

Country case study: Brazil

WHY READ THIS CASE STUDY?

- A** Several practical restrictions to the implementation of the first package of road concessions were observed including economic crisis, lack of experience, the development of bypasses to avoid the payment of tolls, opportunistic behavior of government and concessionaires.
- B** The different government levels resulted in different forms of road concessions. Federal and states concessions independently designed, faced different problems and provided different results.
- C** The use of crossed subventions, with the benefits of high traffic level motorways balancing out the losses incurred in low traffic motorways, provided very positive results.
- D** The private participation in road infrastructure led to better management and investments in the rehabilitation of the network.
- E** The experience acquired in the first package of road concessions has been successfully applied in the design of the second package.

Background

Brazil has three levels of administration: the Federal Government, 26 States and one Federal District, and the municipalities. The Federal government is in charge of infrastructures of national importance while states and municipalities administrate local infrastructure. In the road sector for instance, the federal government plans and builds interstate roads while states administrate the intrastate network.

The Brazilian Road Network represented 1.6 million Km in 2006; the federal network reached 73.009 km, from which 58.152 km were paved. Road is the most important mode of transportation, responding for 65% of freight movements and 95% of passenger's displacements. Traffic volumes are composed by 20% of heavy vehicles and 80% of cars and light commercial vehicles.

Despite its importance, recent surveys show that the road network lacks a considerable amount of investments (CNT, 1999; The World Bank, 2007). GDP's share devoted to road financing decreased from 1.51% in 1975 to 0.54% in 1982 and less than 0.1% in 1998. Consequently, there has been a decline on network growing, which was 12% a year in 1975 and has reached 2% a year in 1996.

In the last years the investment in rehabilitation and maintenance has been just enough to avoid the network deterioration; however, to increase the parcel of roads in good

condition from 25% in 2007 to 63% and avoid unnecessary reconstruction investments, the World Bank estimates that about RSUSD 1.2 billion (USD 0.6 billion) per year should be invested in the next six years.

In Brazil, the private provision of road infrastructure was motivated by severe shortages of public resources, which led to an increasing deterioration of the quality of roads, requiring enormous investments to recovery, maintenance, operation and expansion of the network. In this context, partnerships between public and private sectors have gained strength. The resources of the private sector have become an alternative solution to the crisis. Initially, from 1995, the private participation took place through concessions. Recently, to facilitate the participation of private enterprises in projects with little or no economic return, the government enacted in December 2004, a law regulating the establishment of public-private partnerships - PPP.

Road concessions

The Federal Road concessions program started under the responsibility of DNER (Brazilian National Department of Roads, succeeded by DNIT – Departamento Nacional de Infraestrutura de Transporte, in 2002), which was a government institution (a type of state owned enterprise). As a way to reduce problems related to capture, and to improve transparency and efficiency, in 2001 a law creating the National Agency for Land Transport (ANTT) was approved, whose main responsibility was to coordinate and regulate road concessions.

The first package of road concessions included 5 concessions awarded by the Federal government (bidding process conducted by the DNER between 1994 and 1997), and two contracts between the Federal government and concessionaires of Rio Grande do Sul (whose bidding occurred in the scope of state government, and were subsequently transferred to federal responsibility).

In the second package, 7 concessions, totalizing 2,600 km have been auctioned in October 2007. Institutional arrangements in the Federal Program of Concessions include the federal government to maintain ownership of facilities and regulation of the concession. The investment, operation and revenue collection are the responsibility of the private operator.

The States' concessions are managed by the states and are mainly based on federal highways through agreement, being formed by stretches of roads delegated to the states to be included in a broad program of concessions. This includes basically the current concessions, consisting of sections of roads delegated to the states and awarded to private companies, following bidding process in the states of Paraná and Rio Grande do Sul (with 3008 km in length); and concessions operated by the own state public sector.

The private management of roads brought a good level of service for the network under concession. The CNT survey published yearly since 1999 shows that the road extension

classified as good or very good rose from 19.7% in 1999 to 26.1% in 2007. Among the thirty best highways, 24 are toll roads. The concessions offer good traffic conditions and quality service, which has a positive impact on the economy.

In December 2004 a law approving PPP's was adopted by the government. Under a PPP the private sector has the right to receive payments from the user (as in concessions schemes) but also transfers from the government. So far, the regulations about concessions and those about PPPs are independent, in order that a project must be designed either as a concession or as a PPP.

The Federal program

The central government began its program of federal roads concessions in 1993. The main features of the awarding of Via Dutra (i.e. the Rio de Janeiro to São Paulo expressway), which is representative of the main characteristics of projects of the first phase, include:

- The concession was awarded to the bidder submitting the lowest fare;
- The financial structure was 32% of equity and 68% debt, with the latter consisting of 45% from the National Bank of Economic Development (BNDES), 10% from suppliers credit, and 13% from the International Finance Corporation (IFC) and foreign banks;
- Concessions contracts detail the work of construction and maintenance to be carried out by the concessionaire, and daily fines are imposed if the specified schedule is not reached;
- The concessionaire is authorized to start collecting tolls after the initial work is completed; about 4-6 months after the award of the concession;
- The concessionaire takes the traffic risk, but is entitled to have the levels of toll revised if the costs change significantly;
- The traffic along the route is mainly centered in urban areas, rather than long distances, with volumes around 25,000-30,000 vpd in the state of São Paulo and 15,000-20,000 in the state of Rio de Janeiro, and in a range between 80,000 -150,000 near the cities of São Paulo and Rio de Janeiro;
- The same basic rate (toll per km) is charged on each of the four toll plazas along the route, and
- The concessionaire has the right to use alternative sources of revenue, primarily from commercial developments related to concessions (for example, service stations).

CHARACTERISTICS OF THE FIRST PACKAGE OF FEDERAL ROAD CONCESSIONS IN BRAZIL*								
Road Segment	Length (km)	Date of contract signature	Term of concession (years)	Estimated investment (USD mi)	Forecast Vehicle Per day	Investment (UUSD)/ km/ years	Toll fee evolution (UUSD / km)**	
							1998	2008
Rio-Niteroi Bridge	13.2	Dec 94	20	70	72	265,152	0.057	0.144
Rio de Janeiro- Juiz de Fora	179.7	Oct 95	25	150	58	33,388	0.027	0.020
Presidente Dutra	406.6	Oct 95	25	720	197	70,831	0.018	0.040
Rio de Janeiro- Alem Paraiba	144.4	Nov95	25	150	30	41,551	0.032	0.026
Osorio- Porto Alegre	112.3	March 97	20	20	60	8,904	0.030	0.026
Total / Average	856.4	-----	23	1,110	83,4	83,965	0.032	0.045
*excluding the two concessions in Rio Grande do Sul that have been transferred to the federal government.								
** in current values and current exchange rate; while in general fares of public services decreased in American dollars they increased (in real terms) in national currency.								

Source: Consultants' compilation.

The Brazilian experience with toll roads emphasizes several issues with respect to the development of toll roads. Some of these issues are important to best practices in the future. These include the following.

An interesting practice employed was the use of cross-subsidies; cases in which the operating profits of a toll road with high volumes of traffic are used to cover losses incurred on links with low volumes of traffic (or not tolled) in the network (this is particularly used in some states, like Rio Grande do Sul and Paraná). Subsidies are also employed in toll roads individually, such as the Via Dutra, in which the long distance traffic pays the toll, while in some areas the local drivers can enter and leave without being charged.

The overall results of this first package of road concessions were positive despite the numerous problems faced. The lack of experience, the creation of a regulatory agency after the concessions have been awarded, the strategic behavior of government and operators increased by the information asymmetry, were the main challenges faced in this first concessions.

The economic crisis in 2002 represented a challenge for private investors. The crisis started with the presidential campaign. Markets were afraid of the victory of the candidate of the left Luiz Inácio Lula da Silva, leader of the Labor Party (Partido dos Trabalhadores – PT). The Brazilian currency – Real – was devaluated, from 2.35 per dollar to 4 per dollar in 4 months and the country risk rose. As an extreme measure to stop the devaluation and avoid a dangerous crisis, the IMF lent USD 30 billion. Lula won the election in October and took his functions in January 2003, leading the first government of the left in Brazil. The chaos expected by the market did not take place. The government kept

the conditions imposed by the IMF, doing even better in some points. The Real regained value and stability, the country risk dropped and the inflation was drastically reduced.

An example of strategic behavior of government was the unilateral decision of reducing tolls or non-accepting their programmed adjustments, with the objective of attracting public support during the election campaigns. This occurred in many states. In Paraná, only 50 days after the beginning of toll charging, the government reduced fares by 50%. Tolls have been readjusted in 2000 to compensate the loss occurred during this period. While the main problem has been solved, this fact underlines the problem of governmental incoherence between long-term engagements and short-term political interests.

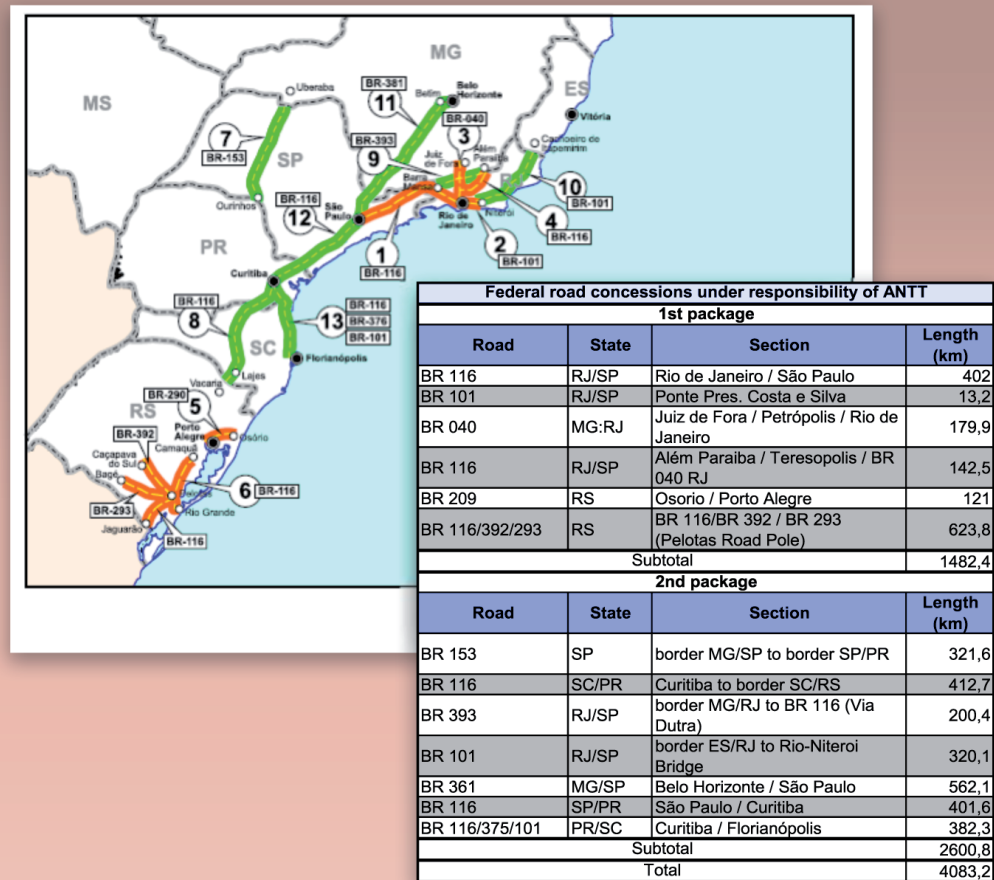
In a survey with 21 Brazilian regulatory bodies realized in 2005 (The World Bank, 2007), more than 50% informed that the Executive interfered at least once in a final deliberation. A new law defining the activities of the regulatory agencies, called "lei das agências reguladoras", whose project was created in 2004 but remains to be approved, aims to strengthen the regulatory role of agencies.

The second package of concessions covered 2,600.78 km, consisting of seven lots. The experience acquired with the regulation of the first concessions was applied in the design of this second package. It includes a better risk allocation giving more responsibilities but also more breathing space to the private operator. The regulation rules are now more focused in economic and quality aspects rather than in the technical requirements for the first package.

CHARACTERISTICS OF THE SECOND PACKAGE OF FEDERAL ROAD CONCESSIONS IN BRAZIL		
Highways	Sections	Length (km)
BR-116/PR/SC	Curitiba – Div. SC/RS	412.70
BR-376/PR - BR-101/SC	Curitiba – Florianópolis	382.33
BR-116/SP/PR	São Paulo – Curitiba (Régis Bitencourt)	401.60
BR-381/MG/SP	Belo Horizonte – São Paulo (Fernão Dias)	562.10
BR-393/RJ	Div.MG/RJ – Entroncamento com a Via Dutra	200.35
BR-101/RJ	Ponte Rio-Niterói – Div.RJ/ES	320.10
BR-153/SP	Div.MG/SP – Div. SP/PR	321.60
TOTAL	7 sections	2,600.78

Source: ANTT (www.antt.gov.br)

FIGURE 1: LOCATION OF FEDERAL ROAD CONCESSIONS IN BRAZIL



Source: ANTT (www.antt.gov.br)

States' concessions program

The lack of appropriate sources of finance for investment in roads is also seen at state levels. The option for self-sustaining roads was reflected even before the launch of concessions programs. Many states have adopted road pricing managed directly by the government.

In general, we can say that at state levels the picture is mixed. For example, in the state of Paraná, the government had been actively hostile to private participation. The new governor announced his intention to submit a bill to the Legislative Assembly of the State proposing the re-nationalization of six awards of roads concessions in the state. None of the contracts was changed, but this behavior introduced uncertainties and treats the stability of such concessions.

Across the spectrum are Minas Gerais and São Paulo. Minas Gerais submitted law projects to the Legislative Assembly to create a legal framework for public-private partnerships and a PPP Fund to participate in financing and guarantees of long-term obligations to the government. One example is the highway MG-50, auctioned through PPP. São Paulo also made the necessary changes in order to adapt its legislation. The most striking fact

in this direction was the bidding of the subway line 4. Both states plan other projects to be implemented as PPP within their multi-annual plans of investments.

Given the lack of public investment in roads, the private sector investments are significant. The program of investment of the 36 concessionaires administrating toll roads in seven states - Bahia, Espirito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná and Rio Grande do Sul - was approximately USD 0.7 billion in 2007, according to ABCR's annual report (2007). This amount represents about 15% of the total investment in roads in the country.

The concessionaires are in charge of about 9,768 km of highways awarded, which represents 6.4% of the Brazilian road network. Revenue in 2007 was RUSD 6.2 billion, with costs reaching RUSD 8.4 billion. Payments for governments reached RUSD 363 million. Additionally, concessionaires paid about RUSD 1.7 million in taxes, bringing direct benefits to 245 municipalities.

The case of Rio Grande do Sul

Among the diversified experiences of Brazilian states, Rio Grande do Sul provides an interesting example. The model used in Rio Grande do Sul was based on the idea of "poles". A pole is a set of toll plazas forming a cordon line (which can be partial or total) around a network hub (or central point where at least three highways converge). The toll plazas are located in at least three of highways converging, with toll collection in both directions (the collection was initially made in a single direction, and a renegotiation of the contract authorized the collection in both directions). The program was based on two main principles: the levels of toll are set by the state, and must be acceptable to users. Other principles were considered:

- The structure of toll collection should maintain a fixed ratio between the values for different types of vehicles; this ratio is directly related to their impact on the deterioration of the pavement;
- Users should understand the basis of toll settings, and how the revenue would be used;
- The system should offer extra benefits for users of non tolled roads; these should include a comprehensive and technically advanced traffic signaling, covering the entire area under tolls;
- The state should evaluate the financial aspects of the system, and
- At the end of the concession, every highway in the system should return to the state in perfect conditions. It happens in general in any case of concession in Brazil, not only in roads and not only in Rio Grande do Sul.

In 1996 the poles were located in only 25% of territory in an area that includes 90 cities, about half the population of the state (50.3%) and 51% of its GDP. This is an important aspect to be highlighted, since it intended to provide a good road standard for the traffic connecting commercial and industrial centers, including traffic between regions exporting agricultural products and the port of Rio Grande, without depending on availability of public funds. The process of bidding was based on the following principles:

- The concession was awarded to the bidder offering the highest tender for a pre-defined level of services and works;
- The bidders must demonstrate expertise in quality control, the successful implementation of construction work, and provision of services;
- The period of concession is 15 years, given both the requirements of public interest as to ensure concessionaires recover the initial investment;
- Revenues of concessionaires come only from the collection of tolls (no compensation of the State if the demand is lower than expected);
- There is transparency on how the revenues are used;
- It is forbidden to give concession privileges for specific groups of users;
- The bidding process follows the pre-defined legal procedures.

CHARACTERISTICS OF ROAD CONCESSIONS IN RIO GRANDE DO SUL							
Concessionaire	Length (km)	Number of toll plazas	Duration (years)	Date of contract signature	Date Operations started	Total investments (millions USD)	Toll fee 2008 (UUSD / km)
BRITA	144.9	3	15	20-05-98	09-11-98	N.A.	0.063
CONVIAS	173.7	4	15	14-04-98		128.640,06	0.062
COVIPLAN	250.4	4	15	21-02-98	29-12-98	92.313,98	0.043
METROVIAS	535.9	5	15	14-04-98	09-12-98	142.654,22	0.025
RODOSUL	132.7	3	15	15-06-98	31-12-98	26.400,73	0.061
SANTA CRUZ	208.0	3	15	29-05-98	09-11-98	9.844,05	0.039
SULVIAS	317.8	6	15	09-04-98	09-12-98	125.297,91	0.067

Source: ABCR (2004), DAER (2008)

One of the main challenges faced by the concessions program was the development of alternative routes of escape through the construction of bypasses to avoid the payment of tolls by users. This action was encouraged by some mayors as a populist measure to win elections. These bypasses are a serious problem that profoundly affect revenues and costs as well as the safety of highways.

In Rio Grande do Sul there was also some friction between the government and the concessionaire. The government elected in 1999 was against the concessions and criticized the precedent government for implementing them. The new government introduced some changes in the program and transferred two poles (formed only by federal roads) to the federal government. Also, the awarding process of the metropolitan region of the states' capital –Porto Alegre – was interrupted and transferred to federal responsibility.

Another concession, in the region of Santa Maria, had been awarded but, by governmental decision, never operated; the case is still being discussed in the tribunals.

The readjustments, which should be automatic as stated in the contract, are a constant source of political discussion; some politicians argue what has been stated in the contracts. These discussions influence the public opinion and hamper public acceptance.

Another challenge was the low traffic levels compared to forecasts, due to these bypasses but also probably as a consequence of the economic optimism in the country and especially in the region during those years. The government refused to solve this problem during a long time generating a high risk situation.

Conclusions and lessons learnt

Brazilian experience in partnerships between the public sector and the private sector in the provision of infrastructure has been remarkable. Various types of concessions were awarded, and political decisions strongly influenced the risks involved in the program.

The private investments in roads are considerable and the quality of roads under private operation is high. Private participation is viewed as the only way to achieve the necessary investment in infrastructure the country needs to satisfy its needs.

Economic shocks, threats of expropriation, lack of adjustments in prices, opportunistic behavior of governments and concessionaires, local politicians building routes of escape, provide a range of practical constraints faced in implementing concessions programs and highlight the difficulties of reforms implementation.

However, a set of public policies have been implemented and the experience acquired by both public and private sectors were applied in the design of the second package of road concessions. The regulation on public-private partnerships (PPP) provides a more flexible framework to private participation in the transport sector.

In 2007, the first public-private partnership for highways in Brazil effectively started. In Minas Gerais, works began on the recovery and maintenance of MG-050, a highway of major logistic importance for the State. At the end of the year, the government of Pernambuco signed an authorization to build a 320-meter long bridge and a 6.2 km long road at Praia do Paiva.

In spite of the problems discussed here, a summary of the Brazilian experience shows that private ownership of infrastructure has, in general, led to better management and investments in the rehabilitation of the network. This is a key issue in terms of the country's competitiveness. The rethinking and promotion of financing models through PPP must be priority to Brazil.

Further information

This case study is largely based on the chapter 12 of:

Senna, L.A.D.S. and Michel, F.D. (2006) *Rodovias auto-sustentadas: O desafio do século XXI*. CLA. Brazil.

Complementary sources are:

ABCR (Brazilian Association of Road Concessionaires) www.abcr.org.br

ANTT (National Agency for Land Transport) www.antt.gov.br

Karisa Ribeiro, K., Dantas, A. and Yamamoto, K. (2007) The Brazilian Experience in Road Concession: Past, Present and Future. World Conference on Transport Research. Berkeley, US.

LASTRAN (1998) Avaliação do Impacto da Implantação de Concessões nas Rodovias do Rio Grande do Sul. Laboratorio de Sistemas de Transportes, UFRGS, Porto Alegre – RS, Brasil.

The World Bank (2007) Como Revitalizar os Investimentos em Infra-Estrutura no Brasil: Políticas Publicas para uma Melhor Participação do Setor Privado. Report n° 36624-BR.