

FIJI NATIONAL TRANSPORT SECTOR PLAN

Executive Summary



Beca International Consultants Ltd.



in association with

Wilbur Smith Associates
KRTA Ltd
Deloitte Ross Tohmatsu

**GOVERNMENT OF FIJI
ASIAN DEVELOPMENT BANK**



Fiji National Transport Sector Plan Executive Summary

prepared under

Technical Assistance Project ADB 1715-FIJ

by

Beca International Consultants Ltd

in association with

Wilbur Smith Associates

KRTA Ltd

Deloitte Ross Tohmatsu



CONTENTS

	Page No.
S1 INTRODUCTION	
S1.1 The National Transport Sector Project	S-1
S1.2 Overview of the Fiji Transport Sector	S-1
S1.3 Contents of the Report	S-3
S2 TRANSPORT POLICY	
S2.1 National Policy Framework	S-4
S2.2 Land Transport Policy	S-8
S2.3 Marine Transport Policy	S-15
S2.4 Air Transport Policy	S-21
S3 TRANSPORT INFRASTRUCTURE PLAN	
S3.1 Plan Objectives and Criteria	S-28
S3.2 Existing Infrastructure Plans	S-29
S3.3 Transport Demand Forecasts	S-30
S3.4 Road and Rail Infrastructure Plan	S-31
S3.5 Ports Infrastructure Plan	S-39
S3.6 Airports Infrastructure Plan	S-42
S4 MONITORING AND UPDATING	
S4.1 Transport Planning Unit	S-45
S4.2 Transport Database	S-45
S5 RECOMMENDED FUTURE ACTIONS	
S5.1 Transport Sector Plan Implementation	S-46
S5.2 Projects for Possible International Funding	S-46
S5.3 Transport Planning Unit Development	S-47

S1.0 INTRODUCTION

S1.1 THE NATIONAL TRANSPORT SECTOR PLAN PROJECT

ADB Project TA 1715-FIJ, the National Transport Sector Plan (NTSP) project for Fiji has been carried out by Beca International Consultants Ltd in association with Wilbur Smith Associates, KRTA Ltd and Deloitte Ross Tohmatsu. Terms of Reference are listed in the appendix and cover the two broad areas of transport policy review and preparation of a transport investment plan for the next 20 years.

The project period was from mid-April to December 1993, with reporting stages as follows:

- an Inception Report produced in May 1993
- Working Paper No.1 on Transport Data and Transport Policies which marked the conclusion of the Phase I Studies and was completed at the end of June.
- Working Paper No.2 on Transport Demand Analysis, comprising Phase II which was completed in August.
- The Phase III studies from mid-August to mid-October concentrated on developing an investment plan for the transport sector over the next 20 years and finalising recommendations on transport policy. The Draft Final Report marks completion of this stage

There is a one month period for comment from the ADB and Fiji Government prior to completion of the Final Report on the project.

S1.2 OVERVIEW OF THE FIJI TRANSPORT SECTOR

Geography and Demography

Fiji is made up of 300 islands, one third of which are inhabited, with the country's 750,000 people widely dispersed over 1.29 million square kilometres of the South Pacific Ocean. The extent of the Fiji archipelago is illustrated in Figure S1.1. The provision of basic goods and services to the people is thus a challenging problem and highlights the need for a cost-

effective transport system for the social and economic development of the country.

Roads and Road Traffic

There are 7,000 kilometres of roads in Fiji of which 5,000 are under the control of the Public Works Department (PWD), a further 200 kilometres under municipal councils, and the remaining 1,800 kilometres are forestry and agricultural project roads. In recent years all of the main strategic road connections have been made, and in most cases these have been bitumen sealed. The current Fiji Road Upgrading Project Stage 2 (FRUP2) will extend the sealed network further leaving only a short section of Kings Road to complete the sealing of trunk roads connecting all of the main population centres on Viti Levu and Vanua Levu.

There are an estimated 50,000 road vehicles in use of which half are private cars. Vehicle ownership is still low, standing at 1 per 15 population. Bus transport provides extensive services and is entirely commercially run; and there is also a good supply of taxis. Heavy road vehicles are presently limited by law to 30.8 tonnes gross weight and 8 tonne axles, which is low by international standards. Length limits, in conjunction with all up weight preclude the use of long articulated vehicles.

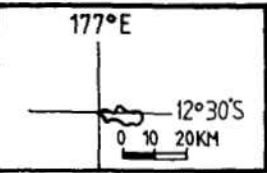
A feature of road transport is the abundance of sugar cane trucks, frequently overloaded, during the harvesting season, which lasts for almost half the year. On-road enforcement of loading restrictions and vehicle condition is very limited and many poorly maintained vehicles use the roads.

Ports and Shipping

The main ports of entry, Suva and Lautoka are operated by the Ports Authority of Fiji. Fiji is well served by international and regional shipping. Inter-island services are provided by two competing roll-on roll-off shipping services, but these do not extend to the outer islands where services are provided by small general passenger/cargo vessels and can be infrequent and irregular.

Airports and Air Transport

Nadi is the international airport of Fiji, with Suva-Nausori handling some Pacific regional traffic up to B737 size. There has been considerable investment in the facilities at Nadi which is operated and financially administered by the Civil Aviation Authority of Fiji. CAAF also manages other Government-owned airports and



INSET ROTUMA

LEGEND

- Divisional Boundaries ————
- Provincial Boundaries ······



16°S

17°S

18°S

19°S

E 180° W

177°E

NORTHERN DIVISION

DIVISION

VANUA LEVU

Labasa

RABI

Buca

Bua

Nasavusavu

TAVEUNI

YASAWA GROUP

VITI LEVU

MANANUCA GROUP

GROUP

Ba

Lautoka

Nadi

Sigatoka

Korolevu

Tavua

Rakiraki

Natovi

Korovou

Nausori

Navua

Suva

CENTRAL DIVISION

BEQA

Koro

OVALAU

LOMAIVITI

GROUP

GAU

EASTERN DIVISION

VANUA BALAVU

LAU

LAKEBA

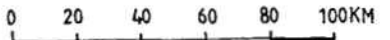
GROUP

KAHARA

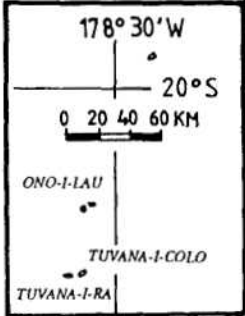
MOALA

TOTOYA

KADAVU



SOUTH PACIFIC OCEAN



INSET

FIJI ARCHIPELAGO

FIGURE S1.1

provides all air traffic and technical services. There are some 20 smaller aerodromes catering for DHC-6 and BN Islander aircraft. A few aerodromes are operated privately and attached to tourist resorts.

Air Pacific is the national flag carrier and operates only on international routes. The airline is Government owned and commercially run at a profit. Up until recently there have been only two domestic scheduled carriers, Fiji Air and Sunflower Airlines which share the market under Government regulated competition. Recently, however, the Government has approved the entry of a small charter carrier and a larger scheduled service operator and this is precipitating considerable change in the small domestic air transport industry.

S1.3 CONTENTS OF THE REPORT

The final report is presented in three volumes:

- Executive Summary
- Main Report
- Appendices - revised Working Papers 1 & 2

The Main Report is divided into three parts, reflecting the main themes of the project:

- Part A deals with transport policy and makes recommendations on matters of transport regulation, service provision, cost recovery and the future role of government in the transport sector ;

- Part B deals with physical planning, identification and economic evaluation of projects, and provides a future plan of expenditure needs for the sector; and
- Part C discusses the role of the proposed Transport Planning Unit, and the database and monitoring requirements for updating the sector plan.

Through the remainder of this Executive Summary, the recommendations have been italicised and numbered under the categories of:

General -	G
Road and Rail Transport -	R
Marine Transport and Ports -	M
Air Transport and Airports -	A
Transport Planning Unit -	T

S2.0 TRANSPORT POLICY

S2.1 NATIONAL POLICY FRAMEWORK

S2.1.1 GENERAL ECONOMIC POLICY

Parliamentary Paper 1993/2 "*Opportunities for Growth - Policies and Strategies for Fiji in the Medium Term*" was endorsed by the Parliament of Fiji in April 1993 and provides a comprehensive statement of economic and, to a lesser extent, social policy. This policy framework has enabled the Consultants to direct their efforts in certain policy directions in the knowledge that these have already been accepted in principle by Government. However, while Government has decided on its policy preferences at a general level, when the implications of these policies result in actions which change the way institutions are organised, operate and direct their financial affairs, Government's response is not always consistent with the policy principles it has espoused.

The main thrusts of economic policy set out in the Parliamentary Paper can be summarised as follows:

- remove barriers to market competition
- improve education and training opportunities for all citizens
- less Government involvement in activities which can be more efficiently undertaken by the private sector

S2.1.2 GENERAL TRANSPORT SECTOR POLICY

The general thrust of Government policy is carried through into policies for the transport sector. These are generally supported by the Consultants and can be summarised as:

- transport services and, increasingly, transport infrastructure to be provided by the private sector.
- economic return to be the primary criterion in deciding on transport infrastructure investments.

- promotion of greater competition through transport deregulation while maintaining safety standards.
- where common-user transport facilities are managed by statutory authorities, these are to be on a commercial basis with a minimum of cross-subsidy between activities.
- transport infrastructure costs to be recovered through user charges with a fair distribution of cost recovery.
- integrate transport planning with other economic sector planning.

There are some situations where economic efficiency will be subordinated to other objectives of Government policy, in particular where Government wishes to provide targeted support to remote areas. There may also be instances where the private sector is unwilling or unable to provide transport services, or where a natural monopoly needs to be retained under Government control. In these cases it will not be appropriate for transport facilities to be fully privatised. In some cases, full deregulation of transport services and price controls is limited in practice by the very thin transport demand or by the desirability of maintaining stability in the supply of services. The Consultants' recommendations in such cases are for a retention of regulation, although sometimes in a modified form.

S2.1.3 GOVERNMENT POLICY FOR ROAD TRANSPORT

Stated Government policy is for:

- continued funding of the national road network, but with more emphasis on maintenance and upgrading
- continuation of the subsidised rural roading programme.
- a road safety programme
- effective controls on vehicle overloading.
- creation of a Road Transport Authority.

The Consultants are in general agreement with this policy emphasis, although there are some concerns regarding the rural roading programme and the extent to which Government

departments outside of Public Works can add to the length of the permanent road network without any real thought for the ongoing maintenance commitment. Controls on overloading are needed, but this must also take account of the effect on critical industries such as sugar, and the desirability of increasing vehicle weight and dimension limits to bring them closer into line with international practice.

S2.1.4 GOVERNMENT POLICY FOR MARINE TRANSPORT

Government policies are to:

- reduce Government involvement in inter-island shipping
- require the Ports Authority to operate on a commercial basis
- continue to fund the construction and maintenance of jetties and navigational aids, while reviewing the scope for recovering maintenance costs from users
- provide support for outer islands services, where these cannot be provided on a fully commercial basis
- divest Government ownership of shipyards and public slipways

In this case, while the Consultants agree with the intent of policy, they differ in some matters of implementation. In particular, the construction and maintenance of island jetties presents a difficult problem for cost recovery, the conclusion being that these facilities are very expensive for the benefits they provide while the beneficiaries have no check on their demand for more jetties as they are provided free. In regard to the ship repair slipway, this is a common user facility which the Consultants recommend stay in public ownership.

S2.1.5 GOVERNMENT POLICIES FOR AIR TRANSPORT

Stated Government policy is:

- promote international air services in support of the tourism industry

- review institutional and financial arrangements for the management of domestic airports

The Consultants have some concerns that the general precepts of Government transport policy applied to aviation may be unduly subjugated to the demands of the tourism industry. There is certainly a need for review of the institutional and financial arrangements for domestic airport management and infrastructure investment, and the Consultants have endeavoured to provide this review within the project.

S2.1.6 CONCLUSIONS ON NATIONAL TRANSPORT POLICY

The Consultants Support Government Policy Statements

The policy framework that Government has created with the "Opportunities for Growth" statement is generally in line with modern thinking on transport sector management in a market economy. Similar policies have been pursued successfully in other countries and should lead to improved efficiency in the transport sector.

Recommendation G1:

The transport policy framework set out in the "Opportunities for Growth" parliamentary paper, with a few noted exceptions, should continue to form the basis for Government Policy in the transport sector

Time Scale to Implement Reforms

A word of caution should perhaps be sounded regarding the time needed to implement large scale policy reform. In a review of such changes made in a number of countries over the last 20 years, the World Bank found that the time for changes to be fully implemented was much greater than originally thought and typically took eight to 10 years compared with the three or four anticipated by the international lending agencies and the Governments concerned.

In particular, where the public sector is called on to relinquish areas in which it has traditionally been heavily involved these policies are likely to face institutional inertia, and probably hostility in some cases. Also, the history of such changes shows that the political will can be variable, and reforms can be delayed by changes of

Government, the new administrations taking some time to become convinced of the wisdom of reforms.

Transport Efficiency and Social Policy

A balance has to be struck between transport efficiency and social policy, particular in a country like Fiji where there is a desire to preserve traditional lifestyles and culture, and where the population is dispersed to many inaccessible locations. It must be remembered that transport systems have a natural concentrating effect on the population and services, promoting urban drift and the concentration of economic activity in the main centres of population. A corollary of this is that the rural areas lose many of the services which in the past have been provided locally. This sets up social problems both in the cities and in the rural communities and is a widespread feature among the developing and developed countries alike.

While those who are mobile are able to thrive in this new environment, there will be sections of the community who because of lack of resources, skills or through social pressures, become the "transport disadvantaged". It therefore should be part of the policy framework for a Government which has the interests of all its people at heart, to make some special provisions for these disadvantaged groups who have in many cases been placed in this position at not fault of their own. To its credit, the Fiji Government has recognised this need and has included provisions in its policy statements to counter such adverse effects.

Recommendation G2:

The objective of economic efficiency in providing transport services and infrastructure should be the principal criterion for evaluating transport policy and planning, but social equity and welfare objectives of Government should be taken into account and will override economic efficiency in some cases.

Controlling Subsidies

However, the Consultants advise that subsidies and suchlike arrangements need to be used sparingly or they will become too large a cost burden on the economy as a whole.

To keep the levels of subsidy in check, the Consultants have recommended for all three

transport modes, that facilities and services provided by Government should never be at zero cost to the beneficiaries. It is important that people who receive such services recognise that they are an economic cost to the country, and even a small contribution will help to engender a feeling of ownership responsibility and help reduce the demand for subsidies to be continually expanded and increased.

Recommendation G3:

Where Government provides subsidised transport services or infrastructure, the users and/or beneficiaries should be required to bear part of the cost through user charges and/or maintenance contribution.

Another element in the Consultants' recommendations in this area is that the users should have some control and choice in the matter of the level of subsidies they receive. This can be achieved through a charging mechanism, so that the population may decide in fact whether some transport services are needed at all or whether they would not be better off using their money for another purpose.

Recommendation G4:

Where Government provides subsidised transport services or infrastructure, the beneficiaries should be encouraged to exercise choice in the level of service that is provided through the charging mechanism.

Cost Accounting within Government

The problems inherent with "free goods" also extends to Government, where there is little financial discipline or discretion to allow Government Departments to decide from whom they obtain transport services and the true costs of their use of these services.

The Consultants recommend that a thorough-going review be made of accounting practice and the setting of Departmental budgets in this area. This will generally require the Government agency obtaining the transport service to purchase it at its true market price from the providing agency. If the purchasing agency it is not satisfied with what is provided it should be free to buy on the open market. It should also have sufficient budgetary control to transfer funds from purchase of transport services to

other areas of expenditure (or *vice versa*) if it feels this would be a better use of resources.

Recommendation G5:

Where Government agencies provide transport services to other Government agencies or to the private sector, these services should be charged at their fair market price.

Recommendation G6:

Assuming recommendation G5 is implemented, Government agencies purchasing transport services should be free to buy these from the public or private sector or to use the funds for other public purposes.

Internal accounting systems also need to be changed to allow the costs of activities to be properly identified. Artificial pricing, (such as plant hire rates), needs to be scrapped as it disguises the costs that are being incurred and encourages inefficient use. This will require some initiatives from the Ministry of Finance and Economic Planning which takes a role in fixing such prices.

Recommendation G7:

A review and reform of Government Departmental accounting practices should be carried out with the objective of fully allocating Departmental costs to the costs of services supplied and to capital works undertaken. In relation to the transport sector this is most required within the Public Works Department and the Marine Department.

Government Price Control

In general, the Consultants consider that Government price controls in the transport sector are not working very well. In too many areas Government has blocked reasonable requests for increases in both Government and private sector charges. In most cases, the Consultants consider that Government does not have the technical and financial expertise to make judgements as which prices are reasonable and which are excessive. This has led to prices falling way behind costs in a number of areas: bus fares; aircraft landing fees; fines for traffic offences; service charges for road users; navigation aids at sea; port charges; and so on.

More recourse is needed to price indexing for the periodic adjustment of tariffs, with the Government concentrating on broad economic management to keep the index in check rather than piecemeal and inconsistent price control.

Recommendation G8:

Government should adopt an automatic system of annual indexing for controlled prices within the transport sector based upon an appropriate price index maintained by the Department of Statistics. This should be preceded by a general updating of prices to bring these into line with costs, incorporating allowances for plant and equipment depreciation and return on invested capital. General reviews should then be conducted at 5-yearly intervals.

Statutory Authorities

In several cases there is no need for the price control at all or, where some controls are necessary, these should of a broad nature, with more discretion given to responsibly constituted statutory authorities, such as PAF, CAAF and the new LTA still to be formed.

It is the Consultants view that the statutory authorities have generally worked well, providing management continuity and the necessary technical expertise in their areas of endeavour. The only concerns that the Consultants have are:

- (i) there may be a tendency for over-investment in fixed infrastructure and a better commercial link with facility users is needed to keep this tendency in check;
- (ii) regulatory and service delivery functions need to be better separated within the organisations; and
- (iii) the possibility of authorities becoming overly involved in business ventures and property management outside of their direct area of responsibility needs to be kept under observation.

In regard to contracting out of work to the private sector where this can improve efficiency and lower costs, the Consultants see no objection at all, and this is in line with practice elsewhere. The Consultants are also supportive of moves towards corporatisation and believe that the two

agencies noted are already well on the way to this corporate structure.

In fact, the Consultants see an expanded role for the statutory authorities, recommending that CAAF take over the second level of airports, on the proviso that they are given the necessary control over cost recovery, and that PAF take on the ship repair slipway and operate it as a common user facility.

Recommendation G9:

Where special purpose public authorities have planning and funding responsibilities for capital investments, cost recovery plans should be prepared and agreed between the users of the services, the public authority concerned and Government, prior to committing funds. User representation on the boards of such authorities will assist this process.

Recommendation G10:

Subject to Recommendation 10, statutory public authorities should be empowered to vary the fees charged for services without the requirement to obtain Government approval for each such change.

S2.2 LAND TRANSPORT POLICY

S2.2.1 GENERAL CONCLUSIONS AND RECOMMENDATIONS

The setting and enforcement of legislation on road vehicle construction and use is the main area of concern in promoting the safe and efficient performance of the road transport task in Fiji. While there is a need for legislative reform as some parts of the Traffic Act and its subordinate legislation are outdated and inadequate, the existing legislation could be more effectively enforced. The scheduled penalties for transport and traffic offences have been allowed to fall far behind general price inflation and this contributes to the ineffectiveness of the enforcement effort.

The means for improved enforcement lie in manpower, equipment, management and training together with the enabling financial resources. The reorganisation of the statutory authorities in the roads sector, together with the Department

of Road Transport, should provide a useful medium to institute these necessary changes.

Although difficult for the Consultants to prove or disprove, there is sufficient anecdotal evidence and history of inquiries into the administration and operation of the road transport industry, to conclude that there has been circumvention and evasion of regulatory controls in the past. It will be important that any reorganised administration be designed to prevent corrupt practice as far as possible. One way of furthering this objective is to separate the issuing of regulatory approvals (roadworthiness, driver licensing, road service licenses) from the technical audit or testing process. This can be achieved through such mechanisms as contracting services from private sector companies specialising in technical testing services and quality assurance. Where such separation cannot be practically achieved, then there should be provision for auditing of the activities of statutory public agencies from within the Government service, either within the headquarters office of the Ministry of Transport or through a general Government audit department.

The following general recommendations are made:

Recommendation L1:

The Consultants generally support the reorganisation of road transport administration as provided for under the draft Traffic Act and Regulations (1987,3rd Draft), subject to specific comments and recommendations referred to later in this report.

Recommendation L2:

The formation of a self-financing Land Transport Authority as a statutory Government agency, as allowed for in the draft Act, is supported in principle and subject to later recommendations in this report.

Recommendation L3:

Regardless of L1 and L2, there is a need for more effective enforcement of vehicle construction and use regulations and, where fines are prescribed for offences or infringements, these should be increased to form an effective deterrent.

Recommendation L4:

That the Department of Road Transport, or its successor the Land Transport Authority, adopt a policy of having roadworthiness testing and certification of, at least, private motor vehicles undertaken by the private sector and implement this in consultation with interested parties..

Recommendation L5:

That the Department of Road Transport confers with the Fiji National Training Council and the road transport industry to review the requirements for training and trade certification of vehicle mechanics and specialist trades, and for training and testing of public service vehicle and heavy goods vehicle drivers.

Recommendation L6:

Where used built-up vehicles or chassis are imported to Fiji, an independent technical inspection report should be required from an approved workshop or test facility on the conformity of such equipment to Fiji construction and use regulations and of the structural and mechanical integrity of the equipment. This test report should be provided to the Department of Road Transport at the time of roadworthiness testing and following any reconditioning carried out within Fiji.

S2.2.2 BUS SERVICES

Fiji enjoys a bus service which has an extensive route coverage, provides good service in relation to fares charged, and which is operated on a fully commercial basis with considerable stability of services. Route service licensing and fare control is administered by the Transport Control Board which is serviced by the Department of Road Transport. Problems with the bus services include: unsatisfactory air pollution and noise control on many vehicles; low return on investment limiting the ability of operators to replace old buses; a lack of comprehensive route and service planning; some instances of failure to adhere to agreed schedules because of unavailability of buses, drivers or poor road conditions; unfair competition from carriers; and limited opportunity for new entrants to the industry.

The Consultants consider that the advantages enjoyed by the travelling public and the Government from the present system of route service licensing for buses outweigh the faults. Although it would be possible to introduce more competition into the industry by tendering out bus routes on a periodic basis, the Department of Road Transport does not have the expertise to undertake this effectively. Such a process would also allow the possibility of subsidies to the less financially attractive routes which cannot be attractive under the present fully commercial system. However, the present system could be improved through stricter enforcement of vehicle roadworthiness and emissions regulations, a more reasonable approach towards price control on bus fares, improved driver and mechanic training and certification, and more effective control of unfair competition from carriers and taxis. Accordingly the Consultants make the following recommendations:

Recommendation L7:

Route Service Licensing for bus transport should be continued, with license applications administered generally as provided for under the draft Traffic Act and Regulations.

Recommendation L8:

Once the Bus Operators Association submits its next application for a fare increase (expected November 1993), an independent study should be commissioned by the Ministry of Transport to verify the costs of bus operation and to suggest a new fare scale based on operator costs including a sufficient allowance for capital depreciation and return on assets. Thereafter, fares should be adjusted automatically on an annual basis based upon a cost formula to be developed by the aforesaid study, with a full review of the formula every five years.

Recommendation L9:

Consideration should be given to reducing the margin of tax protection afforded to the Fiji coachbuilding industry by reducing the rate of tax on fully assembled buses.

S2.2.3 TAXI SERVICES

The taxi industry plays an important part in the passenger transport system. In Fiji generally, and in the main centres in particular, there is no shortage of taxis although most are not of very high standard, but the apparent surplus has not dampened the desire of new entrants. Taxi permits applications are vetted and permits issued by the Principal Licensing Authority and in the past there has been concern about the quality and depth of investigation and the numbers of permits issued. The taxi industry is seen by Government as a business opportunity for ethnic Fijians, who form a small but increasing minority of operators, due to a firm policy to encourage this trend by limiting permit issues to those of other ethnic backgrounds. Particular problems perceived with the taxi industry are oversupply, congregation of taxis in the central city rather than remaining on their prescribed bases, unfair competition with buses, and the running of taxis by prominent citizens and public servants.

Generally, the Consultants' conclusions for taxis are that a good supply can only benefit the public and that, with more vigorous enforcement of vehicle roadworthiness requirements, some protection against blatant "poaching" from scheduled bus operators, and some basic training requirements for new entrants, the problems can be resolved. The specific recommendations are as follows:

Recommendation L10:

The "taxibase" system be retained, but that taxis be permitted to pick up fares on their way to or from their home base or permitted other taxi stand provided no traffic regulations are infringed.

Recommendation L11:

As part of its enforcement efforts, the Department of Road Transport undertake random checks on taxis plying for hire, and that on proof that a taxi is operating outside of its prescribed permit authority, provision be made for deterrent fines.

Recommendation L12:

No taxi be permitted to tout for business at signed bus stops and bus stands.

Recommendation L13:

The Government may wish to require, as a condition of issue of a taxi permit, that taxi operation be the sole business activity or employment of the applicant. (The Consultants do not regard this as a necessary restriction, but it would further the Government's aim of promoting small business opportunities and could limit the provision of taxi services at marginal cost)

S2.2.4 CARRIERS

Carriers are light trucks (usually about 3 tonnes GVW) which have been outfitted with additional seats beyond those normally provided, so that they can carry passengers and their goods. The operations of carriers has long been a source of concern to the Road Transport Department, to the bus operators and the highway authorities. The main problems are unfair competition against scheduled bus operators and the rather poor safety reputation that carriers have acquired, which derives partly from the construction of the extra passenger seats and the securing of goods loads on the vehicles.

The Consultants hold the view that carriers serve a useful transport function in providing a transport service to and from small rural settlements which will not support a regular bus service. For this work, often on poor roads, a reasonably high wheelbase and sturdy vehicle is required. As passengers are often carrying their market produce into town, a combined passenger/goods vehicle is needed. The draft Traffic Act provides for more effective control of carriers and brings them into the same service licensing system as for bus operators, a move which the Consultants support. Recommendations concerning carriers are:

Recommendation L14:

Carriers should be brought into the same licensing system as buses as provided for in the draft Traffic Act. A carrier license should specify the nature of the vehicle to be used, the route(s) to be run and where passengers can be picked up and set down. The licence should not specify a schedule as this is by nature an on-demand service.

Recommendation L15

To ensure that suitable vehicles are used, carrier licence vehicles should be subject to special constructional regulations which would specify the arrangement and fixing of seats, and how goods should be secured. If desired, the regulations can be drafted to prevent the use of certain vehicle configurations regarded as dangerous.

Government may wish to give further consideration.

Recommendation L16:

Consideration be given to increasing the legal maximum vehicle overall length. Further study be made of appropriate limits on permissible individual and multiple axle weights, axle spacings and other vehicle leading dimensions for rigid and articulated vehicles.

S2.2.5 MAXIMUM VEHICLE WEIGHTS AND DIMENSIONS

The maximum vehicle weight limit in Fiji is currently 30.8 tonnes and a maximum overall length of 10 metres. The maximum single axle weight is 7.985 tonnes. The Draft Traffic Regulations only change the situation marginally, raising the gross combination weight to 32 tonnes except for Queens Road, where a higher limit is allowed. The overall length increases to 13 metres. The Consultants see some practical difficulties in a two-tier maximum weight, as most heavy vehicles will start and end their journeys on local urban roads which would need to be identified and similarly rated.

Internationally, individual axle load limits are 8 to 10 tonnes, gross vehicle combination weights from 38 to 45 tonnes, and overall length up to 20 metres. The existing and draft regulations may therefore be considered somewhat restrictive as they limit heavy trucks to rigid bodied or short semi-trailer configurations. There would be some economies to road freight transport to be realised through an increase in maximum allowable weights and dimensions although, as the amount of long distance freight traffic is relatively small, this would mainly be within urban areas. Against such an increase are considerations of: the possible need for bridge strengthening; problems in manoeuvring long vehicles in urban areas; safety implications for other vehicles trying to pass long truck-trailer combinations; the environmental impact of heavy truck movement through villages on the main highways; and the general character of driving conditions on Fiji roads given that some important tourist destinations lie on or close to Queens and Kings Roads.

Overall, it is the judgement of the Consultants, that the environmental disadvantages of allowing increased weight and dimension limits outweigh the likely gains in economic efficiency. However, this is a recommendation to which the

S2.2.6 DRAFT TRAFFIC ACT

The third draft of the proposed revised Traffic Act and Traffic Regulations, dated August 1987, appears to have received careful legal drafting. However, changes in vehicle standards, cost inflation and international practice in road transport administration since 1987 will require some technical changes to be made before the Act can be passed into law. The earliest date for putting the Bill to Parliament is estimated to be mid-1994 and could be later. In particular the following recommendations are made:

Recommendation L17:

An independent technical review be made of the Traffic Act as a short period Technical Assistance Project. During this review, the background strategy papers and the draft legislation should be circulated to interested government and private sector agencies and submissions invited.

Recommendation L18:

The review should include: fines and other penalties for traffic infringements and offences which are now several years out of date; powers to be given to LTA officers and the training that will be required for them to exercise these powers; methods for enforcing vehicle emission standards and appropriate penalties.

S2.2.7 THE LAND TRANSPORT AUTHORITY

The new Traffic Act introduces the Land Transport Authority (LTA) which would be a

statutory authority combining the functions and powers of the old TCB, CTA and PLA. The Consultants strongly support this change, but have the following recommendations regarding the revenue sources of the Authority and its role as an agent of Government in the collection of user charges for the purposes of road maintenance and upgrading.

Recommendation L19:

The LTA should recover its direct costs plus a margin for administration overheads for: vehicle first registration, change of ownership, change of details and numberplate issue; annual relicensing for light motor vehicles; driver testing and drivers licence issue/renewals; roadworthiness testing.

Recommendation L20:

The LTA should act as the agent of Government for the collection of annual licensing fees for heavy vehicles (all vehicles of greater than 3.5 tonnes GVW).

Recommendation L21:

The LTA should have responsibility for roadworthiness testing and certification of motor vehicles with the possibility that some of this work could be contracted to the private sector.

S2.2.8 INCREASED PRIVATE SECTOR PARTICIPATION

The Consultants support the staged introduction of private sector companies to road construction and maintenance work. The private sector will need to gain more experience in the required technical standards, and the public sector in contract administration. Currently, private sector involvement is limited to the supply of materials and equipment for road construction with some limited opportunities to carry out physical works.

A timetable for increased private sector participation is shown in Figure S2.1. Recommended action in the private sector to further these objectives is:

Recommendation L22:

A register of contractors interested in road maintenance works should be established. Registered contractors would be required to attend a training course as a prequalification stage to allow them to bid for maintenance work, this training covering the following aspects:

- *The roles of the Engineer, Contractor and Principal in construction contracts*
- *Introduction to contract law*
- *Basic and advanced construction costing methods*
- *Construction programming*
- *Assembly of tender prices*
- *Management and administration of construction contracts*
- *Field demonstration of maintenance construction techniques*
- *Inspection of PWD maintenance procedures and finished standards*
- *Traffic control techniques during field works*
- *Job safety and accident prevention*
- *Compilation of as-built records*

Recommendation L23:

Following successful completion of training, contractors should be given the opportunity to participate:

- *as main contractors on smaller road construction and maintenance projects on the PWD road network*
- *in ICB upgrading works under FRUP 2 and for other externally funded roading projects to improve intermediate and senior staff technical and management skills*

The role of the Ministry of Infrastructure will change from being a works contractor to the principle (or client/road owner) and the road network manager. PWD staff will need to develop expertise in the assembly, tendering and administration of physical works contracts.

Recommendation L24:

A training programme should be instituted within PWD to enable staff to effectively administer road construction contracts and

manage the road network. Additional technical training on road network management, construction and maintenance contract formation and administration will be required at senior levels. The training programme should include:

- The roles of the Engineer, Principal and Contractor in construction contracts
- Introduction to Contract Law
- Conditions of Contract (General and Special)
- Conditions of Tender
- Technical Specifications
- Contractor Prequalification
- Tender and Evaluation Procedures
- Contract Administration and Payment Procedures

Intermediate staff will require additional training in site supervision.

S2.2.9 OTHER CHANGES TO THE PUBLIC WORKS DEPARTMENT

The following recommendations are made in respect of the future role and responsibilities of the PWD:

Recommendation L24:

The design of airports should be removed from the PWD and transferred to CAAF.

Recommendation L25:

A reformed Roads Section of the PWD should aim to achieve the most efficient design, construction, maintenance and management of the public road network of Fiji. Its entire operation should be on a proper commercial basis.

Recommendation L26:

A specialist management consultant with appropriate experience in the corporatisation of Government Departments should be engaged to advise the PWD on the most appropriate and efficient methodology to achieve this objective.

Recommendation L27:

Administration of the road network should continue along the divisional basis for operations with national policy issues being determined in the head office. Certain specialist core services will need to be retained at a national level.

The Consultants believe that there is a degree of overstaffing in the PWD and make the following recommendations to further investigate and address this issue:

Recommendation L28:

The Roads Section should investigate the reason for the large number of unestablished staff in excess of the authorised levels. A review of the future requirements for established and unestablished staff should be made by a specialist consultant as above to determine the target staff levels necessary for future operations on a commercial basis.

Recommendation L29:

Measurable target levels should be established against which staff performance at all levels can be reviewed. These targets should ensure that performance standards are identified across all Divisions for the following activities, and that a commitment to achieve these standards is obtained from all Section staff.

- Bridge and pavement condition inspection
- Accurate construction and maintenance cost/budget comparison
- Road network information gathering
- Technical training
- Design and survey
- Internal quality assurance

Recommendation L30:

The Divisional Engineers should take a lead in emphasising the prime importance of maintaining the existing road network. Methods of implementing this policy suitable for the individual divisions should be determined by the Divisional Engineers.

The Consultants found that there was inadequate information on the condition of the PWD plant inventory, and were advised that much of the older plant was unserviceable. The true cost of plant is poorly defined because of the form of accounting used by Government.

Recommendation L31:

The existing plant fleet should be thoroughly audited with the goals of identifying and writing off unserviceable equipment and reducing the range of equipment makes for each type of plant. The PWD should resolve to be selective in the future acquisition of plant and equipment and limit the range of manufacturers it accepts to a commercial minimum

Recommendation L32:

New internal hire rates should be established for all the remaining types of plant. PWD has records of plant purchase dates and prices and these should be used to establish accurate ownership costs. The use of these new rates will require a readjustment of future PWD, and its government customer, budget allocations to reflect these more realistic rates.

S2.2.10 ROAD USER COSTS AND COST RECOVERY

At present the revenue collection system provides no clear linkage between the costs of constructing and maintaining the road network and the attribution of the cost responsibility to road users. All taxes and fees from road users are credited to the Consolidated Fund. The Consultants recommend the adoption of the following principles:

Recommendation L33:

That the Government set up a "Road Fund" which would be the recipient of charges levied on road users for the purposes of funding road maintenance and, over time, network extension and upgrading.

This fund ideally should be administered by the Government agency responsible for planning and programming road system. However, this is probably impracticable under the current administrative system where there is no clear

separation between the policy and planning functions of Government and the delivery of services.

Consequently, for the interim period, the Roads Fund would be administered by the Ministry of Finance and Economic Planning. Whether the funds are placed in a separate account or regarded as an accounting cost centre is probably immaterial; the main objective is to apply the discipline that certain funds are to be regarded as user charges rather than general taxation, and cannot be readily diverted to other purposes.

This will provide the road planning and programming agency with some certainty of funding to enable it to efficiently programme its maintenance activities. As periodic maintenance requirements may vary from year to year, and there will be the need to retain some funds against unpredictable events such as cyclones, the Road Fund should be administered to allow funds to be carried over from one year to the next.

Recommendation L34:

That in the short term, the objective be to recover the recurrent costs of maintenance (routine and periodic) and operation of the road network under PWD control through charges on road users levied in proportion to their cost responsibility.

In the short term, it is judged that recovery of more than recurrent costs would either place an unacceptable burden of tax on road users (and would have adverse inflationary effects) or would require the diversion of too large a proportion of fuel tax revenue from the Consolidated Fund to the Road Fund

Recommendation L35:

In the longer term, the user charges be increased progressively in real terms to also cover the costs of capital improvements and extensions to the highway network.

It is not reasonable that roads construction should be cross-subsidised from other sectors of the economy and, over time, the Roads Fund should be required to finance capital works as well as recurrent maintenance of the system.

Recommendation L36:

Revenues for the Road Fund should be drawn from a user charge levied on petrol and diesel, to cover the costs of providing roadspace, and through a user charge levied on heavy vehicles at the time of annual relicensing which has regard to axle configuration, and the typical utilisation and loading of heavy vehicles.

The price relativity between petrol and diesel fuels should continue to reflect their relative resource costs, so that there is no uneconomic switching from one form of motive power to another as vehicles are replaced. Detailed recommendations regarding the level of user charges are given in the Main Report.

S2.3 MARINE TRANSPORT POLICY

S2.3.1 LAND AND PORT DEVELOPMENT BY PAF

The Ports Authority of Fiji has, as its principal function, the provision and management of commercial port facilities. In pursuing this role, PAF is developing a reclamation at Rokobili for use as a future container port with associated land for port-related industry.

It can become a concern when a statutory authority such as PAF moves away from its direct area of responsibility into general business ventures and property development. Although such activities may be lucrative, they can divert management attention away from the primary function, and profits from these other business activities could be used to cross-subsidise inefficient port operations.

However, the Consultants are satisfied that internal reforms carried out by PAF over the past year show that it has a commitment to improving operating efficiency at the port by allowing private sector competition in the provision of cargo handling, plant hire and other port operations while PAF retains overall management of the port and plans for future development needs. The Consultants support these moves which have proved successful elsewhere in the Pacific.

The Consultants' studies indicate that development of a new port complex will be needed in the future, although this may not be for some years, and that the comprehensive

approach being adopted by PAF will provide a better end result than piecemeal development.

Recommendation M1:

The direction being taken by PAF in commercialising port operations should be supported by Government and no additional constraints need be placed on PAF's powers in this regard.

Recommendation M2:

PAF should continue with development plans at Rokobili, including plans to fund the capital development from leases. However, PAF should take care to avoid non-port related activity from cross-subsidising port operating and maintenance costs.

S2.3.2 PORT CHARGES POLICY

Port charges are high compared with other ports in the region. However, the commercialisation reforms being undertaken by PAF should assist in reducing the port charges over time. The structure of charges needs to be simplified and PAF is already working to achieve this. Stevedoring charges are unnecessarily complicated and PAF is already making changes although, as this function is being commercialised, these changes may become academic.

The procedure for changing the level of charges is cumbersome and relies too much on approvals from Government. PAF needs more flexibility to be able to vary its charges to more effectively manage utilisation of cargo storage space. Changes to the Ports Authority of Fiji Act may be required to provide this flexibility.

The structure of vessel-related charges is sound, but could be consolidated. The Consultants recommend changes to dockage dues which are counter-productive in their present form.

The Consultants have examined PAF's internal accounting system and find it to be well constructed. There is no evidence of cross-subsidy between tariff items in port services to international shipping but overall deficits in local shipping cost recovery indicate that these are being subsidised from international charges. Although a political decision, the Consultants recommendation is that charges for charges for

local shipping be generally increased to remove this subsidy effect.

Recommendation M3:

Dockage dues for overseas vessels be on the basis of days (or parts thereof) spent alongside, with a surcharge for vessels exceeding 150 metres length and a rebate for vessels mooring "Mediterranean style". Local vessels would also be charged on a daily basis and at the overseas rate for those vessels too large to be handled through the local vessel facilities

Recommendation M4:

Pilotage and port security charge be incorporated within the Port Dues.

Recommendation M5:

That the Ports Authority of Fiji Act be reviewed with a view to reducing the need to obtain ministerial approval to port tariff changes and providing the degree of autonomy in financial decision-making to PAF necessary for it to function effectively.

Recommendation M6:

Port charges for local shipping be reviewed in comparison to costs of services and revised upwards as necessary.

S2.3.3 STEVEDORING

Stevedoring at Lautoka has been privatised, with four stevedores licensed to operate at the port. While all four may not survive over the long term, the changes provide the benefits of competition which will maintain an efficient service and reduce costs to shippers. This move is supported by the Consultants, and it is recommended that similar changes be introduced at Suva.

Recommendation M7:

Stevedoring at Suva be privatised using a similar model to that introduced at Lautoka; that is, there should be more than one licensed operator and each operator should be free to compete for all work.

S2.3.4 PROVISION OF ISLAND JETTIES AND LANDINGS

For a variety of reasons the average lifetime of small island jetties is only 10 to 11 years. In relation to their real resource cost, which is considerably above the provision in Government budget estimates and around \$1 million each, they are an expensive item in relation to the benefits they provide. Most jetties are constructed and maintained by PWD, although there are a few RoRo ramps provided by the larger shipping operators.

Government has used the free provision of jetties as one means of improving transport services to the outer islands but the zero cost recovery and absence of user charges encourages unrestrained calls for the building of more and more jetties. This tendency is emphasised by the practice of shipping operators of charging for lightering passengers and goods between ship and shore where there is no jetty.

There are disputes about the siting of jetties, because of the high land transport costs to move goods to and from villages remote from the jetty. This can lead to inappropriate locations being chosen from the viewpoint of weather conditions and there are environmental problems associated with some jetty sites. Because of the way costs fall between the Government, villagers and shipping operators, there is nothing to encourage an economically efficient solution to the outer island transport problem.

In most cases, the Consultants consider that jetties are not an economic solution although it is recognised that there may be non-economic reasons why the Government still wishes to provide them. The Consultants consider that it should not be the function of PWD to decide on whether and when jetties should be provided and that the funds allocated to jetty construction would be better placed with the Government agency responsible for social development spending in the islands, namely the Department of Regional Development. This would encourage a more rational use of the funds to provide jetties or to be used for some other more beneficial purpose.

Recommendation M8:

Funding for island jetties be removed from the PWD budget; in its place an allocation be made to the Regional Development Department. This fund be renamed an "island transport assistance fund" and be utilised for funding jetty and road capital works and maintenance not recovered through user charges. The Department should have the flexibility to use the fund for other more appropriate forms of transport assistance as it sees fit after consultation with the tikina councils.

The Consultants recommend that at least a modest level of cost recovery be introduced for jetties so that a more realistic cost signal can be sent to users. It is acknowledged that in most instances the volume of goods and passengers typically cannot justify the significant construction cost of a jetty, so it is not practical to impose charges based on this full cost.

Recommendation M9:

It is recommended that a flat rate "jetty fee" be assessed upon the ship operators when they use a jetty based upon:

- *savings in vessel turnaround time*
- *elimination of lightering costs*
- *convenience benefits to passengers and shippers of cargo (a value equal to the lightering cost is suggested)*

Different fees would apply to each jetty. Operators would be expected to pass on the lightering and convenience cost components as part of the passenger fare and freight rate, within a controlled maximum surcharge. The jetty fees would be collected by the Marine Department and the funds set against jetty maintenance (see recommendation M8)

Recommendation M10:

An authorised representative of the Marine Department be appointed at each island port to take responsibility for maintaining a log of ship calls and noting which of these make use of the jetty; all such entries to be countersigned by the ship's master.

The Consultants expect that such a system, provided it is administered effectively, would lead

over time to the abandonment of jetties at locations where they are not needed, and an adaptation on the part of the shipping operators to forms of shipping service that minimise costs. (for example: this could involve replacement with shallow draught landing barge-type vessels requiring only minimal landing construction works.)

S2.3.5 DOMESTIC SHIPPING ROUTE LICENSING

The Consultants consider that the major routes between Viti Levu and Vanua Levu, plus en-route islands in the Lomaiviti group and the port of Vunisea in Kadavu have satisfactory and competitive formal shipping services. Islands in the Mamanuca and Yasawa groups, and close offshore islands from Viti Levu and Vanua Levu have satisfactory informal shipping services. However, the minor formally-served routes are mostly unsatisfactory; the areas concerned being the smaller islands of the Lau and Lomaiviti Groups and Rotuma.

In the past there has been a desire among parts of the shipping industry and Government to introduce a system of route licensing over the domestic shipping trade in general with the objective of improving levels of service, and the legal framework for such a system already exists. The Consultants strongly advise against such an introduction which is seen to be unnecessary for most of the trade and which would: restrict free competition; be difficult to administer; and be likely to lead to service inefficiencies and higher shipping freight rates over the long term.

Recommendation M11:

that there be no general introduction of route licensing in the domestic shipping trade.

S2.3.6 SERVICE IMPROVEMENTS TO REMOTE ISLANDS

However, it is a social objective of Government that shipping to those areas with unsatisfactory services be improved and the Consultants have considered several options for so-doing. The method recommended is a "service franchising" scheme which would see commercial shipping operators bid for the franchise to provide a specified service to individual island ports in return for a lump sum payment. As a "rule of

thumb" the Consultants suggest that service franchises apply to islands of less than 1750 population, the lower limit on size being determined by Government political decision and with regard to informal shipping connections between the smaller islands. However, Rabi and Rotuma may warrant inclusion although they have larger populations, and the Yasayasa Moala Group, although it contains smaller populations is already well served and can be excluded.

The following guideline recommendations are made for the service franchising scheme:

Recommendation M12:

Franchises should be for three years. Failure to perform in a satisfactory manner would be cause for early termination of the agreement. However, at the start of the scheme, it is recommended that the franchise be operated first for a period of one year only.

Recommendation M13:

Payments to the operator should be made on a graduated scale depending upon how closely he meets the service specifications. The main performance measure would be supply of the service on the timetabled date.

Recommendation M14:

Operators should be allowed to retain all revenues from the cargo and passenger services they provide, with the exception of jetty fees.

Recommendation M15:

Other shipping operators should not be precluded from calling at ports for which an operator has been granted a franchise - i.e. franchises should not be exclusive.

Recommendation M16:

As a condition for subsidy payments, operators should be required to obtain proof of each service call, such proof to include the signature of an authorised local person (or his representative).

Recommendation M17:

Tenders should call for, and be negotiated on, the required franchise payment and the maximum freight rate and passenger fare that the operator is prepared to offer for the service specified.

Recommendation M18:

Operators should be able to tender a discount for offer of service to a group of ports for which individual bids are also being called. However a single operator should not be awarded bids for more than one-third of the total trade on offer.

Recommendation M19:

Islanders should be required to pay a small part of the subsidy and, initially, tenders should be called for various frequency levels, e.g. 4 weekly, 2 weekly or weekly to test the market and to provide the islanders with a choice of service level against the payment they would be required to contribute.

S2.3.7 PRICE CONTROL IN COASTAL SHIPPING

Maximum rates are not charged on the competitive routes. If a franchising scheme is accepted, maximum freight rates and passenger fares can and should be part of the tendering requirements. The Consultants believe that Government at present does not have the expertise to adequately analyse shipping costs, a necessary prerequisite for setting price controls

In view of these considerations, the Consultants recommend:

Recommendation M20:

provided a satisfactory franchising scheme is implemented, price control on shipping freight rates can be lifted.

S2.3.8 LOCAL OWNERSHIP REQUIREMENT

Despite the benefits that may attend the current requirement for Fijian citizen ownership, the

Consultants suggest that this requirement may not be in the overall best interests of the country and note that local ownership is not generally a requirement in other forms of business. Prior to the enactment of the legislation requiring local ownership, there does not appear to be any evidence that foreign ownership was creating any special problems. The coastal shipping industry was operating reasonably well, the country enjoyed low cost shipping services, and there was reasonable stability in the coasting trade.

Recommendation M21:

that the local ownership requirement be rescinded until such time as there is specific and significant evidence that foreign ownership in the domestic shipping industry constitutes a problem.

S2.3.9 THE GOVERNMENT SHIPPING FLEET

The Government's declared policy is to remove itself from commercial operations and the Government Shipping Fleet is a good example of such an operation which the Consultants consider should be first corporatist and then privatised. The process recommended by the Consultants is:

Recommendation M22:

In the six months preceding corporatisation, reform the internal accounting system of that section of the Marine Department concerned with the operation of the fleet to fully allocate vessel direct costs and administration costs; and make complementary staffing changes.

Recommendation M23:

Corporatise the operations of the fleet, and consider introducing private sector management. Government Departments would be required to pay for vessel use, with vessels assigned to a single user being put under time charter. Government Departments would be free to hire from the private sector and operating funds for the fleet would be transferred from Marine Department to the Government agencies purchasing transport services.

Recommendation M24:

Gradually dispose of non-performing assets and reduce staff levels to suit; the latter in a socially acceptable manner, possibly with severance payments negotiated between Government and the affected employees.

Recommendation M25:

After a suitable period, probably one to two years, fully privatise the operation either selling to existing enterprises or by creating a share company. Government could, if it chose, retain a shareholding in the privatised business, although this would be contrary to its present policy.

S2.3.10 GOVERNMENT SHIPYARD AND PUBLIC SLIPWAYS

The Government shipyard is the direct responsibility of the Ministry of Infrastructure while the repair slipways are in the control of the Marine Department. The shipyard is engaged in a commercial activity, building ships at a facility that it controls and uses exclusively. The slipways are used by both the Marine Department for repair and maintenance of its fleet, and by the private sector in which case ship owners engage local marine engineering firms to carry out these functions under contract.

The Consultants have concluded that there is no reason for Government to retain ownership of the shipbuilding and marine engineering activities and that these should be disposed of. However, the Government should retain ownership of the repair slipways and operate these as common user facilities. Offers to buy the shipyard only if the ship repair slipways are included should be refused. The following specific recommendations are made:

Recommendation M26:

The shipbuilding business be put up for sale, with all the site assets including the building slips and the small repair slip being included in the package, either under long term lease or for purchase. (The ship repair slips at Eliza Street are excluded from this sale package). If there are no bidders, the facilities should be closed and the assets liquidated.

Recommendation M27:

The ownership and management of the ship repair slipways at Eliza Street be vested in the Ports Authority of Fiji which would hire out time on the slipways and yard space to marine engineering enterprises; that is it would operate as a common user facility.

S2.3.10 NAVIGATIONAL AIDS PROVISION AND COST RECOVERY

At the present time, up to 70% of the navigational aids are out of commission and this is placing a significant cost burden on domestic shipping through vessel delay and damage, and affects of maritime safety. Resources intended for navaid maintenance are being diverted to other uses. Light Dues return only 25% of the annual \$1.00 million revenue needed to operate the navaids vessel full time, which is the level of input needed. These dues are credited to the Consolidated Fund rather than being channelled directly to their intended use.

Overseas vessels pay a major and disproportionate share of light dues in relation to port calls. However dues are low compared with similar countries and could sustain the fourfold increase required across the board to raise the necessary revenue. Although overseas vessels could be regarded as cross-subsidising domestic shipping, the greatest navaid investment is in landfall and harbour lights which are primarily for the benefit of overseas vessels.

Recommendation M28:

Light Dues should be increased by 3.5 times the present rate to fully recover the annual cost of the navaid vessel operating full-time on navaids maintenance and replacement. It is considered that this increase can be readily borne by overseas shipping.

Recommendation M29:

A "Lighthouse Authority" be established which would receive Light Dues, own the navaids vessel and have responsibility for navaid maintenance and upgrading.

S2.3.11 ROLE OF THE MARINE DEPARTMENT

Duties and responsibilities of the Marine Department have evolved over the years and today they represent a diverse range of activities, including: operation of the Government fleet, shipyard and slipways; provision and maintenance of navigational aids; hydrographic surveying; survey of vessels; and administration of shipping industry regulations. The Consultants recommend the following additional changes to the activities of the Marine Department in addition to those discussed above.

Recommendation M30:

The Department consider hiring private hydrographic surveying companies for such work as an alternative to carrying out this work in-house. Hydrographic surveying could be added to the responsibilities of the proposed "Lighthouse Authority".

Recommendation M31:

Although not fully investigated, there are no evident reasons to corporatise the Marine Department ship survey activities. However, an analysis of the cost recovery of this activity should be undertaken and consideration should be given to periodically commissioning an external technical audit of the Survey Section's activities.

Recommendation M32:

That the Marine Department put more resources into core activities - policy and planning advice to the Ministry; monitoring of regulations; and information services. A review of the functions and relationships between the Marine Board and the Marine Department should be undertaken.

S2.4 AIR TRANSPORT POLICY

S2.4.1 INDUSTRY STRUCTURE

The Government agencies responsible for air transport are: the Civil Aviation Department of the Ministry which has overall responsibility for air safety and air transport regulation, the latter being exercised through the Air Transport Licensing Board; and the Civil Aviation Authority of Fiji which owns and operates Nadi Airport and operates all other Government-owned airports, provides air navigation and other technical aviation services.

Air Pacific is the national flag carrier, with a small fleet of wide-bodied Boeing aircraft operating internationally out of Nadi and regionally out of Nausori. Several overseas carriers fly into Nadi and have various traffic rights granted by the Fiji Government. Air Pacific in turn has service agreements with international airlines.

Until very recently, there were only two domestic airlines flying scheduled services, Fiji Air and Sunflower Airlines, which fly small aircraft (mainly Twin Otter and Islander). The services they provide are complementary rather than competing, Sunflower using Nadi as its hub and serves mainly the tourist market, while Fiji Air is based in Nausori and serving mainly the local market. A few smaller operators are associated with particular tourist operations, and there are recent new entrants in Vanua Air and Pacific Express, the latter yet to commence operations.

S2.4.2 AIR PACIFIC AND INTERNATIONAL OPERATIONS

Air Pacific's mission statement reads "*Our mission is to be an outstanding airline by providing safe, high quality service to our customers, to prosper as a business and to provide a reasonable return to our shareholders*". There is no commitment in this statement that Air Pacific will operate in any particular market or that it will allow itself to be used as an instrument of Government policy in any other field.

In the Consultants' view, the objectives of the airline are clear and reasonable. The commercial success in the past few years, in what has been a difficult competitive market with a small aircraft fleet, is impressive. While it should be noted that the Consultants have not considered

international air transport in detail, as this is already well covered by the World Bank "Pacific Islands Transport Sector Study", the following recommendations are made:

Recommendation A1:

That the Government review its position on granting traffic rights to overseas airlines on a non-reciprocal basis. The Consultants concur with Air Pacific that the Government appears to accede to overseas requests somewhat too readily.

Recommendation A2:

That no cabotage rights be granted to overseas airlines, including other Pacific states. This is certainly not in Air Pacific's interest and would further dilute traffic on the Nadi-Nausori sector

Recommendation A3:

That Air Pacific be given more latitude to set air fares without prior approval from Government. Aviation market competition provides sufficient check upon fare rises and the company needs flexibility to quickly change its pricing in response to market conditions.

S2.4.3 DOMESTIC AIR SERVICES REGULATION

While open competition makes good sense with regard to certain other transport modes, there are strong reasons for controlling the level of competition on domestic air services. The aim for Fiji is to have an airline industry where the main routes have regular services that fulfil the needs of the travelling public, both local and foreign. At the same time, the operators should be in the position to keep their airlines active with reasonable returns to their investors. Further, returns should be sufficient to allow re-equipment when necessary with more efficient aircraft. To do so, a certain amount of market security is required for their operations.

Recommendation A4:

That the current system of controlling competition through designation of capacity and frequency of services be retained but rather than emphasising the presence of two or more operators on any one route, the competition be oriented more towards contestability of route licenses at the times of periodic renewal.

Recommendation A5:

Licences should be issued for a period of between three and five years and, in advance of the expiry of the licence, a public invitation should be issued by the ATLB for applications to operate these services.

Recommendation A6:

That scheduled services be negotiated with regard to frequency and aircraft type(s) to be employed. Major change should take place as part of the periodic re-advertising of licenses, but this should not preclude minor changes being made during the license period. These should be made by the Ministry in accordance with Government policy passed on through ATLB.

The Consultants are of the opinion that control of air fares is appropriate and necessary for the controlled licensing system proposed. However, as with other price controls, more flexibility is needed.

Recommendation A7:

Operators should be permitted to adjust fares upwards each year based upon a selected cost/price index. This will avoid the delays and expenses incurred at present in requesting fare increases from the Air Transport Licensing Board.

S2.4.4 AIR CHARTER SERVICES

A charter transport service is one where there is a contract for carriage between the transport operator and either a particular individual, or a group with a common interest, this contract

being for the hire of the whole vehicle and driver (the aircraft and pilot) for a particular trip. The two essential differences between a charter service and a scheduled service are that the public cannot directly purchase a seat on a charter service; and the scheduled service is guaranteed to transport the passenger even if only one ticket has been purchased.

It is very important in such a thin market that the activities of charter operators be carefully monitored and that charter licenses be issued with strict conditions so that scheduled operators are provided with adequate protection against predatory behaviour. The following general recommendations are made in respect of air charters:

Recommendation A8:

Scheduled operators should be permitted, as a condition of their licence to run additional services and charter flights on routes for which they are licensed in addition to the normal schedule. Scheduled service licences should clearly state when and how charters are allowed.

Recommendation A9:

In cases where the scheduled operator is reluctant to provide an additional service or to arrange a charter where the scheduled service cannot meet the traffic, then it should be referred to the Civil Aviation Division, acting through the ATLB, to decide whether a charter authority should be issued.

Recommendation A10:

Charter operations that run on a scheduled basis, "regular charters", should be totally banned on any route on which a scheduled passenger transport service has been granted a licence to operate.

Recommendation A11:

The Civil Aviation Department should actively monitor the operations of civil aircraft so that licence violations are immediately detected and stopped

Recommendation A12:

Price control should be used to maintain charter rates at a substantial margin above the equivalent scheduled fares where charters are granted on any route, or on any closely competing route where there is a scheduled operator. In the case of bona fide special purpose charters, and where there are no scheduled services operating, then the charter hire can be negotiated freely between the parties without being limited to a minimum charge.

S2.4.5 RECOMMENDATIONS FOR AIR SERVICE LEVELS

The Consultants have developed recommendations for domestic air services according to four levels of air service route/airport:

- Level 1 Main trunk routes on the triangle Nadi-Nausori-Labasa-Nadi
- Level 2 Radial services from either Nadi or Nausori to secondary centres
- Level 3 Other services, mainly out of Nausori to the smaller islands of the Lau and Lomaiviti Groups (excluding level 4).
- Level 4 Services from Nadi and Nausori to airports which have been developed primarily to support tourist resorts

The following objectives are recommended for each level:

Recommendation A13:

Level 1 domestic schedules should be dovetailed as far as possible with international flight arrivals through Nadi, and international-domestic transfer arrangements should be well integrated.

Recommendation A14:

as the Level 1 Nadi-Nausori sector is relatively short and in competition with road, flights must be as frequent as possible and preferably flights should depart at the same times each day.

Recommendation A15:

the services over the Level 1 triangle Nadi-Nausori-Labasa-Nadi should be strengthened to provide a better public service. With careful planning, it would be possible to provide larger aircraft and attract greater patronage. In view of the limited traffic, this will almost certainly require either a single airline operation or a combined service agreement between two domestic carriers.

Recommendation A16:

that Level 1 routes be limited to no more than two operators. A single operator or a joint service arrangement should be favourably considered if it offers an advantage in terms of larger aircraft size, regularity and frequency of flights. In the event of a full merger between two airlines (e.g. Fiji Air and Sunflower), then the ATLB may wish to consider a second operator on the Level 1 routes.

Recommendation A17:

Airlines should be encouraged to improve booking arrangements; in particular penalties for "no-shows" should be applied more frequently because of the apparent extent of this problem which results in inability for customers to reserve seats while at the same time the aircraft fly with a number of empty seats.

Recommendation A18:

Charter operations on Level 1 routes should be permitted only if (i) undertaken by one of the licensed operator(s) as a bona-fide single flight charter or (ii) the licensed operators agree to a third party operating the charter or (iii) the licensed operator will not provide the additional service. Charters should not depart within one hour of a scheduled service.

Recommendation A19:

Air Pacific be allowed to continue to load domestic passengers on the Nadi-Nausori service, provided that the services are intended primarily for on-carriage of international passengers. If Air Pacific should

decide to re-enter the domestic market as a main competitor, then its application should be treated impartially in comparison with other contenders. The Consultants also recommend that Air Pacific should be allowed to increase its fares for domestic passengers on this sector if it so wishes.

Recommendations follow for Level 2 routes which are served by scheduled operations but at a lesser frequency than for Level 1. The routes are from Nadi and/or Nausori to Kadavu, Savusavu, Taveuni and Bureta. These typically support daily or twice daily flights from each hub airport and there is currently a single operator on each route.

Recommendation A20:

For Level 2 routes licenses be issued for between three and five years but for a single operator only. Operators should be required to operate on a commercial basis.

Recommendation A21:

Conditions regarding charter services should be the same as for Level 1, except that charter flights should not depart within 3 hours of a scheduled flight.

For Level 3 routes, little traffic is available and therefore there is little to encourage operators to provide a frequent and reasonably priced service. Consequently, the service must either be matched with the amount of traffic that is available or, alternatively, if more frequent service is desired, subsidies will be required.

Recommendation A22:

The Government consider requiring operators to guarantee a minimum (say fortnightly) service with on-demand additional services when they are justified. The operator would be permitted to advertise his intention to operate these supplementary services given sufficient demand.

Recommendation A23:

Where the Government requires a higher level of service than operators are ready to provide, then a subsidised service may be considered. Under this subsidised operation, it is recommended that competitive bids be taken much in the manner that was recommended for marine shipping services to outer islands.

Recommendation A24:

Charters should not be allowed to operate on the same day as the scheduled service. However, if a special need exists where the licensed operator cannot provide an extra service on the same day, the Ministry may authorise a charter service. Other general recommendations regarding charter operations also apply.

With the exception of normal enforcement of safety standards, there is no need for Government intervention in Level 4 routes to privately operated tourist resort airports.

S2.4.6 GOVERNMENT SHAREHOLDING IN THE AIRLINES

The Fiji Government has shareholdings in both Fiji Air and Air Pacific. In the case of Fiji Air, the Government's holding is only 23% but it is the largest single shareholder, the remaining shares being widely dispersed among a large number of small shareholders. For Air Pacific, the Government owns 78% of the shares, the remainder being divided between other Pacific states, a carryover from the days when Air Pacific was intended to be a regional airline. In neither case does Government become actively involved in airline management policy.

The Consultants see no advantage in the Government retaining shareholdings in the airlines, particularly Fiji Air and other investors may be able to bring capital investment which the Government is not able to provide. Sufficient other controls exist to ensure that questions of national interest in airline operations are not neglected.

Recommendation A25:

The amount of foreign ownership that should be permitted in Air Pacific is a matter of judgement but overseas ownership should not be allowed to dominate, and a 35% holding as suggested by Air Pacific appears reasonable.

Recommendation A26:

It would appear to be in Fiji's interest to buy back the minority shareholdings of other Pacific States in Air Pacific prior to selling its shareholding

S2.4.7 ROLES OF CAAF AND THE CIVIL AVIATION DEPARTMENT

Regarding corporatisation, the Consultants agree that CAAF's regulatory functions cannot be commercialised; however in most respects CAAF is already close to a corporate structure. The following recommendations are made:

Recommendation A27:

the organisation is not large enough for the airports management functions to be separated into a new organisation without incurring significant additional costs, desirable though this may be in theory; however separation of functions into separate cost centres within the organisation with more separation in the management structure is advisable

Recommendation A28:

the proposed structure developed by ICAO appears to be a logical one and achieves the necessary separation. It is the Consultants understanding that CAAF is progressing towards this structure.

Recommendation A29:

CAAF's FIR responsibilities are required to be separately accounting so they do not cross-subsidise domestic operations and this should be reflected in the new management structure.

Recommendation A30:

An "Air Safety Bureau" needs to be set up outside of the CAAF structure, so that CAAF is not in the position of auditing itself in regard to safety matters. CAAF recognises the need for this and it is suggested that this function be established in the Civil Aviation Division, with suitably qualified staff detached from CAAF or recruited from elsewhere for the purpose.

Recommendation A31:

As a corporate agency responsible for its financial performance, CAAF should be given reasonable latitude to establish charging structures and levels for its services which allow it to recover costs with a minimum of cross-subsidy between functions. This is particularly important in relation to its airport management responsibilities which the Consultants recommend be extended. This discretion in price control should extend to aircraft landing fees and other aviation-related charges, the air passenger service charge (the portion not regarded as general tax revenue); and the manner in which these fees are used.

Recommendation A32:

The raising of revenues by CAAF for airport development through concessions and other business ventures should continue to be encouraged, but guidelines should be established to ensure that CAAF does not become over-involved in business ventures unrelated to its primary function of an airports and aviation service provider. Such concessions and business ventures should be associated with the airports management functions of CAAF.

Recommendation A33:

The views of the airport users, that is the airlines and in particular Air Pacific, need to be taken into account in all airport development planning, particularly in regard to cost recovery for major capital development. Ideally, Air Pacific would be represented on the CAAF board but the Consultants acknowledge that this would be inconsistent with CAAF's regulatory functions

(although not with its airport management functions). For developments at Nadi, the main international operators and IATA should be included in such consultation.

It is important that the Civil Aviation Division within the Ministry of Transport and Civil Aviation have staff with the technical competence to advise the Minister and the Air Transport Licensing Board.

Recommendation A34:

Civil Aviation Division staffing should be strengthened by recruiting at least one and possible two aviation advisors, one of which may be seconded from CAAF or be a former CAAF staff member. These personnel will need to cover the fields of aviation law, air safety, air services regulation and air transport economics. One could be a member of the proposed Transport Planning Unit.

S2.4.8 USER CHARGES AND COST RECOVERY

Apart from Nadi, which CAAF is obliged to operate on a commercial basis and where airport concessions and investment income are used partially to subsidise airport operating and development cost, the remaining Government airports all incur costs very much greater than the operating revenues from user charges. This situation has become worse over the years as Government has declined applications to raise landing fees which are now at unrealistically low levels. The Consultants make the following recommendations in regard to user charges:

Recommendation A35:

Domestic landing charges be raised to equal international landing charges.

Recommendation A36:

Landing charges be raised according to Table A4.5 in the main report. Charges for small aircraft (Islander/Twin Otter) would rise from a \$0.71 (domestic) to \$3.00 per tonne

and for larger aircraft (over 50 tonnes) from \$3.29 (domestic) to \$7.50 per tonne.

Recommendation A37:

A plan for increasing aeronautical charges over the next ten years be devised and implemented to enable CAAF to fund its future FIR responsibilities without recourse to cross-subsidy. These charges should be managed through a separate fund.

Recommendation A38:

A new Airport Departure Charge for domestic passengers should be introduced to be collected by the airline on ticket sales and passed on to CAAF in recognition of its increased financial responsibilities for Level 2 airports (discussed below). It is suggested that \$5.00 would be the appropriate level of charge which it is judged would be acceptable on the local market and the amount necessary to fund operation and maintenance of the Government airports brought under CAAF ownership.

S2.4.9 OWNERSHIP AND MANAGEMENT OF GOVERNMENT AIRPORTS

CAAF does not wish to take over financial responsibility for any of the other aerodromes and believes that the present arrangement where it manages these aerodromes with a subsidy from the Government is the way to continue. It appears to the Consultants that the main reason for CAAF taking this stance is their concern at being required to take over loss-making enterprises without any obvious source of revenue for cost recovery and without the discretion to set levels of charges. Nonetheless, it is recommended that the following Level 1 and Level 2 airports be placed under CAAF ownership:

Recommendation A39:

CAAF ownership, operational and financial responsibilities be extended to include the airports of: Nausori; Labasa; Savusavu; Matei; Bureta; Kadavu; and Rotuma. This recommendation relies upon Government acceptance of recommendations A35, A36 and A38

Alternative courses of action if Government does not accept the increased user charges at the levels suggested are discussed in the Main Report.

The remaining airfields with very low usage primarily have value to the villages which they serve but do not have a high national priority. Therefore, it is recommended that a "self help" arrangement be adopted for the routine upkeep of these airports.

Recommendation A40:

Landowners or local tikina council be given the responsibility for routine maintenance of other Government owned airports and attendance on aircraft operations; assistance should be given with equipment and training needs to enable them to perform these functions including maintenance equipment and fire fighting sets. Alternatively, attendance at small airports could be the responsibility of the airline.

Recommendation A41:

For periodic heavier maintenance activities, the outer island mobile maintenance unit be made available.

Recommendation A42:

CAAF undertake periodic safety inspections and rigorously impose required standards, with temporary closures where safety requirements are breached.

Improvements to the cost recovery position at the Government airports, apart from Nausori, can be made by implementing the following recommendations:

Recommendation A43:

Reduction of fire and rescue and communications services at the airports of Savusavu, Bureta, Lakeba and Matei with remaining communication requirements devolved to the airline operators who can station an agent at the airport as and when necessary to report on operability of the aerodrome, local weather conditions and passenger and cargo loads.

Recommendation A44:

Where fire and rescue services are retained, economies can be made by redesignating fireman as groundsman/auxiliary firemen with duties to improve the aerodrome and to attend on the fire appliances when aircraft operations take place.

Together with the recommended increases in user charges, the above measures will allow cost recovery at airports under CAAF responsibility without further Government financial input, as is discussed in the Main Report (Section A4.6.8)

S3 TRANSPORT INFRASTRUCTURE PLAN

S3.1 PLAN OBJECTIVES AND CRITERIA

Investment in the transport system is undertaken for a range of objectives including: economic efficiency; social welfare objectives including social equity; as a tool of regional development; to employ labour; and for national security purposes.

Transport economic efficiency is usually a principal objective of transport investment and the evaluation of projects will normally have recourse to a formal evaluation structure which attempts to measure the economic costs and benefits of the proposal, through the process known as cost benefit analysis (CBA). While project engineering costs can be readily quantified, benefits and disbenefits of transport investment vary from tangible cost savings such as vehicle operating cost reduction through the less readily valued benefits of time and road accident reduction to the intangible external environmental impacts.

At present, Fiji does not employ a formal economic evaluation and ranking system for transport investment with the exception of the larger programmes under international funding where this is required as part of the feasibility study process. It is making progress with environmental assessment in general, and this study has undertaken Initial Environmental Examination of individual projects and classes of transport investment which are included as an appendix to the main report.

The following recommendations are made in regard to the general process of transport project evaluation:

Recommendation G1:

That appropriate standard guidelines be drawn up for technical, economic, social and environmental evaluation so that all transport projects included in the short, medium and long term plan for the sector are subjected to an appropriate level of economic appraisal using a consistent set of assumptions which have been developed for Fiji conditions.

Recommendation G2:

That training be given to technical staff from the implementing agencies in the basics of cost benefit analysis and use of the standard guidelines, such training to be coordinated through the Transport Planning Unit.

Recommendation G3:

The standard appraisal guidelines should include: a manual of procedures dealing with: basic economic theory; specific procedures appropriate to road investment projects; standard values for economic inputs; an appendix of factors published annually for updating the main economic inputs; worked examples for common forms of road and traffic improvement project, and standard worksheets for those who carry out the calculations manually; accompanying computer software mimicking the standard worksheets to enable evaluations to be accomplished with less scope for arithmetic error and ease of updating. Accompanying or integral with the manual should be guidelines for technical assessment of road and traffic improvement works. and guidelines for environmental assessment.

Some specific recommendations in regard to project evaluation methodology are:

Recommendation G4:

The technical basis for the traffic delay assessments used in economic assessments of road link capacity and intersection improvements in urban situations be reviewed to ensure they are appropriate to driver behaviour and traffic control methods used in Fiji.

Recommendation G5:

That the TPU take on the task of periodic updating of user cost inputs for transport project evaluation

Recommendation G6:

That economic values for personal travel time savings be established by comparison with research efforts abroad.

Recommendation G7:

That accident cost valuation, including willingness-to-pay values for intangible costs be considered for inclusion in the road project evaluation process.

Recommendations relating to environmental impact assessment (EIA) and procedures for the transport sector are:

Recommendation G8:

Until updated or superseded, the current format and procedures for EIAs in Fiji should continue to be used for all transport related development projects where these are likely to have significant effects on the environment. Both the public sector and the State should follow the same format and procedures for EIAs as required of the private sector.

Recommendation G9:

For port works or jetties full consideration should be given to the International Association of Ports and Harbours check list of environmental impacts of ports and coastal area developments and, in addition, the South Pacific Region Environmental Programme training manual, "How to Assess Environmental Impacts on Tropical Islands and Coastal Areas".

Recommendation G10:

For general roadworks and highway by-passes consideration should be given to the UK Transport and Road Research Laboratories guidelines "Towards Safer Roads In Developing Countries".

Recommendation G11:

The Traffic Regulations require amendment as soon as possible in order to replace the current "...control of vehicle emissions causing nuisance..." with an enforceable criterion.

Recommendation G12:

Lead-free petrol for motor vehicles should be introduced to Fiji as soon as economically practicable.

Recommendation G13:

A special study should be commissioned to identify the key substances, procedures and systems to be adopted in the event of hazardous spills by land or by sea, in order that a national policy for the safe transport, handling, storage and disposal of dangerous and potentially hazardous substances can be established. It is also recommended that a permanent Hazardous Materials Advisory Committee should be established.

In screening and ranking transport projects, social criteria which are not included within the economic framework of cost/benefit analysis also need to be incorporated. A methodology for screening projects is included in the main report.

S3.2 EXISTING INFRASTRUCTURE PLANS

There are a number of existing plans for infrastructure development at various stages of commitment. It will be necessary for the recommendations of the NTSP to be integrated with this programme and in some cases, NTSP recommendations if accepted, will supersede the existing plans.

S3.2.1 ROADS SECTOR

Tentative forward plans exist for expenditure over the 1993 to 1997 period, involving \$118 million over a five year period. PWD has also identified a list of possible "FRUP3" projects, several of which, but not all, are supported by the Consultants. Conversely, the NTSP recommends some projects for inclusion in FRUP3 feasibility studies which are not identified by PWD. In general, however, the forward expenditure intentions of PWD in the roads sector and the Consultants recommendations are in reasonable agreement.

S3.2.2 PORTS SECTOR

The Ports Authority has developed a Master Plan, the main components of which are the Rokobili development (\$7.5 mill) and Kings Wharf repairs (\$6 mill). Over the 1994 to 1998 period, the extent of the plan, some \$14.5 million capital expenditure in main port facilities is planned. Generally, the NTSP cost estimates for similar works are considerable higher than those of PAF but would be undertaken over a longer time frame.

PWD has plans for \$2.2 million of repairs and \$2.5 million of new construction for small jetties. As stated earlier in this summary, the Consultants have considerable reservations about the low benefit/cost ratio of investments in these smaller jetties, and suggest that the transport demand can be satisfied at lower cost by lightering and lower cost beach landings.

S3.2.3 AIRPORTS SECTOR

The Master Plan for Nadi looks forward as far as 2020 which is furthest projection of any programme in the Fiji transport sector. Over \$100 million of works are contained in this plan, which comprises \$70 million in aircraft movement surfaces, \$25 million in terminal development and the remainder in air navigation and land acquisition. The investment in aircraft movement surfaces in particular, is in excess of what the Consultants consider will be economically justifiable.

At Nausori, a 1986 development plan which CAAF now regards as superseded, included an extension to the runway. Apart from this, the 1986 plan is not too dissimilar from the Consultants view of the investment required at Nausori for it to continue to handle B737 operations.

CAAF prepared a five year plan for development at the Government airports in 1990 covering the period 1990 to 1994 and an indicative estimate of works for the 1995 to 1999 period. This envisages \$6 million of expenditure, mainly at Nausori, up to 1994 and a further \$3.6 million to 1999.

S3.3 TRANSPORT DEMAND FORECASTS

S3.3.1 ROAD TRANSPORT DEMAND

Examination of the historic record of traffic counts shows only modest growth in traffic of around 1% on the two rural road network. Other indicators, such as vehicle ownership, similarly show relatively low growth. The outlook for population (1.1%) and GDP per capita (1% based on historic trend) gives no cause to anticipate that there will be an upsurge in road transport demand over the foreseeable future.

PWD has observed stronger growth in the urban centres (4% or so) and this is where most of the traffic pressures on the existing road network are being felt.

The maturing pine and hardwood plantation forests will add significantly to traffic on certain roads in the future. The only other development with significant traffic generation implications identified in the study is the proposed Namosi copper mine. These traffic generators will add significant traffic volumes to certain roads over and above general growth.

S3.3.2 MARINE TRANSPORT DEMAND

The study has developed forecasts of import and export cargo for the main ports of entry over the planning period. The volume of dry cargo imports determine the wharf capacity requirement and the forecasts indicate a 65% increase through Suva and a 63% increase through Lautoka over the 20 years, that is 2.5% per annum. Although it is an objective of PAF to attract trans-shipment cargo through Fiji, the Consultants conclude that this activity is unlikely to be significant.

For inter-island shipping, the information base is very sparse and inadequate for establishing whether the trade is in growth or decline. However, as the load factors on inter-island vessels are very low, any increase in demand can be readily accommodated by the existing services. For the smaller outer islands, the problem is to provide an adequate frequency and regularity of service in the face of very small freight and passenger volumes. Traffic is dominated by imports to the islands by a ratio of about 3:1. Passenger demand varies between 0.9 and 0.15 trips per head of population depending upon the level of service provided

which averages 20 ship calls per 1000 head of population per year. With the exception of Taveuni and Kadavu, the potential for developing significant additional freight traffic from cash cropping activity on the outer islands is limited, although more frequent services may stimulate some growth.

S3.3.3 AIR TRANSPORT DEMAND

The Consultants have been able to consider the demand for air transport in some detail, thanks to the good quality records maintained by CAAF.

There have been several studies of international air traffic demand through Nadi, including CAAF's own reviewed Master Plan forecast. The Consultants findings are that prior forecasts have almost without exception been too optimistic, and the current CAAF forecast is also regarded as at the high end of credible forecasts of future traffic into Nadi. CAAF projects 2.3 million passenger movements in 2020 compared with 1.4 to 2.1 million by the Consultants. The lower forecasts envisaged will have the effect of deferring airport investment based on capacity considerations.

Domestic air traffic has been static over the past decade, with a dip in passenger movement between 1987 and 1990. The Consultants forecasts are for 2.5% annual growth of domestic movements through Nadi, fed primarily by international transfers, but much lesser growth at Nausori, at best 1%, although the case for nil growth or a decline could also be made.

For the other airports, traffic will depend on local circumstances, with the tourist destinations experiencing growth similar to Nadi, but other destinations growing in proportion to population or, in some cases, returning to traffic levels achieved in the past.

S3.4 ROAD AND RAIL INFRASTRUCTURE PLAN

S3.4.1 ROADS FOR UPGRADING ON THE BASIS OF TRAFFIC CAPACITY

In terms of traffic capacity, the Consultants conclude that, in general, the existing rural road network has adequate capacity for the next 20 years. This does not preclude the need for local provision of passing lanes on sustained grades and at intervals on particularly windy sections

where passing opportunities are limited, particularly where slow traffic such as cane trucks and tractors operate. However, this degree of detail is not within the resources available in the NTSP. It would be prudent to repeat this screening analysis at regular intervals as traffic data is updated and growth is monitored.

The following links, which are more urban in character, will be operating at over 50% of maximum capacity by year 2010 but planned improvements together with local traffic management should address congestion problems:

- Queens Road between Nadi and the Airport
- Nabouwalu Road into Labasa from the West
- Wainikoro Road from Labasa to Malau Road.

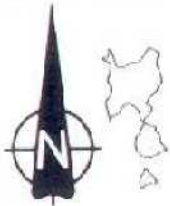
S3.4.2 POTENTIAL ROAD UPGRADING PROJECTS

Based upon forecast future traffic volumes, a schedule of potential road upgrading projects has been drawn up for the short (1997-2001), medium (2002 to 2006) and long term post-2006) as listed in Tables S3.1. The project locations are shown on Figures S3.1 and S3.2 together with the existing FRUP2 upgrading projects. Until the FRUP2 programme finishes in 1996, it is anticipated that there will not be the financial or technical capacity to take on new upgrading projects.

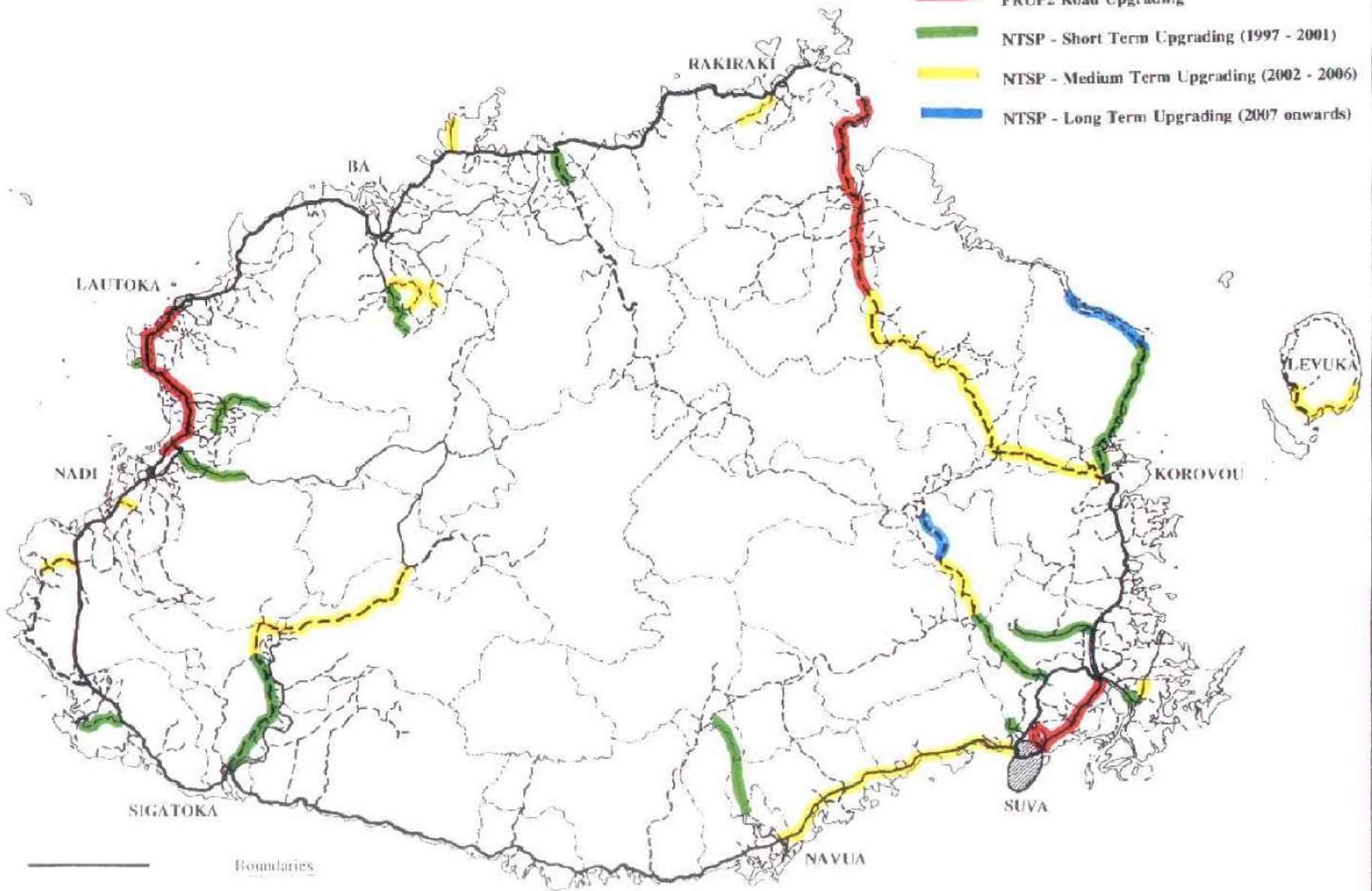
Upgrading to sealed standard has been the focus of the NTSP study, although this does not preclude a lower level of improved gravel standard and feasibility studies should include such intermediate upgrading as an option.

Certain road projects can be recommended for design and construction without any further requirements for economic feasibility study. Generally these road sections have already been subject to a technical and economic appraisal, but have been dropped from recent construction programmes because of unavailability of funds.

A further category of road projects warrants early technical and economic feasibility study prior to inclusion in construction programmes over the next 10 years, that is as part of "FRUP3". Other projects are less certain and on



- FRUP2 Road Upgrading
- NTSP - Short Term Upgrading (1997 - 2001)
- NTSP - Medium Term Upgrading (2002 - 2006)
- NTSP - Long Term Upgrading (2007 onwards)



LEGEND:

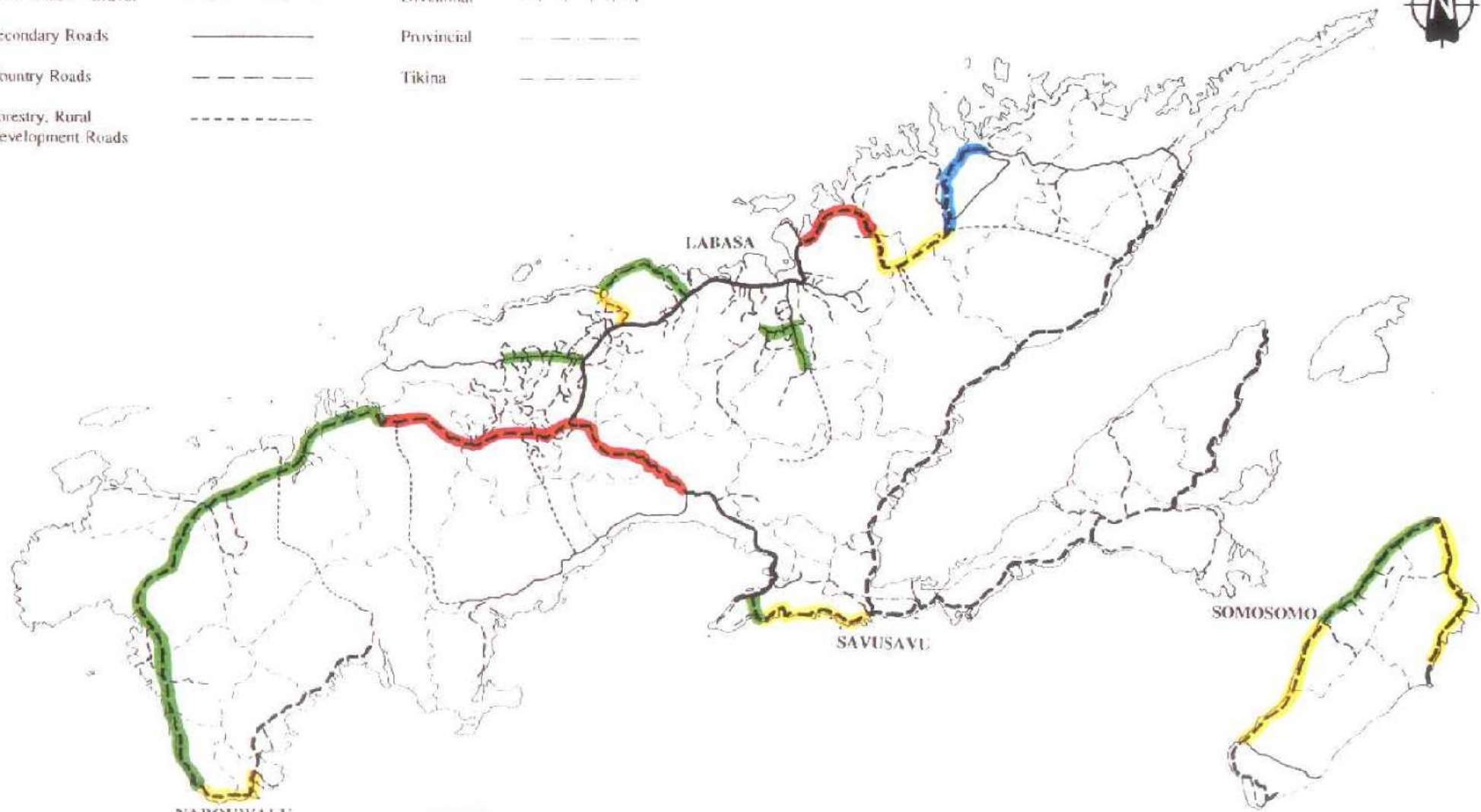
Main Roads - Sealed		Boundaries	
Main Roads - Gravel		Divisional	
Secondary Roads		Provincial	
Country Roads		Tikina	



**ROAD NETWORK
VITI LEVU
FIGURE S3.1**

LEGEND:

Main Roads - Sealed		Boundaries
Main Roads - Gravel		Divisional
Secondary Roads		Provincial
Country Roads		Tikina
Forestry, Rural Development Roads		



- FRUP2 Road Upgrading
- NTSP - Short Term Upgrading (1997 - 2001)
- NTSP - Medium Term Upgrading (2002 - 2006)
- NTSP - Long Term Upgrading (2007 onwards)



ROAD NETWORK
VANUA LEVU
FIGURE S3.2

a longer time frame. Specific recommendations for road sections are as follows:

Recommendation L37:

Roads for construction in the short term as funds are available without the need for further economic feasibility study:

- *Lodoni Road from Korovou to Native Wharf (17km)*
- *Wainibokasi Road from Nausori Airport to Wainibokasi (4 km)*
- *Wailoku Road (2.6 km)*
- *Vuda Point Road (2.3 km)*
- *Nadarivatu Road (5 km)*
- *Buca Bay Road, Savusavu to Airport (4 km)*

Recommendation L38:

That the next round of road feasibility studies, "FRUP3" include the following road sections which are assessed as short term priorities for sealing:

- *Sawani Road - Sawani to Naqali (16km)*
- *Baulevu Road - Kings Road to Baulevu (12 km)*
- *Sigatoka Valley Road - Sigatoka to Narewa (15 km)*
- * • *Tunalia Road - seal extension to Arolevu Rd (5km)*
- * • *Nausori Highlands Rd - Queens Rd to Tovatova Rd (10 km)*
- * • *Sabeto Road - Naboutini Road to Nagado (4.5 km)*
- * • *Moto Road - Vetusi Road - Toqe Road (4 km)*
- *Nabouwalu Road - Dreketi to Nabouwalu (54 km)*
- * • *Nakorotari Rd - Naduna Rd to Nakarotari (10 km)*

- * • *Naduna Road - Airport to Nakarotari Rd (6 km)*
- * • *Tabia to Naduri Rd - Nabouwalu Rd to Naduri Rd (14 km)*
- * • *Navidamu Rd - PWD Depot to Cikobia Rd (12 km)*
- *Taveuni Coast Road - Matei to Des Voeux Peaks Rd (22 km)*

(* sugar roads - see Recommendation L43 below)

Recommendation L39:

Other roads indicated in Table S3.1 as rank "M" or "L" are recommended for inclusion in the medium term (2001 to 2006 years) and long term (post 2006) infrastructure plan respectively. The requirement for engineering and economic feasibility studies for these roads should be reconsidered in 5 years time.

S3.4.3 FORESTRY ROADS

The Forestry Department and the government-owned forest corporations Fiji Pine and Fiji Forest Industries, between them have a large network of forest roads under their control, in excess of 2,500 kilometres of which only about 20% are gravel surfaced. Certain of these roads may be considered for inclusion in the public road network, and a schedule has been provided by the Forestry Department of roads it considers worthy of consideration. These include a transinsular road in southwest Vanua Levu which the Consultants recommend be included in the feasibility study of upgrading the Nabouwalu Road between Dreketi and Nabouwalu. The network of gravel surfaced Forestry roads is being extended at a rate of over 100 kms per annum, which is likely to be maintained over the medium term and carries a corresponding maintenance responsibility.

Recommendation L40:

that PWD include the primary forestry roads in its inventory and mapping. In consultation with the Forestry Department, PWD should carry out an economic evaluation of any road being considered for inclusion in the public road network so that the user benefits in

**TABLE S3.1 - POTENTIAL ROAD UPGRADING PROJECTS
1 - CENTRAL/EASTERN DIVISION**

Road	Type	Length km	Ex Traffic veh/day			% HCV	Prev. EIRR %	Est Cost \$m	Rank
			Start	End	Ave				
Kings Road									
Dama - Korovou	M	56.5	125	250	150	30	6	37	M
Lodoni Road									
Korovou - Native Jetty	M	17	500	200	350	15	12	9	S
Native - Dawasamu	C	13	150	100	125	15	-	7	L
Sawani Road:									
Sawani - Naqali	M	16	400	275	300	22	18	9	S
Naqali - Vunidawa Rd	M	10	250	170	210	20	-	6	M
Vunidawa Rd:									
Saqani Rd - Vunidawa	C	5	160	80	140	20	-	3	L
Baulevu Road:									
Kings Rd - Baulevu	S	12	600	200	400	15	-	4	S
Wainibokasi Rd:									
Airport - Landing	S	4	850	850	850	30	47	1.5	S
Ratu Kadavulevu Rd									
Wainibokasi - Kuku	S	3.5	400	120	250	30	-	1.2	M
Waloku Road:									
	S	2.6			500		15	2	S
Ovalau Circuminsular:									
Buresala-Levuka	M	19	75	600	200	8	-	8.5	M

**TABLE S3.1 - POTENTIAL ROAD SEALING PROJECTS
2 - WESTERN DIVISION**

Road	Type	Length km	Ex Traffic veh/day			% HCV	Prev. EIRR %	Est Cost \$m	Rank
			Start	End	Ave				
Sigatoka Valley Road:									
Sigatoka - Narewa	M	15	500	250	375	25	-	8	S
Narewa - Bukuya Rd	M	25	250	100	175	35	-	11	M
Maro Road:									
Queens - Natadola Beach	C	5.5	700	500	600	12	-	3	S

**TABLE S3.1 - POTENTIAL ROAD UPGRADING PROJECTS
2 - WESTERN DIVISION (Contd)**

Road	Type	Length km	Ex Traffic veh/day			% HCV	Prev. EIRR %	Est Cost \$m	Rank
			Start	End	Ave				
Tunalia Road:									
EOS - Arolevu Rd	C	5	700	200	450	16	-	2.5	S
Mate Rd:									
Queens Rd - Tunalia Rd	C	1			300	15	-	0.4	M
Momi Road:									
Queens - Momi	C	5	300	200	250	12	-	2	M
Nausori Highlands Rd:									
Queens - Tovatova Rd	S	10	1200	200	700	20	-	6	S
Sabeto Road:									
Naboutini - Nagado	S	4.5	550	150	350	35	-	3	S
Naboutini Rd:									
Votualevu Rd - Sabeto Rd	S	5	500	320	400	35	-	2	S
Vuda Point Road:	S	2.3	750	650	700	20	-	0.8	S
Moto Road:									
Vetusui Rd - Toqe Rd	S	4	1000	400	600	15	-	2	S
Vatusui Rd:									
Moto Rd - Toqe Rd	C	8	500	200	350	8	-	4	M
Balevutu Rd:									
Moto Rd - Balevetu	C	4	350	150	250	8	-	2	M
Koronubu Road:									
EOS - Navala Rd	C	4	375	275	325	30	-	2	M
Nadarivatu Road:									
Korovu - Malele	S	5	1200	100	500	8	-	3	S
Vatia Road:									
Kings Rd - Vatia Wharf	S	5.3	300	100	200	10	-	2	M
Saweni Beach Rd:	S	1.9	450	350	400	5	-	0.7	M
Nalkabula Rd:	C	3.4	800		400	15	-	1.5	S
Drasa Dam Road:	C	9.5	450		200	15	-	5	M
Vatukacevaceva Rd:									
Korotale Rd -	C	4	350	50	200	6	-	1.5	M

**TABLE S3.1 - POTENTIAL ROAD UPGRADING PROJECTS
3 - NORTHERN DIVISION**

Road	Type	Length km	Ex Traffic veh/day			% HCV	Prev. EIRR %	Est Cost \$m	Rank
			Start	End	Ave				
Nabouwalu Rd:									
Dreketi-Naviqiri Rd	M	25	300	<i>300</i>	<i>300</i>	20	-	9	S
Naviqiri Rd-Vunivau Rd		14	<i>300</i>	180	<i>240</i>	45	-	10	S
Vunivau Rd-Nabouwalu		15	180	300	240	25	-	8	S
Nabouwalu-Naivado Rd	S	15	280	<i>170</i>	<i>225</i>	10	-	8	M
Wainikoro Rd:									
Coqeloa-Nakelikoso	M	18	350	<i>200</i>	<i>275</i>	20	-	12	M
Nakelikoso-Lakeba Rd		12	200	75	140	25	-	6	L
Buca Bay Rd:									
Savusavu-Airport	M	4	1400	1400	1400	6	-	2.5	S
Airport-Natewa Jcnctn		15	<i>350</i>	220	285	11	-	7	M
Nakorotari Rd:									
Naduna Rd-Nakorotari	S	10	1000	250	625	25	-	3.5	S
Naduna Rd:									
Airport-Nakotari Rd	S	6	750	350	550	10	-	2.5	S
Tabia-Naduri Rd									
Nabouwalu Rd-Naduri Rd	S	14	600	<i>250</i>	<i>425</i>	20	-	6.5	S
Korovuli-Naduri Rd:									
Nabouwalu Rd-Naduri Rd	S	6	200	<i>200</i>	<i>200</i>	20	-	2.5	M
Navidamu Rd									
PWD Depot- Cikobia Rd	S	12	500	<i>200</i>	<i>350</i>	10	-	6	S
Savudrodoro									
TIR-Savudrodoro V. Rd	S	5	300	<i>200</i>	<i>250</i>	25	-	3.5	M
Taveuni Coast Rd:									
Matei-Des Voeux Pk Rd	M	22	400	<i>750</i>	<i>500</i>	7	-	12	S
Des Voeux -Salialevu Rd		22	<i>300</i>	100	<i>200</i>	5	-	12	M
Matei-Bouma		20	<i>300</i>	100	<i>200</i>	5	-	11	M

Note: traffic volumes and % heavies in italics are estimated; other figures are from counts with a 24/12 hour factor applied as necessary ;

relation to the costs of upgrading the road to acceptable design standard and ongoing maintenance responsibility are properly assessed before PWD takes on ownership responsibility

Recommendation L41:

that the trans-insular road from Namuavoivoi to Nadua/Cogea be included as part of the feasibility study of the upgrading of the Nabouwalu Road.

S3.4.4 AGRICULTURAL AND REGIONAL DEVELOPMENT ROADS

Roads constructed under the cocoa and ginger projects account for about 500 kms of rural road, to which can be added roads constructed by the Regional Development Department under the rural roads programme. The higher standard Regional Development roads are turned over to PWD for maintenance. Additions to the network of agricultural roads in future are likely to be minor, but the intentions of the Regional Development Department for new road construction are substantial. There is a concern that roads constructed under the auspices of the Agriculture and the Regional Development Departments make no proper allowance for ongoing maintenance needs and that either this becomes an imposition on PWD or the roads are left to be maintained by the local people, in which case they often are neglected. While there is communication between PWD and the other departments which become involved in road construction, more co-ordination appears to be needed to ensure that investments in country roads are made within a consistent planning and assessment framework.

Recommendation L42:

PWD move to form a joint planning group for rural secondary and country roads development with participation from the Regional Development, Agriculture and Forestry Departments and with input as needed from Fiji Sugar and Fiji Pine.

In the case of roads in the sugar growing area, several of these have been identified as being worthy of upgrading to sealed standard. However, rather than treat each as an isolated

case, there would be merit in undertaking a study of transport needs in each of the main sugar growing areas, in particular: Nadi; Lautoka; Ba; Tavua; Seaqaqa; and Labasa. Traffic on these sugar roads is seasonal, and the sugar can lorries are frequently overloaded. The overloading situation is tolerated and may in practice be the only feasible option as effective enforcement will raise transport costs for an industry already facing potential future problems with marketing its product.

Recommendation L43:

A transport planning study be undertaken focusing on the sugar area feeder road system, interaction with the cane railway, and taking account of the effects of level of enforcement of the loading of sugar lorries in terms of overall national economic costs. Such a study would incorporate the eight roads indicated with an asterisk () in recommendation L38 above.*

S3.4.5 URBAN ROADS

The funding and maintenance responsibilities for urban roads lie with the municipalities with the exception of strategic roads which are managed by PWD. The limited rating base presents the councils with a constraint on resources, there being no contribution from central government.

Problems in the urban areas are primarily those of traffic and parking management and property access control, rather than a lack of road capacity. While bypasses have been requested for Nadi, Labasa and Nausori, the Consultants note that bypasses seldom provide much relief, particularly for larger urban centres, as the majority of traffic originates or terminates in the urban area. General and specific recommendation for the urban centres are:

Recommendation L44:

That consideration be given to allocating a proportion of road user tax revenue to Councils for municipal road maintenance on the basis of cost responsibility of road users. Land owner contributions to the capital funding of urban access /subdivisional roads should remain.

Recommendation L45:

A comprehensive land use and traffic planning study be made of the area encompassing Suva port, the bus station, market area and adjoining commercial development.

Recommendation L46:

A traffic management study be carried out for the centres of Lautoka, Nadi, Ba, Labasa and Nausori.

S3.4.6 SUGAR CANE RAILWAY

The Consultants view is that there is unlikely to be significant extension to the cane growing area in future and that production levels will at best regain those of the early 1980s. Consequently no expansion of the cane railway is expected and expenditure on the railway will be directed towards maintenance of the way and rolling stock, with some replacement of light gauge rail and some new loop and shunting sections.

While railway operations cause some delay at level crossings during the season, these are not considered sufficient to warrant major expenditure on track relocation or grade separation.

S3.5 PORTS INFRASTRUCTURE PLAN

The project has used available engineering information on the existing foundation and structural condition of the wharves, together with recent reports on port upgrading plans and costs and the NTSP forecasts of cargo traffic to develop the following recommendations for the three PAF ports.

S3.5.1 SUVA

The Consultants have considered the future development options for Suva in some detail because of the potentially high cost of development of a new deepwater quay and supporting reclamation at Rokobili. When and whether this is required depends upon port traffic growth and on the development possibilities at the existing port. Four

development scenarios have been costed as shown in Table S3.2

An economic evaluation has been carried out for each scenario resulting in the following conclusions:

- (i) The port should actively pursue the acquisition of more land for container storage on land adjacent to the port. The reclamation of land south of Kings Wharf adjacent to Stinson Parade and including a link bridge to Kings Wharf across the Nubukalou Creek is the least cost option.
- (ii) When the port reaches land area capacity, then extend the reclamation in (i) above southwards.
- (iii) If the additional land referred to in (i) and (ii) above is not made available due to competing demands for its use, planning social or environmental reasons, then obtain additional land between Harris, Rodwell and May Roads and Renown Street.
- (iv) If none of the extra areas referred to in (i), (ii) and (iii) above can be utilised by the port, then PAF will be required to proceed with the construction of a single berth and Ro-Ro berth at Rokobili. The construction of additional back-up reclamation is not recommended at this stage. Even if this area could be developed on a self-funding basis, initial financial funding will still be required and financial resources may well be diverted away for the development of non port related activities.
- (v) A more detailed study should be carried out to refine the cost estimates following the receipt of data on geotechnical conditions, seismic risk and hydrology. At that time, a more detailed technical and financial/economic study should be undertaken to confirm the plan for investment in port facilities.
- (vi) In addition to (v), a Master Plan for Port Development should be produced which would provide an environmental impact analysis as well as identify the resource requirements for the development options.

TABLE S3.2 - SUMMARY OF COST ESTIMATES

Development Option	Cost FJ\$ (million)
Scenario A - Upgrade/Extend Kings Wharf	
- Extend area at Harris/Rodwell Roads	21.4
- Strengthen wharves for heavy axle load	4.5
Scenario AA - Reclaim Land by Stinson Parade	
- Stage 1 South reclamation but no berth	10.5
- Stage 1 South reclamation with berth	30.7
Scenario B - New Wharf at Rokobili	
- Rokobili Stage 1, causeway, no back-up reclamation	38.7
- Rokobili Stages 1 and 2, no back-up reclamation	74.5
- Rokobili back-up reclamation and serviced subdivision	21.4
Scenario C - Backup Reclamation at Rokobili	
- Refer Scenarios A, AA and B for costs	

The following recommendations are therefore made:

Recommendation M33:

Undertake upgrading works to protect Kings Wharf against earthquake damage.

Recommendation M34:

Strengthen Kings Wharf to enable heavy axle fork lift trucks to operate without restriction.

Recommendation M35:

Obtain additional land for container storage and apply higher demurrage charges in order to minimise container dwell time when the existing yard nears capacity, which it is anticipated will be between the years 1997 and 2002. Ideally the land between Harris and Rodwell Roads would be the most suitable area.

Recommendation M36:

Build a new berth in order to obtain more container yard storage area. The time for this expansion is estimated to be between the years 2007 and 2012. The first cost analysis

would suggest that the least cost solution would be a southward extension of the wharf across Nubulalou Creek rather than the proposed new site at Rokobili.

Recommendation M37:

Confirm the above programme of investment by further engineering, geotechnical, hydrological, technical, financial, economic and environmental investigations.

For the local shipping wharf at Muaiwalu, the Consultants have reached the conclusions:

- (i) The congested military facilities at Eliza Street need investigation to determine the needs and options for relieving the congestion.
- (ii) There are incompatible land uses in the Walu Bay area, including engineering works, tank farms, Government offices and local shipping services being in close proximity. Long term planning should aim to rationalise land uses. The possible Rokobili reclamation associated with future port expansion could offer opportunities for land use rationalisation.

- (iii) The Muaiwalu complex will be satisfactory for inter-island shipping demands in respect of berths and back up facilities. Further investigation should be made into transport facilities to take passengers and cargoes from the complex to their destinations in Suva.

resulting in the following recommendations:

Recommendation M38:

Continue with the existing planned development of the Muaiwalu area. However, a long term land use plan for the area should also be prepared in conjunction with planning for the international wharf.

Recommendation M39:

In the event that a new port facility were to be built at Rokobili then local shipping should be transferred back to Kings / Princes Wharf.

Recommendation M40:

A study be made of the transport options for passengers and cargo from Muaiwalu into Suva.

S3.5.2 LAUTOKA

Recent development work at Lautoka should provide sufficient capacity for the next decade at least. However there are axle load limitations which restrict the operating area of heavy fork lifts and PAF should ensure that these are observed by stevedores licensed to work on the wharf.

Recommendation M41:

Ensure that stevedores using the port on a contractual basis observe the axle load limits on the wharf by use of the correct plant.

Recommendation M42:

Consider the extension of the wharf in ten to fifteen years for heavy axle use when traffic

levels have increased to a point where delays are incurred due to the use of inappropriate plant.

S3.5.3 LEVUKA

Levuka is a port of entry largely for historical reasons and latterly because of the presence of PAFCO. With the development of PAFCO's own wharf facility and, taking into account the structural condition of the inner end of the existing PAF wharf and the limited traffic demand, there is little reason why Levuka should retain this historical status.

Recommendation M43:

Given the forecast levels of traffic, no further capital expenditure on the existing facility should be made unless there is a dramatic increase cargo passing over the quay and the operation can be shown to cover its costs.

Recommendation M44:

Enter into discussions with PAFCO concerning the transferring of port responsibility to them in order that they can use the facility as a berth for their fishing vessels whilst still making the facility available for any local shipping activity.

S3.5.4 SAVUSAVU

The Consultants have examined the case for developing the port of Savusavu as an international port of entry. It is considered that the likely traffic growth will be relatively small and that demand will be centred at Labasa/Malau rather than on the south coast of Vanua Levu.

Recommendation M45:

Given the current and potential future traffic, no case can be found for the investment in a deepwater port facility.

S3.5.5 PRIVATE WHARVES

The only private developments foreseen during the planning period are the construction of a

chip loading facility in Vanua Levu and the possible development of a wharf near Navua to serve the Namosi copper mine development, should this proceed.

It appears more likely that the chip loading facility will be built at Malau rather than in western or southern Vanua Levu. The Namosi loading terminal would be required to cater for a bulk carrier loading from a slurry pipeline.

Apart from being aware of the possible development and the potential effects on the environment and road traffic, the Government does not have a direct role in the design, construction financing or maintenance of these facilities.

S3.5.6 OUTER ISLAND JETTIES

The policy and cost recovery aspects of jetty financing have already been covered in Recommendations M8 to M10. The Consultants have concerns about the low level of benefit to cost in the construction of jetty facilities and conclude that some existing jetties do not warrant the cost of continued repair and maintenance, while other new jetties that are planned also will not justify their construction cost. The following recommendations are made:

Recommendation M46:

Work should continue on those jetties that are currently under construction.

Recommendation M47:

Only maintenance of the jetties at Native, Nabouwalu, Ellington, Savusavu, Waiyevo, Vunisea, and Lakeba should continue, these being considered as having strategic importance.

Recommendation M48:

Review and improve both the design and construction of jetties in order to provide for longer life expectancy.

S3.6 AIRPORTS INFRASTRUCTURE PLAN

To allow current airport operations to continue at acceptable safety and operational standards, some remedial and upgrading works will be required at Nadi, Nausori, Labasa, Matei and Savusavu airports. The recommended works are discussed below:

S3.6.1 NADI INTERNATIONAL AIRPORT

The Nadi Airport Master Plan, recently reviewed by CAAF, provides a generous assessment of the range of facilities which may be required so that expansion of the airport is not compromised by surrounding land development. However, inclusion in the Master Plan should not be regarded as a commitment to construct any particular facility, each of which needs to be justified by a technical and economic assessment. Also, it is important that the agreement of the users (the airlines), who will ultimately pay for the facilities, be gained before any major development proceeds. Subject to these general points, the following specific conclusions and recommendation are made for Nadi:

Recommendation A45:

The scope of the improvements associated with FIR services have been reviewed by the Consultants and are generally supported. These are estimated to cost around \$7 million over the next four years

Recommendation A46:

The Consultants doubt that the extension of the 03/21 runway will be justified during the 20 year planning period, although provision should remain in the Master Plan.

Recommendation A47:

The proposed extension of the 09/27 runway, is also questioned, as it appears to be a high cost for what the Consultants consider to be a very small safety improvement. It is recommended that acceptance of this extension be subject to a favourable benefit/cost assessment and acknowledgement of the need by the airline users.

Recommendation A48:

The Consultants support the proposed hydrographic and environmental review of the proposed 09/27 extension, to be carried out as soon as funds permit, as this will provide the necessary cost information to assess its economic viability.

Recommendation A49:

Construction of the taxiway parallel to runway 09/27, likely timing 1996 is supported.

Recommendation A50:

The proposed freight complex and associated office space are not required for operational or safety reasons and the Consultants believe that they should privately funded.

Recommendation A51:

The proposed extension to the domestic apron is supported by the Consultants to allow more efficient use of the existing apron area.

Recommendation A52:

The need for a fourth aerobridge is dependant upon traffic growth and, on the Consultants' forecasts, cannot be justified in the short term. The decision to install a fourth aerobridge should take account of the marginal utilisation that it will receive in comparison to its cost.

Recommendation A53:

Relocation of the operations building to free space for future terminal and domestic apron expansion is supported.

Recommendation A54:

The planned maintenance overlay of both runways in 1996 is a work of prime importance to preserve an important investment.

Recommendation A55:

CAAF should continue with its programme of land acquisition on the airport perimeter for airport purposes.

Recommendation A56:

The siting of the proposed Namaka commercial complex on airport land adjacent to the Nadi-Lautoka highway is considered to be inappropriate in terms of land use and potentially adverse road traffic effects.

S3.6.2 NAUSORI AIRPORT

The major issue governing development at Nausori is whether B737 services continue to use the airport. If the airport were to be downgraded to domestic operations only, the investment requirements will be relatively minor, but if Pacific regional operations continue or expand, then significant works are required to bring the airport up to acceptable standard. If only serving domestic traffic, this would concentrate the travel demand on the domestic services and would make these operations more viable. However, it is acknowledged that the Government may wish to retain regional operations for national political reasons.

Recommendation ABBE:

The Government make a political decision on the future status of Nausori before development plans are prepared.

Recommendation A58:

If regional operations are retained, the following works are likely to be required: a new international terminal building; apron extension; flood protection works; approach lighting; associated land acquisition; total cost a minimum of \$8.5 million over 5 years

Recommendation A59:

If only domestic operations are catered for, then necessary works are limited to minor upgrading of the terminal, airside facilities and car parking area.

Recommendation A60:

In either case, an overlay to the runway and taxiway areas to remedy existing defects will be required

S3.6.3 LABASA AIRPORT

There are operational constraints at Labasa arising from the terrain and limited opportunity for runway extension. Lighting to allow night-time take-offs would benefit air users but the safety issues require further study. Similarly a short runway extension could be useful depending on the type of aircraft likely to use Labasa in future.

Recommendation A61:

Runway lighting and extension be further considered by CAAF; an overlay of the runway be implemented.

S3.6.4 OTHER AIRPORTS

Terminal location and aircraft parking within the strip are problems at Savusavu, and CAAF is taking advice from an ICAO sponsored study in regard to remedial measures.

Matei has problems in regard to terminal position in relation to the runway and apron space; there are also serious deficiencies in the width of the strip. As a development study at Matei is in progress, it would be inappropriate to make a firm recommendation at this stage. However, it is the view of the Consultants that present traffic does not justify the expenditure involved in moving the terminal although correction of the strip width problem may lead to both works being undertaken together.

No significant upgrading works are required at other Government airports.

S4 MONITORING AND UPDATING

S4.1 TRANSPORT PLANNING UNIT

The project was unable to achieve its objective of establishing a functioning Transport Planning Unit as the Government, primarily through the lack of appropriate counterpart staff, although the reorganisation of Government ministries during the course of the project did not assist the process. Computer equipment, software and data files have been left in the care of PWD pending the time when the Unit can be set up.

The Consultants agree that the need for the TPU still exists. In practice, it will require a further technical assistance project to achieve this, but such a project should not be commenced until the Government has recruited suitable staff and has set up the institutional structure within which the TPU can effectively operate. This would ideally be within a policy and planning division of a combined Transport and Public Works ministry.

Recommendations relating to the TPU are:

Recommendation T1:

The TPU be staffed by two professionally qualified staff, the senior member having qualifications in civil engineering and transport planning, and the junior member in economics and policy analysis.

Recommendation T2:

The TPU have a policy monitoring and statistical function but also be given approval and audit responsibilities over the investment plans of Government in the transport sector

S4.2 TRANSPORT DATABASE

The project has brought together a large amount of physical, operational and financial data descriptive of the transport system. However, there is a task still to be undertaken in putting this data together into an ordered and integrated form from the computer files, paper records and mapping. This will form one of the initial tasks of the future TPU.

The following recommendations are made in respect of the transport database:

Recommendation T3:

The TPU should, as a high priority, secure and organise the data collected under the NTSP

Recommendation T4:

The TPU should establish a close working relationship and arrangements for data exchange with the Bureau for Statistics. The TPU should actively promote the need for important data collection with the Bureau.

Recommendation T5:

An annual statistical digest should be published by the TPU so that information on the transport system is available to the general public and those concerned with transport analysis.

Recommendation T6:

A programme for annual and periodic (probably five yearly) updating should be established.

S5 RECOMMENDED FUTURE ACTIONS

This section makes recommendations for actions to be taken in the near future, stemming from the project findings and the implementation of the National Transport Sector Plan.

S5.1 TRANSPORT SECTOR PLAN IMPLEMENTATION

The NTSP will require implementation in terms of both the policy recommendations and the investment plan. The initiative for implementing the plan should be taken by the responsible Ministry, preferably by a Policy and Planning Division within that Ministry. With the continual reorganisation of Government Departments in Fiji, it is not clear what the ministerial structure will be in 1994 when the next Government takes office.

At the time of writing there is a new combined Ministry of Infrastructure, Public Works, and Transport but the Civil Aviation subsector has been split off and combined with Tourism.

In the present structure, the Transport Planning Unit would naturally reside within a new Policy and Planning Division headed by a Deputy Secretary. Responsibilities for Aviation and airports planning will require liaison between the Ministries and there will need to be recognition that the TPU has responsibilities in the airports and air transport subsector if it is to be effective in integrating air transport planning with other modes. It is quite common for Governments to separate Civil Aviation responsibilities from other transport sector administration and often leads to air transport planning being carried out in isolation.

In the absence of an overall transport policy arm within Government, the NTSP will in all likelihood be left to the individual agencies to implement within their own areas: that is PWD for roads; PAF for main ports; CAAF for Nadi Airport; CAD for air transport policy; the Marine Department for the Government shipping fleet, shipyard, navigational aids and the regulatory functions; with the Ministry of Finance and Economic Planning exerting some overall influence on the policies and investments that are pursued. This is certainly a second-best outcome to the preferred option of a single

agency driving transport regulatory and investment policy.

In terms of the report, the Consultants suggest that the Government's first move, once the final report is accepted, should be for the Government to formally accept, reject or amend each of the recommendations in this Executive Summary, so that the policy commitments are clarified. At present it is not clear whether Government has the intent to follow the general framework of the deregulatory and private-sector oriented transport policies which it has agreed to in the *"Opportunities for Growth"* paper published early in 1993.

Following this stage, there are crucial organisational changes to be made. The most pressing of these is the establishment of the LTA and in the aviation sector, transfer of airport responsibilities to the CAAF.

S5.2 PROJECTS FOR POSSIBLE INTERNATIONAL FUNDING

The following projects are suggested for funding by way of technical assistance and consultancy, either from internal sources or through bilateral or international funding:

Roads Sector

- Institutional Restructuring and Training within the Public Works Department - this would be a technical assistance project aimed at implementing Recommendations L24 to L32. Some overlap with the present Maintenance Strengthening Unit assistance may occur depending on how far the current project goes in institutional reform of work recording and cost accounting. Specialist management consulting expertise teamed with engineering management experience is required.
- Assistance to the Domestic Contracting Industry - a complementary technical assistance programme to train the domestic contracting industry to fit them for taking on road construction and maintenance contracts, implementing recommendations L22 and L23
- Engineering and economic feasibility and environmental impact studies for roads nominated as "FRUP III" - suggested as a consultancy project similar to FRUP I and II.

- Redrafting of the Traffic Act - short term individual TA consultancies are suggested for (i) legal drafting assistance, requiring general knowledge of traffic legislation; (ii) vehicle emissions control - a review of technical options for testing and enforcement; (iii) review of vehicle constructional regulations, weights and dimensions.
- Establishment of Land Road Transport Authority - it is suggested that the Ministry would benefit from the assistance of a Management Consultant to assist it in developing the staffing structure, financial management and general method of operation of the LTA.
- Transport Planning Unit Establishment - a one year TA is suggested for a specialist in transport planning with expertise in computer database systems; transport policy and economics. Government would be required to employ appropriate permanent counterpart staff and show commitment to the TPU before this TA is allowed to proceed.

The PWD has suggested other studies which could be candidates for technical assistance or be funded internally:

- the Second Rewa Bridge/Nausori Town bypass feasibility;
- development of a Management Information System for PWD (logically this would follow or be part of the corporatisation TA);
- Nausori-Suva regional road feasibility study; and
- Outer Island Roads feasibility studies.

Ports and Shipping Sector

The details of the inter-island shipping franchising scheme will require some further development. It may assist in the implementation of this scheme for a shipping specialist to work alongside the Marine Department and other government officials to help in the drawing up of bid documents, decide on how routes should be packaged for tender, and develop the mechanisms for involving the islanders in deciding the level of service required and contributing to the costs of the services.

This would be a short term TA with return visits to monitor the progress of tender submission, evaluation and the first year of service delivery.

The second project in the maritime sector is a comprehensive land use and transport operational study for the development of Suva Port and the adjoining city area, including the bus station, taxi stands, market and local street network traffic management.

Air Transport Sector

A number of planning and development studies have been carried out in recent years, so there is relatively little need for further such work in the sector. The exception is the Master Plan for Nausori Airport, which CAAF has already indicated that it intends to develop.

In conjunction with the Master Plan there will be a need for engineering investigation to identify the exact requirements for improvement and overlay of the aircraft pavement and a functional planning/architectural design study for the terminal building.

S5.3 TRANSPORT PLANNING UNIT DEVELOPMENT

The Transport Planning Unit, which originally formed an important output of the NTSP, is still a priority for implementation. Unless this is done within a relatively short space of time, the benefits of the information gathered by the NTSP and the equipment provided through the project are likely to be devalued and eventually lost.

However, before the TPU can be established, it is vital that Government decide on where this unit will be located physically and also its place within the Government departmental structure. As already noted, the Consultants hold the view that the TPU should have responsibilities which give it authority in the process of planning and approving sector investment plans and changes in transport policy. If it is viewed purely as a statistical and research agency, it will not attract the desired calibre of professional staff and may not have a very secure future.

In the interim, it is proposed that the TPU be located as a unit responsible directly to the Permanent Secretary for Transport, rather than being located within any of the modal agencies.

The Consultants recommend that a further TA project be set up to establish the TPU and proposed Terms of Reference for such a TA are included as an Appendix to the Main Report.

It is emphasised that before technical assistance personnel begin their work, the Fiji Government should have established a position for the Unit in the administrative structure and also recruited suitable staff.