11 DISTRIBUTION AND LOGISTICS

This chapter will focus on two main subjects:

1. *"Gateway"*—How is Chile doing as the "gateway"? Can it strengthen this function? How?
2. *Logistics for export and import*—How are goods transported and distributed in Chile? What are remaining problems?

The first subject will place Chile in the international perspectives. The second subject will concentrate on Chile's domestic systems.

11.1 Chile as the "Gateway": International Distribution

11.1.1 International Cargo Movements through the "Gateway"

Chile's function as the "gateway" is already a real one though it is still limited in terms of cargo volume. Figure 11.1.1 is reproduced here (originally Figure 10.2.6, Chapter 10) to indicate the extent of that function. As is seen, transit cargos as a whole only account for a fraction of total international movements.[1] It is also evident that most of the transit cargos go through the North Zone, to and from Bolivia primarily.

The annual total volume of transit cargos (880,000 tons westbound and 510,000 tons eastbound) may be still insignificant compared with Chile's total handling volumes. Nonetheless, this present picture clearly illustrates a promising possibility that Chile should pursue: its "gateway" function can expand further. To demonstrate this, Chile's current position in the international distribution and transportation networks particularly with neighboring countries will be reviewed in following sections.

11.1.2 Macro-Region Andina

"Macro-region Andina" is a notion proposed and pursued by authorities concerned in Region I. Without any definite boundaries, it roughly covers an area encompassing the southern part of Peru, most of Bolivia, northern part of Argentina, part of Paraguay, and the states of Mato Grosso and Mato Grosso do Sul of Brazil. Arica and Iquique are the two principal seaports supposed to serve this area. Conversely, this "macro-region Andina" is roughly equivalent to the potential hinterland of the Arica and Iquique ports. Within the region, Bolivia naturally assumes the central position because of its vicinity and landlocked status.

Being similar in size and scale, Arica and Iquique ports have slightly different characteristics when viewed in this framework. Arica is more outlet-oriented whereas Iquique shows strength in import. This difference largely reflects Bolivia's trade pattern: its exports are mostly bulky commodities which Iquique cannot handle due to its severe access problem while its imports, most being consumer products, find a convenient channel through ZOFRI, the well-established free trade zone in Iquique.

[1] The figures shown are combined total of marine and land transportation. Air cargos, transit air cargos in particular, are negligible (international total: 226,000 tons in 1999). So are transit cargos to and from Peru.

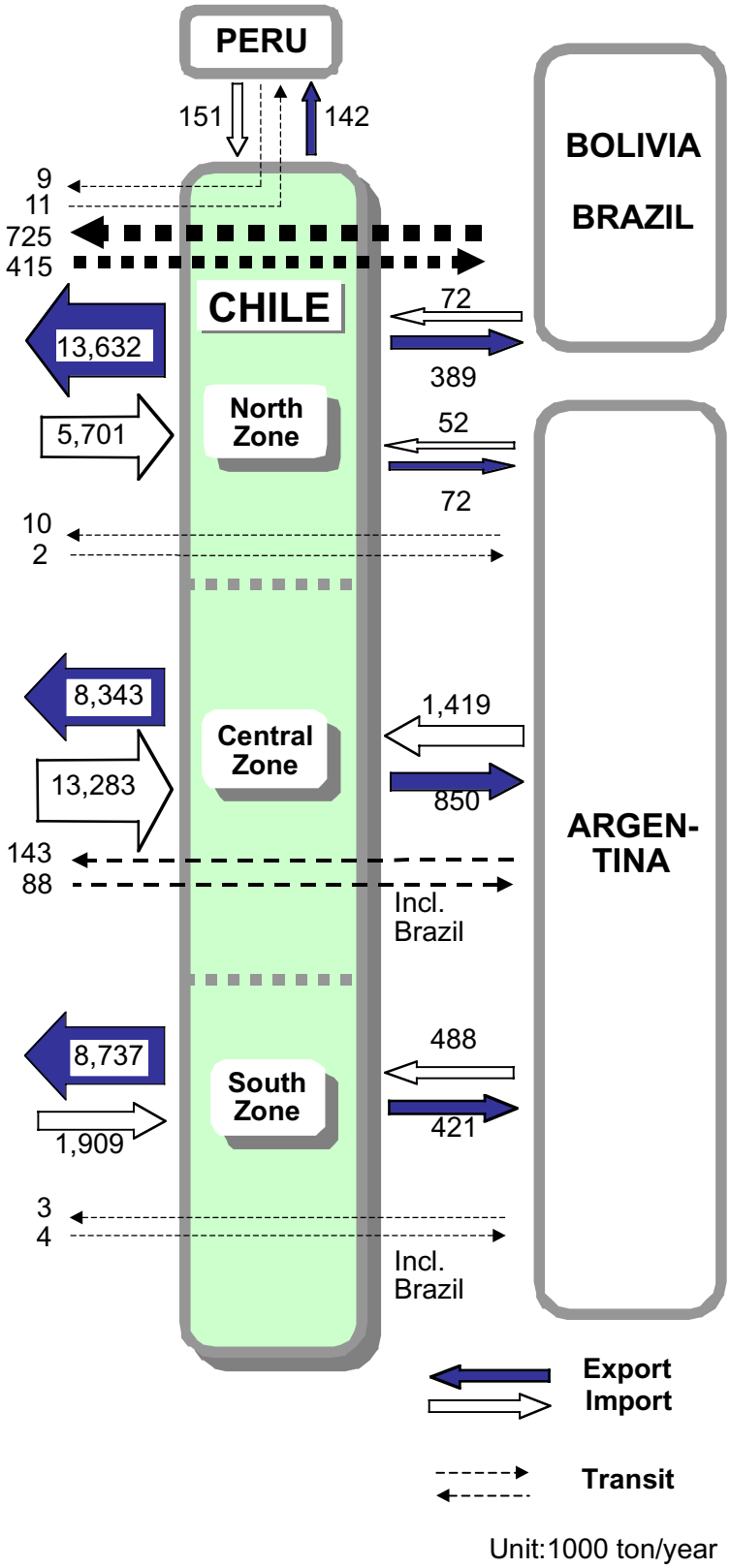

Figure 11.1.1 International Cargo Movements in 1999

Source: Figure 10.2.6, Chapter 10.

A breakdown of cargo handling data of Arica port will illustrate its unique position (Table 11.1.1). Unlike any other port in Chile, majority of its cargos (65%) are transit to and from either Bolivia or Peru.

Table 11.1.1 Cargo Handling at Arica Port (1999)

	Tonnage (1000 ton)	Share (%)
Chile Import/Export	249	18.4
Chile Domestic (*cabotaje*)	55	4.1
Bolivia Transit	859	63.5
Peru Transit	22	1.7
Transshipment	144	10.7
Total	1,352	100.0

Source: Empresa Portuaria Arica

Taking advantage of the bulk of outbound commodities passing through Arica, one vision envisages the city as a major manufacturing base for the "macro-region Andina." The 130-ha industrial park being developed by ZOFRI Chacalluta may fit in well with this concept (Figure 11.1.2).

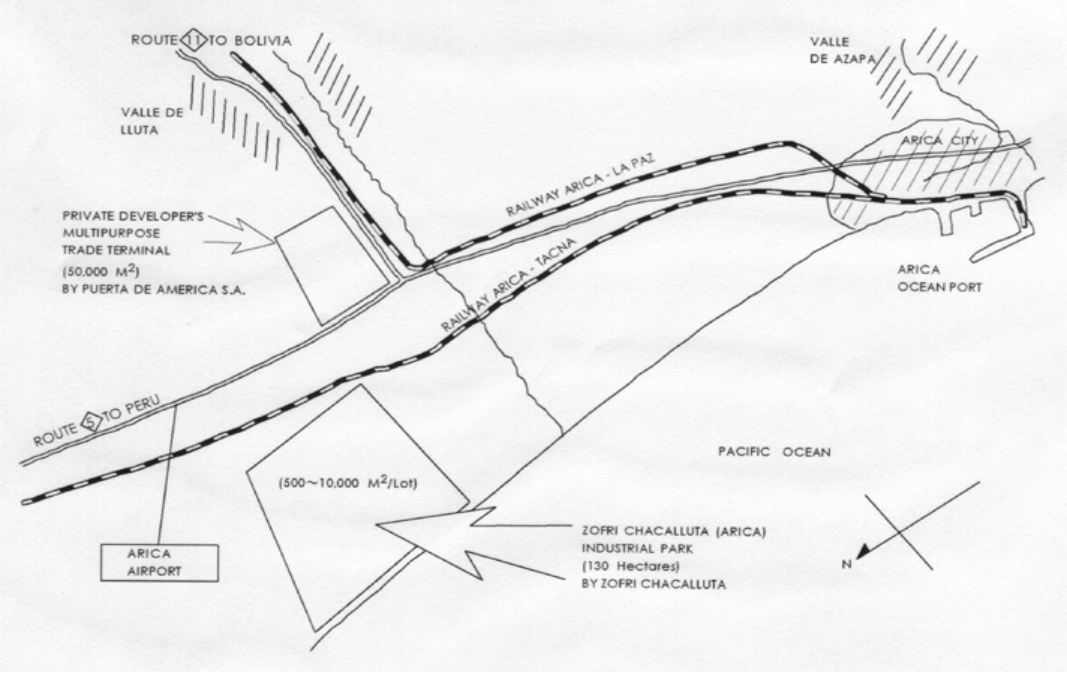

Figure 11.1.2 Arica and Industrial Park

Source: JICA Study Team

ZOFRI (Zona Franca de Iquique), established in 1975, has grown into the largest commercial free trade zone in South America with annual sales over US$ 4 billion. As a commercial FTZ, its main function now is to channel various commodities imported from the U.S., Japan, South Korea, China, etc. to northern Chile and to the countries in the "macro-region Andina." It is the "commercial gateway" in full operation. ZOFRI also has an industrial zone where bonded factories manufacture various products. Because of the space limitation at its current location, ZOFRI plans to shift its functions more towards logistics and related services. It operates a computerized semi-automatic warehouse system, provides its customers with EDI services and has acquired land at

Alto Hospicio (outside Iquique) for future extension of logistic services.

As many have repeatedly pointed out, development of this "macro-region" in general and Arica and Iquique in particular will much depend on, among others, transportation infrastructure in Bolivia. It is imperative to improve several crucial transportation links in Bolivia, removing bottlenecks and constructing missing links, to complete the continental networks of land transportation (Figure 11.1.3). Though this matter is outside Chile's jurisdiction, it can and should persuade Bolivia and neighboring countries to take concerted action in that direction.

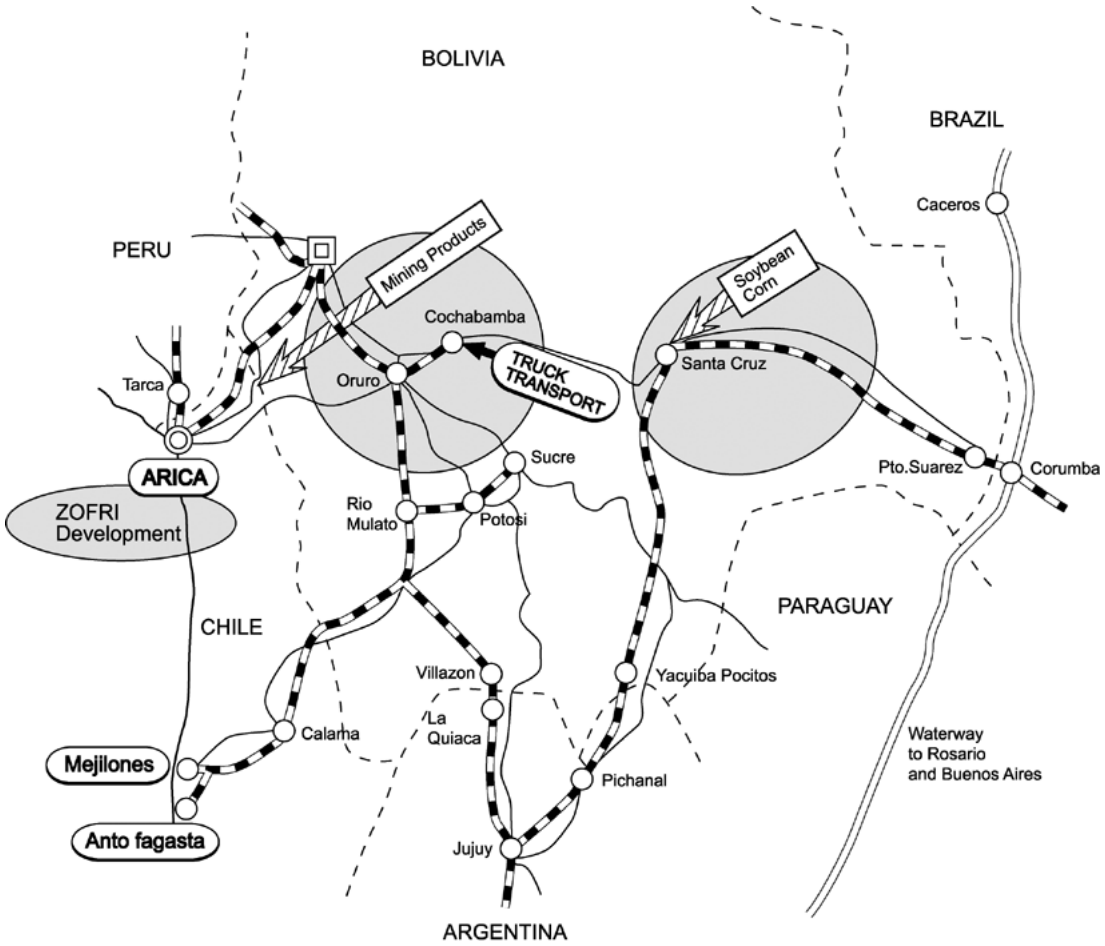

Figure 11.1.3 Missing Links in Bolivia

Source: JICA Study Team

11.1.3 ZICOSUR

ZICOSUR (Zona de Integración del Centro Oeste de America del Sur) is another regional concept, spearheaded mainly by Region II. Its coverage is almost the same as the "macro-region Andina" except for Peru, which is at present excluded from the ZICOSUR concept.[2] To promote the concept and foster regional cooperation, three conferences have been held so far attended by the delegations from the "member" countries and local governments in them.

The port of Antofagasta and the planned port at Mejillones will serve the region as the

[2] The fact is that Peru did not send its delegation to the ZICOSUR conferences in spite of the official invitation.

two principal seaports. In 1999, Antofagasta port handled about 1.6 million tons, of which 185,000 tons (slightly more than 10%) were transit cargos for Bolivia and Argentina (Table 11.1.2). The Table shows that a possibility does exist for Antofagasta to be the major "gateway" to Argentina but it largely remains as it is: a mere *possibility*.

Table 11.1.2 Cargo Handling at Antofagasta Port (1999)

	Tonnage (1000 ton)	Share (%)
Chile Import	187	11.3
Chile Export	1,092	66.0
Chile Domestic (*cabotaje*)	104	6.3
Bolivia Transit (To)	38	2.3
Bolivia Transit (From)	138	8.3
Argentina Transit (To)	2	0.1
Argentina Transit (From)	6	0.4
Transshipment	24	1.4
Total	1,655	100.0

Source: Empresa Portuaria Antofagasta

The port of Mejillones, located 50 km north of Antofagasta, will start its first-stage construction in September 2000. When completed in 2002, the port will have 3 berths with 12.5 m draft and handle 2 million tons annually. A 100% concession project, the port will be constructed and managed by a three-company consortium led by Complejo Portuario Mejillones S.A., a company affiliated with CODELCO, the future primary user of the port.

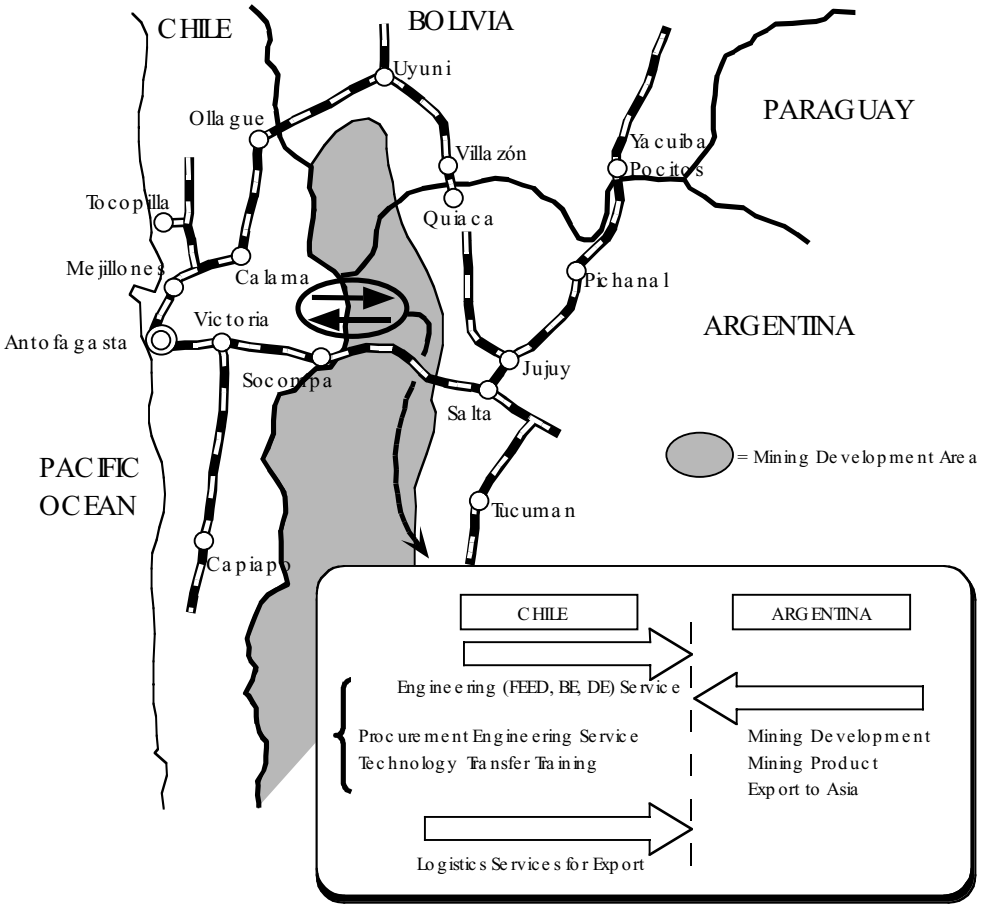

Figure 11.1.4 Mining Development in Argentina and ZICOSUR

Source: JICA Study Team

One great advantage of the port over other locations is the virtually unlimited stretch of vacant flat land adjacent to the port. This hinterland is ideal for major factories, logistic services, utilities, etc. to locate except for one limitation: water. This otherwise ideal location seems still close to ideal, however, considering the steadily declining cost of desalination.

In view of their locational advantages, the ports of Antofagasta and Mejillones have a clear potential to further develop as the "gateway" for ZICOSUR. One possible and very plausible direction is for Chile to cooperate with Argentina for the mining development on the eastern side of the Andes. Based on the 1999 agreement on mining development between Chile and Argentina, Chile may offer its highly advanced mining technology and engineering know-hows to the Argentine counterpart to support their new enterprise. As Argentine mines start operation, their outputs will certainly head westward to Chilean ports. Chile's logistical services will then be in greater demand (Figure 11.1.4).

11.1.4 Central Bioceanic Corridor

The roads connecting Valparaíso and San Antonio, two largest seaports of Chile, with three Argentine Provinces of Mendoza, San Juan and San Luis are the principal east-west arteries of Chile. The concept of "central bioceanic corridor" centers on these routes. In fact, Route 60 crossing the Chile-Argentina border at Paso Cristo Redentor is by far the busiest and most important trans-Andes route linking the two countries. Similarly, Valparaiso port (1999 handling: 4.6 million tons) and San Antonio port (1999 handling: 8.3 million tons) are the two major ports situated at the western ends of the corridor. Their combined volume of cargos, about 13 million tons a year, is compared to that of Buenos Aires, 18.7 million tons a year.

However, if viewed as the "gateway," this corridor's current performance is not up to expectation. As Table 11.1.3 shows, transit cargos to and from Argentina still account for a very minor portion of the total handling.

Table 11.1.3 Cargo Handling at Valparaiso and San Antonio Ports (1999)

	Valparaiso		San Antonio	
	Tonnage (1000 ton)	Share (%)	Tonnage (1000 ton)	Share (%)
Chile Import/Export	4,300	93.5	6,700	80.8
Chile Domestic (*cabotaje*)	13	0.3	650	4.7
Argentina Transit (To)	8	0.2	70	0.8
Argentina Transit (From)	250	5.4	83	1.0
Total	4,600	100.0	8,290	100.0

Source: JICA team's estimates based on data fromEmpresa Portuaria Valparaiso and Empresa Portuaria San Antonio

One crucial problem with this route is the pass of Cristo Redentor on Route 60: it often closes during winter due to heavy snowfall. To solve this problem, various ideas have been raised and studied. One promising solution appears to be a new detour route between Rancagua and Mendoza crossing the border with a 13-km tunnel at lower altitude. The Ministry of Public Works has recently completed pre-feasibility study of this project.

Since this corridor is part of the Valparaíso -Santiago-Buenos Aires bioceanic corridor, one of the three priority corridors across the South American continent, its economic potential should be enormous. In addition to the specific improvements on highways and ports, the whole areas along the corridor need to be geared, physically and mentally, to the concept of "gateway" just to grasp the opportunities. Very active cooperation between the Chilean and the Argentine business circles (Valparaíso and Region V in Chile and Cuyo region in Argentina) is a positive sign in this respect. Furthermore, a special center or two for bioceanic logistic services may be an appropriate and necessary addition to the current transportation infrastructure.[1] To transform the whole areas along the corridor into the "knowledge center" of not only Chile but of South America as well is another vision worth serious consideration (Figure 11.1.5).

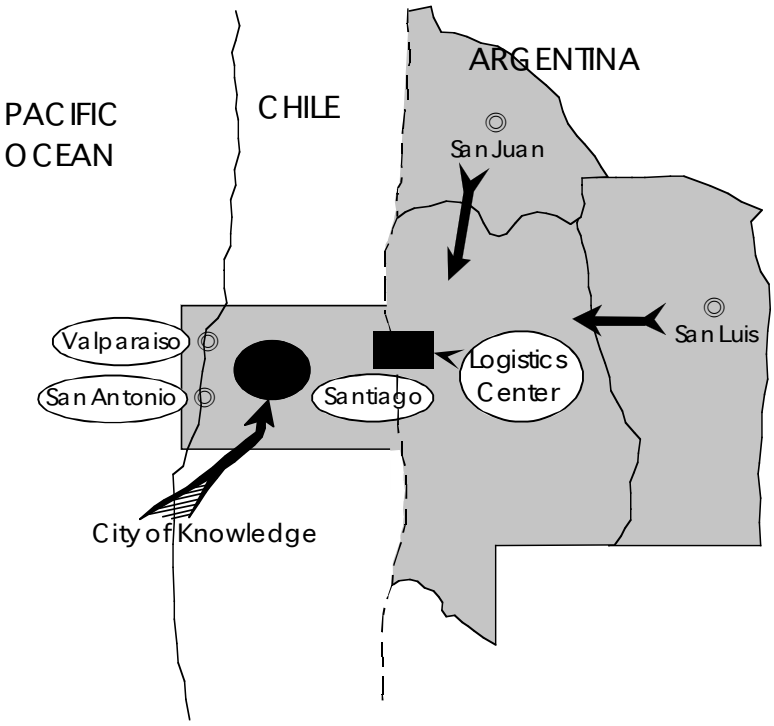

Figure 11.1.5 Central Bioceanic Corridor

Source: JICA Study Team

11.1.5 Concepción-Bahia Blanca Bioceanic Corridor

This is another one among the three priority bioceanic corridors identified by the 1996 study. Distance between Concepción and Bahia Blanca is 1,500 km. Cross-border traffic along this corridor is minimal at present due mainly to poor road condition at some sections. The city of Bahia Blanca, an industrial base and port town on the Atlantic coast, is actively promoting this corridor. According to a plan, one road and one railway will cross the pass of Pino Hachado. The existing road needs extensive improvements while a new railway link should be constructed connecting Victoria

[1] A large truck terminal is in operation in the Mendoza area to handle containers and general cargos bound for Chilean ports for export. One-through logistical services are offered there by shipping companies like Ultramar. A Chilean counterpart facility may become necessary as its "gateway" functions strengthen and Argentina-bound cargos increase.

(Region VIII) and Zapala, an Argentine town near the border (Figure 11.1.6). If road and railway transportation along this corridor is still limited, two pipelines are already installed transporting natural gas and crude oil from Neuquen to Concepción.

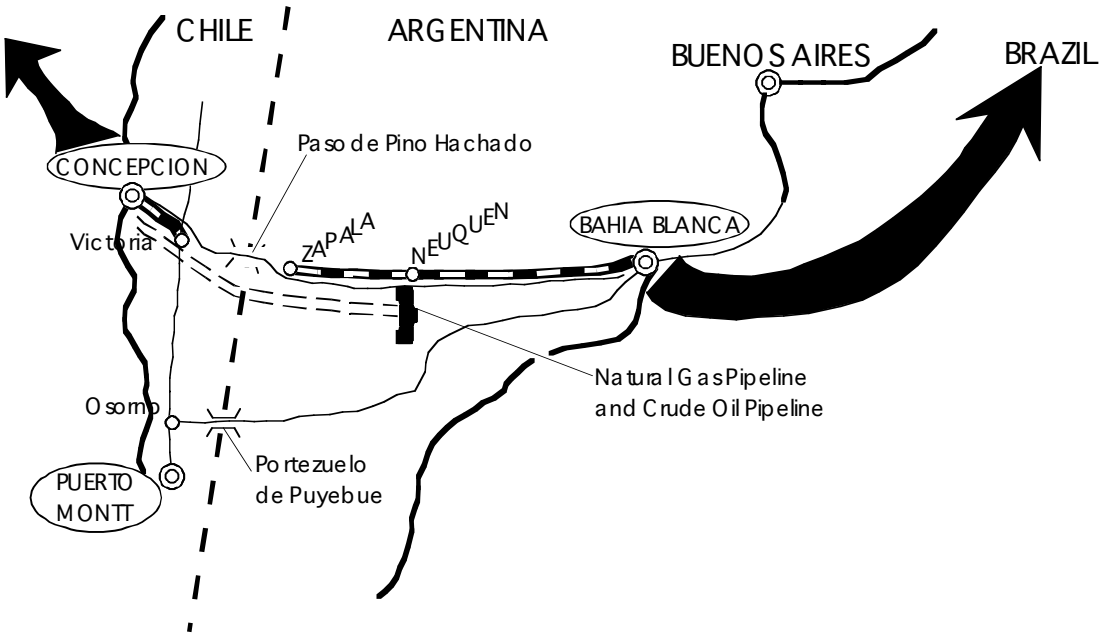

Figure 11.1.6 Concepción-Bahia Blanca Bioceanic Corridor

Source: JICA Study Team

11.1.6 Bolivia, Brazil and Argentina

As stressed earlier, Bolivia as a whole is the "missing link" of the South American transportation networks. Of particular importance are Santa Cruz (Bolivia)-Cuiaba (Brazil) road connection and Santa Cruz-Cochabamba (Bolivia) railway line. Because of the financial costs involved in them, no progress is in sight about the two projects.

Brazil is particularly keen to provide adequate transportation means to its western part, a huge producer of soybeans and corns. From the Chilean viewpoint, this grain cargo represents a massive shipment which can pass through Chilean ports. However, because of the obstacles lying in Bolivia, this scenario has yet to materialize. Meanwhile, Brazil is instead pushing railway constructions in the western part to link it to the outlets on the Atlantic coast.

Argentina has been very cooperative with Chile to improve the trans-Andes crossings. In addition to that, a good indication of progress in terms of "gateway" promotion is its plan to improve the road sections along the foot of the Andes to construct a major north-south trunk highway connecting the Bolivian border and Patagonia (Route 40). The highway will link such provincial economic centers as Jujuy, Mendoza and Neuquen. The importance of this highway should be obvious. It will give an easy access to the cross-Andes points. As economies of this western part of Argentina pick up, more and more products will try to cross the Andes to get to the Pacific coast. However, the crossing points are not everywhere. Access to them on the Argentine side is thus very crucial to encourage the commodities to head westward.

11.1.7 Energy Distribution

To think of a different form of "gateway" possibility, this section will briefly touch upon energy resources transferred to Chile across the Andes. Argentina is the major supplier of hydrocarbon resources to the MERCOSUR region. It now supplies Chile with natural gas (about 38 million cubic meters a day) through five pipelines. It also provides crude oil (15,000 cubic meters a day) to two refineries near Concepción through a trans-Andes pipeline (Figure 11.1.7).

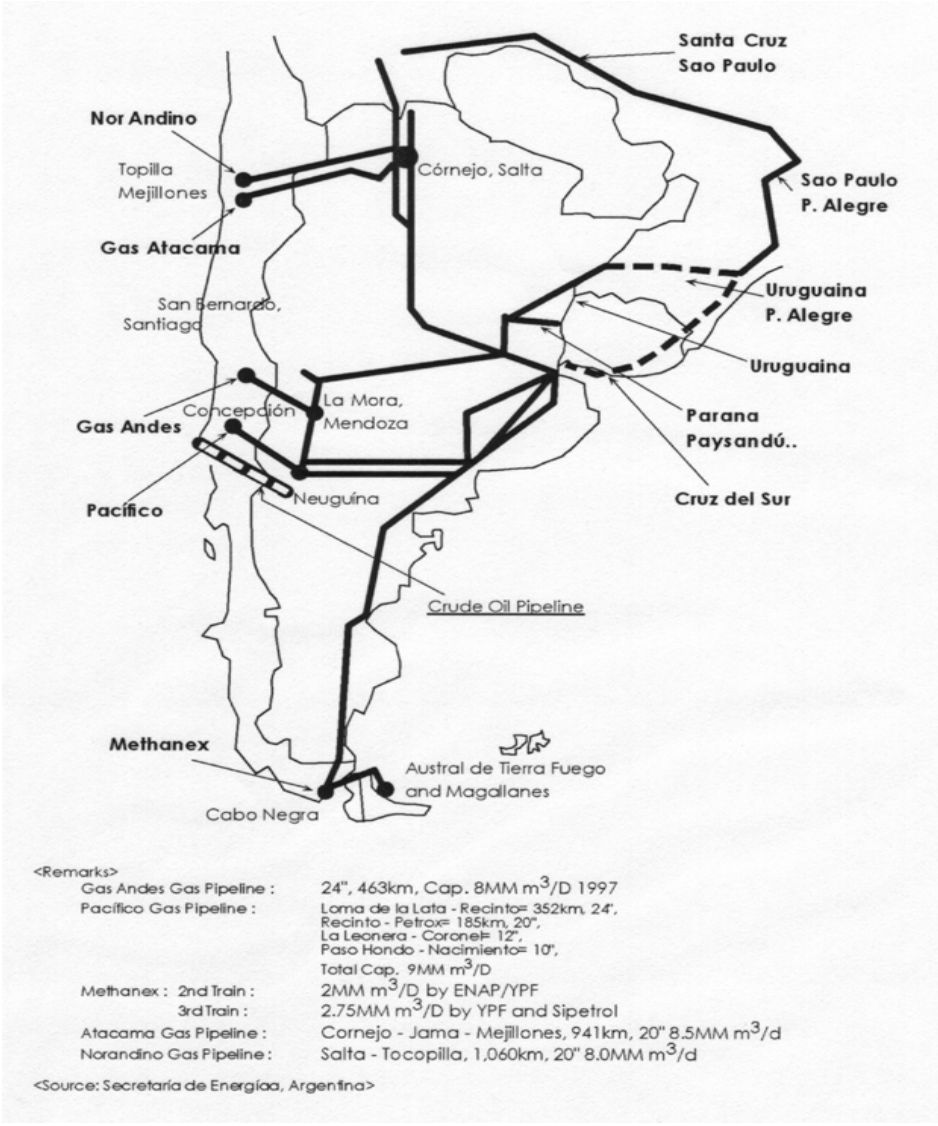

Figure 11.1.7 Argentina-Chile Energy Supply System

Source: JICA Study Team

This system has greatly contributed to secure the energy supply for Chile. At the same time, this points to a possibility for Chile to develop chemical industry processing the Argentine resources further mainly for export (Methanex near Punta Arenas, the world's major producer of methanol, is exactly a case in point). This is a "gateway" of different kind and deserves a careful consideration.

11.1.8 Panama: Striving for the Latin American Distribution Center

On December 31, 1999, the Panama Canal Zone was officially handed over to the government of Panama. Implications of this historic move are far-reaching. Of particular importance and relevance in this Study's context is that it has opened a tremendous possibility for Panama to become *the* distribution center for Latin America.

ARI (Autoridad de la Región Interoceanica), an organization newly created to maintain, develop and manage the restored areas (140,000 ha) and installations (7,000 units), has quickly developed an ambitious master plan. Its three central pillars are "Ciudad del Saber (City of Knowledge)" (Clayton), Albrook Export Processing Zone, and Howard Intermodal Center, all located in the Pacific Area. "Ciudad del Saber" is a kind of science and culture city, inviting R&D institutions, educational organizations, incubators, cultural exchange programs, etc. to locate in the Clayton area. The Albrook Export Processing Zone is planned to situate near the port of Balboa. The Howard Intermodal Center, as its name suggests, is a very large-scale logistic complex aspiring to be the Latin American Multipurpose Distribution Center. It will have the integrated capacity to handle air, sea and land transportation simultaneously utilizing the former Howard Air Base equipped with a 2,590 m runway.

Panama's locational advantages are indisputable, just like Singapore's which have helped the city-state transform into an international center for economic activities. Then, is Panama a formidable rival to Chile?

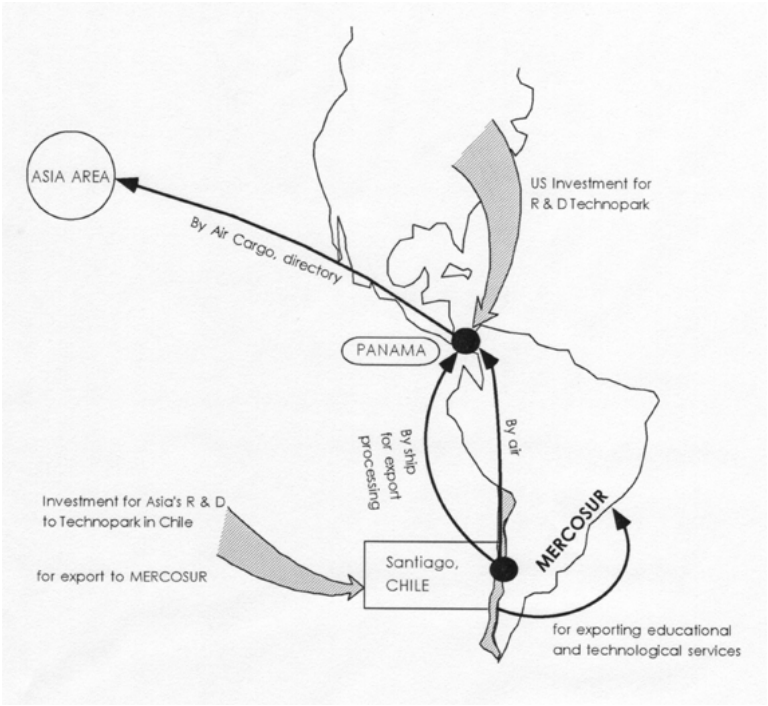

Figure 11.1.8 Panama as Chile's Manufacturing and Distribution Base

Source: JICA Study Team

Many people may think yes and they may be right. However, some others think differently. Think about this fact: Chile *is* the No.1 user of the Panama Canal among the Latin American countries.[2] Then it will make sense to utilize Panama as Chile's

[2] According to 1999 statistics, Chile-bound cargos accounted for 5.6% (6.6 million long tons) of the total shipment

"offshore" manufacturing and distribution base where Chilean-made products are further processed or assembled and then shipped again to the final destinations in North America or Asia. Figure 11.1.8 sketches out this scheme.

11.2 Logistics for Export and Import

11.2.1 Liner Services

A number of major shipping companies provide regular liner services for Chilean ports. Table 11.2.1 shows some examples. (Note: This Table is not meant to be exhaustive.)

Table 11.2.1 Liner Services Available at Chilean Ports (Examples)

Route	Frequency
Europe<->Panama<->Callao<->**Arica**<->**Iquique**<->**San Antonio/Valparaíso**	Weekly
Singapore<->Hong Kong<->Pusan<->Kobe<->Yokohama<->**Iquique**<->**Arica**<-> **Valparaíso** <->**Lirquen**	Weekly
Buenos Aires<->Santos<->Rio Gallegos<->**Talcahuano**<->**Valparaíso** <->Callao<-> Auckland (NZ)<->Sydney<->Merbourne	?
Mexico<->East Coast U.S.<->Brazil<->Argentina<->**Valparaíso** <->Panama<->U.S. (for automobiles)	?

Source: JICA study team based on the information given by selected shipping companies.

It is interesting to note that the last two services take the south route, via Cape Horn. This shipping route is active, serving as a viable alternative to land transportation across theAndes.

11.2.2 Valparaíso vs. Buenos Aires

One issue directly concerned with Chile's "gateway" functions is the costs (both monetary and time) associated with a shipment from, say, Mendoza to Asia. The question is: which is cheaper to ship a cargo from Mendoza to Asia, via Buenos Aires or via Valparaíso? It seems there are as many observations on this question as there are concerned people. Since the JICA study team was not able to conduct its own study on this particular subject, it will only cite one recent study made by Empresa Portuaria Valparaíso. According to the results, the answer to the question above is via Valparaíso. It compared the time and costs for a shipment from Mendoza to Yokohama 1) via Valparaíso and 2) via Buenos Aires. The study first found that the maritime costs were the same for Valparaíso-Yokohama and Buenos Aires-Yokohama. It then found that the port charges were higher at Buenos Aires. It further identified that the total delivery time were 38-39 days for the Valparaíso route and 49 days for the Buenos Aires route. All told, the study concluded, the total costs were lower for the Valparaíso route by 5 to 10%.

This finding alone will do little to change the current pattern of cargo movement originating from Mendoza. Even if that conclusion is quite accurate, it is another matter how to evaluate the 5 to 10% difference: to some it may mean a significant cost reduction; to others the difference may be marginal. What we have to keep in mind when dealing with the "gateway" possibility is this dictum: transportation cost is the most decisive factor to shape the pattern of cargo movement but, at the same time, transportation cost alone does not decide all.

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through the South Band (from Atlantic to Pacific), sixth largest in the world. Similarly, Chile-originated cargos accounted for 11.5% (8.9 million long tons) of total passing through the North Band (from Pacific to Atlantic), or the world's third. In total, 15.5 million long tons of Chilean cargos passed through the canal. This total figure ranks Chile at sixth in the world and top in Latin America (runners up: Peru, 8th; Venezuela, 10th).

11.2.3 Domestic Distribution

Its geographic conditions have undoubtedly affected the development of distribution systems in Chile. First of all, its very skewed pattern of population distribution, combined with the climatic conditions, has discouraged a fully nationally integrated system to develop. To simplify the picture, the Chilean economy has developed as a collection of regionally self-contained economies and, as a consequence, little interregional transaction has taken place. Transportation and distribution of commodities are basically short-range, confined to a small area. Lack of long-haul freights may well be a prime reason why Chile's domestic distribution systems have remained relatively small scale. Following are brief overviews of domestic distribution by mode.

Trucking

This is by far the largest means of transportation for domestic freights. According to the JICA study team's own estimates (Figure 10.2.3 above in Chapter 10), about 57% of domestic cargos were road-transported (that is, by trucks) in 1998. A serious problem for the trucking industry is the one-way haul of the northbound fleet. While there is much demand for the Santiago-Arica services, for instance, few cargos can be loaded on the way back. For the southbound fleet, this problem does not exist primarily because of agricultural products to be delivered to Santiago markets or Valparaíso/San Antonio ports.

Railway

Railway accounted for 6% of total domestic cargo transportation in 1998, according to the same estimates. Much of the volume, however, is due to mineral products in the north or cellulose in the south. General shippers do not rely much on the railway services to transport their cargos.

Coastal Shipping (*cabotaje*)

As a country with a long coast line and a narrow land strip, Chile naturally favors coastal shipping (*cabotaje*) as a cheap alternative to trucking. The same estimates show its share was 37%, a relatively high figure for any country with marine access.

Air Freight

Although air transport is well developed in Chile and some areas still remain only accessible by air, air freights are generally insignificant in the whole picture of domestic distribution. In 1998, airlines carried 44,000 tons of domestic cargos, which accounted for 0.1% of total ton-km transported domestically.

11.2.4 Logistic/Distribution Center

One noticeable characteristic of Chile's distribution systems is that there are few logistic or distribution centers where freights are transshipped and warehoused. (Examples include ZOFRI in Iquique and the pre-port distribution center of Valparaíso port located 20km east of the port.[3] Note that both are related to port operations.) This does not mean that the Chilean system is underdeveloped. Rather this simply means that Chile does not need many of them because of, once again,. its geographical condition.

[3] The center was built to relieve the traffic congestion at the port. It has a parking area for 240 trucks and provides integrated information about daily shipping schedule.

Unlike the U.S. where cargo movements are two-dimensional and therefore it is highly justifiable to locate such a "center" at a strategic location, Chile is basically one-dimensional and transshipment does not save transportation cost. A cargo moves straight from the origin to the destination.

However, Japan will give a different perspective to this issue. In a sense Japan shares the same geographic characteristic with Chile: basically one-dimensional. Nonetheless, in the past decade in particular, logistic centers or distribution centers flourished in Japan to meet a new type of necessity: to secure on-time delivery of a huge number of items 24 hours a day. Of course, benefit of scale economies is a basic motivation for them but increasingly fine-tuned operation necessary to meet market requirements is another reason to develop such highly sophisticated logistic centers around large cities like Tokyo. In this case logistics or distribution is a highly professional services provided only by specialized companies. As Chile's economy grows and its functions as the "gateway" strengthen, there will emerge possibility and necessity to develop such operations in Chile, too.

11.2.5 Trucking Industry

Since trucking is the main means of transportation for domestic cargos, a brief description of the industry will be appropriate here.

In Chile a large portion of domestic cargos originate from a few large-scale companies like CODELCO. Those companies commonly have their own transportation subsidiaries carry the cargos or contract out the operations to large-scale trucking agents. The rest of the market is open to small- and medium-size truck owners, who number many and compete for a market slice. In general, the trucking industry itself is much under the influence of a few large-scale corporations.

To maintain the industry's healthy competition, government has introduced a certain eligibility requirement on prospective truck operators. Restricting excessive new entries through this screening, government expects the industry to stabilize at some desirable size.

One peculiarity with the industry is that it is exempt from value added tax (IVA). Instead, truck operators simply make a tax declaration, under the regulation so-called "Renta Presunta," based on the turnover estimates. This regulation is extremely beneficial to the trucking companies and this may explain why there are so many entries in this industry.

Argentine trucks are allowed not only to carry Argentine freights to Chilean destinations but also to load Argentina-bound cargos on the way back to Argentina. There is a restriction, however, on the number of Argentine trucks which can enter the Chilean territory. An interesting fact is that a number of Mendoza-based trucking companies are actually owned by Chileans.

11.2.6 Customs

A general perception about customs operation is favorable among traders doing business in Chile. Customs clearance is very smooth and handled skillfully at the border. Trade statistics are accurate and open. This leads to the transparency of customs operation.