b. Influence of the Bioceanic Road

When the Bioceanic Road becomes ready for service, trade with Asia and Oceania will be influenced. About 90% of exports to Asia and Oceania is grain such as soybean and wheat; half is transported from Villeta port through Argentina, and half from Ciudad del Este by land to a Brazilian port, and then changing to water transport. Taking into consideration the unit price of grain based on weight, it is not feasible, from the viewpoint of cost, to transport by land across the Andes and export from Antofagasta in Chile.

On the other hand, imports from Asia and Oceania include a variety of items, the main ones being electric goods, vehicle-related items (including cars), toys, metal machinery, and fertilizer. Of these products, 62% are transported to Paraguay by land (truck + railway), 27% by water, and 11% by airplane. Regarding land transport, 36% uses the route connecting Ciudad del Este and Brazilian ports, 19% the route connecting Puerto Falcon with ports in Chile, passing through Argentina, and the remaining 7% the route connecting Encarnación with Argentine and Uruguayan ports (by railway and truck). It's estimated that once the Bioceanic Road becomes ready, products whose value based on weight is relatively high, such as electric goods and toys, will use the route through the Andes instead of using the ports on the Atlantic side. The Pacific side has the ports of Iquiqué and Arica besides Valparaíso and Antofagasta, providing more choices of destination, so the current route through the Andes, Valparaíso – Mendoza – Puerto Falcon, may be changed to a route connecting Asunción with Bolivia, passing through the "Chaco" region.

Table 42 Trade Volume with Asia and Oceania (1997)

Export				Import			
Items	Volume 1000t	Rate %	Price in CIF US$/t	Items	Volume 1000t	Rate %	Price in FOB US$/t
Lumber-related products	42	49.4%	592	Electric goods	56	20.2%	2,419
Oil-stuff seeds	35	41.2%	299	Vehicle-related items	48	17.3%	4,310
Others	8	9.4%	2,067	Machinery	45	16.2%	2,187
				Toys	35	12.6%	2,322
				Metal machinery	11	4.0%	737
				Fertilizer	8	2.9%	1,483
				Others	74	26.7%	2,296
Total	85	100%	501	Total	277	100%	2,566

Table 43 Transport Method for Trade with Asia and Oceania

Customs	Department	Transport method	Export	Import
Asunción,Sajonia,Itá Enramada,PAKSA	Central	River	36.7%	27.3%
Ciudad del Este	AltoParaná	Truck	20.3%	36.1%
Encarnación	Itapua	Truck	0.0%	4.9%
Encarnación	Itapua	River	41.7%	0.1%
Encarnación	Itapua	Railway	0.0%	1.7%
Pedro Juan Caballero	Amanbay	Truck	0.4%	0.1%
Salto del Guairá	Canindeyú	Truck	0.3%	0.0%
Pto.Falcon	Pte.Hayes	Truck	0.6%	18.9%
Aeropuerto International	Central	Aircraft	0.0%	11.0%
TOTAL			100.0%	100.0%

3.2 TRANSPORT INFRASTRUCTURE REPAIR STRATEGY

(1) Basic policies

The role of the transport infrastructure in the revitalization of the Paraguayan economy is to activate the local economy by facilitating the movement of goods and people. Taking into consideration this role, it can be concluded that the basic policies for transport infrastructure repair are: to repair and expand the transport infrastructure now lacking, to maintain existing installations, and to secure the necessary funds and personnel for the repair of installations, maintenance, and administration. These policies shall be summarized in the following 9 items:

-Repair of the export corridor
-Improvement of mobility in the country
-Repair of farm roads
-Repair of transport infrastructure support distribution
-Strengthening of road maintenance and administration
-Improvement of the regulations of river transport
-Decentralization of power in infrastructure repair
-Securing funds for infrastructure repair
-Effective use of railroads

(2) Roads

1) Development target

The target for repair of the road network through 2020 is shown quantitatively. The current extent of National Roads and Departmental Roads is about 5,000 km each, and the pavement ratio is approximately 50% for National Roads and 10% for Departmental Roads. The target is more than double the extent of the network and to elevate the pavement ratio to 100% of National Roads and 20%

of Departmental Roads. Moreover, a 15-hour trip from leaving Asunción to a rural location shall be reduced to 8 hours.

Table 44 Target Figures for Road Repair

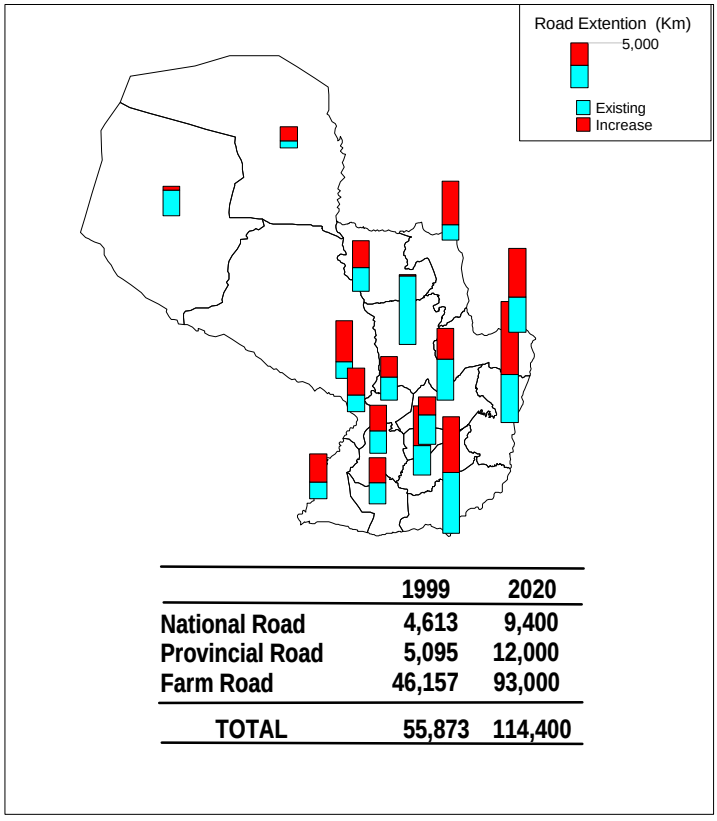
	Present state	Development target
Extent of National Roads (km)	4,613	9,400
Pavement ratio of National Roads (%)	47.9	100.0
Extent of Departmental Roads (km)	5,095	12,000
Pavement ratio of Departmental Roads (%)	11.3	20.0
Extent of Farm Roads (km)	46,157	93,000
Pavement ratio of Farm Roads (%)	0.3	5.0
Necessary time Asunción – departmental capital (hours)	15 hours	Within 8hours

2) Necessary road extent

Discussions were held regarding on the volume of roads necessary to support the local economy and social activities, taking into consideration the regional balance. The necessary road extent has been estimated for each department, based on population, area, cultivated area, and number of cattle.

The results are shown in Figure 50. In order to expand by 2020 to about 36,000 km of roads with pavement or with minimum repair necessary, it will be necessary to extend the roads in the peripheral departments in the west and north, such as Pdte. Hayes, Itapuã, Alto Paraná, Canindeyú, Amambay, and Alto Paraguay. As for San Pedro and Boquerón, extension of roads is enough.

Figure 50 Necessary Road Extension by Department



	1999	2020
National Road	4,613	9,400
Provincial Road	5,095	12,000
Farm Road	46,157	93,000
TOTAL	55,873	114,400

Table 45 Necessary Road Extension by Department

(1) Existing Road Length and Main Indicators by Department

Department	Road Length(Km) in 1998			Area (Sq.km)	1998		
	Paved	Unpaved	Total		Population (1000)	Cultivated Area(sq.km)	Cattle (head)
Concepción	159	2,492	2,651	18,051	192	203	679
San Pedro	254	7,447	7,701	20,002	362	1,281	942
Cordillera	316	2,137	2,453	4,948	216	122	240
Guaira	169	3,087	3,256	3,846	175	399	204
Caaguazú	280	4,257	4,537	11,374	462	1,819	489
Caazapá	34	3,308	3,343	9,496	144	1,385	249
Itapua	358	6,394	6,752	16,525	491	5,278	528
Misiones	149	2,186	2,335	9,556	100	144	415
Paraguari	302	2,251	2,553	8,705	247	310	443
Alto Paraní	207	5,130	5,337	14,895	705	5,773	325
Central	321	1,609	1,930	2,465	1,334	89	88
Ñeembucú	22	1,892	1,914	12,147	88	117	412
Amambay	0	1,602	1,602	12,933	137	636	594
Canindeyú	108	3,836	3,944	14,667	146	2,168	625
Pte. Hayes	645	1,235	1,880	72,907	83	47	1,844
Alto Paraguay	0	802	802	90,943	38	29	294
Boqueron	121	2,699	2,820	83,075	15	144	589
Total	3,445	52,363	55,808	406,535	4,935	19,946	8,962

(2) Road Development Target by Department

Department	Road Length(Km) in 2020			Area (Sq.km)	2020		
	Paved	Unpaved	Total		Population (1000)	Cultivated Area(sq.km)	Cattle (head)
Concepción	1,007	4,677	5,684	18,051	208	178	704
San Pedro	1,584	6,315	7,899	20,002	462	1,374	939
Cordillera	393	4,450	4,843	4,948	209	116	222
Guaira	334	4,890	5,224	3,846	175	394	205
Caaguazú	1,049	6,965	8,014	11,374	517	2,046	483
Caazapá	303	7,484	7,787	9,496	147	2,312	227
Itapua	1,181	11,821	13,002	16,525	616	5,621	533
Misiones	496	4,645	5,141	9,556	103	144	393
Paraguari	666	4,774	5,440	8,705	234	294	413
Alto Paraní	1,500	11,976	13,477	14,895	1,171	6,255	316
Central	2,787	2,038	4,826	2,465	2,530	87	94
Ñeembucú	483	4,550	5,033	12,147	88	115	401
Amambay	829	5,702	6,531	12,933	167	846	602
Canindeyú	924	8,411	9,335	14,667	187	2,760	672
Pte. Hayes	2,272	4,200	6,472	72,907	101	45	1,831
Alto Paraguay	95	2,328	2,423	90,943	17	235	295
Boqueron	547	2,722	3,270	83,075	48	137	596
Total	16,450	97,950	114,400	406,535	6,980	22,959	8,927

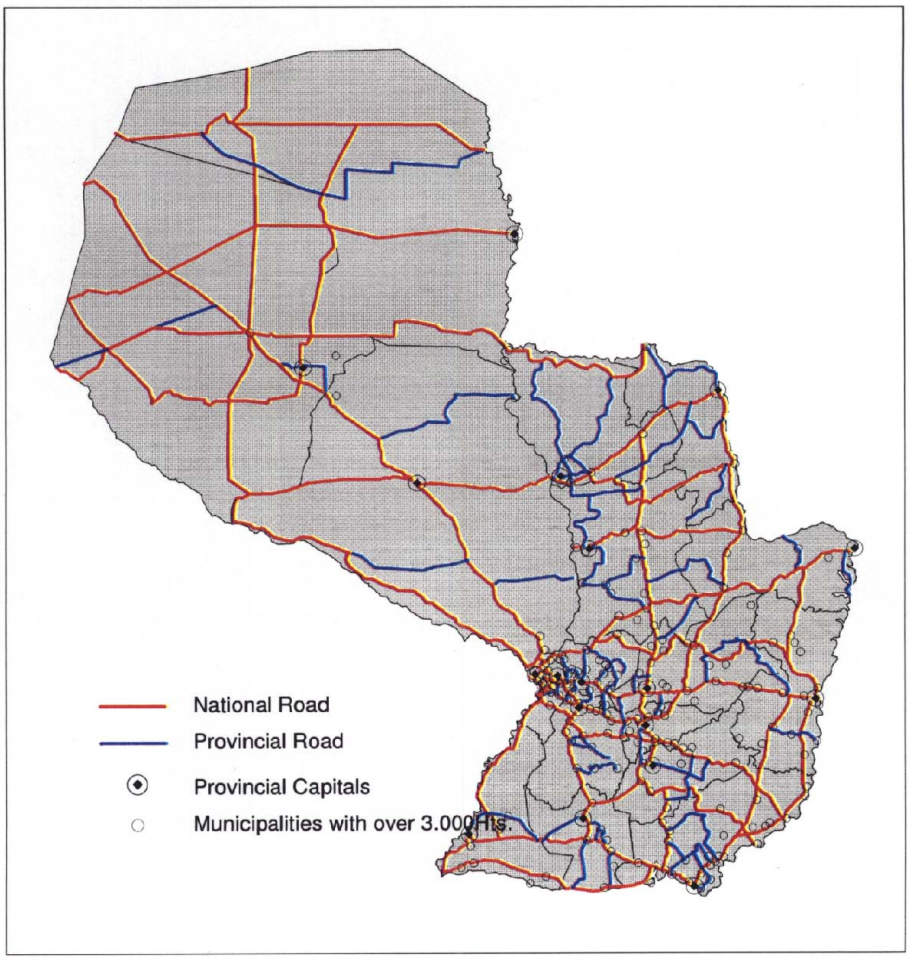
3) Establishment of the main road network

Paraguay has already established by Law National Roads Nos. 1-12, but it's still a large-meshed net. It is necessary to add more National Roads, and to prepare a main road network formed by National and Departmental Roads.

Attention was paid to following points when preparing the idea for the main road network:
To fulfill the targets for road repair already explained.
National Roads cross two or more departments, and the network is formed by National Roads only.
Departmental Roads complement National Roads, by connecting cities with more than 2,000 inhabitants.

Figure 51 shows the established main road network

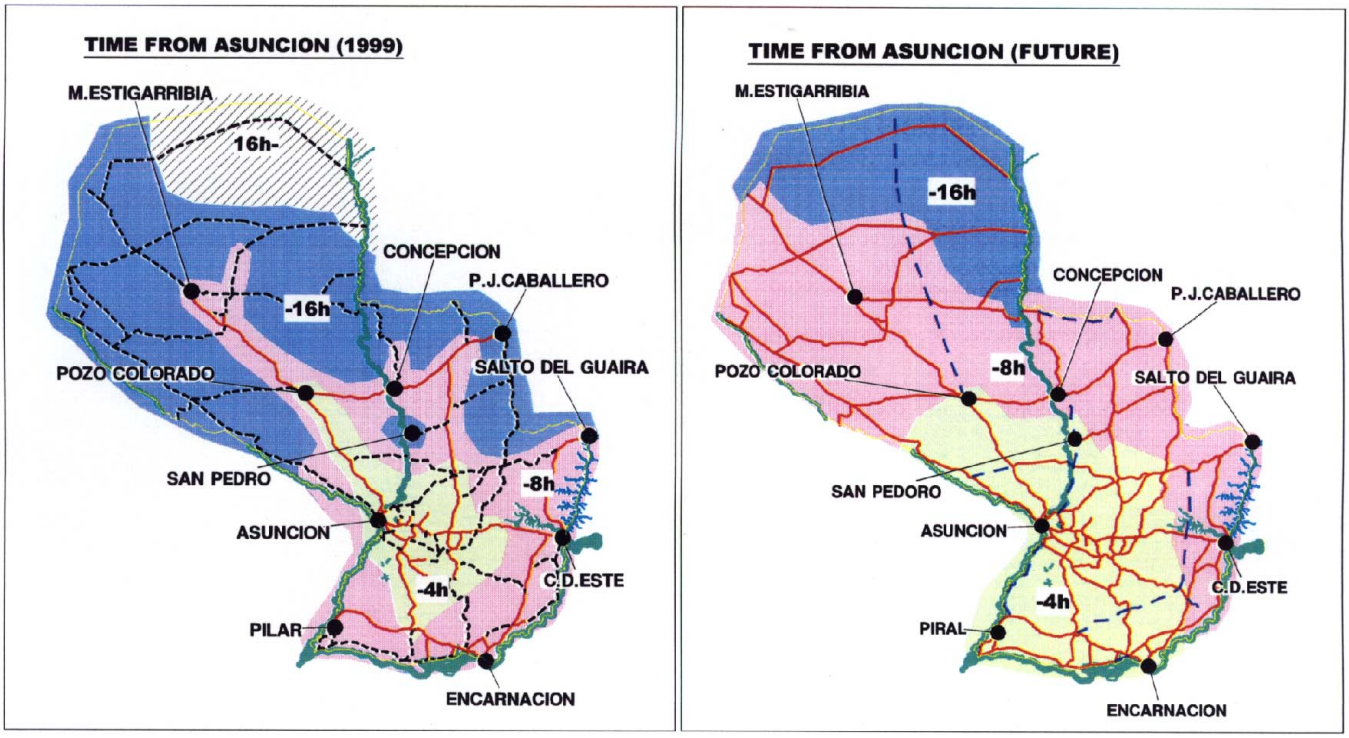
Figure 51 Main Road Network throughout the Country (year 2010)



4) Reduction in time per distance

Assuming that the proposed main road network is completely repaired, the time needed to reach Asunción will be as shown in Figure 52. The area within 4 hours will expand drastically, and 90% of the national territory will be covered within 8 hours.

Figure 52 Reduction of Time Needed from the Capital, Asunción



(3) Port/waterway

1) Repair of ports/waterways

Figure 53 shows repair projects for ports and waterways. Port Pilar can substitute for Ports Asunción and Villeta when the water level in Paraguay River sinks, and MOPC has completed its detailed design. Port Encarnación is expected to increase its function as an embarkation port for the export grain coming from granaries in the east, such as Itapúa and Alto Paraná, and the expansion of container terminals, storage facilities, etc, is suggested. Moreover, though Paraná River has difficulties for navigation, due to its narrow width and silt accumulation, its maintenance and repair are difficult because there is only one dredger available. It's suggested to increase the number of dredgers and to prepare a navigation support system in order to secure safe navigation.

According to the future volume of freight each ports, the volume of freight of Pilar port is the largest, so that the improvement of Pilar port is necessary. Also the amounts of freight of private ports increase. At present, most of private ports is located by the Paraná River, in the future, a lot of private ports will be developed Paraná river coast considering that production districts are located near that river. If this disorder development is left, a bad influence is given to a coastal environment. It is important to establish the permission system for private port construction, to improve the public ports (Encarnación) along the Paraná river for preventing this disorder development.

Figure 53 Port/waterway project

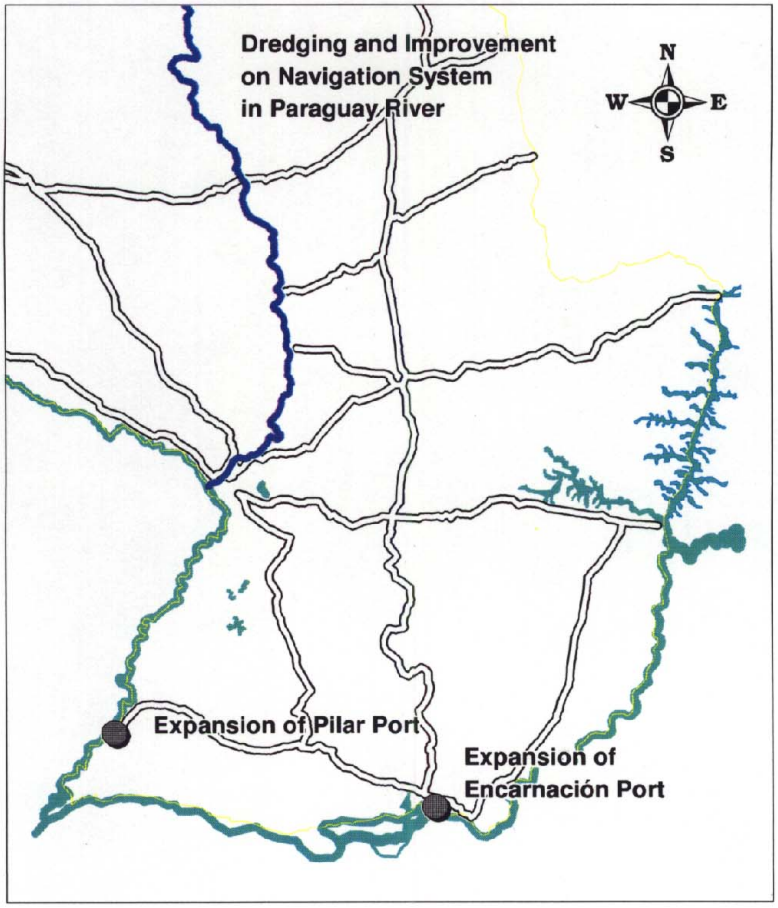


Table 46 Estimated Volume of Freight by Each Port

(1000 tons)

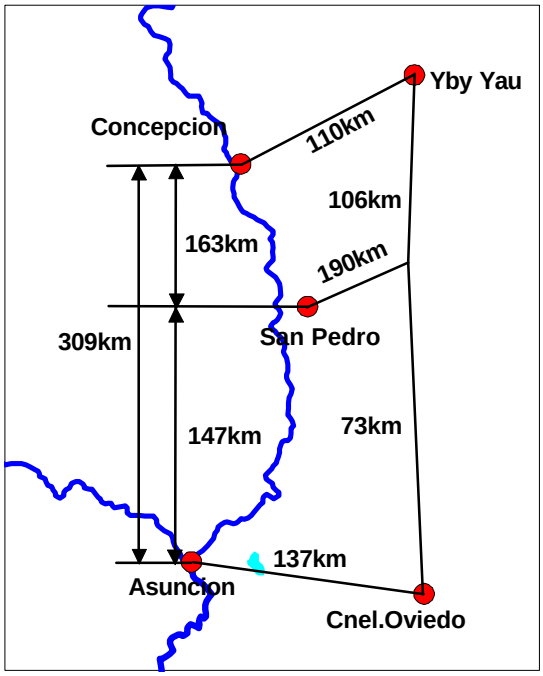
Mode	Custom	Exportation			Importation			Exportation+Importation		
		1997	2010	2010/1997	1997	2010	2010/1997	1997	2010	2010/1997
Barge	Asunción	115	138	1.20	261	320	1.23	376	458	1.22
	Villeta	224	268	1.20	60	101	1.68	284	369	1.30
	Concepción	57	69	1.21	0	0	–	57	69	1.21
	Encarnación	408	478	1.17	1	1	1.00	409	479	1.17
	Plair	0	360	–	0	554	–	0	914	–
	Private Ports	923	1,024	1.11	1,004	2,109	2.10	1,927	3,133	1.63
	Total	1,727	2,337	1.35	1,326	3,085	2.33	3,053	5,422	1.78
Truck	Cdad.Del Este	1,722	1,633	0.95	680	1,533	2.25	2,402	3,166	1.32
	Encarnación	42	28	0.67	63	118	1.87	105	146	1.39
	José Falcón	517	517	1.00	539	1,072	1.99	1,056	1,589	1.50
	Pedro J.Caballero	146	144	0.99	33	44	1.33	179	188	1.05
	Salto del Guairá	91	116	1.27	9	13	1.44	100	129	1.29
	Mcal.Estigarribia	0	0	–	0	265	–	0	265	–
	Total	2,518	2,438	0.97	1,324	3,045	2.30	3,842	5,483	1.43
Rail	Encarnación	171	251	1.47	74	111	1.50	245	362	1.48
	Total	171	251	1.47	74	111	1.50	245	362	1.48
Total		4,416	5,026	1.14	2,724	6,241	2.29	7,140	11,267	1.58

2) Rapid river bus project

If roads are not in good condition yet, boats may offer advantages over buses for passenger transport. Asunción – San Pedro – Concepción is a good example: as there is no road along Paraguay River, buses

have to take a roundabout route, through Coronel Oviedo and Yby Yau. The distance between Asunción and Concepción is 210 km in a straight line, but the road distance is 543 km. On the other hand, the sailing route via Paraguay River is 309 km. In the same way, the distance between Asunción and San Pedro is 348 km by road and 147 km by water. A project to introduce a rapid river bus, making use of this advantage in distance, was studied.

Figure 54 Distance between Asunción and Concepción by Road and River



a. Potential demand

The number of passengers between the Central department and Concepción was 430 per day in 1997, and almost all of them were bus passengers. In the case of passengers between Central and San Pedro, the number was about 2,500 per day. These numbers are expected to increase by 2.1 times and 1.7 times, respectively, by 2010. The ratio of passengers among the potential demand for using the river bus depends on the river bus charge and on the choice of passengers. Assuming that 10% of the demand will be shifted to the river bus, a number sufficient to make the project feasible is obtained.

Table 47 Potential Demand for Express River Bus

(passenger / day)

Mode Section / Year	Asuncion – Concepcion		Asuncion – San Pedro	
Year	1997	2010	1997	2010
Car	14	30	127	529
Bus	417	889	2,401	3,865
Total	431	919	2,528	4,394

b. Operation outline

Five rapid boats with capacity for 100 passengers, and an average speed of 70 km per hour, will be purchased, and put into passenger transport service for the Asunción – San Pedro – Concepción route. One boat will make one round-trip through the whole route per day. Three boats will travel between Asunción and San Pedro, and each of them will make two round-trips. They will not cruise at night due to safety reasons. One boat will be a reserve.

The cruising time from Asunción to Concepción will be 4.5 hours, and to San Pedro, 2.1 hours. This is 40-50% less than the travel time by bus. The fare by bus from Asunción to Concepción is Gs 40,000-65,000. Taking into consideration the shorter traveling time, fares for the river bus will be established at Gs 100,000, and Gs 50,000 to San Pedro.

c. Investments

Investments from the private sector are assumed. Construction of a new rapid boat-type Catamaran with 1,200-ps engine, and 100- passenger capacity, costs US$1,100,000 (hull US$600,000 and engine US$500,000). Assuming that 5 boats are purchased, and initial expenses are 20% of the cost of the boats, the necessary funds will be US$6,600,000 (Gs 23.1 billion, based on the exchange rate of year 2000). If 20% is owned capital and 80% is a loan, the capital that the enterprise needs will be about US$1.3 million.

The cost of a place to moor the boats, and a dockyard will be borne by the enterprise, but the harbor will be a public work with the cost borne by the government, taking into consideration the public nature of the project. In addition, waterway maintenance and installations for the safety of navigation shall be also provided as public work.

d. Operation cost

The crew of each boat will be one captain, one mate, and two crews. The navigation distance per year for one boat will be about 100,000 nautical miles, and navigation time will be 3,000 hours. Based on these assumptions, the operation cost was calculated as shown in Table 48. The basis of calculation is explained below.

Table 48 Operation Cost of the River Bus

(Gs. million/year)

Expenditure item	Cost
1) Fuel	1,122
2) Oil	150
3) Maintenance cost	963
4) Depreciation cost	1,283
5) Capital opportunity cost	1,155
6) Personnel cost	426
7) Administration	510
8) Total	5,609

-Fuel cost:

Consumption of diesel oil is proportional to the size of the engine (ps) and navigating distance, being 1.7 liters/ps per 1,000 nautical miles. The price of diesel oil is 1,100 guarani/liter.

-Oil cost:

Consumption of oil is proportional to the size of engine (ps) and navigating distance, being 2 liters/100 ps per 1,000 nautical miles. The price of oil is 12,500 guarani/liter.

-Maintenance cost:

Annual cost of maintenance/repair is estimated as 5% of the boat cost.

-Depreciation:

Fixed amount for 12 years; the residual value will be 20% of the boat cost.

-Capital opportunity cost:

12% of the average remaining value (50% of the boat cost).

-Personnel cost:

For Captain, 3.6 million guarani/month; Mate, 1.5 million guarani/month; Crew, 1 million guarani/month; the cost of land personnel will be included in administration cost.

-Administration cost:

Estimated as 10% of the total of above expenses.

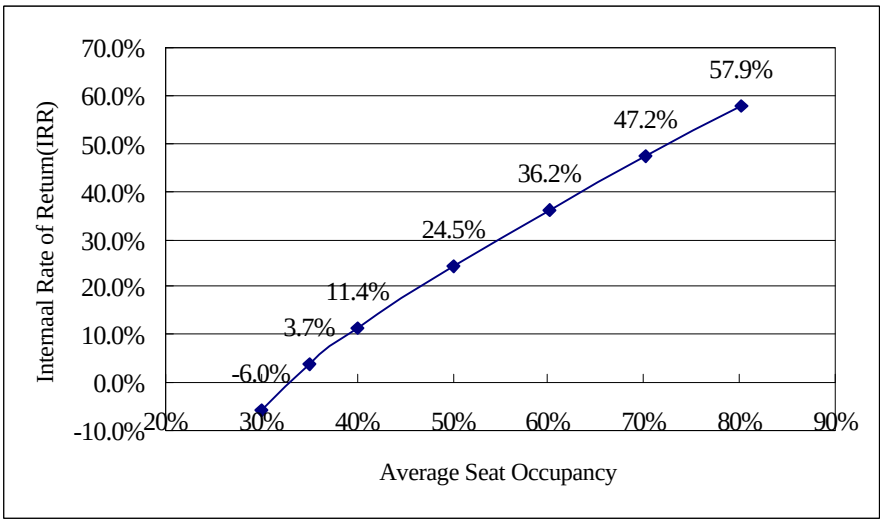
e. Profitability

Assuming that the average seat occupancy (passengers/capacity) will be 50%, the annual (assumed as 300 days) income will be Gs12 billion (100 passengers x Gs100,000 x 4 boats x 2 services x 300 days x 50%). The merit of this riverboat is its short traveling time, due to the fact that the navigating distance is shorter than the road distance. Consequently, if a road along the river that directly connects Asunción – San Pedro – Concepción is constructed and bus services starts in the future, demand for the river bus may drop drastically. Therefore, the internal rate of return (IRR) was calculated from the above-mentioned investment amount, operational expenses, and income, assuming the project life of river bus as 10 years (period until the construction of new road and start of bus service). The result was IRR of

24.6%, revealing that the project has enough profitability to introduce capital from the private sector.

As for the expected seat occupancy, more detailed studies are required. Figure 55 shows the correlation between occupancy rate and IRR. If a net IRR higher than 10% is required to introduce capital from the private sector, seat occupancy must be higher than 40%. It can be also said that, if 20% profitability is enough, and seat occupancy higher than 60% can be expected, reduction in fare by more than 20% is possible.

Figure 55 Correlation between Average Seat Occupancy and Internal Rate of Return (IRR)



f. Conclusion

It was indicated that introduction of a rapid river bus making use of capital from the private sector has a big potential. Keeping the waterway of Paraguay River in good condition is important also from the viewpoint of promoting exports through repair of the export corridor, and, moreover, it is internationally agreed as a responsibility of Paraguay to maintain the section of the waterway belonging to the country. Improvement of the waterway is not wholly succeeding due to lack of funds, but this project is worth studying from the viewpoint of promoting the improvement, by increasing the economic effects of the work. Once this project succeeds, the possibilities of extending it to upper stream cities such as Valle Mi, Puerto Olimpo, or Bahía Negra may be studied.

(4) Terminal

As cargo transport increases, freight vehicles also increase. Especially, export cargoes from production area to customhouses will grow significantly due to diversification of production area. To mitigate road traffic congestion, large trucks are desirable on trunk roads than small ones from the view of transport efficiency. In this connection, truck terminals will become needed for efficient transshipment from large truck to small trucks and vice versa.

Locations of truck terminals should be studied, taking into consideration as a candidate sites, for example, Ciudad del Este as a gateway of road transport to/from Brazil and Ypacaraí as a entrance to the Capital Region.

(5) Organization/system

1) Functional road classification

By the Presidential Decree No.40 in 1954, roads in Paraguay are classified into 3 categories: national roads (rutas), departmental roads or branch road (caminos departamentos or ramales) and local roads (caminos vecinales). This is not a functional classification but an administrative classification. Actually, traffic volumes on 12 national roads are quite variable from less than 100 vehicles per day to more than 40,000 vehicles per day. No clear structural difference exists between departmental roads and local roads. Besides the administrative classification, therefore, it is recommended to define a functional classification (such as international road, primary and secondary trunk road, local road, agricultural road, forestry road, etc.) and establish standards for design, bridge structural design and maintenance for each category road.

2) Decentralization of road administration

Presently, most roads are administrated by MOPC and it is apparently difficult for one Central Government Organization to manage such a large network composed by national, departmental and local roads. Therefore, decentralization of road administration should be promoted. In this case, responsible agencies should be clearly defined for each road category of functional classification stated above. Table 49 shows an example of demarcation of responsibility. Administrative body does not mean here an operational body but an agency to undertake final responsibility.

Table 49 Road Function and Administrative Body

Road Function	MOPC (Central Gov.)	Departme nt	Munici- Pality	Others	Remarks
International Road	○				MERCOSUR Road
Trunk Road	○				
Secondary Trunk Road	○	○			
Local Road		○	○		
District Road			○	○	
Farm Road				○	

Note: Others are owned by private company or individuals and cooperatives

To promote this decentralization, departmental and municipal offices will need to set up a proper organization in charge, financial arrangement, and to procure equipment and personnel. In addition, MOPC should study to standardize road and bridge planning and administration.

3) Reinforcement of planning agency

MOPC established the Integrated Transportation Planning Office (OPIT) under Vice Ministers in 1990, charging roles of study and research on nation-level transportation development, transport demand study and formation and prioritization of transport projects. However, it is not necessarily functioning properly mainly due to shortage in budget and personnel. As proposed by ETNA in 1992, it should be positioned directly under the Minister and over Departments. In addition, it should be a decision-making agency for investment planning. For this purpose, OPIT must be reinforced in personnel and technical capacity and OPIT should manage all transportation data for planning basis and be responsible to issue a transport statistical yearbook annually.

(6) Finances

The main reason for the delay in infrastructure development is a lack of financial resources. Therefore, it's necessary to create new financial resources, designated for the exclusive use of transport infrastructure development. There are two principles to be followed when creating such resources. One is "payment by beneficiaries" and the other, especially important in Paraguay, is "transparency of capital flow." In the case of road infrastructure, the direct beneficiaries will be the users of the road and owners of land along it. Part of the benefits will be collected from the former through tolls, a tax on fuel, and a tax on vehicle purchase and vehicle property. As for the latter, part of cost for the infrastructure may be borne by them through a tax on real estate or a valorization system.

The effects of taxation on road users have been studied quantitatively. The new tax explained below shall be collected in addition to the existing tax, and it will be necessary to legally approve that the increased amount of tax will be used exclusively for roads development.

The tax on gasoline and gas oil shall be increased by 10% of the retail price (5% for the first 3 years). Regarding vehicles, 10% of the car price shall be collected as an acquisition tax, and 1% per year as an ownership tax. However, buses will be exempted from this tax.

As a result, a total of US$4 billion (Gs14 trillion) through 2010 can be expected as the financial resource for transport infrastructure. Taking into consideration that the current resource has a level of about US$1 billion, the new system will enable investment on a scale 5 times larger than the current one, and the infrastructure can be developed to the same level as in surrounding countries.

Figure 56 Creation of New Financial Resources for Transport Infrastructure Development

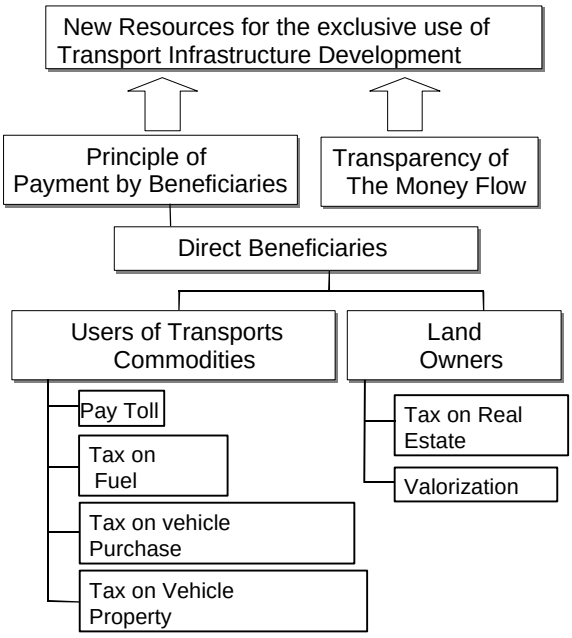


Table 50 Creation of New Financial Resources for Transport Infrastructure Development

(US$ Million at 2000 price)

Kind of Objective Tax	2003	2004-2006	2007-2010	Total
Tax on Fuel	33	152	379	564
Tax on Vehicle Acquisition	161	556	944	1,661
Tax on Vehicle Ownership	183	592	909	1,684
Total	377	1,300	2,232	3,909

(7) Railway

The proposed project on railways is shown in Figure 57. However, it's necessary to study the demand forecast (analysis of needs), cost calculation, and operating organization (privatization) to analyze its feasibility.

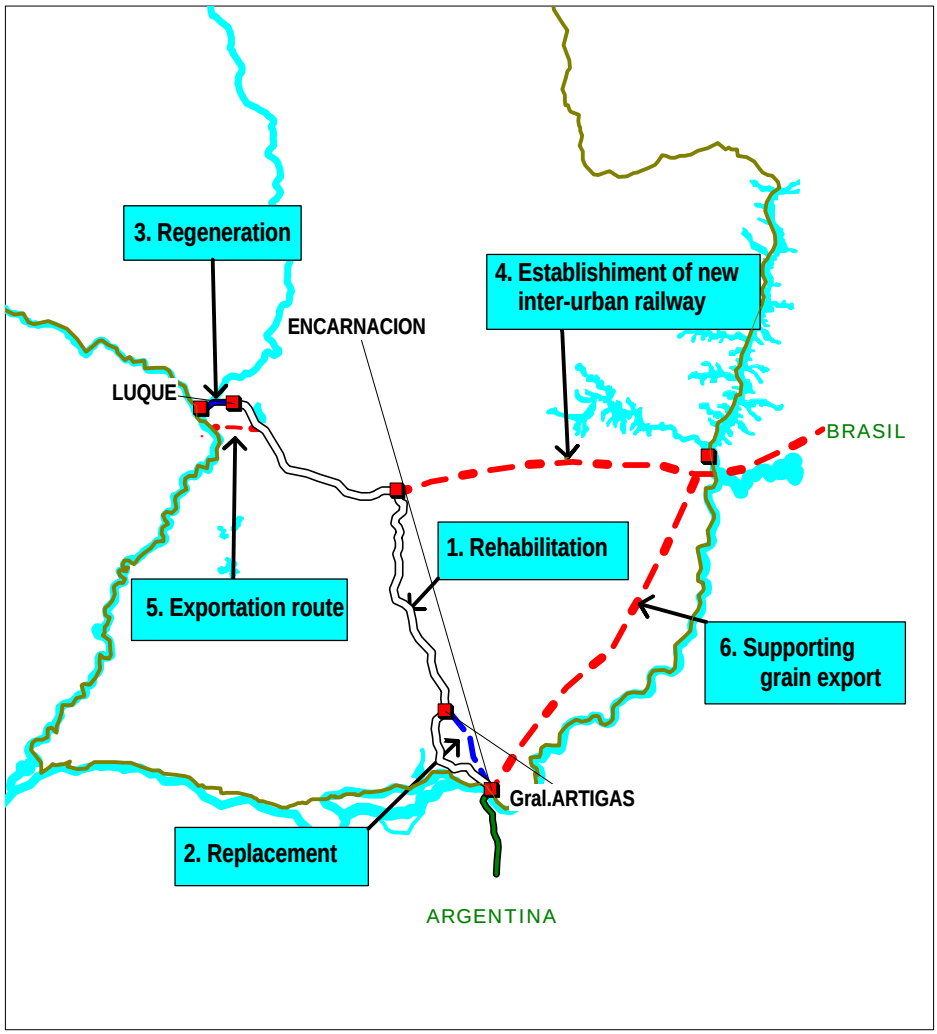
1) Restoration of existing route

With regards to railways, the effective use of existing facilities shall be studied first. Several companies, including a Spanish, one are now making proposals on a restoration plan for the existing route. In these plans, demand is based on a bold estimation and needs to be carefully examined. The flow of passengers between the departments of Central and Itapúa is estimated as 8,000 passengers/day.

Table 51 Potential Demand Forecast of Existing Route

Passengers	Persons/Day
Central – Itapua	2,500
Centrai – Guaira	2,800
Central – Cordillera	1,600
Central – Caazapa	1,000
Total	7,900

Figure 57 Railway Improvement Plan



2) Repair of the Encarnación – Gral. Artigas route

Repair of the route in the area that will be submerged with the construction of Yacyreta Dam has been promised by the dam company. However, taking into consideration the fact that the area has not yet been submerged and operation has already been suspended, the plan requires revision. It's necessary to elaborate a plan that takes into consideration the physical distribution needs along the route (in particular, the export needs of soybean production and import needs for fertilizer) and passenger flow needs.

3) Regeneration as an urban railway

In the "Aftercare Study on Urban Transportation Planning in Asunción Metropolitan Area, 1999 JICA," it is proposed to introduce a basic bus system to the roads to meet demand for buses and relieve traffic congestion. If this demand still increases, introduction of a rail system shall be needed.

The demand for buses on the route along the existing Asunción – Luque railway is estimated as 70,000 passengers/day in 2010, so railway can be studied as a possible traffic method to satisfy part of this demand.

In this case, methods to control the competing bus and car traffic shall be also studied.

4) Establishment of new inter-urban railway

One potential route shall be Asunción – Ciudad del Este – Cascavel (Brazil). This route connects the capital Asunción with the second largest city Ciudad del Este, and its passenger demand in 2010 is estimated as 28,000 passengers/day, as shown in Table 52.

Table 52 Inter-departmental Bus Passengers in 2010

Passengers travelling between departments			Passengers/day
Central	-	Alto Paraná	23,894
	-	Guairá	2,780
	-	Cordillera	1,660
Guairá	-	Alto Paraná	40
Total			28,374

As for freight transport, taking into consideration that the import volume from Brazil in 1997 was 1,903,000 tons and the export volume 737,000 tons, and that 90% was transported by land, the connection of a railway link to Brazil makes possible trade by railway. A reduction in transport cost can also be expected.

Regarding the connecting point with Brazil, coordination will be needed with the route for the second Amistad bridge. One point that will require attention is the difference in rail track gauge between Paraguay and Brazil. If connection with Brazil is a premise, plans shall be made in accordance with the Brazilian rail gauge.

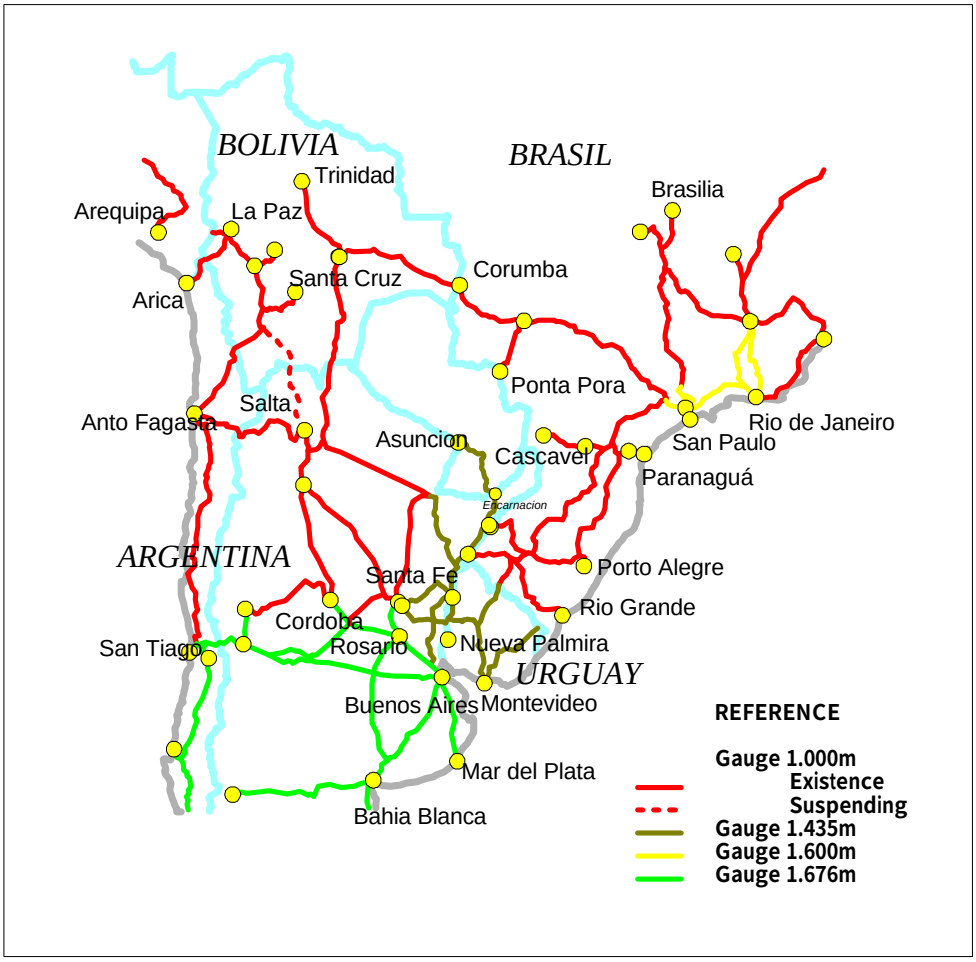
5) Transport route to exporting ports

The port of Villeta in Central Department has now the biggest volume of freight handled, and its main item is soybeans. Water transport using Paraná River will increase in the future and the importance of

Villeta will decrease relatively, but nevertheless a significant volume will be handled there. Therefore, when analyzing the feasibility of the above-mentioned inter-urban railway between Asunción and Ciudad del Este, a freight line branching off from Coronel Oviedo or Ypacaraí to Villeta port shall be planned.

In addition, analysis from the viewpoint of physical distribution shall be made together with studies of a distribution terminal.

Figure 58 Difference in Rail Track Gauge



6) Railway supporting grain export

The region between Ciudad del Este and Encarnación is a granary of soybean production. One idea shall be to establish a railway here to support exportation. This route will connect Encarnación and Argentina, and coordination of rail width with the Asunción – Ciudad del Este line shall also be required.