

3.2.4 Transport infrastructure

(1) Problems and tasks in current transport infrastructure

1) General

JICA elaborated in 1992 a General Transport Plan (ETNA Plan 2010), and the repair of infrastructure has been taking place in Paraguay based on this plan, showing progress especially in the roads. As for ports, Villeta and Concepción have been repaired, and private ports along Paraná River were also repaired. However, almost no progress has been seen with regards to the railroad, which is operated only in a limited section.

On the other hand, drastic changes of traffic movement were observed since the last master plan. Table 4 shows a comparison between the estimation of the ETNA Plan 2010 and actual figures of agricultural production. Production volume of soybeans has exceeded the estimation, but the remaining items show actual figures far below the estimation. The difference is drastic for cotton, the production of which suffered from drought in 1997. Consequently, an increase was observed in waterway transport, which is the main transport method for soybeans, and the repair of ports and waterways is gaining importance.

Table 17 Transition in Agricultural Production Volume

Year	Actual volume (Ton)				Estimation in ETNA (1,000 Ton)			Difference (A)/(B)
	1994	1995	1996	1997 (A)	1990	2000	1997 (B)	
Wheat	375,679	208,617	543,435	400,189	453	1,171	956	0.419
Maize	461,664	816,167	654,074	1,055,661	1,081	1,909	1,661	0.636
Soybean	1,795,792	2,212,109	2,394,794	2,670,003	1,497	2,279	2,044	1.306
Sugar cane	2,799,318	2,576,000	2,736,000	2,795,000	3,284	4,844	4,376	0.639
Cotton	379,877	461,239	329,751	139,096	539	885	781	0.178

When studying repair of the transport infrastructure in Paraguay, it is necessary to think not only of “hard infrastructure”, but also of “soft infrastructure,” such as management of each transportation organ and financing. To increase efficiency, considerable investment is needed. Paraguay’s infrastructure repair has been delayed, even when compared with other countries in South America, and it’s necessary to actively promote repair in order for Paraguay to keep its position within MERCOSUR. In order to achieve this purpose, it’s important to make clear the roles assigned to the central and local governments, and public and private sectors, and to proceed with effective repair works.

2) Roads

Significant efforts are being made to repair the roads, but they have not yet achieved a satisfactory level, in quantity or quality. The following are existing problems related to roads:

- The pavement rate is low.
- The functional classification of roads is not clear.
- The repair of roads to Bolivia has been delayed.
- Maintenance is not satisfactory.

It is obvious that a big portion of these problems is due to the lack of funds. Though the cost of maintenance/repair varies according to the type of road and contents of the maintenance/repair, the following is a simulation using the unit cost assumed by MOPC, indicating that the appropriate cost for maintenance/repair shall be 66 million dollars per year. However, the actual budget amount for 1999 is about 10 million dollars, which is less than 1/6 of the amount needed.

National roads (paved)	2,585km x 3,000US\$/km/year =	US\$7,755,000
National roads (not paved)	1,905km x 2,000US\$/km/year =	US\$3,810,000
Departmental roads (paved)	788km x 2,000US\$/km/year =	US\$1,576,000
Departmental roads (not paved)	4,439km x 1,500US\$/km/year =	US\$6,658,500
Rural roads (paved)	137km x 1,500US\$/km/year =	US\$205,500
Rural roads (not paved)	46,020km x 1,000US\$/km/year =	US\$46,020,000
Total		<u>US\$66,025,000</u>

3) Port/Waterway

As already explained, waterway transport is increasing in importance together with the expansion of soybean exports. However, in Paraguay River, the fleet needs to be dismantled due to lack of depth and width, and a bad sailing route configuration, resulting in extra days of travel and a reduction in loading capacity during the dry season, thus hindering efficient services. The lack of depth is also due to a lack of dredgers, which are leased from Argentina, but the quantity is still insufficient.

4) Railroads

The Carlos Antonio Lopez railroad (FCPCAL: Ferrocarril Presidente Carlos Antonio Lopez), connecting the capital Asunción with Encarnación, was opened in 1861. Locomotives, passenger cars, freight cars, rails, etc. were renewed in the 1910s, but investments for modernization have been neglected since then. The installations thus became obsolete, competition with truck transportation

became impossible, and the demand kept on decreasing. In the early nineties, part of the railroad was compensated for submergence due to construction of Yacyreta Dam, giving a chance for renewal of the rails and installation, but this was not realized, and the transport of cargo was discontinued along the whole route. Now there is only one service per week for tourist passengers between Asunción and Ypacarai. There is an idea to reactivate the operation by privatization, but it seems they missed a chance.

The reason why FCPCAL decayed is that they didn't make efforts to keep share in transport by competing with trucks, deteriorating the service quality (low transport speed, frequent accidents) and further reducing the demand, thereby forming the vicious circle. In order to end off this vicious circle and restore railway transport, drastic plans and investments detached from the current organization and installation shall be required.

5) Organizations and system

Organizations related to transport and issues regarding their operation can be summarized in four points.

a) Lack of public investment

The development of social capital in Paraguay is delayed because of the low level of public investment. Improvement of social capital has an important effect in bringing a comfortable life to people and providing a base for the economy. As its funding source is taxes, growth of the economy results in an increasing social capital standard, and improvement of social capital leads to growth of the economy. Therefore, funds for the repair of transportation infrastructure shall be brought from sources other than existing taxes. Based on the benefit principle, a system to collect funds from the users of the transport system shall be prepared.

b) Concentration in road administration

Roads in Paraguay are under the administration of MOPC, with few exceptions. It is obvious that local governments with a small financing scale cannot take care of everything, but it's also impossible for MOPC to do so. This situation has resulted in the delay of road repairs in rural regions. It's necessary to make clear the distinction among National Roads, Departmental Roads, Rural Roads, and Farm Roads, and to enrich the road plans/administering organizations in local governments, enabling the decentralization of power.

c) Insufficient control (planning) standards

Expansion in the transport infrastructure, especially in road extension, results in increase of the cost and time required for maintenance and administration. In Paraguay, the design standards for roads are basically those of Brazil. Moreover, those standards are applied only for national and equivalent roads, and there is no consideration for local roads. It's necessary to prepare planning/design standards for each type of road, and to make clear the standards for maintenance and administration.

d) Delay of data control

In order to elaborate the transportation plan, it's necessary to grasp the current situation of installations and usage. However, as the control of data is not centralized, there are cases in which the data are fragmented or inconsistent. It's required to collect necessary data periodically, and to review the organization from the viewpoint of data control.

(2) Forecast of future traffic demand

1) Passenger demand

The total flow of passengers among departments is estimated to increase by 36%, from 74,000 passengers in 1997 to 100,000 passengers in 2010. The growth rate will be especially high in movement by car, and the number of cars will be more than double.

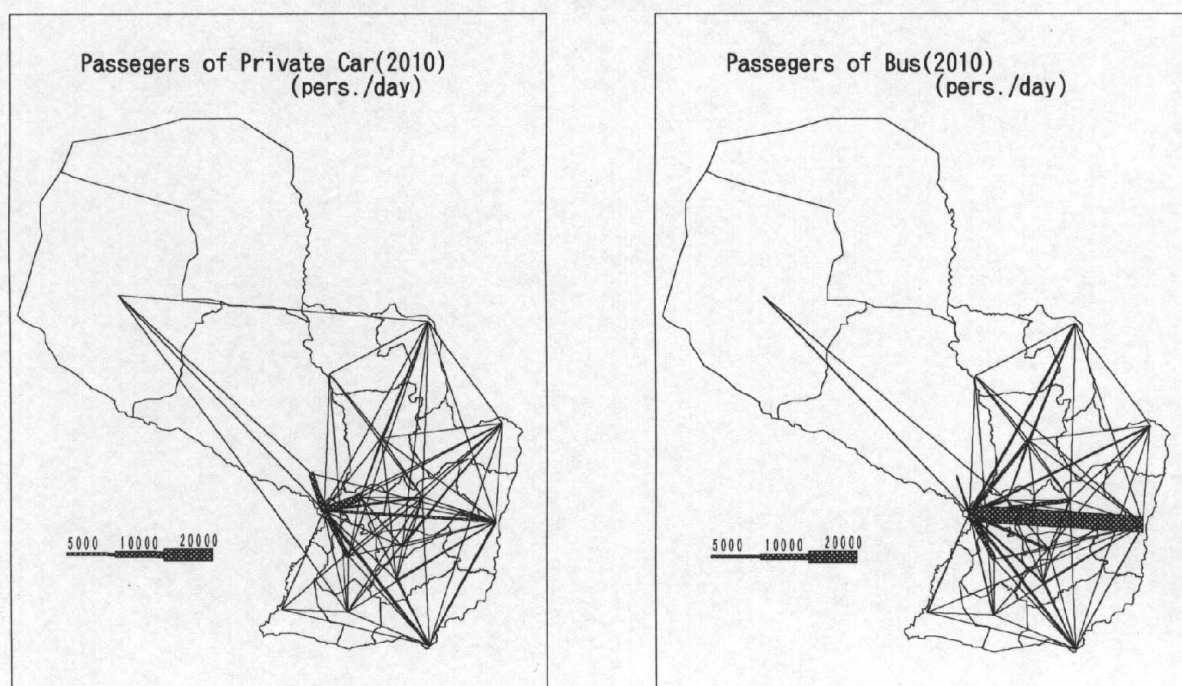
As for the distribution of passenger traffic among departments, regarding traffic by car, movement to all directions with Central Department as the center shows high volume. However, with regards to public transport, movement between Central Department and Alto Paraná Department exceeds 20,000 people per day, indicating significant needs for public transport connecting Asunción and Ciudad del Este.

Table 18 Flow of Passengers among Departments

		1997	2010	2010/1997	
Population	Number of persons	5,095,666	6,980,321	1.37	
Number of passenger cars	Number of cars	241,787	571,691	2.36	
Total flow of passengers	Persons/day	73,869	100,603	1.36	
	Cars	Persons/day	19,011	41,455	2.18
		Cars/day	7,760	16,920	
	Bus	Persons/day	54,858	59,148	1.08
		Cars/day	2,032	2,191	
	Railway	Persons/day	0	0	
		Cars/day			

Average number of passengers Cars: 2.45 persons/car Bus: 27.0 persons/vehicle

Figure 4 Flow of Car and Bus Traffic among Departments (2010)



2) Freight demand

Regarding transport demand for freight, it will increase by 50%, from 36,469,000 tons to 54,592,000 tons in 2010. The international transport (export volume plus import volume) will increase by 58%, from 7,141,000 tons to 11,267,000 tons, and its percentage of the total transport demand increases from 19% to 21%, indicating that international transport will become more important. Its importance will also increase taking into consideration the transportation distance.

Figure 5 Forecast of Transport Demand by Item

