18 CENTRAL ZONE: TOWARDS A GATEWAY CITY FROM A PORT CITY

18.1 Central Zone: Its Importance as a Gateway

Chile, located on the Pacific Coast, is a natural gateway between South America and Asia and the Pacific. The emerging reality of regional integration among South American countries not merely increases Chile's importance as a logistics center but also provides the country with new opportunities as a trade and business center of the continent. To take full advantage of its geographical position and seize existing opportunities, it is crucial to formulate an effective strategy so the country may the principal, and full-fledged, gateway of South America.

The Central Zone, which consists of Region IV (Region of Coquimbo) and Region V (Region of Valparaíso), is located in the central part of Chile and neighbors some land-locked provinces of Argentina, such as Mendoza and San Juan. The zone is the principal gateway of Chile, handling with over 60% of import cargoes from overseas and about 27% of export cargoes to overseas (Table 18.1.1).

Table 18.1.1 International Cargo Movement in 1999

(1,000 tons/year)

		North Zone	Central Zone	South Zone	Total
Export	To South American countries	603	850	421	1,874
	To other countries	13,632	8,343	8,737	30,712
Import	From South American countries	276	1,419	488	2,183
	From other countries	5701	13283	1909	20,893
Transit	Transit to South American countries	428	88	4	520
	Transit to other countries	744	143	3	890
Export	To South American countries	32.2%	45.4%	22.5%	100.0%
	To other countries	44.4%	27.2%	28.4%	100.0%
Import	From South American countries	12.6%	65.0%	22.4%	100.0%
	From other countries	27.3%	63.6%	9.1%	100.0%
Transit	Transit to South American countries	82.3%	16.9%	0.8%	100.0%
	Transit to other countries	83.6%	16.1%	0.3%	100.0%

Source: Cámara Marítima a y Portuaria de Chile A.G.; and Customs Services of Valparaíso, Chile, *Tráfico Terrestre Avanzadas Fronterizas*, Enero a Diciembre 1999

There are three major ports and two national border paths in the Central Zone. Among the three ports, San Antonio has the largest capacity (Table 18.1.2). With the Ports of Valparaíso and San Antonio, Region V handles the majority of international cargo of the zone (Table 18.1.3) and is of great importance as the principal gateway of Chile as well.

Table 18.1.2 Current Capacity of Major Ports in the Central Zone

	1999			
	Total Cargo (tons)	Number of Berths	Port Efficiency (tons/hr)	Handling Capacity (ton/year)
Coquimbo	242,721	2	102	1,000,000
Valparaíso	3,718,271	8	140	5,500,000
San Antonio	6,490,186	9	183	8,100,000
Total	10,451,178			14,600,000

Source: 1) Cámara Marítima y Portuaria de Chile A.G., *Maritime Transport Statistics*.
2) Directimar Armada de Chile, *Boletin Estadístico Marítimo 1999*.
3) Ministry of Public Works.

Table 18.1.3 International Cargo Handling by Port and Cargo Class

(Metric tons)

Port of Discharge	Year	General Cargo		Refrigerated Cargo		Solid	Liquid	Total
		Container	Break	Container	Break	Bulk	Bulk	Cargo
Valparaíso	1999	1,004,593	375,870	40,828	24,066	19,154	1,674	1,466,187
	1997	1,045,869	767,599	77,103	110,112	0	90,962	2,091,646
	1996	933,480	570,528	55,288	183,638	0	137,368	1,880,305
	1994	882,231	674,207	31,930	194,625	0	106,654	1,889,650
San Antonio	1999	1,121,989	369,557	212,094	0	2,378,812	119,429	4,201,884
	1997	1,314,548	545,593	75,660	0	1,371,503	152,006	3,459,312
	1996	1,088,063	556,507	31,867	0	1,527,001	148,322	3,351,763
	1994	452,613	164,804	5,573	98	1,643,379	182,002	2,448,471
Coquimbo	1999	9,475	3,573	0	0	19,256	0	32,305
	1997	898	10,871	0	0	18,894	3,475	34,139
	1996	554	698	0	0	30,199	0	31,453
	1994	1,855	5,500	0	0	24,406	0	31,762

Source: Camara Maritima y Portuaria de Chile A.G.

In Region V, the volume of general and refrigerated cargoes handled by San Antonio Port has tended to exceed that of Valparaíso Port since the mid-1990s. Physically, San Antonio has greater development potential with more space to expand in surrounding areas and has, in fact, been growing rapidly. Valparaíso Port, on the other hand, seems to have stagnated or declined in recent years and the Province of Valparaíso is faced with prolonged unemployment. The introduction of machinery for higher efficiency of port operations, which accelerated after the granting of a concession in the port to the private sector, has resulted in a decrease in demand for manual port labor. Some workers have moved to San Antonio Port, but the competition with the Metropolitan Region in the installation of manufacturing industries and trading businesses has aggravated the regional employment situation, particularly of the Province of Valparaíso.

This study focuses on the development of Valparaíso City as an international gateway, though the strategy and action plans are intended for the use of the Central Zone as a whole. The focus on Valparaíso City is because the port, the city's main economic activity and strength, has been declining and affected the competitiveness of port-related services and industries in the city and the province. The JICA Study Team, based on the Phase I Study, believes that the city has great potential to become an important business center in the macro-region including the Cuyo region (Mendoza, San Juan, and San Luis) and partially the Pampa region (e.g., Cordoba) of Argentina. The section of transport infrastructure development, therefore, covers the entire zone with emphasis on the connection between the Metropolitan Region and the Argentine regions. Infrastructure, particularly that for transport, is a basis for the development of Valparaíso as the principal gateway of South America.

18.2 Present Conditions of Valparaíso City

The main feature of the gateway development strategy proposed for the Central Zone is the transformation of Valparaíso City from a port city into a principal gateway city in the South Cone of South America. The transformation is, on one hand, the reinforcement of existing economic activities of the city and, on the other, the fostering of new types of businesses and industries towards the development of a full-fledged international gateway, as discussed further in Section 18.4. In various aspects the city must make the most of its environments and strengths to become the principal gateway in the macro-region. For this purpose, this section analyzes the present conditions of Valparaíso City, such as its strengths, the present situation and outlook regarding regional integration with Argentina, and the development of small- and medium-sized enterprises (SMEs) as a key actor for the gateway development strategy.

Table 18.2.1 demonstrates the distribution of population in Region V.[1] A percentage of the population accounting to 57.86% concentrates in the province of Valparaíso. About 70% of the population of the province lives in the two principal communes of Valparaíso and Viña del Mar. (Table 18.1.4) Such high concentration clearly indicates the importance of this area in the region.

Table 18.2.1 Population Projection of Region V in 1999

	Total		
Petorca	71,661	4.64%	
Los Andes	87,950	5.70%	
San Felipe	132,586	8.59%	
Quillota	224,626	14.55%	
Valparaíso	**893,166**	57.86%	100.00%
(Valparaíso)	(294,506)	(19.08%)	32.97%
(Viña Del Mar)	(339,482)	(21.99%)	38.01%
San Antonio	130,061	8.43%	
Isla de Pascua	3,516	0.23%	
Total	1,543,566	100.00%	

Source: Homepage of INE, http://www.ine.cl

18.2.1 Strengths of Valparaíso City

(1) Port and Beaches

One of the important characteristics of Valparaíso (together with neighboring Viña del Mar) is the coexistence of its port and beaches. San Antonio is a port city, though it does not have good beaches. Coquimbo, on the other hand, has beautiful beaches but with a small port. Therefore, the coexistence of a port and beautiful beaches is one of Valparaíso's strengths.

(2) Know-how and Experience in Port-related Industries

Valparaíso has a long history as a port city. It is historically a trading post and a

[1] Estimated by INE

gateway between South America and Asia-Pacific countries. In Valparaíso, there exists the rich accumulation of knowledge and experiences regarding port and port related services. According to the general manager of Valparaíso Port, all of Chilean fruits exports to the United States is transported through Valparaíso. Additionally, a large quantity of fruits produced in Regions VI and VII are also exported through this port, accounting to approximately 1.2 million tons per year. The general manager states that Valparaíso Port is efficient for food export, resulting from accumulated know-how in Valparaíso.

San Antonio Port is larger than the Port of Valparaíso. However, the city of Valparaíso is still larger with port-related activities such as customs agents, exporters, and financial services. Thus, it seems to be important to take full advantage of existing know-how and experience from Valparaíso. As a gateway, not only cargo handling capacity but also information and knowledge are the key factors for competitiveness.

Such knowledge and know-how could be an attraction of the port and as well as an export product to other countries. For example, an existing maritime company studies the environmental impacts of port services. This kind of software industry could be exported to other countries, especially those in South America.

(3) Closeness to Santiago, the Economic Center of the Country

Valparaíso City is located near Santiago, which generates almost 50% of GDP of the entire Metropolitan Region in 1999. Over much time, Valparaíso has performed the function of the gateway for Santiago. The distance between Santiago and Valparaíso is 120 km, approximately 2 hours by car. Such a location might create the possibility that Valparaíso develops supplementary business functions of Santiago. If the city could provide attractions to people who live in and visit Santiago, Valparaíso would have potential for day-trip tourism, shopping, and convention industries, for example.

Many people interviewed by the Study Team, however, regards the closeness to Santiago as a weakness for Valparaíso. A heavy concentration of economic activities in Santiago makes it a "black hole" for Valparaíso's industries. It is hard to compete directly with Santiago and attract businesses in the same fields. Therefore, it is important to realize effective function sharing between Santiago and Valparaíso so that Valparaíso can attract and maintain industries.

(4) Highly Qualified Human Resources

In Valparaíso, there are many prestigious universities and higher education centers such as the Universidad Católica de Valparaiso, the Universidad Técnica de Federico Santa Maria, the Universidad de Valparaiso, and the Universidad de Playa Ancha. These institutions attract students from all over Chile and other South American countries such as Argentina, Peru, Bolivia, Ecuador, and Columbia. Approximately 2,000 foreign students a year arrive to study at Chilean universities especially at the postgraduate level. Among them, a substantial percentage study in Valparaíso. The Universidad Católica de Valparaíso, for example, accepts nearly 300 foreign students every year. [2]

[2] Renzo Devoto, Director, School of Commercial Engineering, Universidad Catolica de Valparaíso.

The Chilean Navy is located in Valparaíso. As a result, retired navy personnel with high technical skills can be easily hired in Valparaíso. This feature contributes to the high technical level of port and port-related industries and services.

(5) Good Climate and Beautiful Coastline

Valparaíso and Viña del Mar together is one of the most famous beach resorts in Chile and in South America. There are many hotels and resort apartments especially in Viña del Mar. People come to this area to spend summer vacations and weekends.

This environment also provides desirable residential conditions. Viña del Mar is considered one of the best destinations in Chile for retired people with status and money, while favorable living conditions also attract business people.

Valparaíso is located only two hours from Santiago. It is thus possible that people take a day-trip from Santiago to Valparaíso City. It also means people from the Valparaíso area can go to Santiago easily. There is a possibility to establish satellite or home offices. This possibility would increase along with the development of information technologies.

(6) Historical City Landscape and Architecture

In port cities, especially historical ones, there are often many traditional and sometimes exotic buildings and historical spots. Valparaíso is such a city. Currently, many old buildings have been demolished and rebuilt by using modern materials such as steel and concrete. Such old buildings may no longer be convenient for modern offices due to the difficulty in refurbishment and in the installation of IT equipment. Once these buildings are lost, however, it will be difficult to recover the historical heritage.

Historical buildings and houses are also adored by many people. In London, for example, historical buildings and spots are a favorite attraction for both visitors and residents. British people place plaques on the walls of these buildings to explain the historical significance. This method may also be applicable to Valparaíso to offer visitor attractions. The preservation of historical buildings is important not only for visitors but also for the people living and working in this area. Some people have already noticed this value. *Fundación Valparaíso*, a non-profit organization established by an American, has been working to preserve the historical streets and architecture and to foster and diffuse the good images of Valparaíso.

(7) Reliability of the Transportation Sector

It is often pointed out that Chilean transport and port services are more reliable compared to those of other South American countries. Many Argentine cargo owners and transport companies say that Chilean ports such as Valparaíso are more reliable in terms of port operations because of highly efficient customs services, better labor relationships, and experience in port services in general. In Argentina, for example, some customs officers demand bribes, while this never happens in Chile. The manager of an international transport company experienced truck robbery on several occasions in Argentina. These incidents rarely happen in Chile.

(8) Political and Economic Stability and Transparency

Chilean political and economic stability and transparency are an attraction for foreign companies in doing business and making investment in Chile. According to the World Bank, Chile is the country that poses the least obstacles to foreign investment and establishment of firms.[3]

18.2.2 Regional Integration with Argentina

For the Cuyo region of Argentina, Chilean ports including Valparaíso, San Antonio and Coquimbo are closer in geographically than Argentine ports on the Atlantic Coast, e.g., Buenos Aires.

Cordoba, the second largest industrial city in Argentina, is located at almost the same distance to both coasts. At present, the transport cost between Cordoba and Valparaíso is much higher than that between Cordoba and Buenos Aires. Therefore, the majority of people in Cordoba do not wish to use Chilean ports, though the possibility to attract cargoes from Cordoba to Chilean ports will increase when transport infrastructure is improved and transport costs are reduced.

With support of the Chilean Consulates in Argentina, the JICA Study Team visited Argentine companies in Mendoza, San Juan, and San Luis in order to study their business strategies in relation to regional integration. The Study Team is of the opinion that the Chilean government should take an immediate action to accelerate regional integration with Argentina, especially integration between the Central Zone and the Cuyo region.

(1) Positive Aspects for the Gateway Strategy

a. Possibility of cooperation

Some people argue that Chilean and Argentine companies tend to compete with each other in the same market and, therefore, it is impossible to cooperate. However, it is first necessary to specify the product areas in order to further discuss on competition and cooperation between the two countries. In some product areas, there is possibility for cooperation between Chile and Argentina to export their products to international markets. For example, the wine industries of the Central Zone and the Cuyo region have been complementary to each other in the export market for some time. The President of the Chamber of Commerce, Production, and Tourism of Region V said that there were complementary aspects in the agriculture sector.

It is often difficult for Chile to compete alone in international markets due to the limited quantity of products that the country can produce and export. For example, the percentage of Chilean wine only accounts for 3-5 % of the total world wine market, though it is evaluated for its good quality. In order to gain bargaining power and stability in the world market, however, the quantity needs to be increased and the quality sustained and improved. Supermarket chains, for example, normally require a stable supply of a wide range of products, including a small quantity of high quality

[3] *Chile News* No11, April 16, 2001.

wine to a large quantity of "volume zones", i.e., the price ranges that people buy most regularly. Argentine wineries are able to provide a large quantity of wine. There is the possibility of cooperation to increase shares of the world wine market by complementing high quality Chilean wine with Argentine volume zone wine.

It is necessary to analyze the characteristics of exports in the Cuyo region to identify possible complementary export products. Table 18.2.2 shows the exports of Mendoza, San Luis and Cordoba. These provinces could be categorized into two groups: Group 1 includes those provinces that export products similar to products exported by Regions IV and V such as Mendoza[4]; and Group 2 includes those provinces that have different export products such as San Luis and Cordoba.

Table 18.2.2 Export Products of Mendoza, San Luis, and Cordoba

Mendoza 1999

Product	US$ Million (FOB)	
Wine in less than 2 lt. containers	89.1	13.4%
Petroleum untreated oil	83.3	12.6%
Other Garlic	71.7	10.8%
Gas - oil	60.6	9.1%
Grape juice (must included)	40.7	6.1%
Canned olives	27.0	4.1%
Other wines	22.1	3.3%
Fresh Pears	18.1	2.7%
Petroleum oil for petrochemistry	18.0	2.7%
Petroleum liquified gas	16.8	2.5%
Other products	215.6	32.5%
Total	663.1	100.0%

San Luis 1997

Product	US$ Million (FOB)	
Paper and cardboard	52.6	18.8%
Fur and Leather	48.3	17.3%
Meat	25.2	9.0%
Prepared Legumes	17.9	6.4%
Machinery and Devices	17.3	6.2%
Common metals	16.8	6.0%
Art, Plast. Mat.	12.2	4.4%
Pastry	10.8	3.9%
Chemist products	10.4	3.7%
Cereals	4.9	1.8%
Rest	63.2	22.6%
Total	279.6	100.0%

Cordoba 1999

Product	US$ Million (FOB)	
Automobiles and its parts	434.1	18.0%
Pellets	385.8	16.0%
Vegetable Oil	361.7	15.0%
Oleaginous	337.6	14.0%
Cereals	241.2	10.0%
Machinery	192.9	8.0%
Dairy and Honey	120.6	5.0%
Meat and derivation	72.3	3.0%
Organic Chemicals	48.2	2.0%
Cocoa and its preparation	24.1	1.0%
Plastic	24.1	1.0%
Other	168.8	7.0%
Total	2411.5	100.0%

Source: INDEC, Argentina.

The major export products of Group 1, such as wines and fresh fruits, are also the export products of Regions IV and V. Therefore, Mendoza can be a competitor to the Central Zone. Argentina has a large domestic wine market, about US$2,000 million per annum. Therefore, wine export is still small in terms of volume and value. However, the wine industry in Mendoza is on the verge of industrial development. The value of production has grown rapidly, at a rate of 10% between1997 and 1998 and 22% between 1998 and 1999. ProMendoza[5] estimates that fine wine production would

[4] According to an interview conducted by the JICA Study Team, San Juan will be in Group 1. However, the export structure of San Juan is not clear due to lack of data.

[5] ProMendoza is a private organization established by private companies and supervised together by the provincial government and representatives of private companies together.

increase at least by 20% in the next 5 years. Fruit production is also growing rapidly. In the last 2-3 years, according to ProMendoza, fruit production has increased by 40-50%. Grater land space and cheaper labor, as compared to Chile, allows for an easy increase in production.

These situations can be regarded as an opportunity for Chilean producers. Some companies are aware of the situation and of the advantages of having similar natural conditions with larger land space and cheaper labor force. Big wineries, such as Concha y Toro, have invested in Mendoza and produce fine wines utilizing different labels. Nowadays, approximately 30 Chilean companies are present in Mendoza, mainly in winery, wine related products, and the transport sector.

From another point of view, it is critical for Chilean companies to find ways to compliment Argentine companies to avoid direct competition. There are two principal ways for survival in the world market: to compete directly with Argentine companies, or to find a way of complementation. Argentine companies will become stronger based on the much larger land space and population. Thus, the complementation policies will be a basic strategy for Chilean companies.

In addition, it is more important for both Chilean and Argentine companies to capture a larger market, rather than to compete with each other in a small market. In this sense, there are some possibilities of cooperation in certain business activities such as marketing.

Regarding Group 2, or provinces with export products different from those of the Central Zone, it is suggested that the zone should attract cargo owners from these provinces by reducing total transport costs to the final destination.

b. Diversification of export destinations

Some Argentine companies have begun to consider exporting their products to Asian and Pacific countries because these companies are adversely affected by the stagnation of Brazil's economy, on which they heavily rely for their exports. According to ProMendoza, approximately 30-40 % of exports were destined to Brazil in the late 1990s. Thus, Brazil's economic stagnation has adversely affected Argentine exporters.

Some products, such as garlic, have been substituted for by Brazilian domestic products. ProMendoza has explained that Mendoza's garlic exports were US$100 million, of which about 68% were directed to Brazil in 1999. As Brazilian domestic garlic has substituted for garlic imported from Mendoza, the Argentine exporters need to find other destinations for their exports.

Argentine companies are considering diversifying their export destinations, especially to countries with higher potential markets, e.g., Asian countries and other MERCOSUR countries. Accordingly, there are opportunities for the Chilean gateway cities, Valparaíso in particular, to offer port and export related services.

There may be other opportunities for Chilean companies. Argentine companies are considered to have little experience in international markets. This is partially because

Argentina adopted a "closed economy" policy in the past and because Argentine companies tend to place priority on the domestic market. Therefore, Argentine companies seek knowledge and information of international markets. Accumulated know-how and experiences from Chilean companies would be another exportable product to Argentina.

c. Advantage in clearing phytosanitary standards

One of the reasons that Argentine companies have had little access to international markets, especially Asia and North America, is the difficulty in clearing the phytosanitary standards of these countries.

Chile has few problems in this respect due partially to its geographical feature, that is, because the country is surrounded by sea, deserts, and high mountain ranges. Chile has also made vigorous efforts to solve phytosanitary problems and has accumulated experience in this area. The phytosanitary quality of Argentine products should be improved in order to increase agricultural exports. As Argentine companies seek support from Chile, there is a possibility to export knowledge and experience concerning phytosanitary control to Argentine companies.

(2) Possible Constraints on the Gateway Strategy

a. Political and institutional instability in Argentina

Political instability in Argentina is considered as an obstacle to accelerate regional integration and establish business relationships with Chile. Change in the administration often results in inconsistency and discontinuation of international policies, regulations, information systems, etc. It is not unusual that high-ranking and even administrative officers in government agencies such as customs offices are changed after each election. Such change leads to the inefficiency of the services and constrains the advancement of practical talks concerning regional integration.

b. Limited knowledge about Chile and Chilean companies

Argentine companies sometimes lack sufficient knowledge about Chile and Chilean companies. The Director of an export company, for example, explained that the reason for not using Chilean ports is because the Chilean Navy controls them. Such misunderstandings or inaccurate information about Chile are a primitive barrier for regional integration and for the improvement of business relationships.

c. Increase competition between gateways in South America

It is said that the operational and service efficiency of port and port-related services in Valparaíso has been improved after the privatization (or the concession) of the port. Port facilities have been improved to a level at which the port can efficiently handle current cargo volume.

At the same time, the competition between the Ports of Valparaíso and San Antonio is becoming harder. It is reported that CSAV, one of the largest maritime companies in Chile, and its subsidiary have shifted a major percentage of handled cargoes to San Antonio Port after obtaining a concession at the port. As a result, Valparaíso has lost

part of its cargo.

The rise of other gateways in South America, such as Buenos Aires, makes competition harder. This is not only caused by the difference in efficiency of ports, but also the resulting from total transportation cost between cargo owners and final destinations.

According to the general manager of a transportation company in Mendoza, most of the cargoes have been directed to Buenos Aires since the port was privatized. This is because total transportation cost to Chilean ports, such as Valparaíso and San Antonio, is similar to that to Buenos Aires. The tariff rates paid by his company and the time required to arrive at major destinations are as shown in Table 18.2.3.

Table 18.2.3 Tariff of a Transportation Company in Mendoza per 20-40 foot Containers

Destination	Tariff (US$)	Necessary time (Hours)
Mendoza to Valparaíso or San Antonio	700	24
Mendoza to Buenos Aires	800	24

Source: The JICA Study Team based on interviews.

Valparaíso is much closer to Mendoza in terms of physical distance, and the transport cost from Mendoza to Valparaíso or San Antonio is slightly lower than that from Mendoza to Buenos Aires. However, because of the time required for quarantine and customs clearance at the boarder path, total time to each port is almost equal. In addition, the border path, Cristo Redentor, is closed between 8:00 p.m. and 8:00 a.m. during the winter season and closed completely when there is heavy snow. In contrast, truckers can drive at higher speed from Mendoza to Buenos Aires throughout the year. Thus, the owner of a truck company explains that it is almost the same or even better for cargo owners to use Buenos Aires.

An Argentine winery explains that the total cost to Buenos Aires is even lower than to Valparaíso. However, if the Chilean side can offer lower tariffs, they would definitely use the Chilean port due to higher reliability.

Interviews conducted by the JICA Study Team in some Asian countries indicate that the freight between Buenos Aires and Asian countries, such as Korea, is much cheaper than the freight between Valparaíso and these countries. The cost competitiveness of a port depends principally on the freight between a port and the final destination.

To sum up, to improve the competitiveness as a gateway, it is necessary to maintain the regularity of transportation throughout the year as well as reduce freight.

18.2.3 Development of SMEs

Small- and medium-sized enterprises (SMEs) (including micro enterprises according to the Chilean definition) employ nearly 90% of workers in Valparaíso as of 1997.[6] However, exports are mainly done by several large companies. The top 12 companies exported 63% of total exports from Region V in 1999 (Table 18.2.4). Furthermore, the

[6] CORFO, Basic Statistics of Enterprises in Chile, November 1998.

top two companies, both mining-related, accounted for 43% of regional exports in the same year.

Table 18.2.4 Major Export Companies of Region V in 1999

	Name of the company	US$ (FOB)	%
1	Compania Minera Disputada de Las Condes S.A.	245,822,909	21.68
2	Empresa Nacional de Minera (ENAMI)	243,794,796	21.50
3	Refineria de Petroleo Concon	32,611,419	2.88
4	Cormecanica S.A.	32,356,405	2.85
5	Conservera Pentzke S.A.	26,091,759	2.30
6	Algas Marinas S.A. (ALGAMAR)	23,577,968	2.08
7	Corpora Tresmontes S.A.	21,756,920	1.92
8	Industrias Ambrosoli S.A.	21,223,560	1.87
9	Dole Chile S.A.	21,104,481	1.86
10	Automotores Franco Chilena S.A.	18,752,696	1.65
11	Exportadora Rio Blanco Ltda.	17,686,394	1.56
12	ARMAT S.A.	13,876,741	1.22
	Total of Top 12	718,656,048	63.37
	Total Exports from Region V in 1999	1,134,010,386	100.00

Source: Regional Secretariat of Ministry of Economy.

Large and resource-rich companies can develop and export their products by themselves, while it is hard for SMEs.[7] However, since Chile has a small domestic market, it is critical to develop competitive exporting clusters consisting of SMEs, not merely a few excellent companies, for economic growth. One measure to develop export industries is to foster manufacturing SMEs that are not based on natural resources, as discussed in Chapter 20.

The following are major characteristics of Chilean SMEs pointed out by those who the Study Team has interviewed.

1) Old-fashioned technology
2) Individualism
3) Little knowledge and information about international markets
4) Limited access to finance

A consultant who works for SMEs has pointed out that Chilean SMEs do not need high technologies at present. They rather need low or medium technologies. There are some excellent companies in Chile such as SONDA in the IT industry. There is, however, a huge gap between these excellent companies and the average SME.

Past political decisions might be a cause of the gap between large companies and SMEs. Regarding fishery-based industries, for example, the introduction of a quota system for fishery was necessary to protect fishery resources. However, according to a professor of the Universidad de Valparaíso, the quota was enforced based on the size of each fishing boat rather than on past records. This form of implementation did harm to

[7] In this study, "small and medium sized enterprises" or "SMEs" include "micro" enterprises defined by CORFO, i.e., those with an annual sales less than UF2,401. CORFO's definitions of SMEs in terms of annual sales: "Small" = UF2,401-25,000 and "Medium" = UF25,001-100,000. (UF1 is approximately 15,500 pesos as of July 2000.)

artisan fishermen, small companies and small fishery-based producers. Large fishery-based producers owing large boats received large quotas. By contrast, with small quotas, small fishery-based producers cannot fully utilize their machinery or repay their loans. The companies therefore cannot invest in new, rather expensive modern equipment or facilities. This is part of the reality that SMEs confront today.

A number of interviewees pointed out that a tendency of individualism exists in SME owners. The owners do not wish to cooperate with one another to strengthen their market position against larger companies. However, the existence of individualism itself does not hinder cooperation. For example, even Japanese SME owners, who are in general well known for their cooperative attitude, also cherish individualism. The difference between Chilean and Japanese entrepreneurs, however, seems to lie in their behavior: whereas Japanese SMEs attempt to differentiate their products from others' by specializing in distinct skills or technologies, Chilean SMEs reportedly prefer to enter the same business field where others have succeeded.

Regarding lack of market information, ProChile has been working on the development of information distribution and e-commerce systems via the Internet. This is expected to dramatically improve SMEs' information access. However, some people have pointed out that SMEs do not know how to utilize such information. In addition, ProChile is formulating a program to foster competitive SME exporters to overcome price fluctuations and remain in the world market. CORFO Region V also works for the improvement of the digital divide problem of SME owners. These efforts should be sustained, as it will take a rather long time to increase the market awareness of the owners.

Access to finance has always been the greatest problem for SMEs. CORFO and other governmental agencies have provided finance to SMEs. However, their coverage is limited. As a result, not all SMEs that need finance can obtain such institutional support. It should be noted that SMEs face financial problems most notably in the commercialization stage of a new product.

There are some efforts to change these characteristics of SMEs. The *Universidad Técnica Federico Santa Maria* (USM) created two centers in 1998 through cooperation with the Italian government and the *Universita Luigi Boccomi*. One is the Center of Excellence for Small- and Medium-Sized Enterprises (CPYME) and the other is the Center of Innovation and Enterprise Development Ltd. (CINDE). Both centers are both responsible for designing, executing, and providing positive feedback regarding general projects. They collaborate with regional public and private organizations, e.g., CORFO, the Regional Chamber of Commerce, Production and Tourism (CRCPT), the Association of Industrialists of Valparaíso and Aconcagua (ASIVA), and the Italian Chamber of Commerce.

CPYME and CINDE design and implement the following programs for SMEs.

- Info-centers: Increase familiarities of IT technology
- Simplify municipal documentation: Create a one-window service with electric documentation

- Entrepreneurial training: Transfer Italian know-how (e-commerce, quality, finance and accounting, and marketing) to SMEs
- Incubator of technological enterprises
- Regional tourism development: Develop tourism as a strategic economic sector especially focusing on SMEs
- Internationalization program for regional enterprises: Identify the demand of Italian companies in Milan (as a pilot project), find Chilean providers, and formulate specific projects
- Adaptive program for business development (PADE): Transform regional SMEs into internal development actors of the organization through training and support and increase business knowledge in the finance area
- E-commerce program: Offer assistance to companies and incorporate e-business to their business operations in order to create online communication with their clients, suppliers, and associates
- Integrated program for ISO 9000 certification
- Integrated products design: Transfer the knowledge of design considering the whole production process

Additionally, CPYME is proposing a new financing scheme to CORFO for the commercialization stage of the developments produced by SMEs and is seeking new support for its activities as the Italian cooperation is scheduled to end in November 2001.

Such integrated approaches seem important to develop competitive SMEs. It should be pointed out that the two organizations, CPYME and CINDE, are working as intermediates between public sector organizations, such as CORFO, and those of the private ones such as CRCPT. Such a mechanism should be maintained to reduce the gap between the public and private sectors and facilitate their cooperation.

18.3 Transport Infrastructure Development

18.3.1 Infrastructure Development for Reinforcement of Gateway Function

Transport development will encourage investment and thus can realize higher economic growth and improve the standard of living in the region. In addition, resulting from the reduction of costs and time for transport, export products that are originated in the hinterland of ports will be increasingly competitive in the world market. Moreover, the hinterland itself will be expanded by transport development. Improved transport facilities and services will provide transporters and travelers with safer and more comfortable trips. A reduction of transport loss is also a factor for lowering the commodity price.

Transport development will contribute to foster and reinforce the gateway function of the Central Zone in the following ways:

- Expanding the hinterland area;
- Enhancing the export competitiveness of goods produced in the hinterland;
- Supplying imported goods at a lower price;
- Supporting production activity; and
- Improving safety and comfort in traffic.

In this section, transportation projects in the macro-region of the Central Zone are reviewed and investigated with a view to strengthen its gateway function. The projects include those found in the new national plan, at the idea stage; under feasibility study, deemed as a concession project, and a new project proposed by this Study.

Transportation projects for this analysis can be classified into the following four groups according to their mode or main purpose:

1) Export Corridor Development
2) Trans-Andes Route
3) Port and Port Access
4) Transport Studies

Each project is subjectively evaluated in light of its possible extent of contribution to the reinforcement of the gateway function in the five ways indicated above. An action plan in the transportation sector is formulated based on the analysis.

18.3.2 Development of Transport Corridor

(1) Transport Corridors and Future Traffic

The Central Zone, when the Metropolitan Region is included, has the densest trunk road network in Chile, reflecting the heavy concentration of population and economic activities in this zone. Figure 18.3.1 shows the network of trunk roads and railways, together with the bi-oceanic routes to Buenos Aires.

The backbone trunk road is Route 5 similar to other zones. Most sections of Route 5 in Regions IV and V are being, or will be improved, to high standard highways with

dual carriageways and center medians.

In addition to Route 5, there are three important highways, stretching in a radial manner from Santiago: Route 57 north to San Felipe, Route 68 west to Valparaiso, and Route 78 (*Autopista del Sol*) southwest to San Antonio. Of these, Route 68 and 78 are expressway standards with access control. Another important corridor is Route 60, which is an east-west international highway from Valparaiso to the Chile-Argentine border, continuing to Mendoza and Buenos Aires in Argentina.

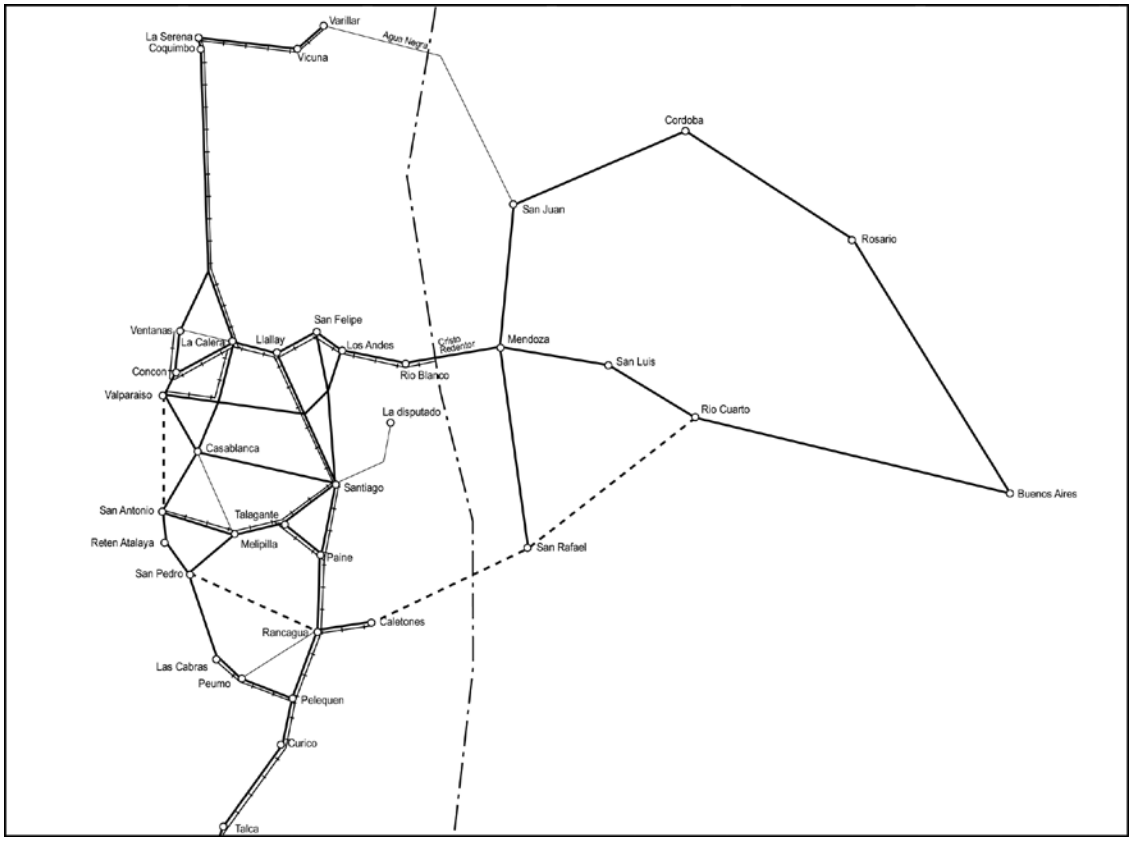

Figure 18.3.1 Main Corridors in Central Macro-region

Other international corridors will be developed when the Aguas Negras route or the Las Lenas route is constructed. The former connects La Serena/Coquimbo and San Juan, while the latter connects Rancagua and San Rafael. The development of these routes are currently under study.

(2) Requirements for Road Development

The Road Department of the Ministry of Public Works (MOP) has a basic policy to improve existing roads in relation to traffic volume as follows:

Road with AADT over 250 vehicles per day should be paved.
Road with AADT over 5,000 vehicles per day should be widened to dual carriageway road.

Table 18.3.1 shows future traffic volume on the trunk highways, estimated by the JICA Study Team based on the data from MOP in the same way as explained in Chapter 12. Except for Routes 21 and 25, the highways in Table 18.3.1 are of high standard with dual carriageways with center medians, whose capacities are 50,000 to 60,000 vehicles per day. Also, most sections will meet their demand until 2006.

Table 18.3.1 Forecast of Average Daily Traffic in Trunk Road Network in the Metropolitan Region, Region IV and Region V

(Vehicles per day)

Route	Road Section		1998	2006	2012
Route 5	Limite Norte IV Region	- La Serena	2,403	4,362	7,195
	La Serena	- Coquimbo	29,099	52,819	87,131
	Coquimbo	- Guanaqueros	5,503	9,989	16,478
	Guanaqueros	- Socos	3,335	6,054	9,986
	Socos	- Los Vilos	4,111	7,462	12,309
	Los Vilos	- Limite Norte V Region	4,901	8,896	14,675
	Limite Norte V Region	- Acceso Papudo	6,549	10,379	14,807
	Acceso Papudo	- Artificio	8,641	13,695	19,536
	Artificio	- Trebol Hihuelas	14,629	23,185	33,075
Route 68	Santiago	- Pudahual	37,303	58,564	82,138
	Pudahual	- Plaza Peaje lo Prado	23,387	36,716	51,496
	Plaza Peaje lo Prado	- Curacavi	17,893	28,091	39,399
	Curacavi	- Casablanca	16,297	25,585	35,885
	Casablanca	- Placilla	20,334	32,226	45,973
	Placilla	- Valparaiso	23,029	36,497	52,066
	Valparaiso	- Vina del Mar	19,627	31,106	44,374
Route 78	Santiago	- Padre Hurtado	14,608	22,934	32,165
	Padre Hurtado	- Plaza Peaje el Paico	10,228	16,057	22,521
	Plaza Peaje el Paico	- Lim. Reg. Metropolitana	7,053	11,178	15,946
	Lim. Reg. Metropolitana	- Bif Aguas Buenas	7,736	12,260	17,490
	Bif Aguas Buenas	- San Antonio	7,909	12,535	17,881
Route 57	Santiago	- San Jose	11,828	18,569	26,044
	San Jose	- Quilapilun	9,705	15,236	21,370
	Quilapilun	- Casas Chacabuco	3,407	5,349	7,502
	Casas Chacabuco	- Plaza Peajr Chacabuco	5,326	8,362	11,727
	Plaza Peajr Chacabuco	- Los Andes	7,661	12,142	17,321
Route 21	Santiago	- Corral Quemado	701	1,101	1,544
	Corral Quemado	- Farellones	307	482	676
Route 25	Santiago	- Las Vizcachas	9,896	15,536	21,790
	Las Vizcachas	- San Jose	6,097	9,572	13,425
	San Jose	- San Gabriel	2,072	3,253	4,562
	San Gabriel	- El Volcan	504	791	1,110

Source: Estimated by the JICA Study Team based on the data from the Ministry of Public Works (MOP).

By 2012, however, there will be some sections where demand exceeds capacity. The further widening or construction of bypass roads should be planned for sections such as La Serena – Coquimbo in Route 5 and Santiago – Pudahual in Route 68.

The Road Department of MOP made a similar analysis on the entire network of the country and estimated the quantity and investment necessary to widen roads by region (Table 18.3.2). Regions IV and V will need to improve a single carriageway road of about 350 km into a dual carriageway road by 2005 and 380 km by 2010. Approximately 40-50% of the projects are expected to be carried out through concession schemes.

(3) Widening of Route 5 to Dual Carriage-way

The Ministry of Public Works initiated the bidding process for the privatization of Route 5 (the section of La Serena – Puerto Montt) in 1995, starting with the Talca – Chillán concession, and finished by awarding the Santiago – Talca concession in 1998. The overall project consists of 1,560 km of roadways with a total investment of over US$2.2 billion. Immediately after finishing the southern section, MOP wished to begin the next privatization project for the northern part of Route 5 from Arica to La Serena, dividing it into four concessions. The southernmost concession is the section of La Serena – Copiapo, which will be the next to be privatized.

Table 18.3.2 Required Investment for Dual Carriageway Road, 2000-2010

Period	Region	Kilometers of Dual Carriageway			Investment Amount (US$ Million)			
		Regional	National Road		Regional	National Road		Total
		Road	No. Conces.	Concession	Road	No. Conces.	Concession	
2000 - 2005	**VI**	6	76	0	4	49	0	52
	V	87	0	192	56	0	221	276
	Nation	686	262	394	438	168	453	1,059
20006- 2010	**VI**	8	78	122	5	50	140	193
	V	137	0	38	88	0	44	131
	Nation	390	233	784	250	149	902	1,300

Source: MOP/GEOTECNICA, *Plan Director de Infraestructura 2000-2010: Third Progress Report*.

Daily capacity is about 12,000 to 15,000 vehicles in the case of a single carriageway road with two lanes in both directions. Table 18.3.1 shows that Route 5 south of Artificio will require widening by 2006. Most of the remaining sections, except those north of Coquimbo, will also need to increase capacity by widening.

(4) Improvement of Route 60, Los Andes - Valparaiso

This project is under planning as a concession project, which covers routine maintenance, improvement and new construction. The total cost is estimated at approximately US$188 million. The concession period is 25 years and the concessionaire will receive a toll of 1,000 pesos for each use of the route.

Currently, Route 60 begins in the east of the Argentine border, the sector of Tunal del Cristo Redentor, and extends to the west, the Province of Valparaiso, offering access to the entire central coast zone and its ports. The route also crosses important cities such as Los Andes, San Felipe, La Calea, Quillota, and Viña del Mar. The project covers the section from Los Andes to Valparaiso (Figure 18.3.2), of which the principal parts are as follows.

1) A bypass to Los Andes, starting about 1,000 m west of Puente Viscachas, following the existing 22 km along the northern bank of the Aconcagua River, and continuing near the existing high-tension wires until re-connecting with Route 60 in the sector of Rinconada.

2) Improvement of the present section of Route 60, starting in Rinconada and continuing to the west, passing the city of San Felipe until El Escobal. The project also calls for the construction of an additional access to San Felipe in the northern sector.

3) Construction of a new 13.7 km section between El Escobal and Lo Campo, following the southern bank of the Aconcagua River, to avoid passing through such large cities as Panquehue, Arturo Prat, and Lo Blanco on the existing route, later returning to the current route, 60 m to the La Estancia sector.

4) Development of a new section of the route extending from La Estancia to the west, crossing the northern bank of the Aconcagua River, along the power lines; continuing by Route F301-E until the eastern sector of Puente Ocao, where it will connect the future Romeral junction for Route 5.

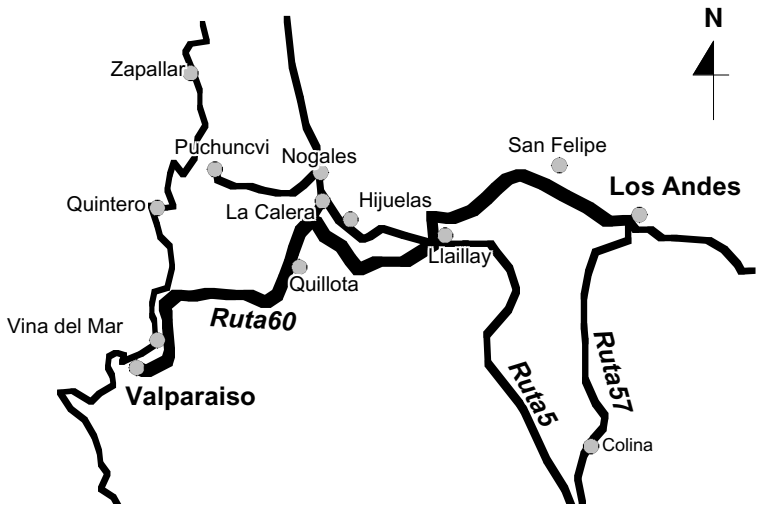

Figure 18.3.2 Location of Route 60 and its new Alignment

5) Crossing longitudinally to the west, the path continues through a tunnel in the southern sector of Pachacama, crossing the rocky corridor in the sector of La Puntilla, which corresponds to the beginning of the municipality of La Cruz and Quillota City. Then, the path follows the path of F-340 until connecting again with the current Route 60.

6) The improvement of Route 60 in the sector of La Puntilla (connecting with the stage of the Pachacama tunnel) and San Pedro.

7) After crossing San Pedro to the south, the construction of an 18.2 km extension to Route 62 with the concession of the Troncal Sur at the sector of Penablanca. This segment will connect with Via Las Palmas and intercept Route 68 in the Aguas Santa Junction sector.

MOP has initiated land, spatial, traffic and environmental studies to obtain necessary information for the selection of different paths available for the route. The objective is to conform to the expected traffic flows and provide a suitable alternative from a technical and economic point of view.

(5) Route 66, Camino de la Fruta

The project involves the overall improvement of the current Route 66 between its intersection with Route 5 at 120 km to the south of Santiago, and the port of San Antonio in Region V. The total length of the project is 135 km (Figure 18.3.3).

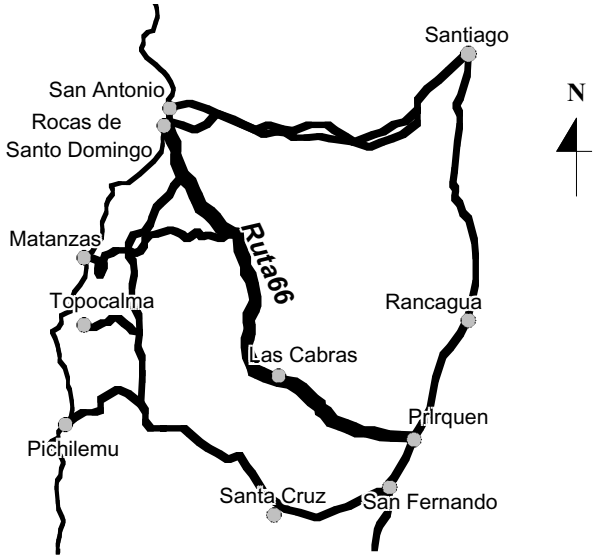

Figure 18.3.3 Location of Route 66, Camino de la Fruta (The Road of Fruit)

Improvement includes widening a 65-km section to a dual carriageway with 13 multilevel intersections; regularization of 19 level intersections, and the construction of 5 new bridges over different rivers that intersect the road. Also to be included are the construction of local roads, incorporation of third lanes in sloped areas, and a bypass in the community of Las Cabras.

The most important function of Route 66 is to connec the main ports of the Central Zone and the southern part of the country. In particular, Route 66 is the main access to the Port of San Antonio. In addition, this road provides access to seaside resort areas such as Santo Domingo, Llolleo, Cartagena, and Algarrobo. To the north, between Cartagena and Quintay, the road passes numerous tourist and production areas.

The bidding process for the project of Route 66 project is scheduled to open in the first half of 2001. The estimated cost is US$100 million and the concession time period is tentatively set at 25 years.

(6) Coastal Road between Valparaiso and San Antonio

The project aims to construct a new coastal highway between Cartagena and Algarrobo to provide a connection between Santiago and Valparaiso via the San Antonio area. This will be implemented as a concession project, of which the total cost is estimated at US$78 million. The project is composed of the following sections:

1) New coastal highway Cartagena – Algarrobo

The new coastal highway (32.4 km) is conceived as an alternative to the current route. It will be designed for an 80 km/hr speed limit with restrictions in certain sectors. In

the first stage, the section of Aguas Buenas to San Sebastian will have two carriageways. The rest of the section will have a single two-way carriageway. The project will be built over mountainous territory at an average of 2.5 km south of the current coastal highway.

Additional access-ways (16 km) must be incorporate in this route connecting the beach resorts of Las Cruces, El Tabo, El Quisco, and Algarrobo. This requires upgrading existing highways to urban road standards with the designed speed of 50km/hr. Junctions will be built at Cartagena, San Sebastian, Las Pataguas, Las Cruces, El Tabo, Punta de Tralca, and Algarrobo.

2) Camino Algarrobo to Casablanca (Route F-90)

It is necessary to improve the design of this existing road (33.4 km) by adding third lanes in some sections to accommodate heavy traffic. The road will be designed for 100 km/hr, with a restriction of 80 km/hr in some sections. Re-pavement is included in this concession. A new intersection is planned at Quillaicillo (Route F-962-G).

3) Camino Quillaicillo to Orrego Abajo (Route F-962-G)

This existing road (14 km) calls for design improvements, including a bypass to the town Lagunillas and the development of third lanes for heavy traffic with a speed limit of 80 km/hr in busier sections. The concession also entails improvement of certain existing pavement.

4) Las Potaguas Bypass

To avoid difficult territory in the sections of Lo Abarca and Lo Zarate, that impede planning, hamper construction, and damage overall service quality, a bypass has been planned. This bypass will connect the Quillaicillo-Orrego Abajo (8.4 km) with the new coastal highway.

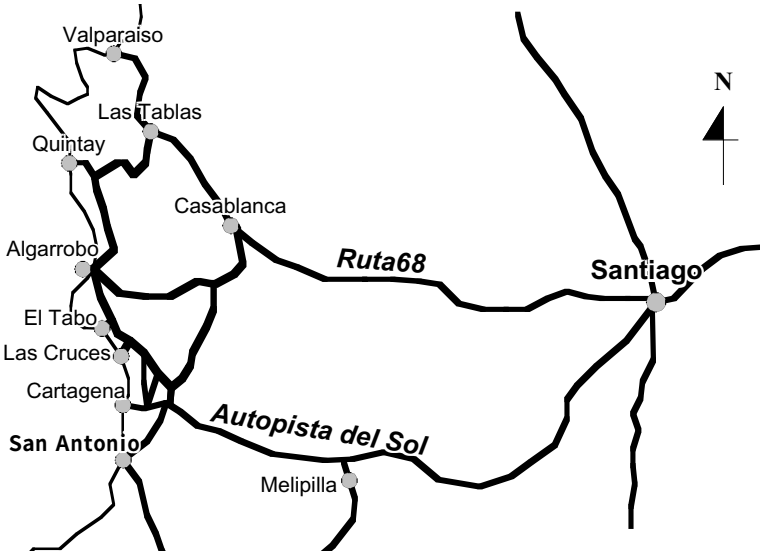

Figure 18.3.4 Location of Coastal Road, Valparaiso – San Antonio

(7) Longitudinal Highway between La Serena and San Felipe

As a preparatory study for developing the National Plan, the Road Department of MOP conducted an analysis of the future deficit of road stock (*Director Plan of Infrastructure 2000-2010*). The results show that there are two longitudinal highways identified in Regions IV and V for future development. One is the coastal road stated above and the other is the inner mountain (cordillera) road from La Serena to San Felipe (Figure 18.3.5.)

The proposed road extends mainly through the cordillera of Region IV, which has a sizable population and numerous economic activities, e.g., forestry, fruit production, and mining. The road is expected to function not only as a farm-to-market road but also as a production support road. The said report indicated 2010 as the year to initiate the project (Table 18.3.3). It is recommendable, however, to carry out a feasibility study for the project earlier. It may be difficult to invite the participation of the private sector due to low financial return, even though a high economic return can be expected.

Table 18.3.3 Longitudinal Highway between La Serena – San Felipe

Region	Section			Distance (km)	Investment (US$ million)	Year in need
IV	Vicuna	-	Ovalle	122	36.6	2010
IV	Ovalle	-	San Marcos	67	8.7	2010
IV	San Marcos	-	Illapel	116	34.8	2010
IV	Illapel	-	Tilama	94	28.2	2010
V	Tilama	-	Cabildo	27	8.1	2010
V	Cabildo	-	La Vega	27	3.5	2010
V	La Vega	-	Putaendo	48	14.4	2010
V	Putaendo	-	San Felipe	15	2.0	2010
	Total			**516**	**136.3**	

Source: MOP/GEOTECNICA, *Plan Director de Infraestructura 2000-2010: Third Progress Report*.

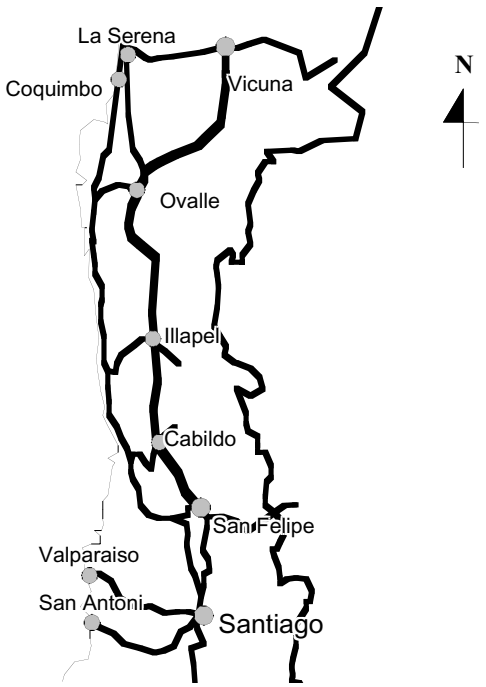

Figure 18.3.5 Location of La Serena – San Felipe Cordillera Road

18.3.3 Development of Trans-Andes Route

(1) Priority Routes

Geographically, there are 58 passes that cross the Chilean border over the Andes, of which 38 passes have traffic data counted by the frontier guard (Table 18.3.4). The busiest pass is Los Libertadores (called Sistema Cristo Redentor in Argentina) on National Route 60 (Valparaiso – Los Andes – the border – Mendoza) with traffic of 160,000 vehicles in 1999, 24% of the national total, carrying 615,000 passengers (21%) and 936,000 tons of cargoes (41%). In terms of daily traffic, 440 vehicles utilize the pass, transporting about 1,700 passengers and 2,600 tons of cargoes. The Aguas Negras pass in Region IV has not been developed yet and its traffic is minimal, one vehicle in every four days and no cargo traffic counted at Rivadavia.

Table 18.3.4 Trans-Andes Traffic in the Central Zone in 1999

Pass	Chilean Vehicles			Foreign Vehicles		
	Vehicles	Passengers	Cargoes (Tons)	Vehicles	Passengers	Cargoes (Tons)
Aguas Negras	170	583	0	1,425	5,567	0
Los Libertadores	68,432	222,100	584,945	92,474	393,299	351,198
Nation Total (38 passes)	234,837	1,063,919	949,967	433,682	1,895,462	1,303,960

Source: Customs Office of Los Libertadores.

In 1998, the Chilean government agreed with MERCOSUR countries on the prioritization of bi-oceanic routes, selecting 12 passes for urgent development (Table 18.3.5). Both the San Francisco and Los Libertadores passes are included in the priority passes. The investment for 1996-2000 committed in the agreement was almost implemented as scheduled in both Chile and Argentina. Top priority was given to the Jama pass to which about one third of total investment was allocated. Since the end of 2000, Chilean Route 23 has been completely paved up to the border and on the Argentine side, about 200km still requires pavement.

Table 18.3.5 Selected Border Passes with Priority

(US$ Million)

Border Pass	Region in Chile	Investment in 1996 - 2000	
		Chile	Argentina
Jama	2	54.0	45.0
Sico	2	1.0	8.0
San Francisco	3	14.0	24.0
Aguas Negras	4	10.0	10.0
Cristo Redentor	5	15.0	15.0
Pehuenche	7	10.7	15.0
Pino Achado	9	20.0	2.0
Cardenal Samoré	10	10.0	12.0
Coihaique	11	1.0	7.0
Huemules	11	0.3	6.0
Integracion Austral	12	10.0	15.0
San Sebastian	12	10.0	6.0
Total	-	156.0	165.0

Source: Acuerdo de Complementación Económica No.35, MERCOSUR-Chile Integración Fisica, Servicio Transporte, Inversiones

(2) Improvement Project of Los Libertadores Route

Presently, the Los Libertadores route (or Sistema Cristo Redentor route) is the only thoroughly paved route between Chile and Argentina. The main problem of this route is occasional closure due to snowfall. In the year 2000, the pass was closed for 40 days due to heavy snow measuring over 5 meters deep. The longest continuous closure was 15 days. Diseconomy caused by this 15-day closure is estimated at US$3 million without taking into account the interest on and loss of cargoes.

The Frontier Committee of both countries held a series of conferences to solve the closure problem and make the route passable all the year round. The most direct and realistic solution to be considered is the installment of snow shelters along the road in addition to snow clearances and bridge improvements. The Committee is now developing a two-staged snow shelter construction plan for critical spots of 8.5 km out of the 102 km high altitude section, which will cost a total of US$86 million; US$ 41million for Chile and US$45 million for Argentina (Table 18.3.6).

Table 18.3.6 Snow Shelter Project on Los Libertadores Route

(Meters)

Stage	Period	Chile	Argentina	Total
Stage I	2001 - 2002	1,870	2,630	4,500
Stage II	2003 - not defined	2,100	1,900	4,000
Total		3,970	4,530	8,500

Source: Ministry of Environment and Public Works, Mendoza.

The plan includes route realignment, re-pavement and the acquisition of snow-ploughs, for which the estimated costs are US$17 million for Stage I and US$20 million for Stage II. This project is reportedly included in the next five-year plan for each country and to be implemented as a concession project through international bidding, with the condition of only one operator and a unified toll. According to a pre-feasibility study, full recovery cost would be possible in 20-23 years.

(3) Alternative Plan for Los Libertadores Route

According to some estimates, demand will exceed the capacity of the Los Libertadores pass in 2006. To cope with the demand increase, there is an ambitious idea to improve the current pass by constructing a long tunnel connecting Juncal in Chile and Horcones in Argentina. In the engineering study made by an Austrian consulting firm in 1995, a low-height tunnel was recommended and the total cost was originally estimated at US$500 million tough later revised to US$1,800 million. The present traffic volume of the Los Libertadores pass is not great enough to realize such a huge investment that is economically and financially feasible.

Another alternative is to connect Rancagua in Region VI and San Rafael in Argentina via the Las Lenas pass (4,130 m above sea level) by constructing a 13-km tunnel. Total cost is estimated at US$1,500 million that would be shouldered by Chile and Argentina. Financing is expected to come from international organizations. Both countries have been carrying out a series of studies to identify the best alternative among the Las Lenas (Region VI), Pehuenche (Region VII), and Aguas Negras passes (Region IV).

(4) Aguas Negras Route

The Aguas Negras pass (4,775 m above sea level) is located on the border of the La Serena/Coquimbo to San Juan route in Argentina. The Route 41, the section east of Rivadavia along the La Laguna River remains unpaved for the last 161 km to the border. In Argentina, the first 80 km from the border is unpaved. This route is only passable in the summer season. Although the Chilean customs house (*Aduana*) is located at Arrequintin near the border, there is very little traffic.

Region IV is eager to develop this route to promote trade with MERCOSUR countries. The regional government published a study report titled "Impact Analysis of MERCOSUR in the Coquimbo Region" in 1998, which emphasizes the importance of the Aguas Negras route. As aforementioned, the Aguas Negras pass is one of the three alternatives. This route is advantageous to commodities traded between Region IV and the Provinces of San Juan and La Rioja. Though the volume is still small, it is growing rapidly. In addition, it is somewhat doubtful whether the route can be a substitute for the Los Libertadores route to Valparaiso and San Antonio.

In the near future, several mining projects, such as the Los Pelambres project, will begin operations near the border in the Province of San Juan. If their products are transported to Chile for export or processing, this route will enter the limelight.

(5) Reactivation of Mendoza – Los Andes Railway

The Argentine government, together with the transport committee of MERCOSUR, has designated three routes as Bi-oceanic Railway Corridors with high priority: 1) Rio Grande de Sur – Chaco – Salta/Jujuy – Mejillones: 2) Sao Paulo – Montevideo – San Luis – Mendoza – Valparaiso; and 3) Bahia Blanca – Neuquen – Concepción. Investments in these three routes are included in the current national plan during 2000-2005 and a law has been enacted to finance related projects in Argentina.

The second route (known as Central Corridor) started the international train operations in 1910 and ending in 1980. In order to reactivate the line, intensive rehabilitation is needed along a 270-km section between Los Andes and Mendoza, accounting for 71 km in Chile and 199 km in Argentina.

On the Chilean side, a 31-km section between Los Andes and Rio Blanco is still under operation by CODELCO transporting about 900,000 tons of copper concentrate a year, while the remaining 40 km to the border has been completely abandoned since 1980. Basic infrastructure such as bridges, tunnels, open cut, and banks can be utilized with minor investment. Out of the 40 km, a 25-km section should be completely renewed, while the other section will function with partial renewal. The total cost is estimated to be US$65 million, including the construction of a transfer station at Los Andes, which is needed due to the difference in gauges (the Los Andes and Mendoza railway is a metric gauge, while FEPASA is a 1,676 mm gauge.)

The Argentine side will require an investment of US$55 million to cover infrastructure, rolling stock, signal and communication, realignment of a 25-km section near Potrillo to be submerged by a dam construction, and a multi-modal cargo station at Lujan de Cuyo

also necessary because of different gauges. Total investment for both countries is US$120 million, which is, in a sense, very economical as compared to the road investment of US$1,500 million required after the demand for transport exceeds the present capacity of the Los Libertadores route.

Railways also have operating cost advantages. A preliminary feasibility study on this reactivation project indicates that the operating cost of a 20-ton freight, between Valparaiso and Mendoza, is US$600 by truck, while it is US$325 by train. Calculations are based on the unit cost of 5.5 cents per ton-km for trucks and 2.5 cents for railways in a mountainous area. The same study concludes that the project is highly feasible with an IRR of 5% and 8 years for capital recovery.
This project will need, and is worth, a further feasibility study including engineering aspects such as how to cope with heavy snowfall and how to improve the 15-km section with a gradient higher than 8% of the old railway. A survey should also be conducted on the willingness of transporters and consignors to use the railway service, providing adequate information on tariffs and time required for the transport.

18.3.4 Improvement of Ports and Port Accesses

(1) Future Demand and Capacity of Ports in Regions IV and V

Prior to its dissolution in 1997, the Port Company of Chile (EMPORCHI) published a catalogue of investment projects on port infrastructure and equipment, based on various previous studies. The main purpose of this catalogue is to provide potential investors with project information. In this catalogue, a projection of future demand is presented in comparison with the capacity of each port (Table 18.3.7).

Elaborated in 1997, when the Chilean economy was growing at a high rate, the projection tends to overestimate the demand, which has experienced a declining trend since 1998. As of 1999, for example, about 3.7 million tons of cargoes were handled at Valparaiso Port and 5.6 million tons at San Antonio Port, both of which are less than 1996 figures.

According to a forecast by EMPORCHI, the Valparaiso Port and San Antonio Ports should have expanded to increase their capacities immediately after being privatized. Due to the export stagnation after the economic crisis in Asia, short-term projects scheduled in the port concession have been delayed for several years.

Table 18.3.7 Capacity and Demand of Main Ports in Central Macro-Region

Demand and Capacity		Cargo Type	Coquimbo	Valparaiso	San Antonio
Economic Transfer Capacity	Current	Multipurpose	1.0	-	-
		Container	-	-	-
		Bulk	-	-	-
		Total	**1.0**	**5.5**	**8.1**
	With Project	Multipurpose	1.9	4.5	5.2
		Container	-	13.2	12.0
		Bulk	-	-	3.2
		Total	**1.9**	**17.7**	**20.4**
Demand	1996	Multipurpose	0.3	1.9	1.2
		Container	-	2.6	3.1
		Bulk	-	-	2.1
		Total	**0.3**	**4.5**	**6.4**
	2005	Multipurpose	0.9	5.2	5.2
		Container	-	10.2	10.2
		Bulk	-	-	4.5
		Total	**0.9**	**15.4**	**19.9**
	2015	Multipurpose	1.1	5.6	5.6
		Container	-	23.8	23.8
		Bulk	-	-	6.2
		Total	**1.1**	**29.4**	**35.6**

Source: The Port Company of Chile (EMPORCHI), Investment Project in Infrastructure, 1997.

(2) Basic Policy for Port Development

The Chilean government has set forth clear policies to create the environment to facilitate privatization or concession systems for public ports as follows:

- Create mechanisms intended to increase competition inside and between various ports.
- Decentralize management and administration in order to achieve higher efficiency.
- Adapt the port structure so that each port can successfully face new strategic challenges resulting from the increasing openness of the Chilean economy to international trade.

In the late 1990s, based on these policies, EMPORCHI was divided into 10 independent entities in order to accelerate necessary investments in the main national ports through awarding concessions to the private sector and to enhance the competitiveness of each port through decentralized management. As a result, efficiency in port operations has improved and the volume of cargoes handled by those ports both for international and internal trade has significantly increased.

As long as total demand is increasing, free competition among ports will bring about good results. If the demand becomes stable in the long run, however, some guidelines by the central government will be needed to optimize economically the Chilean port system as a whole. If every province aims to develop a fully-equipped international port, investment will be scattered, which will hinder the port functions and supportive services from growing to form an agglomeration. Ultimately, economies of scale will be lost. In this respect, the government should prepare a blue print for the long-term development of the Chilean port system, considering the natural, economic, geopolitical, and environmental characteristics of each port.

The Valparaiso Port is the most important port in Chile, as an international gateway of

the macro-region of the Central Zone and the Metropolitan Region. However, the port will be saturated sooner or later, possibly within ten years, while the port is geographically limited in space for further development. From a long-term perspective, the Valparaiso area should aim at developing with less dependency on port functions, for example, by transferring its demand and function to the Ports of San Antonio and Quintero.

(3) Valparaiso Port

Figure 18.3.6 illustrates the layout and development site of Valparaiso Port. The main problems that the port faces are the shortage of space for expansion and difficulty of access. The concession contract includes the following projects for construction, repair and maintenance, access, parking, extensions, lighting, paving, enclosures, close-circuit surveillance, computer systems, and generating station:

Container Terminal: Installation of 4 gantry cranes for handling containers in Berths 2 and 3, which have been remodeled. Length = 620 m, Depth = 12-12.5 m.

Multipurpose Terminal: Modernization of Berths 4 and 5. Seismic reinforcement, dredging (Depth = 10-12 m), Length = 370 m, Yard Length =12,500 m^2, installation of 1 gantry crane.

Multipurpose Terminal: Reinforcement and sealing of gravitational walls in Berths 6 and 7 (pier dam), construction of concrete beams for cranes, installation of 2 gantry cranes.

Multipurpose Terminal: Construction of 2 berths at the Constanera Baron area, refilling and dredging (Depth = 12m), Length = 450m, Yard = 16,700 m^2, installation of 2 gantry cranes.

Multipurpose Terminal: Construction of 2 berths at the Constanera Baron area, backfill and dredging (Depth = 15.5m), Length = 650m, Yard = 71,800 m^2, installation of 5 gantry cranes.

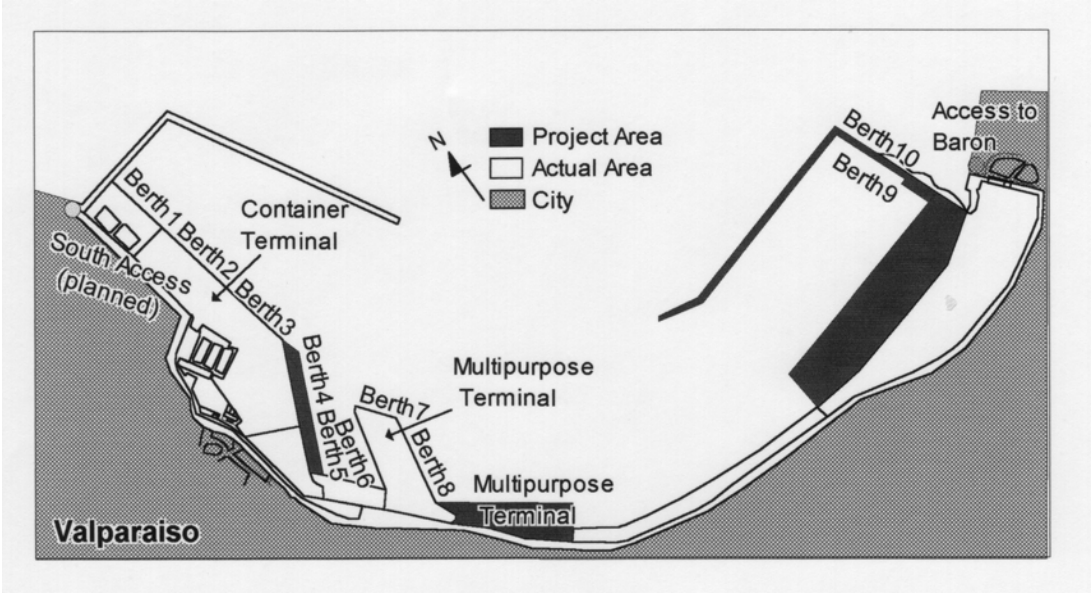

Figure 18.3.6 Layout and Project Site of Valparaiso Port

To cope with the recent increase in container cargoes, a dry port is under construction a few kilometers south of the Route 68 – Camino de la Polvola intersection, near the industrial estate.

To improve the port access, a detour route called Camino de la Polvala is under construction, which provides direct access to the port via a tunnel, without passing the urban area (Figure 18.3.7). Stage 1, from the intersection with Route 5 to a prison has been completed; Stage 2, from the prison to the entrance of the tunnel is now under construction; and Stage 3 of the tunnel is scheduled for 2002-2005. The detail design of the tunnel has been completed.

(4) San Antonio Port

In a couple of years there will be an investment of US$36 million for Sites 1 to 5 in the South Pacific Terminal in order to transport 33 containers per ship-hour, by introducing new equipment and technology (Figure 18.3.8). It is expected that 18 tractors for handling containers and cargoes within the port will be bought. Two gantry cranes of Panamax size will be under operation in November 2001. In November 2003, the third crane will be purchased and the forth purchase will follow in 2006 or 2007, according to the demand for cargo handling.

Figure 18.3.7 New Access Road (Camino la Polvola) to Valparaiso Port

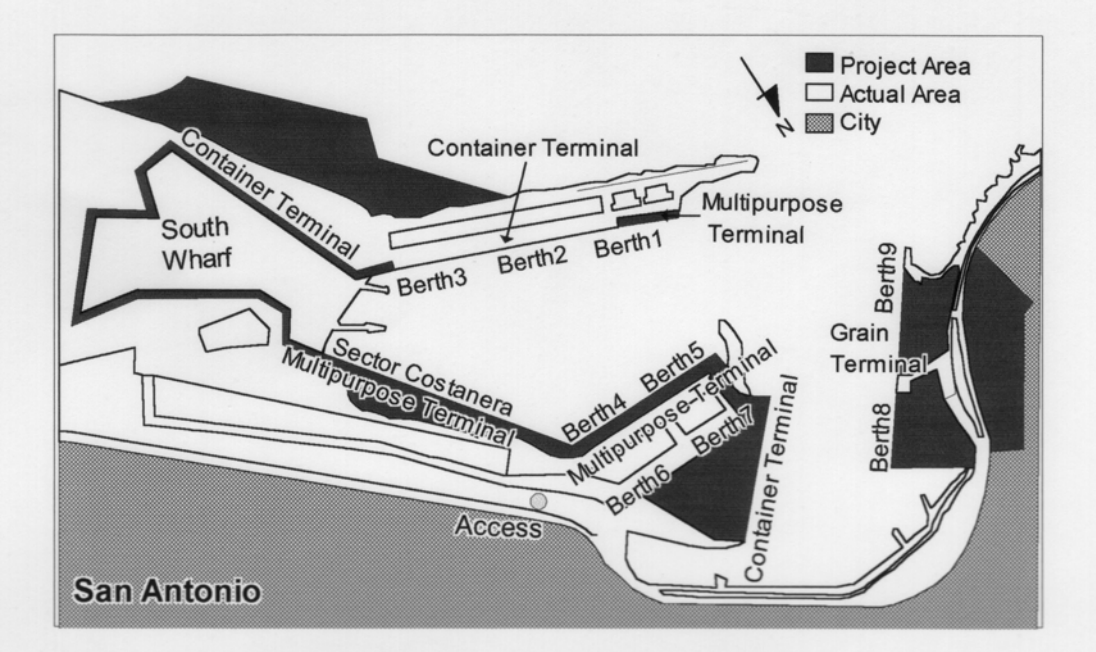

Figure 18.3.8 Layout and Project Site of San Antonio Port

In the next two years, one of the existing warehouses in the terminal will be demolished, being replaced by a new container and general cargo station with a total area of 7,500 m^2. At the same time, CODELCO will develop a multi-modal transport system for sulfuric acid to San Antonio Port, investing around US$150 million. The idea is to

transport from Caletones to Los Lirios by truck and then to the port by railway.

The San Antonio port also has an access problem. Presently, all the trucks traveling to the port have to pass through the urban area for about 1.0 km. To avoid this, the construction of a new access road is planned as a concession project (Figure 18.3.9).

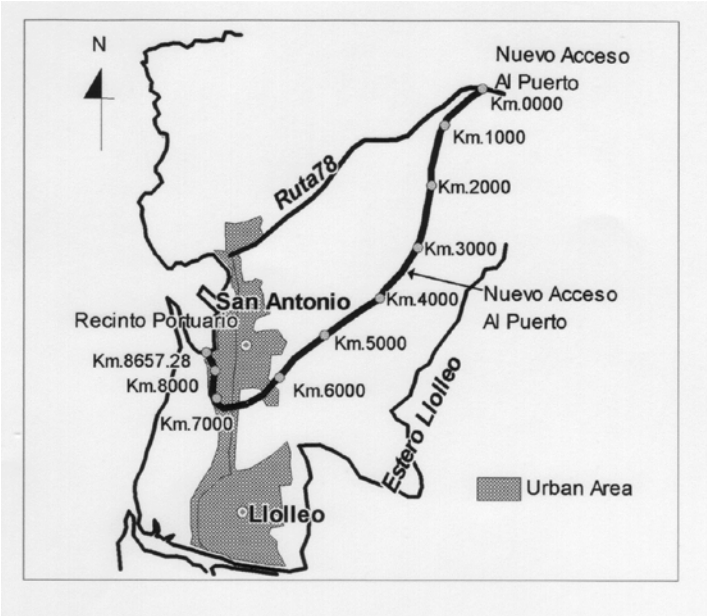

Figure 18.3.9 New Access Road to San Antonio Port

(5) Coquimbo Port

The development of Coquimbo Port consists of two big projects, with expectation to be realized through private sector bidding. One is the extension of mooring places and improvement of the platform that will require an investment of US$7,700,000 (this bidding is planned for 2003). The other is the extension of the fish-processing site, which requires an investment of US$1,600,000 (this bidding is planned for 2002).

Photo 18.3.1 Coquimbo Port and Its Vicinity

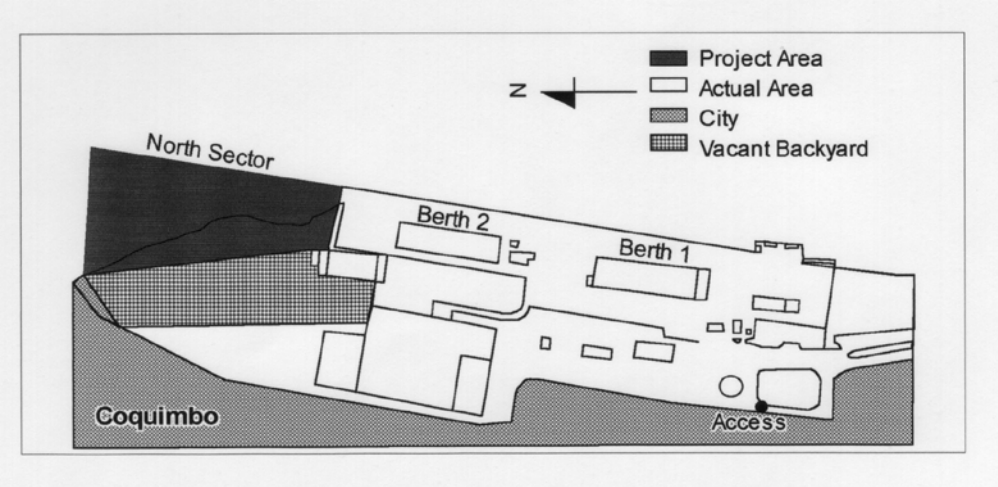

Figure 18.3.10 Layout and Project Site of Coquimbo Port

(6) Quintero/Puchuncavi Port

Quintero Bay is located 45 km north of Valparaiso. The bay has natural conditions advantageous for port development and currently operates hydrocarbon terminals of the Concon Oil Refinary (RPC) and the Oxiquim pier for chemical products owned by Gasmar. Shell and COPEC also have concessions to install pipelines to unload petroleum products.

In 1995, SECTRA/INECON conducted Phase I of the Master Plan Study for Quintero Bay Infrastructure Development with a time-horizon of 30 years. The study tried to clarify the physical conditions and maritime operability of the bay, present and future demand for port services in Region V, the present capacity of port services including short-term projects and an analysis of legal matters.

The study has shown that the bay has high potential to develop a huge port complex, which could be an alternative to Valparaiso Port in the long run. Considering that the bay is not located far from Valparaiso and trunk roads such as Route 5 and Route 60, it may be worth gradually transferring the port function from Valparaiso to the Quintero Bay area as space for further development is limited in Valparaiso.

To develop the bay area as a large complex of international trade ports complex, it is essential to plan complete segregation of the port access from axes of urban activities. Direct connection to the bay with Concon and Quillota by a high standard road is also important. The Master Plan Study should be continued during Phases II and III, in conjunction with a study on the long-term development strategy for Valparaiso.

(7) Los Andes Dry Port

There is a dry port in the suburbs of Los Andes, where four agencies are working in a similar manner at the border; including the international police, the frontier guard, the Agriculture and Livestock Service (SAG), and the customs office. Every international truck can clear customs procedures, either at Los Libertadores near the border or at the dry port of Los Andes. However, trucks with transit cargoes should go through

customs at Los Libertadores. Chilean importers can receive their imported cargoes at Los Liberatdores after inspection if all the required documents are complete.

The international police inspect documentation validity, vehicles and drugs. The SAG carries out plant and animal quarantine, especially to control fruit flies that have been completely eradicated in Chile. Customs officers check each declaration and impose customs duties.

About 20% of all trucks pass through customs at Los Libertadores and 80% at Los Andes. The dry port of Los Andes has a total area of 2.5 hectares and its capacity is 300 trucks a day. In 1993, when the dry port was built, about 200 trucks were inspected daily. The number increased to 500 in 2000, already exceeding the capacity, and is expected to grow further to 1,500 trucks a day by 2005.

Thus, a new dry port is also planned at the suburban area of Los Andes. The project is called "El Sauce Complex", which will include an area of 32 hectares. It is planned as a concession project to be implemented by the private sector. Currently, the container share is about 20% of cargoes from/to the dry port, 60% of which is carried by full trailers and the rest by trucks. As the process of containerization progresses, the new dry port is planned to handle container cargoes.

Another important planning issue is the unification of the customs offices between Chile and Argentina; an issue that has a long history. During the past 15 years, five plans have been developed for such unification under different project names, tough nothing has been realized. The Chilean side intended to integrate the customhouses of both countries at the new dry port of Sauce, but the Argentine side has developed its own port at Upsa Llata. This move is towards the opposite direction of unification. At the moment, Chile and Argentina agree that an electronic information exchange system should be introduced in both customhouses within two years. The project is called "ISIDORA".

Countries of the South Cone have unified the documentation system for customs. The common documents are called MIC/DTA ("*Manifesto International de Carga por Carretera*" and "*Declaración de Tránsito Aduanero*"). The information exchange system seems to be close at hand and beneficial to both the customs and transporters/ traders. Nevertheless, such a system does not exist even among the customs at Los Libertadores, Los Andes, Valparaiso, and San Antonio. The customs officers at each customhouse have to check all the documents manually, which is time-consuming and could be avoidable by an advanced communication system. The information exchange system should be urgently introduced not only internationally but also domestically in order to reinforce the gateway function.

18.3.5 Research and Studies for Transport Development

(1) Study on Comprehensive Cargo Distribution in Chile

The transportation database has been fairly developed in Chile by the Road Department, MOP. For example, OD matrices by mode are available for 1998 and utilized in the

Model MEPLAN. However, a comprehensive database of commodity distribution is not yet available, even though cargo transport is dominant in inter-city traffic. Although some data exists on cargo OD, it does not represent demand in net distribution (from the initial origin to the last destination in multi-modal transportation) but demand in gross distribution (OD data unlinked at every transfer point). The former "net distribution data" or "linked commodity OD data" is essential for any national or regional transportation planning.

A broad survey on cargo transport should be conducted, covering all transport modes, aimed at composing a database including OD in net by commodity type and lot size and shape, with consideration of seasonal variation and commercial distribution.

In general, a cargo-transport survey is much more complicated and difficult to conduct than a person-trip survey. It may be recommendable to carry out a pilot cargo-transport survey in some selected regions like Regions I, II, and IV, where the structure of cargo distribution is rather simple as compared with the Metropolitan Region and Region V. The survey should be composed of: 1) a roadside OD survey; 2) interview survey and data collection at ports, railway stations, and airports; 3) questionnaire surveys for companies with large cargo generation or attraction; 4) questionnaire surveys for transporters; and 5) other supplementary surveys such as traffic count and registration data of trucks and vessels.

Based on the resulting database, transport cost data, and other relevant information, the medium- and long-term transport policy should be formulated. The policy should cover such subjects as: 1) the future demand of cargo transport; 2) the economically optimum modal share; 3) how to guide transport demand to the optimum modal share; 4) who should bear transport development costs; and so on.

(2) Comparative Study of Trans-Andes Route in the Macro-Region

The Chilean and Argentine governments are currently undertaking a comparative study for the prioritization of alternative trans-Andes routes of the Aguas Negras, Las Lenas, and Pehuenche passes. This study has been carried out from an engineering point of view.

In addition to the engineering aspects, a socio-economic and environmental study should be carried out in order to clarify the impact of the trans-Andes route development on the regional society and economy of both countries. The feasibility of the project should incorporate factors such as development benefits and change in traffic resulting from the project.

(3) Impact Study of IT Development on Ports and Related Industries

Every business and economic activity is or will be affected and forced to change by advanced information technology (IT). The Internet, for example, is generating new businesses, while making existing ones outmoded, especially in the fields of communications, distribution, transportation, and commerce. Most brokerage and intermediary businesses are on the verge of collapse. Port business and administration cannot be an exception.

The economy of port cities such as Valparaiso, San Antonio, and Coquimbo has been dependant on their port functions; that is, there is the accumulation of financial firms, stevedores, transporters, docks for ship repair, and related service industries around the ports. The progress of IT may possibly make these functions unnecessary in the future. In addition, the decision sriteria of traders may change. Thus, ports in the IT era would require other kinds of services and facilities.

Port-related industries should look for a way to survive based on sight and early signs of change in current trends. The local government should consider this an issue for each city and carry out an impact study of the IT revolution on port-related industries. Experiences of international ports in developed countries will provide worthy suggestions.

(4) Feasibility Study on La Serena – San Felipe Road

In Region IV, National Route 5 exists along the coast and in the inner mountain area (*cordillera*). There is no longitudinal highway. The area is densely inhabited and produces fruits, vegetables, and wood. The Road Department of MOP has identified the importance of new north-south road developments in this area and is preparing a road project from La Serena – San Felipe.

The project is still at an early stage and requires location, engineering, economic and financial studies. It may be difficult to expect private sector involvement in this project due to low traffic demand. Therefore, it is advisable that MOP undertakes a full-scale feasibility study on this project.

(5) Feasibility Study on Reactivation of the Los Andes – Mendoza Railway

An idea to reactivate the Los Andes – Mendoza railway was discussed above. Apparently, the project has economic advantages in both initial and operating costs, compared with road development. A feasibility study would therefore be worthwhile.

The study should focus on not only engineering aspects such as countermeasures against steep gradient and heavy snowfall, but also demand for railway transport. Even after implementing the project, it is estimated to take 11 hours from Mendoza to Los Andes, whereas it is less than half that time by truck. As demand is the key factor of the project, a careful survey should be conducted regarding the willingness-to-use railway transport by transporters and consignors.

Currently, more than half of the cargo from Argentina to Chile consists of inflammable goods such as petroleum, gasoline, oil, and gas. Therefore, railway and truck modes should be compared to determine which is more suitable to transport dangerous cargoes.

18.3.6 Transport Infrastructure Development

The transport projects reviewed or proposed in the previous sections have been subjectively evaluated with a view to reinforce the gateway functions of Regions IV and V. The results are shown in Table 18.3.8.

The five criteria stated in Section 18.3.1 have been adopted for evaluation. Ranks "A", "B", and "C" indicate the degree of contribution, "high", "medium", and "low", respectively. In overall priority setting, a project with two or more "As" is ranked as "A"; a project with three or more "Cs" is ranked as "C"; and others as "B". The progress of the projects is shown as of November 2000. Some projects with no ranks have been studied and/or proposed by foreign or local groups.

Table 18.3.8 Project Prioritization for Action Plan Formulation

Project Category	Project		Criteria and Priority					
			Hinter-land Expan-sion	Price Competi-tiveness	Expansion of Domestic Market	Produc-tion Support	Safety and Comfort	**Overall Priority**
Export Corridor	1	Widening of Route 5 to Dual Carriageway						
	1-1	Llaillay - Los Vilos	A	B	B	B	B	**B***
	1-2	Los Vilos - Coquimbo	B	B	B	A	A	**A***
	1-3	Coquimbo - La Serena (Widening to 6 lanes)	A	B	B	B	B	**B**
	1-4	La Serena - Copiapo	B	B	B	B	B	**B**
	2	Realignment and Widening of Route 60	A	A	A	B	A	**A***
	3	Camino de la Fruta	A	A	B	A	B	**A****
	4	Valparaiso - San Antonio Coastal Road	A	B	B	B	B	**B****
	5	La Serena - San Felipe Cordillera Road	B	A	A	A	B	**A**
Trans-Andes Route	6	Improvement of Los Libertadores Route	A	B	C	B	A	**A***
	7	Juncal in Chile - Horcones Tunnel	A	C	C	C	A	**B**
	8	Aguas Negras Route	A	B	B	B	C	**B***
	9	Reactivation of Mendoza - Los Andes Railway	A	A	A	B	A	**A**
Port and Port Access	10	Valparaiso Port Expansion	A	B	B	C	C	**B***
	11	Valparaiso Port Access	A	B	B	C	A	**A****
	12	San Antonio Port Expansion	A	B	B	C	C	**B***
	13	San Antonio Port Access	A	B	B	C	A	**A****
	14	Coquimbo Port Expansion	A	B	B	C	C	**B***
	15	Quitero/Puchuncavi Port	A	B	C	C	C	**C**
	16	Los Andes Dry Port	A	A	B	B	B	**A****
	17	Unified Custom House	A	B	B	B	C	**B***
Research and Study	18	Comprehensive Cargo Distribution Study	A	A	A	B	B	**A**
	19	Study of Trans-Andes Route in Central Region	A	B	B	B	B	**B**
	20	Impact Study of IT Revolution on Port Function	B	B	C	C	C	**C**
	21	F/S for La Serena - San Felipe Road	A	B	A	A	C	**A**
	22	F/S for Los Andes - Mendoza Railway	A	A	B	B	B	**A**

Note: ** and * indicate on-going and committed projects, respectively.
Source: JICA Study Team.

All the listed projects are important to foster and strengthen the gateway functions in the regions and should be started in the next decade. In particular, the projects ranked "A" ought to be started in the early 2000s, while the rank "C" projects could be started after 2005. The rank "B" projects should be started before 2005.

High priority projects ranked "A" are listed in Table 18.3.9 with assumed starting years, implementation periods, and executing agencies. The privatization of major transport infrastructure is the basic policy and, therefore, most of these projects would be implemented by the private sector under concession schemes. The governmental agencies should undertake projects with low financial return and projects for research and study.

High-priority projects in Table 18.3.9 will be the basis to formulate the action plans proposed in this study. It is unnecessary to propose on-going projects as action plans.

Instead, some projects ranked "B" will be added.

Table 18.3.9 Proposed High Priority Projects for Reinforcement of Gateway Functions

	Project	Status	Implementation Period		Execution	Remarks
			Starting Year	Duration		
1	Camino de la Fruta	On-going	2001	2.0	Private Sector	By concession
2	Valparaiso Port Access		2001	1.0	MOP	By concession
3	San Antonio Port Access		2002	2.0	Private Sector	By concession
4	Los Andes Dry Port		2001	1.5	Loa Andes Customs	
5	Widening of Route5 (Los Vilos - Coquimbo)	Committed	2005	2.5	Private Sector	By concession
6	Realignment and Widening of Route 60		2004	3.0	Private Sector	By concession
7	Improvement of Los Libertadores Route		2003	2.0	Private Sector	By concession
8	La Serena - San Felipe Cordillera Road	Preliminarily studied or newly proposed	2003	4.0	Subsecretariat of Road Development	
9	Reactivation of Mendoza - Los Andes Railway		2004	2.0	Private Sector	By concession
10	Comprehensive Cargo Distribution Study		2001	1.5	SECTRA	
11	F/S for La Serena - San Felipe Road		2002	1.0	SECTRA	
12	F/S for Los Andes - Mendoza Railway		2001	2.0	SECTRA	

Source: The JICA Study Team.

By grouping the high-priority projects according to their main purposes, action plans for transport infrastructure will be proposed under the following titles.

- Improvement of North-South Trunk Route No.5
- Development of International Corridor
- Trunk Road Development for Regional Economy Revitalization
- Strengthening of Ports and Port Access
- Comprehensive Study on Physical Distribution
- Feasibility Study on Strategic Projects for Transport Corridor Development