase III
Ireland	M11 Gorey to Enniscorthy Motorway PPP
	N17-N18 Gort to Tuam PPP Motorway
	N11-N7 Motorway PPP
	M50 Motorway: Dublin bypass
	M7 - M8 Motorways: Casteltown - Portlaoise – Cullahill
	N6 Carriageway: Galway – Ballinasloe
	M7 Limerick Southern Ring Motorway
	Waterford Toll Road (toll bypass around Waterford)
Italy	Tangenziale EST Esterna MILANO PPP
	Autostrada BreBeMi PPP (toll motorway linking Brescia and Milan)
Jamaica	Jamaica Toll Road (motorway section between Sandy Bay and Four Paths)
	H2K Highway North-South Link Project
Japan	Trans-Tokyo Bay Highway (Tokyo Bay Aqualine)
Korea	Chonan-Nonsan Highway
	AH1 highway
	AH6 highway
Malaysia	North Sout

<i>Country</i>	<i>Project</i>
Netherlands	A9 Gaasperdammerweg Motorway PPP A1 A6 Motorway PPP A15 Motorway: Maasvlakte – Vaanplein A12 Motorway: Lunetten - Veenendaal
Nigeria	Lekki-Epe, 1st section - 2nd section
Norway	E18 Motorway: Grimstad - Kristiansand
Poland	A1 Motorway: Strykow – Pyrzowice A1 Motorway Gdansk - Nowe Marzy A2
Portugal	Pinhal Interior Motorway Baixo Alentejo Motorway IC 24 Motorway Douro Litoral A4/IP4 Motorway: Amarante-Vila Real Road Network in Azores IC16 - IC30 Greater Lisbon Roads
Russia	M11 Moscow – St. Petersburg motorway PPP section (15-58 km) Orlovski Tunnel Slavyanka Roads WHSD
Senegal	Dakar-Diamniadio
Slovakia	R1 Expressway PPP
South Africa	N4 toll road
Spain	Autovia A66 Benavente – Zamora Malaga - Las Pedrizas AP46 motorway C-25 Motorway – Eix Transversal Expressway: Cuellar-Valladolid Expressway: Santiago - Brion
Turkey	EurAsia Tunnel (Eurasia tunnel under Bosphorus in Istanbul) Gebze-Orhangazi-İzmir Motorway (Including the İzmit Gulf Bridge) North Marmara Motorway (Odayeri-Pasakoy Section) (Including the Third Istanbul Strait Bridge) North Marmara Motorway (Kınalı-Odayeri Section) (European Part) North Marmara Motorway (Kurtkoy-Akyazı Section) (Asian Part)

<i>Country</i>	<i>Project</i>
	Kinalı-Tekirdag-Canakkale-Balikesir Motorway (Including the Canakkale Strait Bridge)
	Menemen-Aliaga-Candarli Motorway
	Ankara-Nigde Motorway
UK	A19 Dishforth -Tyne Tunnel, UK
	M6 BNRR
	Aberdeen Western Peripheral Route / Balmedie to Tipperty (AWPR/B-T) PPP
	M8 Motorway PPP (upgrading of non-motorway section between Glasgow and Edinburgh)
	M25 Motorway Widening
	M80 Motorway
	A1 and A4/A5 Road Corridors Upgrade

Section 4. Other references

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Section 5. Key risk areas in road PPPs

The Table below summarizes the key risk areas in road PPPs³

<i>Sr. No.</i>	<i>Risk</i>	<i>Issues/Comments</i>
1.	Toll collection technology <ul style="list-style-type: none"> • toll plazas • free flow systems (no plaza or physical barrier) 	<p>Which system is most suitable?</p> <ul style="list-style-type: none"> • cost • system performance • flexibility • environmental impact • ease of use` • illegal passes <p>Challenge of free flow system is the collection/ enforcement risk and cost thereof</p>
2.	Demand / Traffic Risk – shadow and real-tolled projects <ul style="list-style-type: none"> • risk of not enough traffic 	<ul style="list-style-type: none"> • Extensive studies required at various stages of procurement process • Few remedies available, other than lowering tolls to hope for increase of traffic volume • Traffic guarantee – authority may grant a traffic guarantee – if actual levels of traffic fall below estimated threshold, payment is made by authority (may be for an initial period of concession) • Impact of improvements to competing roads • Exchange rate could be an issue if the guarantee is in a foreign currency
3.	Construction Issues <ul style="list-style-type: none"> • Long-term risk of construction overruns • Right of Way, Control over road 	<ul style="list-style-type: none"> • complexity of construction (does it involve bridge/ tunnel?) • how will cost overruns be borne by consortium members? • capacity for design and construction contractor to manage issue • Do local laws give third parties right to enter project road? Does any agency have right to prevent works from proceeding?
4.	Maintenance structures	<ul style="list-style-type: none"> • Is there to be a maintenance sub-contractor? How is this to be managed?
5.	Operation Performance	<ul style="list-style-type: none"> • What could be the possible criteria of performance to create a link between payments and performance? • How will the performance criteria will be measured?

³ Public-Private Partnerships in Roads - Public-Private-Partnership in Infrastructure Resource Center, World Bank Group
<https://ppp.worldbank.org/public-private-partnership/sector/transportation/roads-tolls-bridges/road-concessions>

<i>Sr. No.</i>	<i>Risk</i>	<i>Issues/Comments</i>
6.	Change in law	<ul style="list-style-type: none"> • Concessionaire will seek protection for changes to safety regulations General changes of law are usually borne by concessionaire – this can cause problems for the project’s viability
7.	Events of default that give rise to termination right of authority	<ul style="list-style-type: none"> • Concessionaire will want to limit these, and ensure that they are objective and clear compensation on termination also needs to be clear
8.	Rights of step in	<ul style="list-style-type: none"> • When can funders step in when project is failing before termination? Funders usually want this right established in a separate direct agreement.
9.	Compensation on termination	<ul style="list-style-type: none"> • UK and Ireland provide for zero compensation for termination for concessionaire default. • This is a concern for sponsors and financiers – and raises prospect of windfall gain for authority (free road) • Likely to be resisted by private sector for projects in developing countries – more likely to have risk sharing between parties
10.	Force Majeure	<ul style="list-style-type: none"> • UK and Ireland have very limited circumstances when compensation is paid on termination. • Developing countries unlikely to be able to pass as much risk to private sector.
11.	Jurisdictional issues – these include:	<ul style="list-style-type: none"> • Does authority have legal power to enter into concession contract? • Population and migration levels • Political will • Stability of country – political stability • Transparency of procurement process • Deal flow • Which authorities are involved in award process? • Insolvency regime • Impact of accounting treatment