TIMOR-LESTE TRANSPORT SECTOR

OUTLINE OF PRIORITIES AND PROPOSED SECTOR INVESTMENT PROGRAM

EASTR Working Paper No. 5
Transport Sector Unit, Infrastructure Department
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Abbreviations and Acronyms

AADT	Average annual daily traffic (annual traffic = AADT x 365)
ADB	Asian Development Bank
CBM	Community-based maintenance
CEP	Community Enhancement Program
CFET	Consolidated Fund for East Timor
DCA	Directorate of Civil Aviation (of MTCPW)
DEM	Directorate of Equipment and Materials (of DRBFC)
DLT	Directorate of Land Transport (of MTCPW)
DRBFC	Directorate of Roads, Bridges, and Flood Control (of MTCPW)
DST	Directorate of Sea Transport (of MTCPW)
EIRP	Emergency Infrastructure Rehabilitation Project
EU	European Union
JEG	Japan Engineering Group
JICA	Japan International Cooperation Agency
km	kilometer
MEAD	Ministry of Environment and Development (former, now Ministry of Development and Environment)
MOJ	Ministry of Justice
MPF	Ministry of Planning and Finance
MTCPW	Ministry of Transport, Communications, and Public Works
NDP	National Development Plan (Planning Commission 2002)
PER	Public Expenditure Review
PWD	Public Works Department (of MTCPW)
RAMS	Road Asset Management System
RDTL	Republica Democrátia de Timor-Leste
SOLAS	Safety of life at sea
TA	Technical assistance
TFET	Trust Fund for East Timor
TLSS	Timor-Leste Social Survey (conducted in 2001)
TSMP	Transport Sector Master Plan for East Timor (ADB)
UN	United Nations
UNDP	United Nations Development Program
UNOPS	United Nations Office of Project Services
UNPKF	United Nations Peace Keeping Force
UNTAET	United Nations Transitional Administration for Timor-Leste

* Unless otherwise indicated, all monetary values are in US$ in current prices

PREFACE

The Government's proposed investment program was prepared under the direction and guidance of the Ministry of Transport, Communications, and Public Works, in close collaboration with the Ministry of Planning and Finance.

The program is part of a larger exercise undertaken by the Government of Timor-Leste that includes investment programs for the following sectors:

Basic service sectors
- Education and training
- Health care
- Housing and other services

Production-related sectors
- Agriculture, forestry, and fisheries
- Natural resources and environment
- Private sector development

Basic infrastructure sectors
- Communications
- Power
- Transport
- Water supply and sanitation

Governance-related sectors
- Public sector management
- Local government and civil society
- Rights, equality and justice
- Security, peacebuilding and reconciliation
- External relations

Supporting expenditure data and analysis have been provided by the Ministry of Planning and Finance. Unless otherwise specified, these data are drawn from two sources. CFET budget appropriations data have been provided by the Budget Office of the Ministry of Planning and Finance for FY2001/02 onwards. CFET data for FY1999/00 and FY2000/01 are rough estimates based on aggregate data for CFET expenditures included in the National Development Plan. Information about external assistance to Timor-Leste comes from the Registry of External Assistance database of the Ministry of Planning and Finance. Data on external assistance are current as of December 31, 2004; they have been made available through the generous cooperation of Timor-Leste's development partners. They are supplemented with information provided by individual government agencies that have responsibilities for particular donor-funded projects and programs. The information about these programs includes assistance channeled by donors through international and local NGOs, as well as programs implemented directly by individual donors. Some data provided by donors are provisional and subject to change as work on individual projects and programs progresses.

The data presented in this paper cover both capital and recurrent expenditures in an effort to present a complete picture of development spending in Timor-Leste. However, as the paper indicates, information on both categories is incomplete in a number of areas.

This working paper was drafted on the basis of findings of a World Bank transport sector study in October 2003 and updated based on joint World Bank-Asian Development Bank in July 2004. This version of the paper incorporates the Government's data on donor programs current as of February 2005, and covers the consensus on which the Governments Sector Investment Plan for Transport, April 2005, was based.

The paper reflects policies and programs for the transport sector as of February 2005.

The original drafts were written by David Bray and Koji Tsunokawa (staff consultants) and William Paterson (Team Leader).

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EXECUTIVE SUMMARY

The Government and community of Timor-Leste face substantial challenges in the transport sector. The international port and airport in Dili are operating satisfactorily, though the decline in demand that is expected to accompany the withdrawal of much of the international presence in mid-2004 will reduce demand at the facilities and hence their revenues. There is no domestic civil aviation, and formal domestic shipping services require a large annual subsidy. Timor-Leste has a substantial 6,000 km road network, though this is generally in poor condition. The country's terrain, geology, and weather conditions significantly add to the costs of providing and maintaining roads. With only 19,600 vehicles in the country, including 6,500 motorcycles and 3,000 United Nations vehicles, the tax base for recovering the cost of providing roads from the community is small.

The Government has established much of the essential framework for the transport sector, including laws, institutions, and development plans. It has also identified a number of key issues that it will need to address in the future.

- Emphasis on infrastructure works will move from a reactive to a preventive approach.
- Road design standards and maintenance practices and vehicle load limits need to be oriented to minimizing life-cycle transport costs.
- Sustainable community-based arrangements are needed for managing the rural road network.
- There is a need to engage with the community to address social issues related to transport.
- There is a need to reduce the environmental impact of transport.
- Government staff need additional resources and new skills.
- The need to undertake more careful feasibility studies and to determine financing sources is likely to lengthen the time required to initiate projects.
- Road investment requirements in particular will remain high.
- Spending will need to rise for adequate maintenance of the current road system.
- Corporate port and airport authorities should become financially self-sustaining in the medium term.
- Developing a sustainable private contracting industry, with good contract management, will minimize the cost to the Government of infrastructure.
- Light-handed regulation of the transport sector is appropriate.
- User charges are essential for a sustainable transport system.

Roads

The road system is degraded and entails a very high cost for the reactive work needed to keep it functioning. The Government therefore has set a five-year program and a ten-year vision for the road system to:

- Bring the road network up to a sustainable condition where, with regular maintenance, life-cycle costs will be minimized, road closures will be reduced and manageable, and road access will be reliable.
- Improve key roads to support a growing economy.
- Ensure effective capacity to manage the road system, comprising asset management systems (including risk management), use of the private sector for cost-effective delivery, and reliable funding and adequate cost-recovery from users.

Ports and airports

The Government's vision for the maritime and aviation sub-sectors in FY2008/09 is to:

- Establish the basis for financially sustainable provision of port and airport facilities from user charges.
- Ensure adequate commercial domestic services, and supplement these services for disadvantaged groups.
- Facilitate international trade and tourism.

Transport development plan

The Government has prepared a transport development plan to support these visions. The plan covers planning investigations, rehabilitation of existing infrastructure, and capacity building to support the continued development of the country's domestic capacity to undertake this work and to sustain its assets in the longer term. Discussions are underway with several donors to implement some of the projects included in the proposed program.

The estimated cost of transport sector development and operation over the five-year period to FY2008/09 is almost $176 million. This excludes operations and minor investments in the port and airport in Dili, which are to be financed by user charges. This ambitious program is double that of the past five years. Ongoing donor programs and CFET would provide about $95 million of the funding needed. Additional CFET allocations of $23 million would be required as well as $56 million of new donor funding. The Government expects to be able to generate an additional $8 million by raising fuel taxes as the cost of imported fuel is reduced, and by introducing annual vehicle registration charges that will be enabled by a proposal in the investment program.

Under the proposed program, annual expenditures in the transport sector would rise from about $12 million in FY2003/04 to about $47 million in FY2006/07 and then tail down to about $27 million by FY2008/09. Road construction and maintenance would account for a large share of the increase, rising to $34 million in FY2006/07.

Successful implementation of the program depends not only on the availability of funding, but equally on aggressive action aimed at building implementation capacities within the sector. The program offers a major opportunity to develop Timor-Leste's domestic construction industry since it would involve more than $100 million of civil works and maintenance

expenditures over the five-year period. Recent years have seen good progress in building the capacity of the local industry, which in turn offers significant job opportunities. The Government recognizes the contribution that the construction sector can make to the development of small and medium enterprises and to employment. The policies and programs that are needed to take advantage of these opportunities are discussed at greater length in the draft SIP report for Private Sector Development.[1]

[1] Available at <http://www.mopf.gov.tp/tldpm/SIP.htm>

I. THE SETTING FOR THE TRANSPORT SECTOR

Transport Demand

Current transport demand in Timor-Leste is modest. About 19,600 vehicles were in use in 2002, comprising 14,300 publicly registered vehicles (6,500 motorcycles and 7,800 cars, vans, buses and trucks), about 2,300 unregistered vehicles, and 3,000 United Nations vehicles. Port records indicate that 740 vehicles were imported into Timor-Leste in the 12 months to the end of June 2003. Though some aged vehicles have probably been scrapped, the number of vehicles in use is not likely to have changed much in recent times. Vehicle ownership in Timor-Leste is low, with 25 vehicles per thousand people (excluding UN vehicles) in 2002. A 2001 household survey indicated that only three percent of people live in households that have a motorbike and fewer than one percent live in households that have a car or truck. The registered public transport fleet (excluding taxis) is about 650 vehicles, of which nearly 600 are minibuses. About 500 of the public transport vehicles are based in Dili and Baucau.

Traffic counts in 2000 indicated that one-third of the road network outside urban centers carried more than 200 vehicles per day (with 15 percent carrying more than 500 vehicles per day and less than two percent carrying more than 1,000 vehicles per day). One-third of the network carried fewer than 50 vehicles per day. Recent indicative analysis suggests that the average daily traffic for motorized vehicles excluding motorcycles is about 160 on national roads, 90 on district roads, 30 on rural roads, and 170 on urban roads. The heaviest traffic flows (in excess of 400 vehicles per day) are on the northern coastal road (Dili-Batugade and Dili-Baucau) and sections of the road to the south (Dili-Aileu and Ermera).

Some decline in road transport demand will occur with the completion of the initial phase of external assistance to Timor-Leste. With appropriate network improvements, the rate of traffic growth thereafter is expected to be 0.5-1.0 percent above economic growth (ADB 2002: 25).

A little more than 300,000 tonnes of freight passed through Dili Port in 2001 (ADB 2002: 61). Imports accounted for about 85 percent of this movement. In the 12 months to the end of June 2003, 22,000 containers (almost exclusively 20-foot containers) amounting to 310,000 tonnes of freight passed through the port. Ninety-five percent of incoming containers were exported empty. As noted by ADB (2002: 61), movement through the port in recent years has been boosted by the presence of international personnel and materials imported to support the reconstruction effort. In the year ending June 2002, containers for the UN alone accounted for 11 percent of the container movement. Looking ahead, the Transport Master Plan for East Timor (TSMP) forecast that movement would decline by almost a half when the UN Peace-Keeping Force (UNPKF) and related assistance was completed, but would then rise by an average of almost 5 percent per year due to economic growth. The number of containers moving through the port is expected to recover to the level of the past year by about 2011.

In the first six months of 2003, 39,990 people arrived or departed from Lobato Airport in Dili on a total of 1,830 flights. All were international passengers; domestic travel comprised only UN flights. Some 237 tonnes of air freight passed through the airport during the same period,

two-thirds of it as imports. The presence of the UNPKF and other external assistance has boosted this movement, especially airfreight, and a substantial drop in movement at the airport is expected as this presence declines. The TSMP forecast that over the longer term, passenger movement would rise at a rate five percent higher than growth in GDP.

Transport Infrastructure and Services

Land transport

Timor-Leste's road network is extensive but in poor condition. Roads provide access to the rural parts of the country, where the majority of the poor live. They link rural communities to markets, services, and participation in the wider society. Urban roads sustain important commercial, industrial, and service activities in towns.

Table 1: Road Network in Timor-Leste, 2003 (estimated)

Region	Length (km)	Density - km of road/	
		1,000 km^2 land area	1,000 population
Baucau	1,611	324	7.0
Dili	1,475	596	5.5
Same	1,204	422	9.7
Maliana	1,432	429	8.3
Oecussi	314	385	6.7
Total	6,036	417	7.2

Source: MTCPW.

The road network is strongly influenced by its spatial and physical environment. A main arterial road runs along the semi-arid northern coast, serving the economic activity around Dili and trade connections by sea and to the west. Connections with the southern economic zone cross a mountainous and midland area, which includes steep lands of unstable rock and poor soils that are highly susceptible to erosion and landslides. The southern coastal zone, which has higher population density, agricultural production, and energy reserves, has a moister climate and comprises alluvial formations and numerous rivers which aggrade and are prone to change course during the monsoon rain period. The road network is thus vulnerable to natural hazards of erosion and flooding, and access is frequently cut at high-risk locations during the wet season. The terrain and low standard of roads limit the support they can provide to the economy in the south and midlands, including coffee and other agriculture, and, soon, energy sources. Some further features of the road network are shown in Annex 2.
The road network in Timor-Leste is estimated at 6,040 km in length.[2] About 1,430 km links district centers, and forms the national network. A further 870 km of road, described as district roads, provide links to large administrative centers, with the remaining 3,020 being rural access or feeder roads. On the basis of pre-1997 information, about 2,600 km of the network is bitumen paved, 500 km is gravel, and almost 3,000 km is earth-formed. The national road network has about 317 bridges, with an average length of 34 meters; half of the bridges are less than 10 meters in length.

While the road network is extensive, road standards are generally poor. Pavements are generally narrow (3.5 to 5.5 meters) and require vehicles to move off the pavement to pass other vehicles. Vertical and horizontal alignments are poor, limiting travel speeds and sight distance. Inadequate drainage exacerbates road damage.

[2] A road inventory database was prepared in 2001 as part of a Road Asset Management System (RAMS).

By the end of FY2003, a total of $36.2 million had been spent on roads in Timor-Leste through donor programs, and a further $6.1 million through CFET (Consolidated Fund for East Timor) appropriations (see Annex Table 1). Major projects have included $21.3 million provided through TFET (Trust Fund for East Timor) for the Emergency Infrastructure Rehabilitation Project (EIRP) to repair about 1,250 km of national road and 660 km of district road. That project included $0.74 million for community-based road maintenance, with 355 villages involved in maintenance of 1,445 km of road. The Japanese Government provided a grant of $4.7 million through UNDP for urgent repairs to the Dili-Alieu-Ainaro-Cassa road (136 km). The Japan Engineering Group (JEG) of UNPKF has also cleared landslides and undertaken other road repairs; this work, which is likely to have exceeded $3 million in value, is not included in the CFET, TFET, or bilateral aid programs (see Annex 5). About 1,000 km of rural road has been repaired or built through the Community Empowerment Project (CEP), which was implemented by the sub-district level of government. The CEP has ended, however, and there is no formal means at present for maintaining rural roads.[3] Much of the expenditure on roads was needed to repair damage to roads caused by the unusually heavy wet season of 1999-2000.

The density of the road network in Timor-Leste is relatively even (Table 1), and the average density is high by comparison with other low-income countries. For example the density of the total length of road of 420 km/'000 km^2 of land area and 7.2 km/'000 people in Timor-Leste compares with an average of about 110 km/'000 km^2 of land area and 1.4 km/'000 people in eight other low-income countries.[4] Average GDP per capita for these countries was $272 in 1998, compared with $442 in 2002 in Timor-Leste. The density of roads with respect to population in Timor-Leste is almost the same as that for eight middle-income countries with GDP per capita some eight times higher.

The extensive road network results in reasonably good penetration, with villages in Timor-Leste being an average of 0.7 km from a vehicle-passable road (Table 2). Poor people typically live in areas that are more distant from roads, especially paved roads. However, the extensive road network also imposes a considerable cost obligation on the Government for its upkeep; the cost is exacerbated by the cost of emergency repairs needed because of the country's geology and weather. Moreover, due to the low number of road users, there is limited opportunity for cost recovery.

[3] Very recently responsibility for the maintenance of the entire road network including feeder roads was delegated to MTCPW.

[4] See Appendix A in World Bank, "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural Communities", World Bank Technical Paper No 496, Washington DC (undated work in progress for public discussion).

There is limited regulation of road use and transport services at present. Vehicles are registered only once (there is no annual vehicle registration fee), and there is no record of when they are scrapped. Public transport services are also licensed only when first introduced, although vehicles should undergo a bi-annual safety inspection. Public transport services are provided by the private sector without explicit subsidy (though the absence of an annual registration fee and the low level of fuel excise—$0.06 per liter—represent an implicit subsidy of road transport in general). MTCPW has limited the number of licensed taxis to 1,000. The Ministry inspects public transport vehicles when they are first licensed, and requires drivers of public transport vehicles to be literate. The loaded mass of trucks is limited, though no scales are available to enable the regulation to be enforced.

Table 2: Proximity Of Village Centers To Roads (2001)

	Distance (km)	
	Vehicle-passable road	**Paved road**
By region		
Urban		
Dili/Baucau	0.1	0.1
Other urban	0.4	0.6
Average	0.3	0.3
Rural		
Center	0.8	5.3
East	1.4	3.1
West	0.1	1.1
Average	0.8	3.8
National	0.7	3.1
By income		
Urban		
Non-poor	0.2	0.3
Poor	0.5	0.6
Rural		
Non-poor	0.9	3.1
Poor	0.7	4.8
National		
Non-poor	0.7	2.4
Poor	0.7	4.2

Source: 2001 TLSS, reported in World Bank (2003).

Expenditure on roads in recent years has sought to maintain a basic level of accessibility, especially on national roads. It has therefore focused on basic maintenance and emergency works.

Sea transport

The port in Dili is the main, and only international, port of entry to Timor-Leste. The main port, which previously served a lesser role, is located near the center of the town. It now has a wharf length of 300 meters and can concurrently accommodate two large vessels with a draft of up to 7 meters. Roll-on-roll-off facilities are also available for front-loading vessels. Improvement works at the port have been undertaken by the UNPKF (wharf extension), with $5.7 million of bilateral aid from the Government of Japan (fenders, channel access, navigation aids and upgrading of the container yards), and the EIRP ($1.3 million) for completion of the wharf extension, slipway repair, and paving). The port currently achieves a financial surplus on operating activities based on receipts from port fees and service charges.

The main port in the center of Dili is complemented by a fuel terminal located towards the western end of Dili that is currently operated by Pertamina. The Government is seeking ownership of this terminal. Small wharfs or jetties are located at Hera, Tibar, Com, Caravela,

the enclave of Oecussi, and the island of Atauro—the latter two provide the only means of access to the localities from other parts of Timor-Leste.

Development of a new international port to replace the current port in Dili would alleviate some of the problems associated with the location of the current port in the center of town. But the costs of developing a new port and suitable road links would be substantial, and are unlikely to be justified in the near future. The implications for the freight industry of moving the port to a less central location would also need to be examined. Probably the best site for a future cargo port would be at Tibar, a few km to the west of Dili.

Regular direct shipping services are provided to Darwin (Australia), Kota Kinabalu (Malaysia), Singapore, and Surabaya (Indonesia). Other services also operate to Indonesian ports. A ferry service between Dili and Oecussi (twice weekly) and Dili and Atauro (once weekly) is provided by a private company under contract to the Government. The service, which uses a 300 passenger vessel that is able to accommodate about ten vehicles, is generally well patronized. The Government of Germany currently meets the cost of the subsidy for the service, which has been about $0.6 million per year, and is also funding the acquisition of a new vessel that is to be leased by the RDTL to a private operator. The subsidy needed for the service is expected to decline due to the use of a more efficient vessel and to an expected rise in coastal freight traffic.

Legislation is in place to establish a Ports Authority of Timor-Leste (APORTIL), with its formation awaiting establishment of the Board of the Authority. The Directorate of Sea Transport is currently working with the Ministry of Planning and Finance and consultants to the latter on implementing a commercial accounting system. APORTIL will be responsible for shore protection in Dili, which is ancillary to its commercial activities. There is no explicit arrangement at present for compensating APORTIL for such community service obligations.

Air transport

Presidente Nicolau Lobato International Airport (previously named Comoro Airport) in Dili can accommodate B727 and similar category aircraft. The 1,850 meter runway (with a 30 meter wide pavement) was last repaved in 1988, and required emergency maintenance in 2000. Navigation aids, ground guidance systems, and the passenger terminal have been improved, though VHF radio facilities need upgrading. Each week, 15 return air services are provided between Darwin and Dili by Air North (of Australia), typically using 30-seat turbo-prop aircraft, and seven return services fly between Denpasar and Dili, provided by Merpati (of Indonesia), generally using B737/F100 jet aircraft with about 100 seats. The airport achieves a financial surplus on operating activities based on receipts from aeronautical and non-aeronautical fees and charges. Philips Petroleum has expressed interest in leasing part of the airport to support the Timor Sea natural gas and light oil development.

No other airports in Timor Leste have regular public passenger services. Baucau airport (120 km from Dili) was previously used by Indonesian military, and has a runway that can accommodate B747 and similar category aircraft at reduced take-off weight. This airport is presently used only for UNMISET purposes. Other airfields include Suai (1,050 m sealed runway), Oecussi (a gravel runway), and airfields at five other locations. Though Baucau

Airport can accommodate larger aircraft than can Lobato International Airport in Dili, it is poorly placed to be the country's sole international airport: considerable investment in the airport and the road to Dili would be needed for it to play a significant role, and it would be costly to sustain international airports for regular public air services at both Baucau and Dili. Still, Baucau Airport is a substantial resource, and there may be opportunities to make more effective use of it for other aviation activities.

Sector responsibilities within the government

All transport management is now located within the Ministry of Transport, Communications, and Public Works (Figure 1). The Directorate of Roads, Bridges, and Flood Control (DRBFC) is responsible for providing and managing road infrastructure. The Directorate operates through a central administration and five regional offices (in Dili, Baucau, Same, Malian, and Oecussi). A Directorate of Equipment and Materials (DEM) manages equipment owned by the Government, including that which has been transferred from the Japan Engineering Group. The Director-General for Transport and Communications is responsible for other transport matters. The Directorates of Sea Transport (DST) and Civil Aviation (DCA) are responsible for both providing and managing infrastructure and for regulatory activities in their respective sub-sectors. The Directorate for Land Transport (DLT) is a regulatory agency. Transport sector responsibilities are summarized in Table 3.

Figure 1: Government Transport Sector Organization

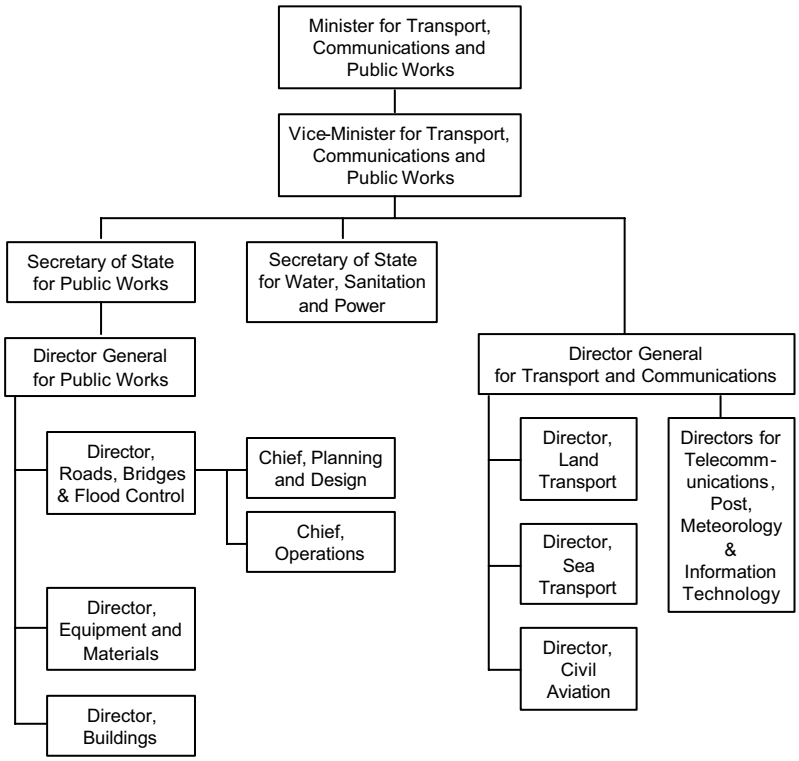


Table 3: Transport Sector Responsibilities

Function	Road	Aviation	Maritime
Policy	DLT	DCA	DST
Infrastructure			
- Planning	DRBFC	DCA	DST
- Management	DRBFC	DCA	DST
- Operation	DRBFC	DCA	DST
- Delivery of works and maintenance	DRBFC, private sector contractors, community[a]	Private sector contractors, DCA staff	Private sector contractors
Services			
- Delivery	Private	Private	Government/private
- Regulation & enforcement	DLT, police	DCA	DST

[a] The Government involves communities in some routine maintenance of national and district roads. Currently, there is no formal arrangement for management of feeder and rural roads. While the Government has overall responsibility, communities participate in the construction and maintenance of some roads. Some roads have been developed through rural development projects.

DRBFC has 12 staff with engineering qualifications, out of a total staff complement of 91. Some of these staff were employees of the roads authority under the former Indonesian administration, thus providing some continuity in technical knowledge and experience. There has been less staff continuity in the aviation and marine sub-sectors. The focus of MTCPW in the transport sector to date has been on sustaining road accessibility and ensuring effective port and airport services. This has resulted in, for example, a concentration on engineering staff in the road sub-sector, with less capacity in strategic planning and evaluation. DRBFC, DST, and DCA have gained from the presence of UN advisers. Projects financed through the TFET and bilateral programs have generally been implemented through separate project management units. While the general goal has been to implement projects using the private sector, DRBFC is currently using equipment provided by JEG to construct a bridge at Natabora, and has established a capacity for minor and emergency works through its regional offices.

Legal And Regulatory Arrangements

The Government has implemented five laws to establish the essential framework for the transport sector (Table 4). All were passed in 2003. Regulations are currently being prepared to support the implementation of the Basic Law for Vehicle Transport.

Table 4: Principal Transport Laws

Law	Name	Function
Law No. 1/2003	Basic Law for Civil Aviation	Aircraft and flight safety and security; defining airspace; institutional arrangements; industry regulation and airport charges.
Law No. 2/2003	Basic Law for Vehicle Transport	Vehicle registration; road charges; regulation of passenger and freight transport services and passenger fares; planning and coordination of public infrastructure provision.
Law No. 3/2003	To Establish a Ports Authority of Timor-Leste (APORTIL)	Establishment of a port authority with its own Board and finance committee; relationship between the authority and the Government; tax-free status; cost recovery.
Law No. 4/2003	Establishing Minimal Conditions for Security and Management of Sea Transport Not Covered by SOLAS Convention of 1974	Applies to vessels less than 500 tonnes used for international transport; empowers Harbormaster to inspect vessels.
Law No. 6/2003	Road Code	Road rules; traffic management; classification and use of roads; vehicle categorization; fines; vehicle emissions; accident reporting; driver licensing.

II. OBJECTIVES FOR THE TRANSPORT SECTOR

As indicated in the National Development Plan (NDP), the Government recognizes that "Having effective systems of physical infrastructure and services is crucial for agricultural productivity and poverty reduction, a determinant of business investment, instrumental to human development, and the foundation for private sector development" (Planning Commission 2002: 263). The Government's supporting vision is "To plan for, provide, and manage physical infrastructure that is efficient, cost-effective, and financially sustainable, and which supports the social and economic development priorities of the people of Timor-Leste" (Planning Commission 2002: 263). Effective development of the transport sector will support these objectives, by enhancing the sector's potential to be self-financing in the longer term; by underpinning regional development and thus supporting food security and poverty alleviation and discouraging a population drift to Dili; by supporting social development through improved access to health and education services; by improving environmental outcomes; and by making effective use of the private sector. The National Development Plan outlines specific objectives for each transport sub-sector, as indicated below.

Land Transport

The Government's objectives for roads, bridges, and flood control are to:

- identify the national, district, and rural road network essential for the support of economic and social development;
- initiate policies with a legal and regulatory framework that improves quality of life, encourages private enterprise, and improves access and safety particularly in impoverished areas;
- develop roads, bridges, and topologies of flood control that provide environmental protection and reverse existing ecological damage;
- ensure development and regulation for the safe circulation of transport;
- ensure that the transport infrastructure meets national defense imperatives;
- establish technical standards for a national road network;
- preserve existing road assets as the first priority through sustainable maintenance and long-term management plans for support systems;
- establish an institutional structure and develop the technical and administrative capacity of Timorese staff to manage, maintain, and improve the road network;
- implement sustainable strategies for the maintenance of rural access roads; and
- establish and implement erosion control measures to prevent damage to physical infrastructure and economically valuable property (Planning Commission 2002: 271).

The objectives for land transport management are to:

- establish institutional capacity to support growing demand for land transport services;

- create sustainable regulatory processes for ensuring the safe use of vehicles, effective traffic control, and appropriate licensing and registration of all vehicles;
- coordinate service requirements with those of road building, urban and rural road construction, and infrastructure systems that can achieve the national objectives of economic growth and poverty reduction;
- resolve the problem of saturation of major road arteries through improved accessibility for outlying and remote population areas;
- reduce import dependence on oil through increased use of public transport and improved energy efficiency of road vehicles;
- pursue optimal models of regulation and technical knowledge from established and comparable land transport systems, incorporating these into Timor-Leste;
- implement a national public safety program for driving and maintaining all road vehicles, through driver awareness campaigns and public information services;
- formulate regulations with traffic and vehicular rules governing safe and legal vehicle operation, and enforcement capabilities with appropriate penalties; and
- establish an effective policy for public transport fees and charges, and a retention fund for these revenues to enhance public transport (Planning Commission 2002:288).

Maritime Transport

The efficiency of sea transport has a major impact on the performance of Timor-Leste's economy, with the potential to reduce the cost of imports and to facilitate exports. Sea transport also provides the only formal link to Oecussi and Atauro.

The Government's objectives for maritime transport are to:

- develop a code of commercial maritime law;
- conclude ratification procedures on behalf of Timor-Leste of the United Nations Convention on the Law of the Sea;
- establish a registry of shipping for Timor-Leste;
- establish a modern system of port taxes and tariffs with effective enforcement capabilities that preclude contraband and corruption;
- pursue enactment of the law on public maritime domain in conjunction with the MEAD and MOJ;
- establish a public passenger sea transport service between Dili and Atauro, and between Dili and Oecussi;
- create a plan and institute a policy for regulation of national coastal traffic;
- achieve a national capacity for essential survey and inspection procedures, and thereon, for certifications regarding ship conditions, materials safety, and hazards;
- train and develop East Timorese in special maritime studies abroad;

- improve port container and bulk handling while reducing congestion at Dili;
- provide the facilities and services required to situate the Naval Defense Force at the Port of Hera in concert with the Government's priorities;
- complete current projects and rehabilitation activities on schedule with Japanese bilateral and multilateral assistance; and
- assess and subsequently implement an effective system of fire prevention and both port and maritime fire and damage control (Planning Commission 2002:293).

Aviation

Civil aviation is essential for tourism, trade, support for multilateral and bilateral aid programs, and sustaining links between expatriate East Timorese and their mother country. The Government's objectives for its civil aviation authority are to:

- attain a high standard of safe and efficient passenger service;
- establish effective air cargo systems for international and national transport;
- develop a reliable staff with the qualifications needed to ensure safe and effective airport operations, comparable to the best in the region;
- establish reliable and secure systems needed for an efficient mail and postal expediting hub and internal national postal support services;
- establish an appropriate financial system that allows the civil aviation administration to recover its full costs of operation;
- provide the ground facilities required to support military, air and land priorities; and
- support national development priorities and poverty reduction initiatives through indigenous staff recruitment, training, employment, and district services (Planning Commission 2002:298).

Intermodal Transport

The NDP explicitly recognizes the need for management of intermodal linkages between sea and land transport at Dili. Intermodal linkages are also important for moving goods from farms to markets, and for people who need to use more than one public transport vehicle to travel between their origins and destinations.

Progress Toward Key Objectives

Considerable progress has been achieved in the transport sector in recent years. Dili Port and Lobato Airport, which previously served local roles, have been developed to fulfill national functions. Dili Port has been able to accommodate the substantial demands placed on it during reconstruction, and is achieving an operating profit. A coastal shipping service provides an essential link to Oecussi and Atauro, albeit with the need for a substantial subsidy. Lobato Airport is accommodating demand for international passenger and freight transport, and is achieving an operating profit. Emergency repairs and refurbishment have sustained the road

network, and basic road transport services are being provided. A legal framework for transport has been largely established. These accomplishments provide a sound base for future development of the transport sector and are initial actions that support the 2002 National Development Plan.

The NDP specifies performance indicators for the objectives set for each transport sub-sector. Substantial progress has been made, though it is likely that some specific objectives may not be met on schedule (Annex 3). It is notable that data are being collected on only a few explicit performance indicators for the provision of roads, and that there are no explicit targets for cost recovery.

III. MAIN ISSUES AND CHALLENGES

The Government still faces a number of challenges with respect to transport infrastructure. These relate mainly to financing and management of the transport sector, especially for roads.

Transport demand will require upgraded infrastructure in some locations

Transport demand is sufficiently modest at present that growth will not seriously challenge the capacity of current road, port, and airport infrastructure for some years to come. However, upgraded infrastructure will be warranted in some circumstances: (a) where it reduces risks and the total long-term cost of road provision; (b) where the incidence of accidents is high and remedial actions are required; (c) where traffic volumes are sufficiently high to warrant road widening and improved alignment; and (d) where upgraded roads are needed to complement development in other sectors, for example agricultural rehabilitation and expansion and international trade.

Emphasis on infrastructure works will move from reactive to a preventive approach

The vital need of the last few years has been to restore the operability of the transport system. In the case of roads, this has involved relieving critical bottlenecks, particularly damaged bridges, landslips, and other pavement failures. The cost of this reactive approach is high because the dilapidated state of the infrastructure makes it vulnerable to further failure.

The challenge for the Government in the road sub-sector in coming years will be to undertake a targeted program of risk reduction and gradual rehabilitation of the network so that it can be sustained with normal routine and periodic maintenance and a manageable amount of emergency repairs. The targeted program would identify the areas most prone to natural hazards and reduce the risk of closures and expensive repairs, through the completion of missing or incomplete bridges and stabilization and protection of slopes and riverbanks. The rehabilitation program would restore and strengthen deteriorated pavements to an appropriate standard, using low-cost treatments where traffic volumes are too low to warrant expensive surfacing. This approach will minimize the life-cycle cost of providing roads. Enhanced transport planning and evaluation are needed to establish a prioritized program of road investment proposals that is integrated with economic development plans in other sectors and that maximizes economic and social returns.

Road design standards and maintenance practices and vehicle load limits need to be oriented to minimizing life-cycle transport costs

Higher standards of road construction reduce maintenance needs and allow the use of larger trucks, but excessive standards are costly. In the short run, as many pavements in the network have thin structures suited to light vehicles, the axle loading on some roads may need to be limited to avoid premature damage and destruction of the pavement, prior to its rehabilitation to the required strength. In the long run, a lower than usual limit on axle loads may not be warranted, given that it would produce only a small saving in construction costs. More detailed study will be needed to determine such restrictions as freight transport travel patterns develop.

Sustainable arrangements are needed to manage the rural road network

Formal sustainable arrangements need to be established to maintain the extensive rural road network. Low incomes and high rates of underemployment provide the opportunity to use labor-intensive forms of construction and maintenance to reduce economic costs and enhance social equity.[5] Moreover, the local communities who are the greatest beneficiaries of rural roads have strong incentives to maintain them in good condition, provided support can obtained for more difficult equipment-supported activities such as the maintenance of crossing, drainage, or slope retention structures. There is scope therefore for finding a suitable arrangement for sharing the responsibility and costs between Government and rural communities for managing rural roads.[6]

Addressing social impacts and involvement

Roads and road traffic can have a substantial impact on communities. Gaining community consensus and support for developing and maintaining roads is essential for the efficient implementation of projects and maximization of project benefits. When infrastructure works require access to and extraction of construction materials, or involve the acquisition of land, the concerns of local communities need to be properly addressed before the works are undertaken, or they may lead to substantial disruption. The Government has undertaken some consultations with communities for specific projects. A more formal and sustained consultation process will need to be adopted to help develop the support and participation of local communities and also to take account of their needs in the design and implementation of the works. In many cases, jobs in road building and maintenance can generate income for local communities. Community support and contribution will also be essential for the sustainable maintenance of the extensive rural and feeder road network in Timor-Leste. The risk of transient transport operators and workers introducing adverse health impacts on local communities will also need to be addressed.

Reducing the environmental impact of transport

Transport is affected by the environmental circumstances in which it operates, and itself affects the environment.[7] The Government recognizes the effect of factors such as deforestation on increasing the quantity and velocity of water runoff, which contributes to land slips and erosion of roads. The Government is addressing these matters through other policy initiatives. At present the emissions of greenhouse gases and other pollutants from road transport are modest given the small number of motor vehicles in use in Timor-Leste, and traffic volumes and congestion are too limited to produce emissions with a major impact on health. In future, the growth in the number of road vehicles that is expected to accompany economic growth will increase the volume of vehicle emissions, though rising income will

[5] The overall rate of workforce participation in Timor-Leste in 2001 was 60 percent. World Bank 2003: 42.
[6] The Sector Investment Program for Local Government and Civil Society includes provision for a Community Development fund that would channel donor and CFET resources to local communities, some of which could be allocated for road maintenance on a cost sharing basis. Available at <http://www.mopf.gov.tp/tldpm/SIP.htm>
[7] For a more complete discussion of environmental issues see the Sector Investment Program for Natural Resources and the Environment. Available at <http://www.mopf.gov.tp/tldpm/SIP.htm>

allow people to purchase better vehicles and to maintain them better—which will slow the growth of emissions. The Government wishes to improve the quality of the vehicle registration system so that it can better enforce traffic regulations, including a requirement for regular inspection of vehicles. Environmental problems from marine and air transport are less serious, though the Government understands the need to carefully manage the risk of oil spillages in the harbor of Dili.

DRBFC in particular will need additional resources and new skills

DRBFC has focused to date on managing emergency repair work, and its staff have only limited skills in transport planning and project appraisal. These tasks will be essential for supporting the shift to identifying road projects to meet longer-term development needs and to optimizing road design and maintenance standards. Because all works and engineering services such as design and supervision are being contracted out to the private sector, DRBFC's primary role will be that of asset manager. The agency will need to adopt practical management systems to survey and analyze road requirements, in order to prepare annual and rolling programs of maintenance and rehabilitation. Its staff will need training in project management and contract administration. Similar analytical skills will be needed to support planning in the aviation and marine sub-sectors, management of road traffic, and policy development.

The time required to initiate projects is likely to increase

As the UN-sponsored program of assistance winds down, bilateral assistance is expected to play a growing role in the transport sector. The Government understands that the approval processes involved in such assistance can be considerable. The shift to addressing longer-term development needs will also involve a period of planning to identify prioritized projects suitable for donor financing. Assuming that the time needed for project preparation and approval is three years, a continuing investment program in road upgrading of $10 million a year, for example, would require investment projects of more than $30 million to be in the preparation and approval pipeline at any point in time. Given the limited number of projects in the pipeline at present, the Government proposes that some future support for road development and management will need to occur on a program basis, governed by clear spending principles.

Road investment needs in particular will remain high

Future reinvestment needs for Lobato Airport and Dili Port are expected to be modest, given the scale of the facilities, recent investment in the port, and the contraction in demand that is expected at the end of the initial phase of assistance to Timor-Leste. Road assets, on the other hand, are generally still prone to failure, notwithstanding explicit expenditure of more than $40 million and work undertaken by JEG in recent years for emergency repairs. The reason for this lies in the high burden of sustaining the current dilapidated infrastructure. For the core road network, indicative analysis suggests that over the next decade $90 million will be needed for rehabilitation, and $34 million for periodic maintenance, to bring the system up to a standard where it can be sustained through regular maintenance and provided at the lowest possible life-cycle cost. For the non-core network, $38 million will be needed for periodic

maintenance over the same period. Annex 4 presents a more detailed assessment of future road spending needs, including an estimate of the minimum level of spending that is needed to avoid further deterioration of the road system (although this option will result in higher long-term maintenance costs). The Road Asset Management System needs to be updated to provide information that can be used to refine this estimate, and to provide the basis for evaluating and prioritizing specific projects. Underinvestment will result in higher maintenance costs, and in a higher long-term cost for providing roads.

Spending will need to rise to adequately maintain the current road system

Recently MCTPW, or more specifically, DRBFC has been assigned responsibility for the feeder road network. DRBFC was previously responsible for developing and maintaining the national, district, and rural road networks, which total about 3,020 km. National roads form the arterial network while district roads connect the district capitals with the national highways. Rural roads connect districts to sub-districts and major villages. Feeder roads provide the country's farming areas with primary access to markets and support institutions. A little more than 700 km of feeder roads has now been added to DRBFC's responsibility.[8] Based on previous experience in Timor-Leste under the Emergency Infrastructure Rehabilitation Project I and in other countries, an annual allocation of about $650 per km has been estimated for the maintenance of the feeder roads and has been included in Annex Table 5 in the amount of $2 million starting in FY2005/06.

Every year, particularly when the monsoon rains are severe or sustained over a long period, many parts of the infrastructure can fail. Commonly this occurs on roads in the form of landslides and land slips on the outer edge of the road. It is estimated that each year about 500 to 550 km of roads have failures that make them impassable. Seasonal weather patterns can also damage ports and airports, and their supporting infrastructure. To ensure that the negative effects of such events to people and the economy are minimized, it is essential that MTCPW have in place an emergency response system and an emergency fund that can be released quickly. Given past experience with these sections of road, such a fund for the transport sector would probably need an allocation of about $1.5 million. No such provision has been included in Annex Table 5, however.

Appropriations from CFET for routine maintenance of the road network in Timor-Leste rose steadily to a peak of $3.1 million in FY2002/03, equivalent to an average of about $1,000/km. The allocations subsequently declined to about $1.2 million in FY2004/05. This level, equivalent to about $400/km, is well below what is needed for adequate maintenance of the national network. The proposed program calls for additional allocations from CFET that would lift annual maintenance spending to $5.2 million by FY2008/09, equivalent to about $1,700/km. The latter figure broadly matches the guidelines set out in Annex 4 below, after taking account of expected inflation. It does not include the cost of maintaining rural feeder roads. The proposed program includes additional CFET allocations for this purpose, rising to $2.15 million by FY2008/09. This would provide an average of about $700/km for rural roads

[8] The financial needs of the national core network, the district roads and rural roads were included in the earlier versions of the Transport SIP, but the category for the Feeder/Rural roads was significantly understated as only the 2,300 km rural road network requirements were included, not the additional 700 km of feeder roads.

at that time, which is in line with the foregoing estimates of the costs of maintaining this part of the network. The annual outlays on routine maintenance would total about $7.3 million per year by FY2008/09. With appropriate spending on rehabilitation of the core road network, the requirement for maintenance spending on the entire road network could be reduced somewhat. Securing village responsibility for maintenance of rural and feeder roads will be a means to gain greater benefit from limited funding.

Corporate port and airport authorities should become financially self-sustaining in the medium term

Implementation of the port authority (APORTIL) and, in due course, an airport authority with commercial accounting systems and appropriate user charges should enable these functions to become financially self-sustaining in the medium term, with the agencies able to finance investment from free cash flow. It is expected, though, that the current agencies will face difficulties in the short term due to the decline in demand, and therefore income, that will accompany the withdrawal of the UNPKF. Accordingly, external financial assistance will need to continue in the short term to support the necessary investments in the port and airport. The port and airport authorities will also need external support to meet their community service obligations.

Developing a sustainable private contracting industry, with good contract management, will minimize the cost of infrastructure

Other than work undertaken by the UNPKF, private companies have been used to implement most infrastructure projects. This is in accordance with the strong priority the Government attaches to private sector contracting and outsourcing (Planning Commission 2002: 272). A competent contracting industry has emerged, although it is still small and has limited resources (Annex 5). In the roads sub-sector, more than 90 companies are pre-qualified to undertake works, and six of them are considered able to take on contracts larger than $0.5 million. Ensuring a continuing, steady program of works will facilitate the further development of the industry, and will reduce the cost of projects by avoiding the high costs involved in winding down and mobilizing teams for sporadic works. The average cost of works can be reduced by encouraging technical innovation and equipment investment, active competition for work, and effective supervision of quality.

The potential transfer of equipment from JEG and other donors to MTCPW and use of the equipment by DRBFC to implement projects extends the Government's role beyond the current focus on project identification and contracting. The Government has established the separate Directorate of Equipment and Materials (DEM) to manage the equipment. The Government recognizes the merit of DRBFC maintaining a focus on project management, and will investigate other options for making the equipment available to the private sector, which is likely to be better able to use it. Options could include making the DEM a commercial enterprise that hires equipment to Government agencies and the private sector on a full cost-recovery basis, or arranging for donors to sell equipment to the private sector in Timor-Leste and to provide the proceeds from the sale to the Government for use in infrastructure projects that require use of the equipment. Annex 5 outlines these options and the advantages and issues associated with them.

Light-handed regulation of the transport sector is appropriate

Regulation in the transport sector will focus on essential areas of safety, security, and certainty. Implemented regulations need to be enforced consistently to ensure public acceptance. Regulations increase business and government costs. Accordingly, there is a need to ensure that proposed regulations provide a net benefit to the community. Consideration will be given to the preparation of "regulatory impact statements' for proposed regulations (as practiced by government administrations in other countries) to ensure that the costs and benefits of regulations are fully appreciated before a decision is made to implement them.

User charges are essential for a sustainable transport system

Appropriate user charges improve economic efficiency and social equity. This is especially so in road transport, where Timor-Leste's low fuel tax and the absence of registration fees encourage more travel than is optimal, especially by large vehicles, and subsidize parts of the community who are less needy than others. Moreover, raising revenue from other tax bases to cross-subsidize the provision of transport infrastructure may divert resources away from other services intended for the socially and economically disadvantaged.

Consideration needs to be given to vehicle registration fees and fuel taxes that divide the cost of providing roads equitably among road users in relation to the damage they cause and the use they make of the road system. A balanced approach is needed, including assessment of the willingness and ability to pay of road users and of the implications of using other sources of revenue to finance roads. A rise in fuel prices of 10 percent will increase the cost of travel by public transport, for example, by about 3 percent.

The retail price of fuel in Timor-Leste is not high by international standards. However, fuel taxes make up an unusually small proportion of the retail price. Consideration will be given to means for reducing the cost of imported fuel to a level comparable to that in countries similarly situated to Timor-Leste. Introducing an offsetting fuel tax could raise additional revenue for the Government of about $1.5 million per year (Annex 6). Introduction of a vehicle registration fee at an average rate of $100 per vehicle plus an administrative charge could generate net revenue to the Government of $1 million per year. Ideal registration charges would be related to the size of vehicles.

IV. MEDIUM-TERM DEVELOPMENT PROGRAM

Policy Framework For Future Public Investment

The Government will continue to focus on developing a transport system that meets the needs of the economy and ensures essential community linkages at the lowest possible cost.

In the case of the road system, the Government currently faces the burden of managing a system that is degraded, and which entails a very high cost for reactive work needed to keep it functioning The Government therefore has adopted a ten-year vision for the road system to:

- Bring the road network up to a sustainable condition where, with regular maintenance, life-cycle costs will be minimized, road closures will be reduced and manageable, and road access will be reliable;
- Improve key roads to support a growing economy; and
- Ensure effective capacity to manage the road system, comprising asset management systems (including risk management), use of the private sector for cost-effective delivery, and reliable funding and adequate cost-recovery from users.

Works in the period to FY2008/09 will lay the essential basis for achieving this vision.

Five specific principles will guide future Government spending on roads:

- Priority will be given to maintaining current roads before extending the road network, with its associated maintenance obligations.
- Priority will be given to maintaining the core road network, i.e. roads that serve major economic and administrative functions.
- In-kind community contributions will be sought for maintenance of the non-core road network.
- Investment will focus on projects that provide net economic benefits in terms of reduced road maintenance and vehicle operating costs, or that support agricultural and industrial developments that are worthwhile when account is taken of the cost of road investment.
- Road users will be expected to make a greater contribution to the cost of providing roads.

The Government's vision for the maritime and aviation sub-sectors in the period to FY2008/09 is to:

- Establish the basis for financially sustainable provision of port and airport facilities from user charges;
- Ensure adequate commercial domestic services, supplementing commercial services for disadvantaged groups; and
- Facilitate international trade and tourism.

Investment in the maritime and aviation sub-sectors will generally be directed to projects that enhance the financial viability of the port and airport in Dili and the Government-sponsored Dili-Oecussi/Atauro ferry service, to help the commercial functions of these businesses become self-financing by the end of FY2006/07.

The focus on maintaining the operability of the transport system in recent years has allowed little emphasis on planning longer-term maintenance and investment. As a result, there are few well-developed project proposals, and a consequent need for investigations to identify projects that meet the spending criteria described above and can be implemented in the period to FY2008/09.

As indicated in the following sections, the medium-term program for the transport sector will involve:

- Preparation of prioritized investment proposals that are based on appropriate design standards and meet the investment criteria described above.
- Development of a road use charging policy, and increased cost-recovery from motorists.
- Implementation of independent commercial port and airport agencies that will be able to finance their own investment needs by FY2006/07.
- Building capacity and skills in policy and planning, regulation, pricing and financial management, contract management, and other specific technical skills.

Road Infrastructure

The development needs in road infrastructure center on three main elements:

Strategy for road development and management

An updated, comprehensive development strategy for the road system is urgently needed to provide the framework within which available funds can be spent to the best effect. The plan will identify capital expenditure needs for roads beyond those that are currently committed or under preparation. Outputs of the strategy will be: (a) optimal level of expenditure on road construction and road maintenance, taking account of road classification, the appropriate mix of road design standard, vehicle characteristics, road maintenance standard and risk mitigation, and budget constraints; (b) a detailed five-year and indicative ten-year road investment program; (c) a program to increase expenditure and management capability for sustainable road maintenance, addressing appropriate methods of delivery, labor-intensive approaches, risk management, and community involvement in maintenance of rural roads; (d) recommended road use charges, including vehicle registration fees and fuel taxes; and (e) basic information that will serve the Government's longer-term needs for road planning and management.

Proposed road investments will also take account of planned investment in other sectors such as agriculture that will influence travel demand, and for which road access is instrumental to

success. Consideration will be given to the optimal use of community-based inputs for road maintenance. Road use charges will be directed to encouraging optimal choices in vehicles that are purchased for use in Timor-Leste and in the use of those vehicles, as well as to generating revenue to meet the cost of providing the road system. Basic information for longer-term road planning and management will include, for example, establishment of a road hierarchy, including determination of the core road network; updating and institutionalization of the RAMS and an associated traffic counting system; derivation of vehicle operating costs, value of travel time, costs associated with freight transport, and an accident analysis system. The cost of this work is estimated at $1.0 million.

Capital and maintenance expenditure for road infrastructure

The TSMP outlined an investment plan of $26.7 million of urgently needed works, with economic internal rates of return for the 11 individual projects of between 20 and 52 percent per year. However, circumstances have changed since 2001 when most of this work was undertaken, including implementation, to varying extents, of some of the proposed projects.

Interim estimates of the needs for maintenance and rehabilitation on the whole road network over the next ten-year period have been developed using a bottom-up approach that takes account of the current condition of the network and the inputs of the recovery phase programs, as detailed in Annex 4. This approach is considered more reliable than generalized estimates based on assumptions about average maintenance conditions, and it also allows specific projects to be identified for potential donor assistance. For the national road network, inventory data on road and traffic characteristics were available from Phase 1 of the EIRP, and data on recent conditions were obtained from a JEG survey which assessed vulnerable and impassable sections.[9] A broad program of treatments was developed, based on road conditions and traffic volumes, to bring the core network to a maintainable condition within ten years. Specific treatments to reinforce the roadway and bridges were programmed where chronic or potential closures were evident, with the intent of achieving a lasting reduction in risk. Currently planned inputs during Phase 2, including bridge replacements, were taken into account and their expenditures programmed as committed. For district, urban, and rural roads, the approach adopted is for average expenditures by category of works over substantial portions of the network.

The resulting program—in a highly desirable scenario—comprises annual programs averaging $21 million per year over the first six years, with an average of approximately $3 million for routine maintenance, $7 million for periodic maintenance, $8 million for road rehabilitation, and $3 million for bridge and structure repairs (Annex 4). Priority will need to be given to rehabilitation in the earlier years of the program to protect roads that are at risk of rapid further deterioration. In years 7-10, rehabilitation needs will be somewhat lower, though periodic costs would be higher.

Given the other road projects in the pipeline, it is expected that the road upgrading program would commence in FY2005/06, and that investment in that year and the next would enable

[9] Inventory data were available from the RAMS database in the PMU of MTCPW, and the JEG survey data of July 2003 were available from the DRBFC of MTCPW.

the Government to progress, by the end of FY2006/07, 25 percent of the way towards its objective of a sustainable road network in ten years' time. High priorities are likely to be the upgrading of the main road along the south coast of Timor-Leste and of heavily trafficked sections of road elsewhere.

Capacity building and staff development

Work in recent years has supported the development of basic engineering skills in the DRBFC. JICA is currently considering technical assistance for further development of MTCPW staff through the provision of an infrastructure policy advisor to the Minister and a road sector advisor to the DRBFC, and related training. There is a further need to develop DRBFC's skills in geotechnical engineering, bridge engineering, road safety and traffic engineering, and road project evaluation and preparation; this would be met through the provision of part-time technical assistance over a three-year period, at a cost of $0.6 million. Twinning arrangements with a suitable overseas roads organization would facilitate the development of DRBFC's institutional capacity, with a direct cost of about $0.15 million.

Traffic And Transport Management

Investment in traffic and transport management includes four main elements:

Urban traffic management

Investment in traffic management through improved signage, lane markings, and traffic islands will enable more efficient and safer use to be made of urban roads. Expenditure of $0.2 million per year is needed, following actual expenditure of $0.34 million in FY2003/04. This would require $0.4 million to be added to the declining allowance made in the current CFET budget, over the period to FY2008/09 (Annex Table 3).

Land transport administration system

Better management of land transport is needed to enhance the safety of vehicles, security of services, and Government revenue. Timor-Leste needs a computerized vehicle registration system that provides up-to-date information on the vehicle fleet in use. This is essential to allow annual vehicle registration fees to be imposed, and thereby provide increased Government revenue that will support environment and road safety objectives and transport regulations. The system needs to be implemented using enhanced information technology, and relying on the regional offices of the DRBFC for vehicle registration and inspection. Also needed is an accident reporting system and means for enforcing vehicle load limits. This work is expected to cost about $0.7 million. Work undertaken as part of the proposed road development and maintenance strategy will provide guidance on the appropriate level of registration fee for various classes of vehicle.

Public transport development study

There are only limited public transport services in Timor-Leste at present, especially in rural areas. A study is needed to develop a strategy to facilitate the provision of improved urban

and rural public transport services, identify needs and means for providing bus terminals, and to refine the regulation of public transport services and fares. The cost of this study is estimated at $0.25 million.

Capacity building and staff development

The Directorate of Land Transport requires technical assistance in policy analysis, to support optimal regulation and management of the transport sector, including appropriate road and public transport user charges. This assistance would also facilitate coordination of DLT and DRBFC activities. The cost of part-time assistance and supporting study tours is estimated at $0.75 million.

Ports and shipping

Investment in the maritime sub-sector includes two main components:

Dili Port development and shore protection

It is intended that APORTIL will become operational within the FY2003/04 financial year. In the period to FY2008/09, investment in ports in Timor-Leste will primarily be related to reinvestment in assets that have reached the end of their economic lives. Project proposals have not yet been prepared in detail, but the needs include:

- Some of the current wharf infrastructure is more than 40 years old, and is dilapidated. An inspection is needed to identify investment requirements, followed by refurbishment works.
- There is evidence that the channel at Dili Port has been silting up and that some parts have become undesirably shallow (as little as 3.6 meters). A hydrographic survey of the port has been completed, but work has not yet been undertaken to determine the optimal extent of dredging. An investigation of the need is required, followed by necessary works.
- The sea wall that protects the entire shore of the bay on which Dili is located is subject to sometimes heavy waves. While not critical, an investigation of the quality of the current sea wall and future investment needs is required.

The cost of an investigation of these needs is estimated at $150,000, with an allowance of $5 million for subsequent works.

Ferry service and associated support

A project is currently being investigated to replace the current ferry that serves Oecussi and Atauro with a new vessel; to upgrade and extend port facilities at Dili, Oecussi, and Atauro; to provide technical assistance and training; and—funding permitting—to construct a slipway for vessel maintenance at Hera Port that could be financed by the Government of Germany. The project is likely to cost about $9 million. In the meantime, the current ferry needs a continuing subsidy (at an annual rate of $0.45 million) until the new ferry becomes available in late 2005. There may be a need to subsidize the new ferry service, at least in the beginning

(at a rate of $0.1 million per year), while traffic demand builds up, giving a total cost of $1.3 million in the period to FY2006/07.

New cargo port at Tibar

Dili Port is located downtown and its operations have the potential to cause considerable environmental and traffic problems in the future. Additionally, as cargo traffic increases, capacity limitations will become a problem. Initial investigations made several years ago indicate that the favored location of a future cargo port would be at Tibar a few km to the west of Dili. Exactly how Tibar should be developed physically, financially, and economically requires a feasibility study. A sum of $500,000 has been included in Annex Table 5 for that purpose.

Development of maritime services

This proposed project has three components. The first would cover the purchase of much-needed tugboat services; the second would develop a ship repair and maintenance facility to provide a critically needed service to fishing boats and the country's naval defense force; and the third would develop port facilities for easier landing of vessels. The project would strongly emphasize the building of local capacity. It would effectively connect remote farming regions with each other and provide access to remote markets.

Airports and Aviation

It is intended that an airport authority will be established by the end of the 2004/05 financial year. Investment needs in the period to FY2008/09 have five components:

Runway improvement

Some deficiencies in the runway pavement at Lobato Airport are becoming apparent, and an investigation involving non-destructive pavement testing is needed to determine runway rehabilitation needs. The cost of protecting current sealed runways at other airports that have a potential future role (which will be established by the aviation strategy described below) will be minimized if the work is done while equipment is already mobilized for use at Lobato Airport. The cost of the structural investigation at Lobato Airport, and of a simpler assessment of engineering needs at other airfields and other airfield infrastructure, will be about $0.15 million. Finally, traffic using the road that crosses next to the eastern end of the runway at Lobato Airport presents a safety hazard. The cost of relocating that road is estimated at $0.1 million, giving a total investment in runway infrastructure of $7.74 million.

Communications and navigational aids

The current VHF radio at Lobato Airport is to a minimal standard and needs to be upgraded to enhance air safety. This estimated cost is about $0.15 million.

Accounting and management information system

A financial manual and proposal for implementation of an accounting system for Lobato Airport has been completed. The system is essential for the successful operation of an airport authority; its implementation cost is estimated at $0.06 million.

Establishing an airport authority and aviation strategy

Work is required to prepare legislation, regulations, and other actions needed to establish an autonomous, commercial airport authority and a separate agency able to undertaken regulatory activities in the aviation sub-sector. A process to finance community service obligations of the airport authority will also need to be established. This work, which it is estimated to cost $0.20 million, will benefit from the experience with APORTIL, and will provide guidance for any necessary refinement of institutional arrangements in the maritime sub-sector.

Capacity building

Staff need to be trained in areas such as aviation and airport management, and the cost of a current proposal for this purpose is estimated at $0.15 million over the period FY2004/05 to FY2006/07. This training could be complemented by a twinning arrangement with another airport authority to further assist with development of institutional capacity, at a cost of about $0.15 million over a three-year period.

Program Priorities For The Medium Term

The responsible Government agencies have established a clear set of priorities for the proposed transport sector program (Table 5). The Government attaches particular importance to the continuation of the ferry subsidy and to the following programs:

- The strategy for road development and management, because its outcome will guide most future capital and maintenance expenditure in the road sub-sector and the formulation of road user charges to be imposed on motorists;
- Technical assistance for development of the capacity of DRBFC staff to assist with implementation of a sustainable road program;
- Implementation of a vehicle registration system to allow the implementation of improved vehicle management and registration fees; and
- Investigation of wharf, dredging, and shore protection needs for Dili port and for the runway at Lobato airport to define the ongoing investment needs.

Table 5: Priorities for proposed new program

Priority Ranking	Start Date	Proposed Total Amount for program					Total
		FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	
A. High priority Programs							
DRBFC capacity building	FY2004/05	750,000					750,000
Strategy for road development	FY2004/05	1,000,000					1,000,000
DLT capacity building	FY2004/05	500,000					500,000
Dili port investigation	FY2004/05	150,000					150,000
Civil aviation capacity building	FY2004/05	300,000					300,000
Runway improvement investigation	FY2004/05	150,000					150,000
Total proposed amount		2,850,000					2,850,000
Disbursements		1,470,000	980,000	400,000			2,850,000
B. Programs for the medium-term	FY2005/06						
Tefhnical assistance for MTC&PW	FY2005/06		1,500,000				1,500,000
Public transport development study	FY2005/06		250,000				250,000
Raod improvement (Dili-Los Palos-Lautem)	FY2005/06		10,000,000				10,000,000
Land transport administration system	FY2005/06		700,000				700,000
Dili port and foreshore development	FY2005/06		5,000,000				5,000,000
Tibar port feasibility	FY2005/06		500,000				500,000
Establish airport authority	FY2005/06		200,000				200,000
Communications and navaids	FY2005/06		150,000				150,000
Accounting system	FY2005/06		60,000				60,000
Runway improvement	FY2005/06		7,740,000				7,740,000
Development of Marit ime Services in TL	FY2006/07			7,000,000			7,000,000
Road improvement (Manatuto-Natabora)	FY2006/07			7,500,000			7,500,000
Road improvement (Viqueque-Natabora)	FY2006/07			6,500,000			6,500,000
Urban traffic management	FY2006/07			450,000			450,000
Raod improvement (Los Palos-Viqueque)	FY2007/08				10,000,000		10,000,000
Total proposed amount			26,100,000	21,450,000	10,000,000		57,550,000
Disbursements			12,890,000	17,200,000	14,760,000	9,200,000	54,050,000
C. Total Program							
Proposed amount		2,850,000	26,100,000	21,450,000	10,000,000	-	60,400,000
Total disbursements		1,470,000	13,870,000	17,600,000	14,760,000	9,200,000	56,900,000

The high-priority programs identified in Table 5 would require new approvals of donor support amounting to $2.8 million that would need to be agreed upon with donors for FY2004/05. New approvals for FY2005/06 would amount to $26 million.

V. EXPENDITURE PROGRAMS AND SOURCES OF FUNDING

Recent Public Expenditure In The Transport Sector

Total donor and government spending on the transport sector amounted to $82 million over the five-year period ending FY2003/04 (Table 6). The very high levels of spending in FY2000/01 and FY2001/02 stemmed from the large programs of rehabilitation and repair that were funded by donors. Donor spending accounted for about three quarters of total outlays in this period.

Table 6: Expenditures by donors, CFET, and autonomous agencies in the transport sector, FY1999/00 through FY2003/04

Funding Source	Disbursements					Total	
	FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	Amount	Percent
Donor programs	1,053,397	20,199,503	21,723,180	4,043,956	5,204,726	52,224,762	64.0
CFET appropriations	4,600,000	5,658,000	2,485,000	4,112,750	5,827,100	22,682,850	27.8
Autonomus agencies	1,255,000	1,350,000	1,365,000	1,383,000	1,400,000	6,753,000	8.3
Total	6,908,397	27,207,503	25,573,180	9,539,706	12,431,826	81,660,612	100.0
Donors as % total	15.2	74.2	84.9	42.4	41.9	64.0	

Source: Annex Table 1.

With the main tasks of emergency rehabilitation completed, donor support for the transport sector has declined sharply, with disbursements fairly stable at about $5 million per year over the past two years. As a result, in FY2002/03 and FY 2003/04 total outlays in the transport sector were less half the level of the two previous years.

About two-thirds of total spending has been allocated to road transport, primarily for reconstruction and rehabilitation in FY2000/01 and FY2001/02 (Table 7). As noted above, spending on roads in recent years has sought to maintain a basic level of accessibility, especially on national roads, by focusing on basic maintenance, rehabilitation, and emergency works. However, the fact is that the current levels of spending in the road transport sector are substantially below those required for even minimally adequate maintenance of assets and selective upgrading. A significant increase in allocations will be required to meet the goal of bringing the road network to a sustainable condition within ten years.

Table 7: Expenditures in the transport sector by program category FY1999/00 through FY2003/04

Program Category	Source of funds			Total	
	CFET	Autonomous	Donors	Amount	Percent
Policy, planning & management	155,950		4,986,187	5,142,137	6.3
Road rehabilitation & maintenance					
Road repair & rehabilitation*	11,642,050		35,803,371	47,445,421	58.1
Road maintenance	8,921,500			8,921,500	10.9
Materials, equipment & R&D	455,050			455,050	0.6
Sub-total	21,018,600	-	35,803,371	56,821,971	69.6
Road transport sector	1,508,300			1,508,300	1.8
Civil aviation		4,116,000	2,368,648	6,484,648	7.9
Sea transportation					
Port construction & operations		2,637,000	8,916,556	11,553,556	14.1
Ferry services			150,000	150,000	0.2
Sub-total	-	2,637,000	9,066,556	11,703,556	14.3
Total	22,682,850	6,753,000	52,224,762	81,660,612	100.0

Source: Annex Tables 1 and 3.

* Includes flood control

A particular concern of the Government throughout 2003 was the weak state of the project pipeline for the road sector. At that time, the only committed road project was the $9 million Phase II of the EIRP, which is to be completed by mid-2005. This program, which includes civil works of $6.7 million, addresses a backlog of road works, slip rehabilitation, and upgrading of the Cassa Bridge.

The Government has stepped up discussions with donors about a range of new activities for the road sector. Currently under preparation is the upgrading of the Dili to Cassa Road (with upgrading of the Mola Bridge, rehabilitation of slips and resheeting of the current road) and the provision of technical assistance to the MTCPW by the Government of Japan. The European Union has undertaken to fund the upgrading of five bridges on the south coast road between Viqueque and Los Palos, at an indicative cost of about $6 million.

Investment in marine infrastructure has amounted to about $11.5 million over the past five years. The resumption of the ferry service to Oecussi has been made possible with assistance from Germany to cover the cost of the operating subsidy (about $0.6 million a year) [p 22 suggested 0.45 million]. Donors (mainly Portugal) have also provided support of more than $2.4 million for airport operations.

Proposed Investment and Maintenance

Recurrent and capital expenditures in the transport sector are summarized in Table 8 and Table 9. The proposal is for total spending on the transport sector of about $175 million between FY2004/05 and FY2008/09. This includes proposed new CFET and donor-funded programs amounting to about $56 million.

Table 8: Proposed expenditures on road transport, by program category

Program Category	Disbursements					Total	
	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	Amount	Percent
Road & bridge construction							
Donor programs ongoing	7,912,368	9,953,585	10,927,282	4,432,914	352,000	33,578,149	19.2
CFET appropriations	5,105,000	6,180,000	6,416,000	6,761,000	7,420,000	31,882,000	18.2
Proposed new CFET	-	1,000,000	2,000,000	2,300,000	1,000,000	6,300,000	3.6
Proposed new donor programs	600,000	4,400,000	8,000,000	9,500,000	9,000,000	31,500,000	18.0
Sub-total	13,617,368	21,533,585	27,343,282	22,993,914	17,772,000	103,260,149	59.0
Road maintenance							
CFET appropriations	1,228,000	1,519,000	1,824,000	2,232,000	2,680,000	9,483,000	5.4
Proposed new CFET	-	2,420,000	4,510,000	4,610,000	4,660,000	16,200,000	9.2
Sub-total	1,228,000	3,939,000	6,334,000	6,842,000	7,340,000	25,683,000	14.7
Road transportation							
CFET appropriations	662,000	559,000	274,000	303,000	320,000	2,118,000	1.2
Proposed new CFET	-	100,000	100,000	100,000	100,000	400,000	0.2
Proposed new donor programs	200,000	900,000	200,000	150,000	200,000	1,650,000	0.9
Sub-total	862,000	1,559,000	574,000	553,000	620,000	4,168,000	2.4
Total Road Transport sector							
Donor programs ongoing	7,912,368	9,953,585	10,927,282	4,432,914	352,000	33,578,149	19.2
CFET appropriations	6,995,000	8,258,000	8,514,000	9,296,000	10,420,000	43,483,000	24.8
Proposed new CFET	-	3,520,000	6,610,000	7,010,000	5,760,000	22,900,000	13.1
Proposed new donor programs	800,000	5,300,000	8,200,000	9,650,000	9,200,000	33,150,000	18.9
Total	15,707,368	27,031,585	34,251,282	30,388,914	25,732,000	133,111,149	76.0
Total for transport sector	20,494,939	42,250,535	46,985,032	38,089,664	27,331,000	175,151,170	100.0
Share of roads in sector total (%)	76.6	64.0	72.9	79.8	94.1	76.0	

Source: Annex Table 1.

The proposed program for road transport amounts to almost $133 million, which accounts for 80 percent of the transport program as a whole and represents a significant increase over the $57 million spent in the past five years (Table 8). Outlays on new construction and rehabilitation amount to about $103 million as part of the proposed move towards establishing a stable, sustainable road network over the next ten years. Spending on road construction is expected to rise sharply in FY2004/05 as work begins on the above-mentioned Japan- and EU-funded programs and the currently planned CFET allocations for upgrading and rehabilitation.

An important component of the new proposals is technical assistance for detailed planning studies that would help set clear priorities for construction, rehabilitation, and maintenance for the ensuing five years. The proposed road network study will refine the scale of the road investment and maintenance program, and define a program of specific projects. Given the proposed planning studies, there will be merit in donors taking a program approach to providing support for road investment and maintenance, with budget support provided for specific works that are identified in accordance with the studies.

Table 9: Proposed expenditures on other transport programs, by program category

Program Category	Disbursements					Total	
	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	Amount	Percent
Policy, planning & management							
Donor programs	678,821	375,000	-	-	-	1,053,821	
CFET appropriations	57,750	74,250	64,750	71,750	74,000	342,500	0.2
Proposed new donor programs	300,000	1,000,000	700,000	500,000	-	2,500,000	1.4
Sub-total	357,750	1,074,250	764,750	571,750	74,000	2,842,500	1.6
Airports and aviation							
Civil aviation authority	854,000	894,000	972,000	972,000	975,000	4,667,000	2.7
Proposed new donor programs	220,000	5,070,000	2,200,000	1,110,000	-	8,600,000	4.9
Sub-total	1,074,000	5,964,000	3,172,000	2,082,000	975,000	13,267,000	7.6
Port construction, operations							
Donor programs	1,204,000	1,337,700	1,500,000	1,000,000	-	5,041,700	2.9
Ports authority operations	873,000	547,000	547,000	547,000	550,000	3,064,000	1.7
Proposed new donor programs	150,000	2,500,000	6,500,000	3,500,000	-	12,650,000	7.2
Sub-total	2,227,000	4,384,700	8,547,000	5,047,000	550,000	20,755,700	11.9
Shipping services							
Donor programs	450,000	3,421,000	250,000	-	-	4,121,000	2.4
Proposed new donor programs	-	-	-	-	-	-	-
Sub-total	450,000	3,421,000	250,000	-	-	4,121,000	2.4
Total Other Programs	4,108,750	14,843,950	12,733,750	7,700,750	1,599,000	40,986,200	23.4
Total transport sector	20,494,939	42,250,535	46,985,032	38,089,664	27,331,000	175,151,170	100.0

Source: Annex Table 1.

The Government is proposing a significant increase in spending on routine road maintenance. The CFET budget allocates $1.2 million for the maintenance of national roads, with appropriations rising to $2.7 million by FY2008/09. As noted above, this level of spending remains well below what is needed to ensure that the road system remains in good working order. Moreover, the budgeted amount does not make adequate provision for maintenance of rural and feeder roads. The SIP therefore includes an additional $16.2 million to meet these needs to bring total allocations for maintenance to about $26 million for the five years. These funds would be directed towards the national and district network as well as to priority interventions within the 3,000 kilometers of rural and farm access roads that currently receive minimal or no maintenance.[10]

As noted elsewhere, a key issue related to the rural and feeder road program is the clarification of responsibilities for the network and the role of local communities in maintaining these assets. The above allocations could be combined with resources available under the proposed Community Development Fund in a way that would provide local communities with a role in decision making at the local level on priorities for road maintenance.

[10] See the SIP for the Agriculture, Forestry, and Fisheries sector for a further discussion of the problems associated with determining a sustainable level of government support for rural infrastructure. Available at <http://www.mopf.gov.tp/tldpm/SIP.htm>

The large increase in civil works spending can have a very important impact on job creation over the next five years while greatly improving transport services. A rough estimate of the impact on employment suggests that over the next five years the proposed program could add as many as 6,000-10,000 new jobs in construction. A key issue is Timor-Leste's institutional capacities for effective implementation of the much expanded roads program. As Annex Table 1 shows, at the peak of the rehabilitation program (in FY2000/01 and FY 2001/02), annual spending on roads was $18 million. The proposed program calls for an increase in estimated spending to $34 million in FY2007/08, followed by a decline to $27 million the following year (Table 8). The Government is very conscious of the need to build up the capacities of the relevant agencies responsible for the transport sector, and of the domestic construction industry, for this much larger program of construction.

Spending of $30 million is proposed for aviation, ports, shipping services, and capacity building in the transport sector (Table 9). This compares with $24 million of expenditures over the past five years. Much of the increase stems from the new ferry that will begin operating soon, and from the substantial program of upgrading that is planned for the airport. The proposed program includes a number of capacity building initiatives in the amount of about $1 million for the MTCPW and the Civil Aviation Authority, the specifics of which were reviewed in Chapter 4.

Capital And Recurrent Spending In The Transport Sector

Over the past five years, capital outlays in the transport sector amounted to an estimated $62 million, three quarters of which was funded by donors (Table 10). The proposed program for the next five years calls for a doubling of capital spending to $130 million, with two thirds funded by donors. Recurrent spending, largely on road maintenance, would rise from $19 million during the past five years to about $43 million. CFET would continue to finance about 80 percent of these recurrent outlays.

Table 10: Expenditures in the transport sector, by type

Source of Funding	FY1999/00-FY2003/04		FY2004/05-FY2008/09		Total	
	Amount	Percent	Amount	Percent	Amount	Percent
Recurrent expenditures						
Donors	5,186,932	6.4	8,363,821	4.8	13,550,753	5.3
CFET	13,885,150	17.0	34,638,500	19.8	48,523,650	18.9
Sub-total	19,072,082	23.4	43,002,321	24.6	62,074,403	24.2
Capital expenditures						
Donors	47,037,830	57.6	92,330,849	52.7	139,368,679	54.3
CFET	15,550,700	19.0	39,818,000	22.7	55,368,700	21.6
Sub-total	62,588,530	76.6	132,148,849	75.4	194,737,379	75.8
Total expenditures						
Donors	52,224,762	64.0	100,694,670	57.5	152,919,432	59.5
CFET	29,435,850	36.0	74,456,500	42.5	103,892,350	40.5
Total	81,660,612	100.0	175,151,170	100.0	256,811,782	100.0

Source: Annex Table 6.

There is a strong case for such increased emphasis on better transport infrastructure. The main issue, as noted above, is whether the Government agencies concerned and the domestic construction industry have the capacity to handle a doubling of the work load in the sector in a short period of time, while ensuring the effective use of funds. Increased use of foreign contractors is likely to be necessary, and close attention will need to be given to the use of labor-intensive construction methods to ensure that the potential employment benefits are realized. In this connection, the $5 million skills training project (STAGE) funded by the European Union and executed by the International Labor Organization has a major role to play in supporting the development of relevant domestic skills. Complementary programs, for example for equipment leasing, may also be needed to ensure that Timor-Leste's construction industry can respond to the new opportunities.

Sources Of Funding

The role of donors

Over the past five years, donor support for the transport sector amounted to about $52 million, or about two thirds of total outlays (Table 11). TFET and Japan were by far the most important supporters of the program, supplying half of total spending. Ongoing and currently approved donor projects will disburse another $44 million over the next five years, thus providing for about a quarter of the proposed program.

Table 11: Sources of funding for transport sector program

Source of Funding	FY1999/00-FY2003/04		FY2004/05-FY2008/09		Total	
	Amount	Percent	Amount	Percent	Amount	Percent
Donors						
TFET	26,628,199	32.6	9,000,000	5.4	35,628,199	14.3
Japan	14,883,299	18.2	20,053,600	11.9	34,936,899	14.0
Germany	1,041,300	1.3	9,118,700	5.4	10,160,000	4.1
European Union	3,053,907	3.7	4,568,549	2.7	7,622,456	3.1
Portugal	3,940,974	4.8	253,821	0.2	4,194,795	1.7
ADB	1,450,000	1.8	800,000	0.5	2,250,000	0.9
Other donors	1,227,083	1.5	-	-	1,227,083	0.5
Sub-total	52,224,762	64.0	43,794,670	26.0	96,019,432	38.4
CFET appropriations	22,682,850	27.8	43,825,500	26.1	66,508,350	26.6
Autonomous agencies	6,753,000	8.3	7,731,000	4.6	14,484,000	5.8
Total	81,660,612	100.0	95,351,170	56.7	177,011,782	70.9
Proposed new programs						
Additional CFET allocations		-	22,900,000	13.6	22,900,000	9.2
New donor programs		-	49,900,000	29.7	49,900,000	20.0
Grand total	81,660,612	100.0	168,151,170	100.0	249,811,782	100.0

Source: Annex Tables 1 and 4.

The Government recognizes that the phase-out of TFET in the coming years will bring new challenges for the funding of the transport investment program. Japan, Germany, and the

European Union have all made major commitments related to the program for the next five years. However, some $56 million of new money remains to be mobilized, in addition to some $23 million more for CFET spending on road building and maintenance. In the event that this level of funding is not available from donors on a grant basis, the Government will have to consider alternative funding arrangements, including additional CFET allocations, or a reduction in proposed spending for the transport sector.

The role of user charges

Given the current level of transport demand and the state of the economy in Timor-Leste, user charges are unlikely to generate enough revenue to support unsubsidized private sector provision of infrastructure for any mode of transport, at least in the short term—and in the case of roads, probably in the medium to long term as well. Government funds and international aid are needed to support investment in fixed infrastructure in the transport sector for the time being.

Using the private sector to implement and maintain projects and provide public transport services is vital, however, to ensure that transport is cost-effective in the medium and longer term. The first steps in this direction are being taken with the port and airport. Implementation of the Port Authority (APORTIL) and an equivalent airport authority with commercial accounting systems and appropriate user charges should enable these sub-sectors to become financially self-sustaining in the medium term. They may face difficulties in the short term due to the decline in demand that will accompany the withdrawal of the UNPKF, during which time there will be a need for continued external assistance to finance needed investments. A continued subsidy will be needed to sustain the current ferry service to Oecussi and Atauro in the short term, though the introduction of a new ferry in late 2005 should substantially reduce and perhaps eliminate the need for a subsidy.

In the road sub-sector, the introduction of user charges will lead to better travel decisions by the community and generate more revenue for the Government. The Government recognizes the scope for generating additional revenues from road user charges that in turn can fund the additional requirements for road maintenance. Preliminary estimates suggest that revenue from fuel excise and registration fees could meet 70 percent of the cost of road maintenance by FY2006/07. This is based on the assumption of a rise in fuel excise from the beginning of 2005 at a rate of $1.5 million per year in FY2003/04 prices; the revenue would be contingent on a reduction in the imported cost of fuel and a corresponding increase in fuel excise. Revenue is expected to rise by five percent per year in nominal terms, reflecting inflation as well as an increase in the number and use of vehicles. Net revenue from registration fees is expected to be $1 million per year in FY2004/05 prices, rising in nominal terms in the following years by five percent per year. This revenue stream should commence in FY2005/06 following the implementation of the proposed vehicle registration system. The total revenue in FY2006/07 from fuel taxes and registration charges could be about $5.8 million: about $1.2 million from the current fuel excise and $4.6 million from a rise in the level of fuel excise and the introduction of annual registration charges. The Government would seek to collect additional revenue from road users to eventually recover the full cost of road maintenance within a further period of about five years.

VI. MANAGING UNCERTAINTY

Project Preparation and Approval By Donors

The timing and likely scale of future donor assistance for the transport sector are uncertain. These uncertainties will be addressed in the following ways: (a) ensuring that clear sector development plans establish infrastructure development needs and priorities; (b) ensuring that more projects are under preparation than can be funded, to allow for the failure of some projects to secure support; and (c) seeking guidance and certainty from donors regarding their priorities and interests.

Domestic Funding

The Government will need to provide increased domestic funds to meet recurrent costs in the transport sector. However, the limited resource base for increased Government revenue leaves the risk that such resource mobilization may not be fully achieved. The extent to which the winding down of UNPKF will reduce the operating surplus of the airport and port is also uncertain. The uncertainty can be managed by budgeting less than full use of all the potential sources of additional revenue in the immediate future.

In the event of shortfalls in the capacity of CFET and donors to fund the proposed program, the Government would need to consider scaling back the program. For roads, an alternative program—based on a "Low Case Scenario" assuming lower levels of donor support—would result in a lower but still sustainable standard for the network. Details of this smaller program are in Annex 4.

Extraordinary Events

Extraordinary events can disrupt transport services and impose substantial additional costs on the operation and maintenance of transport infrastructure. Road infrastructure faces significant risks from natural hazards including erosion, landslides, and flooding. Ports and airports face natural risks of storm damage and man-made risks such as those from hazardous materials and security breaches. Exposure to risk can be managed systematically through interventions that address the reduction of risk, preparedness for emergencies, response plans for handling emergencies, and through planning recovery options.

For example, preventive investment in strengthening the resilience of sensitive sections of the road network—through adequate drainage, slope stabilization, riverbank protection, and practices that minimize disturbance to natural landforms and vegetation—can do much to reduce the probabilities of closure or damage and reduce the costs that are currently spent on reactive emergency maintenance. A readiness plan could include stocks of emergency equipment such as bailey bridges and earthmoving equipment in the vicinity of sensitive areas. Response arrangements include clear designation of responsibilities for directing emergency operations and authorizing expenditures and resources, and coordination between institutions and affected people. The Government would like to incorporate such a systematic risk management approach into infrastructure planning and operation so as to significantly

reduce the probability and impacts of disruption and to reduce the overall costs of responding to emergencies.

References

Asian Development Bank (ADB) (2002), "Transport Sector Master Plan for East Timor", Pacific Department, May.

Pacific Islands Forum Secretariat (2003), "Pacific Fuel Price Monitor – Edition 3- Fuel Prices for November-December 2002", March. <http://www.forumsec.org.fj/docs/PFPM%20Edition%2003.pdf>

Planning Commission (2002), "East Timor – National Development Plan", Dili, May.

Republica Democrátia de Timor-Leste (2003), "The Road Map (for the implementation of NDP Programs – Final Draft", 15 April, Dili.

World Bank (2003), "Timor-Leste - Poverty in a New Nation: Analysis for Action", May, Washington DC.

World Bank (undated work in progress for public discussion) "Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural Communities", World Bank Technical Paper No 496, Washington DC.

Annexes

ANNEX 1 Table 1: Actual and Proposed CFET Appropriations and Donor Expenditure Programs Completed, Ongoing and Under Preparation for the Transportation Sector

Budget Category	Annual Appropriations										Total			
	FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	FY1999/00-FY2003/04		FY2004/05-FY2008/09	
											Amount	Percent	Amount	Percent
Policy, planning and management														
Donor programs	200,000	2,501,168	1,551,000	395,000	339,019	678,821	375,000	-	-	-	4,986,187	6.1	1,053,821	0.6
CFET appropriations	-	5,000	24,000	65,750	61,200	57,750	74,250	64,750	71,750	74,000	155,950	0.2	342,500	0.2
Proposed new donor programs						300,000	1,000,000	700,000	500,000				2,500,000	1.4
Sub-total	**200,000**	**2,506,168**	**1,575,000**	**460,750**	**400,219**	**1,036,571**	**1,449,250**	**764,750**	**571,750**	**74,000**	**5,142,137**	**6.3**	**3,896,321**	**2.2**
Road and bridge construction and rehabilitation														
Donor programs	807,132	12,345,966	15,829,086	2,996,780	3,824,407	7,912,368	9,953,585	10,927,282	4,432,914	352,000	35,803,371	43.8	33,578,149	19.2
CFET appropriations	3,500,000	4,000,000		658,000	3,484,050	5,105,000	6,180,000	6,416,000	6,761,000	7,420,000	11,642,050	14.3	31,882,000	18.2
Proposed new CFET							1,000,000	2,000,000	2,300,000	1,000,000			6,300,000	3.6
Proposed new donor programs						600,000	4,400,000	8,000,000	9,500,000	9,000,000			31,500,000	18.0
Sub-total	**4,307,132**	**16,345,966**	**15,829,086**	**3,654,780**	**7,308,457**	**13,617,368**	**21,533,585**	**27,343,282**	**22,993,914**	**17,772,000**	**47,445,421**	**58.1**	**103,260,149**	**59.0**
Road maintenance														
CFET appropriations	1,000,000	1,500,000	2,288,000	3,148,000	1,440,550	1,228,000	1,519,000	1,824,000	2,232,000	2,680,000	9,376,550	11.5	9,483,000	5.4
Proposed new CFET							2,420,000	4,510,000	4,610,000	4,660,000			16,200,000	9.2
Sub-total	**1,000,000**	**1,500,000**	**2,288,000**	**3,148,000**	**1,440,550**	**1,228,000**	**3,939,000**	**6,334,000**	**6,842,000**	**7,340,000**	**9,376,550**	**11.5**	**25,683,000**	**14.6**
Road transportation														
CFET appropriations	1,000,000	153,000	173,000	241,000	841,300	662,000	559,000	274,000	303,000	320,000	1,508,300	1.8	2,118,000	1.2
Proposed new CFET							100,000	100,000	100,000	100,000			400,000	0.2
Proposed new donor programs						200,000	900,000	200,000	150,000	200,000			1,650,000	0.9
Sub-total	**1,000,000**	**153,000**	**173,000**	**241,000**	**841,300**	**862,000**	**1,559,000**	**574,000**	**553,000**	**620,000**	**1,508,300**	**1.8**	**4,168,000**	**2.3**
Airports and aviation														
Donor programs		1,139,421	1,229,227											
Civil aviation authority	750,000	830,000	840,000	845,000	851,000	854,000	894,000	972,000	972,000	975,000	2,368,648	2.9	4,667,000	2.7
Proposed new donor programs						220,000	5,070,000	2,200,000	1,110,000		4,116,000	5.0	8600000	4.9
Sub-total	**750,000**	**1,969,421**	**2,069,227**	**845,000**	**851,000**	**1,074,000**	**5,964,000**	**3,172,000**	**2,082,000**	**975,000**	**6,484,648**	**7.9**	**13,267,000**	**7.6**
Sea port construciton, maintenance														
Donor programs	46,265	4,212,948	3,113,867	652,176	891,300	1,204,000	1,337,000	1,500,000	1,000,000				5,041,700	2.9
Ports authority	505,000	520,000	525,000	538,000	549,000	873,000	547,000	547,000	547,000	550,000	8,916,556	10.9	3,064,000	1.7
Proposed new donor programs						150,000	2,500,000	6,500,000	3,500,000		2,637,000	3.2	12,650,000	7.2
Sub-total	**551,265**	**4,732,948**	**3,638,867**	**1,190,176**	**1,440,300**	**2,227,000**	**4,384,000**	**8,547,000**	**5,047,000**	**550,000**	**11,553,556**	**14.1**	**20,755,700**	**11.8**
Shipping services														
Donor programs					150,000	450,000	3,421,000	250,000			150,000	0.2	4,121,000	2.4
Proposed new donor programs														
Sub-total	**0**	**0**	**0**	**0**	**150,000**	**450,000**	**3,421,000**	**250,000**	**0**	**0**	**150,000**	**0.2**	**4,121,000**	**2.4**
Total transportation														
Donor programs	1,053,397	20,199,503	21,723,180	4,043,956	5,204,726	10,245,189	15,087,285	12,677,282	5,432,914	352,000	52,224,762	64.0	43,794,670	25.0
CFET appropriations	4,600,000	5,658,000	2,485,000	4,112,750	5,827,100	7,052,750	8,332,250	8,578,750	9,367,750	10,494,000	22,682,850	27.8	43,825,500	25.0
Autonomous authorities	1,255,000	1,350,000	1,365,000	1,383,000	1,400,000	1,727,000	1,441,000	1,519,000	1,519,000	1,525,000	6,753,000	8.3	7,731,000	4.4
Proposed new CFET							3,520,000	6,610,000	7,010,000	5,760,000			22,900,000	13.1
Proposed new donor programs						1,470,000	13,870,000	17,600,000	14,760,000	9,200,000			56,900,000	32.5
Total	**6,908,397**	**27,207,503**	**25,573,180**	**9,539,706**	**12,431,826**	**20,494,939**	**42,250,535**	**46,985,032**	**38,089,664**	**27,331,000**	**81,660,612**	**100.0**	**175,151,170**	**100.0**

Source: Annex 1, Tables 2, 3, and 5

Annex 1 Table 2: Summary of Donor Funded Programs for Transportation

Sub-sector/Project	Donor	Annual Appropriations										Total	
		FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	Disbursed	Approved
Policy, planning and management													
Emergency Infrastructure Rehabilitation I	TFET		1,144,000	1,501,000	345,000							2,990,000	2,990,000
Transport Sector Policy	Portugal		1,257,168									1,257,168	1,257,168
Transport Sector Improvement	ADB	200,000	100,000	50,000	50,000	50,000	50,000					500,000	500,000
Transport Sector Training	Japan					35,200						35,200	
Sub-total		**200,000**	**2,501,168**	**1,551,000**	**395,000**	**85,200**	**50,000**	**0**	**0**	**0**	**0**	**4,782,368**	**4,747,168**
Road Sector													
Emergency Road Repairs	Australia		295,000									295,000	205,000
Airport Roundabout Rehabilitation	Japan				65,000							65,000	65,000
Dili-Amaro-Cassa Road Rehabilitation ???	Japan		2,350,000	2,350,000								4,700,000	4,700,000
Infrastructure Rehabilitation	Japan		825,000	2,305,000								3,130,000	3,130,000
Road and Bridge Repair	USA		46,184	46,184	46,183							138,551	157,494
Technical Assistance Road Tepairs	Portugal		13,140	4,622								17,762	17,746
Road Repairs	Norway		486,400									486,400	486,400
Road Engineering and Administration Trair	Japan			15,833								15,833	15,833
Transport Sector Restoration	ADB	500,000	221,000	279,000								1,000,000	1,000,000
UNDP Rural Roads	Australia	307,132										307,132	307,132
Urgent Road Rehabilitation	Japan			94,786								94,786	94,786
Basic Design Study for Roads & Bridges	Japan				418,500	418,500						837,000	837,000
Improvement of Roads and Bridges (Dili-C	Japan						1,573,943	3,851,886	4,814,857	2,888,914	352,000	13,481,600	13,481,600
Road and Bridge Improvement	Japan						1,544,000	1,544,000	1,544,000	1,544,000		6,176,000	6,176,000
Livelihood Stabilization Program	Japan					352,000	352,000					704,000	704,000
Upgrading of Five Bridges (Viquaqua-Los I	EU					3,053,907	1,505,425	1,557,699	1,505,425			7,622,456	7,622,457
Emergency Infrastructure Rehabilitation I	TFET		8,109,242	10,733,661	2,467,097							21,310,000	21,310,000
Emergency Rehabilitation II	TFET						2,937,000	3,000,000	3,063,000			9,000,000	9,000,000
Sub-total		**807,132**	**12,345,966**	**15,829,086**	**2,996,780**	**3,824,407**	**7,912,368**	**9,953,585**	**10,927,282**	**4,432,914**	**352,000**	**69,381,520**	**69,310,448**
Airports and aviation													
Civil Aviation Management Training	Japan			2,688								2,688	2,688
International air transport Comoro(???)	Portugal		1,139,421	1,226,539								2,365,960	2,361,710
Sub-total		**0**	**1,139,421**	**1,229,227**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,368,648**	**2,364,398**
Sea Transportation													
Dili Harbour Fenders & Navigation Aids	Japan		706,042	1,943,958								2,650,000	2,650,000
Port Management Training	Japan		1,792									1,792	1,792
Rehabilitation of Dili Port	Japan						44,000					44,000	44,000
Technical Advisor Port of Dili	Portugal	46,265										46,265	46,265
Emergency Infrastructure Rehabilitation I	TFET		506,114	669,909	153,977							1,330,000	1,330,000
Ferry Service Subsidy	Germany			562,994	680,982							1,243,976	1,144,918
New Ferry	Germany						3,000,000					3,000,000	3,000,000
Maritime Transport Service Project	Germany					891,295	2,068,406	1,501,267	1,526,483	1,850,000		7,837,451	8,500,000
Hara Fisheries Port Rehabilitation (???)	TFET			500,000	498,199							998,199	998,199
Dili Port West Container Yard Rehabilitatio	Japan		2,999,000									2,999,000	2,999,000
Sub-total		**46,265**	**4,212,948**	**3,676,861**	**1,333,158**	**891,295**	**5,112,406**	**1,501,267**	**1,526,483**	**1,850,000**	**0**	**20,150,683**	**20,714,174**
GRAND TOTAL		**1,053,397**	**20,199,503**	**22,286,174**	**4,724,938**	**4,800,902**	**13,074,774**	**11,454,852**	**12,453,765**	**6,282,914**	**352,000**	**96,683,219**	**97,136,188**

Source: Registry of External Assistance

Annex 1 Table 3: Summary of CFET Budget Appropriations for Transport Sector

Budget Category	Annual Appropriations										Total			
	FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	FY1999/00-FY2003/04		FY2004/05-FY2008/09	
											Amount	Percent	Amount	Percent
Office of Minister of TC&PW		5,000	7,500	10,250	8,750	8,750	8,750	9,000	9,250	9,500	31,500	0.1	45,250	0.1
Office of Vice Minister of TC&PW			5,000	7,000	6,000	6,000	6,000	6,250	6,500	6,750	18,000	0.0	31,500	0.0
Permanent Sec Transport Communications			11,500	5,500	6,800	6,000	10,500	7,500	11,000	11,500	23,800	0.1	46,500	0.1
Directorate for Administrative Services				41,250	34,013	33,250	43,750	38,250	38,500	38,750	75,263	0.3	192,500	0.4
Directorate for Planning Services				1,750	5,638	3,750	5,250	3,750	6,500	7,500	7,388	0.0	26,750	0.1
Roads, Bridges and Flood Control														
Directorate of roads, bridges and flood contr	1,000,000	1,500,000	2,288,000	3,148,000	1,440,550	1,228,000	1,519,000	1,824,000	2,232,000	2,680,000	9,376,550	31.9	9,483,000	18.4
Periodic maintenance of roads	3,000,000	3,000,000			2,519,000	2980000	3,061,000	4,200,000	4,600,000	5,000,000	8,519,000	28.9	19,841,000	38.5
Road improvements					200,000	600000	800,000	850,000	850,000	1,000,000	200,000	0.7	4,100,000	8.0
Bridge rehabilitation						510000	1,000,000						1,510,000	0.0
Urban roads, drainage, footpaths	500,000	500,000		200,000	200,000	300000	400,000	400,000	400,000	450,000	1,400,000	4.8	1,950,000	3.8
Flood control		500,000		250,000	318,000	500000	606,000	650,000	650,000	700,000	1,068,000	3.6	3,106,000	6.0
Public safety campaign					50,000	55000					50,000	0.2	55,000	0.1
Material and Equipment				208,000	247,050	215000	313,000	316,000	261,000	270,000	455,050	1.5	1,375,000	2.7
Directorate for Land Transport Services	100,000	153,000	173,000	241,000	251,300	307000	309,000	274,000	303,000	320,000	918,300	3.1	1,513,000	2.9
Rehabilitate bus terminals					200,000	200000	200,000				200,000	0.7	400,000	0.8
Traffic signals					340,000	100000	50,000				340,000	1.2	150,000	0.3
Civil aviation	750,000	830,000	840,000	845,000	851,000	854000	894,000	972,000	972,000	975,000	4,116,000	14.0	4,667,000	9.1
Sea Transportation	505,000	520,000	525,000	538,000	549,000	873000	547,000	547,000	547,000	550,000	2,637,000	9.0	3,064,000	5.9
Total	5,855,000	7,008,000	3,850,000	5,495,750	7,227,101	8,779,750	9,773,250	10,097,750	10,886,750	12,019,000	29,435,850	100.0	51,556,500	100.0
Memo items:														
Capital Expenditures	3,500,000	4,500,000	1,402,000	1,781,100	4,367,600	5,926,300	6,644,700	6,645,700	6,976,300	7,325,000	15,550,700	52.8	33,518,000	65.0

Source: Budget Office

Annex 1 Table 4: Source of Funding for Transportation Sector

Source of Funding	Annual Appropriations										Total	
	FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	Disbursed Amount	Approved Amount
Donors												
TFET		9,759,356	13,404,570	3,464,273		2,937,000	3,000,000	3,063,000			35,628,199	35,628,199
Japan		6,881,834	6,712,265	483,500	805,700	3,513,943	5,395,886	6,358,857	4,432,914	352,000	27,977,699	27,977,699
Germany			562,994	680,982	891,295	5,068,406	1,501,267	1,526,483	1,850,000		12,081,427	12,644,918
European Union					3,053,907	1,505,425	1,557,699	1,505,425			7,622,456	7,622,457
Portugal	46,265	2,409,729	1,231,161								3,687,155	3,682,889
ADB	700,000	321,000	329,000	50,000	50,000	50000					1,500,000	1,500,000
Norway		486,400									486,400	486,400
UNDP	307,132										307,132	307,132
Australia		295,000									295,000	205,000
United States		46,184	46,184	46,183							138,551	157,494
Sub-total	1,053,397	20,199,503	22,286,174	4,724,938	4,800,902	13,074,774	11,454,852	12,453,765	6,282,914	352,000	89,724,019	90,212,188
CFET Appropriations	5,855,000	7,008,000	3,850,000	5,495,750	7,227,100	8,779,750	9,773,250	10,097,750	10,886,750	12,019,000	58,086,600	58,085,600
Total	**6,908,397**	**27,207,503**	**26,136,174**	**10,220,688**	**12,028,002**	**21,854,524**	**21,228,102**	**22,551,515**	**17,169,664**	**12,371,000**	**147,810,619**	**148,297,788**
CFET as % of total	84.8	25.8	14.7	53.8	60.1	40.2	46.0	44.8	63.4	97.2	39.3	39.2

Source: Annex Table 2

Annex 1 Table 5: Proposed New Projects and Programs in the Transportation Sector

Program	Possible Funding Source	Proposed Amount	Annual Disbursements FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	Total Amount
Policy, planning and management								
Technical assistance for MTC&PW	Japan	1,500,000		500,000	500,000	500,000		1,500,000
DRBFC capacity building & staff development		750,000	300,000	250,000	200,000			750,000
Public transport development study		250,000		250,000				250,000
Sub-total		2,500,000	300,000	1,000,000	700,000	500,000	0	2,500,000
Road and bridge construction and rehabilitation								
Strategy for road development and management		1,000,000	600,000	400,000				1,000,000
Road improvement (Dili-Los Palos_Lauten)		10,000,000		4,000,000	3,000,000	3,000,000		10,000,000
Road widening (Maubisse-Turiscai-Alas)	CFET	4,000,000		1,000,000	1,500,000	1,500,000		4,000,000
Road improvement (Manatuto-Lachubar-Natabora)		7,500,000			3,000,000	2,500,000	2,000,000	7,500,000
Road improvement (Viqueque-Natarbora)		6,500,000			2,000,000	2,000,000	2,000,000	6,000,000
Road opening (Turiscai-Soibada-Salau)	CFET	1,500,000			500,000	500,000	500,000	1,500,000
Road improvement (los Palos-Unlari-Viqueque)		10,000,000				2,000,000	5,000,000	7,000,000
Road widening and extension (Vemasse-Uaimora-Lactua)	CFET	1,300,000				300,000	500,000	800,000
Sub-total		41,800,000	600,000	5,400,000	10,000,000	11,800,000	10,000,000	37,800,000
Road maintenance								
Road maintenance national system	CFET	8,700,000		1,170,000	2,510,000	2,510,000	2,510,000	8,700,000
Road maintenance rural and feeder roads	CFET	7,500,000		1,250,000	2,000,000	2,100,000	2,150,000	7,500,000
Sub-total		16,200,000	0	2,420,000	4,510,000	4,610,000	4,660,000	16,200,000
Traffic and Trtansport Management								
DLT capacity-building & staff development		500,000	200,000	200,000	100,000			500,000
Land transport adminstration system		700,000		700,000				700,000
Urban traffic management improvement		450,000			100,000	150,000	200,000	450,000
Road safety programs	CFET	400,000		100,000	100,000	100,000	100,000	400,000
Sub-total		2,050,000	200,000	1,000,000	300,000	250,000	300,000	2,050,000
Ports and Shipping								
Dili Port development & shore protection - investigation		150,000	150,000					150,000
Dili Port development & shore protection - works		5,000,000		2,000,000	2,000,000	1,000,000		5,000,000
Development of Maritime Sesrvices in Timor Leste		7,000,000			4,500,000	2,500,000		7,000,000
Tibar Port Feasibility Study		500,000		500,000				500,000
Sub-total		12,650,000	150,000	2,500,000	6,500,000	3,500,000	0	12,650,000
Aviation								
Civil aivation capcity-building & staff development		300,000	70,000	130,000	100,000			300,000
Establishing an Airport Authority * aviation strategy		200,000		200,000				200,000
Runway improvemnet - investigation		150,000	150,000					150,000
Runway improvemnet - works		7,740,000		4,530,000	2,100,000	1,110,000		7,740,000
Communication and navaids		150,000		150,000				150,000
Accounting system		60,000		60,000				60,000
Sub-total		8,600,000	220,000	5,070,000	2,200,000	1,110,000	0	8,600,000
Total new programs		**83,800,000**	**1,470,000**	**17,390,000**	**24,210,000**	**21,770,000**	**14,960,000**	**79,800,000**
Donor funded programs		60,400,000	1,470,000	13,870,000	17,600,000	14,760,000	9,200,000	56,900,000
CFET funded programs		23,400,000		3,520,000	6,610,000	7,010,000	5,760,000	22,900,000

Source: Annex 1, Tables 2, 3, and 5

Annex Table 6: Classification of Transport Sector Expenditures by Type of Expenditure
(In US$)

Category	Annual disbursements										Total	
	FY1999/00	FY2000/01	FY2001/02	FY2002/03	FY2003/04	FY2004/05	FY2005/06	FY2006/07	FY2007/08	FY2008/09	FY1999/00-03/04	FY2004/05-08/09
On-budget expenditures												
Recurrent spending												
Donors	246,265	2,502,960	1,553,688	395,000	489,019	1,288,821	825,000	250,000	-	-	5,186,932	2,363,821
CFET	2,355,000	2,508,000	2,448,000	3,714,650	2,859,500	2,853,450	3,128,550	3,452,050	3,910,450	4,694,000	13,885,150	18,038,500
Proposed new CFET	-	-	-	-	-	-	2,520,000	4,610,000	4,710,000	4,760,000	-	16,600,000
Proposed new donor programs	-	-	-	-	-	1,470,000	3,130,000	900,000	500,000	-	-	6,000,000
Sub-total	2,601,265	5,010,960	4,001,688	4,109,650	3,348,519	5,612,271	9,603,550	9,212,050	9,120,450	9,454,000	19,072,082	43,002,321
Capital spending												
Donors	807,132	17,696,543	20,169,492	3,648,956	4,715,707	8,956,368	14,262,285	12,427,282	5,432,914	352,000	47,037,830	41,430,849
CFET	3,500,000	4,500,000	1,402,000	1,781,100	4,367,600	5,926,300	6,644,700	6,645,700	6,976,300	7,325,000	15,550,700	33,518,000
Proposed new CFET						-	1,000,000	2,000,000	2,300,000	1,000,000	-	6,300,000
Proposed new donor programs						-	10,740,000	16,700,000	14,260,000	9,200,000	-	50,900,000
Sub-total	4,307,132	22,196,543	21,571,492	5,430,056	9,083,307	14,882,668	32,646,985	37,772,982	28,969,214	17,877,000	62,588,530	132,148,849
Total on-budget expenditures												
Donors	1,053,397	20,199,503	21,723,180	4,043,956	5,204,726	10,245,189	15,087,285	12,677,282	5,432,914	352,000	52,224,762	43,794,670
CFET	5,855,000	7,008,000	3,850,000	5,495,750	7,227,100	8,779,750	9,773,250	10,097,750	10,886,750	12,019,000	29,435,850	51,556,500
Proposed new CFET						-	3,520,000	6,610,000	7,010,000	5,760,000	-	22,900,000
Proposed new donor programs						1,470,000	13,870,000	17,600,000	14,760,000	9,200,000	-	56,900,000
Total	6,908,397	27,207,503	25,573,180	9,539,706	12,431,826	20,494,939	42,250,535	46,985,032	38,089,664	27,331,000	81,660,612	175,151,170
Off-budget donor expenditures	-	-	-	-	-	-	-	-	-	-	-	-
Total expenditures	6,908,397	27,207,503	25,573,180	9,539,706	12,431,826	20,494,939	42,250,535	46,985,032	38,089,664	27,331,000	81,660,612	175,151,170

Source: Annex Tables 2, 3 and 5.

ANNEX 2: THE ROAD NETWORK IN TIMOR-LESTE

The length of the road network in Timor-Leste is reported to be 6,036 km. About half of this network is rural road, which is commonly not reported as part of "classified" road networks when making international comparisons.

Table 1: Length of road in Timor-Leste (km)

Region	National	District	Urban	Rural and feeder	Total
Baucau	373	270	158	810	1,611
Dili	293	157	316	710	1,475
Same	246	206	97	655	1,204
Maliana	423	164	106	740	1,432
Oecussi	91	73	40	110	314
Total	1,426	869	716	3,025	6,036

Source: DRBFC.

The Japan Engineering Group (JEG) recently surveyed the "core" national road network, which was taken to be Road Numbers A01 to A14. Features of the roads are summarized in Annex 2 Table 2. The roads are generally in poor condition and carry modest quantities of traffic, with the notable exceptions of A01 and A06. The JEG review focused on identifying locations where roads were currently impassable due to landslides or absent bridges, and locations where failure could occur in the future. JEG found that the north coast road is generally in better condition than other roads. The north-south roads must cross difficult terrain, which makes them subject to landslips and water runoff. The south coast road is in poorer condition, and is also subject to landslips and the passage of waterways to the sea.

Table 2: Features of major roads in Timor-Leste

Route No.	Road Link	Length (km)	AADT (veh/day)	Roughness (IRI)	Road condition
A01	Dili-Com	202.9	3,490	5.1	Good
A02	Dili-Suai	178.3	930	9.8	Fair to very poor
A03	Dili-Maliana	151.1	1,690	5.9	Good to fair
A04	Tibar-Ermera	45.0`	510	6.1	Fair
A05	Aituto-Betano	53.6	650	8.7	Good to very poor
A06	Baucau-Viqueque	63.1	5,500	6.0	Good to fair
A07	Viqueque-Natabora	48.4	1,100	10.0	Poor
A08	Lautem-Viqueque	153.5	620	10.4	Good to very poor
A09	Manatuto-Natabora	85.6	390	11.0	Poor
A10	Ermera-Hauba	68.5	240	12.1	Poor to very poor
A11	Ermera-Maliana	63.2	220	11.3	Poor to very poor
A12	Maliana-Zumalai	50.9	270	11.6	Fair to very poor
A13	Aiassa-Cassa	24.6	320	11.9	Poor to very poor
A14	Natabora-Betano	46.4	1,360	10.9	Poor
	Total	1,235.1	1,480	8.7	

ANNEX 3: ACHIEVEMENT OF NATIONAL DEVELOPMENT PLAN INDICATORS

Roads, Bridges, and Flood Control

Objective	Performance Indicator	Achievement (to February 2005)
1. Identify and plan the national district and rural road network	• Plan completed and approved • Assessed road access to population	To be developed Reported in Timor-Leste social survey
2. Initiate policies within a legal and regulatory framework	• Laws enacted and regulations approved	Not yet implemented. Limited need for legislation.
3. Develop roads, bridges, and topologies of flood control	• Number of road closures • Number of new roads and km • Area of new and repaired pavement • Number of water retaining walls/culverts • Reduction in flood damage	Data not collected on a regular basis
4. Development and regulation management for the safe circulation of transport	• Assessed accident and damage rates • Dili and District traffic plans completed • Percent of projects on time • Percentage of projects within budget	Accident data not reviewed Work is underway Projects generally implemented successfully
5. Establish transport infrastructure that meets national defense imperatives	• Assessment of defense access needs met • Access to security posts	Continuing discussions to ensure needs are met
6. Establish technical standards for a national road network	• Number of days per year road closure • Percentage of population with all-weather access to road utilization • Percentage of road meeting vehicle load capacities • Cost ratio of maintenance	Data not collected on a regular basis Reported in Timor-Leste social survey Not undertaken to date because of insufficient data Monitored
7. Implement capital improvements to the road network	• Achieve capital funding for roadways • Achieve capital funding for flood control	Funding constrained by budget allocations and external support
8. Preserve the existing road assets through appropriate allocation of road funds and a system of sustainable maintenance	• Number of roads with maintenance achieved • Km of roads and percent maintained • Percent of maintenance on time	Road and bridge management systems are not currently available to provide the basis for monitoring assessed and actual asset expenditure needs
9. Establish an institutional structure and develop technical and administrative capacity	• Division staff and management approved • Qualified technical staffing levels met • Certified staff levels attained	Approved Not all positions are filled Staff still need training
10. Implement sustainable strategies for the maintenance of rural access roads	• Rural road maintenance plan approved • Number of roads maintained under plan • Km of rural roads maintained	No plan prepared to date Limited – undertaken on an ad hoc basis Maintenance of rural roads is a community responsibility at present
11. Establish and implement sustainable erosion control measures	• Reduced number of flood-related incidents • Percent reduction in road maintenance • Assessment of environmental impact	Not monitored at present

Objective	Performance Indicator	Achievement (to February 2005)
12. Enhance human resource capabilities for sustained indigenous development	• Number of local qualified staff • Number participating in training workshops • Percentage retained and qualified	No precise data. Staff turnover is low.

Sources: National Development Plan (Planning Commission 2002) for *Objectives* and *Performance* Indicators. Directorate of Roads, Bridges, and Flood Control for *Achievement*.

Civil Aviation

Objective	Performance Indicator	Achievement (to February 2005)
1. Attain a high standard of safe and efficient passenger service	• Maintain 100% incident- and accident-free air and ground operations	Achieved
	• Join ICAO by year end 2002	Convention approved by National Parliament
	• Compliance with ICAO Guidelines by 2003	In progress (Ministry of External Cooperation)
	• Civil aviation laws and regulations enacted by end of 2003	In progress
2. Establish effective air cargo systems for international and national transport	• 100% rehabilitation of Dili facilities by 2005	In progress
	• 90% of cargo facilities renovation by 2002	Achieved
	• Create mobile off-loading and conveyor cargo and passenger systems by 2003	Achieved
3. Generate a reliable staff with qualifications required to ensure safe and effective operations	• 80% of ground and CA staff recruited and trained by end of 2002	Achieved
	• 100% of staff hired and trained by end 2003	In progress
4. Establish the reliable and secure systems needed for efficient mail and postal expediting	• With Post Office, establish fully secure and efficient air mail and post by end of 2002	Achieved
	• Establish with Post Office and postal ministry fees for all postal handling and shipping by 2003	In progress
5. Establish an appropriate financial system that allows full cost recovery of operations	• System implemented database with donor support by 2003	Proposal prepared
	• Fee structure and budgeting system by 2003	Partially achieved
6. Promote a favorable environment for development with confidence among the Division staff	• 80% of development studies completed 2002	Basic training only to date
	• 100% of assessment developments by 2005	Basic training only to date
	• 100% training for ICAO and Civil Aviation laws and regulations	Basic training only to date
7. Provide ground facilities required for military air and land priorities	• Compliance with military requirements as specified and maintained	Achieved
8. Support national development priorities and poverty reduction initiatives through staff recruitment, training, employment and air-assisted district services	• Public promotion and competition for main and secondary air service locations	Continuing
	• Private contractor requirement s for capable local hiring and trainin g	Using local contractors where appropriate
	• Coordinated support program for air service to rural airports and access to population	Not applicable as no commercial or government services are operated to rural airports

Sources: National Development Plan (Planning Commission 2002) for *Objectives* and *Performance* Indicators. Directorate of Civil Aviation for *Achievement*.

Sea Transport

Objective	Performance Indicator	Achievement (to February2005)
1. Develop commercial maritime law	• Code completed by 2003	Not yet achieved - in progress
2. Ratification procedures for principal maritime conventions on maritime safety and maritime transport	• Ratification achieved by 2003 • Conventions on safety implemented by 2003	Not yet achieved - in progress Not yet achieved - in progress
3. Ratification of the United Nations Convention of the Law of the Sea	• Ratification achieved by end 2003 • Conventions promulgated by end of 2002	Ratification approved by National Parliament Promulgated by National Parliament
4. Establish a registry of shipping	• Registry completed by end of 2002	Not yet achieved.
5. Establish a modern system of port taxes and tariffs with effective enforcement capabilities that preclude contraband and corruption	• System approved and implemented by end of 2002 • Enforcement staff and control systems in place by 2003	System approved in principle, but not yet approved for implementation Not yet addressed, pending approval of system
6. Enact the law on public maritime domain in conjunction with MOE&P and MOJ	• Joint regulation by end of 2002 • Enforcement procedures enacted and published by 2003	Not yet achieved Not yet achieved
7. Establish passenger sea transport service between Dili and Atauro, and between Dili and Oecussi	• Dili to Atauro service established by 2003 • Dili to Oecussi service established by 2003	Implemented Implemented
8. Plan and institute a policy for regulation of national coastal traffic	• Plan drafted by end of 2002 • Plan for total coastal traffic instituted in 2003	Not initiated. Little formal coastal traffic.
9. Achieve a national capacity for survey and inspection procedures, and certification for ship condition, materials safety, and hazards	• Ship survey and inspection regulations passed • Inspection staff recruited or contracted 2003 • Materials safety inspection system 2003 • Hazardous handling systems in place 2003	Completed In progress Completed Completed
10. Achieve access to proper training and development for Timorese in special maritime studies abroad	• 100% of human resources required for technical port operations educated and certified by 2004	Completed (continuing)
11. Improve port container and bulk handling while reducing congestion problems at the Port of Dili	• 100% of regional ports operational by 2005 • Dili port congestion resolved by 2003 • Container port handling improved by 50%	In progress In progress Achieved
12. Situate Naval Defense Force at Hera	• Comply with defense requirements by 2003	Complied with needs (in progress)
13. Complete current projects and rehabilitation activities on schedule with Japanese bilateral and multilateral assistance	• Projects completed on time and in budget • 90% rehabilitation by 2004, 100% by 2005 • Land infrastructure at Dili completed 2003	In progress In progress Will be completed

Objective	Performance Indicator	Achievement (to February 2005)
	• Tibar and Hera repairs completed 2003	Hera completed. Tibar not yet initiated
	• Ports of Com and Oecussi remodeled 2004	Not yet initiated
14. Assess and implement an effective system of fir prevention and both port and maritime fire and damage control	• Assessment completed by end of 2002	Completed
	• Port of Dili fire and emergency systems to international standards by 2003	In progress. Will be completed with current port upgrading.
	• Secondary fire and emergency systems 2004	In progress. Will be completed with current port upgrading.

Sources: National Development Plan (Planning Commission 2002) for *Objectives* and *Performance Indicators*. Directorate of Sea Transport for *Achievement*.

Land Transport

Objective	Performance Indicator	Achievement (to February 2005)
1. Create service infrastructure with competent and sufficient staff to support the growing demand for land transport services	• 100% of basic law completed by 2003 • 100% staffing levels achieved and sustained • Regulations and enforcement implemented	Completed Not fully achieved. Draft regulations prepared and ready for approval and implementation.
2. Create sustainable regulatory processes for ensuring safe vehicular utilization, traffic control, and licensing and registration of all vehicles	• 60% of sector policies defined in 2002 • 100% of policies implemented by 2003 • Traffic control supervision 100% by 2004 • National licensing 100% by 2003 • Traffic plans completed with Roads Division	Difficult to assess Not yet complete (in progress) DLT plays a coordination role, with the Police responsible for traffic control. Not yet complete. Limited by absence of a need for annual registration and an effective registration system. Not yet complete. Limited coordination between divisions to date.
3. Coordinate service requirements with those of road building, urban and rural roadway construction, and infrastructure systems	• Signage and traffic control in Dili completed • Roadway hazard rural signage completed	Underway - not yet complete Underway in current financial year - not yet complete
4. Resolve the problem of saturation of major road arteries through improved accessibility for outlying and remote population areas	• Integrated road/port access plan by 2003 • Vehicle load/road-use requirements by 2003 • Percent of nation with access to safe roads • Reduced travel time to clinics and schools	Not yet complete Limited role for DLT. Police and DRBFC have major roles. Not being monitored by DLT Not being monitored by DLT
5. Reduce import dependence on oil by using alternative public transport and improving vehicle energy efficiencies	• Increased bus and public conveyances • Reduced emissions with new standards for vehicle inspection and licensing	Sufficient services provided at present to meet current and potential demand, with flexibility to introduce additional services when required. Not yet accomplished
6. Provide employment opportunities through effective job development and capacity building programs	• Increased local district and rural staff • 100% training coverage for all staff in relevant technical areas	Not yet accomplished – current proposal under consideration Not yet accomplished (in progress)
7. Establish optimal models of regulation and technical	• Plans and models from regional nations acquired and compatibility approved	Not yet complete

Objective	Performance Indicator	Achievement (to February 2005)
knowledge from established and comparable land transport systems	• Compliance with international standards for road and traffic safety	Not yet initiated
8. Implement a national public safety program for driving and maintaining all transport vehicles by creating driver awareness campaigns	• 100% of population with access to public safety regulations • 100% of schools with road safety and driving safety programs for relevant youth • Public safety media campaign instituted	Initiated in Dili for drivers of public transport vehicles Undertaken at one school to date Being initiated, with advertisements in newspapers and a TV clip
9. Formulate regulations for traffic and vehicular rules governing safe legal vehicle operation, and enforcement	• Assessment procedures for accidents and traffic incidents implemented • Reduced accident and traffic incident rates	Data collected by Police, but no analysis of data No data analysis to date
10. Establish an effective policy for public transport fees and charges, and a retention fund for these revenues	• Affordable public transport fees established • Rural system for public transport and fees • Fund established for retention and road use fees, public transport revenues	Established Focus to date on services between Dili and district centers. Not initiated.

Sources: National Development Plan (Planning Commission 2002) for *Objectives* and *Performance* Indicators. Directorate of Land Transport for *Achievement*.

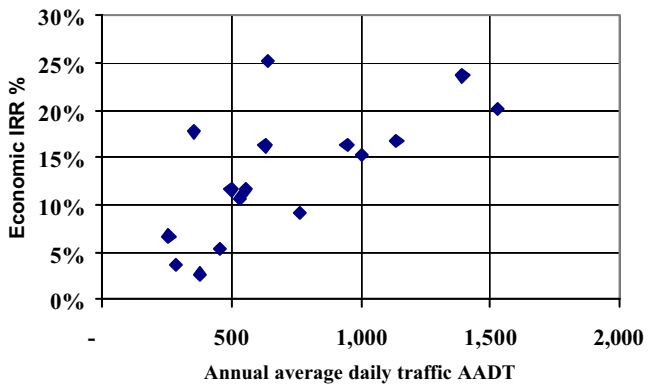
ANNEX 4: ASSESSED ROAD REHABILITATION AND MAINTENANCE NEEDS

Several estimates of the expenditure needed to maintain the road network in Timor-Leste have been prepared. The costs have generally covered the categories of emergency, routine, and periodic maintenance, and have been based on a typical average unit cost per kilometer of each class of road. These estimates have diverged, and include:

- $18.2 million in the Transport Sector Master Plan (ADB 2002: 28);
- $13.5 million (Republica Democrátia de Timor-Leste 2003: Annex 3); and
- $19.1 million (draft work undertaken in support of the Public Expenditure Review).

Factors that contribute to the difference between the estimates include differing assumptions about the state of the road network, commingling of road rehabilitation and periodic maintenance costs, high unit costs experienced to date in Timor-Leste as a result of the heavy demand for engineering services, and use of an aggregated approach. Nonetheless, the clear message that maintenance needs are high has resulted in appropriations for road maintenance being forecast to rise from $3.2 million in 2002/03 to $8.9 million in 2007/09 (Annex Table 3 in Annex 1).

Figure 1: ADT and EIRR – Eastern Indonesia periodic maintenance HDM-III analysis



While a road maintenance program of this size might be considered ideal from an engineering perspective, it is not feasible given current financial constraints, nor is it economically viable. The total cost of maintaining the network to design standards amounts to more than one quarter of the total spending by the Consolidated Fund for East Timor in FY2004, and around one fifth of total spending over the medium term. It is much more than most countries are able to allocate to their road maintenance programs. Recent analysis of the road network in eastern Indonesia has shown that periodic maintenance is rarely viable for paved roads with traffic volumes less than 500 vehicles a day. This is illustrated in Annex 4 Figure 1, which shows an IRR of less than 10 percent for four out of five roads with traffic densities of less than 500 vehicles a day. Less than 15 percent of the Timor-Leste national road network has traffic volumes above 500 vehicles a day. As a general rule, paved surfaces become viable once traffic volumes pass 200 vehicles a day. Consequently, the economic returns on periodic maintenance for much of the paved network are likely to be low.

An analysis prepared for development of this Plan [which?] has integrated the derivation of the cost of both maintenance and rehabilitation costs. It acknowledges that some roads are in good enough condition to be sustained by periodic maintenance roughly every ten years (i.e.

with resurfacing of the road pavement and simple refurbishment of drainage) with simple routine maintenance and emergency repair in between. In other cases, more substantial rehabilitation is needed to restore roads to a condition where routine and emergency maintenance will suffice.

Two scenarios have been considered, in recognition of funding constraints and the possibility that some road investment will not be economically justified. The first is a program that would achieve the Government's objective of having a road network that, in ten years' time, can be sustained with routine and emergency maintenance. The second is the minimum level of expenditure that will enable the continuation of the current road system, i.e. without further deterioration but with repairs that will reduce the incidence of road closure.

The results of the analysis are summarized in Annex 4 Table 1. They suggest that total expenditure of $192 million is needed to bring the road system to a sustainable level, with the minimum level of expenditure on roads being $119 million. The analysis assumes that the unit cost of road works is reduced from the current high level in Timor-Leste to levels closer to those common in comparable countries such as Laos. As indicated in Annex 4 Table 2, it is also assumed that relative priority is given in early years to road rehabilitation, so as to protect roads that are especially vulnerable to further deterioration and hence yet higher costs if work on them is delayed.

The road programs described in Annex 4 Tables 1 and 2 have not yet been subject to economic evaluation and engineering study. Similarly, they are based on limited information on current road conditions. It is intended that the proposed road network study will address these and other matters to develop an optimized program of works.

Table 1: Ten-year road preservation program

($ million, Oct 2003 prices)

	Road class (incl. bridges)			
	National core	**District core**	**Other**	**Total**
Length (km)	1,235	600	4,201	6,036
Sustainable road network				
Rehabilitation				
Roads	44.7	19.7	-	64.4
Bridges and structure	24.6	0	-	24.6
Subtotal	69.3	19.7	-	89.0
Periodic maintenance	28.9	5.4	39.8	74.1
Routine maintenance	11.1	5.4	12.6	29.1
Total	109.3	30.5	52.4	192.2
Minimum program				
Rehabilitation				
Roads	23.0	8.4	-	31.4
Bridges and structure	14.8	-	-	14.8
Subtotal	37.8	8.4	-	46.2
Periodic maintenance	18.6	2.3	27.1	48.0
Routine maintenance	8.3	4.1	12.6	25.0
Total	64.7	14.8	39.7	119.2

Table 2: Distribution Of Ten-Year Road Preservation Program Over Time
($ million, Oct 2003 prices)

	Period			
	Years 1-3	**Years 4-6**	**Years 7-10**	**Total**
Sustainable road network				
Rehabilitation				
Roads	30.0	18.8	15.6	64.4
Bridges and structure	8.0	2.0	4.6	24.6
Subtotal	38.0	30.8	20.2	89.0
Periodic maintenance	14.9	27.1	32.1	74.1
Routine maintenance	9.0	8.7	11.4	29.1
Total	61.9	66.6	63.7	192.2
Minimum program				
Rehabilitation				
Roads	15.1	9.0	7.3	31.4
Bridges and structure	4.8	7.2	2.8	14.8
Subtotal	19.9	16.2	10.1	46.2
Periodic maintenance	10.2	17.5	20.3	48.0
Routine maintenance	7.7	7.5	9.8	25.0
Total	37.8	41.2	40.2	119.2

ANNEX 5: THE CONSTRUCTION INDUSTRY AND EQUIPMENT MANAGEMENT IN TIMOR-LESTE

The construction industry

There are more than 90 construction companies in Timor-Leste. The Ministry of Transport, Communications, and Public Works classifies them into three groups according to the size of contract that they are competent to undertake. The companies belonging to the highest class, A, are eligible for contracting civil works larger than $500,000, those belonging to class C, smaller than $250,000, and class B companies are in between. The numbers of companies in Classes A, B, and C are 6, 37, and 48 respectively. The industry is still at an early stage and not well equipped, as exemplified by the aggregate number of vehicles owned by the six class-A companies (Annex 5 Table 1).

Table 1: Numbers of vehicles owned by six class-A construction companies

Vehicle type	Number of vehicles*
Small dump truck	19
Large dump truck	42
Crane	9
Large dozer	9
Small dozer	6
Bucket loader	15

*The numbers of vehicles were obtained from telephone interviews with the six companies.

Japan Engineering Group Operations

History

JEG (Japan Engineering Group) was dispatched to East Timor as part of UNTAET in February 2002 with the maintenance of roads and bridges as its main mission. On the independence of Timor-Leste in May 2003, JEG was moved under the control of the newly established UNMISET. JEG's first contingent consisted of 680 personnel and about 300 vehicles, and was succeeded by the second contingent of about the same size in September 2003. The third contingent arrived in March 2003 with 520 persons, and was replaced by the fourth contingent of 400 persons in October 2003. JEG is scheduled to withdraw from Timor-Leste at the end of June 2004, along with other UNMISET operations.

Table 2 shows the breakdown of the third contingent as of August 2003. It also shows the number of vehicles of the fourth contingent as of November 2003 in parentheses. The 3rd corps stationed at Suai was abolished in the third contingent, and 26 vehicles that had belonged to the corps were handed over to the Government of Timor-Leste in March 2003. The 4th corps stationed at Oecussi was abolished in the fourth contingent and the vehicles used by the corps were transferred to, and are temporally stored at, the headquarters along with the vehicles discharged from other corps.

Table 2: Size of JEG Third Contingent Personnel and Equipment[a]

Corps		**HQ**	**HS Co**	**1 Co**	**2 Co**	**4 Co**	**Total**
Location		Dili	Dili	Dili	Maliana	Oecussi	
Troop size		30	220	80	90	100	520
Vehicles:	Dump truck (5t)	-	1 (1)	8 (8)	5 (5)	5 (0)	19 (14)
	Special large dump (8t)	-	3 (0)	4 (8)	3 (3)	2 (0)	12 (11)
	Oil-pressure shovel[b]	-	1 (0)	2 (3)	2 (2)	2 (0)	7 (5)
	Crane (20t)	-	1 (0)	1 (1)	1 (1)	1 (0)	4 (2)
	Dozer (13t)[c]	-	1 (0)	1 (2)	1 (1)	2 (0)	5 (3)
	Small dozer	-	1 (1)	2 (2)	2 (1)	2 (0)	7 (4)
	Bucket loader (118kw)	-	1 (0)	1 (1)	1 (1)	1 (0)	4 (2)
	Grader (101kw)	-	0 (0)	1 (1)	1 (1)	1 (0)	3 (2)
	Total	-	9 (2)	20 (26)	16 (15)	16 (0)	61 (43)

[a] Numbers in parentheses are the numbers of vehicles of Fourth Contingent that replaced the Third Contingent in late October, 2003.

[b] They are in three varieties: 20t class and 13t class with caterpillar tracks and an unknown size with four tires.

[c] They are in two varieties: one with rippers and one of 13t class.

Training

JEG has provided training courses to Timorese in different areas of construction including operation and maintenance of machinery and construction planning and management. Annex 5 Table 3 shows the number of trainees who successfully completed training courses that typically lasted for two months. The trainees came from both government and the private sector.

Annex 5 Table 3: Training Provided by JEG

Field of training	**Number of trainees**
Operation of machinery	67
Maintenance of machinery	10
Construction planning and management	7

JEG vehicles donated to the Government of Timor-Leste

The Government created a special unit within the Directorate of Roads, Bridges, and Flood Control (DRBFC) of the Ministry of Transport, Communications, and Public Works to take responsibility for the 26 vehicles already transferred from the JEG to the Government. DRBFC is using the vehicles to construct the Natabora Bridge. The unit consists of one project manager, four engineers, and 15 operators and was allocated $220,000 for fiscal 2003 for hiring 50 local workers. The cost of civil works is estimated at $680,000 to be financed by CFET. All the staff members of the unit had been trained by JEG in the aforementioned program.

Including the vehicles that belonged to the 4th corps and had been transferred to the headquarters in Dili, there are 60 some vehicles altogether that could be donated to the Government on the JEG's final withdrawal. Currently, the Government of Japan is seeking the best disposition of these vehicles within the rules and regulations of Japan. MTCPW is also investigating various options for the future of the special unit and these vehicles, including the separation of the unit from the ministry as an independent company after the completion of Natabora Bridge.

Transfer of road construction equipment provided by donors: consideration of options

Description	Advantages	Issues
1. Transfer equipment to Government of Timor Leste (GOTL) ownership:		
(a) Equipment is owned and used by GOTL		
The equipment is owned and managed by the Directorate for Equipment and Materials of the MTCPW, and used by Government staff for works.	• Equipment is owned and managed by Government. • Government develops construction capacity.	• Conflicts with principle of undertaking works through private sector contractors. • Equipment unlikely to be used as efficiently or effectively compared with the private sector. • Draw on Government budget for operating costs. • Distracts MTCPW from core activity of planning and program management.
(b) Equipment owned and leased by a public company		
The public company acts in a commercial manner. Preferable that the company be wound up when the equipment reaches the end of its useful life. Preferable also that the company be responsible to Ministry of Planning and Finance or similar in keeping with its commercial role.	• Equipment is owned and managed by Government. • Equipment can be used by GOTL agencies and leased to the private sector.	• Needs legislation and establishment of the public company. • GOTL needs to provide working capital to the company, and gain technical assistance (TA) for management and operation. • GOTL exposed to risk that the company will not be profitable. • The company may set prices incorrectly, and undermine the private sector.
(c) Equipment on-leased on long term basis to the private sector		
Lease to private sector specialist equipment leasing companies (to promote specialization and competition), but could be leased directly to construction companies. Lease period to cover the remaining useful life of the equipment.	• Equipment is provided to those who are best able to manage and use it. • Markedly reduces potential financial risk to Government, with the Government to secure a revenue stream that is subject only to contractual risk. • Eliminates distortion to MTCPW activities, and need for TA in how to manage and use the equipment. • Reinforce the private sector.	• Willingness of donors to see equipment leased to the private sector. • Lease price will depend on private sector confidence in future works program. • Lease payments could be disrupted if lessors face financial problems.
2. Sell equipment to the private sector		
Donors sell appropriate equipment in Timor-Leste to private sector, and provide financial grant to GOTL.	• Equipment is provided to those who are best able to manage and use it. • Eliminates potential financial risk to Government. • Eliminates distortion to MTCPW activities, and need for TA in how to manage and use the equipment. • Reinforce the private sector.	• Willingness of donors to sell equipment to the private sector and provide assistance to GOTL using the proceeds. • Sale price will depend on private sector confidence in future works program.

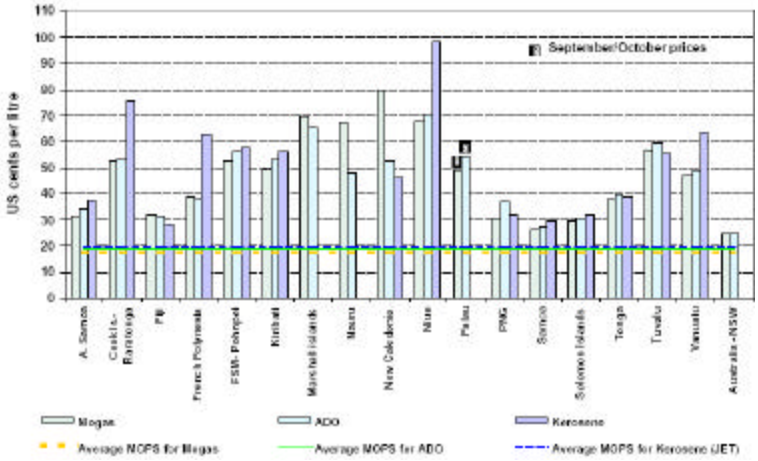
ANNEX 6: THE COST OF FUEL IN TIMOR-LESTE

Fuel used for transport in Timor-Leste is generally imported from Indonesia or Australia and is expensive. Retail prices vary by retailer and the origin of the fuel, but gasoline and diesel prices are generally in the range of $0.45 to $0.56 per liter, with an average price of about $0.48 per liter. It is estimated that the fuel used by road transport, excluding UNPKF-related vehicles, is about 19 million liters per year.

The situation in Timor-Leste may be compared with that of countries in the Pacific that must import their fuel from distant sources. The cost of fuel in these countries varies substantially (Annex 6 Figure 1). The price of fuel in mid-2003 was similar to that in November-December 2002. The most common minimum price exclusive of taxes is about $0.30 per liter, with the lowest cost being about $0.28 per liter in Samoa (where the government periodically awards an internationally-bid period contract for the supply and retailing of all fuel for the country to a single company). The cost in Australia was about $0.25 per liter.

Fuel in Timor-Leste at present has an average retail price of about $0.37 per liter excluding taxes of about $0.11 per liter (comprising customs duty of 6%, excise of $0.06/liter, and sales tax of 6%). If Timor-Leste could obtain the common minimum price in the Pacific (about $0.30 per liter including distribution and retailing but excluding taxes), the retail price of fuel in Timor-Leste would be about $0.40 per liter, i.e. 17 percent lower than at present. This would reduce the cost of fuel used for road transport (excluding UNPKF activities) in Timor-Leste by about $1.5 million per year.

Annex 6 Figure 1: Retail fuel prices in Pacific Island countries
(excl. taxes, Nov.-Dec. 2002, mogas=petrol)

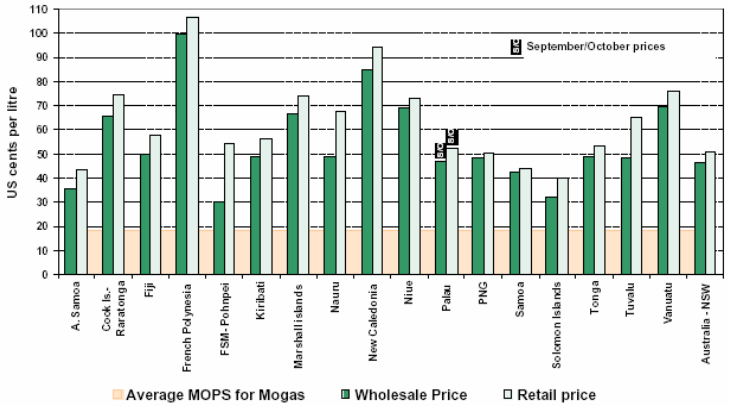


Source: Pacific Islands Forum Secretariat (2003).

The cost to the economy of Timor-Leste of higher-than-necessary prices for fuel is even greater when account is taken of diesel fuel imported for power generation and other activities.

If the imported cost of fuel could be reduced, the Government could introduce an offsetting rise in excise or user charge to generate funds for road maintenance. Such an approach could support social equity. Users of motorized transport, who will generally have higher-than-average income, would help to offset the cost incurred by the Government in providing them with roads. Poor people make relatively less use of motorized vehicles, and therefore gain less from low fuel prices. By way of comparison, it is notable that only three countries in the Pacific region have retail prices for gasoline that are less than that the current price in Timor-Leste (Annex 6 Figure 2). Guidance for means for minimizing the cost of imported fuel can be gained from the experience of Pacific Island countries, notably Samoa.

Annex 6 Figure 2: Retail petrol prices in Pacific Island countries (incl. taxes Nov.-Dec. 2002



Source: Pacific Islands Forum Secretariat (2003)

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