

**Road Concessions:  
Lessons Learned from the  
Experience of Four Countries**

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Best Practice Study

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# I. Introduction

The debt crisis has taught the countries of Latin American and the Caribbean that the fundamentals of a well-behaved economy are stable prices, a competitive domestic market open to international trade, and major investments in human capital and infrastructure. To maintain current rates of growth and welfare, the region needs approximately US\$50 billion in annual infrastructure investment.<sup>1</sup> The challenge facing the governments of the region is to facilitate these investments without jeopardizing other economic goals.

Two distinct strategies<sup>2</sup> for the provision of infrastructure services have been followed in LAC. From the middle of the 20th century until the 1980s, the provision of infrastructure services was dominated by a traditional model, wherein a public sector entity owned, financed and managed infrastructure assets. Since the end of the 1980s, a new model has gained prominence wherein the public sector regulates the conditions under which private firms provide infrastructure services, thus guaranteeing a balance between the interests of consumers and those of producers. In the traditional model, public sector intervention substituted for market signals, while in the new model, government regulation only complements markets. In other words, regulation promotes competition in the market and for the market. A basic principle of the new model is that markets should be involved in all or at least some phases of the process of providing infrastructure services. The two models also differ in the way they treat the pricing of services.

Whereas service costs were not covered in the traditional model, the new model does cover service costs and explicitly recognizes that linking prices to costs is the most effective way to satisfy consumer demand.

The new model has been used for the provision of road services in Latin American countries. However, models of road services differ from those providing other infrastructure services at least in three respects. First, the scope of competition in the markets is more limited in the provision road services than in other infrastructure sectors. Nevertheless, competition for the market should be a requirement for efficient private sector participation in roads. Second, revenues from consumers often need to be supplemented with payments or payment commitments from a public agency, while in other infrastructure sectors such as electricity and telecommunications revenues from consumer are sufficient to cover the cost of services. The reasons for this are the uncertainty of future revenues from toll roads and the fact that road investments cannot be easily divided. Third, construction companies dominate private sector involvement in road services, while in other infrastructure sectors the role of input suppliers is more limited. This feature has two relevant consequences for road concessions. One is that construction companies request financial structures with reduced recourse to sponsors<sup>3</sup> because they are often not prepared for long-term financing. The other is that there may be incentive compatibilities between the roles of

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<sup>1</sup>See Chrisney, M. D. ( 1996)

<sup>2</sup>See Klein, M and N.Roger ( 1994)

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<sup>3</sup> Sponsors are the economic agents who are shareholders of the concessionaire. In other papers, see Trujillo (1997), the public agency granting the concession is denominated by the term of sponsor.

road contractor and concessionaire.

The objective of this paper is to analyze some issues and challenges related to private toll road developments in Latin American countries, and explore new schemes to mitigate some problems that often appear in road concessions. The paper is illustrated with the regulations of four countries and four concession contracts. The concessions are *Acceso Norte* to Buenos Aires in Argentina, *El Cortijo-el Vino* in Colombia, *Talca-Chillán* in Chile, and *Ruta Interbalnearia* between Montevideo y Punta del Este in Uruguay.

The remainder of the paper is organized into three sections. Section II discusses de main issues surrounding road concessions, including the legal framework for private sector involvement in road services, the features of concessionaires, the criteria for selecting proposals, main risks of toll roads, public guarantees and contributions in concession contracts, and financial issues of concessionaire companies. Section III discusses alternative mechanisms for private sector involvement in road construction and operation. Section IV summarized the lessons learned.

## II. Main Issues of Road Concessions

### 1. Legal Framework for Private Sector Participation in Roads

The most common legal vehicle for private sector participation in roads is the concession. Under a typical concession contract, a private sector firm builds or rehabilitates, maintains, operates and finances a road for a period between twenty and thirty years. The government, be it local or central, grants the private firm the privilege of receiving toll payments from road users. In most Latin American countries the concession processes is regulated by legislation. In some, a single law applies to all concessions (water, electricity, roads) while in others there are specific laws for regulating road concessions. Although concession regulation in most countries were initiated long ago, many countries have modified and updated old regulations during this decade.

#### *Basic Regulations*

A profusion of legislation regulates concessions in most Latin American countries. However, only a few laws and decrees define the basic legal framework. The laws and decrees containing the concession framework of the countries analyzed in this paper are the following:

C Argentina. The legal framework is included in Law 17.520 of 1967. This law is modified Law 23.696 of 1989 and Government Decree 1.105/89. The Decree 2637/92 authorizes the government to contract with the private sector the access roads to Buenos Aires through toll systems.

C Chile. Government decrees from 1984 and 1991 initially regulated concessions. However, Law 19.252 of 1993 specifies some process rules for ensuring concession conditions to private investors. This law was modified by law 19.460 of 1996.

C Colombia. Two laws regulate road concessions: Law 80\1993 and Law 105\1994. The former regulates all public works concessions, while the latter refers specifically to road concessions.

C Uruguay. Road concessions in Uruguay are regulated by Law Decree 15637 of 1984. This regulates the concession of any public work and includes general principles that should be later specified in the concession contracts.

#### *Elements of Regulatory Frameworks*

Concession frameworks are not uniform across countries. Nevertheless, most regulations specifically include some key elements of concessions. These elements are the following in the case countries.

C Authority. The authority granting road concessions is often the central government. However, in some countries, local governments and autonomous public agencies may also grant concessions. Concessions are awarded by the central government in Argentina and Chile, while in Colombia and Uruguay, pertinent legislation authorizes local authorities,

municipalities and departments to grant them.

C Scope of Concessions. Road concessions usually include the following activities: (1) the construction of a new road or the rehabilitation of an existing one; (2) the operation and maintenance of the road; (3) administration of the toll system; and (4) the financing of investments. This practice of bundling the functions of a road concession, common in Latin America, simplifies the administrative process. However, it may have negative effects in terms of efficiency and cost. The reason is that constructing, financing and operating roads are activities that require different expertise. A single selection may force public authorities to choose a consortium in which the mix of expertise is not the most appropriate. Section III discusses unbundled schemes. Even though they may increase administrative and coordination cost, they may allow a more efficient allocation of functions among the private sector companies. The overall advantages of unbundled road concessions versus bundled schemes should be evaluated in each case.

C Term. Most regulations state that concessions have to be granted for a fixed term that is not specified in the general regulations. Nevertheless, it must be fixed in the contract or bid documents. Some regulations allow authorities to increase the concession term to compensate the concessionaire for an unexpected fall-of in road revenues. For instance, in Colombia and Chile, authorities are allowed to renegotiate the initial term, if concession conditions change. Modifications of the concession terms are difficult to negotiate

and can bring problems. This paper points out that a variable concession term that depends on the actual values of some relevant concession parameters would allow a mitigation of traffic risk borne by operators without incurring in renegotiation costs.

C Conflicts. Regulations give the public entity the authority to modify and terminate concession contracts and do not usually specify the procedures and processes to resolve conflicts between public authorities and the concessionaire. Most regulations give public authorities the capacity of modifying contract conditions in exceptional situations that are not well defined in general regulations. Therefore, at the time of the investment, the ability of the concessionaire to defend the rules governing the investment is limited. The dominant position of the public sector is evident even in countries in which regulations promote balanced mechanisms. For instance, in Colombia, Law 80/ 1993 encourages contracts to include fair schemes to resolve conflicts and Law 105/94 limits the ability to modify contracts to the period during which the concessionaire is undertaking the construction or rehabilitation work. However, such provisions have not been included in the concession contract for the project *El Cortijo-el Vino*.

C Selection Process. Most regulations establish, explicitly or implicitly, that concessions should be granted through a public bid. While Argentine regulations do not require a public bid when the concessionaire is a public entity, Decree 2637 of 1992 which sets the rules for the concession of access roads to Buenos Aires, established public

bids as a requirement for private concessions. Colombian regulations require a public bid for concession roads. However, if the public authority declares the bid vacant because the proposals do not meet bid requirements, it can then contract directly with a supplier. This has often been the case. For instance, the projects *El Cortijo-el Vino* and *Cali-Candelaria* were declared vacant and were later negotiated with a sole bidder.

## 2. The Concessionaire: Shareholder Composition

The concessionaire is the legal entity to which the concession is granted. A concession contract is signed between the concessionaire and the public authority. Most regulations require

that the concessionaire be an incorporated company in accordance with national legislation. This section focuses on concessionaire shareholder composition and the equity participation of the concessionaire company. According to Table 1, the equity of concessionaire companies in many Latin American contracts is held by construction companies. These companies wish to control the concessionaire equity to ensure that they will be the contractors for road construction. Control by construction companies may help to attract financing to road projects; however, it also raises problems that should be properly addressed. First, while these companies have expertise in public works and short-term financing, their expertise in operating facilities and long-term financing is limited. Construction compa-

TABLE 1  
Equity Participation by Construction Companies

	Equity Participation Construction Companies	Net Worth/ Assets <sup>a</sup>	Concession Date
<b>Argentina</b> Acceso Ricchieri	Huarte (Spain) Aragon (Argentina) 100%	n.a.	1993
<b>Argentina</b> Acceso Norte	Dragados (Spain) Impregio (Italy) Sideco Americana (Argentina) 100%	1 year: 25% 2 year: 18% 3 year: 20%	1993
<b>Chile</b> Talca- Chillan	Delta Ferrovia Chile (subsidiary of Ferrovia Spain) Cruz Blanca 74%	30%	1995
<b>Chile</b> Acceso Norte a Concepcion	Tribasa Chile 80%	30%	1994
<b>Colombia</b> El Cortijo - El Vino	Several construction companies more 80%	32.3%	1994
<b>Colombia</b> Cali-Candelaria	Ferrovia (Colombia) 51%	28%	1996
<b>Uruguay</b> Ruta Interbalnearia	Several companies more than 80%	1 year: 22 % 2 year : 27 % 3year: 25.5%	1994

Source : Price Waterhouse Reports (1996)

<sup>a</sup> Unless the percentage per year is specified, the figure is the average ratio of the first three years.



nies are reluctant to accept financial arrangements in which the concessionaire is required to have a large equity participation because that implies that the construction company either undertakes a large financial investment or loses control over the concessionaire. This in turn, may jeopardize the road construction contract.

Second, there may be an incompatibility in incentives between the role of the construction company as a shareholder and as an input supplier. For instance, while shareholders attempt to minimize the cost of inputs, suppliers attempt to maximize it. In addition, shareholders recover their capital through long-term project cash flow, while a company that is both a shareholder and an input supplier may recover its investments through the construction process.

Third, road projects with small equity participation and small financial support from sponsors have difficulties borrowing for the long term. When lending long term, investors require an appropriate equity-to-debt ratio or other financial enhancements to ensure that the debt service is paid on time.

Low equity participation and control of concessionaires by construction companies might contribute to the problems of Spanish concession program between 1960 and 1980. Gomez-Ibañez and Meyer (1993), summarizing a presentation by Spain's Minister of Public Work, explain the problems of Spanish toll roads in 1984 by arguing that it was a mistake to allow companies to invest as little as 10 percent in equity. The undercapitalization of the toll roads meant that their annual debt service payments were nearly as much as their total shareholder equity. When the companies got into trouble, they had few resources

to draw on. In addition, the construction companies should not have been allowed to become major shareholders in the concessions, and the awarding of a construction contract to important shareholders should not have been banned. This conflict of interest contributed to optimistic projections of construction cost and traffic volume when some concessions were awarded.

### **3. Selection Criteria**

The selection of road concession proposals usually is based on both technical and economic criteria which are stated in the general regulations for road concessions (Chile) or in the bidding documents (Colombia). The economic criteria most often applied when selecting the winning bid are the minimum toll level and the minimum concession term.

#### *Tolls and Concession Terms*

As already explained, road concession regulations normally require a fixed term for concession contracts that is long enough to recover the investment costs. Fixed-term contract selection processes have two versions. In one version, the public authority fixes the concession term and the concession is awarded to the lowest cost bidder. In the other, the public authority fixes the toll and the concession is awarded to the shortest term bidder. In a world of perfect information the two proposals would be equivalent. However, limited information usually prevents this from happening and problems arising in each case may be different. Let us consider some of these problems.

When public authorities fix the concession term and private concessionaires bid on the toll, public authorities usually do not take into account the specificity of each project for fixing the term. The concessionaire proposes tolls for recovering the full cost of investment during the fixed concession term. This practice leads to lower tolls on roads with a higher volume of traffic, thus creating congestion, while roads with less traffic will have higher tolls, preventing an increase in road users. Moreover, toll prices that are not proportional to the length of roads may be socially rejected. Access roads to Buenos Aires illustrate projects with different economic features and

that construction will increase the value of surrounding lands, they may choose to institute a tax on the increase in the value of the land and reduce tolls. Thus, authorities internalize the spillover of the road by sharing its cost among all beneficiaries (i.e. direct users are not the only ones paying for the road).

Alternatively, given incomplete information and uncertainty on relevant rentability parameters, when selections are based on lowest toll or term, the following problems arise.<sup>4</sup>

C The assignation of traffic risk may not be efficient because the concessionaire bears

TABLE 2  
Access Roads to Buenos Aires

	Acceso Norte	Acceso Oeste	Acceso Ricchieri
Length	120 Km	60 Km	60 Km
Investment 1st. Phase	US\$ 350 m	US\$ 150 m	US\$ 100 m
Total Investment	US\$ 622 m	US\$ 332 m	US\$ 219 m
Daily Traffic	200,000 users	100,000 users	110,000 users
Toll (\$\100 per Km)	0.833	1.666	1.00
Concession Term	23 years	23 years	23 years

Source : Price Waterhouse Reports (1996)

equal concession terms. The result is that tolls per kilometer differ among them, and are lower in high traffic roads (See Table 2).

When public authorities fix the tolls and private bids set the term, public authorities are able to manage the pricing policy which may be necessary for optimal allocations when externalities and social restrictions are present. For instance, if the public authority expects

most of the traffic risk<sup>5</sup> in both versions. Since the concessionaire can manage only a

<sup>4</sup> For a discussion of this point see Engel, E. and others (1996) and Trujillo (1997).

<sup>5</sup> Minimum traffic guarantees transfer part of the risk to the public sector. If these guarantees are present, demand risk is shared between investors and the public sector.

small portion of this risk, mechanisms with a fixed concession term are inefficient. Efficiency requires transferring manageable risks to those agents able to manage them and diversifying manageable risks. Inefficiency increases with the variance of expected traffic and the degree of risk aversion of the agent bearing the nonmanageable risk.

C Optimistic proposals may be encouraged because predictions of a large volume of traffic result in bids that require shorter terms or lower tolls. However, the concessionaire does not bear the cost of faulty traffic forecasting because most Latin American public authorities are reluctant to allow concessionaires to go bankrupt. The bankruptcy of a road concession may ruin a country's private infrastructure program. Therefore, public authorities and the concessionaire renegotiate the concession conditions.

C Modifications of contract conditions are difficult because road concession terms are large authorities often need to modify contract conditions to account for economic and political changes. Calculating a fair compensation for the concessionaire is difficult. Concessionaires will often exaggerate losses and minimize benefits in order to become eligible for a higher level of compensation. These modifications may occur often: constructing a new road, increasing tolls to avoid congestion, decreasing tolls to encourage new users.

### *Financial Proposal*

The financial proposal for the road has not seemed to be a relevant selection criterion in the studied cases because concessionaires are normally not forced to implement the financial

structure included in the proposal. Therefore, the sponsors and authorities usually pay little attention to ex-ante financial proposals presented in the bid. The concessionaire makes the financial arrangements after the concession is granted, the consequences are either delays in the construction due to the delay in generating appropriate financial backing or a weak financial structure for the project.

If financial proposals are going to play an important role in the selection process, then enforceability of the proposal should be required to avoid bids that later cannot be implemented. This means that financial proposals should include the commitment of sponsors or financial institutions for implementing them. Since financial institutions will not usually commit funds before the concession contract is signed, selection processes should give more importance to sponsoring direct commitments with the proposed financial plan. Increasing the sponsors' requirements of equity or quasi-equity would strengthen financial plans and assist in completing project financing. However, strong financial requirements from sponsors would reduce the number of potential proposal, thus reducing competition. For this reason, some regulations set a lower limit to equity participation.

Although most regulations establish that the economic and financial structures of the proposal should be taken into account in the concession contract and in the financial evaluation of the proposals, these parameters do not seem to play a major role in concessions. For example, the bidding documents for the *El Cortijo-El Vino* concession said that the proposals should include a financial plan including procedures and guarantees. However, none of the proposals included strong commitments

from banks ensuring that financing would flow to the projects. At most the proposals included letters of intention with weak commitments. Chilean regulations establish that equity participation must be at least 20% of the investment, but this requirement may not be sufficient for ensuring financing after the concession is granted. Argentine regulations require that sponsors have a minimum amount of net assets that is determined as a function of project cost.

#### 4. Risks of Road Projects

Toll roads face risks of different nature, some are quite specific, such as rights-of-way, construction and traffic revenues risk, while others are common to all infrastructure projects (political, financial and foreign exchange risk). This paper discusses only issues regarding the risks specific to toll roads. Fishbein and Babbar (1996) present a review of risks associated with road projects.

*Rights-of-way.* Acquisitions of rights-of-way may delay the road construction program and increase its cost. Although, the public sector is responsible for legally enforcing rights-of-way in most countries, the direct cost of right-of-way acquisitions is, in many cases, borne by the concessionaire. For example, while the rights-of-way for the *El Cortijo- El Vino* (Colombia), *Talca-Chillan* (Chile) and *Ruta Interbalnearia* (Uruguay) roads were acquired by the public authorities, the concessionaires bore their full cost. Fishbein and Babbar (1996) reported that the government has provided the right-of-way at no cost in most of the projects studied by them. In particular, they point out that the government of Malaysia made all land required for highway construction available to the concessionaire free of charge. The acquisition of rights-of-way may also increase road costs by changing the initial

construction program. Concessionaires usually bear the cost of reprogramming road construction. However, the concession contract *El Cortijo- El Vino* allows the concessionaire to terminate the contract if right-of-ways delays prevents them from executing the construction program. Penalties for construction delays do not usually apply when they are due to legal problems arising out of right-of-way acquisitions.

*Construction.* In evaluating a greenfield toll road, the first issue that must be addressed is the completion of the project with respect to time, budget and quality. This risk is higher for roads than for other infrastructure projects because road construction is subject to weather and geological conditions, the availability of appropriate authorizations and the availability of local labor. Most regulations establish, as a general principle, that the concessionaire should bear all construction risks. The concessionaire frequently allocates this risk to the road contractor via a turnkey contract. When the construction company does not control the concessionaire, turnkey contracts are an effective mechanism for transferring the cost overrun to the contractor. However, concessionaires controlled by construction companies may not succeed in transferring the cost overrun to the contractor even when using turnkey contracts because the contract usually includes clauses for the revision of construction costs that should be applied under exceptional circumstances. A contractor who also controls the concessionaire can easily apply those circumstances. Lenders require that construction risk be borne by the contractor by requiring turnkey contracts. They may also require other conditions to ensure road completion on time and within budget. For instance, the concessionaire shareholders must compensate construction cost increases with equity incre-

ases. This condition was included in the financial arrangements of the Buenos Aires *Acceso Norte* (see Box 1).

*Traffic and Revenues.* The major risk for toll road projects is whether the projected traffic and revenues will be achieved. Two issues will be discussed in this regard: traffic forecasting and sharing traffic risk between the public and private sector. This subsection address traffic forecasts, while sharing traffic risk is discussed later.

The quality of traffic forecasts is affected by many technical factors, including the quality of the data, the modeling schemes, and skill of the forecasting team. However, traffic forecast may also be biased by the willingness of local authorities or private sector firm to undertake the project. Technically, traffic forecasts for projects to rehabilitate and expand existing roads are easier than those for new road projects because current users and their behavior are known in existing roads, thus providing a more accurate basis for modeling use after the rehabilitation. Failures to achieve expected revenues in toll roads are commonly reported. Muller (1995) compared original traffic revenues with actual ones for fourteen sections of toll roads in the United States and found that actual revenues were lower than forecasted during the first four years of operation. On average, revenues missed projections by anywhere from 20% to 75% in the first year after opening. Although similar studies for toll roads in Latin America are not available, the report on the *El Cortijo- El Vino* road shows that during the first nine months of operation actual traffic was 81,6% of projected traffic. Medium-term forecasts seem to be more conservative, but they are useless for financing the project. The variability in the accuracy of toll revenue forecasts for the first years argues

for added protection during the early years. For instance, these may include larger debt service coverage, restrictions on distributing profits.

Toll revenues forecast may also have a bias due to the willingness of economic agents to show the feasibility of a toll road. As previously mentioned, the Minister of Public Work of Spain suggested that sponsors' low equity participation and concessionaire control of construction companies may have led to overly optimistic forecasts. Walmsley and Pickett (1992) suggested that the main reason for optimistic forecasts of local transit projects was the willingness of local authorities to demonstrate the need for these projects.

Due to the importance of good traffic forecasts, financiers and rating agencies hire their own experts for forecasting traffic and revenues or for auditing sponsors and concessionaire traffic forecasts. The Euromoney publication *Project Finance* (1996) includes a good overview of the traffic forecasting processes and provides a set of key procedures that should be taken into account.

## **5. Public Sector Contributions and Guarantees**

Public authorities support private sector roads through contributions and guarantees which play different roles in reducing the risk borne by a private concessionaire. The main differences are the following: First, contributions are paid to the concessionaire regardless of the flows of traffic and revenues, while guarantees are dependent on traffic flows. Second, calculating the impact of contributions on the cost borne by the private sector is easier than doing it for guarantees. Third, fiscal impacts of guarantees are also more difficult to assess.

Road projects which have public sector contributions or guarantees bear the risk of default of the public agency due to unwillingness or lack of capacity. Investors feel uncomfortable with this risk because they cannot manage it. Investors cannot impose financial restrictions on the public agency or request collateral to back commitment as they can with private borrowers. Therefore, contributions and guarantees may not reduce the overall project risk because these schemes transform traffic risk into credit and political risks. If the public agency lacks credit records, the guarantees may not bring added value to the project. Nevertheless, investors prefer bearing this risk and thus reducing traffic risks

The regulations of Argentina, Colombia, Chile and Uruguay allow the issuance of public sector contributions and guarantees to concessions. However, the specific regulations for the concessions of access roads to Buenos Aires prohibit subsidies, guarantees or contributions. The four cases analyzed in this paper do not receive contributions, but the *El Cortijo-El Vino* (Colombia) concession and the *Talca-Chillan* (Chile) concession include revenue and traffic guarantees. The amount of public contributions required may be fixed through the selection process. For example, the bid document for *El Cortijo-El Vino* establishes that proposals may request guarantees for a percentage of the traffic estimated by the public agency (INVIAS). Proposals will be rated in inverse proportion to such requested percentage. Nevertheless, the formula for the final evaluation of proposals also included other parameters, making it difficult to evaluate the role of the requested guarantees in the selection process.

### *Types of Contributions*

Road concessions use many different public sector contributions modalities. For example, the contribution may be periodic or one time lump sums; they may be monetary or nonmonetary (for example, rights over lands surrounding the new road). Contributions may also be contingent or noncontingent (i.e. taking the form of guarantees of minimum revenues). Monetary contributions are common in Latin American countries, while land right contributions are more common in East Asian countries. The following comments on contributions are appropriate.

- C One-time contributions reduce the investment cost borne by the concessionaire. Therefore, their effects are similar to a reduction in road cost. They are transparent from a fiscal standpoint. Because these contributions are usually paid before or during the construction period, the concessionaire and lenders do not bear public sector risks or political risks during the operation.
- C Periodic monetary contributions allow a greater control of the concessionaire than one-time contributions. Periodic monetary contributions are usually established when revenues from road users are not sufficient to cover construction and financial costs. The disbursement of periodic payments depends on the capacity and the willingness to pay of the relevant public agency. Therefore, concessionaires receiving these contributions bear the public sector credit risk. Periodic contributions allow governments to defer public expenditures. Since the present value of these contributions does not count as public debt, they are sometimes used to keep the appearance of a small public deficit without real private

sector involvement in the road. For example, road concessions in which tolls are low, operation is managed by a public agency and construction cost are paid through public periodic contributions are schemes designed to artificially reduce the public deficit.

- C Non-monetary contributions. The government may grant the concessionaire the right to developing adjoining lands. Since road developments usually increase the value of adjoining lands, land rights give the concessionaire the opportunity to diversify the revenue base. While this practice has not been used in the study cases, Colombian regulations state that road investments may be recovered from tolls and from the increase in land values.

### *Guarantees*

Minimum traffic or revenue guarantees, in which the public sector compensates the concessionaire in cash if traffic or revenues fall below a specified minimum level, are a common practice in most Latin American countries. The minimum traffic or revenues are set below the corresponding expected value to reduce public sector exposure and keep the private sector incentive to increase traffic or revenues. Nevertheless, sponsors sometimes request guarantees for a large proportion of expected revenues. For instance, the government of Chile guarantees 50 percent of expected revenues in the *Talca-Chillan* road, and the concessionaire of *El Cortijo-El Vino* (Colombia) requested guarantees for the whole value of expected revenues.

When the public sector guarantees minimum revenues to a road project, attention should be given to the following aspects:

- C Liquidity Risk. If the public sector guarantees minimum yearly traffic revenues, the public sector should make the payments when the concessionaire's actual revenues do not reach the minimum. Since it is not known in advance whether or not the payments will have to be made, it is not usually included in the public budget of the corresponding year. In other words, payments are reported in public budgets only after the fact and they flow to the concessionaire at least one year late. Thus, unless that schemes for advancing payments are established, the project bears liquidity risks.
- C Upside and Downside Deviations. Public sector guarantees that set a lower limit for concessionaire revenues also sometimes set a revenues ceiling. These schemes are useful in providing comfort to investors while still limiting private return. However, to prevent reducing the concessionaire's incentives to increase revenues above the ceiling, a percentage of revenues above the upper limits should accrue to the concessionaire.
- C Insufficient revenues. To overcome budgetary restrictions, public authorities may be tempted to use guarantees not for reducing the uncertainty of traffic revenue flows but for compensating insufficient revenue flows. When there are large discrepancies between the forecasts made by independent consultants and those made by the public authority, and a large portion of expected revenues are guaranteed, then the guarantee scheme often plays the role of a contribution scheme.

## 6. Financial Issues

### *Recourse to Sponsors and Project Finance Structures*

Sponsors often prefer a limited recourse project finance structure to limit their financial risk to the amount of their equity investment. Nevertheless, it should be clear that most project finance structures have some recourse to sponsors which is variable along project stages. For example, road financing is usually

company. After construction, the recourse to sponsors usually is limited to equity. However, in some cases, lenders request additional involvement from the sponsors after the construction period. For example, lenders may request sponsors to increase equity when maintenance and operation costs are larger than expected in the initial financial plan. In other cases, lenders request additional equity from sponsors if actual traffic is lower than forecasted (see Box 1).

### *The Capital Structure of Road Projects*

#### BOX 1.

##### **Sponsors Recourse**

###### *Acceso Norte a Buenos Aires*

The concession for building the north access road to Buenos Aires was granted to a consortium of three construction companies: Dragados (Spain), Impregilo (Italy ) and Sideco Americana (Argentina). The concession contract was signed with AUSOL in 1993. Citibank is the concession financial advisor. The construction period, 1994-1996, was financed through equity (US\$80 million) and a syndicated loan led by Citibank. (US\$250 million). The sponsors bear all construction risks as well as traffic risks.

- C **Construction Risks.** In particular, sponsors must increase equity by the same amount of construction cost increases. An independent consultant controls construction to detect equity requirements due to cost deviations.
- C **Traffic Risk.** During the six first months of operations, highway traffic will be measured by an independent consultant and additional equity will be set by the sponsors if actual traffic is below 90% of expected traffic.

Source : Price Waterhouse Reports (1996)

structured so that there is recourse to sponsors during the construction phase. However, when contractors do not control the concessionaire, and these are companies which enjoy a high reputation and provide appropriate performance guarantees, private banks are willing to finance construction without recourse to sponsors. This is not the case in most road concessions in Latin America where concessions contractors control the concessionaire

There are three broad categories of capital and loans used in project financing: equity, subordinated debt and senior debt. Even though this is not the place to discuss these categories fully, some issues regarding the distribution of funds among them will be analyzed.

*Equity.* The equity investment in a project financing structure represents the risk capital.



Equity investors are the last priority for repayment. Lenders have two main motivations for requiring equity investments in projects. The first is to ensure that the cash flow generated by the project is sufficient to pay operating expenses and service the debt. The higher the debt burden, the greater the lender risk. Greater risks may be compensated with higher rates of interest. However, there is a limit to the risk that long-term investors are willing to accept even though higher rates of interest would be offered. The second motivation is that lenders do not want sponsors to be able to step out of the project easily, but to be committed to the project during the entire debt term.

When sponsors are also the road construction contractors, committing sponsors to the project in the long run may require more equity participation than when sponsors and contractor belong to separate interest groups. The reason is that sponsors may recover their initial equity, through their involvement in the construction of the road, long before the senior lenders receive their payments.

*Subordinated Debt.* Subordinated lenders are unsecured. Subordinated debt service is paid only after operation and maintenance costs as well as senior debt service are paid. Therefore, it may be considered as equity by senior lenders for purposes of computing debt to equity ratios. Senior lenders sometimes require subordinated debt from sponsors to cover construction overruns. The concessionaire may issue subordinated debt to cancel a portion of construction payments. This practice may have several purposes: increasing the commitment of the contractor with the concessionaire results and reducing concessionaire financial needs. Subordinated debt may increase the bind of some sponsors to the project without given them the full control of the company as

sponsor equity does. Subordinated debt has also a lower cost than equity.

*Senior Debt.* Commercial banks are the main providers of loans to road concessions in the cases studied (see Table 3). The financial plans presented during the bid processes usually include institutional debt from pension funds and institutional investors. However, when the data for this paper were prepared, commercial banks were the main lenders of the projects.

#### *Credit Rating Toll Roads*

Rating agencies may provide an objective view of the creditworthiness of a road project. According to Fabozzi and Nevit (1995), the best-known commercial rating agencies in the United States are Standard and Poor's, Moody's Investors Service, Duff and Phelps credit Rating Company, and Fitch Investors Service. However, toll road rating is not common in Latin American countries. For instance, the only Latin American toll road reported as rated by Standard and Poor's (1996) is the one in Cuernavaca, Mexico. Among the four cases reported in this paper, only Autopistas del Sol, the concessionaire for the *Acceso Norte* road in Argentina, uses a rating agency for evaluating credit risks. Standard and Poor's report a BB rating<sup>6</sup> for US\$380 million issued by *Autopistas del Sol*. Standard and Poor's (1997) provides a good review of the main issues that are relevant for evaluating the credit risk of toll roads. While most of them have already been discussed, some specific recommendations are presented next.

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<sup>6</sup>The symbol used by Standard and Poor's and other agencies are in Nevit and Fabozzi (1995) page 44. A BB- issue is a distinctly speculative issue, it is not an investment grade.

TABLE 3

	<b>Argentina</b> Acceso Norte	<b>Colombia</b> El Cortijo-el Vino	<b>Chile</b> Talca- Chillan	<b>Uruguay</b> Ruta Interbalnearia
Commercial Banks	US\$250 million	Up to US\$10 million	US\$112 million	US\$4 million*
Loan terms	Construction* period plus six months	Local currency (18 months) Dollar loan (3 years)	10 years	5 years
Rate of interests	n.a.	DTF* + 6 % Libor + 4%	TAB+1.85% Libor+2.5%	Libor+2.5%
Currency	US Dollar	mixed	mixed	US Dollar
Recourse to sponsors	Medium	Medium	Low	Full

Source : Price Waterhouse Reports (1996)

\* Financing for 1996

\* DTF is the average of the rates of interest of Bank liabilities with 90 days maturity. This value is calculated weekly by the Banking Supervision Institution (Superintendencia Bancaria)

\* After construction, a long term loan is expected

### *Concession Agreement and the Legal and Regulatory Environment*

The S&P report stresses the following specific points: (1) definition of the service area; (2) conditions for transferring the concession; (3) clear and concise pricing rules; (4) force majeure events; (5) default and termination provision including payment mechanics; and (6) dispute resolution mechanisms.

### *Construction*

All credit rating agencies address this risk carefully. As pointed out previously,

construction risk is one major risk borne by road concessions. Rating agencies conduct internal and external technical analyses of the construction arrangement. Most rated projects employ fixed price, date-certain contracts. However, the contract should be drawn up tightly to ensure that the scope of uncertainty is limited and the construction consortium assumes most of the completion risk.

### *Traffic*

The report states that Standard and Poor's expects a detailed feasibility study reviewing the underlying economic underpinning and

project specific issues that result in the projected traffic and revenue forecasts. The forecasts should clearly state all the assumptions. The agency also expects that several sensitivity analyses will be performed to simulate normal changes in economic conditions and external factors (such as fuel prices).

### *Financial Projections*

Standard and Poor's stress the issue of debt service coverage in financial projections. This is calculated by dividing annual net revenues by debt service (interest and principal). Typical coverage for an existing facility is 1.5 to 2.0. Standard and Poor's believes that start-up facilities should reach or exceed these coverage levels to offset large risks of greenfield projects. The agency recommends that coverage of maximum annual debt service be calculated to help determine the relative growth of revenues necessary to meet

maximum debt service. For most existing toll roads this value is between 1.1 and 1.25. However, new facilities are not expected to reach these figures during the start-up period.

### *Other Considerations*

Standard and Poor's expects that legal provisions will vary to reflect local laws, ownership issues and the nature of the revenue source in different countries. However, the following provision should be included: (1) covenants that determine the circumstances for a modification of prices; (2) debt restrictions that set financial parameters for future debt; and (3) financial covenants that establish minimum financial cushions and earning distribution restrictions that govern how investors will be paid.

### III. Alternatives to Traditional Concessions

#### 1. Purpose and Main Features of Alternative Schemes

This section discusses two alternative schemes to traditional concessions that have been recently proposed to address some of the issues analyzed in this paper (see Engel, E and others, 1997; and Trujillo, J.A. and others, 1997)<sup>7</sup>. The aim of both schemes is to reduce the problems derived from the assignment of traffic risk to concessionaires due to fixed-term concession contracts (these problems were discussed in the second section). Both schemes call for a variable concession term whose actual length will depend on actual parameters, not forecasted ones.

Both schemes demand unbundling the road projects into its component parts. That means establishing different contracts for different project activities. For instance, Engel et al. (1997) suggest different contracts for operating and constructing the road, while Trujillo, J.A. (1997) proposes to unbundle road construction and financing. However, the role of unbundling has a different nature in each scheme. Even though unbundling activities may play an important role for increasing efficiency in the scheme proposed by Engel et al. (1997), it is not its basic feature.<sup>8</sup> Unbundling financial activities from

other activities is the central feature of Trujillo's proposal.

#### 2. Least Present Value Revenues

Engel et al. (1996 and 1997) propose a new method for selecting the winning bid wherein each proposal requests a minimum present value of toll revenues. The winning proposal would then be the one requiring the least present value of toll revenues. Under this method, the concession term would be variable and would conclude when the concessionaire has reached the level of revenues requested in the proposal. This method reduces the problems that appear in fixed-term contracts. It transfers a large portion of the traffic risk to future users because if actual traffic revenues are smaller than expected, the concession term will be longer than expected. In other words, the revenues required by the concessionaire to undertake the road project will stem from outyear users. Because the actual present value of toll revenues depends on actual traffic and revenues, and does not depend on forecasted traffic and revenues optimistic and opportunistic proposals are not encouraged. In addition, contract renegotiations due to changes in demand conditions may not be needed. If renegotiations are needed, the present value requested by the concessionaire acts as clear guideline in the processes.

This proposal is not free of problems. There may be a lack of incentives for the concessionaire to improve quality and customer service because revenues are independent of demand and consumer satisfaction. This problem may be mitigated by unbundling the construction and operation

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<sup>7</sup> The papers were prepared for the Conference on *Alternatives to Traditional BOTs for Financing Infrastructure Projects*, sponsored by the Inter-American Development Bank that was held in Washington, D.C., on June 3, 1997.

<sup>8</sup> The basic feature of the scheme proposed by Engel et al. is a new selection criteria for winning bids.

contract. The former would be granted based in the least present value of toll revenues requested, while the later would be granted to the bid requesting the least toll revenues. In order to implement this method, bid documents should fix the rate of discount before the auction takes place. However, fixing a rate of discount for the whole concession period is not easy, and actual differences between rates of interest and discount may distort the projects.

This scheme rests on the assumption that sponsors care about the present value of revenues independently of the period in which they achieve them. However, the time path of operation and maintenance costs, and the features of financial markets may require sponsors to be concerned about both the present value of revenues and the period in which they are earned.

C *Costs of maintaining and operating the road become very large when the contract extends over a long period.* Therefore, revenues requested for an expected concession period may not be sufficient once the period is extended. There are two ways to inveigle construction sponsors into extending the length of the concession period. One way is by unbundling construction, and operation and maintenance activities so that the construction concessionaire does not have to bear the operation and maintenance costs. The other way is to set a cap on the length of time required by sponsors to earn the revenues requested. The implementation of either one of these solutions requires some form of public contribution to ensure that the desired present value of revenues is reached within a reasonable length of time.

C *Financial markets may not offer funds with uncertain debt service and maturity.* Relatively underdeveloped financial markets may not offer funds with variable debt service and uncertain maturities. In that case, sponsors may be unwilling to participate in a concession in which the concession term is uncertain because they would be unable finance the project. Sponsors are concerned by both the present value of revenues and the period in which they obtain them, particularly in developing countries which lack these facilities.

### **3. Unbundling Road Activities: Financing and Construction**

The basic feature that distinguishes the scheme proposed by Trujillo et al. (1997) is the legal and regulatory separation of the different activities required for providing road services. A traditional concession contract grants to a unique concessionaire the responsibility for constructing, operating and financing the road, while unbundled schemes may grant these responsibilities to different agents. This separation allows public authorities to design specific contracts and choose the appropriate economic agents for each activity, but it does not prevent the same agent from undertaking both construction and operation activities under two different contracts, one regulating construction and the other regulating operation.

The essence of this proposal is not the assignation of different activities to different agents, but the isolation of the regulatory framework for each activity. To ensure the existence of appropriate capabilities, a traditional concession may require a consortium including a construction and an

operation company. However, a unique concession contract covers construction and operation activities. In unbundled schemes, one contract regulates operation activities and another contract regulates construction activities. This allows, for instance, the establishment of a long-term contract with a company financing a road requiring a relatively long period for recuperating costs through tolls, and a short-term contract with the economic agent that operates and maintains a road that requires investments with short recuperation periods. Even more, short period contracts for operation and maintenance may improve the performance of these activities by increasing competition because operation and maintenance contracts may be rebid every four or five years.

Trujillo and others (1997) present a scheme for separating the financing of a project from the rest of the activities. For expository purposes, we are going to simplify the scheme by assuming that the public authority grants three contracts: financing, operation and maintenance, and construction. Although a unique company for managing all activities may be more efficient in some situations, unbundled mechanisms do not prevent one company from managing all activities. However, the contract features of each contract should be adapted to each activity.<sup>9</sup> The main features of these contracts are discussed below:

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<sup>9</sup>The process of unbundling road activities may be similar to that of unbundling electricity supply activities and, as happened with electricity, it may give rise to some reservations. However, although in the past power services were vertically integrated in most countries, they have been unbundled and efficiency gains have become apparent.

### *Construction Contract*

This contract establishes the conditions for constructing the road and it is similar to traditional construction contracts. It would therefore be granted through a public bid. The winning proposal would be the lowest priced one. In order to increase the commitment of constructors to the project and generate financing for it, builders may be required to contribute to financing a portion of the costs by subscribing subordinated debt.

### *Operation and Maintenance Contract*

This contract, which should be granted through a public bidding process, establishes the conditions for road maintenance and operation. The winning bid selection criteria would be the one requiring the least annual payments or least payment per road user. Authorities may rebid the contract every four or five years. The operation and maintenance contract can be attached to the construction contract for the first five years after starting operations. This would increase the constructor's incentive to reduce operation and maintenance costs.

### *The Financing Contract*

This contract establishes the conditions for managing a special purposes vehicle to pay construction costs and collect a percentage of the road tolls until building cost can be raised from users. The financial concessionaire is responsible for all activities related to the design and organization of the special purpose vehicle (SPV). The SPV borrows funds from financial markets and, in some cases, from the road constructing concessionaire for paying the construction cost. The SPV pays operating costs and services the debt with the toll

revenues. The financial concessionaire must guarantee that the SPV will obtain the required financing. The maturity of SPV financial funds is a function of actual toll revenues, therefore, the maturity of SPV liabilities is variable.

The contract may require that the construction and operation concessionaire issues a subordinated debt to the SPV. This subordinated debt would increase the commitment of the building and operation concessionaire to the project and strengthen the financial SPV. The concession authority may grant other assets and rights to the SPV (for example, rights to receive the revenues of selling the adjacent land) and may take subordinate debt issued by the SPV. In some occasions, the public authority may guarantee debts issued by the SPV. SPV rights to toll receipts last until all SPV liabilities have been canceled. Therefore, the life span of the SPV depends upon the financial features of its liabilities and actual revenues. In other words, the SPV remains in existence until all its liabilities, including senior and subordinated debts are repaid.

This proposal is similar to that of Engel et al. in that it demands variable concessions. Therefore, the previously discussed advantages and problems of schemes with variable concession terms also apply to this proposal. Costs derived from the proper coordination of contracts should also be taken into account in assessing the viability of this scheme in developing countries. An advantage of this proposal is that separation of financing and construction may increase the scope of competition because local construction companies in developing countries may not be able to make an appropriate financial proposal for traditional concession, whereas they can make proposals for constructing the roads under this scheme.

## IV. Lessons Learned

The following is a summary of guidelines discussed in this paper for assessing toll road concessions.

1. *Clear rules and credible institutions for solving conflicts and renegotiating contracts could reduce the perception of regulatory risks, in turn reducing the financial cost of these projects.* Modifications and interpretations of contract conditions are usually necessary, but they are often difficult to undertake because road concession terms are large and contracts are complex. As a result, there may be conflicts in between concessionaires and public authorities in the interpretation of contract conditions. Public authorities often need to modify contract conditions to take into account economic and political changes. These modifications may occur when constructing a new road, when increasing tolls to avoid congestions, and when decreasing tolls to encourage new users.

Calculating a fair compensation for the concessionaire is difficult. Concessionaires will tend to exaggerate losses and downplay benefits in order to receive a larger compensation. Clear rules and credible institutions for resolving conflicts should be included in the concession contracts and, if possible, in concession laws. Guidelines and procedures for renegotiating contracts should also be included in the contracts. Revenue based schemes which have a simple scheme for calculating fair compensation, would help the renegotiation of contract conditions. Therefore, even if a concession is granted using minimum toll criteria, the concession contract may include guidelines for contract modifications based on revenue.

2. *The assignment of traffic risk should be reconsidered.* In most traditional concession schemes, traffic risk is borne ex- ante by the concessionaire and the public sector, but ex- post it is borne by the public sector. However, mechanisms assigning the whole traffic risk to the concessionaire or the public sector may not be efficient because a large part of the traffic risk is beyond the control of the sponsors and the public authority. Therefore, mechanisms that allow transferring manageable risks to those agents more able to manage them, as well as diversifying nonmanageable risks are desirable. Unbundled schemes (Trujillo, J.A and others, 1997) and revenue based auctions (Engel, E and others, 1997) may be effective for assigning risk to final users because the concession term becomes a function of actual traffic. Therefore, lower revenues from lower traffic are compensated with revenues from a longer concession term. However, the use of these schemes is limited by the existence of a developed financial markets that offer funds with variable maturities or appropriate refinancing facilities easily.

3. *Minimum tolls as the selection criterion may encourage overly optimistic proposals.* Proposals predicting larger traffic will require lower tolls. This means that optimistic proposals are likely to win the bidding process. However, the cost of an erroneous traffic forecast is not usually borne by the concessionaire because the participation of equity and quasi-equity in the project is usually small, and most governments are reluctant to let a concessionaire go bankrupt. The bankruptcy of a road concession company may ruin a country's private infrastructure



program. Therefore, public authorities and concessionaires renegotiate the concession's conditions established by the optimistic, and perhaps opportunistic, proposal. To discourage this behavior, attention should be given to the financial proposal of the concessionaire. If sponsor equity participation in the project is large, then the risk of opportunistic behavior is reduced. A concessionaire with a strong financial structure may bear the lower traffic for longer periods without danger of bankruptcy, thus reducing pressures for a renegotiation of the concession contract.

4. *Guarantees from the public sector are more common than contributions in road concession in Latin American countries.* Three of four cases reviewed in this paper included guarantees, but not contributions. Contingent contributions are charged against future public budgets and their economic and financial implications are, therefore, difficult to evaluate. It should be noted that a project with full traffic risk guarantees bears credit risk and liquidity risk. The credit risk stems from the capacity and willingness to pay of the public agency. Liquidity risk exists because it takes time to include payments in public budgets after the occurrence of the events whose consequences are guaranteed. Full guarantee schemes may also suffer from a loss of interest on the part of the concessionaire for improving traffic forecasts, particularly when guarantees are large.

5. *Concessionaires controlled by large construction companies may have efficiency and incentive compatibility problems.* The shareholders of concession companies are, for the most part, construction companies. These companies have a great deal of expertise in public works and short-term financing, but

their expertise may be limited in operating facilities and long-term financing. The role of the constructing company as a shareholder as well as an input supplier may give rise to an incompatibility of incentives. As input supplier, it may be willing to maximize the construction costs but as concessionaire it should be willing to minimize them. The profits associated with high building costs accrue in the short run, while the profits from lower construction costs are obtained in the long run. A large equity participation may reduce the incentive compatibility problems.

6. *Financial proposals should play a relevant role in the selection processes. Even more, financial proposal should be enforceable.* The financial proposal should play an important role in the selection of the winning proposal. Financial proposals should include commitments of sponsors and appropriate financing. These conditions will help the implementation of the proposed financial plan and avoid delays in starting road construction.

A final remark, unbundled mechanisms and revenue based selection criteria seem to be a promising approach for the mitigating traffic risk management problems of concession roads. Although no experiences with these schemes can be reported, they may allow the transfer of traffic risk to road users since neither approach fixes the concession term but makes it a function of toll revenues.

Unbundled schemes also give local authorities the opportunity of designing isolated contracts for each activity, financing, construction and operation. Independent contracts allow for providing appropriate incentives to each economic agent and increase the scope for

competition<sup>10</sup>. The two main criticisms of these schemes are the lack of efficient public sector institutions to articulate, coordinate and supervise the project and private sector participants, and the cost of coordinating the different agents and the lack of sponsors willing to accept a contract with uncertain

terms for receiving income. The advantages of specialization versus the cost of coordination in using unbundled schemes should be analyzed in each case. The availability of financial markets able to offer funds appropriate for these schemes also should be appraised in each case. It cannot be expected to find schemes that are free of problems and appropriate for every case.

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<sup>10</sup> For example, the operation contract can be attached to the construction contract for the first operational year of the road to ensure that the contractor internalizes the costs and benefits of his performance. After the initial period, the operation contract may be rebid every four or five years, thus increasing competition in the provision of road services.

## **Project Description**

*Acceso Norte de Buenos Aires, Argentina*

### **Original Status**

The project is a concession of the International Panamerican Highway in the section going north to the city of Buenos Aires and the 25 kms. detour of the General Paz Avenue. At the time of the concession, the four lane freeway (in some sections it has 6 and even 10 traffic lanes) was in poor condition and dangerous, and had constant traffic jams. The side service roads were interrupted.

### **The Concession Project**

The concession project consists in building a fast limited-access highway that requires the construction and rehabilitation of 120Km of roads. After completion of the project the road will have up to 12 traffic lanes as well as side service roads, with 2 traffic lanes going each way. Dangerous spots will be eliminated, and the road surface, ditches, signposts and lighting will be improved.

The project is divided in six sections with the following works to be done:

- C Section 1: General Paz Avenue (25 kms). Before completion of the project, this was a very dangerous road before de project was four lane highway (2 going each way), interrupted by service roads. The project converted the road into a six lane highway (three lanes going each way) and eliminated dangerous spots and interruptions by service roads.
- C Section 2: General Paz interchange. At the time of the concession, the interchange had problems of operational capacity and safety. The project undertook the total rehabilitation of the interchange including new access lanes for heavy traffic.
- C Section 3 : General Paz-Marquez (8kms). This portion of the highway originally had 10 traffic lanes (5 lanes each way) with capacity and efficiency problems. The project undertook the construction of 12 lanes (6 going each way), a new main artery , a motorway exit (2 lanes going each way) and continued service roads (2 going each way).
- C Section 4: Tigre feeder road (8 kms) The project consist in a complete rehabilitation of the four lanes including signposting and lighting .
- C Section 5: Marquez - Junction (12 kms) The project increases the number of lanes from six to eighth and eliminate the interruptions of service roads
- C Section 6: Pilar and Campana Branch roads ( 67 kms). The project tconsist in new and improved resurfacing, shoulders, signposting and lighting. Ninety percent continued service roads.

### **Investment**

The investment is divided in two periods. The pre-toll phase for 2 years and an anticipated investment of US\$346 MM and the post-toll phase, which starts when the works of the previous phase are over and an expected investment of US\$323 MM.

## **Project Description**

### *Talca-Chillan, Chile*

#### **Original Status**

The section out for bid is 192 kms in length. At the time of concession, the road had 70 kms. of double lanes in good condition, remaining sections have only one lane at different degrees of deterioration. The route was originally designed to allow a speed of 100 km/h, however, the relatively large number of intersections (intersections with crossroads, private roadways and intersections going to towns) decrease the quality of service.

#### **Concession Project**

The purpose of concession is to transform the road into a controlled roadway by means of a reduction in the number of intersections, the elimination of road intersections and “U” turns, and the gradual elimination of private roadways that connect to it. This course of action will be arranged through complementary roads. Solutions to the pedestrian and cyclists traffic in the semiurban areas are considered as well. The concession should undertake the following works:

- C Complete construction of the second roadway.
- C Pavement resurfacing and ancillary works.
- C Construction of overpasses and underpasses at crosspoints and approaches to the local network public roads.
- C Turning zone development approximately every 5 kms., by building overpasses in order to move “U” turn traffic off the route.
- C Interconnection of some network roadways to direct traffic towards the overpasses. This includes the improvement of the current secondary roads as well as service streets.

This section of the road will have two tolls that will operate with a bidirectional collection system. One of them will be located in San Rafael (north of Talca), and the other will be located at the existing Perquilauquén toll house, which will be redesigned to accommodate the new operating conditions.

The route has a complete system of gas stations, restaurants and rest shops. The concessionaire is in charge of producing a booklet with basic information which will be updated periodically, to be handed to users as they enter the concession area.

#### **Investments**

The estimated investment is US\$160 million

## **Project Description**

*El Cortijo-El Vino, Colombia*

### **Original Status**

This project is an extension of *Avenida 80*, one of the main routes into Santafé de Bogotá. At the time of the concession, it served as a regional integration route to several municipalities to the west of Bogotá, among them *Cota, Tenjo, Madrid, Funza, San Francisco, La Vega* and *Subachoque*. The project is also a part of the Bogotá-Medellín connection, joining Puerto Salgar with the capital city through Tobiagrande and La Vega.

### **Project Concession**

The project consists of the rehabilitation of 24 Km of existing roads and the construction of 31 Km of new roads. The existing road will become the north roadway and a new road will be built to the south up to Siberia. The existing road will connect the current bridge over the Bogotá River and the second road will connect with the new bridge parallel to the existing one. The main works to be done are:

- C Construction of a bridge and its approaches over the Bogotá River.
- C Construction of intersections at the following places: detour to the La Florida park, detour to Subachoque and detour to Facatativá.
- C Construction of a bi-level intersection in the existing Siberia intersection. This work is optional
- C Construction of a new roadway between Siberia and Puente Piedra, and another roadway between Siberia and La Punta (6 kms).
- C Excavation and earth removal on 6 kms. of the existing roadway between Siberia and La Punta. Resurfacing of the existing roadway from La Punta to El Vino.
- C Resurfacing and upkeep of the existing roadway between El Cortijo and Siberia.
- C Planning and alignment of the electric and telephone systems.
- C Signposting.

### **Investments**

The estimated investment is US\$39 million

## **Project Description**

*Ruta Interbalnearia, Uruguay*

### **Original Status**

The road between Montevideo and Punta del Este is 128 Km long. Twenty kilometers of two lane roadway are in good condition, and 23 Km of two lanes were under construction at the time of the bidding for the project. The remaining sections are one lane roadways. The route has intersections with crossroads and private roadways, and intersections with creeks and railroad tracks that decrease the quality of service.

### **Concession Project**

The purpose of concession is to transform the road between Montevideo and Punta del Este into a two-lane controlled roadway by means of a reduction in the number of intersections. The main works are the following:

- C Section I (20Km). This section was already constructed at the time of the concession and it is in good condition. Therefore, the works include only the construction of a bridge and a toll post
- C Section II. (31 Km). Construction of a new 8 Km. lane and 6 bridges. (four 35m bridges, one 141m and one 298m).
- C Section III (47Km). Construction of 39 Km of new lanes and rehabilitation of the existing one. It includes the construction of five bridges (two railroad overpasses and three bridges over creeks).

There will be three toll posts. However, the concessionaire may ask for authorization to change the number of toll posts and their localization.

### **Investments**

The expected investment is US\$40 million

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