

# **Toll Road Concessions**

## **The Chilean Experience**

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# Contents

**Foreword** v

**Acknowledgments** vi

**Abstract** vii

**1 The Context of the Concessions Program** 1

**2 The Program in Detail** 4  
Regulatory framework 4  
Concession structure and bidding process 7  
Institutional structure 11  
Evolution of the program 12

**3 Financing** 15  
Government support 15  
Financing arrangements 16

**4 Lessons Learned** 18

**Notes** 21

## **Annexes**

Annex 1 Statutes and Regulations Pertaining to Chile's Concessions Regime 22  
Annex 2 Sample Bidding Document, Table of Contents 23  
Annex 3 Firms Participating in Bidding 25  
Annex 4 Financing for Toll Road Concessions 26  
Annex 5 Additional Reading 28

## **List of Tables, Boxes, and Map**

### **Tables**

Table 1 Twelve intercity road concessions 3  
Table 2 Financing of concessions 17

### **Boxes**

Box 1 Experience with conciliation commissions 5  
Box 2 Experience with present value as an evaluation criterion 9  
Box 3 Balancing toll levels along Route 5 10  
Box 4 The multiple roles of the concessions agency 12

### **Map**

Map 1 Chilean toll road concessions—Twelve main intercity concessions 2





## Foreword

Over the past decade growing demand for infrastructure has driven the private provision of roads, power, telecommunications, water and sanitation, and other public services in developing countries. Governments short of resources have sought alternative methods of financing transport improvements without affecting their fiscal situation. Charging tolls, too, has become an attractive option for managing traffic on increasingly congested roads.

Although the benefits of involving the private sector in building and operating toll roads are apparent, some countries have faced difficulties in managing the processes involved. Like any private infrastructure project, toll roads require sound partnerships between the public and private sectors. A fair allocation of responsibilities and a fair distribution of risks are key elements in any such partnership.

The toll road concession program implemented in Chile during the 1990s has shown very positive results. This study reviews the Chilean experience of involving private firms in upgrading about 2,000 kilometers of expressways—with an overall investment in excess of US\$3 billion. The report focuses on the regulatory framework established, the bidding process used, and the distribution of risks in the financial schemes adopted by private concessionaires. The findings provide lessons that are relevant for policymakers and private investors alike.

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## Abstract

This report reviews the positive experience of the Chilean toll road concessions program during the 1990s. It focuses on 12 projects at different stages of implementation. The projects represent nearly 2,000 kilometers of expressways and an investment of about US\$3.3 billion. The authors assess the program, examining the development of the regulatory framework and bidding process. Particular attention is paid to the parameters governing the allocation of risk between the government and private investors and the institutional structure of the concessions program. The financing of concessions is reviewed, with attention to the roles of incentives, enhancements, and the domestic and foreign financial markets. This report also discusses the lessons derived from the implementation of the program.





## The Context of the Concessions Program

In the early 1990s, the government of Chile made a policy decision to seek private capital to support needed investments in a deteriorated and antiquated infrastructure. To this end, it designed a concessions program to encompass the construction, operation, and maintenance of transportation infrastructure, including roads, ports, and airports. Although initially stimulated by budgetary constraints, the program doubled as a mechanism to increase economic efficiencies by passing responsibility for the construction and maintenance of infrastructure to the private sector. The approach, if successful, would make it possible to shift public expenditures to programs that provided high social returns but that did not offer significant investment opportunities to the private sector.

At the time the program was designed, the country's most pressing infrastructure need was to upgrade and modernize the national highways, and this sector became the starting point for the concessions program. During the 1980s, underspending for design, construction, and maintenance left Chile's heavily traveled highways in need of major improvements. Meanwhile, the country's vehicle fleet increased substantially, from nearly 900,000 in 1982 to more than 1.3 million ten years later. Traffic accidents nearly doubled during the same period.

The sustained economic growth that began in the mid-1980s stimulated the development of new industrial areas and export processing zones, which in turn increased short- and medium-distance travel to and from major urban centers. Growing labor mobility and increased business travel created additional demand for road transportation, demand that is expected to continue to rise for the next 15 to 20 years. By 1990, the situation called for a level of investment that would place a heavy burden on the national budget and crowd out investments in the social sectors.

The government responded by launching a program under which concessionaires would finance highways and other in-

frastructure in the private capital markets. The program was designed to boost investment in the country's infrastructure without raising taxes or increasing public-sector debt, which were not politically viable options at the time. Equally important, concessionaires would be able to tap a new pool of private-sector talent to manage the construction, maintenance, and operation of their projects, thereby increasing the efficiency with which new infrastructure was built and operated and improving general productivity.

By the early 1990s, the Chilean economy had achieved substantial growth and stability. On the domestic front, GDP was growing at a sustained average annual rate of 6 percent, inflation had declined to approximately 10 percent, and fiscal accounts had shown a surplus for several years. On the external front, although the current account showed a deficit of about 2 percent of GDP, the balance of payments continued to register surpluses due to inflows of long-term capital and direct foreign investment.

By that time, economic policy was based on ensuring macroeconomic balances, consolidating trends for sustained growth, lowering inflation, and reducing unemployment. Monetary policies were being handled by the central bank, independent of the administration. Other key policies included incentives to increase domestic savings, exchange rates that reflected the real exchange value of foreign trade, and interest rates that reflected the value of money in domestic markets. To advance the country's position in foreign markets, the government lowered tariffs, promoted foreign trade, and made changes to attract direct foreign investment.

At the same time, the government adopted policies that required increasing expenditures in the social sectors (health, education, and housing), although it was understood that such expenditures could not be allowed to threaten the balance in the fiscal account. Finally, it became clear that sustained

Map 1

### Chilean toll road concessions—Twelve main intercity concessions

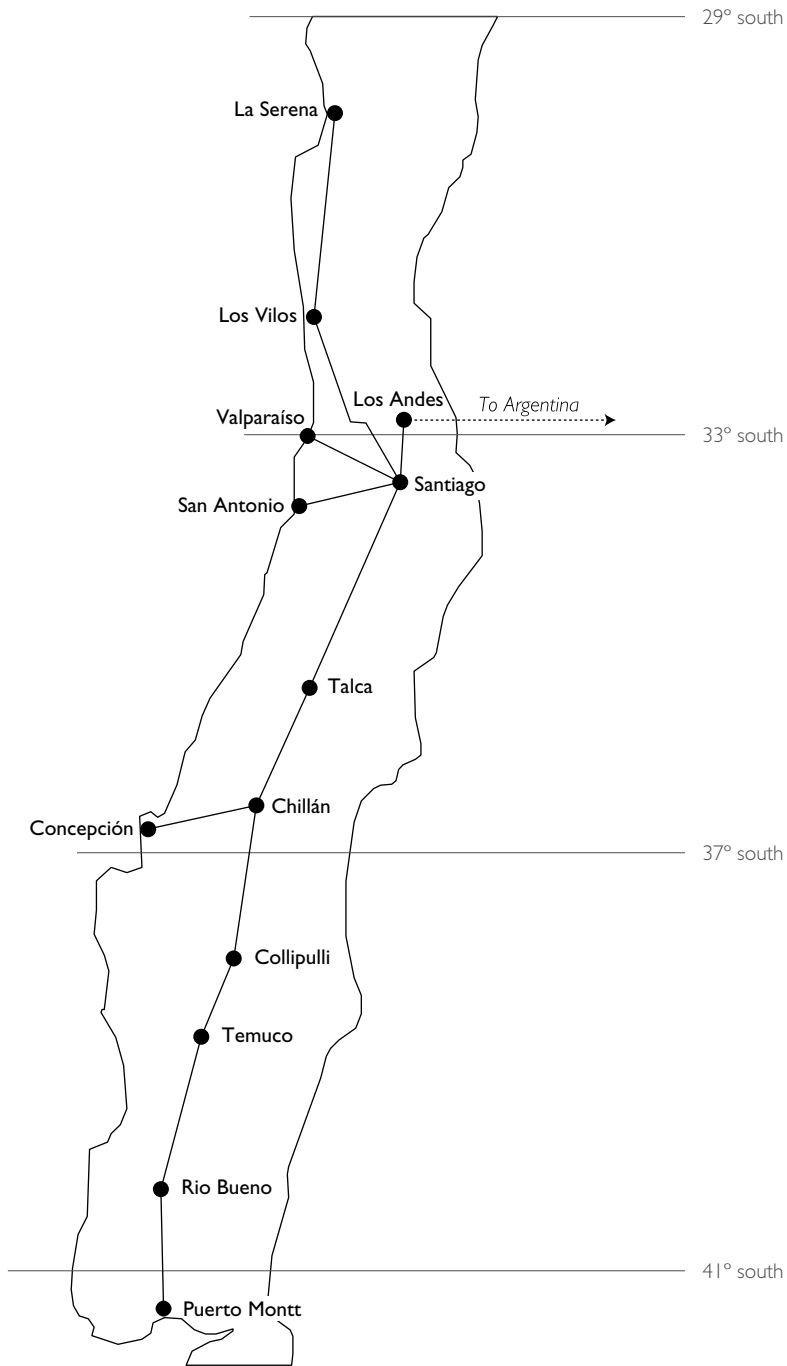


TABLE 1

**Twelve intercity road concessions**

Route	Section	Length (kilometers)	Daily traffic 1996 (units)	"Official budget" (\$million)	Bid invitation	Award	Start operations
148	Chillán–Concepción	89	3,000	230	February 1994	January 1995	July 1998
78	Santiago–San Antonio	104	6,000	140	April 1994	June 1995	August 1999
5	Talca–Chillán	192	9,000	183	October 1995	January 1996	October 1999
5	Los Vilos–Santiago	218	9,200	272	April 1996	October 1996	December 2000
15/57	Santiago–Los Andes	96	5,200	146	April 1996	February 1997	October 2000
5	La Serena–Los Vilos	228	2,500	265	November 1996	April 1997	March 2000
5	Temuco–Río Bueno	172	3,500	203	December 1996	August 1997	September 2001
5	Chillán–Collipulli	160	5,900	224	November 1996	October 1997	September 2001
5	Río Bueno–Puerto Montt	136	5,800	210	June 1997	March 1998	December 2001
5	Collipulli–Temuco	163	5,700	241	October 1997	July 1998	June 2002
68	Santiago–Valparaíso	130	12,600	400	June 1996	August 1998	February 2002
5	Santiago–Talca	266	18,000	750	April 1998	August 1998	December 2002

Source: "Ficha Histórica de los Proyectos de Concesión," Coordinación General de Concesiones, Ministry of Public Works, Santiago, January 2000.

growth based on the expansion of exports could not be fully successful without rehabilitating and modernizing the country's transportation infrastructure.

When the concession program was conceived, Chile's road network comprised about 12,500 kilometers of paved roads, 32,400 kilometers of partially paved roads, and 36,200 kilometers of unpaved roads. The country's major highway is Route 5, which runs north-south over a distance of about 3,000 kilometers, stretching from the Peruvian border to Puerto Montt, some 1,000 kilometers south of Santiago. East-west roads link major inland cities with the country's main ports and with neighboring Argentine cities. The entire network was publicly owned and operated.

The concessions included in the program included the southern half of Route 5—about 1,500 kilometers divided into eight sections—and four of the main east-west laterals, all of which were to be converted into expressways (map 1). This study focuses on these 12 intercity concessions, which cover nearly

2,000 kilometers of road and represent an overall investment of about US\$3.3 billion.<sup>1</sup> The twelve concessions—all granted between 1994 and 1998—were selected because of their economic importance (table 1). Not covered in this study are four road concessions granted before 1994, two urban road concessions in Santiago, and the country's airport concessions.

This study assesses the development of the toll road concessions program, examining the regulatory framework, bidding system, and private financing arrangements. Chapter 2 focuses on the regulatory framework, the evolution of the bidding process—with particular reference to the allocation of risk between the government and the investors—and the institutional structures for managing the concessions program. Chapter 3 discusses the financing of concessions, including the use of incentives and the role of domestic financing. The report concludes with a set of lessons and recommendations based on the experience gained during the implementation of the program.

## The Program in Detail

To modernize the country's infrastructure to meet the needs of a growing economy, the government established a concession program designed to attract private investment in public works that could be supported by user charges. The program was also intended to improve investment efficiency and management through private participation in the design, construction, and operation of projects.

### Regulatory framework

The key provisions of the Chilean concessions regime are contained in special decree no. 164 of 1991 (the “concessions law”), amended by laws no. 19252 of 1993 and no. 19460 of 1996. The applicable regulations are set forth in decrees no. 240 of 1991 and no. 956 of 1997. A summary of the applicable legislation is presented in annex 1.

The concessions law updated all previous legislation governing the construction, rehabilitation, maintenance, and operation of public works—which fall within the purview of the Ministry of Public Works—and other infrastructure. The ministries responsible for railways, housing, potable water, and other infrastructure are required to provide a mandate to the Ministry of Public Works for management of concession procedures in their sectors. Some ministries are just beginning to tap the expertise available in Public Works. Public Works manages the concession process on behalf of other ministries when asked to do so.

The legislation created a system of competitive bidding based on flexible arrangements for awarding concessions, establishing mutual rights and obligations, and setting up conflict resolution procedures. It also provided for the use of incentives—including subsidies and government guarantees—to promote private investments. Amendments introduced in 1996 allowed more flexibility in contractual arrangements

and created a special lien that enables public works to be used as security in the financing of concessions.

Under Chilean law a concession may originate in two ways; first, in response to a proposal from a private party (*sistema por postulación*); second, upon a recommendation from the Ministry of Public Works. In both cases, the concessions law requires that the contract be awarded through a transparent system of competitive bidding. Bilateral “sole-source” agreements between the state and private firms are not permitted. In the case of a project proposed by an interested third party, the ministry must decide within one year whether it will grant a concession for the project. If a proposed project goes ahead, the proponent is normally compensated for its feasibility work on the project.

The criteria applied for awarding bids are set forth in the concessions law and its implementing regulations. They include:

- Rate structure and level.
- Period.
- Subsidy to be received from the state.
- Payments to be made by the concessionaire for the use of preexisting infrastructure and other goods and services.
- Minimum revenue levels guaranteed by the state.
- Distribution of risks between the state and the proponent during and after construction.

Bidding documents must specify the criteria to be used and explain how these are translated into scores.

A concession is formally awarded by a decree issued by the Ministry of Public Works and countersigned by the Ministry of Finance. The successful bidder is required, within the period specified in the bidding documents, to create a new company dedicated to the development and operation of the concession. The concession contract, incorporated as an integral part of the bidding documents, is signed with the newly created company.

The Ministry of Public Works is responsible for supervising the construction and must determine when the project has been completed in accordance with the specifications contained in the bidding documents. The ministry also must determine when penalties are to be imposed on the concessionaire. The concessionaire may contest such decisions by seeking relief from a three-person conciliation commission (*comisión conciliadora*) established for each concession (box 1).

The conciliation commission has jurisdiction over all disputes and claims originating from the interpretation and implementation of the concession contract. Each party names one member of the commission; the third member, who acts as president, is appointed by mutual agreement. The commission establishes its own rules, standards, and procedures. The concession's secured lenders may intervene in the proceedings of the commission under certain circumstances. If the commission fails to achieve conciliation within 30 days, the parties may ask the commission to act as an arbitration tribunal, the decisions of which are final and not subject to appeal. Alternatively, concessionaires may bring the conflict to the appropriate court of appeals. The conciliation commission helps ensure the successful implementation of the concessions regime by providing impartiality, procedural fairness, and transparency. The relatively short decision period increases the likelihood of a quick resolution of disputes. Finally, the access granted to secured lenders provides an im-

portant procedural safeguard to protect the rights of interested creditors.

The concessions law establishes that concession contracts may be modified by the ministry at any time for reasons of public interest. Although the public interest is not defined in the law—giving the state considerable discretion—the term has so far been interpreted to refer to additional works that may be required after a concession contract is signed. In such instances, the concessionaire must be compensated through changes in the rate structure, the concession period, the amount of state subsidies, or other mechanisms. Bidding documents usually specify the maximum additional investment that the concessionaire may be required to make under a unilateral modification for reasons of public interest. If a limit is not specified in the bidding documents, the maximum amount of additional investment required from the concessionaire will be 15 percent of the initial amount of the project. All actions to unilaterally amend the concession contract are subject to appeal to the conciliation commission.

Under the concessions law, property and rights of way needed for the concession are expropriated under decree no. 294 of 1984, following a declaration of eminent domain (*declaración de utilidad pública*). The costs of expropriation are borne by the concessionaire unless the bidding documents specify otherwise. The Ministry of Public Works carries out the expropriation, surveying the land required for the project,

#### BOX 1

#### **Experience with conciliation commissions**

Conciliation commissions have yielded mixed results in settling disputes. Some cases have been resolved using the conciliation process, but others have been delayed and most likely will end up being arbitrated by the commissions. Some typical cases:

- In a dispute over geological risk insurance provided by the government, the commission's recommendation of a lump sum payment was accepted by the parties.
- After a disagreement over whether two kilometers of an existing road were included in the concession reached the arbitration stage, the commission (acting as arbitrator) found that although the stretch was included in the concession, the government should share the cost of maintaining it.
- In a dispute over a fine levied against a concession firm for delays in reimbursing the government, the amount of the fine was reduced.

Concessionaires claim that the commission does not really work as a conciliation mechanism but is, in fact, an arbitration tribunal. This view derives from the manner in which its members are appointed. The government and concessionaire each appoint one member and agree on the third. The issue is that the government's representative—who is usually a senior public sector official—has limited authority to commit public funds. Recommending additional expenditures by the government—usually an issue in disputes—puts such officials in a difficult position with respect to their superiors, the auditors, and the public (media and politicians). That difficulty often makes it impossible for the commissions to reach the consensus they seek. Although the spirit of the concessions law was to appoint “independent persons,” practice has been different, limiting the role played by the commissions.

having it appraised, and performing other legal tasks to prepare for sale and transfer. The concessionaire's role is to purchase the land from the owner on the state's behalf. The bidding documents usually provide that if the project is delayed because of difficulties in obtaining needed land the concessionaire will have additional time to complete the project.

The concessions law specifies that all risks related to the project are borne by the concessionaire, including costs due to *force majeure*. If *force majeure* interferes with the operation of the concession, the concession contract may be suspended by the government or by mutual agreement of the parties. If the works are partially or totally destroyed, the concessionaire is responsible for repair or replacement. Concessionaires seeking relief from responsibility for events of *force majeure* may appeal to the conciliation commission.

Once a bid is awarded, the concessionaire must post a construction bond to guarantee the fulfillment of its obligations during the construction stage. The amount of the bond is typically between 2.5 and 5 per cent of the project budget. The lower percentages apply to higher budgets (normally those over \$300 million). Once construction is completed, the construction bond is replaced by a performance bond that guarantees the concessionaire's obligations under the contract during the operational phase of the contract. Performance bonds are not pegged to investment budgets but depend instead on yearly operating budgets, which usually range from \$5 to \$10 million. Concessionaires must also insure the project against damage from *force majeure* and against liability for injuries to third parties during construction and operation of the concession. Additionally, concessionaires must provide, two years before the expiration of the concession, a bond in an amount ranging from 2 to 4 percent of the project budget (in real terms) to guarantee that the project will be properly maintained and handed over in good working order.

To give the concessionaire some freedom in managing its revenues, the concessions law allows it to set and adjust rates within limits set for each concession. The concessionaire may alter the rates that apply to different types of vehicles within established limits; vary the rates depending on the time or the day of the week as long as the differentials do not discriminate against certain users; and enter into volume or prepaid discount agreements with firms or individuals. Rates are automatically adjusted once a year for changes in the consumer

price index or sooner if prices have risen by more than 15 percent since the last adjustment.

Amendments made to the concessions law in 1996 improved the legal provisions governing termination of the concession contract. The law now specifies that the concession may be terminated at the end of the concession period or earlier by mutual agreement of the ministry, the concessionaire, and secured lenders. The government may terminate the agreement at any time if the concessionaire seriously breaches its contractual obligations. The law specifies detailed procedures for terminating a contract in response to a serious breach and provides procedures for rebidding the remaining period of the concession. The concessionaire's secured lenders are paid out of the proceeds of the rebid, on which they are granted a first lien. The 1996 modifications removed the presumption that the concession reverts automatically to the state and clarified that once a concession is granted it is expected to remain in the private sector.

In the event of bankruptcy of the concessionaire, the creditors shall decide, at the request of the receiver, whether to auction off the remaining period of the concession or to continue the operation of the company. If the creditors decide to appoint new management to run the company, the concession contract remains unchanged through the end of its term. In any bankruptcy situation, the ministry must appoint a representative to work with the creditors to ensure continuation of services under the concession contract. If the creditors decide to auction off the concession, the terms and conditions of the original concession contract and bidding documents remain unchanged. The minimum bid price must be at least two-thirds of the total outstanding debt contracted by the concessionaire.

An innovative feature introduced in the latest amendments to the law was a new form of security (*prenda especial de concesión de obra pública*) that the concessionaire may pledge for the benefit of creditors. The pledge can be structured as a lien on the concession rights granted under the contract, on payments from the state to which the concessionaire is entitled under the contract, and on all direct revenues the concessionaire receives. The concessionaire may also pledge shares of the company formed to build and operate the concession. The ability of lenders to obtain preferred creditor status, together with the safeguards offered by the law's conciliation and bankruptcy provisions, were designed to remove some of the uncertainties that lenders faced in structuring security packages.

Other changes introduced to the Chilean financial regulations in 1995–96 were designed to facilitate the involvement of local banks and institutional investors in concession projects. One key modification to the banking law increased the limit on lending for infrastructure projects from 5 percent to 15 percent of the lender’s capital and reserves. The other significant change allowed pension funds and insurance companies to invest in bonds issued by companies that did not have an established track record. That reform made possible the issuance of “infrastructure bonds” in the Chilean capital market. Under the scheme, concessionaires are able to issue bonds rated by local agencies. Bonds can be issued during the construction phase or when the project has begun operations. In the first case, the risks of cost overruns and construction delays are normally reduced by transferring responsibilities—and the related risks—to contractors using turn-key contracts. Other risk elements associated with the new bonds are linked to the generation of cash flow during operations. Minimum revenue guarantees and other features mentioned earlier are critical for ensuring an acceptable rating for the bonds.

## **Concession structure and bidding process**

Requests for bids are accompanied by engineering studies and designs that are sufficiently detailed to reduce ambiguities and preclude some if not all potential conflicts. This approach allows bidders to prepare detailed estimates of capital, maintenance, and operating costs. Such estimates play a critical role in structuring the final contract. Concessionaires bear all risks related to construction and operating costs, except those deriving from delays in expropriation of properties or needed rights of way. In a few cases where geological studies have not been sufficiently detailed, the government has borne the risk of unforeseen geological conditions that might affect the cost of excavation.

The first projects tendered under the new law were not accompanied by full engineering studies and technical designs. Bidders were required to perform and submit the studies with their technical proposals. Although this approach accelerated the bidding process and gave bidders an opportunity to suggest innovations in designs and technical solutions, it had major drawbacks. Bidders had to invest considerable resources in preparing their bids, and the higher costs were a critical de-

terrent to participation. Moreover, the expropriation program for each concession could not be fully defined at the time of bidding, which meant that the timetable set forth in the request for proposals was less than definitive.

A prequalification process for individual projects or groups of projects screens firms for legal status, experience, and financial and technical capability. The authorities encourage the participation of foreign as well as domestic firms. The government launches the prequalification process by disseminating the request for proposals and conducting “road shows” designed to interest potential bidders in the project. A formal prequalification then establishes the information to be submitted and the minimum requirements for participating in the subsequent bidding process. In the Chilean experience, the prequalification process has proved to be extremely useful in starting a dialogue with potential bidders, who then have a chance to become familiar with the project before the formal bidding begins. Moreover, it has enabled the concessions agency to learn in advance about concerns that potential bidders may have about project design, the bidding process, and contractual arrangements. Such concerns routinely lead to changes in the bidding documents before they are issued.

Prequalified firms receive detailed bidding documents prepared by the concessions agency. Those documents include a comprehensive description of bidding procedures and of the contractual conditions that will govern the construction and operation of the concession. The contents of a typical bidding document are shown in annex 2.

Bidding unfolds in two stages. Although the technical proposals and the cost proposals are submitted simultaneously, the technical proposals are examined first. Technical proposals must include an acceptance of the basic engineering designs prepared by the concessions agency (or present an alternative design), a description of proposed systems for operating the toll road, a proposal for operating toll plazas and collecting tolls, a capital cost budget (in the inflation adjusted monetary units used in Chile<sup>2</sup>), and an implementation program. The technical proposals are then evaluated by an ad hoc committee of senior staff of the concessions agency plus representatives of the ministries of public works and finance. The committee uses a scoring system based on technical design (20 percent), proposed operational approach (40 percent), and proposed toll system (40 percent). Proposals that fail to achieve a minimum score are dropped from further consideration.

The second stage begins with a public unsealing of the cost proposals submitted by bidders with acceptable technical proposals. The cost proposal should address key economic and financial variables including, in some cases, the sharing of risk between the Chilean state and the concessionaire. Cost proposals are evaluated by a committee composed of senior officials of the ministries of public works and finance that recommends an award. The award must be approved by the Ministry of Public Works before being ratified by the Ministry of Finance and the Office of the Controller. Once approved and ratified, the contract is awarded in the form of a decree that is signed by the Chilean president and published in the government's official gazette.

The successful bidder must form a special-purpose company to build and operate the concession. The exclusive economic activity of the new company must be the concession that it was formed to develop and operate. If a bidder wins more than one concession, it must create a new company for each one.

Restrictions govern the capital structure of concession companies. Sponsors (the members of the company or group that won the bid) must provide equity capital for the concession company in an amount equal to at least 30 percent of the official project budget. The rest of the budget may consist of short- and long-term financing provided by domestic and international financial institutions.

The criteria for evaluating cost proposals have evolved considerably since the first bidding processes in 1994. Initially, the essential criterion was a weighted average of several variables including tolls, guaranteed minimum traffic, subsidies (when applicable), payments to the state (for existing infrastructure and other services), and the period of the concession. But that system was difficult to apply and did not always result in efficient and sustainable operation by the concessionaire. The evaluation criteria were soon changed, and subsequent bids were evaluated according to which offered the lowest toll. If two or more bidders proposed the same toll, subsidiary criteria were triggered. These were the length of the concession and the payments to be made to the state for use of existing infrastructure or simply as a premium for the right to operate the concession.

Under prevailing circumstances of intense competition among bidders, the toll levels proposed were sometimes so low that they raised concern about the concessionaire's long-term financial viability. For these reasons, the government soon

began to specify a floor and a ceiling for tolls. The range was defined with reference to the possible impacts of toll levels on traffic diversion, the economic assessment of the project, and toll levels in adjacent concessions. This approach allowed for better control over toll levels among the various segments being concessioned. (Changes in the criteria for evaluation of costs proposals are discussed further in the section on evolution of the concessions program.)

The government's basic policy has been to dissociate toll setting from the financial needs of concessionaires. Tolls should be set according to traffic allocation criteria, with special transfers and subsidies being used as incentives to even out the financial returns of projects. This policy makes economic sense, since if tolls are set exclusively to cover investments, maintenance, and operating costs, then high tolls will result from low traffic volumes, and low tolls will result in high traffic and congested conditions. Neither outcome would be desirable.

A more elaborate scheme for bid evaluation—under study by the Ministry of Public Works since 1994—was used recently in one of the largest concessions, the Santiago–Valparaíso toll road (box 2). The scheme was designed to address issues arising from difficulties in forecasting traffic levels. Bidding documents established the toll level to be used, and bidders put forward their proposals based on the present value of total revenues and using a discount rate fixed in the bidding documents. The firm offering the lowest present value was awarded the concession, and this number became a contractually agreed amount. The concession ends when the present value of toll revenues actually received, in real terms, equals the amount established in the concession contract. In contrast to evaluation criteria previously used, the term of the concession is variable but subject to a maximum number of months. The term is shortened when traffic flows are higher than anticipated and longer when flows are lower.

The present value approach has the advantage of reducing the importance of accurate traffic forecasts in assessing the demand risks inherent in concession contracts. When the present value of revenues is used as the evaluation criterion, bidders in effect disclose the revenue they require to meet their targeted return on investment. This discourages artificially low bids and reduces the scope for renegotiations during the life of the contract. Another advantage is increased flexibility in the contractual arrangements because of the ease of computing fair compensation for termination of the concession.



BOX 2

**Experience with present value as an evaluation criterion**

Only one of the 12 concessions discussed in this essay, the Santiago–Valparaíso expressway, was awarded using a new approach that uses present value of total revenues (expressed in real terms) as the chief evaluation criterion. The project involved converting the 130-kilometer highway into an expressway by building three tunnels (totaling 5,200 meters) and upgrading the existing infrastructure. Total investment was estimated at about \$400 million. The award was made in August 1998; the project is expected to begin operation in February 2002.

Five bidders participated, but one did not pass the technical evaluation. The cost proposals for the present value of total revenues ranged from the equivalent of \$381 million to \$452 million. Bidders had the option of choosing a fixed or a variable discount rate based on a risk-free rate in inflation adjusted monetary units plus a premium. The winning bidder (as well as two others) chose a fixed discount rate, which was set at an annual rate of 6.5 percent plus a premium of 400 basis points. The discount rate was thus expected to reflect the actual cost of capital. Bid documents also offered the option of

a minimum revenue guarantee at an annual cost of 0.75 percent of the value of the outstanding guarantees. The winning bidder declined to take the guarantee, which may be considered redundant when the contract is based on the present value of total revenues.

The bidding documents also gave the government the option to terminate the concession contract early, but not sooner than 12 years from award. The early termination option was one of the key reasons for adopting the present value of total revenues scheme. Increases in traffic may make it necessary to upgrade the expressway by 2010, which would require heavy additional investments. The government believed that such an eventuality would best be handled by rebidding the concession. If the concession is rebid, the concessionaire will be compensated in an amount equal to the difference between the contracted present value of total revenues minus the present value of revenues accumulated so far and the present value of future operating and maintenance costs through the estimated end of the concession.

Despite these advantages, concessionaires and prospective bidders have voiced concern about the complexities of preparing bids using the new approach. Investors and concessionaires have expressed reservations about entering a business in which improvements in operating efficiency do not translate into a higher rate of return on investment. Local financing institutions for their part are not likely to be comfortable with a variable term for the concession if they are requested to provide financing in the form of bonds or long-term, nonrecourse loans.

Since the concessions program began, risks associated with traffic projections have raised concern. The solution has been to manage this risk by offering bidders the option of a minimum revenue guarantee. Because the guarantee has been linked to an arrangement for sharing revenues beyond a set level, it has been viewed as a risk-sharing measure. The minimum revenue guarantee is typically based on traffic projections, with 80 percent of the expected yearly revenue from the concession as a typical ceiling. Bidders may choose the duration of the guarantee from a range specified in the bidding documents. If in a given year revenue levels fall below the minimum set for that year, the government will pay the

concessionaire the shortfall. In one bid, the minimum revenue guarantee was offered in return for a premium. In this case, the winning bidder chose not to purchase the guarantee.

The duration of the minimum revenue guarantee is subject to the constraint that the present value of the guarantee requested for each year may not exceed 70 percent of the estimated official budget of the project. The minimum revenue guarantee is thus related to the debt-equity ratio, since concessionaires are required to provide at least 30 percent of the project investment as equity capital from their own resources. Together, the minimum income provision and the equity requirement are designed to instill confidence in lenders by ensuring that concessionaires will have a yearly revenue at least equivalent to their debt service. Most bidders have opted for income guarantees close to the maximum of the range for the initial years, dropping to the lower end for the outer years. That approach may be intended to reassure local banks providing short- to medium-term financing.

Although the minimum revenue guarantee has not been triggered for any of the 12 concessions dealt with in this review, representatives of the government have expressed concern

about how to treat it from a budgetary perspective. According to the concession contracts, the government is obliged to make the payments due under the minimum revenue provisions in July of the year following the year in which the shortfall occurs. However, no detailed procedure links the triggering of the guarantee with appropriate of payments to the national budget, and normal practice has been not to make budgetary provisions for such contingent liabilities.

Another concern has been the possibility that an economic downturn could trigger a high number of such guarantees, causing a severe drain on the budget. In a recent study of such issues, the concessions agency focused on the value of the contingent liabilities and asked whether budgetary provisions were necessary to cover expected future payments. Using traffic forecast models and Monte Carlo techniques, the agency found that it was highly unlikely that a substantial number of guarantees would be triggered simultaneously. The study therefore recommended against budgetary provisions. A contingent-liability valuation method is being developed by the Ministry of Finance to monitor fiscal risks associated with the minimum revenue guarantees.

Under the revenue sharing system developed as part of the risk-sharing scheme, a concessionaire must share with the government 50 percent of the revenues it collects beyond a threshold level set for that concession. The threshold level is set as that level of revenues beyond which the concessionaire would earn a rate of return on invested capital of more than 15 percent. Minimum revenue guarantees and the corre-

sponding revenue sharing scheme have been optional, but practically all concessionaires have chosen to include both schemes in their contracts. When the net present value scheme is used, the revenue sharing scheme is not applicable, since excess revenues are regulated by shortening the concession period.

The net present value scheme replaces the minimum revenue guarantee in the long run: If traffic volumes are lower than anticipated, the term of the concession is extended until the contractual net present value of revenues is achieved. That approach, however, does not remove the possibility that in a given year the concessionaire may face short-term liquidity problems due to low traffic levels. In such cases, the government would make a cash transfer to the concessionaire, counting the transfer as income in the computation of the net present value of revenues and therefore shortening the term of the concession. (The optional minimum revenue guarantee is not available in net-present-value contracts.)

The government has offered yearly operational subsidies for certain roads where expected traffic volumes would not provide an adequate return on investment at a reasonable toll level. To make bids more attractive to investors in such cases, an annual lump-sum subsidy is specified in the bidding documents. The same approach is used by the government to balance toll levels along Route 5 (box 3). Four concessions receive an annual subsidy established in the concession contract based on expected traffic volumes and return on investment. The subsidy runs from year five (assumed to be the first year of nor-

#### BOX 3

### **Balancing toll levels along Route 5**

When the government implemented the concessions program along the southern segment of Route 5 in late 1996 it made several important policy decisions. First, the entire 1,500 kilometers of road would be upgraded to an expressway with similar design parameters, regardless of variations in traffic levels along the route. Second, each segment of the expressway would receive roughly equal investments per kilometer, except when special characteristics warranted a difference. Third, concession terms would be long. Finally, toll levels within each vehicle class would be roughly equal on all segments of the expressway.

Equalizing tolls along Route 5—in six of the eight concessions the tolls for cars are the same—has the effect of making some of the concessions more profitable than others. To deal with the disparity, a cross-subsidy scheme was established. The government requires bidders for the most profitable segments to offer special payments in return for the concession and uses the revenues to subsidize segments with lower traffic levels. Only the successful bidder, the one that offered the highest payment, actually makes the special payment. Although designed as a zero-sum scheme, the practice has yielded a small surplus for the government.

mal operation) through the end of the concession period. Each year the basic subsidy is adjusted up by 5 percent in real terms.

To facilitate the use of foreign exchange to finance concession projects with foreign exchange the government recently introduced an exchange rate guarantee. The guarantee takes one of two forms. For new concessions, a portion of the minimum revenue guarantee may be denominated in dollars. For concessions that use the net present value scheme, part of the value will be denominated in dollars so that, in practice, the concession term is extended in the event of devaluation. The exchange rate guarantee has been made available to existing concessions in which foreign exchange is used in loans or bond issues. In such cases, in return for the new guarantee from the state the concessionaire must agree to invest in improving safety conditions on the highway, above and beyond the level called for in the original design. (The foreign exchange guarantee is discussed further in the next section.)

## **Institutional structure**

The concessions program is managed by the Ministry of Public Works, the mission of which is to develop, repair, and maintain public works that fall within the jurisdiction of the central government as opposed to local or municipal governments. The ministry has the authority to delegate all or part of its functions through a system of competitive bids and to grant concessions for certain works. Under Chilean practices, bidding procedures and operations must be closely coordinated with the Ministry of Finance, including the preparation of bidding documents, prequalification of bidders, and award of concessions. The decree awarding a concession must be signed by both ministers. The requirement for coordination is designed to ensure that all fiscal matters implicit in a concession contract are consistent with economic policies and budgetary practices.

The *Coordinación General de Concesiones* was established as a separate agency within the Ministry of Public Works in 1991, shortly after the concessions program was launched. Its original scope was to design and implement the bidding process for granting concessions; supervise the concessions program, with particular emphasis on contract management; select, review, and recommend projects to be included in the program; and issue norms and criteria for concessions to be

used by the ministry. The ministry created a Concessions Council, chaired by the minister, to define strategic directions for the program and make or recommend major decisions such as project selection and bid awards.

Since its inception, the concessions agency has broadened the scope of its responsibilities from program design and early bidding processes to project design, bidding, selection of concessionaires, and supervision of concessions during construction and operations (box 4). The agency is currently organized into three departments—Projects, Construction, and Operations—plus a series of units that provide support on legal, environmental, sociological, and engineering matters.

The Projects Department is responsible for identifying, preparing and evaluating projects to be included in the concessions programs, with strong emphasis on demand assessment and cost benefit analysis; preparing engineering designs and cost estimates; preparing bidding documents, including evaluation criteria and incentive schemes; promoting and managing the bidding process, including evaluating bids and recommending awards; and coordinating activities with ministries and other government agencies during project selection and bidding.

The Construction Department, which manages contracts with concessionaires during the construction phase, is responsible for approving final designs and technical specifications; ensuring that construction work done by concessionaires meets applicable standards of design, quality, safety, and environmental protection; monitoring progress of construction work; recommending improvements to bidding documents regarding design and construction; coordinating and monitoring expropriations; discussing and agreeing with concessionaires on minor changes in scope and recommending major changes in scope; and helping resolve conflicts with communities affected by projects.

The Operations Department is responsible for managing concession contracts during the operational phase, with special emphasis on quality of service to users and maintenance of infrastructure. The department's main responsibilities include ensuring that concessionaires meet their contractual obligations, supervising maintenance activities, supervising operation of toll plazas, recommending improvements to the operational provisions of bidding documents, and approving payments of subsidies and minimum income guarantees concessionaires.

BOX 4

### **The multiple roles of the concessions agency**

*The agency promotes new concessions*, participating not only in policy studies of strategic concessions options, but also in selecting individual projects, promoting the participation of private investors, and managing the bidding process. It also proposes legislative and regulatory changes, including changes related to the conditions under which private investors participate in and raise financing for concessions. In its role as promoter the agency represents the public sector in efforts to cooperate with the private sector:

*The agency supervises construction activities.* Once a concession has been awarded, the agency is responsible for managing the expropriation process, ensuring the concessionaire's compliance with technical and financial obligations during construction, defining changes in project scope, handling relations with towns and communities affected by the project, and certifying the completion of construction.

*The agency supervises operations.* The agency's long-term supervisory role involves administration of all contractual matters during operation of the concession. In addition to contract management, that role includes activities aimed at providing users the highest quality of service and maintaining optimal standards of safety, maintenance, and environmental protection.

Questions have been raised within the government about whether a single agency should assume so many different roles. The argument has been made that conflicts may arise among certain functions, particularly those of promoter and supervisor, and those of regulator and contract manager. The dominant line of thinking favors leaving the role of promoter within the Ministry of Public Works and establishing an autonomous agency, similar to the one that regulates the power sector; to manage concessions contracts. Observers expect such a scheme to be fully implemented within the term of the administration that recently took office.

Several support units provide services to the three operational departments. The Engineering Unit is responsible for seeing that project designs meet norms and standards and for reviewing and approving detailed engineering designs produced by concessionaires. The Territorial Unit provides advice on issues related to the social impact of projects, particularly on strategies to mitigate any adverse social effects created by projects. The Legal Unit provides advice on legal matters related to the bidding process and the concessions contract. The Expropriation Unit is responsible for taking the legal and regulatory steps needed to acquire the land required for projects. The Environmental Unit provides advice on the resolution of environmental issues in projects and monitors concessionaires' observance of environmental norms.

### **Evolution of the program**

By 1990 the country's infrastructure, including roads, was in urgent need of modernization to meet the needs created by growth in economic activity. As noted earlier, however, the public sector was not in a position to make available the resources required for modernization due to budgetary and debt constraints deriving from macroeconomic policies vital to the country's goals of stability and sustained growth. The solution to the dilemma was a program capable of attracting private in-

vestment in public works that could be supported by user charges. The concessions program also would improve the efficiency of investments and their management by bringing private initiative into the design, construction, and operation of projects. Projects were to be conceived in such a way that investors would see them as attractive business opportunities while users would view them as providing good quality services that were worth their cost.

The government's approach was to start the program by improving and upgrading existing highways, rather than building new projects. Given the country's geography, intercity toll roads might easily become natural monopolies that would require a solid regulatory framework. Critics questioned whether toll charges on roads to which no alternative existed constituted a limitation on citizens' right of access to a public good. Eventually, toll charges were found to be no more discriminatory than gasoline taxes or vehicle registration and licensing fees.

From the outset the concessions program enjoyed strong political support not only in Congress but also from the transport and construction industries. A broad consensus existed on several key points, including the importance of upgrading infrastructure to meet the needs of exporters and other growing businesses; the need to preserve fiscal discipline without introducing new taxes; priority allocation of public expendi-

tures to health, education, housing, and the alleviation of poverty; and the use of existing road budgets to maintain and rehabilitate secondary and tertiary systems.

The first phase of the intercity road concessions program began in 1992 as a pilot for testing the regulatory framework, contract forms, and bidding system. This phase included three projects that had been under study by the ministry for some time. Although they were not considered key priorities, the projects were attractive targets for private investment. The first phase included a tunnel along Route 5 and two east-west roads of secondary importance.

After the pilot phase, the concessions program focused on a set of existing roads with high impact on the export sector of the economy, mainly those that provided access to ports in the south-central region of the country and a critical link to Argentina. This set of projects included upgrades to expressway status of access roads from Santiago to the ports of San Antonio and Valparaíso, the Santiago–Los Andes road that joined the main international road to Argentina, and the Chillán–Concepción road that provided an expeditious northern link from Route 5 to the country’s second industrial and port area.

Another set of projects covered about 1,500 kilometers of the existing Route 5 (the Panamerican Highway), the country’s main north-south artery. Route 5 carries most of the traffic around Santiago, with traffic decreasing gradually to the north and south of the capital. The government’s original intention was to grant a single concession for Route 5, but concerns over the possibility of monopolistic effects on toll levels caused the concession to be divided into eight sections that varied in length from 136 to 266 kilometers. The decision was made to upgrade this portion of Route 5 to an expressway and to aim for uniform toll levels by establishing a system of subsidies for sections with lower traffic (see box 3).

The 12 sections of road described in table 1 were concessioned between 1994 and 1998. Annex 3 provides details on the firms that participated in the bidding for these concessions. (More information on the characteristics of each concession can be found on the concession agency’s Web site at [www.cgc.cl](http://www.cgc.cl).)

The first three concessions (Chillán–Concepción, Santiago–San Antonio, and Talca–Chillán) were bid under the 1991 law, using the toll rate as the primary evaluation factor. Bidders were prequalified for the first time in the Talca–Chillán concession—the first along Route 5—thereby creating a registry of bidders

for subsequent Route 5 concessions. From this point forward, on the principle of transferring as much risk as possible to the private sector—the government provided only very basic engineering designs. Risk was mitigated through the minimum revenue guarantee.

The next group of projects was bid under the new legal framework. It included four concessions: Los Vilos–Santiago, Santiago–Los Andes, La Serena–Los Vilos, and Chillán–Collipulli. The improved legal framework had introduced elements such as the special pledge and the issuance of bonds in domestic markets that facilitated the financing process. The last two bids of this group included the concepts of a floor and ceiling for tolls and subsidies to compensate for low projected traffic volumes.

The next generation of projects—with bids awarded between mid-1997 and mid-1998—retained most of the features introduced for the second group but changed the primary evaluation criterion. The keen interest of private investors in the concession process had produced strong competition that was leading to lower expected returns on investment. If that trend continued, it could jeopardize the financial viability of concessionaires and make it difficult to raise financing. In response, the government imposed a special payment on bidders as a premium for the right to enter the business. Known as the *pago por bienes y derechos*, the payment was introduced as the primary evaluation criterion for the 1997–98 group of projects. The qualified firm that offered the highest payment won the concession. Proceeds—which were close to \$150 million for the four concessions—go into an infrastructure fund managed by the Ministry of Finance that is used to subsidize other projects and to pay minimum revenue guarantees.

The last concession awarded used the present value of total revenues as the primary evaluation criterion. Although exchange rate insurance, introduced to facilitate foreign financing, was implemented after the 12 concessions had been awarded, it was offered to existing concessionaires in return for the concessionaire’s agreement to enhance safety standards.

Starting in 1996 all projects were subject to environmental impact assessments contracted by the concessions agency. These included an analysis of project design and its relation to environmental and socioeconomic conditions in its area of influence. The objective is to ascertain the project’s possible impact on the environment during construction and operation. The assessment forms the basis for an environmental man-

agement plan that includes mitigation proposals, possible compensations, and prevention measures. After being reviewed and approved by the regional and national environmental authorities, the plan becomes part of the concession contract. The concessionaire is therefore contractually responsible for meeting all environmental standards.

The road concessions program has also introduced an extensive scheme for consultations with and participation of main stakeholders related to each project. The consultation

and participation process starts in the early stages of project design when stakeholders' inputs are sought for features such as the design of intersections, pedestrian crossings, bus stops, and stands for selling local products to travelers on the road. The consultation process continues after preliminary designs are completed with interviews and surveys conducted with municipal authorities, local leaders, and communities at large to further identify interests, concerns, and potential impacts.

## Financing

Vital to the program of toll road concessions was a regulatory framework to enable private investors to earn a return on their investment by collecting tolls. The right to collect tolls was complemented by guarantees and occasionally by subsidies, all designed to mitigate the risks inherent in forecasting traffic volume.

### Government support

The minimum revenue guarantee was the first and most important instrument for attracting investors and facilitating the structuring of financing arrangements. (Given the cost structure of the concession business, the cost and conditions of financing are the most important variable influencing return on investment.)

When the program was launched, it was assumed that most of its financing would come from the domestic financial market. The pool of funds obtainable from local banks is limited, however, by prudential regulations related to portfolio diversification. Banks operating in Chile may invest no more than 15 percent of their capital in greenfield infrastructure projects. To expand the pool of domestic financing available for concessions, financial-sector reforms introduced in 1996 enabled institutional investors (pension funds and insurance companies) to participate in financing by purchasing “infrastructure bonds” denominated in inflation adjusted monetary units in the domestic financial market. Traditionally, Chilean institutional investors invest in companies listed on Chile’s stock market and, in a more limited way, through equity participation in private development funds.

Insurance companies participated actively in the first issue of the new infrastructure bonds, but pension funds have been reluctant to invest, citing liquidity requirements that curtail their ability to invest in long-term instruments. Contributors

to pension funds are free to move among existing funds at short notice, and the monthly flow of contributors between funds generates requirements for cash transfers of accumulated funds, forcing pension funds to maintain a proportion of their portfolio in liquid instruments that otherwise would be available for investment in longer-term instruments.

Domestic bond issues are currently being prepared for four projects. The key to these bond issues is the insurance provided by international insurance agencies (such as MBIA and XL Capital Insurance Limited), which provides investors comfort through a higher project rating. Bonds are rated by reputable local agencies that take into account the solidity of projects, the terms of the concession contract and of private guarantees, and the validity of the available enhancements, including minimum revenue guarantees, subsidies, and revenue pledges.<sup>3</sup>

Some concessionaires consider the cost of bond financing to be relatively high in relation to the return expected from the concession. For that reason, they have continued to seek loan financing, even on short terms, especially during the construction period.

The limited availability of financing in the domestic market led concessionaires to explore mechanisms that would enable financing in international markets. The key issue here has been the availability of instruments to hedge foreign exchange risk. Concessions are by their nature conducted in local currency. Although the revenue obligations of concessions are expressed in a real-term, inflation adjusted monetary unit that historically has undergone only minor fluctuations against the dollar,<sup>4</sup> there remains an inherent risk associated with possible fluctuations. Other characteristics of the Chilean financial market—notably regulations related to intermediation by financial institutions of foreign exchange insurance and other risk mitigating instruments—limit the availability and use of instruments to hedge foreign exchange risk.

In 1999 the government established a mechanism to provide exchange rate insurance for foreign debt. The basic plan covers situations in which the value of the inflation adjusted monetary unit depreciates by more than 10 percent against the value of the U.S. dollar at the time coverage began. The premium has been established at 1 percent of the value covered. All concessions for which agreements had been signed when the new insurance was introduced were declared eligible. In such cases, the insurance premium would be paid by investing an agreed amount to upgrade the safety conditions of the expressway beyond the standards established in the concession contract.

## Financing arrangements

Sources of financing available to concession firms include equity contributions and direct financing from sponsors, plus loans, bonds, and other instruments available in the domestic and international financial markets. A minimum amount of equity must be contributed to concession firms as specified in the bidding documents. The equity contribution—generally defined in inflation adjusted monetary units in the bidding documents—is normally about 30 percent of the official budget estimate for the project. (Because the actual financing required for projects—when working capital and interest on construction loans are taken into account—is normally about 30 to 40 percent higher than the official budget estimate, the contractual equity contribution is closer to 20 percent of the total financing.) Contractual equity becomes an upfront contribution that must be subscribed and paid when the concession firm is created and not later than 60 days after the award decree is published in the government's official gazette. Concession firms can then structure their financing in the domestic or international capital markets through a combination of short- and long-term loans and bonds. Most sponsors are large international construction companies which, by and large, have easy access to financing.

Concessionaires' approaches to obtaining finance have evolved since the first two of the 12 concessions under study were awarded in 1995. Although one of the first concessions obtained limited-recourse, long-term financing at early stages of construction, with a full guarantee from the sponsors, most of the other concessions have relied on bridging arrangements followed by some form of long-term financing. Experience has

shown that domestic and foreign financial institutions feel more comfortable about providing long-term financing when construction is well advanced. The financial markets have shown a reluctance to use nonrecourse financing, and financial arrangements normally have included some form of support from sponsors, especially during construction. Due to uncertainties in demand for toll roads, banks tend to rely basically on government obligations to define the amount of debt financing that they will provide. Those obligations are based on minimum revenue guarantees and, in some cases, subsidies.

As mentioned earlier, sponsors contribute equity to the company formed to build and run the concession. In many cases, equity contributions have exceeded contractual obligations. Only one concession (Talca–Chillán), which was the first to raise long-term financing through a domestic bond issue, limited its equity contribution to the contractual amount. In two cases, sponsors sought the participation of local investment funds to channel resources from institutional investors such as pension funds and insurance companies. Annex 4 provides more details on financing arrangements.

Only three concessions obtained long-term loans from local banks before reaching the operational phase: Santiago–San Antonio (6 years), Chillán–Concepción (18 years), and Temuco–Río Bueno (21 years). Others have used short-term loans from local banks to be replaced at a later date by long-term instruments. The two largest concessions, in terms of investment (Santiago–Talca and Santiago–Valparaíso), are at early stages of construction and in the process of defining their financial structure. During 2000 they sought close to \$1 billion in financing, an amount that far exceeds the capability of the domestic market. Both projects are considering a mix of domestic and foreign bond issues.

The first two concessions awarded in 1995 (Chillán–Concepción and Santiago–San Antonio) were able to obtain long-term loans syndicated by local banks. In both cases, recourse to the sponsors during the construction phase was established, and loan amounts were largely dependent on the minimum revenue guarantees provided in the concession contracts. A third concession (Temuco–Río Bueno) later obtained in the local market a syndicated loan with a 21-year maturity for the equivalent of \$200 million.

Another group of four concessions opted to use the domestic bond market. In the case of Talca–Chillán, a bond issue for the equivalent of \$165 million, guaranteed by MBIA and



TABLE 2

**Financing of concessions**

Concession	Sponsor (nationality)	Total cost (\$million)	Debt/equity ratio	Award date	Financial closure	Form of long-term debt
Chillán–Concepción	Tribasa/Trinela (Mexico/Chile)	211	48/52	January 1995	July 1995	18-year local loan in UFs
Santiago–San Antonio	Endesa (Spain)	160	67/33	June 1995	April 1996	6-year local loan in UFs
Talca–Chillán	Ferrovial/Delta (Spain/Chile)	186	80/20	January 1996	January 1996	9-year bond issue in UFs
Los Vilos–Santiago	Tribasa/Huarte (Mexico/Spain)	317	74/26	October 1996	<sup>a</sup>	Not yet defined
Santiago–Los Andes	Endesa (Chile/Spain)	175	73/27	February 1997	<sup>a</sup>	Bonds <sup>b</sup> in inflation adjusted monetary units (UFs) <sup>c</sup>
La Serena–Los Vilos	Sacyr (Spain)	280	63/37	April 1997	December 1999	8-year foreign loan
Temuco–Río Bueno	Ferrovial/Bufete (Spain/Mex.)	277	70/30	August 1997	December 1998	21-year local loan in UFs
Chillán–Collipulli	GTM/Tribasa (France/Mex.)	247	80/20	October 1997	<sup>a</sup>	Bonds in UFs <sup>b</sup>
Río Bueno–Puerto Montt	Sacyr (Spain)	290	70/30	March 1998	December 1999	10-year foreign loan
Collipulli–Temuco	Ferrovial/Bufete (Spain/Mex.)	274	80/20	August 1998	July 1998	Bonds in UFs
Santiago–Valparaíso	Sacyr (Spain)	400	—	August 1998	<sup>a</sup>	Bonds/loans under study
Santiago–Talca	Ferrovial (Spain)	750	—	August 1998	August 1998	Not yet defined

a. Companies are raising short-term financing to meet their construction needs

b. Bond issue still in preparation.

c. An inflation adjusted monetary unit, the *unidad de fomento* (UF), is in common use in Chile's financial and construction sector.

Source: Authors' research.

underwritten by a local bank, was placed in late 1998, when construction was well advanced. The bond issue took more than two years to complete, because it was the first of its kind and size in the Chilean market. It established a precedent, however, that is expected to help other concessions to follow this route. In August 2000 Collipulli–Temuco issued bonds for the equivalent of \$210 million guaranteed by XL Capital Insurance Limited and underwritten by a local bank. Three other concessions (Chillán–Collipulli, Santiago–Los Andes, and Santiago–Valparaíso) are currently well advanced in structuring bond issues in inflation adjusted monetary units guaranteed by insurance companies or, in one case, by the Inter-American Development Bank. In another case (Santiago–Los Vilos), long-term financing was delayed due to financial dif-

iculties faced by the foreign sponsor in its home country. In October 2000 the lenders took over the concession and hired and contractor to complete the project.

Two concessions (Los Vilos–La Serena and Río Bueno–Puerto Montt, both under the same sponsor) have recently obtained long-term loans from foreign banks for \$158 million and \$180 million, respectively. In both cases, concessionaires used the exchange rate guarantee established by the government in 1999. The reserve requirement established by the Chilean central bank for foreign exchange financing and “nonproductive investments” was set to zero in 1999, which amounts to its practical elimination and made possible this form of long term financing.<sup>5</sup> Table 2 and annex 4 summarize the financing arrangements of the 12 concessions.<sup>6</sup>

## Lessons Learned

The experience gained during the implementation of the program yielded several lessons, from which policy recommendations can be derived.

*The concessions scheme changed how resources are allocated to road infrastructure.*

Before the concessions program began, the Ministry of Public Works ranked all of the investments that had to compete for public sector resources. Those rankings were evaluated by the Ministry of Planning before funds could be allocated by the Ministry of Finance and approved by Congress. The Ministry of Public Works now has greater autonomy. Concession projects are selected, designed, and approved by the ministry, but they do not compete for resources with other public sector projects. The increased autonomy requires that the policies, strategies, and guidelines used to select concession projects be very well defined. They must include the public-private distribution of risks and the long-term financial exposure that the public sector is prepared to assume through guarantees and subsidies. Projects are subjected to a market test through the bidding process, during which private investors assess whether expected returns are commensurate with the risks of each project. (Risks include projections of traffic volumes, investment estimates, time to completion, and changes in the political and economic climate.)

*Foreign construction companies dominate the Chilean road concessions market.*

It was originally assumed that the investors most likely to become interested in Chile's road concession business would be led by Chilean financial groups, which would in turn seek

technical support from the domestic construction industry. Domestic investors did indeed show some interest, but foreign investors were quickly attracted. Those most interested were European construction companies with experience in road construction and in management of toll roads. Starting in 1996, when the modified concessions law was approved, high levels of competition among foreign firms led the government to establish "special payments" as the key selection criterion for bid evaluation. The government designed such fees to test the seriousness of firms interested in participating in the concessions business, considering the ability to make such payments as a sign of a firm's capacity to mobilize financial resources efficiently during the construction phase and thereby obtain a more attractive return on their investments. It is unclear, however, how the economic rent generated by a project is distributed within a sponsoring consortium between the short-term construction activities (2 to 3 years) and the long-term operation of a toll road (20 to 30 years).

*It takes at least five years for a proposed concession to become a fully operational toll road.*

The time required to prepare a toll road project varies greatly with the availability of engineering and planning studies and with the time required to interest prospective investors in a given project. Preparation may take from a few months to more than a year. In the 12 concessions under analysis an average of eight months passed from the date the bid was advertised to the publication of the award in the government's official gazette. Another eight months were required to set up the concession company and begin construction. The time required to complete construction and commence full-scale operations has varied between 33 and 45 months depending on project complexity. Most projects have been divided into two

or three segments that become operational in phases. Table 1 shows the actual time taken for each concession.

*Concessionaires have found it difficult to arrange long-term financing during the construction phase.*

Because they attach great importance to the risks of construction delays and cost overruns, local banks have proved reluctant to offer long-term loans until construction is complete. Only three concessions were able to obtain long-term financing while construction was in progress. In all three cases, the banks requested the concessionaire's sponsors to provide guarantees to cover construction risks. Most of the projects under study were obliged to use some form of bridge financing from local banks to cover the construction phase. Concessionaires expect to obtain long-term financing when construction is well advanced and construction risks have been minimized or eliminated.

*Minimum revenue guarantees were a key factor in providing comfort to investors and financiers.*

When considering a loan for a toll road (usually limited-recourse financing) or rating a toll-road project, banks and credit rating companies view the minimum revenue guarantee as crucial in mitigating risks. They look at the guaranteed minimum as an indicator of the cash flow to be generated by each project and therefore of the borrower's ability to repay a given loan. The guarantee is generally viewed as a contingent obligation of the government that is triggered whenever the yearly income falls below the minimum guaranteed for that year.

*When projects have a high economic and social impact, but externalities do not translate into high private returns, public-private distribution of risk becomes critical.*

Chile's strategy for developing and upgrading the road network during the mid- to late 1990s was based on selecting projects that had a high potential to promote economic growth. Externalities were obvious, but usually they could not be translated into revenues to the private investor. The policy of setting uniform tolls along the expressway network further limited the ability of potential concessionaires to improve their

return on investment. Under the circumstances, the distribution of risks became the key tool used to attract private investment. Risks that could not be transferred through market instruments had to be borne by the government. Concessions are by their nature a partnership between government and the private sector. Well-defined parameters of design, investment, and risk mitigation provide limited but attractive levels of return to private investors. The concession firm assumes risks related to financing conditions, construction and operational efficiencies, and the elasticity of demand. The government assumes risks associated with foreign exchange, minimum levels of traffic, and delays and cost overruns related to expropriation.

*Elasticity of demand depends on the identity of the actual user—the transportation company or the driver—and on the user's willingness to pay.*

The relation between elasticity of demand and toll levels on the Chilean highway system has never been conclusively demonstrated. An experience with the concession granted for a tunnel along Route 5 during the pilot phase may be instructive, however. (The project was not one of the 12 reviewed in this report.) The tunnel was the first concession project in the Chilean road system that included a guarantee, not of minimum income, but of minimum traffic. After several years of operation, traffic levels have been lower than expected, particularly for trucks providing long-range transport of merchandise to and from Santiago and northern Chile. Although the tunnel is shorter and spares drivers the burden of driving along a winding mountain road, the alternative route is toll free, and a considerable number of trucks take it instead of the tunnel. Transport companies provide their drivers with a lump sum to cover the cost of tolls. Many drivers apparently prefer to keep the money even at the cost of extending their 20- or 30-hour journey by 30 to 45 minutes. By contrast, the concessionaire has found it easy to make special arrangements, such as negotiated tolls, with bus companies, who use the tunnel to provide better service to their customers.

*The availability of a free parallel route is not a precondition for establishing a toll road concession.*

When the concession law was being revised in the mid-1990s, critics asked whether the policy of not providing an

alternative route with free access did not violate constitutional rights to move freely about the country and to have access to private property. A legal opinion requested by the Ministry of Public Works validated the way in which the concession program dealt with both points. The legal opinion asserted that tolls affect the cost of moving from one point to another within the country, but not the freedom to do so. Tolls are just one item in the total cost of transportation, falling into the same category as taxes on fuels or fees for the issuance of driving permits. The opinion also stated that exercise of the rights assured by the Constitution is not necessarily free of cost to the individual. It also argued that laws can establish limitations on and obligations for the exercise of property rights where such limits and obligations are in the general interest. Adequate road infrastructure is in the general interest.

*It is too early to properly assess sustainability, but the recent financial crisis had little impact on the implementation of the concessions program.*

By the time the last of the 12 concessions had been granted, the Chilean economy was entering a recession provoked by the economic crisis in East Asia and a drop in the prices of key export commodities. The recession delayed negotiations for financing and increased financing costs due to relatively high interest rates over several months, but concessionaires do not believe that it had a major impact on their projects. On the contrary, the slowdown of construction activity occasioned by the recession increased the supply of subcontractors, materials, and labor, lowering prices and wages. Additionally, it accelerated the approval of the exchange rate guarantee mechanism, which enabled foreign financing of some projects.

*The small size of the domestic financial market led to the creation of an exchange rate guarantee that provided access to foreign financial markets.*

In their search for construction financing, most of the concession projects awarded in 1997 and 1998 encountered limits on the financing capacity of local banks and on access to in-

stitutional financing. The limits led the government to encourage foreign financing by providing a hedge against foreign exchange risks. The terms and conditions of new concessions included a provision that denominated a portion of the minimum revenue guarantee in dollar terms. Concessions that use the net present value system are allowed to denominate part of the net present value in dollars. The exchange rate guarantee is also available to existing concessions that seek foreign exchange financing. In such cases, instead of paying an insurance premium, concessionaires agree to invest in improving safety conditions beyond the standards specified in the concession contract.

*Government members of conciliation commissions should have adequate authority to accept and enforce negotiated agreements.*

The current practice of appointing members to conciliation commissions prevents the commission from operating as intended. The representative from the government typically holds a senior position in the public sector, and the conflicts before the commission often hold out the possibility that the government may have to make additional payments to concessionaires. The fact that public sector representatives can act only when explicitly authorized to do so by law (notably in making public expenditures) imposes severe limitations on their freedom of action—and their objectivity—as members of a commission whose decisions may lead to the expenditure of public funds. One possibility is to appoint to the commissions “independent persons” who are authorized to represent the government on the commission but who are not bound by the limitations imposed on public officials.

*Concessionaires should have only one government interlocutor in each phase of a project.*

Concessionaires have complained about having to deal with several government agencies in matters involving technical designs, drawings, contractual payments, environmental requirements, labor laws, and other issues. They recommend that the concessions agency make an effort to streamline the handling of contractual matters.

## Notes

1. All dollar amounts refer to U.S. dollars.
2. The Chilean financial and construction sectors use a monetary unit that is adjusted daily for inflation. It is known as the *unidad de fomento*, or UF.
3. Credit rating agencies normally assess risks related to off-take (traffic volume and demand characteristics), construction (potential delays and cost overruns), structural aspects of the business (concession agreement, cash flows, and capital structure), operations (operator and cost structure), country risk (economic, political, and regulatory environments), and sponsors (prior experience, commitment to the project, strategic importance of the project, and financial strength).
4. During the period 1990–94, the *unidad de fomento* increased steadily in dollar terms from \$19 in January 1990 to \$28 by September 1994. Since then, the relationship has maintained a fairly constant value, with an average slightly above \$30 and deviations not exceeding 10 percent.
5. The reserve requirement was established by the central bank after a financial crisis to limit arbitrage operations with foreign short-term deposits in the domestic market. A percentage was retained by the central bank for one year or an interest penalty had to be paid.
6. Several concessions were structuring their long term financing programs at the time of the review. These did not disclose their terms.

## Annex 1

# Statutes and Regulations Pertaining to Chile's Concessions Regime

Article 52 of Law 15840 of 1964, as amended by Law 19474 of 1996, and DFL 206 of 1960, as amended by DS MOP 294 of 1984, provide legal authority for the contracting and concessions activities of the Ministry of Public Works as expressed most recently in Article 87 of DFL MOP 850 of December 1997.

The legislation and decrees authorize the ministry to award public works contracts by national and international competitive bidding, including temporary concessions for development, operation, and maintenance of public works. They also set the duration of such concessions, which are not to exceed 50 years.

DFL MOP 591 of 1982, amended by DS MOP 217 of 1983 and summarized in DFL 164 of 1991, "Normas relativas a la ejecución, reparación, conservación y explotación de obras públicas fiscales por el sistema de concesión," and in DS MOP 900 of 1996, sets general standards for the execution, operation, and maintenance of public works, as well as for bids

for public works contracts under Law 15,840 of 1964 and DFL 206 of 1960.

DS MOP 240 of 1991, "Reglamento de la ley de concesiones," provides norms for the implementation of Law 19252 of 1993 amends DFL 164 of 1991.

Law 19460 of 1996, "Modificaciones a la ley de concesiones contenidas en el DFL 164 de 1991," amends DFL 164 of 1991 (concessions), Decree 824 of 1974 (income), Decree 825 of 1974 (VAT), Article 84 of DFL 252 of 1960, and the general banking law.

DS MOP 956 of 1997, "Reglamento de las normas relativas a la ejecución, reparación o conservación de obras públicas fiscales por el sistema de concesión," sets standards for the execution, operation, and maintenance of public works under the concession scheme established in Article 87 of DS MOP 294 of 1984 and in DFL 164, as amended by Law 19252 of 1993 and Law 19460 of 1996.

## Annex 2

# Sample Bidding Document, Table of Contents

### Instructions to Bidders

Introduction

Bidding Process

Definitions

Official Estimated Budget

Cost of the Proposal

Content of Bidding Documents

Designs and Related Studies

Clarifications to Bidding Documents

Proposals

Language

Delivery of Proposals

Documents to Be Included in the Technical Proposal

Documents to Be Included in the Commercial Proposal

Validity of Proposals

Bid Opening and Evaluation

Delivery of Proposals and Opening of Technical Proposal

Evaluation of Technical Proposal

Opening of Commercial Proposal

Evaluation of Commercial Proposal

Bid Award and Concession Contract

Bid Award

Right to Reject All Proposals

Establishment of Concession Firm and Contract Signing

Costs of Concession Contract

Starting Date for Concession Contract

Termination Date for Concession Contract

Contractual Relations between the Concession Firm and the Ministry of Public Works

Construction and Operating Guarantees

Inspection by the Ministry of Public Works

Technical Inspections during Construction and Operation

Delivery of Information

Infrastructure Works Made Available to the Concession Firm

Expropriations

Payment of Expropriations by the Concessionaire

Fines for Not Meeting Obligations

Maximum Weight and Dimensions of Vehicles

Access to the Toll Road

Insurance for Third Party Liability

Insurance for Damages to Existing Infrastructure

Assignment of the Concession Contract

Modifications to the Capital Structure of the Concession Firm

Construction Phase

Detail Engineering to Be Carried Out by the Concession Firm

Standards to Be Applied during Construction and Commissioning

Operating Phase

Authorization for Provisional Operation of Key Segments of the Road

Authorization for Permanent Operation of Key Segments of the Road

Records to Be Kept during the Operating Phase

Delivery of Regulations for the Operating Phase

Maintenance of the Works

Modifications to the Operating Regime

Subcontracting of Operations and Maintenance Activities

Force Majeure during the Operating Phase

Termination of the Concession Contract

Main Causes for Termination of the Contract

Termination on Termination Date

Transfer of the Works at Termination Date

Termination Due to Serious Breach of Obligations under the Concession Contract

The Conciliation Commission

Commercial Terms

Payments for Pre-existing Infrastructure

Premiums for Meeting Safety Standards

Toll Charges

Payments Due to the Government by the Bidder and the Concession Firm

Additional Investments

Tax Aspects

Procedures for Making Payments by Both Parties

Penalties for Late Payments

Minimum Revenue Guaranteed by the Government

Regime for Toll Charges

Classification of Vehicles

Location of Toll Booths

Structure of the Toll System  
Adjustment of Tolls  
Revisions to the Toll Structure  
Management of the Toll System

**Technical Aspects**

Introduction

Works to Be Carried Out on Main Segments of the Road  
Special Access Roads  
Special Services

Detailed Works to Be Carried Out

New Works to Be Constructed  
Rehabilitation of Existing Infrastructure  
Signaling and Safety  
Environmental Aspects  
Study of Environmental Impact  
Environmental Management during Construction  
Environmental Reports

Engineering Designs

General Engineering Norms to Be Used  
Specific Norms and Standards

Presentation of Engineering Designs  
Information Needed for Expropriation Procedures  
Operating Phase

Maintenance of the Works by Concession Staff  
Service Standards to Users  
Measurement of Flow of Vehicles  
Statistical Information to Be Kept  
Material Testing and Essays  
Annual Work Program  
Environmental Management  
Environmental Reports

**Commercial Aspects**

Evaluation Criteria

Toll Levels  
Payments for Existing Infrastructure  
Payments for Goods and Services  
Points in the Technical Evaluation

Commercial Proposal

Evaluation of Commercial Proposals



## Annex 3

### Firms Participating in Bidding

Concession	Bidders	Countries	Award
Chillán–Concepción	Tribasa/Neut Latour	Mexico/Chile	Tribasa/Neut Latour
Santiago–San Antonio	Cassa Obras y Desarrollo/Cominco ECOVIAS Infraestructura 2000 (ENDESA) Tribasa Autopista San Antonio SA	Chile Spain/Chile Spain Chile/Spain Mexico Chile	Infraestructura 2000 (ENDESA)
Talca–Chillán	Ferrovial/Delta	Spain/Chile	Ferrovial/Delta
Los Vilos–Santiago	ICA/TECSA Obras y Desarrollo/Cominco Tribasa/Neut Latour	Mexico/Chile Spain/Chile Mexico/Chile	Tribasa/Neut Latour
Santiago–Los Andes	Infraestructura 2000 (ENDESA)	Chile/Spain	Infraestructura 2000 (ENDESA)
La Serena–Los Vilos	Sacyr Tribasa	Spain Mexico	Sacyr
Temuco–Río Bueno	Ferrovial/Delta/CB Infraestructura 2000 (ENDESA) Sacyr	Spain/Chile Chile/Spain Spain	Ferrovial/Delta/CB
Chillán–Collipulli	Obras y Desarrollo/Cominco Infraestructura 2000 (ENDESA) Tribasa	Spain/Chile Chile/Spain Mexico	Tribasa (Merged with GMT from France after the award)
Río Bueno–Puerto Montt	Concesiones IberoChilenas ICA/TECSA Ferrovial/Delta/CB Infraestructura 2000 (ENDESA) Sacyr	Spain/Chile Mexico/Chile Spain/Chile Chile/Spain Spain	Sacyr
Collipulli–Temuco	Ferrovial/Agroman ICA/TECSA Infraestructura 2000 (ENDESA) Sacyr	Spain/Chile Mexico/Chile Chile/Spain Spain	Ferrovial/Agroman
Santiago–Valparaíso	Entrecanales/Belfi/Claro&Co ICA Ferrovial/Agroman Sacyr/ACS	Spain/Chile Mexico Spain/Chile Spain/Chile	Sacyr/ACS
Santiago–Talca	ICA Ferrovial/Infraestructura 2000 Sacyr Mendes Junior/Necso	Mexico Spain/Chile Spain Brazil	Ferrovial/Infraestructura 2000

## Annex 4

# Financing for Toll Road Concessions

The information provided below has been obtained on an informal basis. As most of the projects have not reached financial closing, the bulk of the information is still confidential. The authors do not guarantee accuracy.

“UF” stands for *unidad de fomento*, an inflation adjusted monetary unit used in the Chile’s financial and construction sectors. Historically, the UF has been fairly stable against the dollar.

### Chillán–Concepción

*Total cost:* UF 6,336,000 (\$211 million)

*Equity:* UF 3,444,249, 52 percent

*Debt:* UF 2,720,000, 42.9 percent. Eighteen-year loan syndicated by local banks (domestic prime rate plus 2.25 percent/variable) (Banco Chile, 47.8 percent; Banco Santiago, 40.7 percent; Banco Sudamericano, 11.5 percent); other financing in the amount of UF 171,729. Recourse to the sponsor during construction; not during operation.

### Santiago–San Antonio

*Total cost:* UF 5,320,251 (\$154 million)

*Equity:* UF 1,831,000 (\$53 million), 34 percent

*Debt:* Loan of UF 3,212,880 (\$93 million), 66 percent, plus line of credit of UF 276,377 (\$8 million), locally syndicated for six years at a variable rate (Banco Chile, 33.3 percent; Banco Santander, 33.3 percent; Banco Estado, 33.3 percent). Recourse to the sponsor during construction; not during operation.

### Talca–Chillán

*Total cost:* UF 6,125,000 (\$184 million)

*Equity:* UF 1,250,000 (\$38 million), 20 percent

*Debt:* Bridge loan from Banco Santander. UF 5,000,000 in nine-year bonds issued in December 1998, at 96.4 percent,

guaranteed by MBIA and underwritten by Banco Santander; the total cost of the bonds was an inflation adjustment plus domestic basic long-term rate (PCR) plus 2.3 percent plus guarantee cost. The project was about 90 percent complete when bonds were issued.

### Santiago–Los Vilos

*Total cost:* UF 9,500,000 (\$285 million)

*Equity:* UF 2,500,000 (\$75 million), 27 percent

*Debt:* UF 7,000,000 (\$210 million), 73 percent. Bridge loan from local banks at TAB plus 1.2 percent for 18 months (Banco Chile, 25 percent; Banco Santiago, 25 percent; Banco Estado, 25 percent; Banco Investamerica, 25 percent), replaced in January 2001 by two-year foreign bridge loan from Bancomex at U.S. Treasury rate plus 6.25 percent. Long-term financing expected to take the form of 20-year bonds denominated in UFs, based on a minimum income guarantee (MIG) of PRC plus 2 percent.

### Santiago–Los Andes

*Total cost:* UF 5,268,000 (\$152 million)

*Equity:* UF 1,441,000 (\$41 million), 27.3 percent

*Debt:* UF 3,827,000 (\$109 million), 72.7 percent. Locally syndicated bridge loan due December 2000 expected to be extended for one more year up to \$113 million (Banco Chile, 50 percent; Banco Santiago, 50 percent). Long-term financing in UF-denominated bonds is expected. Recourse to the sponsor during construction; not during operation.

### Los Vilos–La Serena

*Total cost:* UF 8,409,524 (\$252 million)

*Equity:* UF 3,143,000 (\$93 million), 37 percent

*Debt:* Six-month revolving bridge financing from Banco del Estado, UF 700,000, and Banco Santander, Euro 45,000,000.

Long-term financing from ICO and Caixa, eight years, total \$158 million (UF 5,266,666), guaranteed by Banco Central Hispano and Argentaria; Sacyr guarantees in case of nonpayment by the state (MIG and subsidy).

#### **Temuco–Río Bueno**

*Total cost:* UF 8,300,000 (\$249 million)

*Equity:* UF 2,500,000 (\$75 million), 30 percent

*Debt:* UF 5,800,000 (\$174 million), 70 percent. Twenty-one years at TAB plus 2.25 percent, locally syndicated (Banco Chile, 44 percent; Banco Estado, 44 percent; Security, 5 percent; BHIF, 7 percent. Termination guarantee by the sponsors during construction.

#### **Chillán–Collipulli**

*Total cost:* UF 7,417,801 (\$223 million)

*Equity:* UF 1,500,000 (\$45 million), 20 percent

*Debt:* Bridge loan from Banco Santander. Long-term bond issue in UF in preparation to be guaranteed by XL Capital Insurance and underwritten by Banco Santander (cost of guarantee is about 1.85 percent).

#### **Río Bueno–Puerto Montt**

*Total cost:* UF 8,678,571 (\$260 million)

*Equity:* UF 2,678,857 (\$78 million), 30 percent

*Debt:* Six-month revolving bridge financing by Banco del Estado in UFs and Banco Santander in Euros. Ten-year per-

manent financing in the amount of \$180 million (UF 6,000,000) from ICO and Caixa, guaranteed by Banco Central Hispano and Argentaria; Sacyr guarantees in case of default by the state (MIG and subsidy).

#### **Collipulli–Temuco**

*Total cost:* UF 9,250,000 (\$278 million)

*Equity:* UF 1,850,000 (\$68 million), 20 percent

*Debt:* Bridge loan from Banco Santander. Twenty-year bond issue for UF 7,400,000 (\$210 million) guaranteed by XL Capital Insurance and underwritten by Banco Santander. The terms of the bond have not been disclosed.

#### **Santiago–Valparaíso**

*Total cost:* UF 12,318,769 (\$370 million)

*Equity:* UF 2,464,000 (\$74 million), 20 percent

*Debt:* Financing not yet defined, but UF- and dollar-denominated bonds are anticipated. In June 2000 the Inter-American Development Bank approved a guarantee to be syndicated with private insurance agencies. The sponsor began construction using its own resources.

#### **Santiago–Talca**

*Total cost:* UF 22,500,000 (\$675 million), official cost

*Equity:* UF 4,500,000 (\$135 million), 20 percent

*Debt:* Financing is not yet set. Bonds issued in United States are being considered, as is local bank syndication.

## Annex 5

### Additional Reading

Coordinación General de Concesiones, “Infraestructura Pública y Programa General de Concesiones,” Ministry of Public Works, Santiago, January 1998. The Web site of the concessions agency, [www.cgc.cl](http://www.cgc.cl), offers up-to-date information in Spanish and English on the Chilean government’s concessions program.

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