2) The case of the Singapore Port

The Port of Singapore Authority (PSA) established Vessel Traffic Information System (VTIS) which started 1st of October 1990, which is basically similar to the systems in dense traffic channels and ports like Juan de Fuca, English Channel and traffic routs in Japan (see Figure VII-1-4-8).

The objectives of the VTIS are as follows:

i) to improve safety of navigation in the Singapore Strait.
ii) to facilitate the state flow of shipping in and out the Port of Singapore.
iii) to provide navigational information to vessels using the Singapore Strait.

Reported information from VTIS participants is used for not only safety of navigation in the port area but also for the Port Traffic Management and the Expert Planning Systems to efficiently plan and co-ordinate the development of pilots, tugs, and launches.

1.4.6 Information Flow System for the Buenos Aires Port

(1) Background and findings

There is lack of adequate and accurate planning and management information on the development of the maritime transport sectors.

The necessary and vital port management information system must be formulated on a national basis in the simplified format to be effective and well understood at the different port capacity/functional level.

The sub-secretariat of Port and Navigable waterway shall introduce the system to report the information of port operation and service.

All the port statistic data shall be compiled in the form of formation of port management/operation system, and shall be reported quarterly per year as the port performance to the sub-secretariat of Port and Navigable Waterway, Ministry of Economy.

(2) The requirement and type of data and information in this system

The required basic functions of the information flow system for the container terminal operation at the Buenos Aires port are at the preliminary stage and the introduction of such system is essential for improvement of container transportation.

For EDI system the following information flow are specified hereunder;

- Shipowners' information exchange

- Agents' information exchange
- Transport companies' information exchange

For Terminal Operating system:

- Automatic data exchange of containers/chassis at gate in/out
- Inventory control of in-yard containers to and from ships
- Making of loading and discharging sequence list of containers to and from ships
- Optimum positioning of Transtainer, Tractor, Quay Crane
- Determination or checking of yard stacking address of receiving and delivery containers
- Calculation of ship's stability
- Making of various lists, reports and others
- Data transmission between control stations and moving stations(Transtainer, Tractor, Quay Crane etc.)

a. Data and information to be reported are categorized as follows;

- Traffic data
- Productivity
- Performance and utilization of facilities

b. The requirement for this system

The data and information submitted to the sub-secretariat from all the port level should be classified to the strategic data for the monitoring aspect and to justify plans of development of port infrastructures and operational arrangement and accurate data as to the performance, productivity, utilization of facilities at each port and trades trends in the maritime sectors.

(3) The present situation of port data compiling system

The issues like independent manual procedure are being encountered at each port. In the case of Buenos Aires port, all the terminal operator started to install desk top computer to follow their traffic and information flow independently. Such data collected by each terminal operator were transferred to the AGP office for monitoring. ASP are collecting all the performance data of respective terminal by using computer network or manually.

It was also observed at number of other ports to compile port statistic data independently at their own data basis of desk top computer. There are many transfer works on documents in case such data are required to the head office of port or provincial port office.

There are differences in the contents of the reporting format among related agencies and organizations of port users.

The purpose of collecting data at the respective port level is not classified. The cargo volume data and/or port throughput data which had been collected and compiled by each port level at their own format and system have not been reported in consistent manner among the different ports.

The format which is presently used are too simply, and is not effective presentation to plan the strategic matter of the port development in the sub-secretariat and provincial head office of port and maritime transport.

(4) Recommendable measures on the development of information flow system

a. A standardized computer application system that can be utilized efficiently by all related agencies and terminal operators of port users shall be developed.

The computerized system is composed of following four-sub-systems as the first stage of system development.

=> arrival and leaving ships control system
=> facility and equipment management system
=> charge control system
=> managing the statistic data compiling system

b. Team responsible for introducing and establishing such computer system development on the Data and Information of port performance supply system shall be set up by responsible officials from all the ports and Sub-secretariat, Ministry of Economy.

c. An International Standard Coding System (ISO rule) of commodities and shipping, to ensure international compatibility shall be studied to introduce and apply for such information flow by coding system.

d. The software user-friendly system with a lot of on-line help texts shall be developed by the team or with the assistance of manufacturers or the consultants.

1.5 Measures for Improving Quality of Port Service for Container Transport in Argentina

In this section the institutional development for the port service on the short term measures as well as the infrastructure development by optimum utilization of existing facilities at the Buenos Aires port are described. Then as the long term measure the secondary port development as well as the supplemental ports like Bahia Blanca, Quequen and Rosario ports for container terminal is described.

1.5.1 Short Term Measures

It is estimated that the Buenos Aires port including Dock Sur terminal will be able to handle nearly 1.2 to 1.3 million TEUs containers by current arrangement of the existing facilities and necessary upgrading of supporting container operational facilities. According to the demands forecast of container handling, the port will receive more than 1.35 million TEUs of containers around 2005.

Thereafter the port will require additional infrastructures like supplemental and secondary container terminals for the Buenos Aires port to meet the increasing demands. The considerable short term measures to increase the container handling capacity and to improve the port service quality are discussed in the following paragraphs.

The following aspects and issues in addition to the implementation of the infrastructure development at Buenos Aires port as discussed in the section 1.4.1 are considered as the short term measures.

- Establishment of Responsible Institution of Port Management
- Coordination for Optimum Utilization of Existing facilities
- Conducting Nationwide Containerization Study
- Integrated Container Terminal Area Development
- Introduction of Port Sale Concept
- Improvement Measures in Technical Aspects of Maritime Control
- Development of Information Flow System
- Establishment of Training Institution for Human Resources Development

The content of the above issues are briefly described as follows;

(1) Establishment of responsible institutions

a. For the Buenos Aires Port operation

It has been reported that the AGP which is now supervising the operations of Buenos Aires port under private terminal operators will be restructured. It is essential that

the government shall establish a responsible institution by replacement of AGP to provide the following roles and functions,

- to continue to supervise the contractual obligations of private terminal operators
- to provide necessary coordinations among each terminal operator and between railway authority, maritime authority, city municipality and other agencies involved in the port areas
- to prepare a grand master plan of further development of the port Buenos Aires
- to implement the advises and recommendations
- to present and function as a responsible organization and authority on behalf of the Buenos Aires port to presently working private terminal operators and future participants and investors
- to supervise the balance of financial situation of port

b. For the coordination of other ports development

It has been reported that currently the sub-secretariate of Port and Navigational is responsible for coordinating the development of port facilities on the national basis, classification of port functions of Argentina. It is essential that the government shall establish a responsible institution in the Ministry to conduct the following assignments and function for assisting the sub secretariate.

- to prepare nationwide port development plans and coordinate regional port development by assisting financial arrangement and technical supervision of infrastructure development
- to collect statistic data of sea transportation of all the ports in the nation and publish annually to the Ministry of Economy to plan and assess a current sea transport operational efficiency and identify the fields of port sales by port authority
- to establish the computerized network system to communicate necessary data of port activities traffic incomes/expenses on line from this institution to all the ports of authority control and responsible organization of the port operation in the provincial government.
- others like establishment of training institution for development of maritime.

(2) Coordination of agencies concerned for optimum utilization of existing facility

a. Aspects required coordination

The privatization of the port operation of Buenos Aires port have resulted in drastic changes in the port services in cost and operation system in efficiency.

The terminal operation are however under the following physical restrictions and constraints,

- shallow draft of the access channel, basins around the piers and along side berths,
- narrow width of the access channel and narrow basin in front of each berth

- limited land area for expansion due to city development towards the port,
- Stock yards areas provided to terminal operators as concession are not integrated in one unit of terminal area with berth for handling large volume of cargoes and container transferred, but scarcely available by the power plant facility, grain silo facilities and railway marshaling yards at the middle of the stock yard, and old branch office building of the maritime authority in the north and oil tanks and ship repair dock in the south,

Under such circumstances coping with increasing traffic specially containers, the government should provide the following assistance for utilizing the existing port facilities at the optimum level.

- to prepare coordinating land use plan of port and city areas at the Buenos Aires with city municipality and AGP, including review of the previous land use plan of the port area
- to prepare the updated and integrated plans with technical justified schemes for utilization of the remaining parts of the land available to the port operation services including railway yard among the concerned parties, city authority as early as possible before proceeding to the next stage of privatization program

b. Coordination with railway

For extension of distribution and collection of cargo, the effective utilization of the railway is essential. Argentina is fourth largest country in American continent with large network of railway already developed and should use frequently in transporting of cargo considering its present connection to inland industrial region from the ports and coastal areas.

The function of railway for further containerized transportation will play essential parts of the national containerization in faster and economical cargo movement.

The effective utilization of railway facilities are mutual benefits of all terminal operators for upgrading container handling capacity through the port. Such coordination with private companies, railway company and other agencies is considered essential for expansion of handling capacity of respective operators.

(3) Conducting nationwide containerization study

a. Background

Since Argentina have number of major ports which have been developed in long history for different function and characteristic requirement of regions such as exporting grain transported by railway between production area to ports, like Bahia Blanca,

Quequen and transshipment ports like Rosario, Santa Fe and city commercial port like Buenos Aires .

All of these strategic important ports began to receive number of containers, specially through the Buenos Aires port which very soon will fully saturate their handling capacity unless further physical development and measures are taken in short period.

The major ports of neighbor countries have started to develop the container terminals with deep draft and some of them have already modernized the water front facilities and handling equipment to accommodate the present panamax and post panamax type of container carriers (40 to 50,000 DWT with draft of 11 to 12 m) to compete to the global containerization movement with Asian countries and North America.

The consignors' objective are generally to minimize the land transport cost and deliver their cargoes to the nearer ports with adequate facilities to ensure faster and smooth deliver services of cargo. Thus, immediate physical development and institutional arrangement is needed to cope with the trend of containerization.

b. Objective and scope of the study

The above strategically important ports which have different advantages and disadvantages due to physical conditions for container transportation services should have necessary waterfront and land facilities to meet the future demand of container traffic.

Considering above circumstances of changing mode of cargo transport and demands of users for development of strategic ports it is recommended to conduct the "Nationwide Containerization Study" and to establish a master plan of a nationwide container terminals development consisting of the following aspects of study, but not limited.

- the container traffic demands in national scale for short and long term period
- the required function and services to the regions of respective strategic ports
- the regional industrial, agricultural and manufacturing development policies in the hinterland of the study ports and identify items of containerizable commodities
- selection of strategic container terminal ports considering phasing of development along with the Buenos Aires port
- the target of port service and operation efficiency level to be competitive with neighbor countries and trade partners countries
- the medium term development plan of container handling facility at the selected ports
- impacts to shipping and cargo volume, the current regional development of land transportation system such as a bridge construction between La Plata, Argentine and Colonia, Uruguay crossing the La Plata River, particularly to the Buenos Aires port

- prepare a grand master plan of integrated national transport networks relative to intermodal system
- prepare a time frame for development of Buenos Aires port considering the private sector participation in operation and development including financing
- comparison of economic cost / benefits between the capital and maintenance dredging cost of main channel to Buenos Aires for accommodating larger ships and cost / benefit by the development of a new port near the Buenos Aires
- the alternatives as long term development for expansion of the Buenos Aires port by development of artificial offshore port island near the Atlantic Ocean
- the environmental impacts by development of ports infrastructures

(4) Integrated Container Terminal Area Development for the Buenos Aires Port

As explain in the section 1.4.3 (1), the respective port administration in the world have developed their container terminal depending on the respective local conditions, to meet the demands of port users, and regional economic and industrial business field.

The container terminal at Buenos Aires port have just provided for commission. There are still some issues to be improved such as;

- Expanding the terminal areas
- Procurement of additional and larger type of gantry cranes
- Integrated cargo movement between the wharf and intermodal transport within the port area
- Satellite inland depot for stocking containers outside, but near the container terminal for smooth and quick handling of containers
- Improvement of supporting facilities of containers
- Deepening the depth alongside the wharf and access channel.

The terminal area would be developed based on the existing arrangement of port facilities, the following alternatives measures of infrastructures development at the Buenos Aires port would be considerable and feasible to improve container handling capacity for short and medium measures. (Refer to the Figure VII-1-5-1 indicating tentative example concept for further development of container terminal at port of Buenos Aires)

a. Reclamation around terminal 5 and 6, between these piers and area between piers and breakwater infront of them shall be developed to expand stock yard areas and extend berthing areas.

b. Relocation of existing railway marshaling yard behind the Terminal No.5 to form the integrated terminal area for container movement within the port to decongest the existing peripheral area of the port.

c. Procurement by respective terminal operators of additional handling cranes on quay and stock yard area.

d. The satellite inland depot for containers should be planned and develop jointly with railway and shipping cos. outside of the Buenos Aires city to have wider space of container movements by trucks within the port area.

(5) Introduction of port sales concept

a. Concept

The next stage of the port management is for the public sector to take an active move on port sales promotion to the port users by providing information and publications of the ports.

The concept of port sales will lead the direction of port services for the port management body to recognize the existing composition and condition of port facilities and to invite future expansion of business fields and subsequently necessary infrastructures development in this coming decade. The port will be able to encourage private investors who have a strong and growing desires of participation gradually into the port activities through frequent publication about the port facilities and available services as well as dissemination of updated port statistics.

When the credibility of port services are developed among port users, so will participation extend within and outside the region.

From the experiences of the Ports of Los Angeles, Long Beach in USA, the port administration should have concept and recognition that the development of port infrastructures and support facilities will activate not only the trades of export and import cargoes but more importantly the regional economic activities and industries and agricultures of the port hinterland.

The port shall equip and develop the facilities of communication center and cargo distribution center, the global business market chances by using ports facilities and services of equipment, hardware and software services would be able to provide not only the port users but to enterprises in surrounding cities and regions.

It is expected that such local enterprises can extend their business to foreign market and also obtain international informations for their participation.

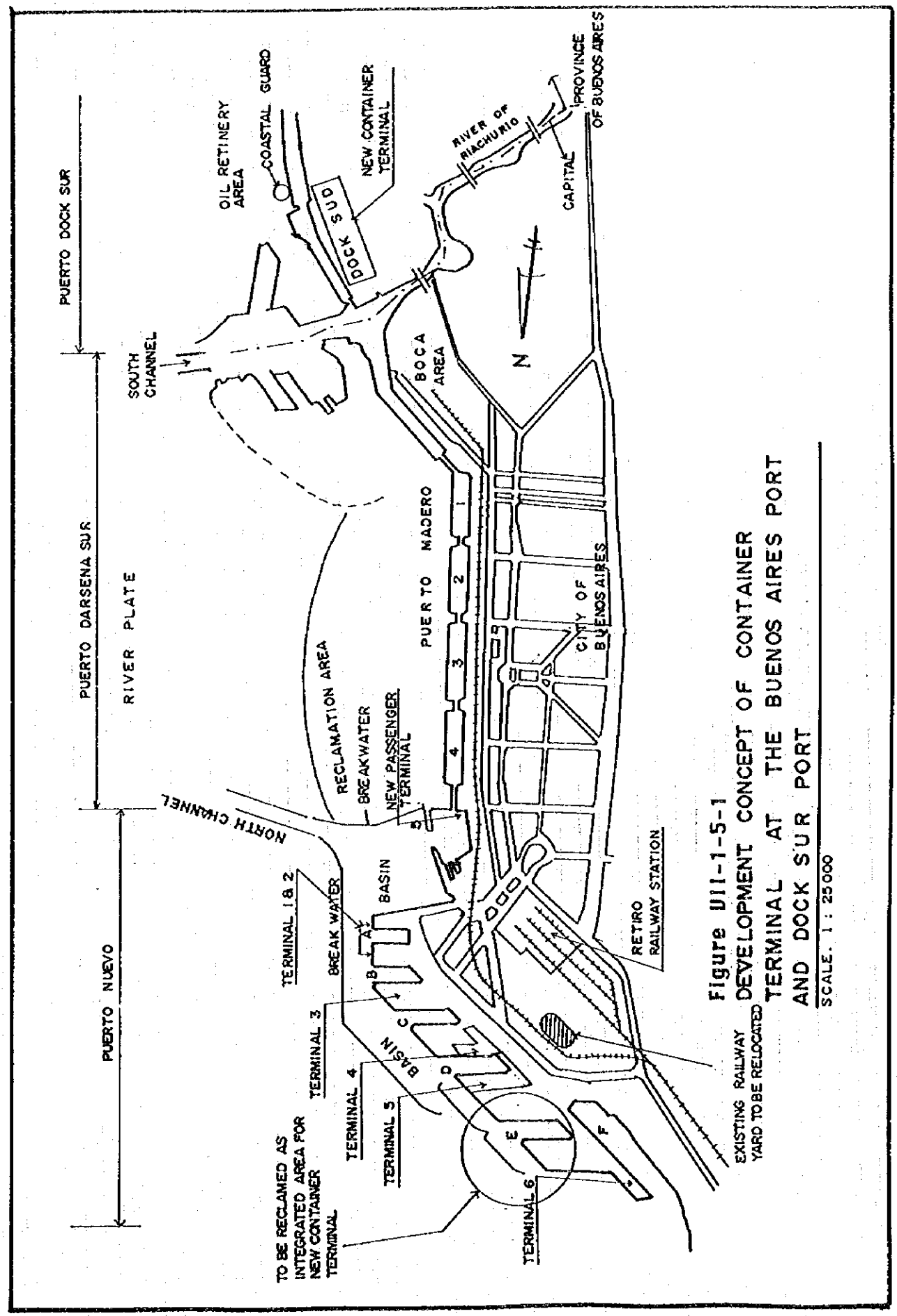

Figure VII-1-5-1 DEVELOPMENT CONCEPT OF CONTAINER TERMINAL AT THE BUENOS AIRES PORT AND DOCK SUR PORT

SCALE. 1 : 25000

b. Activities for port sales

One of the port sale's activities is to provide adequate information and publications of the ports statistic data of facilities, port services available to provide, traffic of ships and cargoes, to the port users. Such publications and statistic data will be useful for port administration to develop new clients of users and market research.

For this purpose the port authority shall guide the terminal operators to keep and maintain the standard operation service with better efficient handling equipment and keep their terminal clean and orders.

For the activities of the Port Sales the port authority shall establish a commercial department in their organization to promote the following business activities,

- The port authority shall always keep record of updated asset and liability data in order that the port authority can stimulate the private domestic and international investors efficiently and effectively
- The port authority shall coordinate among concerned sectors for collection and delivery of cargoes with the use of intermodal transport to/from the port.
- The port authority should visit port users more frequently and provide the necessary information of port facilities and operational services.
- The port authority shall establish a section in their administration to collect and compile statistic data of port users, trade partners, items and volume of export and import cargoes to identify the field of markets for their port sales.

c. Developing business fields of the port authority

From the experiences of the port authority of Rio de Janeiro and others, the port authority shall develop to establish the following institution:

- A new education center to train professional staffs, engineers, specialized technicians working in the national, provincial port and waterway transport.
- Institute for waterway research works with hydraulic research in Argentina, studying the sedimentation maintenance dredging strategy and provide the academic and consulting research investigation to the national ports and waterways.

(6) Improvement measures in technical aspects of Maritime Control

The Traffic Separation Scheme which consists of the following zones as shown on Figure VII-1-5-3 shall be introduced in the approach channel to Buenos Aires.

a. Traffic Separation Area; an area where traffic separation zone or deep water route is established
b. Traffic Separation Zone; An area which separates opposing streams of traffic by the use of separation zone and traffic lane

c. Traffic Lane; An area within defined limits in which one-way traffic is established

d. Separation Zone; A zone separating the traffic lanes in which ships are proceeding in opposite directions

(7) Development measures of information flow system

The computerized information flow system should be developed through the following phases.

a. Urgent requirement phase.

1) To set up a team responsible for all tasks regarding computer system development

2) To provide Term of Reference to assign the member of team and training to member of team for software programming.

3) The centralized personnel training is required. There are two kinds of trainees involved in the training, operating the system directly or in charge with the system' daily operation, and the training for personnel at each port level.
Follow-up training should also be provided for upgrading the programs.

4) To select and introduce codes for several major items of commodities and port data using ISO rule and enrich the staffs' experience in using coding system, then gradually extending the limit of coding system in accordance with up-graded skill of the staffs operating this computerized information flow system.

5) To define the content and structure of master files to be established as the system.

6) To select and decide on the computer hardware to be used by the team for system development and practical use at the head office of Buenos Aires port, other main port of authorities and provincial government port office.

b. Short term development phase

1) To develop sub-system and operate such system at the head office of the Buenos Aires and Sub-Secretariat of Port and Navigable waterways.

2) Installation of data communication between sub-secretariat office and each head office of Buenos Aires, Bahia Blanca, Quequen, Rosario and other port head office of the concerned provinces. (concept is shown on Figure VII-1-5-4).

3) To develop the Port Trade Information System as the initial stage for data interchanges among the ports of region, neighbor countries.

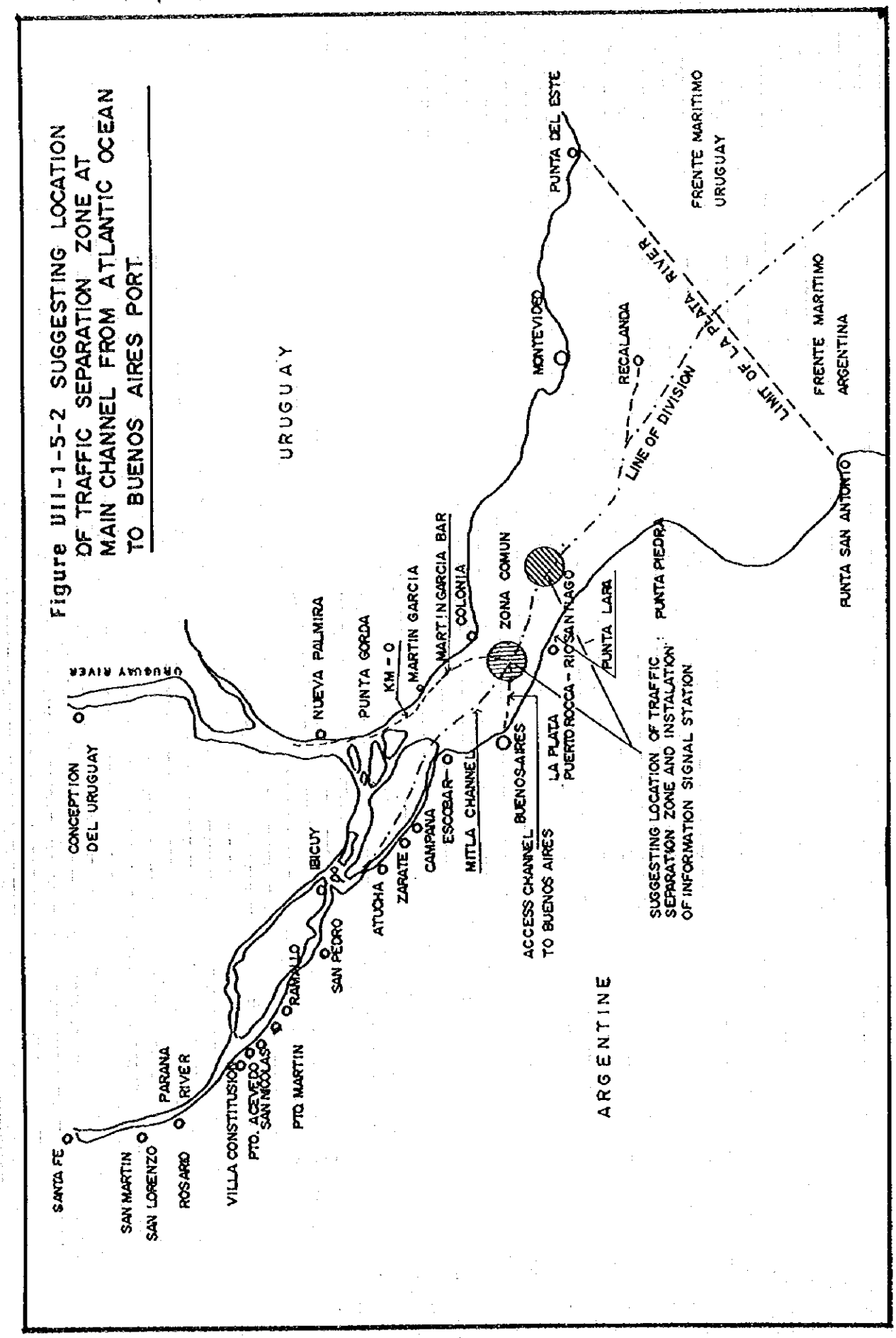

Figure VII-1-5-2 SUGGESTING LOCATION OF TRAFFIC SEPARATION ZONE AT MAIN CHANNEL FROM ATLANTIC OCEAN TO BUENOS AIRES PORT

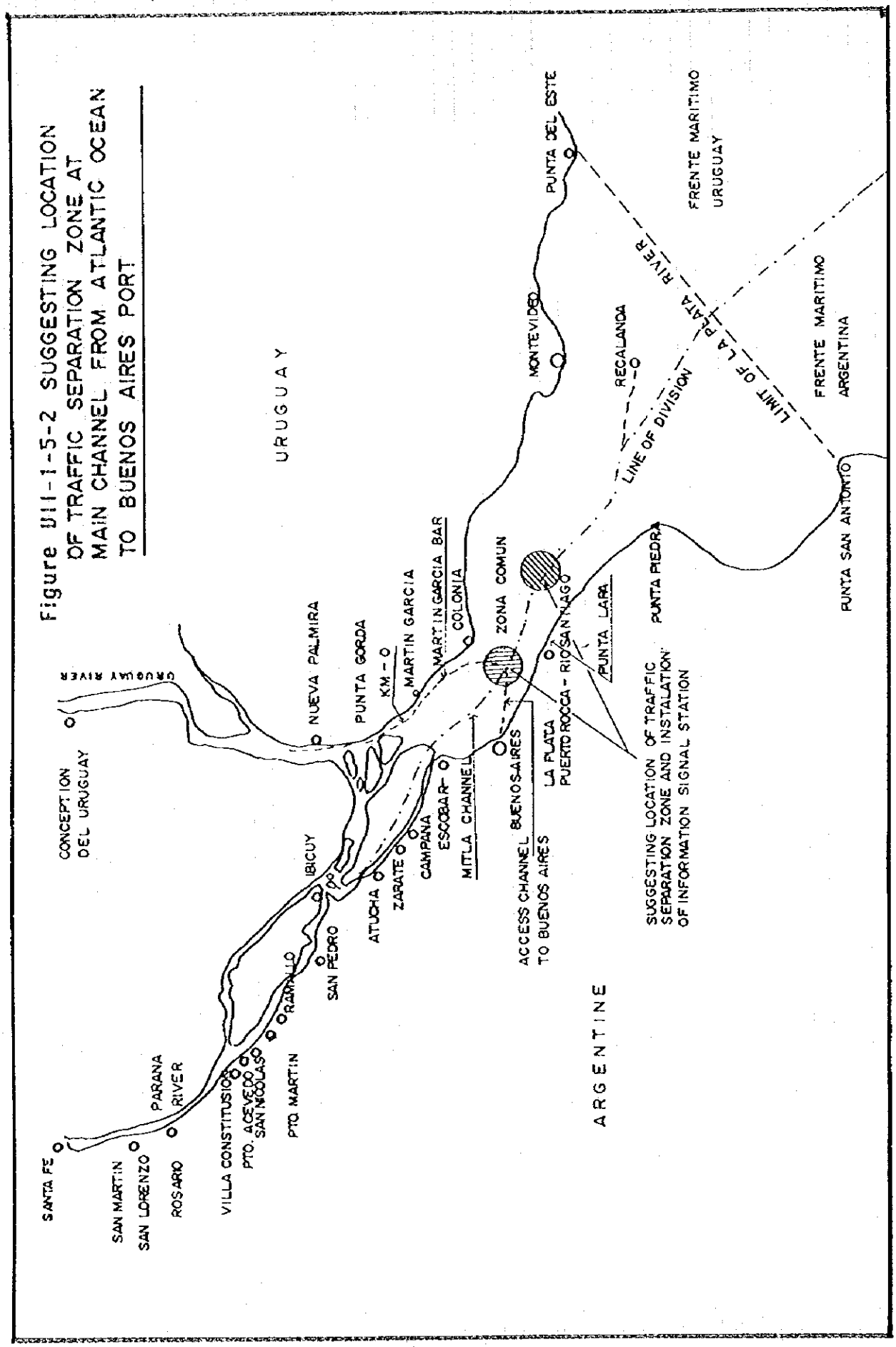

Figure VII-1-5-2 SUGGESTING LOCATION OF TRAFFIC SEPARATION ZONE AT MAIN CHANNEL FROM ATLANTIC OCEAN TO BUENOS AIRES PORT

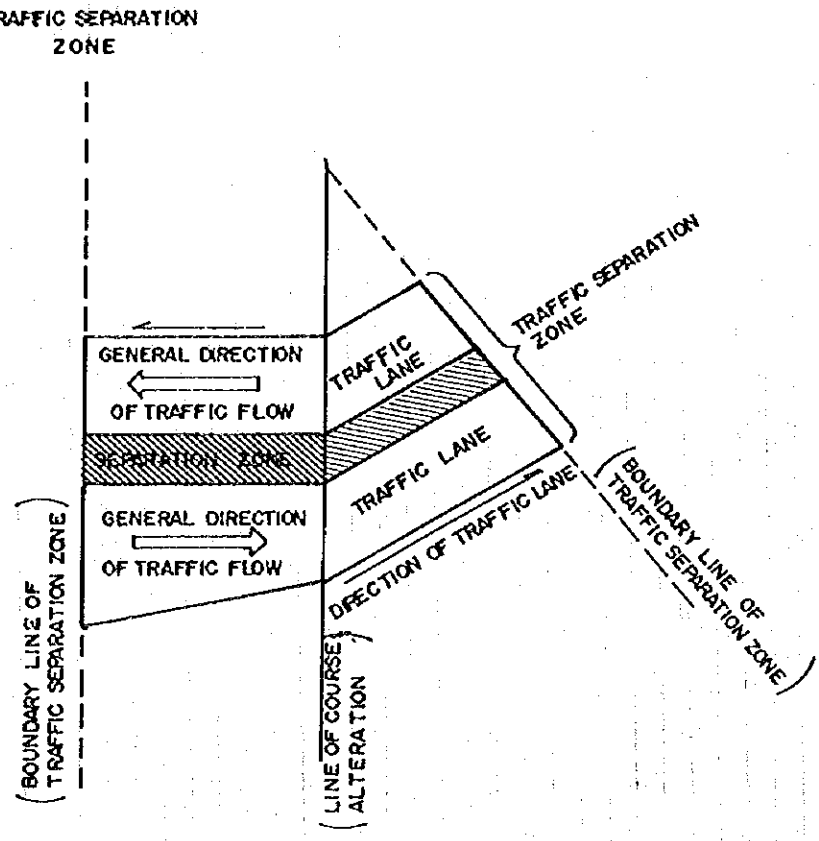

Figure VII-1-5-3
THE TRAFFIC SEPARATION AREA ILLUSTRATION

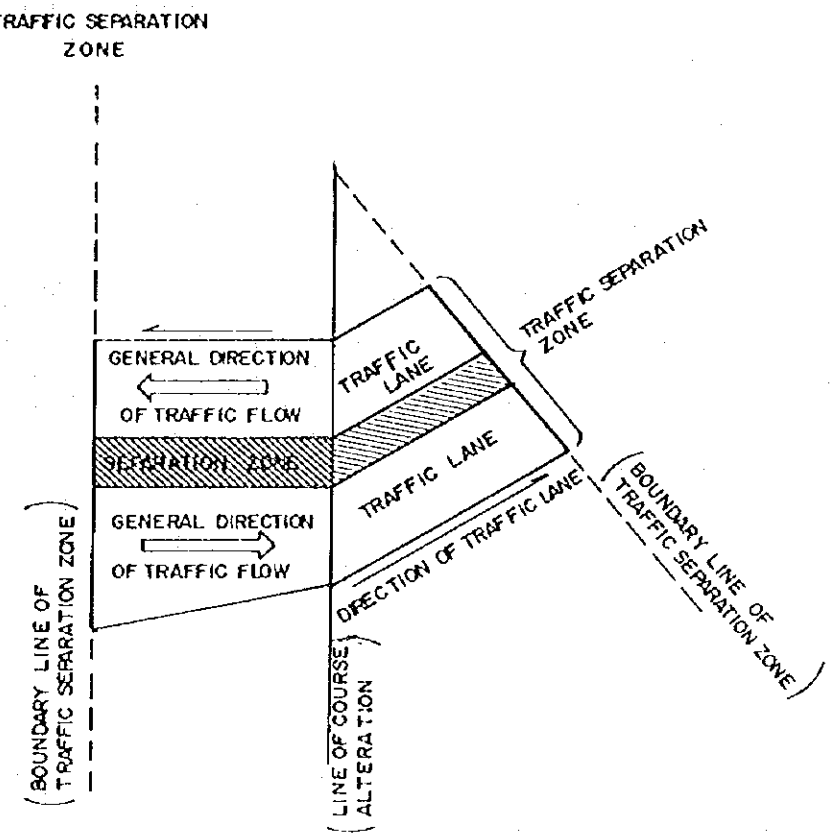

Figure VII-1-5-3
THE TRAFFIC SEPARATION AREA ILLUSTRATION

(8) Establishment of training institution for development of maritime resources

a. The establishment of training institution in order to provide the training of a new technology and equipment usages developed for maritime affairs such as computer operations for container data tracing and handling equipment operations.

b. From the experiences of the Port of Nagoya, the NCB recruit young workers from the professional school and provide trainings to them after few years experiences to catch up with the latest technology developed for the maritime under the supervisory from the port authority and container terminal safety society such as;

1) encourage the drivers, operators to obtain the operation licenses of large, special and heavy equipment operation
2) provide trainings and educations of safety operations to the labors working inside the ships
3) train workers to be qualified for operation of cargo handling equipment under the guideline of the Ministry of Labor, Government of Japan
4) provide factory safety training and education at the training institution for one year under the port and harbor public employment security office and on the job training (OJT) at the terminal
5) encourage crane operators to obtain the operation licenses of crane operation under the technical center of port cargo handling equipment.

c. Provision of a guidance and orientations of an environmental preventions to the ports of Argentina in cooperation with the Coast Guard office to port users, ships during sailing through the channel and berthing for cargo handling operation.

(9) Roles of port service between public and private sectors

The following aspects should be considered as the roles of public and private sectors for port services and operation.

a. Future roles of the Government may maintain the planning of economy and elaborate a coordination policy based on the cooperation of the regional economic and political sectors. The government shall develop the future profile of the central port authority in accordance to the two concepts, Autonomous ports, Port Authority system as introduced in USA, Singapore, South Africa, and Provincial/Municipal controlled ports system as introduced in Japan.
The government shall also reinforce the further decentralization, deregulation and privatization of the ports operation by private management with the contract basis.

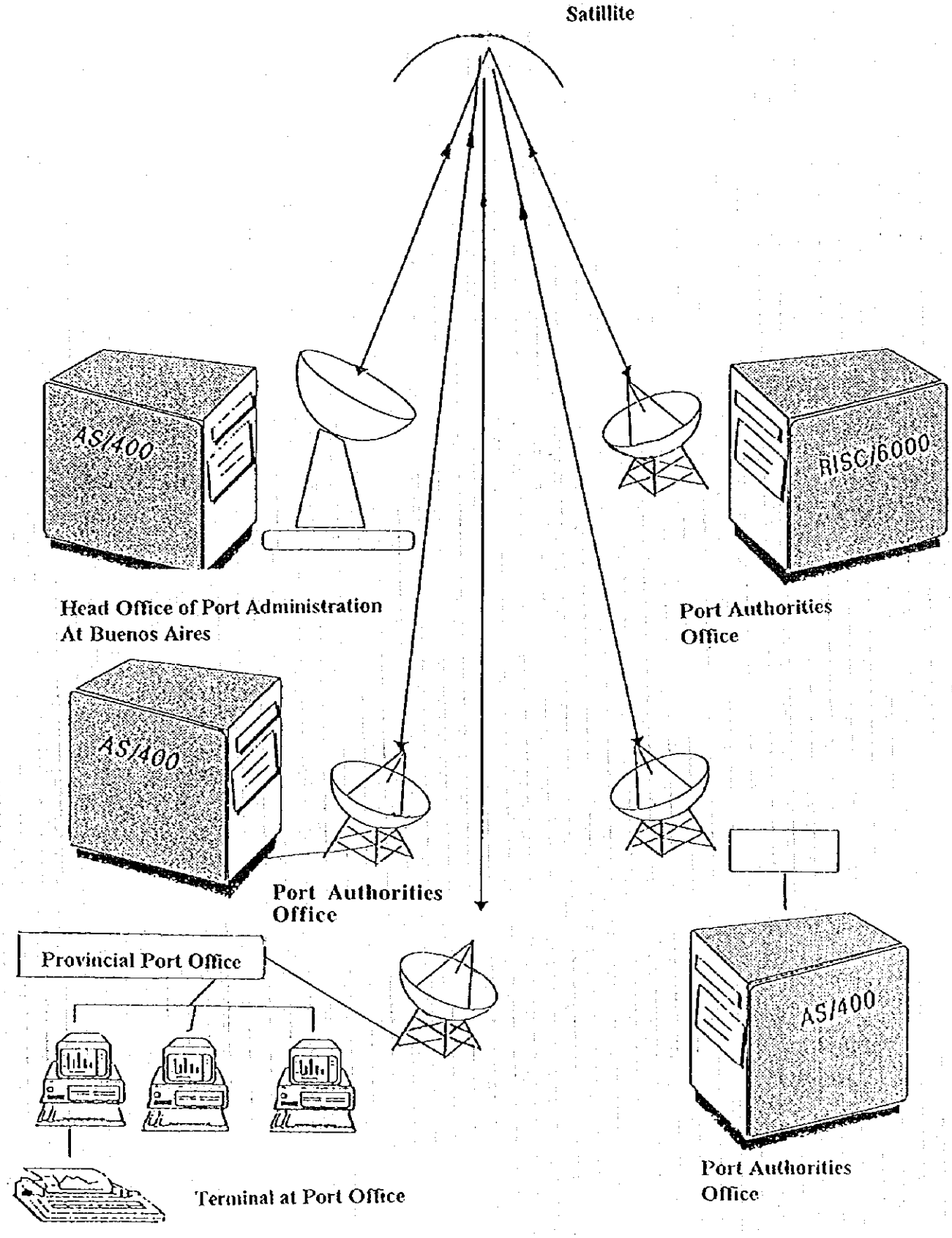

Figure VII-1-5-4 CONCEPT OF INFORMATION FLOW SYSTEM

b. The government shall prepare a master plan of integrated nation transportation networks system to identify the role and business fields of private sectors investment and participation and the government functions by each sector of transport based on demands and characteristic services of transports in the regions.
For example, the development of heavy traffic routes in highway road or railway lines or ports facilities to carry cargo or passengers should be opened to be operated and managed by private sector investment. Transport facilities such as roads, land transport, railway lines and ports which are essential mean of communications in isolated and remote areas should be managed by the government.

c. The government should collect statistic data of transport of each sector. Such statistic data will assist planners to identify the fields of private and public sectors to participate and will stimulate the private investors as business for the public transportation and communication services.

1.5.2 Long Term Measures

(1) Upgrading quality of port services as the third generation port

The UNCTAD published the port development stage and classified three generations depending on the quality of the port services and function based on the demands of traffic from port users, municipality and, provincial government.

The port of Buenos Aires and other major ports of Argentina have been the transshipment points of cargo for export and import trade corridors defined as second generation level of port services.

The required function and services to the ports in Argentina will be changed with fast and efficient global communication network.

In order to cope with the mode of transport of containerized cargo transport and upgrading port services to third generation it is essential that the port of Buenos Aires shall develop the effective land transportation network, specially railway system, not only to develop the port infrastructures by deepening the channel, alongside berths and by constructing deeper draft berths.

The port activities which shall be upgraded the quantities to the third generation level are also required to cooperate and co-exist with city economic and social activities

like to have a conventional centers, hotels and accommodation facilities, business centers, shopping centers, and water front recreational center for people in the port area.

Argentina should have such port that can provide multipurpose services and function for the third generation level of the port services and operational efficiency as a hub port to the region.

(2) Development of secondary ports to Buenos Aires port and deep draft sea port

Since the project implementation will take in general 4-5 years to complete the planned facilities, but the demands of cargo would increase faster than expected. Therefore while the port of Buenos Aires can handle around 1.2 million of container, the port shall as soon as develop necessary stock areas and berthing length to cope with the further increasing container traffic. Such new facilities shall be already completed before saturation of the existing facilities.

a. Potential for development of new container terminal at supplemental ports

Considering the physical constraints of the port of Buenos Aires the present arrangement will be saturated around 2005 and therefore further development for deeper draft port is required in short period to accommodate third generation size container ships.

The government shall assist and plan to develop the container terminal as supplemental to the Buenos Aires container terminal at the following ports, which are geographically located at the strategic core transshipment points in the region and neighbor countries and have played important roles for transshipment of cargo for national economic development. Since these ports have large hinterland of export industry products, manufacturing goods and grains, it will require the sea ports to handle containerized cargo.

1) Bahia Blanca Port,
2) Quequen Port, and
3) Rosario Port

These port have already received strong demands for container terminal development from their regional communities and port users. They have necessary land area for such container terminal development and the development plan thereof have been prepared. They have a good access of intermodal transportation to connect the hinterland and port.

b. Development of deep draft sea port in longer term

It is obviously presumed that business served by the port particularly Buenos Aires port have a total economic impacts of more than billion US dollar to national economy and the port operation directly contribute more than million US dollar to the city of Buenos Aires each year.

The ports shall generally function as an economic engine around which the people depend their collective future. The port shall be the energy center for the city and region. The Buenos Aires port not only services Argentine importers and exporters, but it is a gateway for trade with the world and between the neighbor countries through its intermodal connections. Considering such aspects, the government shall plan to develop the deep draft sea port by artificial man-made off shore island type near the Atlantic coast area and near the Buenos Aires for integrating the grain and container handling in the long term development and further expansion of port facilities of the port of Buenos Aires Port for containers transportation.

(3) Long term development of Information Flow System

The computerized system development should be proceeded for the following development in the long term plan.

a. To establishment communication method to all ports including non-commercial, private ports.

b. To develop the extension of Port Trade Information System.

Chapter 2
Development of Trunk Routes Between Argentina and Brazil/Chile

2.1 Introduction

The sub-issue on "the Development of Trunk Routes between Argentina and Brazil/Chile" is essential to support industrial development and trade promotion in Argentina, which require more concerted development efforts of Mercosur member countries and Chile in order to materialize the best results of economic integration in southern South America.

On the present issue, the study assesses requirements for transport infrastructure improvements and better transport services, and analyses various transport development issues associated with the trunk routes development. The development of Argentina - Brazil/Chile trunk routes will realize trans-continental corridors connecting Mercosur countries along them and oceans of both the Atlantic and the Pacific. They will open up new economic opportunities for countries and regions along those routes. The study refers to the experiences of coordinated transport systems improvements in the European Union, which has devised the Common Transport Policy, eased cross-border controls and promoted cabotage operations and developed common land transport networks. They will be good precedents to prepare the common transport policy for Mercosur countries.

The present Chapter deals an issue of transport connection with Chile. Presently, the traffic volume between Argentine and Chile is still small but steadily increasing. Although Chile is not yet a member of Mercosur, the Study Team considers the country as a geographically and economically unseparable part of the transport integration in the region. Particularly, South America and East Asia are considered and expected to become global growth poles over the turn of century and to lead the economic growth in the world. Therefore, the direct link of two growth poles by the shortest route has tremendous global economic impacts and has a stimulus to the other regions of the world.

The possibility of handling export and import cargoes of Argentina and other South American countries through Chilean ports will certainly accelerate the further development of Chilean economy. It is evident from the example of port-based economic growth of Singapore. The access to Mercosur market through land transport routes and the potential use of port facilities at the Atlantic coast for Chilean shipper will also promote the new economic potentials for Chile and countries and regions along the corridors connecting the Pacific and the Atlantic.

2.2 Current Situation of Transport Networks Connecting Argentina and Brazil/Chile

2.2.1 Existing State of Trunk Routes in Argentina

Argentina has historically relied its source of wealth upon the export of agricultural products such as wheat, soy beans and beef, which are mainly produced in the area called the Humid Pampa (Pampa Humeda) extending within the radius of about 600 km from the capital city of Buenos Aires. Those export agricultural products were transported to Buenos Aires, ports along the Parana and La Plata rivers such as Rosario, Santa Fe, etc., and ports along the Atlantic coast such as Bahia Blanca and Quequen, and exported directly to the European markets from those ports. All other regions of Argentina also connected to Buenos Aires and other major ports. In this process of Argentine economic development, there were not any substantial regional economic linkage with other neighboring countries such as Brazil and Chile.

This economic and historical situation had inevitably afffected to the formation of present Argentine inland transport network of rail, road and river transport, which are characterized by a typical radial network converging to and extending from Buenos Aires. Since the other major cities of Argentina such as Rosario, Cordoba, Mendoza, Tucuman and Bahia Blanca are all directly connected to the capital city and commercial center of Buenos Aires, all major trunk routes are also established along this radial network.

(1) Rail Transport Systems

The railway systems of Argentina has been developed since the middle of 19th century for the transportation of agricultural products from producing areas of the Humid Pampa to Buenos Aires and other ports along the Parana and La Plata rivers and the Atlantic coast. At the peak of its operation, the operating kirometerage of rail network reached to 44,000 km, which is now reduced to about 33,000 km but keeps a typical radial network from Buenos Aires as is exhibited in the Figure VII-2-2-1.

The rail network was formerly owned and operated by the government since 1948, in which year the government purchased five private railway companies other than Belgrano line which was a public railway. Ferrocarriles Argentinos (FA), created by Law number 18360, had the monopoly in rail transport service, and operate a rail network of about 35,000 km of track length with three different gauges on six railway lines:

Narrow gauge	(1,000 mm)	Belgrano line
Standard gauge	(1,435 mm)	Urquiza line


BOLIVIA
PARAGUAY
BRASIL
CHILE
URUGUAY
LA QUIACA
JUJUY
SALTA
TUCUMAN
FORMOSA
RESISTENCIA
CORRIENTES
POSADAS
SGO. DEL ESTERO
SOYA
PASO DE LOS LIBRES
CONCORDIA
SAN JUAN
CORDOBA
SANTA FE
C. DEL URUGUAY
MENDOZA
SAN LUIS
ROSARIO
BUENOS AIRES
MALARGUE
SANTA ROSA
OLAVARRIA
MAR DEL PLATA
NEUQUEN
ZAPALA
BAHIA BLANCA
C. DE PATAGONES
VIEDMA
S.C. DE BARILOCHE
ING. JACOBACCI
ESQUEL
COL. SARMIENTO
COMODORO RIVADAVIA
COL. LAS HERAS
PUERTO DESEADO
RIO GALLEGOS
Figure VII–2–2–1
Argentine Railway Network
FERROCARRIL BELGRANO S.A.
BUENOS AIRES AL PACIFICO S.A.
FERROCARRIL MESOPOTAMICO S.A.
FERROCARRILES METROPOLITANOS
FERROEXPRESO PAMPEANO S.A.
FERROSUR ROCA S.A.
NUEVO CENTRAL ARGENTINO S.A.
PCIA. DE BUENOS AIRES
PCIA. DE CHUBUT
PCIA. DE CORDOBA
PCIA. DE JUJUY
PCIA. DE MENDOZA
PCIA. DE RIO NEGRO
PCIA. DE SALTA
PCIA. DE SANTA CRUZ
SIN SERVICIO
CLAUSURADO
ANTARTIDA ARGENTINA
C.N.T.F. (GS.Map.01)

Broad gauge (1,676 mm) Mitre, San Martin, Roca and Sarmiento lines

The railway transportation volume reached its peak in 1959 and had been declining since 1960's. The operational deficit reached a peak of 845 million dollars in 1988. The freight traffic fell from 15,000 million ton-km in 1970 to under 7,500 million ton-km in 1990.

As a result of the crisis in the whole Corporations of public services, the Government initiated and the Congress passed a new Law in 1989; Law number 23696 "State Reform Law". This became the beginning of the entire privatization process for those public Corporations. This is also the start of FA's privatization process through the concession, in which the main assets remain under the FA's property. A presidential decree number 666/89 set the first step on railway concession. It assumes the concessionaires to take the duty of infrastructure maintenance and of providing public transport services and private railway operation.

Concerning the freight services, five cargo concessions completed their bidding processes between 1991 and 1993 over standard and broad gauge lines. The bidding process of Belgrano line did not succeed, because of its poor track and rolling stock conditions. The Government segregated Belgrano line from FA (Decree number 1774/93), aiming at a reorganization and additional investment for improvements before beginning a new bidding process. The outline of those five concessionaires for freight services and Belgrano line is summarized in Table VII-2-2-1.

(2) Roads and Road Transport Systems

Roads in Argentina are extensively developed all over the country and link to a limited extent to the networks of neighboring countries through border passes as is exhibited in Figure VII-2-2-2. The network is basically the combination of diagonal routes focusing to Buenos Aires and north-south and east-west routes inter-linking the diagonal routes like a lattice. However, it must be pointed out that the lack of statistical information in domestic transport and that of systematic data collection in international transport are the major constraints for the analyses. Faced on this restriction, the international road transport data are fragmentarily collected and arranged from various sources by the collaboration of Ms. Carmen Polo, one of the most renowned road transport expert in the country, in order to get an orderly and comprehensive profile of the situation of the sector.

Table VII-2-2-1 Argentine Rail Freight Transport Companies

Rail Companies	Ferroexpreso Pampeano (FEPSA)	Nuevo Central Argentina (NCA)	Buenos Aires al Pacifico (BAP)	Ferrosur Roca	Ferrocarril Mesopotamico General Urquiza	Ferrocarril General Belgrano
Former FA lines	Roca and Sarmiento	Mitre	San Martin parts of Sarmiento	Roca	Urquiza	Belgrano
Location /Region	Rosario - Bahia Blanca Corridor. Area of Province of Buenos Aires	Buenos Aires–Rosario –Cordoba–Tucuman	Buenos Aires–Mendoza –San Juan	Buenos Aires–Bahia Blanca–Zapala	Buenos Aires north to borders and connections with Brazil, Urguay, Paraguay	Buenos Aires to far north and north west. Connections with Bolivia and Chile
Freight Carried	Grain, By-products, Stones, Vegitable oil	Grain, By-products, Vegetable oil	Grain, Stones, Coal, Crude oil, Wine	Stones, Cement, Chemical products, Grain	Grain, Stones, Wood, Containers	Oil, Minerals, Sugar, Grain, Cement, Stones, Vegetable oil
Start-up	Nov 1. 1991	Dec 22. 1992	Aug 26. 1993	Mar 12. 1993	Oct 22. 1993	It operates as a corporation since Oct 1993, not yet transfered to the private sector.
Items						
Track length	5.064 km	4,511 km	5,479 km	3,343 km	2,751 km	10,340 km (Total) 5,700 km (Trunk net)
Headquarter	Bahia Blanca (Bs.As.)	Rosario (Santa Fe)	Mendoza	Olavarria (Bs.As.)	Buenos Aires	Buenos Aires
No. of Staff*	567	866	1,063	836	540	1,450
Concession	30 Years	30 Years	30 Years	30 Years	30 Years	
Gauge	Broad gauge	Broad gauge	Broad gauge	Broad gauge	Standard gauge	Narrow gauge
Technical Advisor	Iowa Interstate (USA)	Anacosta & Pacific, Montana rail Link, RBC Associates (USA)	Railroad Development Corp., Conrail (USA)	Canac (Canada)	Railroad Development Corp..Conrail (USA)	

Note: (*) as of December 1994
Source: G.E. Mardaras

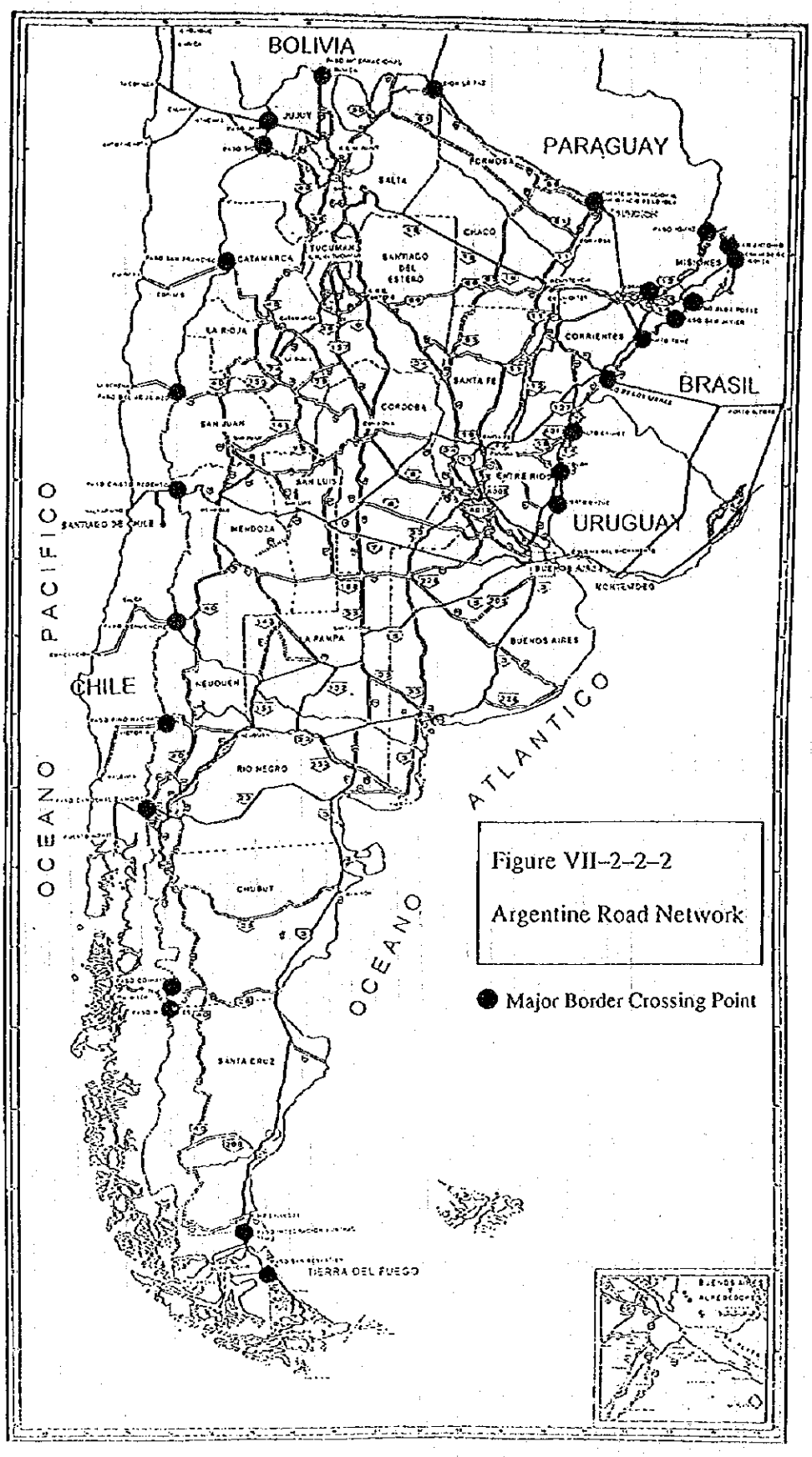

Figure VII–2–2–2

Argentine Road Network

● Major Border Crossing Point

The national and provincial road networks in the country were generally in critical condition by the end of 1980's because of the lack of maintenance caused by the deterioration of national economy, and only 25 % of the national network was said to be in good condition. The provincial roads were in similar or less favorable situation. Furthermore, other problems include the insufficient capacities of access roads to the Federal Capital and provincial capital cities, port access and international crossings.

Faced in this situation, the Government took the policy of private sector participation in the financing and management of the road network. The "Public Works Concession Law" was modified in 1989 and the clause of :

> "job concessions can be granted for the operation, administration, repairs, expansion, preservation or maintenance of existing works, in order to obtain funds for the construction or preservation of others which are physically, technically or in other ways connected with the first one",

was included. This amendment of regulation forsees the concession by toll system of road works related to the repair and maintenance of the primary national road network to the private sector. Concerning the repair and maintenance of low traffic routes, the concessionaire could receive certain periodic payments from the Road Authority in stead of applying toll system.

At the same time, redefinition of responsibilities between the Nation and Provinces was made. The role of the National Road Authority was defined that it remains as planning and coordination agency. The Provinces are in charge of the management of works and network control, although the main domestic network as well as international connection and access roads to export ports shall remain under the control of the National Road Authority. The transfer of certain road sections between the Nation and Provinces was also made.

For the road transport sector until 1991, domestic cargo transport and international cargo transport were operated under different systems. For international transport, a regulated system ruled and the share of the fleet was determined by the government. On the other hand, domestic cargo transport had developed in a virtual lack of regulations and control by the government, with no restriction for the entrance to the business, no regulation on traffic and tariffs and little control as regards safety.

As from October 1991, the system of hold allocations by flag in the international cargo transport between Argentina, Brazil and Chile was eliminated. For Paraguay and Uruguay, existing allocations remained. This was an action for a previous step to the liberalization being discussed among countries forming Mercosur. In 1994, due to

expansion of trade, further improvement to grant occasional or temporary licenses for either single trip, for 30, 90 or 120 days was made.

As regards domestic cargo transport, the "economic Deregulation Decree" (2284/91) reaffirmed and established the rule of free contracting of transport services. The Decree 1494/92 confirmed that cargo transport is not considered as a public service.

In 1992, measures to reduce cargo transport costs including the elimination of tax on the first sale of vehicles and the reduction of taxes and fees on tyres were introduced. The import of vehicles by allocations, which are established yearly and fixed as 1,000 units for 1992 and 1993 and 3,400 for 1995, and import liberalization for equipment of higher power than manufactured in the country followed. At the same time, control and safety measures were introduced. The technical control of vehicle became obligatory as well as a psychophysical test for drivers, and maximum allowance age for cargo vehicles is determined as 10 years for dangerous cargo transporting vehicles and 20 years for others.

By the introduction of above-mentioned policies of deregulation, following effects were observed:

1) Reduction in freight charges in international transport in the order of 15-20 % tariff reduction in traffic between Argentina and Brazil and 15 % in traffic between Argentina and Chile;
2) Decrease in the share of the Argentine fleet in the international cargo transport;
3) Decrease in local freight in some routes and products where railways started to have a greater share; and
4) More powerful and modern fleet entered the market by the introduction of import allocation system and local production by car industry.

Although many improvements in the road transport industry have been made in recent years, it can be pointed out that the government's position to international transport in competition with other flags would be clarified considering the development of Mercosur market in coming yeas and the formulation of Cargo Transport and Multimodal Transport Law is awaited for formalizing the sector.

(3) Inland Waterways

Inland waterways of the Parana and La Plata rivers are important means of transport not only for Argentina but also for countries united by River Plata Basin (Cuenca del Plata) including Argentina, Bolivia, Brazil, Paraguay and Uruguay. The

treaty for the development of River Plata Basin has been in force since 1970, but it did not work until 1987, in which it was revitalized and decided to study the improvement of the navigable conditions of the Paraguay and Parana rivers so as to promote trade among the countries in the Basin.

The inter-governmental committee (CIH) of the Hidrovia Paraguay-Parana was set up in June 1992 and the "Agreement for Fluvial Transport" was already ratified by concerned governments by February 1995. The CIH is the political organ of governing Hidrovia and has functions:

1) to make decisions necessary for the government of Hidrovia;
2) to supervise the operation of Hidrovia;
3) to command the execution of studies, to approve the reports prepared by the Agreement Commission (Comision del Acuerdo), the technical organ of the Agreement, and to develop the cartographic plan for the Hidrovia;
4) to approve and modify the regulations; and
5) to suggest to the governments of member countries for necessary modifications of the "Agreement for Fluvial Transport".

The present situation of the Paraguay-Parana rivers is a lack of maintenance of waterways and that of modernization of facilities and, therefore, underutilization of the potential capacities of the waterways is evident. Although the framework for the development of Hidrovia was prepared as mentioned above, few steps have so far been taken to effectively enforce the provisions of the Agreement. The Agreement Commission has not yet been set up. Since all member countries of Mercosur and Bolivia are linked by the Hidrovia Paraguay-Parana, the demand for transporting cargoes through the Hidrovia will substantially increase in the coming future in accordance with the deepening of inter-links of economies among Mercosur member countries.

2.2.2 International Cargo Movement Between Argentina and Brazil/Chile

(1) Argentine Foreign Trade with Brazil/Chile

Before analyzing the international cargo movement between Argentina and Brazil/Chile, and between Argentina and Asia, it will be appropriate to overview the recent Argentine trade from the aspect of its regional composition. As is exhibited in Table VII-2-2-2, Argentina is dependent on South and North American market; 57.0 % of export market in 1994 and 55.0 % of import in the same year. Particularly, the trade with the Mercosur partner, Brazil, counts a quarter of total export and one fifth of total

import. The trade with Chile seems not to have realized its potential yet; only 6.3 % of export and 3.8 % of import are directed to Chile in 1994.

Table VII-2-2-2 Argentine Export and Import by Continent

Destination	Export				Import			
	1993		1994		1993		1994	
	000tons	%	000tons	%	000tons	%	000tons	%
Africa	1,673	4.1	1,710	3.7	572	4.1	1,023	5.9
America	20,165	49.4	26,585	57.0	11,288	80.7	12,612	73.3
Brazil	10,333	25.3	12,360	26.5	6,396	45.7	7,543	43.8
Chile	1,473	3.6	4,555	9.8	511	3.7	705	4.1
USA	2,110	5.2	3,136	6.7	1,644	11.8	1,898	11.0
Asia	5,361	13.1	5,238	11.2	381	2.7	578	3.4
Japan	1,745	4.3	1,244	2.7	60	0.4	67	0.4
China	417	1.0	323	0.7	68	0.5	77	0.4
Europe	13,456	33.0	13,073	28.0	1,451	10.4	2,589	15.0
Oceania	138	0.3	71	0.2	293	2.1	410	2.4
Total	40,795	100.0	46,678	100.0	13,985	100.0	17,212	100.0

Destination	1993		1994		1993		1994	
	mil US$	%	mil US$	%	mil US$	%	mil US$	%
Africa	404	3.1	541	3.4	134	0.8	190	0.9
America	6,929	52.8	9,027	57.0	9,564	57.0	11,874	55.0
Brazil	2,814	21.5	3,655	23.1	3,570	21.3	4,286	19.9
Chile	592	4.5	999	6.3	706	4.2	831	3.8
USA	1,264	9.6	1,724	10.9	3,813	22.7	4,894	22.7
Asia	1,665	12.7	2,037	12.9	2,354	14.0	2,570	11.9
Japan	467	3.6	445	2.8	669	4.0	620	2.9
China	163	1.2	225	1.4	215	1.3	217	1.0
Europe	4,052	30.9	4,175	26.4	4,636	27.6	6,861	31.8
Oceania	68	0.5	59	0.4	95	0.6	95	0.4
Total	13,118	100.0	15,839	100.0	16,783	100.0	21,590	100.0

Source: INDEC, Comerci Exterior Argentino, 1994

In volume term, recent increase of volume of land transport is reflected in figures of trade with Brazil, which counts 12.4 million tons of export and 7.5 million tons of imports. The volume of trade with Chile is still low in comparison with that of Brazil; 4.6 million tons of export and 0.7 million tons of import, reflecting the factor of both countries' similar export products pattern and physical constraints of transporting cargoes through high mountains and severe meteorological conditions in southern sea route.

The trade with Asia has reached more than 10 % in export and import, but much lower than Argentine traditional markets of South and North America and Europe. In volume-wise, Asia total counts 5.2 million tons of export in 1994 and only 0.6 million tons of imports in the same year.

(2) Mode of Transport

In 1993, 89 % of Argentine foreign trade in tonnage are handled by marine transport, followed by road transport with 9 %. The share of road transport has been glowing in the last five years due to increase in trade with Brazil . In value term, the share of road transport is 22 % in 1993, which means that valuable goods are transported by road rather than by ship (Table VII-2-2-3).

Table VII-2-2-3 Export and Import by Means of Transport

Means of Transport	1989		1990		1991		1992		1993	
	000ton	%	000ton	%	000ton	%	000ton	%	000ton	%
Ship	33,036	89.4	42,593	90.4	43,709	89.5	50,696	89.9	48,688	89.2
Truck	1,963	5.3	2,156	4.6	3,047	6.2	4,341	7.7	4,934	9.0
Rail	228	0.6	268	0.6	219	0.4	194	0.3	177	0.3
Plane	39	0.1	41	0.0	66	0.1	114	0.2	116	0.2
Pipeline	1,668	4.5	2,065	4.4	1,821	3.7	1,074	1.9	660	1.2
Total	36,934	100.0	47,123	100.0	48,862	100.0	56,419	100.0	54,575	100.0

	mil US$	%	mil US$	%	mil US$	%	mil US$	%	mil US$	%
Ship	10,360	75.3	12,586	76.9	14,236	70.4	17,971	66.5	19,012	63.7
Truck	1,907	13.9	2,222	13.6	3,420	16.9	5,448	20.1	6,563	22.0
Rail	125	0.9	126	0.8	124	0.6	146	0.5	132	0.4
Plane	1,151	8.4	1,156	7.1	2,143	10.6	3,366	12.5	4,041	13.5
Pipeline	208	1.5	284	1.7	287	1.4	113	0.4	98	0.3
Total	13,754	100.0	16,374	100.0	20,210	100.0	27,044	100.0	29,846	100.0

Source: INDEC

The share of rail transport is minimal since there is only a limited rail links with neighboring countries: Paso de los Libres-Uruguayana link with Brazil, Posadas-Encarnacion link with Paraguay, Paso de Socompa link with Chile and La Quiaca link with Bolivia. The most important link with Brazil, Paso de los Libres-Uruguayana link, requires the transshipment of cargoes at the border because gauge of Ferrocarril Mesopotamico is standard (1,435 mm) while that of RFFSA (Brazilian National Railway) is narrow (1,000 mm). The fact that another important pass of Cristo Redentor with Chile is not linked by rail is also a reason of low share of railway.

(3) Existing Cargo Transport between Argentina and Brazil

The most important mode of land transport for external trade between Argentina and Brazil is road transport. In fact, cargoes transported by road between Argentina and Brazil have been rapidly increasing as is shown in Table VII-2-2-4. Particularly, the Argentine export to Brazil since 1993 and import from Brazil since 1991 have resulted quite sharp increase of trade volume keeping pace with the formation of Mercosur.

Table VII-2-2-4 Argentine-Brazil Trade by Means of Road Transport

(unit: '000 tons)

Year	Direction	
	Argentina/Brazil	Brazil/Argentina
1983	254.7	209.7
1984	217.4	274.3
1985	234.7	250.9
1986	244.8	344.6
1987	287.4	314.1
1988	281.7	353.6
1989	506.9	320.2
1990	593.8	280.9
1991	569.8	780.1
1992	537.9	1,472.4
1993	867.0	1,380.2
1994	1329.2*	991.2**

Note: * first 9 months
** first 8 months
Source: Carmen Polo, Road Transport Study, Oct. 1995

The main routes used for trade with Brazil is Paso de los Libres- Uruguayana, which counts 61 % in volume and 84 % in value in 1993, followed by Foz do Iguazu which counts 29 % in volume and 12 % in value in the same year (Table VII-2-2-5). This situation of concentration in trucks to Paso de los Libres - Uruguayana route is expected to change after the completion of Santo Tome - Sao Borja bridge construction project.

Cargoes transported by truck between Argentina and Brazil are exhibited in Table VII-2-2-6. Cargoes of Argentina-Brazil direction transported by truck are mostly agricultural products including vegetables, fruits, fish, meat and diary products. The cargoes of opposite direction are chemical and petrochemical products, paper, and coffee and cocoa. Vehicles and car parts are transported for both direction. Origin and destination of those cargoes depend region of production of them as are shown in the Table. In Brazil, Sao Paulo and three southern States, i.e. Parana, Santa Catarina and Rio Grande do Sul, seem to be dominant. In Argentina, it depends on the production area. Cargoes transported by rail are mainly containers and sugar for Argentina-Brazil direction, and container, rice and soy beans for opposite direction (c.f. Table VII-2-2-11).

Table VII-2-2-5 Cargo Movement Through Argentina -- Brazil Border Passes

Border Point	State (Brazil)	1993		Jan/Sep 1994	
		000 tons	%	000 tons	%
Uruguayana	Rio Grande do Sul	663.3	61.0	739.5	48.4
Foz do Iguacu	Parana	319.3	29.3	606.6	39.7
Porto Xavier	Rio Grande do Sul	29.0	2.7	88.5	5.8
Sao Borja	Rio Grande do Sul	23.6	2.2	23.0	1.5
Dionisio Corqueira	Santa Catarina	10.9	1.0	33.8	2.2
Itaqui	Rio Grande do Sul	36.5	3.4	22.9	1.5
Others	–	5.5	0.5	15.0	1.0
Total		1,088.0	100.0	1,529.3	100.0

Border Point	State (Brazil)	1993		Jan/Sep 1994	
		mil US$	%	mil US$	%
Uruguayana	Rio Grande do Sul	1,064.6	84.1	875.4	76.7
Foz do Iguacu	Parana	151.8	12.0	224.0	19.6
Porto Xavier	Rio Grande do Sul	12.2	1.0	15.1	1.3
Sao Borja	Rio Grande do Sul	24.8	2.0	10.2	0.9
Dionisio Corqueira	Santa Catarina	2.3	0.2	9.4	0.8
Itaqui	Rio Grande do Sul	9.0	0.7	5.8	0.5
Others	–	1.5	0.1	2.0	0.2
Total		1,266.3	100.0	1,141.9	100.0

Source: Argentine Embassy in Brazil

Table VII-2-2-6 Argentine Trade with Brazil Transported by Truck

<Argentine Export to Brazil>

Product	Volume tons	Origin	Destination
Garlic,Onions,Olives, Olive oil,Canned food	more than 150,000	Cuyo Region (Mendoza, San Juan, San Luis) and neighboring Provinces	Rio Grande do Sul Santa Catarina Parana Sao Paulo Rio de Janeiro Goias and Minas Gerais
Fish	34,385	Mar del Plata	Rio Grande do Sul Sao Paulo
Car parts and Vehicles	52,770	Buenos Aires Santa Fe Cordoba Tucuman	Sao Paulo Belo Horizonte
Leather	4,412	Buenos Aires Cordoba Santa Fe	Rio Grande do Sul Santa Catarina Parana
Meat and Diary Products	28,600	Buenos Aires Santa Fe Cordoba	Sao Paulo
Apples and Pears	78,764	Rio Negro Neuquen	Sao Paulo Rio de Janeiro

<Argentine Imports from Brazil>

Vehicles and Car parts	135,000	Sao Paulo Rio Grande do Sul Santa Catarina Parana	Buenos Aires Cordoba Tucuman Santa Fe
Chemicals, Plastics, Petrochemicals	179,866	Sao Paulo Rio Grande do Sul Parana Rio de Janeiro North-Eastern States	Buenos Aires Cordoba Santa Fe
Paper	159,900	Sao Paulo Southern States	Buenos Aires Tucuman
Coffee	30,681	Sao Paulo	Buenos Aires
Cocoa	8,100	North Eastern States	Buenos Aires
Meat(Chicken, Pork, Fish)	54,467	Rio Grande do Sul Santa Catarina Parana	Buenos Aires Santa Fe
Fruit (Banana, Pineapple)	70,932	Sao Paulo	Buenos Aires

Source: Carmen Polo, Road Transport Study, Oct. 1995

(4) Existing Cargo Transport between Argentina and Chile

The overall trade volume between Argentina and Chile is as following:

Year	Argentine Export (000tons)		Argentine Import(000tons)
	with fuels	without fuel	
1992	1,749	1,134	258
1993	1,473	942	670
1994	4,554	1,098	680

The sharp increase in export volume as of 1994 was the consequence of the commissioning of the Puerto Hernandez - Santiago pipeline, through which oil exports are made.

The volume of cargoes transported by truck are increasing quite rapidly in recent years as is indicated in Table VII-2-2-7. The balance of direction of movement inclines to Argentina-Chile direction rather than the opposite one. More than 90 % of traffic pass through Cristo Redentor route, followed by 5 - 7 % through Cardenal Samore pass in the south. The combined total of other passes are at present negligible 0.1 %.

With reference to cargoes transported by truck, main Argentine export cargoes are mineral products, foundry products and plastics and plastic products. Other cargoes such as grains and vegetable oils are carried by ship. As regards Chilean export to Argentina, almost all products listed in Table VII-2-2-8 are transported by track.

Concerning the region of origin of Argentine export products, Provinces of Mendoza, Capital Federal, Cordoba and Buenos Aires are dominant (Table VII-2-2-9).

Table VII-2-2-7 Cargo Movement Through Argentina -- Chile Border Passes

(unit: tons)

Year	Cristo Redentor		Cardenal Samore		Other Passes		Total		
	to Chile	from Chile	to Chile	from Chile	to Chile	from Chile	to Chile	from Chile	to/from
1990	689,019	240,015	7,282	17,608	n.a.	n.a.	696,301	257,623	953,924
1991	691,634	350,886	25,941	39,065	n.a.	n.a.	717,575	389,951	1,107,526
1992	820,155	374,179	32,662	53,659	2,316	2,233	855,133	430,071	1,285,204
1993	735,337	446,149	74,676	74,035	1,865	1,637	811,878	521,821	1,333,699
1994	855,506	623,870	49,616	48,270	491	479	905,613	672,619	1,578,232
94 share	94.5	92.8	5.5	7.2	0.0	0.0	100.0	100.0	-

Table VII-2-2-8 Argentine/Chile Trade

Argentina/Chile*		Chile/Argentina**	
Products	Volume tons	Products	Volume tons
Total	1,610,888	Total	660,209
Mineral fuels and oils	572,527	Ore, slag	158,405
Grain	439,717	Wood and manufactured	101,874
Grease, oils and by-products	141,076	Fuels	69,399
Food industry waste	88,226	Ceramics products	45,375
Solt, sulfer, others	79,002	Copper, copper products	38,352
Foundry, iron and steel	33,274	Vegitable processed	36,207
Foundry products	22,993	Fruit	34,225
Sugar, pastry	22,527	Wines	26,971
Glass, glass products	22,056	Paper and board	25,246
Plastic, plastic products	20,959	Inorganic chemical products	25,015

Note: (*) data of 1992/93 average, (**) 1994 data
Source: (*) INDEC, (**) Banco Central de Chile

(5) Border Crossing

For the smooth crossing of international cargoes at the border, a document called MIC/DTA (Manifiesto Internacional de Carga - Declaracion de Transito Aduanero), which means International Cargo manifestation - Traffic Statement at Customs, is adopted. The MIC/DTA document is prepared by the transport company and is registered by the customs in the country of departure. This document, which includes five copies, should go together with the cargo. The first copy is kept at the customs where the registration is made, the second at the customs of exit, the third at the customs of entrance, the fourth at the customs of destination and the fifth for the bearer.

The loading of cargoes at different places in the country of origin on a same transport unit with the same MIC/DTA can be made if the route, intermediate load customs and the terms of transport up to the customs of destination are specified in the original MIC/DTA and submitted to the customs of departure.

Table VII-2-2-9 Export by Province of Origin Through Mendoza Customs (1994*)

Province of Origin	Volume		Value	
	ton	%	000US$	%
Pampa Region	141,075	38.9	214,802	59.1
Buenos Aires	26,143	7.2	19,824	5.5
Capital Federal	61,456	16.9	114,947	31.6
Cordoba	27,315	7.5	44,686	12.3
Entre Rios	2,012	0.6	1,469	0.4
La Pampa	0	0.0	0	0.0
Santa Fe	24,150	6.7	33,875	9.3
Cuyo	209,478	57.7	134,089	36.9
Mendoza	185,696	51.1	107,437	29.5
San Juan	16,492	4.5	6,239	1.7
San Luis	7,291	2.0	20,413	5.6
South Patagonia	198	0.0	281	0.0
Chubut	198	0.0	281	0.0
Santa Cruz	0	0.0	0	0.0
T. del Fuego	0	0.0	0	0.0
Comahue	987	0.3	362	0.0
Neuquen	937	0.3	331	0.0
Rio Negro	50	0.0	31	0.0
NEA	8,836	2.4	10,643	2.9
Chaco	3,475	1.0	4,405	1.2
Corrientes	869	0.2	2,342	0.6
Formosa	0	0.0	0	0.0
Misiones	4,492	1.2	3,896	1.1
NOA	2,539	0.7	3,547	1.0
Catamarca	0	0.0	0	0.0
Jujuy	0	0.0	0	0.0
La Rioja	133	0.0	1,327	0.4
Salta	28	0.0	10	0.0
S.del Estero	0	0.0	0	0.0
Tucuman	2,378	0.7	2,210	0.6
Total	363,114	100.0	363,724	100.0

Note: (*) Eleven months of 1994
Source: INDEC

Since the introduction of the MIC/DTA, the time required for the customs procedure at the border and other places has reduced, and the cue to cross the border has substantially shortened. However, the time required for document delivery, customs clearance, registration at the Ministry of Agriculture and approval from SENASA (Animal Sanitation Service) used to be about 7 days in 1992 and is about 4 days at present.

(6) Tariff of International Transport

For the transportation of cargoes, particularly that of trucks, there is no predetermined tariff except for the specific cargoes. Freight of cargoes is generally settled by negotiations between carrier and customer in each particular case and are different according to products, seasons of the year, volume of cargoes, origin and destination of cargoes, etc. Therefore, the following analysis is made only for indicative purpose and not necessarily applicable to each particular case.

In the case of cargo transport by truck between Argentina (Buenos Aires) and Brazil (Sao Paulo), the basic freight for each type of vehicle is as following (US$/trip):

Open van	US$ 2,000 ~ 2,800
Covered van	US$ 2,300 ~ 3,500
Cold storage van	US$ 4,000 ~ 6,000

In the case of frozen cargoes, freight between Buenos Aires and Sao Paulo has changed as follows:

1991	US$ 3,200/truck
1992	US$ 2,200/truck
1993	US$ 1,800/truck
1994	US$ 1,700/truck up to August
	US$ 4,000/truck from September on

The reducing trend of freight until August 1994 is brought by the effect of the elimination of allocation and arrival of a large number of truck companies to the market. The Brazilian recession in 1993 had the effect of excess capacity. The sharp increase of freight in the end of 1994 was brought by the higher demand at the market.

The tariff of container transport between Buenos Aires and Sao Paulo by truck compared with maritime transport is exhibited in the following:

Cost Component	Maritime	Road
Transport to port (Brazil)	250	-
Santos Port charges	250	-
International freight	1,400	2,300
Buenos Aires Port	240	-
Transport from port (Arg)	210	-
Total	2,350	2,300

The change of tariff rates by origin and destination of cargoes for the period 1990 -1994 is exhibited in Table VII-2-2-10. There were substantial reduction between October 1990 and October 1993 due to the deregulation of entry to the business, etc. However, there were increase in the rate after October 1992 reflecting the market situation caused by the sharp increase of trade between Argentina and Brazil, which brought about the shortage of fleet.

Table VII-2-2-10 Tariff of International Cargo Transport by Truck

(unit: US$/ton)

Origin	Destination	Oct'90	Oct'91	Oct'92	Sep'93	Sep'94
General Cargo						
Buenos Aires	Sao Paulo	125	107	83	93	110
Buenos Aires	Porto Alegre	93	80	63	75	92
Buenos Aires	Rio de Janeiro	135	115	90	103	135
Buenos Aires	Salvador	191	175	120	n.a.	150
Buenos Aires	Curitiba	114	100	76	83	105
Buenos Aires	Uruguayana	55	48	40	47	n.a.
Cordoba	Sao Paulo	135	130	95	n.a.	120
Mendoza	Sao Paulo	172	135	108	126	140
San Juan	Sao Paulo	170	135	109	126	n.a.
Refrigerated Cargo						
Buenos Aires	Sao Paulo	141	130	n.a.	n.a.	150
Buenos Aires	Porto Alegre	119	111	n.a.	n.a.	215
Buenos Aires	Rio de Janeiro	145	136	n.a.	n.a.	240
Rio Negro	Sao Paulo	n.a.	n.a.	n.a.	n.a.	260

Source: ABTI (Association Brasileina de Transporte Internacional)

Concerning the cargo tariff rates of international rail transport, only a limited cases up to the border are available since the rail transport has not yet directly linked to the railways in neighboring countries. Following rates in Table VII-2-2-11, which are applied for export and import cargoes to and from Brazil, are taken from the tariff of Ferrocarril Mesopotamico.

Table VII-2-2-11 Rail Tariff Rates Applied for Export and Import Cargoes

Cargo	Origin	Destination	Rate (US$/ton)	Distance (km)	Rate (US$/ton-km)
Rice	San Salvador	Paso de los Libres	12.5	259	0.0483
Sugar	Paso de los Libres	Buenos Aires	19.0	747	0.0254
Soybeans	Posadas	Paso de los Libres	8.5	367	0.0232
			(US$/TEU)	(km)	(US$/TEU-km)
Container (loaded)	Buenos Aires	Paso de los Libres	315	750	0.420
Container (empty)	Buenos Aires	Paso de los Libres	81	750	0.108
Container (loaded)	Buenos Aires	Encarnacion	350	1,100	0.318
Container (empty)	Buenos Aires	Encarnacion	57	1,100	0.052

Source: Ferrocarril Mesopotamico

2.2.3 Major Trunk Routes

Since the start of Mercosur, the volume of trade between member countries is increasing rapidly and thereby traffic volumes between them, particularly those between Argentina and Brazil for both direction. This increase is observed not only in marine traffic volumes but also, and more acutely, those in road transport . This trend of increase in land traffic volumes between Argentina and Brazil will continue further in

relation to the achievement of more knitted economic links among two countries as Mercosur proceeds. However, the land transport infrastructure across the border of two countries is presently restricted to the Paso de los Libres - Uruguayana rail cum road bridge (one lane for each direction) and Iguazu road bridge. About 90 % of Argentina-Brazil land traffic pass through those two routes and is experiencing acute shortage of capacity.

The Argentine inland regions along the Andes mountains are constrained to realize its economic potentials, because of long distance to the domestic markets and ports for export. The recent better diplomatic and economic relationship between Argentina and Chile has widened the development potentials of its long-awaited surface links between both countries across the Andes, which will open up the direct access to the Pacific not only for the Argentine regions along the Andes but also for other regions of Argentina and neighboring countries including Bolivia, Paraguay, Brazil and Uruguay. Present road condition and traffic volume per day of each Trans-Andes pass is as in Table VII-2-2-12.

Table VII-2-2-12 Present Road Conditions and Traffic of Argentina/Chile Passes (1994)

Pass	A.D.T.		Road Length (Kms)				Max.Grad	Max. Alt.
			Earth	Gravel	Paved	Total	(%)	(m)
Jama	6	Chi	66	82	113	261	4.6	4,767
		Arg	79	164	96	339	4.7	4,170
Sico	10	Chi	–	209	103	312	1.7	4,553
		Arg	10	242	56	308	1.9	4,505
San Francisco	2	Chi	96	189	9	294	8.3	4,747
		Arg	–	203	161	364	1.0	4,310
Agua Negra	7	Chi	–	124	126	250	3.8	4,775
		Arg	–	14	287	301	3.1	4,415
Cristo Redentor	736	Chi	–	–	67	67	8.0	3,185
		Arg	–	–	196	196		3,185
Pehuenche	5	Chi	7	100	68	175	2.5	2,553
		Arg	34	48	69	151	2.1	2,443
Pino Hachado	15	Chi	20	80	91	191	7.0	1,884
		Arg	–	12	106	118	1.7	1,704
Cardenal Zamore	225	Chi	–	26	102	128	3.9	1,308
		Arg	–	33	92	125	5.1	1,268
Coyhaique	30	Chi	–	52	–	52	4.0	820
		Arg	–	129	3	132	4.0	805
Huemules	10	Chi	–	–	60	60	2.0	560
		Arg	–	150	–	150	2.0	660
Integ. Austral	150	Chi	–	130	70	200	–	–
		Arg	–	11	59	70	–	–
San Sebastian	150	Chi	–	261	65	326	–	–
		Arg	–	11	79	90	–	–

Note: A.D.T. = Average Daily Traffic
Source: Ministry of Public Works, Chile

The existing network connecting Argentina and Brazil/Chile is consisted of following three routes (from the Pacific to the Atlantic). Out of three routes, only the

Central Corridor has presently sizable volume of traffic. Other two routes are strategically important with reference to the economic linkages of concerned countries and the development of peripheral regions although they are endowed with various resources. The major cities that each corridor passes through are as following:

(1) Northern Corridor

Iquique/Arica/Antofagasta - Pasos de Jama/Sico/Socompa - Jujuy/Salta - (National Route 16/Belgrano Railway) - Resistencia - Corrientes/Posadas - Paso de los Libres - Uruguayana - Porto Alegre/Rio Grande - Curitiba/Paranaguay - Sao Paulo

(2) Central Corridor

Valparaiso/San Antonio - Santiago - Paso Cristo Redentor - Mendoza -
(1) (National Route 7/BAP Railway) - Buenos Aires - Montevideo
(2) Cordoba - Santa Fe - Parana - Paso de los Libres - Uruguayana - Porto Alegre/Rio Grande - Curitiba/Paranagua - Sao Paulo

(3) Southern Corridor

Concepcion (Talcahuano/other ports) - Victoria - Paso de Pino Hachado - Zapala/Neuquen - (National Route 22/Ferrosur Roca) - Bahia Blanca/Quequen

These three Corridors have different objectives and expected results of development for concerned regions and countries and, therefore, are meaningful to develop respectively, not necessarily at once but at least in the medium and long term perspectives. Each of those three Corridors are stated in detail in the following.

2.2.4 Northern Corridor

(1) Existing State of the Route

The Northern Corridor connects Northern Region of Chile (Region I), as is exhibited in Figure VII-2-2-3, passing through Northern Provinces of Argentina (NOA and NEA), with southern States of Brazil (States of Parana, Santa Catarina and Rio Grande do Sul). It crosses three alternative Passes of Andes Mountains, namely, from north to south, Paso de Jama, Paso de Sico and Paso de Socompa (max. alt.: 4,475 m); the first two are road routes, and the last one is a rail route.

1) Road Routes

From Chilean port of Antofagasta to the North-Western region of Argentina, there are two alternative routes. One connects to San Salvador de Jujuy via Paso de Jama (maximum altitude: 4,767 m) and the other to Salta via Paso de Sico (max. alt.: 4,553 m).

Antofagasta - Calama	215 km	
Calama - Paso de Jama	250 km	(Chile/Argentina border)
Paso de Jama - San Salvador de Jujuy	260 km	
San Salvador de Jujuy - Resistencia	880 km	
Total	1,605 km	(up to Resistencia)

Antofagasta - Calama	215 km	
Calama - Paso de Sico	305 km	(Chile/Argentina border)
Paso de Sico - Salta	300 km	
Salta - Resistencia	840 km	
Total	1,660 km	(up to Resistencia)

The Jama route is presently 95 km shorter from Jujuy to the Pacific coast than the Sico route from Salta. However, new copper mines are to be developed at Chilean side of the border near Peine, and new link of Baquedano - Peine road, which makes Antofagasta - Paso de Sico section 50 km shorter than the existing route of detouring Calama. Both routes pass through high plateau of the Andes but are passable all the year round because snowfall in this region is not usually so much as to disturb the traffic.

In Chilean side, the routes are also connected to other ports of Iquique (510 km north to Antofagasta) and Arica (further 275 km north). Chilean ports are blessed with depth to receive any size of ship, but Antofagasta is too close to the built-up area of the city. Mejillones, 53 km north to Antofagasta, is considered to be an ideal site for the port development when the cargo volume will exceed the capacity of Antofagasta port in the future.

The Corridor supports neighboring inland countries of Bolivia through La Quiaca, situated 291 km north to San Salvador de Jujuy and 405 km north to Salta, and of Paraguay through Mission La Paz, situated about 550 km north-east to Salta, where a bridge over Pilcomayo River is now under construction.

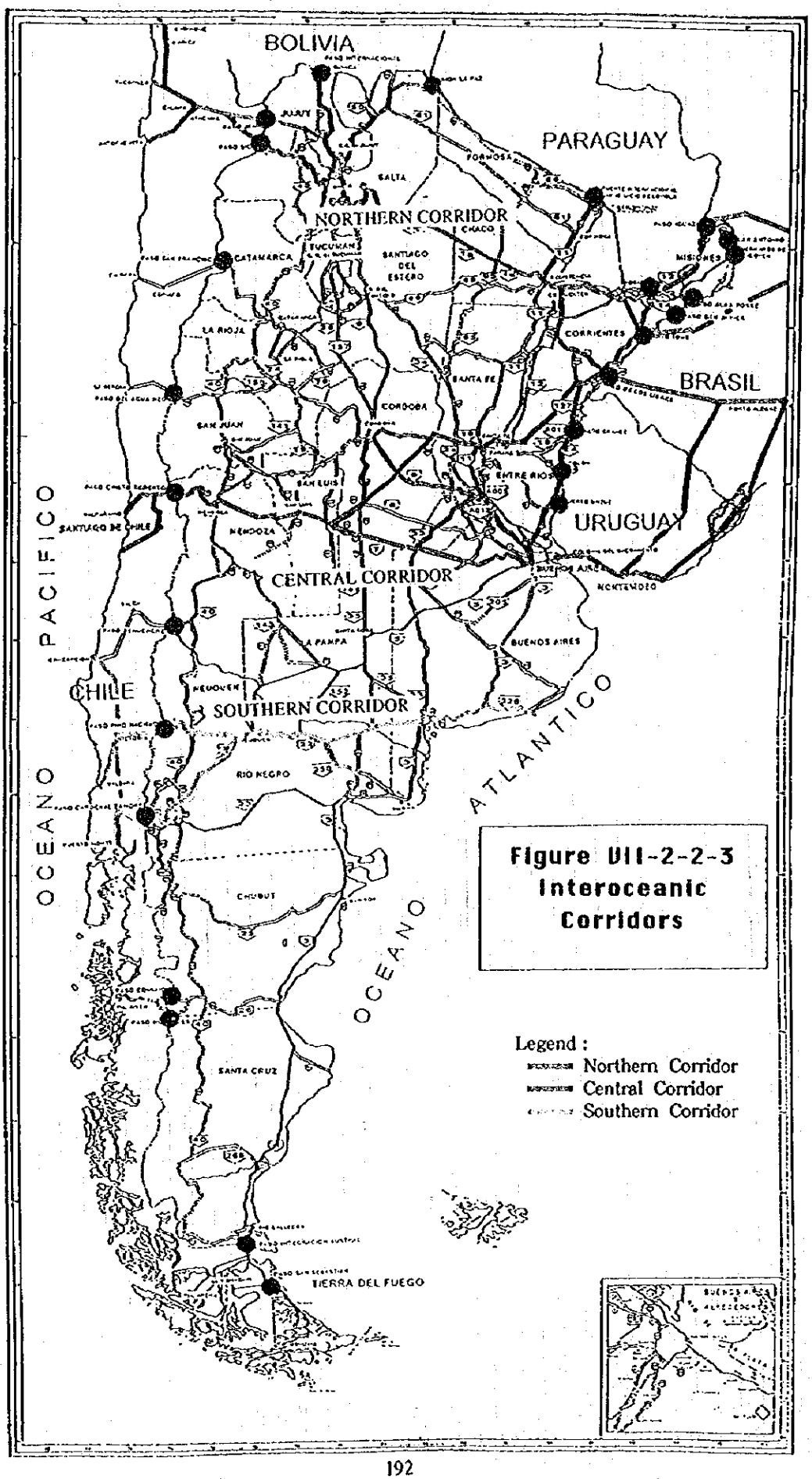

Figure VII-2-2-3
Interoceanic Corridors

From Resistencia, the corridor leads to:

Resistencia - Corrientes	25 km
Corrientes - Paso de los Libres	465 km
Paso de los Libres - Uruguayana	2 km (Argentina/Brazil border)
Uruguayana - Curitiba	1,090 km
Curitiba - Sao Paulo	390 km
Sao Paulo - Santos	70 km
Total	2,042 km (from Resistencia to Santos)

From Uruguayana, roads connect to Porto Alegre (635 km), the capital city of Rio Grande do Sul State of Brazil and commercial and industrial center in Southern Brazil, and to Rio Grande port (655 km), where container terminals of receiving full-container vessels and an industrial area behind the port are now under construction.

2) Rail Route

There is a rail route of 1,000 mm gauge connecting between Salta and Antofagasta through Socompa, which is called C-14 Line. The Line has two switchback sections and two loop sections in order to clear a maximum grade of 25 o/oo. The effective train length is limited to 282 meters by the length of switch-back section. The load capacity of the structure is limited to 17 tons/axle.

The C-14 is connected to Belgrano line and leads to Barranqueras port on Parana River. There is no bridge of connecting Barranqueras and Corrientes on the opposite bank of Parana River, where the Mesopotamico line of standard gauge (1,435 mm) and of former Urquiza line starts. The Mesopotamico line is connected to Brazilian rail system at Paso de los Libres/Uruguayana. The Brazilian rail is again the narrow gauge of 1,000 mm and, therefore, requires cargo transfer facilities either at Paso de los Libres or Uruguayana or both. But the existing cargo transfer facilities of both Argentine and Brazilian lines seem to be insufficient and require modernization, particularly in the Argentine side. The operation of facilities for transshipment of cargoes have rooms for substantial improvements.

(2) Function of Corridor on Regional Development

The Northern Corridor is expected to secure the surface link to Chilean ports at the Pacific coast and to open up the development potentials of agriculture, mining and other productive sectors in the North-Western Region (NOA) and North-Eastern Region

(NEA) of Argentina. The Corridor will also serve as Brazil's alternative access route to the Pacific, which will be important for Southern States of Brazil, and as alternative route to the sea ports for Bolivian and Paraguayan external trade.

The Corridor also serves as links for inland NOA and NEA regions of Argentina, inland countries of Paraguay and Bolivia and also Chile to Brazilian market and, through Atlantic ports of Brazil such as Santos, Paranagua and Rio Grande, to the North American, European and African markets.

Inland Provinces of Argentina, particularly those along the Andes mountain ranges, and other inland countries such as Paraguay and Bolivia are constrained their economic development potentials by the long distance from sea ports, although they are rich in potential resources of various productive sectors. The improvement of access to deep-water Chilean and Brazilian ports will certainly open up the development potentials of countries and regions along the corridors to be developed. To actualize this opportunity, it is urgent to solve the remaining trade problems between Argentina and Chile including sanitary issues.

(3) Regional Measures for Further Development

Present state of transport infrastructure for Argentina-Chile links is not yet sufficient but upgrading of roads, which have not much snowfalls and are passable almost all the year round, and construction of bridges connecting two countries are scheduled to be completed by the end of 1996. However, the situation of ports in Northern Chile requires substantial upgrading or new construction in order to serve as reliable facilities for external trade of concerned countries along the Corridor.

The existing C-14 Line connecting Salta and Antofagasta via Socompa is underutilized because of limited traffic demand. The capacity of the line is also limited of its obsolete facilities and rolling stocks, and insufficient maintenance of them. In addition, the Belgrano Railway and the Mesopotamico Railway are not directly connected and separated by Parana River at the Resistencia/Barranqueras - Corrientes section. Since the demand for rail transport over Parana River is not at the moment existent, the possibility of connecting Belgrano Line and Mesopotamico Line would be a long term issue.

The existing link between Argentina and Brazil on the Northern Corridor bypasses to south to Paso de los Libres - Uruguayana Bridge because there is no other bridge over Uruguay River connecting two countries. The planned construction of Santo

Tome - Sao Borja Bridge will relieve the present congestion of traffic at Paso de los Libres - Uruguayana Bridge. The existing Paso de los Libres - Uruguayana Bridge alone is not sufficient to handle the increasing Argentina - Brazil land traffic and, therefore, the planned project can be economically justified.

2.2.5 Central Corridor

(1) Route

The Central Corridor starts from Valparaiso port or San Antonio port:

Valparaiso port - Los Andes	130 km
Los Andes - Cristo Redentor	70 km
Cristo Redentor - Mendoza	205 km
Mendoza - Buenos Aires	1,100 km
Total	1,505 km

The Corridor serves central regions of Chile including Santiago Metropolitan Region, Regions V and VI, passes through Cristo Redentor Pass of Chile/Argentina border, goes through resource rich central Provinces of Argentina including Provinces of Mendoza, San Luis, La Pampa, Cordoba, a part of Santa Fe, Entre Rios, and reaches to Capital Federal and Buenos Aires (Figure VII-2-2-3).

To the south of Valparaiso, there is another deep sea port of San Antonio which is now under expansion of container wharf and container handling equipments. Since Valparaiso port is surrounded by the built up areas of the city, San Antonio seems to be more prepared for the future expansion of port facilities and port modernization.

The Central Corridor, which passes through Paso de Cristo Redentor and connects economic centers of Argentina and Chile directly, handles more than 90 % of the Argentine-Chile traffic of border crossing and trade by land transport. However, the Paso is unreliable of its closure by snowfall in winter. The length of closure is different year by year according to the volume of snowfall. (In the year 1994 it stopped 12 days consecutively, but in the year 1995 it has been caused smallest problems.)

There are several ideas to cope with snowfalls and secure the passage all the year round:

1) to build tunnel at lower altitude,
2) to cover the snow-vulnerable road sections by roof, and

3) to set up snow-removing work unit, which will be ready to be mobilized at any time of snowfall, or to contract out the snow-removing works to the private sector.

Presently, the Mendoza's economy is closely linked to Chile. As is shown in the Table VII-2-2-13, 93.7 % of cargoes registered at Mendoza Customs head for Chile in volume term and 83.6 % in value term. The improvement of border crossing infrastructure will certainly contribute to the growth of local economy.

Table VII-2-2-13 Export by Destination Through Mendoza Customs (1993)

Destination	Through Mendoza				Total Argentina		Mendoza/Argentina	
	Volume		Value		Volume	Value	Volume	Value
	ton	%	000US$	%	ton	000US$	%	%
Chile	353,165	93.7	269,990	83.6	942,392	513,407	37.48	52.59
NAFTA	6,503	1.7	9,234	2.9	1,082,936	1,402,671	0.60	0.66
Mercosur	2,922	0.8	3,266	1.0	6,899,998	3,007,386	0.04	0.11
European Union	1,343	0.4	996	0.3	10,241,442	3,474,067	0.01	0.03
Other Europe	269	0.0	2,271	0.7	1,606,110	369,186	0.02	0.62
Asia Pacific	3,044	0.8	25,890	8.0	3,251,510	1,109,408	0.09	2.33
South America*	7,138	1.9	9,379	2.9	2,561,966	763,979	0.28	1.23
Central America	1,225	0.3	1,439	0.4	627,677	223,055	0.20	0.65
Others	1,250	0.3	649	0.2	3,788,657	1,018,980	0.03	0.06
Total	376,859	100.0	323,114	100.0	31,002,688	11,882,139	1.22	2.72

Note: (*) Excluding Chile and Mercosur
Source: INDEC

Recently, the fruit export to Brazlian market is increasing. To transport the fruits produced in Cuyo Region to major market in Sao Paulo passes through the following route:

Mendoza - Cordoba	720 km
Cordoba - Paso de los Libres	835 km
Paso de los Libres - Sao Paulo	1,480 km
Total	3,035 km

From Buenos Aires, there are two alternative routes; one is leading to existing Paso de los Libres-Uruguayana bridge, goes into Brazil and passes through southern States of Rio Grande do Sul, Santa Catarina and Parana, and finally arrives at Sao Paulo, the economic and financial center of Brazil.

Buenos Aires - Paso de los Libres	770 km
Paso de los Libres - Sao Paulo	1,480 km
Total	2,250 km

Buenos Aires - Montevideo	120 km
Montevideo - Rio Grande	350 km
Rio Grande - Porto Alegre	310 km
Porto Alegre - Curitiba	690 km
Curitiba - Sao Paulo	390 km
Total	1,860 km

In the latter case, it is assumed that the route pass through the Colonia - La Plata bridge. As is shown in the above, the Montevideo route which passes proposed bridge will about 400 km shorter. The route also passes through Rio Grande, where new deep-sea container port is under construction. The distance from Buenos Aires is less than 500 km. If the capacity of handling containers at Buenos Aires Port would be saturated or deep draft full container liner vessels would call South American ports regularly, the economic link of Argentine economy with Rio Grande Port will certainly deepen.

(2) Function of Corridor on Regional Development

The Central Corridor, which passes through Paso de Cristo Redentor and connects economic centers of Argentina and Chile directly, handles more than 90 % of the Argentine-Chile traffic of border crossing and trade by land transport. However, the Paso is unreliable of its closure by snowfall in winter. The length of closure is different year by year according to the volume of snowfall. (In the year 1994 it stopped 12 days consecutively, but in the year 1995 it has been caused smallest problems.)

South America and East Asia are considered and expected to become global growth poles over the turn of century and to lead the economic growth in the world. Therefore, the direct link of two growth poles by the shortest route has tremendous global economic impacts and has a stimulus to the other regions of the world. The development of the Corridor is to promote the better linkage of those two potential growth poles in the world economy.

The Argentine rail system of Buenos Aires al Pacifico (BAP) runs up to Mendoza, and not connected to the Chilean rail. It is conceivable to link both systems by rail in the long future, since it used to be linked together until the rail was disconnected by

the cave-in at the border tunnel. However, more realistic approach would be to develop the container transshipment facilities at the rail terminal of BAP line and transport the container by truck from Mendoza to Santiago or ports of Valparaiso or San Antonio. Actually, Bap is developing such facility at the terminal near to Mendoza. At present, volume of handling containers are less than 100 TEUs per month but planned by the BAP to reach 400 TEUs per month by the end of the year 1995.

(3) Regional Measures for Further Development

Comparing with Valparaiso and San Antonio ports in Chile, the latter seems to have more development potentials for handling containers, although the existing facilities of both ports are not good enough to handle possible large-scale export of Argentine products through Chilean ports. The possibility of handling export and import cargoes of Argentina and other South American countries through Chilean ports will certainly accelerate the further development of Chilean economy. It is evident from the example of port-based economic growth of Singapore. The cargo transshipment to/from neighboring countries has certainly pushed forward the economy of Singapore. To develop a port as a full-scale container port or a bulk cargo port requires a huge sum of investment fund. To construct such port will be economically viable only if the port can attract enough volume of cargoes from its hinterland and utilize modernized port facilities and cargo handling equipments in full scale without any excess capacities of facilities and equipments. The access to Mercosur market through land transport routes and the potential use of port facilities at the Atlantic coast for Chilean shipper will also promote the new economic potentials for Chile and countries and regions along the corridors connecting the Pacific and the Atlantic.

Concerning a tunnel project at the site of low altitude than existing tunnel, the present traffic volume would not justify the huge amount of investment for its construction. Some alternative measures such as constructing roofs over the snow-disturbing road sections, which is much cheaper than tunnel construction, need to be searched for. However, as the economic links between Argentina and Chile and also those between South America and East Asia deepen, the low-altitude tunnel project will be revitalized.

Presently, almost all volumes of land traffic between Argentina and Brazil pass through Paso de los Libres - Uruguayana Bridge. The capacity of the bridge, which is two-lane road cum rail bridge, is near to its saturation for increasing traffic by road. The completion of works to build new bridge at Santo Tome - Sao Borja over Uruguay River is awaited to ease the congestion. For cargoes originating in the central regions of

Argentina and heading for Brazil through Rosario or vice versa do not have direct land link to/from the city and Mesopotamia region. The Rosario - Victoria Bridge Construction Project will serve for that purpose.

The planned construction of Buenos Aires - Colonia Bridge will serve not only the traffic between Argentina and Uruguay but also that between Argentina and Brazil. The construction of the bridge may open up the possibility of using Montevideo port of Uruguay and Rio Grande port of Brazil for Argentine cargoes in the future when Buenos Aires port would be saturated.

2.2.6 Southern Corridor

(1) Route

The Southern Corridor is to link both countries' resource rich regions of Patagonia by the following route (c.f. Figure VII-2-2-3):

Concepcion - Victoria	250 km
Victoria - Pino Hachado	210 km
Pino Hachado - Zapala	125 km
Zapala - Neuquen	185 km
Neuquen - Bahia Blanca	565 km
Total	1,335 km

The Chilean side of Paso de Pino Hachado is not improved yet and presently, at the season of snowfall, the Pass is closed for about four months. The Argentine side of the Paso is well developed and only the final 10 km is not yet paved but passable to the border all the year round. Further down the south, Paso Cardenal Zamore is passable all the year round because road maintenance works at the snowfall season are regularly conducted at both sides of the border.

(2) Function of Corridor on Regional Development

The region along the Southern Corridor is rich in oil, gas, agriculture and tourism resources in Argentine side and forestry, fishing and tourism resources in Chilean side. The Southern Corridor connects the Pacific and the Atlantic by the shortest distance among three corridors with a possibility of road and rail connection, and also connected to the Pampa Humeda and Buenos Aires by road and rail from Bahia Blanca. Both ends of the Corridor are served by deep sea ports.

(3) Regional Measures for Further Development

The Chilean ports near Concepcion including Talcahuano, San Vicente and Lirquen are identified that substantial improvements will be needed for handling possible large quantity of Argentine export/import cargoes in the future. They have development potentials for handling them.

There is a project idea of rail link between Zapala (Argentina) and Lonquimay (Chile), the remaining unconnected section is only 170 km for both side of the border. The Argentine side has started construction of its first 14 km section from Zapala.

Chile has interests not the connection of the Pacific to the Atlantic but the southern connection of Chilean territory passing through Paso Cardenal Zamore, going south through National Route 40 of Argentina, and passing Pasos Coihaique, Huemules, and Integracion Austral to Punta Arenas.

2.3 Experience of the European Union's Transport Integration and Its Relevance to Mercosur Transport Policy

This section deals the issue from a little wider viewpoint: from that of Mercosur rather than bilateral relations of Argentine, Brazil and Chile. The evolution of Mercosur will undoubtedly bring about many economic potentials for each of four member countries. In accordance with the deepening of forward and backward linkages of productive sectors, transport linkages will also expand and traffic volumes of passenger and freight between member countries will increase. The symptoms of such phenomena are already evident.

In order to enjoy the maximum merits of Mercosur, it is ideal to integrate the transport systems of four member countries into single system. However, since transport systems of different countries are developed based on the different purposes, historical backgrounds, functions and planning principles, it is very difficult to integrate of them into one system. There are many problems to solve patiently, some of which would already be evident and some would still be latent.

The question would be what kind of problem will come out in the process of transport integration. There is a good precedent; i.e. the experience of transport integration among the EU member countries. Compared with the case of EU's transport integration, Mercosur is in a better situation at least in following three points; (1) the number of member countries is fewer than that of the EU, (2) the languages used by people of Mercosur member countries are communicable each other, while those of the EU are facing with various problems on this respect, and (3) the market integration of Mercosur started later than that of the EU. Therefore, it is possible to learn the merit and demerit of various policies implemented in the EU's transport integration process

Mercosur is possible to learn from the EU's experience. The Mercosur can enjoy the late comer's merit as far as economic and transport integration are concerned. In the remaining part of this section, the analysis and examination are made on issues which are experienced by the EU member countries in the process of transport integration and are considered to be relevant to the establishment of the integrated Mercosur transport systems.

2.3.1 Formulation of the Common Transport Policy

(1) EU's Common Transport Policy

Transport is a major area for concern in the formulation of the Mercosur Treaty and, therefore, a Common Transport Policy (CTP) would be devised applicable to the member countries of Mercosur. Over the years considerable discussion have been taken place on the matter within the Working Group of Transport in the Mercosur and to a certain extent throughout the transport industries of member countries. But to date no clear and common transport policy has yet emerged.

What precisely was meant by a "Common Transport Policy" will be to establish a common market with free movement of goods, people and services. It is clear that to achieve the main objectives of the market it would be necessary to integrate the transport policies of member countries.

In the case of EU on this issue, progress towards the realization of the CTP started slow. In fact the Treaty of Rome expected the evolution of the CTP in late 1950's. Since then no clear CTP has yet emerged as unresolved issue of vehicle weights harmonization between the member states of EU. The reason that no great progress in this area has been made is that member states have their own divergent views as to the priorities of transport as well as their own individual geographic, economic and cultural considerations. Certain states have adopted strict interventionist policies while others have adopted a much more liberal approach to government participation in transport.

The Court of Justice had to intervene several times on interpretation of the transport provision of the Treaty of Rome in order to make progress possible. In 1985 the Court judged that the inland transport of goods and passengers should be open to all Community firms, without discrimination as to nationality or place of establishment. The Commission placed transport in the forefront of moves towards the completion of internal market recognizing that the harmonized provision of transport services was essential for other barriers to trade.

Since then, the CTP has developed gradually, preparing a wide range of measures and actions aiming at bringing about the single market for transport services. They include improved competitiveness, financial performance and efficiency of transport enterprises and improvements in the functioning and quality of transport systems, such as safety, reliability and passenger comfort. Measures for the environment protection,

transport-related research and development activities, transport relations with third countries have also begun to be dealt with at Community level.

The implementation of the Maastricht Treaty marks a turning point and gives a new impulse to the evolution of the CTP. The provision on Trans-European Network (TEN) and establishment of Cohesion Fund provide a new basis for the integrated development of transport infrastructure. The Treaty emphasizes that in accordance with subsidiary, the CTP must consist of actions which cannot be realized adequately by the member state individually.

(2) Relevance to Mercosur Common Transport Policy (MCTP)

Mercosur would also aim the evolution of the MCTP, in order to realize free movement of goods, people and services within Mercosur. However, as the experience of the EU has indicated, each member country of Mercosur may have different views to the priorities of transport. Each country have so far taken individual transport policies without assuming any other countries' consent based on its own geographic, economic and historical conditions.

The EU's experience has shown that at least following issues will be discussed and measures would be evolved in the process of preparing the MCTP.

1) Selection of objectives and scope of the common transport policy.
2) Mercosur's trunk routes
3) Development of transport infrastructures in peripheral regions
4) Technical harmonization
5) Regulatory framework
6) Cost charges and subsidies
7) Common fund of infrastructure development
8) Safety
9) Environmental protection
10) External relations with non-Mercosur countries
11) Research and development
12) Action program to deal with above issues

2.3.2 The Mercosur Transport Network

(1) The Trans-European Transport Network

For several decades, the EU member states have spent considerable amount of resources to developing their transport infrastructures. These have been designed and constructed according to their national needs and priorities. Consequently, Europe is equipped with transport infrastructures which are lacking interconnections and do not function to the needs of an integrated economy and society. The EU recognized that its overall competitiveness in the world economy depends very much on the adequacy and efficiency of their transport services, and decided to prepare a Trans-European Transport Network. It is a vision of the needs of an integrated economy in which there are users' choice of modes which are interconnected, safe, efficient and environmentally-friendly. It requires close coordination of member states in various activities.

To plan a Trans-European Transport Network means reaching an agreement to a common vision of future needs of the member states' economy in which choice of transport modes to be developed is determined. The EU has identified major tasks for developing an integrated transport infrastructure:

1) fill in the many missing trans-border links and connections between national systems;
2) create new meeting points between the various transport modes so that the user can choose road and rail, air or rail and any other combination according to need and convenience;
3) make national infrastructures inter-operable by removing those technical and other impediments which impose delays at national borders;
4) enable easy access to the trans-European network; and
5) coordinate all of the necessary projects.

Formulation of the Trans-European Transport Network requires effective partnership between the EU and member states not only at the political and official levels but also transport users and operators. The collaborative partnerships of these parties have made it possible to prepare guidelines which design the objectives, the priorities and the shape of the overall trans-European transport network. The guidelines reflect a very broad consensus among those parties on the long-term requirements for transport services. At the same time, the member states can determine their national transport infrastructure strategies, the detailed design and planning of them, the timing and the pace of completion of all projects, which of course subject to be coherent with the Union guidelines.

The guidelines are considered to be not rigid and may need to be altered in the light of changing economic, political and financial circumstances. They are subject to review at five yearly intervals. The Trans-European Transport Network are specifically consisted of multi-modal networks. They are:

1) a road network totaling 56,000 kilometers of motorways and high quality roads equipped with traffic management systems and giving access to all European regions;
2) a rail network of around 70,000 kilometers, parts of which would comprise the high speed rail network and corridors devoted to combined transport and giving access to regions and ports;
3) a combined transport network based on specific rail, road, inland waterway and maritime shipping corridors, together with trans-shipment facilities for switching freight from one transport mode to another;
4) an inland waterway network of 12,000 kilometers of navigable routes;
5) a trans-European airports network of 267 airports;
6) efficient and competitive sea ports by means of projects emphasizing improved access and infrastructures;
7) an European maritime traffic management system to increase the safety and efficiency of maritime transport and to protect the environment in ecologically sensitive areas;
8) an air traffic management network which would integrate existing surveillance and communication systems, together with air traffic control centers; and
9) an information and management system employing modern information and communication technologies, including satellites, to achieve as smooth a flow of traffic as possible throughout the transport network.

Presently, the total cost of those projects identified by the guidelines is estimated at ECU 400 billion over the next 15 years.

(2) Relevance to the Establishment of Trans-Mercosur Network

The EU has already established a comparatively closely knitted transport network even before the evolution of concept of EEC. Therefore, there are considerable difference in the requirements of trans-regional network, to which transport administrators, planners, transport operators, and users would image as required MTN.

Although EU has aimed a multimodal trans-European transport network which would be completed within 15 years and estimated the required cost for investment.

However, for Mercosur countries, it is advisable to start from the real core issue for establishing the MTN rather than pursue the complete set of aimed networks of various modes. The Study Team is of the view in this respect as following issues would be included:

1) To establish intra-modal network such as rail network with different gauges and ways of harmonizing the difference of them;
2) To link meeting points between different mode of transport such as rail-road, rail-port, road-inland waterway, etc.;
3) To fill in the missing links at the border, which is the same with the task of EU's TETN.

However, the Study team consider the most important and urgent task to be prioritized would be:

4) Selection of trunk corridors for the support of the regional integration and stimulus to the regional economic development; and
5) Implementation of "Mercosur Comprehensive Transport Study", which would cover all member countries of Mercosur and preferably the neighboring countries as well (Chile must be included) and conducted in the same planning framework and study method.

2.3.3 Combined Transport

(1) Intermodal Operations in Europe

Intermodal operations are widely employed for medium- and long-distance haul in Europe, particularly in Germany and France. The intermodal operations are considered to be competitive with other transport systems, especially with road transport, for the haul of more than 600 km distance. Since the cargo transport in Europe is characterized by the short haul of less than 200 km distance, which is more than 90 % of cargo transport, and, therefore, road transport is dominant and the share of intermodal transport is about 4% of total cargo traffic calculated by ton-km basis.

The intermodal operations are not limited to the road-rail link and other modes of transport such as ship, port, air, inland waterways are also possible to combine with other mode of transport. But the transfer between road and rail are the most dominant. There exist following two types of intermodal transport systems according to the difference in the connection of the movile unit and the load carrying unit. They include:

1) the system to use the same load carrying unit and to swap the movile unit, which include container, swap-body, slide-van-body, etc.; and
2) to load the load carrying and movile unit on to another movile unit, which include rolling load, piggy-back, roll-on/roll-off, etc.

The use of an intermodal system capable of transfer between road and rail allows collection and delivery of consignments by trailer and without transshipment of the load itself. The major benefits of intermodal systems are:

1) to provide lower transportation costs over long distance haul;
2) to provide greater flexibility for the shipper to load; and
3) to reduce congestion in road, which is also environmentally desirable.

The EU has approved the trans-European combined transport network which comprises sea, rail, road and inland waterway links on October 1993. Combined transport uses two or more modes to carry the same load. It causes special technical problems, particularly at the point of transshipment. The combined transport system remains many technical and financial problems to be improved in the future, including the following:

1) to reduce the transshipment time at the terminal; and
2) to develop high standard information system in order to realize the smooth transshipment of load between different modes.

(2) Relevance to the Development of Combined Transport in Mercosur

There are many types of intermodal operations in the world, but the most desirable operation to be developed in Mercosur is container transport system. The reason of it is extensively analyzed and stated in the Chapter 1 of this volume. For the further development of container transport system, Mercosur require the upgrading of intra-modal transshipment system as well as that of intermodal operations. For example, rail network in Argentina is consisted of systems of three different gauges and the transshipment of cargoes between rail systems of different gauges does not have efficient facilities for transshipment of containers. The transshipment facilities at the border from Argentine rail (Ferrocarriles Mesopotamico) to Brazilian rail at Paso de los Libres and Uruguayana require to be developed substantially.

The Study Team is of a view that the volume of containers to be handled at ports and land transport systems in Mercosur countries will increase quite rapidly in near future.

It is advisable to concentrate the introduction of modernized container handling systems at port, rail and road in the first place. The introduction of other types of combined transport systems will not be proceeded hurriedly.

2.4 Policy Measures to Cope with Future Expansion of Traffic Between Argentina and Brazil/Chile

(1) Three corridors have individual objectives and functions of their own, and each corridor can be considered as independent route rather than alternative route to another. Therefore, all three corridors should be developed at least in the medium and long term perspective.

(2) Presently, the development of three corridors tends to be considered as infrastructure development projects. They must be considered in terms of grand designing of regional development potentials under the new economic opportunities brought by the start of Mercosur and direct link of the Pacific and the Atlantic. It is necessary to conduct "Comprehensive Regional Development Study(s)" for each region along three corridors in advance to confirm the feasibility of certain transport development. The Studies would include, in addition to the technical study items, the following issues:

- Development potentials of agricultural, industrial, mining, forestry, tourism and other productive sectors' development along each corridor, and
- Analyses of potential domestic and international markets and the marketability of those products.

The result of the Studies will constitute guidelines for private investors in and out of the country who are expected to work as promoters of the regional development.

(3) The implementation of following three Bridge Construction Projects will relieve existing and forthcoming bottlenecks of Mercosur connection:

- Rosario - Victoria Bridge Construction Project
- Santo Tome - Sao Borja Bridge Construction Project
- Colonia - La Plata Bridge Construction Project

(4) Since the lack of consistent and updated transport information on the reliable inventory of transport facilities and traffic data for Mercosur countries affects the planning of future transport network for Mercosur, it is highly desirable to implement the "Mercosur Transport Study" of unified planning concept, study items and study methods as soon as possible. The Study may be implemented covering Mercosur member countries. However, the inclusion of other neighboring countries such as Chile, Bolivia and Peru would be highly desirable.

(5) The upgrading of cargo transshipment facilities from rail to rail of different gauges, those of rail/road transfer points and those at some ports are urgently required. The better layout of them and operation procedures are also required. Since the extensive railway network has already been prepared in the southern South American Region, it is highly desirable to work out ways of the best use of existing railway systems.

(6) The experience of countries in European Union on the smooth cross-border traffic systems and regulatory progress would be useful for working out those of Mercosur countries. Particularly, following issues are important:

- EU's Common Transport Policy, which will be useful guideline for the preparation of Mercosur Common Transport Policy;
- EU's Trans-European Transport Network, which suggests the designation of Mercosur Trunk Routes; and
- EU's development of Combined Transport System. Among various alternative systems, the modernization of container transport systems would have the highest priority in Argentina and Mercosur.