GOVERNMENT OF THE REPUBLIC OF NAMIBIA

MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION

DEPARTMENT OF TRANSPORT

NATIONAL TRANSPORTATION MASTER PLAN STUDY

VOLUME 8

ROAD USER CHARGES

FINAL REPORT 28 MAY 1997

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Nordic Consulting Group
and SweRoad

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List of Abbreviations

ACCPAC	**Standard software package for RUC accounting**
CEO	**Chief Executive Officer**
COMESA	**Common Market for Eastern and Southern African States**
CUPS	**Customs Union Permit System**
DOT	**Department of Transport**
ESA	**Equivalent Standard Axles**
GRN	**Government of the Republic of Namibia**
GVM	**Gross Vehicle Mass**
ICTE	**Interministerial Committee of Technical Experts**
LDV	**Light Delivery Vehicle**
LGV	**Light Goods Vehicle**
MVA	**Motor Vehicle Accident Fund**
MWTC	**Ministry of Works, Transport and Communication**
NamFund	**Namibia Road Fund**
Nampol	**Namibian Police**
NaTIS	**National Traffic Information System**
NTMPS	**National Transportation Master Plan Study**
PASCB	**Permit Administration System - Cross Border**
PCE	**Passenger Car Equivalent**
RSS	**Road Safety Secretariat**
RTRN	**Regional Trunk Road Network**
RUC	**Road User Charges**

RSA	**Republic of South Africa**
SACU	**Southern African Customs Union**
SACU/MOU	**Memorandum of Understanding on Road Transportation in the SACU area**
SADC	**Southern African Development Community**
SATCC	**Southern Africa Transport and Communications Commission**
SATCC/TU	**Technical Unit of SATCC**
Sida	**Swedish International Development Co-operation Agency**
SUT	**Single Unit Truck**
SWECO	**Swedish Consultant for the NTMPS**
SweRoad	**Swedish National Road Consulting AB**
ToR	**Terms of Reference**
URMM	**Urban Roads Maintenance Model**
VKE	**VKE (Namibia) Inc.**
VKT	**Vehicle Kilometres of Travel**

Final Report on Road User Charges

Executive Summary

SWECO in association with VKE (Namibia) have been commissioned to undertake a National Transportation Master Plan Study for Namibia which, among other things, is to include the design of a comprehensive road user charging system.

A previous Interim Report set out the findings of the Consultants on the current situation and a review and recommendation on the proposed short term RUC system.

This Final Report concentrates on the detailed design of a three tier RUC system involving vehicle licence fees, fuel levies and weight-distance charges. Cross-border charges, abnormal vehicle charges and overload fees are also covered.

A brief summary is provided of the current situation, government policy and international agreements relating to road user charges in Namibia. It is clear that the Namibian Government is committed to implementing a comprehensive system of road user charges including cross-border charges with appropriate institutional and legislative structures. Legislation and international agreements are in place or are being prepared to allow for the implementation of cross-border charges.

A number of ongoing projects and studies are identified as having a potential impact on implementation of the RUC system.

Section 5 contains a discussion on components of a comprehensive RUC system for Namibia. Recommendations are made on transparency and accountability issues relating to the long term RUC system. It is suggested that attention should be given at an early stage to clarifying relationships with the various Government ministries currently involved with parts of the RUC system. Legislation for the long term RUC system should be used to clarify the accountabilities for the charging instruments, the Road Fund and decisions on road expenditure and how these accountabilities relate to the roles of the various Government ministries.

Section 6 documents the vehicle data used in this RUC Study. The data is essentially an extrapolation of data used in previous RUC studies for Namibia. Extrapolation is used to give estimates of vehicle numbers and use for the financial years 1998/99 to 2000/01.

Updated estimates have been prepared of the costs to be recovered by the long term RUC system and these are documented in section 7. Two cost recovery budgets are presented for each of the financial years 1998/99 to 2000/01 - a “smoothed” budget which is the recommended budget and a “scaled” budget which has a reduced level of expenditure.

The recommended total RUC recovery is N$384 million in 1998/99, N$415 million in 1999/2000 and N$448 million in 2000/01. The "scaled" recovery level is approximately 86% of these figures.

Both budget scenarios average the costs to be recovered by the RUC system over the three financial years except for inflation. In most cases this gives over-recovery in the first two years which is balanced in the third year. The over-recovery, which occurs mainly because loan financing is being used in the first two years, can be looked on as making a contribution towards later loan repayment commitments. It is recommended that the RUC rates be adjusted yearly to allow for the actual rate of inflation in road costs.

A new set of road user charges have been calculated for each of the financial years referred to above and for each budget scenario and are documented in section 8. The calculation method is essentially the same as that used in previous RUC studies for Namibia.

It is recommended that the calculated vehicle licence fees be reduced by 50% and those for light vehicles be adjusted to account for under or over recovery by the recommended fuel levies. The vehicle licence fees recommended for 1998/99, based on the "smoothed" budget scenario, are:

	Annual Licence Fee, N$	**% Increase (Decrease) on Current Fee**
Petrol Powered Vehicles:		
Motorcycle	192	433
Car	306	183
LDV	349	142
Mini Bus	303	110
LGV	0	(-)
Bus	793	(83)
2 Axle SUT	1 465	(62)
3 Axle SUT	2 897	(38)
2 Axle Truck Tractor	7 563	98
3 Axle Truck Tractor	7 808	66
Diesel Powered Vehicles:		
Car	792	633
LDV	835	480
Mini Bus	887	516
LGV	244	(46)
Bus	793	(83)
2 Axle SUT	1 465	(62)
3 Axle SUT	2 897	(38)
2 Axle Truck Tractor	7 563	98
3 Axle Truck Tractor	7 808	66
Other	0	(-)
Unpowered Vehicles:		
1 Axle Trailer or Semi-Trailer	245	(93)
2 Axle Trailer or Semi-Trailer	490	(93)
3 Axle Trailer or Semi-Trailer	735	(89)
Caravan	31	(35)
Light Trailer	0	(-)

The above fees use vehicle type and number of axles as the fee determinant instead of tare weight which is used currently.

The recommended fuel levies, based on the "smoothed" budget scenario are:

	1998/99	1999/2000	2000/01
Petrol Levy, cents/litre	60.0	63.0	66.0
Diesel Levy, cents/litre	35.0	37.0	39.0

The above petrol levies require an increase in the price of petrol ranging from 2.6 cents/litre to 8.6 cents/litre if other components remain constant. On the other hand the price of diesel could be reduced by between 10.9 cents/litre and 14.9 cents/litre. For diesel-powered vehicles the reduction in the fuel price will be more than offset by the introduction of weight-distance charges for heavy vehicles and the recommended increase in vehicle licence fees for light vehicles.

The estimated RUC revenue in N$ million at the recommended level of fees and charges is:

	1998/99	1999/2000	2000/01
Vehicle Licence Fees	55	60	65
Petrol Levy	174	188	203
Diesel Levy	67	74	81
Weight-Distance Charges	88	93	99
Total Budget	384	415	448

An issue that needs to be addressed is control of the refund of the RUC diesel levy which will involve some N$55 million to N$70 million per year.

The detailed design of a weight-distance charging system is presented in section 9. The system will apply only to heavy load vehicles (5 228 single unit trucks or truck tractors plus approximately 2 270 trailers or semi-trailers in 1998/99). It is recommended that trailers and semi-trailers be treated separately from truck tractors and that the weight-distance charges be based on the legal maximum gross vehicle mass for the vehicle.

Recommended weight-distance charges (N$ / 100 kilometres), for the "smoothed budget scenario, are:

	1998/99	1999/2000	2000/01
Petrol Powered Vehicles:			
2 Axle SUT	6.49	6.46	6.50
3 Axle SUT	5.29	5.11	5.03
2 Axle Truck Tractor	14.13	14.38	14.74
3 Axle Truck Tractor	9.50	9.47	9.56
Diesel Powered Vehicles:			
2 Axle SUT	14.92	15.22	15.60
3 Axle SUT	16.91	17.20	17.59
2 Axle Truck Tractor	22.56	23.14	23.83
3 Axle Truck Tractor	21.12	21.56	22.12
Unpowered Vehicles:			
1 Axle Trailer (single tyres)	10.62	10.95	11.31
1 Axle Trailer (dual tyres)	3.36	3.42	3.49
2 Axle Trailer (single tyres)	20.18	20.81	21.52

	1998/99	1999/2000	2000/01
2 Axle Trailer (dual tyres)	9.49	9.73	10.02
3 Axle Trailer (single tyres)	22.38	23.06	23.83
3 Axle Trailer (dual tyres)	11.69	11.98	12.32

The recommended system of weight-distance charges includes the use of hubodometers to measure distance travelled. This recommendation is made with the proviso that demonstrable on-road enforcement must be applied to ensure compliance with the hubodometer requirements which are extensive. Detailed recommendations are given on the control, installation and enforcement of hubodometers.

To minimise bad debts and to facilitate enforcement it is recommended that a system of weight-distance licences be used. These weight-distance licences would be "sold" by registration and licensing agents as well as being available 7 days a week from a central office by telephone or facsimile with appropriate credit arrangements. A separate administration fee per licence is recommended to cover the cost of issuing the licence.

After careful consideration it is recommended that allowance be made for distance travelled off public roads. A refund system is proposed for this with claims made against licences purchased.

Cross-border charges compatible with the domestic weight-distance charges are presented in section 10. The charges would only apply to foreign registered heavy load vehicles and are significantly lower than the maximums set under the international agreements for the Southern African region. It is recommended that distance be assessed from the consignment note required to be carried by the international agreements. This requires close attention to the accuracy of consignment notes and adequate on-road enforcement to ensure that travel within Namibia is correctly represented.

Charges for vehicles operating under abnormal vehicle permits and fees for overloaded vehicles are given in section 11. These fees have been calculated as an extension of the weight-distance system.

Introduction of the weight-distance charging system is not recommended unless nation-wide computer support is available. This can be provide by modification to the NaTIS system for vehicle registration and licensing currently being implemented in Namibia. As mentioned above, the weight-distance charging system should also not be implemented without adequately trained and motivated enforcement resources.

Implementation of the long term RUC system is dependent on:

- Establishment of a national network of vehicle registration and licensing agents.
- Implementation of the vehicle subsystem of NaTIS nation-wide complete with modifications to support weight-distance charges.
- Establishment of border post facilities with adequate resources to handle cross-border charges.

- Enactment of the draft Road Traffic and Transport Bill.

- Implementation of legislation for weight-distance charges (Recommended provisions are included in Appendix M).

Weight-distance charges could be implemented in advance of the establishment of a Road Fund and its administration, however these are desirable components in the acceptability of a RUC system.

A detailed implementation plan for the short term system is given in Appendix N. It is recommended that the long term RUC system not be implemented until all components are in place. This means that the earliest implementation date for the system is early 1999.

1. Introduction

1.1 Original Terms of Reference

The Government of the Republic of Namibia has embarked upon an ambitious programme of reform in the transport sector. In order to provide a framework for this broad-based set of activities, the Ministry of Works, Transport and Communication (MWTC) has commissioned the Swedish Consulting firm SWECO to undertake a National Transportation Master Plan Study (NTMPS). This master planning work consists of:

- The preparation of a traditional Master Plan for transport in Namibia.
- A number of other tasks relating the co-ordination, implementation and monitoring of the reform work, most of which are closely related to the long term planning effort.

A part of the work of the Consultant covers the field of road financing in general and the introduction of a system of Road User Charges (RUC) in particular. This RUC Study requires the Consultant to cover the following main activities:

- Based on reviews already carried out regarding current road taxation arrangements, identify the relevant issues related to the introduction of road user charges and of other taxes on road users.
- Prepare the design for implementation of a road user charging system, which as a first step will be based on vehicle licences and fuel levies. The long-term aim is to introduce a weight-distance charging system for heavy vehicles, cross-border charges and other charging instruments as appropriate.
- Detail arrangements for the collection and monitoring of road user charges, both in the short and long terms. The work in this field will not only cover concrete proposals for implementation but also the training of staff and the provision of advice during implementation.

The actual implementation of the RUC system in the long term does not form part of the responsibilities of the Consultant.

1.2 Modification to ToR

The background work done on road user charging for Namibia is extensive. In the period between the drafting of the Terms of Reference for the NTMPS and commencement by SWECO, further progress had been made, particularly on the short-term aspects of the new RUC system. Furthermore, recent developments in regard to the implementation of the short term RUC system have also influenced the activities of this RUC Study.

1.2.1 Impact of Preparatory Work

Recent work on licence fees and fuel levies and agreements with the Ministry of Finance on an interim accounting system mean that the basic design of the short term RUC system is, for all intents and purposes, already complete. Given the advanced nature of the proposals for the short term RUC system it was agreed with the MWTC that the Consultant's work in this field be limited to reviewing the existing proposals including the arrangements for collection and monitoring to ensure integrity and effectiveness of the system. This has been completed and reported in the Interim Report on Road User Charges of 13 December 1996.

1.2.2 Implementation Activities

The Terms of Reference envisage that the RUC Study would provide assistance with implementation of a monitoring system for the short term RUC system and to train the relevant staff in the operation of this monitoring system. Recommendations on the short term RUC system, including accountabilities, reporting and monitoring, were made in the Interim Report on Road User Charges.

The delay in assigning staff and establishing the short term RUC system has meant that this RUC Study has been completed before the short term system becomes operational. It was agreed that the introduction of the monitoring system and the training of the staff in the operation of this system would become the responsibility of those implementing the interim accounting system and other components of the short term RUC system. The time saved has been used by the Consultant on the long-term aspects of the road user charging system particularly to:

- Develop a system of cross-border charges compatible with the long term domestic RUC system.

- Discuss and check the road user charging proposals with affected parties.

1.3 Focus of the Study

The focus of this RUC study is on the charging instruments and the measures needed from both a technical and administrative point of view to make the RUC system work. In addition, related issues have been taken account of and are commented on as necessary to facilitate the development of a practical and effective RUC system.

2. Objectives and Structure of the Report

2.1 Objectives

The objectives of this Final Report are:

- To summarise the findings of the Consultants on the current situation and relevant issues related to the introduction of road user charges in Namibia.

- To present the design of a long term RUC system for Namibia consisting of:

  - An updated assessment of road use and costs to be recovered.
  - Proposed charges.
  - Collection systems.
  - Institutional and legal aspects.
  - An implementation plan.

The report concentrates on the practical aspects of the RUC system, its implementation and management rather than the theoretical basis for the system which has been extensively reviewed by others.

The role, funding and operationalisation of the various institutional arrangements and reforms proposed in association with the RUC system fall outside this Study. However comments have been provided on these aspects where this is relevant to the successful planning, implementation and long-term sustainability of the RUC system.

2.2 Structure of the Report

The material collected and analysed in this report is presented under the following headings:

Section 3 provides a brief description of the current situation in the RUC field in Namibia, including Government policy, international agreements and an overview of ongoing and already completed work.

Section 4 summarises the status of the short term RUC system.

Section 5 describes the components of the long term RUC system.

Section 6 presents the data on vehicle classes, numbers, characteristics and usage that has been used in determining the long term road user charges.

Section 7 documents the costs to be recovered by the long term RUC system.

Section 8 describes the calculation method and cost allocations employed to determine the future road user charges. The Section also describes the occurrence and level of cross-subsidies under the proposed system.

Section 9 is devoted to weight-distance charges, how to apply these charges to different vehicle classes, how weight and distance should be assessed, the instrument (licence) for collecting weight-distance charges, and the associated administrative cost.

Section 10 presents proposed cross-border charges.

Section 11 deals with abnormal vehicle charges and overload fees.

Section 12 outlines collection and control systems required to support the new road user charges instruments.

Section 13 discusses implementation issues.

Appendices contain background material and the detailed analysis.

Throughout this report assumptions and recommendations are marked in italics.

3. Current Situation

3.1 Status Quo

The status quo of activities related to RUC in Namibia is briefly outlined below. Some of this is documented in more detail by Fischer & Associates in their report of June 1996.

- Vehicle registration and licensing in Namibia is currently performed by three different Ministries. In Windhoek, Walvis Bay and Oshakati this function is carried out by the Receiver of Revenue, Ministry of Finance. In other districts this is done by the magistrate's offices of the Ministry of Justice, except in the three remote districts of Okakarara, Opuwo and Otjinene where the Ministry of Regional and Local Government and Housing undertakes the work.

- Driver and learner testing is currently the responsibility of the Ministry of Home Affairs and is performed by Nampol's Traffic Unit. The issuing of driver licences however, takes place at vehicle registration authorities upon submission of a Certificate of Competence issued by the Traffic Unit.

- Traffic law enforcement is the responsibility of the Nampol Traffic Unit, although this task is also performed by local authorities' traffic divisions in the four major towns.

- Road carrier permits including those for cross-border operations are issued by DOT of the MWTC. The DOT has recently established a road transport inspectorate which, among other things, has been given the responsibility to enforce the conditions of these permits.

- Vehicle roadworthiness testing is currently conducted by the Traffic Unit of Nampol. The certificate for fitness is issued by the vehicle registration authority, based on an application form signed and stamped by the Traffic Unit.

- The Ministry of Mines and Energy is responsible for regulating fuel prices in terms of the Petroleum Products and Energy Act 1990 and the Integrated Fuel Taxation Policy for Namibia of 1996, for setting fuel refund policy and for collecting fuel taxes, duties and levies.

- The Customs and Excise Department of the Ministry of Finance is responsible for refunding the levy on diesel used off-road.

3.2 Government Policy

3.2.1 July 1995 Decision

In July 1995, the Cabinet took the decision to introduce a system of road user charging in Namibia and approved some aspects of the system. The decision of the Cabinet was in effect a decision *in-principle*, as the detailed structure and mode of operation of the new system remained to be worked out.

The existing policy of the Government, based on the July 1995 Cabinet decision, is:

a) Basic Principles

The basic principles of the RUC policy are:

- Road users as a group are to pay the full cost of providing and maintaining roads and streets which can be economically justified from a traffic point of view (user pays principle).

- One class or category of road user should not subsidise another (equity principle).

- Charges should promote efficient utilisation of resources (efficiency principle).

b) Charging Instruments

The following charging instruments are to be implemented as a part of the road user charging system:

- Fuel levies on diesel and petrol used on-road, for the recovery of traffic-related (marginal) costs.

- Annual vehicle licence fees, for the recovery of non-traffic-related (fixed) costs.

- Weight-distance charges on certain categories of heavy domestically registered vehicles, to recover the marginal costs not recovered through fuel levies.

- Abnormal vehicle charges, to recover the road damage and other costs caused by these vehicles.

- Transit charges (of the weight-distance type) for foreign registered vehicles, to recover the (marginal) road costs attributable to such vehicles.

- Entry fees for foreign registered vehicles (optional), to recover their pro-rata share of fixed costs.

c) Institutional Arrangements

The following new institutional arrangements are to be established:

- A dedicated road fund into which road user charges will be paid.

- A board to administer the road user charging system (approved in principle).

3.2.2 Decision on Interim RUC System

In December 1996 the Cabinet, *inter alia*:

- Noted that a system of weight-distance charges for very heavy vehicle categories will not be implemented in Namibia, pending further investigation of practical and administrative aspects.

- Noted that the RUC system has in the interim been implemented through an accounting system run in parallel with the normal budget, and that this system will become a stand alone operating account for the 1997/98 financial year.

- Approved road user levies on fuel at 57.4 cents per litre for petrol and 49.9 cents per litre for diesel and a fuel revenue tax of 2.5 cents per litre for both petrol and diesel, without change in the pump price. These fuel levies, together with vehicle licence fees, have been calculated to provide sufficient revenue to cover road expenditures intended to be financed by the proposed Road Fund.

- Approved a policy framework for revenue taxes on fuel of between 5% and 8% of the basic price of fuel to bring them into line with revenue taxes on other commodities. This would be 10.1 cents per litre on petrol and 10.3 cents per litre on diesel at current prices which would generate N$ 62.2 million annually. It was agreed that this should be phased in over a number of years. The initial revenue tax is 2.0 % of the basic price on both petrol and diesel.

- Agreed that fuel prices be published in such a way as to show the various levies - third party insurance (MVA) levy, road safety secretariat (RSS) levy, Equalisation Fund levy, road user charges levy - as well as the taxes and basic fuel price.

- Agreed that fuel prices be reviewed on a quarterly basis to reflect variations in the international oil price and the necessary notices be published in the Gazette by the Minister of Mines and Energy in terms of the Petroleum Products and Energy Act 1990. The pump price of fuel will be set after taking account of the fuel prices in neighbouring countries so as to avoid large disparities.

The Government has also approved a 50 % increase in annual vehicle licence fees with effect from 1 January 1996 and a further 10 % increase on 1 January 1997. Details of the vehicle licence fees applying from 1 January 1997 are presented in Appendix C.

3.2.3 Institutional Structures and Functions

The institutional structures associated with the road user charging system in Namibia are being developed within the context of the ongoing major reform work of the Ministry of Works, Transport and Communication (project MWTC 2000).

The following institutional reforms in the road sector of importance to the proposed road user charging system are under preparation:

a) The role of the **MWTC** to be limited to that of a policy and regulatory body.

b) A **road fund administration (NamFund)** will have the regulating function to ensure that the basic objectives of the maintenance and development of the road network are achieved. To that end NamFund will administer a dedicated road fund, manage the new road user charging system and provide the funding for the provision, maintenance and administration of the public road system.

c) A **national road authority** as a separate agency of the state for the planning and management of the trunk, main and district road networks. The operational activities in the fields of road construction and maintenance will be contracted out.

d) A **roads contractor** formed from those parts of the Directorate: Transport Infrastructure Maintenance and Construction which are directly involved in road maintenance and construction activities. This will be a state owned company established on a commercial basis to carry out contracting work in the road sector.

The development of these new institutional structures has not kept pace with the preparation of the new road user charging system. This means that during the early phases of the implementation of the RUC system, the existing Government departments will continue to be responsible for the activities associated with the RUC system.

Another Cabinet decision that has implications for the RUC system is the agreement that driver and vehicle roadworthiness testing, currently undertaken by the Nampol Traffic Unit, is to become the responsibility of the MWTC. This will leave Nampol to concentrate on traffic law enforcement.

3.3 International Agreements

On 24 August 1996 the GRN signed a Protocol on Transport, Communications and Meteorology in the Southern African Development Community (SADC) Region. This Protocol together with associated Annexes requires, *inter alia*:

- Development of an adequate roads network and a harmonised regional road infrastructure policy.
- Establishment of an autonomous national roads authority.
- Development and implementation of cohesive and definitive road funding policies, including that revenues obtained from foreign road users are devoted to the maintenance of the Regional Trunk Road Network (RTRN).
- Harmonised national road user charging systems.
- Harmonised cross-border road user charging systems.
- Regional support for research on regional road funding, strategies for procuring funding and a regional road maintenance fund.
- Development of standardised bilateral or multilateral agreements on road transport.

Namibia has also signed the COMESA Treaty and its predecessor the PTA Treaty. The COMESA Treaty has not yet been ratified by Namibia. This agreement is not operational in Namibia. Instead attention is being given to agreements under the SADC Protocol.

One multilateral agreement which has been in existence since 1990 is the Memorandum of Understanding on Road Transportation in the Common Customs Area Pursuant to the Customs Union Agreement Between the Governments of Botswana, Lesotho, South Africa and Swaziland (SACU MOU). Namibia acceded to the MOU in early 1995, but has not yet signed the document. A process of consultation and amendments of the original text is ongoing and it is expected that the MOU will be implemented in Namibia in early 1997.

The MOU specifies, *inter alia*, requirements for permits and other documents for the carriage of goods and passengers between member countries. It also deals with the fees for permits which should include the recovery of infrastructure costs. Similar bilateral cross-border transportation agreements have recently been drafted for use between Namibia and Zambia, Zimbabwe and Angola.

Further detail on the SADC Protocol and the above agreements is given in Appendix B.

3.4 Overview of RUC Work Already Done

The Government policy outlined above is based on extensive preparatory work on road user charging systems for Namibia carried out in the late 1980s and the early 1990s. The Consultant has made a detailed desk study of the reports, policy papers, draft legislation and other documents which constitute the work done to-date. The documents reviewed are listed in Appendix A of this report.

A summary of the findings, recommendations or requirements from selected documents is presented in Appendix B. Those aspects which have a direct or indirect impact on the new road user charging system are referred to below.

3.4.1 ICTE Report

The substantive report on road user charging in Namibia is that produced by the Interministerial Committee of Technical Experts (ICTE) in August 1994. This report provides a well argued case, both in theoretical and practical terms, for the establishment of a road user charging system in Namibia. The report outlines:

- The role and responsibility of the Government and the road users, contained in basic policy principles regarding cost recovery, cross-subsidies within the road sector, inter-modal relations, etc.

- Principles for cost recovery, basically determining which type of road costs are to be covered by the RUC system.

- The charging instruments to be employed under the new system.

- The principles of administering the new system, including the institutional structures which need to be established.

A summary of the significant recommendations of the report is given in Appendix B.

3.4.2 NAMRUC Model

A computer model has been developed by VWL Namibia Inc. for the MWTC to calculate road user charges for Namibia. The model uses the principles approved by the Cabinet and data available as of April 1994. The model was used to calculate fuel levies and licence fees, with and without weight-distance charges, using forecast 1993/94 data. A number of data deficiencies were identified at that time. Details of the computer model are provided in Appendix B.

3.4.3 Urban Road Maintenance Model (URMM)

Appendix B also contains details about a model (URMM) that has been developed for the appraisal of those urban road maintenance expenditures to be funded from the RUC system.

3.4.4 Weight-Distance Charges

An extensive report on the feasibility of introducing weight-distance charges for heavy vehicles was completed by VWL Namibia Inc. in April 1994. The detailed conclusions and recommendations of the report are presented in Appendix B. The report essentially concludes that:

- A weight-distance charge is justified, desirable and technically feasible but there is a lack of administrative and enforcement resources able to cope with a weight-distance charging system. However, potential agents are available.

- The fuel levy and licence fee be used as an interim measure. As a part of a more long term system a weight-distance charging system, based on the New Zealand model, should be designed and implemented.

- A comprehensive computerised accessible database of motor vehicle information with provision for administering a weight-distance tax be a prerequisite for a weight-distance charging system. The rationalisation of the motor vehicle registration and agency arrangements must take that fact into account.

- Enforcement and inspection resources and activities should be reviewed and refocused.

3.4.5 Cross-Border Charges

International agreements clearly intend that cross border charges will be introduced in member countries. The SADC Protocol and associated annexes, the SACU MOU, and the methodology accepted by the SATCC/TU and SACU specify the following for cross-border charges:

- Cross-border charges are to be non-discriminatory compared with charges for domestically registered vehicles.

- A unified method of calculation to be used, but which gives considerable scope to the specific conditions of the individual member countries.

- The type of costs to be recovered by the cross-border charges.

- Maximum charges for each country
- The payment procedures, type of vehicles covered by the charges, etc.

- Methods of collection and management of funds.

More detail on the SADC/SACU requirements is given in Appendix B.

The report on the feasibility of weight-distance charges recommends that a transit charging system, operated at border control points and based on a transit permit or licence for foreign vehicles and a range of payment methods, be introduced in the longer term. In this context it should be stressed that without a domestic weight-distance charging system in place, the introduction of a cross-border charging system will be very difficult if the principle of non-discrimination is to be upheld.

3.4.6 Legislation

An important part of the ongoing reform work in the road sector is the preparation and enactment of a number of new or revised laws and regulations:

- Namibia has recently enacted the Cross-Border Road Transportation Act, 1996 which makes provision for the regulation of road transportation between Namibia and other countries with which Namibia has concluded cross-border road transportation agreements. The Act authorises the Minister of Works, Transport and Communication to make regulations specifying the administration of cross-border permits. Draft regulations for the SACU MOU have been prepared.

- A draft Road Traffic and Transport Bill has been prepared. This Bill which is expected to be enacted by Parliament in 1997 has as its main aim the liberalisation of the existing economic regulatory controls on road transport. Under the draft Road Traffic and Transport Bill, both private and government bodies will be allowed to set up and run Driver's Licence Testing Centres and Vehicle Testing Stations. New regulations for vehicle registration and licensing are being drafted. It is the intention of MWTC that the current exemption from licensing fees applying to Government vehicles will not be continued under these new regulations.

- Legislation for the new institutional structures in the road sector (NamFund and the new national roads authority) is being drafted.

- While the basic principles for the RUC system are included as part of the above primary legislation, guidelines for the charges are being prepared separately in secondary legislation (regulations).

3.5 Ongoing Work

The following ongoing projects and studies have a potential impact on the implementation of the RUC System for Namibia and should be monitored:

- The wider NTMPS and particularly the implementation of NaTIS.
- Project MWTC 2000.
- The Review of the Role of Traffic Safety, Traffic Policing and Safety.
- The Interim Accounting System for RUC.
- New legislation for the Road Fund and its administration.
- Legislation for weight-distance and cross-border charges.
- The development of border post facilities and facilities for overload control.

4. Short Term System

In accordance with the Terms of Reference for the NTMPS, the road user charging system will be implemented in two phases:

a) A short-term system with charges limited to fuel levies and vehicle licence fees only and with accounting and administrative arrangements to simulate a road fund.

b) A long term system which will include weight-distance charges, cross-border charges and other charges as applicable, with a dedicated road fund and an independent administrative body.

Most of the decisions and components for the short term RUC system are in place. It was originally planned to have the short term RUC system operational as of 1 April 1997 but that date was not achieved for a number of reasons. The proposed short term RUC system has been reviewed by the Consultants. The review is covered in detail in the Interim Report on Road User Charges of December 1996.

The short term RUC system will, in all main respects, operate within the existing systems for the planning, financing and operation of road sector activities. The only major change has to do with the way the revenues and expenditures are handled.

The short term RUC system is intended to be a transitional arrangement between the existing means of financing road activities from general taxation and the proposed long term RUC system.

A brief outline of the specific short term measures is given below.

4.1 Costs to be Recovered

The rates of fuel levies and vehicle licence fees for the short term RUC system are expected to recover road related expenditures incurred by the various ministries at currently approved budget levels.

4.2 Accounting

A detailed proposal for an interim accounting system, based on commercial (accrual) accounting principles, was presented in September 1996. As a part of this work a standard accounting software package, called ACCPAC, has been set up with a chart of accounts and pro-forma financial statements.

The introduction and operation of this interim accounting system will be organised in two distinct phases:

4.2.1 Parallel Accounting

It was intended that this interim accounting system would be used by the Ministry of Finance in parallel with the standard Government system for the 1997/98 financial year. This parallel accounting will translate the Government cash accounting figures into the accrual accounting format and provide comparative figures for use in the 1998/99 financial year. The parallel accounting will also give an indication of the cash flow, taking into account both revenues and expenditures over the financial year.

4.2.2 Trading Account

The interim accounting system will be used to manage revenues and expenditures intended for the Road Fund as a separate Trading Account within the Ministry of Finance. Cabinet approval to the use of the Trading Account as an interim arrangement for the RUC system is being obtained.

Accounting procedures are being prepared for the Trading Account. Monitoring and control procedures are also being prepared for the approval of expenditures, changes in approved budgets, treatment of surplus/deficits, etc. These procedures are to be submitted to the Auditor General for approval.

4.3 Administration and Staffing

Three accounting staff, one from MWTC and two from the Ministry of Finance have been selected to set up and operate the interim accounting system. However, these three staff each have other full time work within their respective ministries. It is therefore intended that external resources will be retained to provide advice and assistance on setting up and operating the interim accounting system. Furthermore, these external resources will also provide internal auditing services.

4.4 Agents

For the short term RUC system the current arrangements with Government departments collecting the fuel levies, refunding off-road diesel use and collecting vehicle licence fees will continue until new legislation is passed. The cost of the agency services provided by other ministries is not recovered from the MWTC.

4.5 Implementation

The Interim Report on Road User Charges of December 1996 contains detailed recommendations on the steps to be taken and measures to be introduced in order for the short term RUC system to function as a bridge between the existing and the new systems for road financing in Namibia.

5. Components of the Long Term System

While the short term RUC system is calculated to provide sufficient revenue to cover current road expenditures, it is recognised as having deficiencies with regard to equitable treatment of different categories of road users and efficiency in resource allocation both within the road transport sector and between the different modes of transport. These issues are to be addressed in the design of the long term RUC system.

In addition, it is intended that the long term RUC system will operate within a legally constituted institutional structure of a dedicated road fund and an independent administrative organisation (NamFund). NamFund is seen as a regulator to ensure that the RUC system achieves defined objectives.

5.1 Systems Approach

The main objective for a comprehensive road user charging system for Namibia is to allow the road sector to be managed more efficiently. This requires a system which:

a) Adequately provides for economically justifiable road expenditure.

b) Controls unjustifiable expenditure.

c) Has efficient and equitable charges from a road user and road transport point of view.

d) Has a practical method of collection of charges from the point of view of road users and transport operators in Namibia with a low cost of compliance.

e) Is not easily circumvented or subject to fraud.

f) Is simple to enforce.

g) Is simple to administer.

h) Is transparent.

i) Has clear accountabilities.

A comprehensive road user charging system can be considered to have a number of basic components or functions as shown in Figure 5.1.

Figure 5.1 RUC System Functions

Primary Function	Secondary Function
Collection of charges/levies and issuing of licences	Establishment and management of contracts with agents and performance agreements with enforcement agencies. Auditing and monitoring.
Road Fund management	Determination of efficient level of funding and associated charges. Accounting. Investment of surpluses. Reporting.
Management of expenditure	Establishment and management of performance agreements and output budgets with road authorities. Auditing and monitoring.

Most of this RUC Study deals with systems for the revenue collection function. However the other functions are just as important for a successful system and are referred to as necessary.

5.2 Charging Instruments

Charging instruments for a comprehensive long term RUC system have been identified in the theoretical work that has been done for Namibia and are encapsulated in the Cabinet decision of July 1995. The instruments and their theoretical purposes are:

Fuel Levies

These levies, in cents per litre on diesel and petrol consumed on-road, produce annual charges that are in almost direct proportion to the distance travelled but with some recognition for the weight of the vehicle. This form of instrument is therefore most suitable for recovering that part of the cost of the road network that varies with traffic use (variable or marginal costs) and which is essentially common to all vehicles.

Vehicle Licence Fees

Vehicle licence fees are a fixed charge per annum irrespective of distance travelled. They can be set at different levels for different classes of

vehicles based on any identifiable vehicle characteristic that does not change, e.g. tare mass, manufacturer's GVM, axle configuration, etc. This instrument is suitable for recovering fixed road costs, i.e. those costs that do not change with traffic use.

Weight-Distance Charges

As the name implies these are charges that vary according to the weight carried and the distance travelled. These charges are used to recover variable or marginal road costs that relate to the weight of the vehicle over and above the costs that have been recovered by the fuel levies.

Cross-Border Charges

Cross-border charges are charges applied to foreign registered vehicles so that they pay for using the roads in the same manner as domestically registered vehicles, thus achieving non-discrimination between domestic and foreign operators. Cross-border charges should have two components:

- An entrance fee to recover a *pro rata* share of the fixed road costs equivalent to the licence fee paid by domestically registered vehicles.

- Transit charges based on distance travelled in the country and the weight carried, to recover the vehicle's share of variable road costs.

Abnormal Vehicle Charges

These charges apply to vehicles operating under abnormal vehicle permits. They are weight-distance charges which take into account the additional load being carried in terms of the permit.

Overloading Fines or Fees

These are charges applied to vehicles that are found to be in excess of the legal or permitted weight. They are essentially of the weight-distance type reflecting the additional road costs incurred by the overloading, but scaled up by a penalty factor.

5.3 Transparency and Accountability

It is an essential component of a RUC system that there is clear transparency and accountability for the charging instruments, the Road Fund and the decisions on road expenditures. This is recognised to some extent by the Cabinet decision to

have a dedicated Road Fund and the approval in principle for a board to administer the RUC system. There are, however, major changes to be made to current arrangements to achieve this.

The Cabinet decision regarding the establishment of a dedicated Road Fund, refers to the Fund as being under the control of the Ministry of Finance. *It is recommended that the Road Fund be completely separate from the Fiscus*. This emphasises that it is a system of charges for road use, not part of taxation, and allows the payers (road users) to be involved in the decision processes which is a tenant of any good user pays system.

It is recommended that the number of Ministries currently involved with the proposed RUC instruments and their responsibilities be rationalised. This will be achieved to some extent under the provisions of the draft Road Traffic and Transport Bill. The roles of the Ministry of Finance, National Planning Commission, the Ministry of Mines and Energy, the MWTC and the national road authority relative to the NamFund board requires further clarification.

In the case of fuel levies and vehicle licence fees, there is an issue to be addressed about the responsibilities of the Ministries that have the principal function and the role of NamFund.

Currently oil companies pay fuel tax and customs duty to the Ministry of Finance and pay MVA, Equalisation Fund, and RSS levies to the Ministry of Mines and Energy based on monthly bulk sales.

There are basically two options for the manner in which RUC fuel levies are paid into the Road Fund:

- The oil companies could pay the RUC levies directly into the Road Fund. This eliminates a third party and ensures that the Road Fund receives the revenue as soon as possible. The Road Fund administration would be solely responsible for ensuring correct payment under this option.

- The levies could be paid to the Ministry of Mines and Energy which would then pay the revenue into the Road Fund. This option has all levies paid through the Ministry of Mines and Energy which could ensure that the correct amounts were paid based on a single set of oil company returns.

On balance it is recommended that oil companies pay the RUC fuel levies directly into the Road Fund. This will encourage commercial cashflow management principles to be applied by the Road Fund administration.

If the gross amount of the RUC levy on diesel is paid into the proposed Road Fund, then the refund amount will in effect be expenditure from the Road Fund and should be controlled by the authority administering the Road Fund. *It is recommended that the Road Fund administration be given the statutory responsibility for the refunding of the RUC diesel levy and be permitted to*

contract refund processing to an appropriate agency such as the Customs and Excise Department.

A similar situation applies with respect to vehicle registration and licensing. However, this is carried out for more purposes than just collecting revenue for the Road Fund. *It is recommended that the MWTC have the legal responsibility for vehicle registration and licensing and for paying licence fees into the Road Fund.* In this scenario it would be the MWTC rather than NamFund that would be responsible for establishing and managing the network of registration and licensing agents. *It is recommended that NamFund be given a responsibility to ensure that the correct amount of revenue was collected and paid to the Road Fund.*

It is recommended that NamFund be given the total legal responsibility for weight-distance charges and cross-border charges. This is because the only purpose of these instruments is to charge for road use.

6. Vehicle Data

Detailed vehicle population and use data were collected for 1990/91 and 1992/93 by other consultants for use in calculating initial road user charges for Namibia. The 1992/93 vehicle data and the growth from the 1990/91 data is documented in the Report on the Implementation of the Proposed Policy on Road User Charging in Namibia: Parts A and B, prepared by VWL Namibia Inc. in April 1994. *Extrapolation of the 1990/91 and 1992/93 vehicle population and use data has been used as the basis for the calculation of road user charges in this present RUC Study with the addition of Walvis Bay data.* The 1992/93 data did not include Walvis Bay. The vehicle data used is shown in Appendix F and is described in the following subsections.

6.1 Vehicle Classes

In the previous calculations vehicles were grouped into 15 classes. These classes have been retained for the basic calculation of RUC rates in this RUC Study. The vehicle classes used relate more to how vehicles are viewed on the road than to how they are registered and licensed. Licensing categories and RUC vehicle classes are related as shown in Table 6.1.

Table 6.1 Relationship between Licence Category and Vehicle Class

Licence Vehicle Category	RUC Vehicle Class
Motorcycle/Motor tricycle/Motor quadrucycle	Motorcycle
Light passenger vehicle (< 12 persons)	Car Mini bus (Combi/Micro bus)
Light load vehicle (GVM <= 3 500 kg)	Light delivery vehicle (LDV) Light trailer
Heavy passenger vehicle (> =12 persons)	Bus
Heavy load vehicle (GVM > 3 500 kg)	Light goods vehicle (LGV) 2 axle single unit truck (SUT) 3 axle single unit truck 4, 5, 6, and 7 or > axle vehicle combinations
Special vehicle	Caravan Other

The light goods vehicle (LGV) class is somewhat misnamed in terms of the registration and licensing use of the word “light” to mean a vehicle with a manufacturers GVM <= 3 500 kg. LGV vehicles are characterised by two single-tyred axles and a tare mass usually not more than 5 000 kg, whereas a 2 axle single unit truck (SUT) has dual tyres on the rear axle and a greater tare mass.

Vehicle combinations with 4, 5, 6 and 7 or more axles are made up from the recorded number of heavy truck tractors, trailers and semi-trailers. Hence the combinations consist of a number of vehicles as defined for registration and licensing purposes. In particular, 6 axle combinations could consist of either two

or three separate vehicles. Combinations with 7 or more axles invariably consist of three vehicles (a truck tractor and two semi-trailers or trailers).

6.2 Vehicle Numbers

Previous RUC calculations documented the difficulties of obtaining accurate vehicle registration information in the absence of a nation-wide computer vehicle registration and licensing system. Because of these difficulties, *vehicle numbers for this RUC Study have been estimated by extrapolation of the previous data with the addition of Walvis Bay vehicles as registered in 1996/97*. Vehicle numbers include Government vehicles currently exempt from licence fees because it is intended that these vehicles pay fees under the long term RUC system.

The relative number of vehicles in each single-unit truck class and each class of combination vehicle was estimated in previous RUC calculations based on a study done in South Africa.

6.3 Vehicle Characteristics

Vehicle population data, as used in the previous calculations, includes the following characteristics for each of the vehicle classes:

- Fuel type (petrol or diesel).
- Fuel consumption rate (litres/km).
- Number of axles.
- Number of passenger car equivalents (PCEs).
- Equivalent standard axles (ESAs).
- Annual vehicle kilometres of travel (VKT) on urban and rural roads.

Gross vehicle mass (GVM) values have been inferred for each vehicle class for use in later calculations. *For light vehicle classes an average GVM has been inferred from observation of typical vehicles in these classes. For buses, single unit trucks and vehicle combinations the inferred GVM has been taken as the current legal maximum vehicle mass.* The inferred GVM values are shown in Table F2 of Appendix F.

As in previous RUC calculations, *all vehicles in each vehicle class are assumed to use the same type of fuel*. Fuel consumption rates for each vehicle class used in the previous calculations were determined in consultation with various parties including NAMROAD and from data obtained from the Road Freight Association in South Africa. It was considered that these rates were unlikely to change significantly with time. *Fuel consumption rates have been used unchanged in this present RUC Study*. For purposes of determining fuel consumption for different gross vehicle masses the fuel consumption rates previously used are shown plotted against the inferred GVM values in Figure 6.1. Combination vehicles have been separated into truck tractors and trailers. For this purpose truck tractors are assumed to have the same fuel consumption rate as single unit trucks with the difference in fuel consumption being attributed to the trailer or trailers.

Figure 6.1 Fuel Consumption Rates vs Gross Vehicle Mass

The following fuel consumption relationships are obtained:

Bus/Truck/Truck Tractor -

Fuel consumption rate (litres/km) = 0.081 + 0.016*GVM

Trailer/Semi-trailer -

Fuel consumption rate (litres/km) = 0.041 + 0.0061*GVM

where GVM is in tonnes (1000 kg).

PCE values for each vehicle class used in the previous calculations were obtained from a study done in South Africa. *These PCE values have been used unchanged in this present RUC Study.* Figure 6.2 shows these PCE values plotted against the inferred GVM values. This gives the relationship:

PCE = 0.61 + 1.46 Log GVM

This relationship is used for buses, single unit trucks and truck tractors. Trailers are assigned a PCE value of 0.5.

Figure 6.2 PCE vs Gross Vehicle Mass

The average values of ESA per vehicle used in previous RUC calculations were obtained by iteration from standard ESA values per vehicle and total ESA-kilometres on sealed rural roads supplied by the Namibian Department of Transport. An ESA value can be calculated for any vehicle given the axle configuration and the distribution of the gross mass to each axle. A close approximation is given by the formula:

$$ESA = (GVM/\text{Sum of Axle Reference Masses})^4 \times \text{Number of Axles} \times \text{Load Factor}$$

where:

- Reference Mass for an axle is the mass on that axle that produces 1.0 ESA. The sum of axle reference masses for various vehicle configurations are shown in Appendix K.

- Load Factor allows for the fact that the vehicle will not be loaded to the GVM level at all times. If the vehicle is assumed to travel half the distance at the GVM value and half at tare mass, then the Load Factor is approximately 0.55 for typical tare mass to GVM ratios.

Using the above relationship Load Factors have been calculated from the ESA and inferred GVM values for each diesel-powered vehicle class. These are shown in Table F2 of Appendix F.

6.4 Vehicle Kilometres of Travel

The method of calculation of VKT used in previous RUC calculations has been adopted in this RUC Study. Total VKT is calculated from total petrol and on-road diesel consumption using the standard fuel consumption rates and estimates of relative travel for each vehicle class. VKT on rural roads is estimated by

extrapolating traffic count data provided by the Department of Transport and using the previously estimated split of rural VKT between vehicle classes. Urban VKT is obtained by subtracting rural VKT from total VKT for each vehicle class.

Total VKT has been calculated for 1996/97 using total petrol and diesel consumption figures for the period 1 April 1996 to 31 March 1997, obtained from the Ministry of Mines and Energy, together with an estimate of diesel consumed off-road, as shown in Table 6.1. Off-road diesel consumption is addressed in more detail in section 8.5.

Table 6.1 1996/67 Fuel Consumption

Fuel Type	Consumption - million litres
Total Petrol	270.252
Total Diesel	342.606
Off-road Diesel	175.572
On-road Diesel	167.034

Because the fuel consumption figures for 1996/97 include the Walvis Bay area, the total VKT calculated for 1996/97 includes travel by Walvis Bay vehicles. An estimate of the VKT on rural roads in the Walvis Bay area for 1996/97 has been made from Department of Transport traffic count and rural road length information.

6.5 Extrapolation

Because of the forward-looking nature of RUC calculations, it is necessary to project the vehicle population and use data to give estimates for 1998/99 (the earliest start for the long term RUC system) and the following two years.

Experience in other countries indicates that traffic growth is linear rather than compound and therefore *linear traffic growth rates have been used for extrapolation in this RUC Study*. The use of linear growth gives a conservative estimate of the future vehicle population and use compared to compound growth. The conservative estimate is preferred for RUC calculation purposes because over-estimation of vehicle numbers and use would give a shortfall in revenue to the Road Fund.

The vehicle data used in calculating charges in this RUC Study is summarised in Table 6.3. Further detail, including comparative data for previous years, is given in Appendix F.

Table 6.3 Summary of Vehicle Data

	1998/99	1999/2000	2000/01
Total Number of Vehicles	187 297	194 451	201 605
VKT, million km Total	3 377	3 492	3 607

Rural	1 571	1 644	1 718
Urban	1 806	1 848	1 889
Petrol Consumption, million litres			
Total	289.2	298.7	308.2
Rural	131.1	137.2	143.3
Urban	158.1	161.5	164.9
Diesel Consumption, million litres			
Total	191.6	199.6	207.6
Rural	111.6	116.9	122.1
Urban	80.0	82.7	85.5
Axle-km, million			
Total	7 223	7 473	7 724
Rural	3 516	3 680	3 845
Urban	3 707	3 793	3 879
PCE-km, million			
Total	4 092	4 238	4 383
Rural	1 988	2 082	2 175
Urban	2 104	2 156	2 208
ESA-km, million			
Total	838	873	908
Rural	541	567	592
Urban	297	306	316

7. Costs to be Recovered

The following types of road costs are to be recovered by the comprehensive RUC system:

- Road administration.
- Maintenance of rural roads (trunk, main, district and farm roads).
- Maintenance of urban roads (subsidies to local authorities).
- Road construction.
- Traffic policing and road safety (including subsidies to local authority traffic departments).

In December 1995 Coopers and Lybrand produced an assessment of the 1996/97 expenditure in each of the above categories which totalled N$265.8 million. VWL Namibia Inc., in conjunction with the MWTC, documented five budget scenarios for rural road maintenance for 1993/94 and made assessments for urban road maintenance subsidies and expenditure on traffic policing and road safety (see Report on the Implementation of the Proposed Policy on Road User Charging in Namibia: Part B, prepared by VWL Namibia Inc. in April 1994). Both rural and urban road maintenance expenditures were subdivided into a number of activities. This subdivision has been retained in this present RUC Study although actual expenditure is not managed at this level of detail.

Revised and updated estimates of road expenditures to be recovered by the Road Fund have been prepared for purposes of calculating long term road user charges. The earliest start for the long term RUC system is 1 April 1998. Therefore expenditures to be used for the calculation of RUC rates should be for the 1998/99 financial year and take account of planned expenditures in later years. These are shown in Table G1 of Appendix G together with the preferred budget scenario for 1993/94 used by VWL Namibia Inc. in previous RUC calculations.

The estimates are described in more detail in the following subsections.

7.1 Road Administration

The DOT Administration figure used by Coopers & Lybrand was an estimate provided by the MWTC of expenditure within the Department of Transport for activities associated with road maintenance and construction.

Under the long term RUC system and the institutional reforms intended for the MWTC, consideration needs to be given to the various new administrative and operational structures:

- The MWTC as a policy and regulatory body.
- The Road Fund Administration (NamFund).
- The National Road Authority.
- The roads contractor.

For these structures it can be argued that there should be no explicit payment from the Road Fund to the MWTC for administration. Any MWTC administration activity such as policy advice, legislation, etc. associated with roads will be dictated by Government requirements and priorities rather than the priorities of road administrations. The administration of MWTC should be considered a part of the core activities of Government which should be funded from general Government revenues. *The cost of MWTC administration is excluded from the calculations in this RUC Study*.

Ideally other MWTC functions relating to roads such as vehicle, driver and operator testing, registration and licensing should be self financing. That is, the fees and charges prescribed for each of these functions should cover the total cost of that function. Under this scenario such fees and charges would not form part of the Road Fund. An exception needs to be made for vehicle registration and licensing because Cabinet has agreed that the licence fee should form part of the RUC system. It would be possible to have two components for the vehicle licensing fee - one part to cover the cost of vehicle licensing administration and the other part to recover road costs. The licensing administration fee would be approximately N$30 per licence, based on initial estimates of the costs of establishing and operating the vehicle module of NaTIS which is to be used for vehicle registration and licensing in Namibia. This estimate allows for repayment of the establishment costs over 5 years, operating costs and agency fees. *For purposes of calculating RUC rates it is assumed that the RUC system does not have to recover the cost of administering vehicle registration and licensing*.

Allowance needs to be made for the cost of a separate Road Fund administration. This is yet to be defined and established.

The administrative cost associated with the National Road Authority is also a reasonable charge on the Road Fund. Some of this cost will be fixed, ie not directly dependent on the amount of road work being carried out. This fixed cost should be minimised but will need to be funded each year from the Road Fund.

An amount of N$8.1 million (in 1997/98 prices) has been used in this RUC Study to cover the cost of the Road Fund administration and the fixed administrative costs of the National Road Authority. Of this amount, N$7.0 million has been associated with rural roads and N$1.1 million with urban roads.

For transparency and control, the cost of any administration associated with the planning, investigation, design, and contract supervision of road and bridge maintenance and construction works should, as far as possible, be explicitly funded for a specific project or group of projects. *Such costs have been allowed for in the revised estimates for road maintenance and road construction.*

Any administration associated with the management of plant, labour and materials required for the execution of road works should be included in the cost of the works. These are the road contractor’s costs. *Such administration costs are*

assumed to be included in the revised estimates for road maintenance and road construction.

7.2 Rural Road Maintenance

The MWTC has prepared estimates of road maintenance, including rehabilitation, expenditures for trunk, main, district and farm roads based on assessed needs for future years. These estimates, in 1997/98 prices, are presented in Table G1 of Appendix G and average a total of N$267.6 million per year for the period 1998/99 to 2000/01.

The estimates for pavement rehabilitation allow for a significant increase in activity on trunk and main roads compared with the current level of activity on this type of work. The MWTC estimates that pavement rehabilitation expenditure will continue at this higher level for the next 10 to 20 years. Loan financing was used to meet some pavement rehabilitation costs in 1997/98 and this is also proposed for 1998/99 and 1999/2000. The total estimated cost of rural road pavement rehabilitation, the portion financed by currently committed loans, and interest on these loans are shown in Figure 7.1. Interest payments continue at N$1.3 million per year until 2004/05 when repayment of the loan capital commences. Thereafter the repayment plus interest figure will be approximately N$1.7 million per year. The Road Fund is expected to meet this loan repayment commitment. *It is assumed that no further loans will be used for pavement rehabilitation work.*

Table 7.1 Rural Road Pavement Rehabilitation Costs (N$ million in 1997/98 prices)

Sources of Finance	1997/98	1998/99	1999/2000	2000/01
Total Expenditure	54.5	67.7	78.6	80.0
Loans	21.8	34.6	32.4	0.0
Government Contribution	33.3	33.1	46.2	80.0
Loan Repayments	0.5	1.0	1.3	1.3
RUC Recovery	33.8	34.1	47.5	81.3

The following approaches could be taken for deciding on the pavement rehabilitation costs to be used for RUC cost recovery purposes:

a) Each year recover the amount shown in the bottom line of Table 7.1.

b) Use an average loan repayment figure of N$1.5 million each year from 1998/99 in place of the actual repayments shown in Table 7.1 and then each year recover the amended bottom line.

c) Ignore the effect of the loan financing, ie recover the top line of Table 7.1 each year.

d) Recover an average of the bottom line figures in Table 7.1 for the years 1998/99 to 2000/01.

Under option a) road users in 1998/99 and 1999/2000 receive the benefits of the rehabilitation work and of the loan financing but road users over the next 40 years have to meet more than half of the costs. This option recovers sufficient revenue each year to meet commitments in that year, but the RUC rates will have to be increased in 1999/2000 and 2000/01.

Option b) has road users contributing to repayment of the loan capital from the time that the loan finance is uplifted. This makes little difference in the RUC recovery figures and the comments on option a) also apply to this option.

Option c) would over-recover N$33.6 million in 1998/99 and N$31.1 million in 1999/2000 and would then under-recover by the loan repayment amount in each further year. The over-recoveries and under-recoveries would balance over 30 or 40 years. This option has road users paying for the work in the year that the benefits are received but does not provide road users with any of the benefits of the loan financing. Large amounts of surplus revenue are retained in the first two years of the RUC system.

Under option d) N$54.3 million will be recovered each year. There will be an over-recovery of N$20.2 million in 1998/99 and N$6.8 million in 1999/2000 which will balance the under-recovery of N$25.7 million in 2000/01. The recovery level for later years could be reassessed in 2000/01 when the forward expenditure requirements would be better known. This option gives stability in the RUC rates over the first three years of the RUC system while smoothing out the effects of the loan financing. *Option d) is recommended.*

There is a question as to whether the proposed rural road maintenance expenditures are economically justifiable and sustainable. This will be addressed by other parts of the NTMP Study. However, in the meantime it is necessary to use a best estimate for purposes of calculating long term RUC rates.

There is also the possibility that maintenance costs per km may decrease under the commercial road contracting arrangement proposed. Some allowance for this has been included in the above estimates.

A "smoothed" rural road expenditure budget scenario is recommended for RUC cost recovery purposes based on using option d) above together with an average of the estimated expenditures for the other maintenance activities. This totals N$246.48 million in 1997/98 prices and is shown in Table G1 of Appendix G.

An alternative "scaled" expenditure scenario is also presented in Table G1 based on scaling the total rural road maintenance, including pavement rehabilitation, expenditure to N$200.0 million (in 1997/98 prices). This "scaled" expenditure level is a slight reduction (to allow for efficiency gains) on the N$206.8 million (N$173 million for maintenance excluding pavement rehabilitation plus N$ 33.8 million for rehabilitation) approved for 1997/98.

7.3 Road Construction

Coopers & Lybrand's analysis of the proposed 1996/97 capital budget for roads used a figure of N$80 million, including rehabilitation, and estimated that roughly N$48 of this would be financed either through grants (about N$8 million) or loans (about N$40 million). Their analysis showed that, after allowing for the repayment of loans over a period of years, the amount of road construction plus rehabilitation expenditure to be recovered from road user charges in 1996/97 would be approximately N$36 million (N$32 million of Government contribution for current year's expenditure plus N$4 million for loan repayment which would also apply in future years). The N$55 million figure used in previous RUC calculations was based on expected long term requirements including an allowance for the accumulated loan repayments.

The approved road development budget, including rehabilitation, for 1996/97 was N$81.9 million (N$30.9 million loans, N$12.9 million grants, N$38.1 Government contribution) inside the State Revenue Fund plus N$56.5 million of road development expenditure outside the State Revenue Fund which is all foreign financed (N$40.3 million loans, N$16.2 million grants).

Proposed road development (excluding rehabilitation) expenditures for 1997/98 and future years are given in Table 7.2 using 1997/98 price levels. The table also shows the amount of funding from grants and loans and the interest payments on currently committed loans.

Table 7.2 Road Development Costs (N$ million in 1997/98 prices)

Sources of Finance	1997/98	1998/99	1999/2000	2000/01
Total Expenditure	82.1	99.0	89.5	70.0
Grants	53.0	18.3	5.3	0.0
Loans	14.0	37.7	22.6	0.4
Government Contribution	15.1	43.0	61.6	69.6
Loan Repayments	1.4	1.1	1.1	1.1
RUC Recovery	16.5	44.1	62.7	70.7

The figures shown in Table 7.2 for 1998/99 and 1999/2000 are for committed projects only. The figures for 2000/01 assume that no new grants or loans are used. If grants or loans are available in 2000/01 then either the total expenditure could be increased or the RUC recovery amount reduced. The use of further loans will however increase the already high repayment commitment in future years.
Interest payments on committed loans will continue at approximately N$1.1 million until 2004/05 when repayment of loan capital commences. From 2004/05 to 2006/07 interest plus repayments for committed loans total approximately N$5.7 million per year. This increases further to over N$9 million from 2007/08.

From Table 7.2 it is evident that loan financing for road development expenditure will fall off over the next few years unless further loans are agreed to. Even though the proposed total expenditures are smaller in the later years there is an increase in the Government's contribution.

Coopers & Lybrand considered that the amount to be recovered by the RUC system is the Government contribution plus loan repayments. In their calculations they assumed that loan repayments would commence as soon as loan moneys were uplifted. This would give an escalating loan repayment commitment (N$13 million in 1997/98, N$21 million in 1998/99, etc.). The actual situation, as shown in Table 7.2, is that most of the loans have a grace period of up to 10 years before any repayment of the loan capital is required. However interest is payable from the time that the loan is committed.

Essentially the same options are available for dealing with the road development loan financing as were considered for pavement rehabilitation. The main differences are the more peaked nature of road development expenditures, the higher total amount of loan financing and as a consequence the larger repayments in future years. *As for pavement rehabilitation, it is recommended that an average road development expenditure be used for RUC recovery for the years 1998/99 to 2000/01*. This will slightly over-recover in the first two years but balance out in the third year. The over-recovery could be viewed as providing some contribution towards the higher loan repayments in future years. *It is recommended that the level of cost recovery for road development be reviewed in 2000/01 (or sooner if there is a significant change in the programmed level of expenditure).*

One of the agreed principles of the RUC system is that road expenditures that are not economically justified from a traffic point of view should not be funded from the Road Fund. It could be argued that such construction activities on rural roads, if there are any, are covered by foreign grants or allocations from the State Revenue Fund. Such activities on urban local authority roads will be excluded from receiving funding from the Road Fund. *No specific allowance has been made in calculating long term RUC rates for funding of non-economically justified road expenditures.*

7.4 Traffic Policing and Road Safety

There is some difficulty in trying to establish an appropriate expenditure level for traffic policing and road safety. Traffic policing is currently carried out by the Traffic Unit of the Namibian Police. However only half of the established posts at field level of the Traffic Unit are filled at present and nearly half the working time is being used for driver and vehicle testing purposes. The intention to transfer the responsibility for driver and vehicle testing from the Traffic Unit to the DOT of the MWTC will increase the capacity of the Traffic Unit to handle enforcement tasks. The budget for the Traffic Unit is part of the budget for the Ministry of Home Affairs but is not managed as a separate item. *The cost of the Nampol Traffic Unit is currently estimated to be N$4.6 million in 1997/98 prices.*

The MWTC has recently established a road transport inspectorate within the ministry. A full complement of 6 chiefs and 32 inspectors has been appointed. This inspectorate is at present financed as a sub-division within MWTC and is

concentrating on enforcement of road carrier permits and related matters. The longer term intention is for the inspectorate to become involved with overweight control measures and checking on cross-border and weight-distance charges. The relative roles and locations of this inspectorate and the Nampol Traffic Unit are currently being reviewed. It is recommended that the Road Fund meet the cost of this inspectorate. *The cost of the MWTC Road Transport Inspectorate is estimated to be N$3.5 million in 1997/98 prices.*

Some traffic policing activity is also undertaken by the traffic departments of the four larger municipalities. The Ministry of Home Affairs provides subsidies to these municipalities to cover salary costs associated with traffic policing. *This subsidy is currently estimated to be N$4.0 million in 1997/98 prices.*

The enforcement resources and performance required for the long term RUC system, both in terms of financial resources and specially trained staff, need to be taken into account when deciding on the type of system that is suitable for Namibia. This is addressed further in subsection 12.3 of this report. *For purposes of this RUC Study it is assumed that the transfer of responsibility for driver and vehicle testing will release sufficient resources to cover the increased enforcement effort required for the long term RUC system.*

Road Safety activities are basically of two types:

- Treatment of black spot sections of the road network
- Road safety information and education

The first of these activities should in principle be included in the road maintenance and development expenditures.

The second type of activity is intended to be financed from the Road Safety Secretariat Levy. Making this part of the Road Fund would allow some trade-off between this and road work. *However, for purposes of calculating long term RUC rates, expenditure on road safety information and education has been excluded from the costs to be met by the Road Fund.*

7.5 Urban Road Maintenance

A study of the maintenance needs of urban roads based on an engineering assessment has recently been completed by Africon Namibia Inc. and Windhoek Consulting Engineers and encapsulated in an Urban Road Maintenance Model (URMM).

The URMM only considers those activities that are mainly related to use of the road by traffic. The whole cost of such traffic-related activities is used in the model. This does not exactly comply with the approach used in the RUC calculation methodology where a proportion of the costs of bitumen road maintenance is considered to be fixed. Expenditures such as those for road

reserve clearing, repairs to traffic signs and drainage structures, are not included because they are wholly fixed costs. The report on the URMM suggests that future extension of the model could include other traffic-related maintenance such as the replacement of kerb stones damaged by vehicles, repainting of road markings, drainage, lighting signposting, and traffic control.

In deciding on which costs should be included in the URMM and how the costs from the model should be used in calculation of long term RUC rates, the important point to note is the intention for the URMM output. It is intended that the URMM be used by the Ministry of Regional and Local Government and Housing to determine the level of funding from the RUC system for urban road maintenance. The underlying principle is that only traffic-related expenditure on urban roads should be met by the Road Fund. However, for purposes of funding and control it is easiest to deal with the whole cost of an activity as occurs in the URMM.

As noted above, the range of activities currently included in the URMM includes some fixed costs but on the other hand some traffic-related activities are excluded. These are likely to balance out and therefore *it is recommended that financial assistance to the local authorities for urban road maintenance be limited to the full cost of those activities currently included in the URMM*. As the RUC funding is aimed at activities that benefit the road user, there needs to be an assurance that it is actually spent on the activities identified by the URMM.

Costs assessed by the URMM include the upgrading of gravel roads to a paved standard. *For the purpose of calculating RUC rates the total cost of upgrading of gravel roads assessed by the URMM has been taken to be the amount of urban road construction to be funded from the Road Fund*. Normally such work would be subject to a separate decision and funding process.

The report on the URMM also notes that development work on major urban arterial roads will, under certain circumstances, qualify for funding assistance from the RUC system. *No specific allowance has been made in this RUC Study for such development work*.
The URMM gives a total cost of urban road maintenance of N$30.027 million in 1996/97 prices. Of this N$2.108 million is for sealing of unpaved roads. *The URMM costs, updated to 1997/98 prices, have been used for urban road maintenance and construction in the "smoothed" expenditure scenario. In the alternative "scaled" scenario urban road construction expenditure is set at N$2.0 million and the maintenance expenditure is scaled to N$26.0 million (1997/98 prices).* The "scaled" scenario allows for a likely reduction in maintenance need in future years.

7.6 Allowance for Price Inflation

Consumer price inflation in Namibia is approximately 8% per year. *This value has been used to adjust road expenditure estimates to 1998/99, 1999/2000 and 2000/01 values for use in calculating RUC rates.* The resulting costs to be

recovered by the RUC system are shown in Table G1 of Appendix G and are summarised in Table 7.3 below.

Table 7.3 Summary of Road Expenditures (N$ million in real prices)

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget	329.256	384.237	355.597	414.976	384.045	448.174
Rural Roads:						
Total Budget	293.508	343.707	316.989	371.203	342.348	400.900
Maintenance	216.000	266.198	233.280	287.494	251.942	310.494
Construction	61.200	61.200	66.096	66.096	71.384	71.384
Traffic Control	8.748	8.748	9.448	9.448	10.204	10.204
Administration	7.560	7.560	8.165	8.165	8.818	8.818
Urban Roads:						
Total Budget	35.748	40.530	38.608	43.773	41.696	47.274
Maintenance	28.080	32.563	30.326	35.168	32.753	37.982
Construction	2.160	2.459	2.333	2.656	2.519	2.868
Traffic Control	4.320	4.320	4.666	4.666	5.039	5.039
Administration	1.188	1.188	1.283	1.283	1.386	1.386

If stability in RUC rates is required then the road expenditures for 1999/2000 could be used for calculating RUC rates for the period 1998/99 to 2000/01. A larger adjustment would then be needed for inflation at the end of the period than would be the case if annual adjustments were made in the RUC rates. *It is recommended that adjustments to the RUC rates be made from time to time to allow for the effect of price inflation on road costs.*

The predicted increase in vehicle numbers and use over time will give increased revenue to the Road Fund without change in the charges. If price inflation was small, then the increased revenue would be sufficient to accommodate the increased need for road expenditure which will result from the increased traffic.

Thus if price inflation is small the Road Fund will be self-balancing each year provided the initial RUC rates are set to recover the sustainable level of road expenditure. This balance will not occur in Namibia while there is significant price inflation.

8. Calculation of Charges

Based on the July 1995 Cabinet decision, an extended range of road user charging instruments is available for the long term RUC system. This means that cost recovery can be related more closely to the type of cost (fixed or variable, weight-related or non-weight-related), and also the charges for a particular vehicle can be tailored to more closely reflect the real cost of road use. Charges need to be calculated for the new set of charging instruments allowing for updated vehicle statistics and expenditure levels applicable to the implementation of the long term RUC system. This includes recalculation of the current vehicle licence fees and the fuel levies approved for the short term RUC system.

8.1 Calculation Method

The NAMRUC computer model was produced in 1994 and used to calculate road user charges for Namibia for the 1993/94 financial year. In this current RUC Study the NAMRUC methodology has been converted to spreadsheet format and extended for purposes of calculating long term RUC rates. The units of account and cost allocation proportions used in the NAMRUC model have been retained after alternatives were considered during a workshop with the participation of various affected ministries[1].

The NAMRUC methodology for calculation of traffic-related charges essentially consists of:

- A table which calculates the total number of units for each unit of account for the vehicle population (refer Appendix F).
- A table which determines the traffic-related portion of road expenditure and allocates this expenditure to units of account (refer Appendix G).
- Calculation of unit costs for each unit of account (expenditure/number of units).
- Calculation of the road user charge per vehicle in cents/km (number of units x unit cost for each unit of account).
- The road user charge is converted into a fuel levy in cents/litre for each class of vehicle.
- The unrecovered road user charge is calculated for given fuel levy rates for petrol and diesel (this is the basis for a weight-distance charge).

The analysis is done separately for each type of road (rural and urban) and the results are weighted according to the proportion of VKT on rural roads and urban roads for each vehicle class.

[1] See record of Workshop on Road User Charges held on 25 March 1997.

The portion of road expenditure that is not traffic-related, ie fixed, is used to determine an annual charge for each vehicle class. The annual charge per vehicle is calculated from the relative benefit (relative benefit factor times VKT) for each vehicle class. The analysis is described in more detail in the following subsections.

8.2 Cost Allocation

8.2.1 Traffic-Related Costs

The proportionate allocation of road expenditures to units of account has a significant effect on the RUC rates for the various classes of vehicles. There are a number of components in this allocation process:

- The proportion of expenditure that is variable (traffic-related) for each type of activity.
- The units of account used.
- The proportion of traffic-related expenditure allocated to each unit of account for each type of activity.

The cost allocation process needs to be country specific. Other countries have used different proportions for traffic-related expenditure and different units of account as shown in Table 8.1. A comparison of the NAMRUC and SADC/SACU methodologies is provided in Appendix E. This comparison clearly shows the differences between the models without establishing a superiority of one over the other.

Table 8.1 Units of Account Used in Other Studies

Study	Vehicle-km	Axle-km	PCE-km	GVM-km	ESA-km
EEC	*			*	*
World Bank	*				*
New Zealand	*			*	*
SACU	*	*			*
NAMRUC	*	*	*		*

In practice there is an almost direct relationship between the number of axles and the PCE value for a vehicle. Therefore one of these units of account could be eliminated. In New Zealand it was found that GVM-km was the most useful intermediate unit of account between Vehicle-km and ESA-km.

As the cost allocation process used in the NAMRUC model has been previously agreed specifically for Namibia, it has been decided[2] to continue to use these cost allocation percentages and units of account for traffic-related costs for calculating

[2] See record of Workshop on Road User Charges held on 25 March 1997.

long term RUC rates in this RUC Study. *It is recommended that the cost allocation process be reviewed at a later date when more detail on the reasons for road expenditure is available*. This review could be one of the functions of the proposed Road Fund Administration. The units of account and cost allocation proportions used in this RUC Study are given in Table 8.2.

Table 8.2 Cost Allocation Proportions

Activity	% Traffic Related	% VKT	% Axle-km	% PCE-km	% ESA-km
RURAL ROADS					
Earth Roads Maintenance					
Blading	90	100			
Light gravel maintenance	90	100			
Betterment & bush clearing	70	100			
Drains & fences	0				
Road signs	0				
Salt Roads Maintenance					
All maintenance	100	100			
Gravel Roads Maintenance					
Blading	90	100			
Light gravel maintenance	90	100			
Betterment & bush clearing	70	100			
Regravelling	90	100			
Drains & fences	0				
Road signs	0				
Surfaced Roads Maintenance					
Pavement reseal	100		50		50
Pavement rehabilitation	100	10			90
Bitumen maintenance	60		50		50
Drains & fences	0				
Road signs	0				
Capacity Improvements	100			100	
Construction	0				
Traffic control	100			100	
Administration	0				
URBAN ROADS					
Unsurfaced Roads Maintenance					
All maintenance	90	100			
Surfaced Roads Maintenance					
Pavement reseal	100		50		50
Pavement rehabilitation	100	10			90
Bitumen maintenance	60		50		50
Capacity Improvements	100			100	
Construction	0				
Traffic control	100			100	
Administration	0				

The NAMRUC model does not explicitly provide for administration expenditure. *Administration expenditure has been added to the cost allocation matrix as a fixed cost in this RUC Study*.

The traffic-related costs allocated to the units of account for the various budget scenarios are detailed in Tables G2 to G7 in Appendix G and are summarised in Table 8.3.

Table 8.3 Summary of Cost Allocation - Traffic-Related Costs (N$ million in real prices)

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget	329.256	384.237	355.597	414.976	384.045	448.174
Traffic-Related Costs	225.806	273.364	243.871	295.233	263.380	318.851
VKT:						
Total	129.351	158.111	139.699	170.760	150.875	184.421
Rural	111.459	137.362	120.375	148.351	130.005	160.219
Urban	17.893	20.749	19.324	22.409	20.870	24.202
Axle-km:						
Total	15.397	18.886	16.628	20.397	17.959	22.029
Rural	14.182	17.478	15.317	18.876	16.542	20.386
Urban	1.215	1.408	1.312	1.521	1.417	1.643
PCE-km:						
Total	17.274	18.252	18.656	19.712	20.149	21.289
Rural	12.954	13.932	13.991	15.047	15.110	16.250
Urban	4.320	4.320	4.666	4.666	5.039	5.039
ESA-km:						
Total	63.784	78.114	68.886	84.363	74.397	91.112
Rural	57.009	70.258	61.569	75.878	66.495	81.948
Urban	6.775	7.857	7.317	8.485	7.902	9.164

8.2.2 Fixed Costs

The allocation of fixed (non-traffic-related) costs has generated the most discussion on the international scene. As for traffic-related road costs, fixed costs need to be assigned to vehicle classes and vehicles by some unit of account.

Economic theory indicates that this should be based on relative demand elasticity or willingness to pay. These are very difficult to measure and in practice a vehicle characteristic is usually used. The SADC/SACU Joint Task Team recommends Gross Vehicle Mass (GVM) as a practical proxy for allocating fixed costs. The NAMRUC model uses relative benefit-kilometres for each vehicle class. It has been decided[3] to retain the use of relative benefit-kilometres for calculating fixed vehicle charges for Namibia.

The relative benefit factors used in the NAMRUC model and this RUC Study are given in Table 8.4.

Table 8.4 Relative Benefit Factors for Allocation of Fixed Road Costs

Vehicle Type	Maintenance and	Construction

[3] See record of Workshop on Road User Charges held on 25 March 1997.

	Administration	
Motorcycle	1.0	0.5
Car	1.0	1.0
LDV	1.0	1.2
Mini bus	1.0	2.1
LGV	1.0	4.9
Bus	1.0	4.6
2 axle SUT	1.0	12.4
3 axle SUT	1.0	12.4
4 axle Combination	1.0	13.8
5 axle Combination	1.0	13.8
6 axle Combination	1.0	13.8
7 or > axle Combination	1.0	13.8
Caravan	1.0	1.2
Light trailer	1.0	1.5
Other	1.0	2.5

The relative benefits factors were determined from calculation of road user benefits for a range of typical projects.

One difficulty with the relative benefit approach is that values are not readily calculable for individual vehicles within a class, eg smaller LGVs or 2 axle SUTs *It has been assumed in this RUC Study that the class value applies to all vehicles within the class.*

8.3 Basic RUC Rates

Traffic-related unit costs (cents/VKT, cents/Axle-km, cents/PCE-km and cents/ESA-km) and basic RUC rates are given in Appendix H for the various expenditure budget scenarios.

The NAMRUC methodology calculates a different unit cost for each vehicle class, which is dependent on the relative travel on rural roads and urban roads. These unit costs are shown as "Weighted Unit Costs" in Appendix H. Use of a rural/urban weighting changes the cost responsibility compared with that without the weighting, as shown in Table 8.5 for the 1998/99 "Scaled" budget. The largest effect of the weighting is for heavy vehicles which operate more on rural roads.

There is some logic in using weighted unit costs for purposes of determining the cost responsibility for a class of vehicles, which was the purpose of the NAMRUC model. The effect of the weighting comes from the fact that the unit costs for urban roads as a group are significantly lower than rural roads as a group. Variations from one rural road to another are not taken into account because further subdivision of VKT data is required and this is not readily available.

Table 8.5 Weighted vs Unweighted Road User Charges (1998/99 Scaled Budget)

Vehicle Class	Weighted RUC cents/km	Unweighted RUC cents/km

Motorcycle	4.1	4.1
Car	4.6	4.7
LDV	4.6	4.7
Mini Bus	4.9	5.0
LGV	5.8	7.8
Bus	8.8	15.9
2 Axle SUT	15.9	13.4
3 Axle SUT	21.5	18.8
4 Axle Combo	28.0	24.6
5 Axle Combo	34.9	30.1
6 Axle Combo	41.1	35.7
7 or > Axle Combo	47.1	41.1
Caravan	0.2	0.2
Light Trailer	0.2	0.2
Other	1.7	5.6

Weighted traffic-related RUC rates for the various expenditure budget scenarios are shown in Table 8.6.

Table 8.6 Calculated Traffic-Related Road User Charges Using Weighted Unit Costs

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Traffic-Related Costs, N$ m	225.806	273.364	243.871	295.233	263.380	318.851
Road User Charges, c/km						
Motorcycle	4.1	5.0	4.3	5.3	4.5	5.5
Car	4.6	5.6	4.8	5.8	5.0	6.1
LDV	4.6	5.6	4.9	5.9	5.1	6.1
Mini Bus	4.9	5.9	5.1	6.2	5.4	6.5
LGV	5.8	6.9	6.0	7.2	6.3	7.5
Bus	8.8	10.5	9.2	10.9	9.6	11.3
2 Axle SUT	15.9	19.3	16.5	20.0	17.1	20.8
3 Axle SUT	21.5	26.2	22.3	27.2	23.2	28.2
4 Axle Combo	28.0	34.2	29.1	35.4	30.2	36.8
5 Axle Combo	34.9	42.6	36.1	44.1	37.5	45.8
6 Axle Combo	41.1	50.2	42.6	52.0	44.2	54.0
7 or > Axle Combo	47.1	57.6	48.9	59.7	50.7	62.0
Caravan	0.2	0.2	0.2	0.3	0.2	0.3
Light Trailer	0.2	0.3	0.2	0.3	0.2	0.3
Other	1.7	1.9	1.8	2.0	1.9	2.1

8.4 Fuel Levies

A levy on vehicle fuel is a relatively simple means of recovering traffic-related costs. A RUC fuel levy on both petrol and diesel should theoretically be set to cover all marginal road costs that are common to all vehicles. This is based on the assumption that all petrol is used on-road and that a reasonably simple refund system not subject to fraud can be used for refunding the RUC diesel levy for diesel used off-road. As noted in section 3, RUC levies on both petrol and diesel

have been agreed as part of the short term RUC system. The current fuel levy rates have been set to recover all assessed traffic-related road costs plus a proportion of fixed costs based on 1996/97 budgeted expenditures.

The following points should be noted with regard to a fuel levy:

- The fuel levy is a proxy for the basic road user charge.
- Although an appropriate fuel levy can be calculated for each type and weight of vehicle, it is only feasible to have one rate of fuel levy for each fuel type, ie petrol and diesel.
- For any given single fuel levy, road user charges for particular vehicles, or classes of vehicles, will be either under-recovered or over-recovered.
- In the NAMRUC model the under recovered RUC is called a weight-distance tax.

In the NAMRUC model, the petrol fuel levy is calculated from the weighted RUC rates for petrol powered vehicles as a class. The same approach is used for the diesel fuel levy in the absence of a weight-distance charge. The diesel levy for use with a weight-distance charge is taken as the lowest levy for any type of diesel-powered vehicle. This approach means that, with weight-distance charges, the diesel levy is significantly lower than the petrol levy. Initial fuel levies calculated using the NAMRUC approach are given in Table 8.7 for the various expenditure budget scenarios. The minimum diesel levy comes from the LGV and Bus classes which have particularly low RUC rates under the NAMRUC weighted approach.

Table 8.7 Fuel Levies to Recover Traffic-Related Costs

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Traffic-Related Costs, N$ m	225.806	273.364	243.871	295.233	263.380	318.851
Petrol Levy, cents/litre	45.9	55.4	47.9	57.9	50.2	60.6
Min. Diesel Levy, cents/litre	22.0	26.1	22.9	27.2	23.9	28.4

Ideally the level of the fuel levies should be set so as not to distort decisions on fuel purchase. Current pump prices of vehicle fuel are at the lower end of fuel prices in the Southern Africa region which means that some flexibility exists to adjust them without risking evasion or smuggling of fuel into the country. On the other hand, the diesel levy could be significantly reduced if a weight-distance charge was introduced as shown in the above table. This could result in smuggling of diesel out of Namibia. A large differential between the petrol levy and the diesel levy could also distort decisions on vehicle purchase, giving

preference to diesel-powered vehicles where a weight-distance charge does not apply, eg for diesel-powered light vehicles including cars.

8.5 Diesel Refunds

If a levy is applied to diesel to recover road user charges, then there will need to be a system for refunding the levy for diesel used off-road.

As noted in the Interim Report on Road User Charges there is an existing process for diesel refunds based on individuals and companies establishing eligibility under a category of economic activity. The current categories of diesel refunds, the current rates of refund and the amounts refunded for 1996/97 are listed in Table 8.8.

Table 8.8 1996/97 Diesel Refunds

Activity	Refund	Refunds	
	N$ per litre	million litres	N$ million
Agriculture			
- Production	0.186*	10.1	1.9
- Transport	0.186	0.3	0.1
Fishing	0.186	62.9	11.7
Off-shore Exploration	0.186	6.5	1.2
Farming	0.021**	8.5	0.2
Drilling Exploration	0.021	4.3	0.1
Mining	0.021	4.3	0.1
Marine Fishing	0.021	61.9	1.9
Total		**158.8**	**16.6**

* Said to be duties plus levies, but does not relate to current rates

** MVA and RSS levies only (RSS levy is taken as zero)

Under the current refund system, once eligibility is established, refund of excise duty and fuel levies is available on all diesel purchased by that individual or company as quantified on original invoices to be supplied with claims. The exception is fuel used in passenger vehicles such as motor cars and minibuses. No investigation or auditing action is undertaken to ensure that claimed diesel consumption actually relates to the activity involved.

The current categories for diesel refunds cover less than the total off-road use of diesel. TransNamib and some construction activities used to receive a refund but no longer qualify. On the other hand only one of the current activity categories, marine fishing, is clearly an off-road operation. Most of the other activities will involve some use of diesel-powered vehicles on public roads. This fact is partly recognised by the requirement for claims for agriculture to be divided into production and transport.

If a refund system is to be used to pay back the RUC levy on diesel used off-road, then changes to the eligibility criteria and refund rates are needed. It is intended

that diesel refunds under the long term RUC system would apply only to those economic activities with a significant proportion of diesel used off-road, ie in stationary engines and off-road machines.

For purposes of calculating the distance travelled by diesel-powered vehicles and the RUC diesel levy, it is necessary to estimate the net diesel consumption that will be subject to the diesel levy. This estimate for 1996/97 is presented in Table 8.9, using data on diesel sales by sector obtained from the Ministry of Mines and Energy together with the on-road and off-road percentages used in previous RUC calculations.

Table 8.9 Estimated 1996/97 Off-Road Diesel Consumption

Sector	Total Consumption million litres	% Off-Road	% On-Road	Consumption Off-Road million litres	Consumption On-Road million litres
Retail Garages	30.2	-	100	-	30.2
General Dealers	5.8	-	100	-	5.8
Farmers	10.6	88	12	9.4	1.3
Agricultural Co-ops	22.3	88	12	19.7	2.7
General Trade (other)	60.0	-	100	-	59.9
Government	22.4	-	100	-	22.4
Local Authorities	2.3	-	100	-	2.3
Transnamib	16.7	79	21	13.2	3.5
Mining	35.9	100	-	35.9	-
Construction	10.8	16	84	1.7	9.1
Public Transport	2.1	-	100	-	2.0
Road Haulage	27.8	-	100	-	27.8
Marine Fishing	95.7	100	-	95.7	
Total	**342.6**			**175.6**	**167.0**

The above table shows that there is currently more diesel used off-road than on-road and that the RUC diesel levy will need to be refunded on approximately 180 million litres of diesel per year. For an RUC diesel levy of 30 to 40 cents/litre, the refund system will need to deal with N$54 million to N$72 million per year compared with the current N$17 million. The higher rate of refund will provide an increased incentive for fraud which will need to be offset by adequate audit.
It is recommended that, if a diesel refund system is to be used, a requirement be placed on the agency processing the refunds to carry out checks from time to time to give reasonable assurance that refund claims are not fraudulent.

An alternative approach to having a diesel levy and refund system is not to place a RUC levy on diesel and instead make all diesel powered vehicles that are designed for operation on public roads pay a weight-distance tax or pay an increased vehicle licence fee. The main disadvantage of this option is that the pump price of diesel in Namibia would be significantly lower than in adjacent countries which would likely result in the smuggling of diesel from Namibia. It

has been decided[4] not to pursue this option for this reason. It should be noted however, that the introduction of a weight-distance charge will reduce the RUC levy on diesel significantly below the currently approved level. This will in turn reduce the pump price of diesel.

8.6 Vehicle Licence Fees

Vehicle licence fees are theoretically suitable for recovering the fixed costs relating to the road system. In theory fixed costs should not be recovered by a charge that varies with road use, ie fuel levy or weight-distance charge because this could make the perceived cost of a particular journey greater than it should be. Table 8.10 gives the annual vehicle licence fees required to recover all fixed costs for the various road expenditure budget scenarios.

Previous calculations using the NAMRUC model showed that vehicle licence fees would need to be increased significantly if they were to recover all the fixed costs of the road network. Since then the fees have been increased by 65%, with the last increase of 10% applying from 1 January 1997.

A further significant increase in vehicle licence fees could present a cashflow difficulty for vehicle owners under existing legislation which requires a single payment at the beginning of the year. Either allowance needs to be made for the vehicle licence fee to be paid in instalments throughout the year, or some of the annual fee could be collected as part of, and in proportion to, one or more of the variable charges.

Current vehicle licence fees vary according to the tare mass of the vehicle with the exception of motorcycles and caravans. For a comparison to be made between the current fees and the calculated fees it is necessary to make an estimate of the tare weight of the average vehicles in each of the vehicle classes used in the RUC calculations.

Table 8.10 Calculated Annual Vehicle Licence Fees

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Fixed Costs, N$ million	103.450	110.873	111.726	119.743	120.664	129.323
Licence Fee, N$/year						
Motorcycle	78	89	82	93	85	97
Car	354	395	368	410	383	427
LDV	384	426	400	443	416	461
Mini Bus	511	554	532	577	554	600
LGV	641	677	667	705	696	735
Bus	1 496	1 586	1 560	1 655	1 629	1 728

[4] See record of Workshop on Road User Charges held on 25 March 1997.

2 Axle SUT	2 862	2 931	2 977	3 049	3 102	3 176
3 Axle SUT	5 657	5 794	5 887	6 029	6 133	6 281
4 Axle Combo	15 757	16 105	16 394	16 756	17 079	17 456
5 Axle Combo	16 242	16 596	16 902	17 270	17 612	17 996
6 or > Axle Combo	16 268	16 623	16 927	17 296	17 636	18 020
Caravan	37	41	38	43	40	44
Light Trailer	60	66	62	68	65	71
Other	4	4	4	4	4	5

The estimated average current vehicle licence fee and the ratio of current fee to calculated fee is given in Table 8.11 for the vehicle classes.

Table 8.11 Current Vehicle Licence Fees

Vehicle Class	Estimated Tare Mass kg	Current Licence Fee N$ per year	Current Fee / Calculated Fee
Motorcycle	-	36	0.46 - 0.37
Car	1 200	108	0.31 - 0.25
LDV	1 500	144	0.38 - 0.31
Mini Bus	1 500	144	0.28 - 0.24
LGV	3 500	456	0.71 - 0.62
Bus	9 500	4 692	3.14 - 2.72
2 Axle SUT	8 500	3 816	1.33 - 1.20
3 Axle SUT	10 000	4 692	0.83 - 0.75
4 Axle Combo	8 500 + 6 500 or 10 000 + 3 500	6 144 or 5 628	0.39 - 0.32
7 Axle Combo	10 000 + 6 500 + 6 500	9 348	0.57 - 0.52
Caravan	-	48	1.30 - 1.09
Light Trailer	600	36	0.60 - 0.51
Other	2 000	192	48.0 - 38.4

More detail on the current vehicle licence fees is given in Appendix C.

It is clear from the ratios of current fee/calculated fee in the above table that the current fees have been determined using a different methodology than that used in this RUC Study. In particular, the current fees for buses, 2 axle single unit trucks and caravans are greater than the calculated fees for all budget scenarios, whereas for most other vehicle classes the current fees are 50 to 70 percent lower than the calculated fees.

8.7 Adjustment to Calculated Levies and Fees

If it is not practical in the short term to implement the calculated vehicle licence fees due to the sharp increase it would entail, there are essentially four options:

a) Leave all vehicle licence fees at the current level.

b) Increase all current vehicle licence fees by a fixed percentage.

c) Increase current fees or reduce calculated fees by a different percentage for each vehicle class.

d) Reduce the calculated vehicle licence fees by a fixed percentage.

In all options the shortfall in fixed costs would need to be recovered by increasing the calculated fuel levies (and weight-distance charges where appropriate).

Options a) and b) would minimise the change in fees but would not comply with the calculated cost responsibilities, ie some cross-subsidies between vehicle classes would remain. Cross-subsidies could be eliminated for those vehicle to which weight-distance charges would apply by making an adjustment to these charges. Option c) would provide a transition between the current fee schedule and the calculated fees. Option d) has the advantage of having the correct relativity between vehicle classes. *It is recommended that vehicle licence fees be determined by reducing the calculated fees by 50%.* The transfer of 50% of the fixed charges to traffic-related charges means that vehicles pay 50% of fixed costs via an annual charge and 50% as they use the road network.

The NAMRUC model does not address the amount by which a fuel levy under-recovers or over-recovers road user charges for light vehicles. Motorcycles in particular have a significant under-recovery. *It is recommended that for vehicle classes where weight-distance charges are not to apply, vehicle licence fees be adjusted to compensate for under-recovery and over-recovery of RUC amounts by the RUC fuel levies.* This does not exactly match with economic theory but is the converse of collecting some fixed costs by means of a variable charging instrument. Such an approach allows flexibility in setting the level of the fuel levies while fully complying with the principle that each class of vehicle meets its cost responsibility.

If allowance is to be made for petrol powered heavy vehicles, there are essentially three options to accommodate the difference between the petrol fuel levy and the diesel fuel levy:

a) Adjust the vehicle licence fees in a similar manner to the light vehicle classes.

b) Refund the difference between the petrol fuel levy and the diesel fuel levy and calculate weight-distance and cross-border charges for diesel powered vehicles only.

c) Accommodate this difference in the weight-distance and cross-border charges by having separate charges for petrol vehicles and diesel vehicles.

Option a) is not favoured because there is a variable charging instrument, ie weight-distance charges, which can be used to reflect the true charges. As the option b) refund would need to be based on the distance travelled as recorded for weight-distance charges, this option effectively becomes the same as option c). *Option c) doubles the number of charges for weight-distance and cross border charges but is recommended as the best overall option.*

Table 8.12 Recommended 1998/99 Vehicle Licence Fees

	Annual Licence Fee, N$		% Increase (Decrease) on Current Fee	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	**329.256**	**384.237**	**329.256**	**384.237**
Petrol Powered Vehicles:				
Motorcycle	161	192	347	433
Car	275	306	154	183
LDV	314	349	118	142
Mini Bus	301	303	109	110
LGV	0	0	(-)	(-)
Bus	748	793	(84)	(83)
2 Axle SUT	1 431	1 465	(63)	(62)
3 Axle SUT	2 829	2 897	(40)	(38)
2 Axle Truck Tractor	7 395	7 563	94	98
3 Axle Truck Tractor	7 637	7 808	63	66
Diesel Powered Vehicles:				
Car	664	792	515	633
LDV	703	835	388	480
Mini Bus	768	887	433	516
LGV	242	244	(47)	(46)
Bus	748	793	(84)	(83)
2 Axle SUT	1 431	1 465	(63)	(62)
3 Axle SUT	2 829	2 897	(40)	(38)
2 Axle Truck Tractor	7 395	7 563	94	98
3 Axle Truck Tractor	7 637	7 808	63	66
Other	0	0	(-)	(-)
Unpowered Vehicles:				
1 Axle Trailer or Semi-Trailer	242	245	(93)	(93)
2 Axle Trailer or Semi-Trailer	484	490	(93)	(93)
3 Axle Trailer or Semi-Trailer	726	735	(89)	(89)
Caravan	30	31	(38)	(35)
Light Trailer	0	0	(-)	(-)

Table 8.12 shows recommended vehicle licence fees for each of the two 1998/99 expenditure budget scenarios based on reducing the calculated licence fees by 50% and adjusting the fees for the light vehicle classes for fuel levy under or over recovery. Separate vehicle licence fees are shown for each fuel type because some light vehicles are diesel powered and the diesel fuel levy is different from the petrol levy.

Because trailers and semi-trailers are registered and licensed separately from the truck tractor, licence fees for vehicle combinations have been separated into their component parts. The separated components add to the calculated vehicle licence fees for 4 and 5 axle combinations but give combination licence fees slightly higher than those calculated for 6, 7 and 8 axle combinations. For the "Scaled" budget the combined vehicle licence fees are N$8 363, N$8 605 and N$8 847 respectively for the 6, 7 and 8 axle combinations. The corresponding figures for the "Smoothed" budget are N$8 543, N$8 788 and N$9 033.

It should be noted that vehicle mass is not a factor in the recommended vehicle licence fees. However the number of axles is a factor for heavy vehicles.

The initial fuel levies need to be recalculated to recover the 50% of fixed costs not covered by the vehicle licence fees. This is accomplished by first converting the unrecovered fixed charge per year into a charge per kilometre for each vehicle class, and adding the charge/km to the basic RUC rates. The revised RUC rates are then translated into fuel levies.

The recommended adjusted fuel levies for the various expenditure budgets scenarios are given in Table 8.13. The levies recommended for diesel are higher than the minimum calculated value and the petrol levies are slightly lower than the calculated weighted average so as to minimise the difference between the diesel levy and the petrol levy.

Table 8.13 Recommended Fuel Levies

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Petrol Levy, cents/litre	50.0	60.0	55.0	63.0	57.0	66.0
Diesel Levy, cents/litre	30.0	35.0	33.0	37.0	34.0	39.0

The petrol levies for the higher ("smoothed") budget scenarios are all greater than the currently approved RUC levy of 57.4 cents/litre. If these road expenditure budget levels are chosen, there will need to be an increase in the pump price of petrol. On the other hand the recommended diesel levies are all significantly lower than the currently approved RUC diesel levy of 49.9 cents/litre. For diesel-powered vehicles the reduction in the fuel price will be more than offset by the introduction of weight-distance charges for heavy vehicles and the recommended increase in vehicle licence fees for light vehicles.

The revenue estimated to be collected from each of the RUC instruments at the recommended pricing levels is given in Table 8.14.

Table 8.14. Estimated Revenue at Recommended Pricing Levels (N$ million in real prices)

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Vehicle Licence Fees	51.725	55.437	55.863	59.872	60.332	64.661
Petrol Levy	144.622	173.546	164.308	188.207	175.695	203.436
Diesel Levy	57.486	67.067	65.883	73.869	70.608	80.991
Weight-Distance Charges	75.423	88.187	69.543	93.028	77.410	99.086
Total Budget	329.256	384.237	355.597	414.976	384.045	448.174

8.8 Cross-Subsidies

A principle of the RUC system accepted by Cabinet is that one class or category of road user should not subsidise another (equity principle). In light of this it

needs to be recognised that the correct RUC for each vehicle varies with the actual weight and weight distribution on the vehicle and the particular road that the vehicle is operated on. The only way of collecting such a charge is by some form of real-time tolling. There will therefore always be some cross-subsidies in any nationally uniform RUC system. Suggestions for minimising under or over-recovery for a particular vehicle type are given in the section above.

The difference between the charge for travel on urban roads compared with rural roads is illustrated in Appendix H. For some vehicle types there is an order of magnitude between the RUC rates for urban roads and rural roads. Even larger differences will occur between individual roads. These differences cannot easily be addressed by a nation-wide RUC system, although in calculating RUC rates for a vehicle class allowance has been made for the relative portion of travel on rural roads and urban roads.

Not all vehicles in a class will travel the average proportion on rural roads and urban roads. Some vehicles will benefit at the expense of other vehicles in their class. This is a cross-subsidy, albeit within a vehicle class.

Another cross-subsidy within a vehicle class will occur because of the different weight carried by vehicles. This difference in weight can, to some extent, be addressed by a weight-distance charge. However, in calculating weight-distance charges some assumptions will always need to be made about the average load factor for a particular vehicle type. This results in cross-subsidisation from vehicles with low load factors to vehicles with high load factors.

9. Weight Distance Charges

The technical feasibility of introducing a weight-distance charge for heavy vehicles in Namibia was investigated and reported on in April 1994. This report reviewed literature on weight-distance charges, documented the road transport environment and the justification for weight-distance charges, and considered options and some practical aspects of introducing weight-distance charges.

Weight-distance charges are considered to be the third tier of road user charges, after vehicle licence fees and fuel levies. A weight-distance charge is directly related to road use like a fuel levy but is also able to take a number of other factors into account, eg vehicle configuration and weight. This allows road user charges for heavy vehicles in particular, where there is a range of weights and configurations, to be tailored more closely to the real road cost of operating these vehicles. Inequities and cross-subsidisation of the larger vehicles by the smaller ones, which occurs under a two tier system, is reduced.

Many forms of weight-distance charges have been tried in other countries. The design is essentially a compromise between equity (having the charge for a particular vehicle set as close as possible to the road costs incurred) and simplicity of administration and enforcement.

9.1 Charge Categories

The number of charge categories for weight-distance charges can be many or few, depending on the range of weights to which the system is to apply and the number of different vehicle configurations that are allowed for. Adequate computer support will reduce any administrative difficulty involved with having many charge categories.

As axle configuration, particularly the number of axles, is a principle factor in the determination of weight-distance charges *it is recommended that the vehicle type categories used in the NAMRUC model be further divided for purposes of setting weight-distance charges*. For example allowance should be made for 3 axle as well as 2 axle buses - the third axle usually being single-tyred.

There is also the question as to whether combination vehicles should have only one weight-distance licence for the combination or a separate licence for each separately registered vehicle. If trailers and semi-trailers have separate weight-distance charges this will recognise that they can travel lesser distances than the truck tractor and allows mix and match of trailers. *It is recommended that trailers and semi-trailers be treated separately from truck tractors for purposes of weight-distance charges.*

The recommended vehicle classes for weight-distance charge purposes are shown in Figure 9.1.

Figure 9.1 Proposed Vehicle Classes for Weight-Distance Charges

9.2 Application to Vehicle Classes

Table 9.2 shows the amount of road user charge, for each heavy vehicle type used in the NAMRUC model, that is under-recovered by the fuel levies recommended in Table 8.13. The under-recovery for each vehicle class could simply be applied as a weight-distance charge for all vehicles in that class. LGVs and Buses are not included in Table 9.2 because the fuel levies more than recover their calculated RUC rates.

In the absence of a weight-distance charge the only way of recovering the shortfall is to increase the fuel levy and/or the annual vehicle licence fee, which was done for the short term RUC system. The first approach produces a significant cross-subsidy from light vehicles to heavy vehicles. The second option involves making an assumption on the annual distance travelled and therefore produces a cross-subsidy from vehicles that travel a small distance to vehicles that travel a large distance.

Table 9.2 Shortfall in RUC Rates for Heavy Vehicles (N$ / 100 km)

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Petrol Powered Vehicles:						
2 Axle SUT	7.07	7.45	6.31	7.46	6.59	7.56
3 Axle SUT	8.09	8.83	7.08	8.83	7.40	8.93
4 Axle Combo	11.41	12.80	10.27	12.87	10.71	13.07
5 Axle Combo	15.47	17.83	14.29	18.04	14.90	18.41
6 Axle Combo	19.68	23.05	18.53	23.41	19.29	23.95
7 or > Axle Combo	21.75	25.69	20.41	26.09	21.26	26.69
Diesel Powered Vehicles:						
2 Axle SUT	13.47	15.45	13.35	15.78	13.95	16.20
3 Axle SUT	16.28	19.08	16.10	19.49	16.83	20.00
4 Axle Combo	21.21	25.05	21.05	25.61	21.98	26.30
5 Axle Combo	26.47	31.58	26.40	32.34	27.55	33.26
6 Axle Combo	31.48	37.80	31.51	38.75	32.86	39.88
7 or > Axle Combo	35.15	42.45	35.16	43.51	36.67	44.78

If trailers and semi-trailers are to be charged separately then the rates for the combination vehicles in Table 9.2 need to be separated into their component parts. This is addressed in the following subsection.

The above system of weight-distance charge is based on the average effect of vehicles in each class and does not take account of differences in vehicle weight within a class. The effect of such differences is also addressed in the following subsection.

9.3 Weight-Distance Charges for Individual Vehicles

Basic RUC rates can be calculated from the unit costs per VKT-km, axle-km, PCE-km and ESA-km and the unrecovered fixed charge for any particular vehicle given its axle configuration and gross mass.

For purposes of calculating the component charges for combination vehicles it is necessary to use an average value for the unit costs per VKT-km, axle-km, PCE-km and ESA-km and the unrecovered fixed charge. The values applying to a 5 axle combination have been used for this calculation. The unrecovered fixed charge is applied only to the truck tractors.

Weight-distance charges are given in Appendix I for the various expenditure budget scenarios and for a range of gross vehicle mass (GVM) for each of the recommended vehicle classes. As the weight-distance charge is the amount of the RUC rate that is un-recovered by the fuel levy it is necessary to have two tables for each expenditure scenario - one for petrol powered vehicles and one for diesel powered vehicles.

The shaded rates in the tables in Appendix I are for the normal legal maximum GVM. The lower GVM value shaded for each vehicle class corresponds to the current Road Traffic Regulation limits while the higher value will apply under the amendment which is proposed to bring Namibia into line with South Africa.

Although weight-distance charges have been calculated for LGVs and buses it will be seen from the tables in Appendix I that the fuel levies are sufficient for these vehicle classes up to the normal legal GVM. Weight-distance charges for the current legal maximum GVM for other heavy vehicles are given in Table 9.3. *It is recommended that the charges in Table 9.3 be the standard weight-distance charges for the vehicle classes shown.*

The recommended weight-distance charges for trailers and semi-trailers shown in Table 9.3 are based on these being towed by a diesel powered truck tractor.

To allow for the situation where, because of tyre load capacity or other legal limitation, the maximum legal GVM for a particular vehicle is lower than the standard GVM, it is recommended that provision be made for a lesser weight-distance charge to be approved for that vehicle. The non-standard weight-distance charge can be obtained from the tables in Appendix I.

Based on the calculated weight-distance charges *it is recommended that only Heavy Load Vehicles, as defined for vehicle registration and licensing (refer subsection 6.1) and including only those diesel powered LGVs with a GVM exceeding 10 tonnes, be subject to the weight-distance charge system.* The maximum number of vehicles to which weight-distance charges will apply in 1998/99 is therefore 5 228 single unit trucks or truck tractors plus approximately 2 270 trailers or semi-trailers.

Table 9.3 Weight Distance Charges (N$/100 km) for Current Legal GVM

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Petrol Powered Vehicles:						
2 Axle SUT	6.26	6.49	5.42	6.46	5.66	6.50
3 Axle SUT	5.14	5.29	3.86	5.11	4.06	5.03
2 Axle Truck Tractor	12.65	14.13	12.05	14.38	12.55	14.74
3 Axle Truck Tractor	8.75	9.50	7.60	9.47	7.94	9.56
Diesel Powered Vehicles:						
2 Axle SUT	13.00	14.92	12.84	15.22	13.41	15.60
3 Axle SUT	14.44	16.91	14.09	17.20	14.75	17.59
2 Axle Truck Tractor	19.39	22.56	19.46	23.14	20.30	23.83
3 Axle Truck Tractor	18.05	21.12	17.83	21.56	18.64	22.12
Unpowered Vehicles:						
1 Axle Trailer (single tyres)	8.56	10.62	8.70	10.95	9.05	11.31
1 Axle Trailer (dual tyres)	2.64	3.36	2.56	3.42	2.68	3.49
2 Axle Trailer (single tyres)	16.27	20.18	16.60	20.81	17.27	21.52
2 Axle Trailer (dual tyres)	7.55	9.49	7.55	9.73	7.88	10.02
3 Axle Trailer (single tyres)	18.00	22.38	18.31	23.06	19.05	23.83
3 Axle Trailer (dual tyres)	9.28	11.69	9.24	11.98	9.65	12.32

It will be noticed that the weight-distance rates in Table 9.3 are slightly different from those in Table 9.2. This is because the GVM has been rounded up to the next highest whole tonne for Table 9.3. The difference in weight-distance charge for 1 tonne changes in GVM is shown in the tables in Appendix I.

When the amended Road Traffic Regulations have been implemented the legal maximum GVM will increase for most heavy vehicles. As a consequence it can be expected that the actual GVM of these vehicles will increase. The higher GVMs will ultimately reflect in higher ESA values for these vehicle classes but the effect of this is already allowed for in the tables in Appendix I. *When the amended Road Traffic Regulations have been implemented it is recommended that the standard weight-distance charges be increased to the higher shaded values shown in the tables in Appendix I.*

9.4 Allowance for Distance

There are a range of choices for how distance is assessed for purposes of determining Weight-Distance Charges.

The value for distance travelled on the public road network used in applying a weight-distance charge could either be an assessed value for the vehicle or an actual measured distance.

A simple approach to assessed distance is to use the average annual distance for each vehicle class for all vehicles in that class. The effect of this is shown in the last column of the tables in Appendix H. This effectively converts the weight-distance charge into an annual fee ranging up to N$45 000 per year, for a 7 axle combination vehicle. This approach has the benefit that there is no room for

fraudulent values of distance, but it would be inequitable for particular operators with vehicles that travel significantly different distances from the standard.

Subdivision of NAMRUC vehicle classes depending on the type of operation with an assessment of annual distance for each sub-class would improve equity but would be very difficult to administer. There would be problems similar to those currently experienced in trying to define "hire and reward" vs "own account" operations.

The use of measured distance is more equitable than using a standard value but there is a risk that the measuring device will be disconnected or tampered with to reduce the recorded distance. Use of distance measuring devices therefore requires an adequate enforcement effort to limit fraud.

There are a number of possibilities for distance measuring devices:

a) For trucks and truck tractors the normal odometer could be used if it could be adequately rendered tamper-proof.

b) Hubodometers have been used in New Zealand on both trucks and trailers for measuring distance for RUC purposes for 18 years. Some road transport operators in Namibia currently use these devices on trailers and semi-trailers for vehicle maintenance purposes.

c) Tachometers are used by transport operators around the world for engine management purposes. Distance can be assessed from time and engine speed.

d) Norway, Sweden and Iceland used a Haldameter to measure distance for RUC purposes up to 2 - 3 years ago.

e) Research is underway in Europe and the USA on vehicle tracking systems which could ultimately be used for RUC purposes.

f) In the USA some long-haul road transport operators have their trucks fitted with satellite based positioning devices so that they can monitor the truck's location and more accurately manage their business. Distance travelled can be assessed by continuously monitoring such devices.

Of the above devices hubodometers are considered to be the most practical for the Namibian situation.
Odometers are less accurate than hubodometers and more easily tampered with. Tachometers are even less tamper-proof and require interpretation for assessment of distance.

Haldameters are no longer in production. Norway, Sweden and Iceland discontinued their RUC systems when they joined the European Common Market and Haldex, the manufacturer of the Haldameter, have disestablished their Haldameter production facilities. In addition to this a number of problems were

reported in maintaining the Haldameters operational under the climatic conditions experienced in these countries.

Transponders for satellite positioning systems are readily available and relatively low cost, although significantly more costly than hubodometers. However such tracking systems would require sophisticated equipment to keep track of all heavy vehicles on a national basis and present a major enforcement problem to ensure that the transponder on each vehicle is active at all times that the vehicle is travelling.

9.5 Hubodometers

9.5.1 Availability

Seven makes of mechanical hubodometer are currently approved for RUC purposes in New Zealand. These are Accutrak, Argo, Jost, Mechanex, Stemco (previously known as Engler), Trailmark and Veeder-Root. These makes all have representatives in a number of countries. A number of these hubodometer makes are currently being used by transport operators in Namibia.

In the New Zealand legislation provision exists for electronic hubodometers, however to date none have been approved because prototypes have not proven reliable under normal vehicle operating conditions.

9.5.2 Performance Specification

A hubodometer is a simple, user friendly, robust device. The performance specification is that it:

a) Records in kilometres and tenths of kilometres.

b) Records revolutions at road speed to within ± 2 %.

c) Adds one count on the unit wheel for the specified number of revolutions.

d) Advances the counter when revolved in either direction.

e) Operates throughout the temperature range -15°C to 85°C with no sign of irregular movement or change in recording accuracy.

f) Shows no presence of condensed water on the inside of the indicator window when immersed in cold water for 6 hours, dried, heated to 50°C and allowed to cool.

g) Is tamper detectable, eg is pressurised with inert gas to prevent fogging.

Hubodometers are calibrated to measure 1 kilometre for a specified number of revolutions. This is then used with tyre specifications showing revolutions per kilometre to choose the hubodometer that is the best match for the tyre.

The accuracy of hubodometers in service depends on the load on the tyre, the amount of tyre wear and the tyre inflation pressure. Hubodometers tend to under-record on new tyres that are inflated to the manufacturer's recommendations for the load and over-record on worn or under-inflated tyres.

Hubodometers are available for most common truck tyre sizes but a compromise may be necessary for some non-standard tyres. *It is recommended that the Road Fund Administration have the ultimate say in determining the tyre size designations which may be used with a particular hubodometer model.*

9.5.3 Cost and Replacement

The cost of hubodometers ranges from N$280 to N$350 per unit based on current prices in New Zealand. The cost in Namibia could be lower than this given the lower local cost structure. However the volumes will be less than in New Zealand. Most hubodometers come with a manufacturer's warranty of 250 000 to 500 000 kilometres, which means that in ideal conditions they should last 2 to 4 years on heavy vehicles in Namibia. This life expectancy could be shortened by damage. Installing the hubodometer within a protective cup limits the damage.

9.5.4 Tampering

Like any device, hubodometers can be tampered with. However the hubodometers approved for use in New Zealand are tamper detectable and hubodometer tampering offences are a very small percentage of all hubodometer offences in New Zealand. A more likely offence is the complete removal of a hubodometer from a vehicle.

9.5.5 Offences and Penalties

Tampering with and removal of hubodometers are not the only possible hubodometer offences. Other possible offences are listed in Appendix M.
It is recommended that hubodometers be regularly checked as part of the on-road enforcement of heavy vehicle laws. The following should be looked for:

a) Hubodometer with no serial number or a serial number different to that shown on the weight-distance licence.

b) Hubodometer make not approved.

c) Hubodometer model not approved for the tyre designation.

d) Hubodometer not fitted correctly.

e) Visible damage to the hubodometer.

f) Evidence of tampering, eg moisture inside the indicator window.

If there is any indication that the hubodometer is not operating correctly it should be checked by having the vehicle travel a known distance, eg a kilometre, at normal road speed. Only inaccuracies of more than 10% should be of concern under this type of test.

In New Zealand distance recorder offences incur an infringement fee equal to three times the weight-distance charge assessed as being payable. Weight-distance offences are also tied to an administrative review of the operator permit such that multiple offences can result in cancelling of the permit. *It is recommended that strong penalties be provided for hubodometer offences similar to those in use in New Zealand.*

9.5.6 Approval and Installation

It is recommended that hubodometers for weight-distance charging purposes be controlled by either the MWTC or the Road Fund Administration as set out in Appendix M.

There are essentially three options for installation of hubodometers:

a) Allow anyone to install hubodometers and rely on law enforcement to ensure that they are correctly installed.

b) Restrict installation to authorised persons or companies, which could include some road transport operators and commercial vehicle repair facilities.

c) Establish or use a Government agency to install hubodometers.

For a hubodometer to accurately measure distance it is important that it is correct for the particular tyre size and that it is mounted within 3 millimetres of the axis of rotation of the axle to which it is fitted. An offset of 5 millimetres can give significant misreading. For enforcement purposes it should also be affixed in a manner so that it is not easily removed. No practical means of sealing the hubodometer to the axle have been developed. *Recommended installation requirements are given in Appendix M.*

Because of the accuracy required for correct installation of hubodometers, it is recommended that, at least initially, installation for weight-distance charging purposes be restricted to approved persons or companies. Approved installers will need to keep a register of the hubodometer makes and serial numbers that they have installed for later enforcement checking.

9.5.7 Use of Hubodometers for Weight-Distance Charging in Namibia

It will be evident from the above that the use of hubodometers for weight-distance charging purposes requires a significant amount of administration and enforcement effort. The number of possible offences emphasises the need for adequate enforcement. Transport operators in Namibia are concerned that enforcement will not be adequate on all operators and therefore there will be a major loss of RUC revenue and inequity between operators who pay and those that do not. These concerns are real and are supported by experience in New Zealand.

The alternative of using a standard distance for all vehicles within a particular vehicle class has inequalities for particular types of operation. Subdivision by type of operation is very difficult to administer and subject to abuse. *On balance it is recommended that the actual distance travelled by heavy vehicles be measured for weight-distance charging purposes in Namibia and that hubodometers be used for the measurement.*

However it is strongly recommended that a weight-distance charging system using measured distance only be introduced when there is demonstrable on-road enforcement of heavy vehicle laws.

9.6 Allowance for Vehicle Mass

As for distance, the value of weight (mass) used can either be a standard value for the vehicle or type of vehicle or more closely related to the actual value. The advantages and disadvantages of using a standard mass or an actual mass are similar to those for distance. A very large enforcement effort is required if any choice on vehicle mass for weight-distance charging purposes is given to the operator.

For calculating charges exactly, the total mass of the vehicle including the load is required. In practice this will often vary from time to time, ranging from tare mass to maximum legal mass or above. Because the ESA of a vehicle is related to the 4th power of the gross mass, it is necessary to have information on the proportion of travel at the various gross masses.

The New Zealand system allows the vehicle operator to nominate the maximum mass that the vehicle will carry under a particular RUC licence (purchased in multiples of 1000 km). This is a very flexible system but also has a number of disadvantages, mainly that it is open to fraud and requires a major full-time enforcement effort. Some assumptions still need to be made to obtain an actual mass value for use in calculating charges to allow for the fact that the vehicle will not be loaded to the nominated maximum gross mass at all times.

For Namibia it is recommended that a standard value for mass be used (multiplied by an appropriate Load Factor). The standard mass could be:

- The vehicle manufacturer's GVM.

- The tare of the vehicle multiplied by an appropriate factor.

- The maximum permissible gross vehicle mass in accordance with the Road Traffic Regulations.

The last option is recommended. This value can be readily ascertained for all vehicles to which the weight-distance charges will apply and will be recorded in the NaTIS vehicle registration and licensing system.

9.7 Allowance for Off-Road Travel

If actual distance travelled is to be measured for weight-distance charging purposes, the question arises as to what allowance should be made for distances travelled off public roads. In theory weight-distance charges should only apply to travel on public roads because these are the roads to which the cost recovery relates. However weight-distance charges are only part of the RUC system.

In section 8 it was noted that refund of the RUC diesel levy would only be available to those economic activities where there is a significant proportion of the fuel used off-road. That is, there will be no refund for fuel used in a road vehicle when it is operating on private roads. Similarly there is no rebate on vehicle licence fees where a proportion of the total annual distance is on private property.

It can be argued that a similar approach to that used for vehicle licence fees and fuel levies should be taken with weight-distance charges, ie that all distance travelled by heavy vehicles no matter where it occurs should be recorded and be chargeable distance. This approach has appeal because it is simple from an administrative point of view. However there is an equity issue that would be very real for farmers and similar people that use their vehicles mainly on their own roads which they have to pay upkeep on.
Options to address this issue include:

a) Identify farmers with large farms and similar people as a group, eg according to submitted documented involvement in farming or similar activities, and allow a standard proportion of each weight-distance licence purchased for heavy vehicles operated by such people to be rebated. The standard proportion should be based on representative surveys.

b) Allow any heavy vehicle owner to claim off-road running provided documented evidence is retained for all travel by the vehicle.

c) Allow vehicle operators to remove a vehicle's hubodometer when not on a public road.

Option a) is similar to the process currently used for diesel refunds as far as establishing eligibility is concerned. Use of a standard or average rebate would still produce inequities because vehicles would have different percentages of travel off road. Option c) eliminates the need for a refund or rebate system but

encourages the removal of hubodometers. This would need vigilant enforcement to ensure that the hubodometer was replaced as soon as the vehicle was on a public road. Such enforcement is unlikely in the remoter parts of Namibia.

Option b) requires a positive action with documented evidence to obtain a refund. Claims are specific to the particular vehicle. *It is recommended that provision be made for any heavy vehicle owner be claim off-road running provided documented evidence is retained for all travel by the vehicle.*

Off-road refunds should relate to a particular weight-distance licence for a particular heavy vehicle and be claimed at the expiry of the licence but within a limit of two years from the date of issue of the weight-distance licence. The claim should include the actual distance travelled off-road, where it occurred and a brief description of the activity involved. Vehicle operators that claim off-road refunds should be required to keep records of all distances travelled off-road and maintain such records for a period of at least two years. Legislative provisions for off-road refunds are given in Appendix M.

A special type off-road travel is travel outside Namibia by domestically registered vehicles. *It is recommended that travel outside Namibia be accommodated by logging the hubodometer reading as the vehicle leaves Namibia and logging it again as the vehicle returns.* The difference in distance would be recorded as a credit against Namibian weight-distance charges. There would be no requirement for the vehicle operator to provide any supporting documentation or keep any records in this case.

9.8 Time Licensed Vehicles

In the New Zealand system special provision is made for certain types of off-road vehicles, mainly mobile machinery, which cannot easily be fitted with distance measuring devices. These vehicles are permitted to operate under RUC time licences which are sold for a year or a quarter of a year.

The RUC rates for time licences assume an average on-road distance per year and that the vehicle will operate at the maximum gross mass for the whole of this distance, ie no Load Factor is used in the RUC calculations for time licences. These vehicles are not permitted to carry a payload other than their equipment.

Weight-distance charges could easily be calculated for identified off-road vehicles in Namibia if the need exists. *It is recommended that off-road vehicles be exempt from weight-distance charges.*

9.9 Special Vehicles

From time to time weight-distance charges will be required for vehicles other than those for which charges have been set. This particularly applies to heavy

transporter type vehicles with oscillating axles (4 or 8 tyres per axle) or vehicles equipped with large tyres. Charges can easily be calculated for such vehicles as the need arises given information on the relevant Axle Reference Loads. A process for this is set out in Appendix K.

It is recommended that provision for special weight-distance rate calculations be made in the legislation.

9.10 Weight-Distance Licences

There are essentially two options for collecting the weight-distance charges described in this section:

a) Post-payment of assessed or declared distance.

b) Pre-purchase of the right to travel.

Option a) is similar in effect to the method of payment that applies to utilities such as water, electricity and telephone. For utilities, meters record the use and users are billed at regular intervals, eg monthly. Utility meters are usually read less frequently than the billing cycle with assessments of usage being made between meter readings. This approach could be used with hubodometers to bill heavy vehicle owners for use of public roads. The hubodometers could be read at quarterly or six-monthly inspections with monthly billing.

In considering the above options it is worth noting that there are the following important differences between the supply of utilities and the supply of roads:

a) Utility suppliers are in a position of total control over the availability of the service and can cut off the supply if a user does not pay the bill sent, whereas it is almost impossible for a road authority to prevent use of roads by a particular person or vehicle. Bad debts for road use are therefore more likely than for a utility. Prepayment reduces this likelihood.

b) Utility meters are an integral part of the supply system and cannot easily be disconnected. This does not apply to hubodometers which can be lost, damaged, removed or replaced with a hubodometer from another vehicle. More checking of the road meter is therefore required to ensure that it is the correct one, is in place and is working, than is necessary for a utility meter. The existence of a licence relating the hubodometer and the vehicle makes hubodometer enforcement easier and clearly identifies operators that have paid and those that have not.

Overall option b) is recommended. This is similar in effect to vehicle licensing where the right to operate on public roads is purchased at the beginning of each year and a licence is issued to identify for enforcement purposes that the fee has been paid.

Because of the large amounts involved for weight-distance charges, it would not be appropriate to require the purchase of a year's travel in advance. In any case it would be difficult to accurately estimate the distance for a whole year. *It is therefore recommended that vehicle owners be permitted to purchase a weight-distance licence for a nominated number of kilometres.*

It must be a legal requirement that weight-distance licensing is continuous, i.e. the start hubodometer reading for a new licence must correspond to the finish reading on the last licence previously purchased for the vehicle.

Provision will need to be made in legislation for the process to apply when weight-distance rates are changed. It is suggested that weight-distance licences purchased at the old rates be valid for up to one month after a rate change. Any unused distance on a licence at the old rates should be credited to the operator's account when a licence is purchased at the new rates. In this case the start hubodometer reading for the new licence would be the actual hubodometer reading at the time that the new licence was purchased or at the date one month after the rate change whichever comes first.

Provision also needs to be made to credit the unused portion of a weight-distance licence in the following situations:

a) If a weight-distance has been issued incorrectly.

b) If the vehicle's hubodometer or registration number change.

c) When the vehicle is permanently destroyed, exported or deregistered.

For enforcement purposes the weight-distance licence needs to be in a form that can be prominently displayed on the vehicle to which it applies. Allowance could be made for licences for trailers to be displayed on the towing vehicle. However it is preferable that each vehicle carries its own licence.

The design of the weight-distance licence should be such that it is not easily counterfeited. Although the base record in legal terms should be the record in the computer system. In the New Zealand RUC system individual licences are printed by computer and contain a two-dimensional bar code which can be read by a hand-held scanner. This eliminates the need for tight control of blank licence forms. The recommended form of licence is shown in Table 9.4.

Table 9.4 Recommended Form of Weight-Distance Licence

Requirements for weight-distance licensing are given in Appendix M.

9.11 Availability of Licences

There is a question of how readily available weight-distance licences should be. Licences could either be available from agents throughout Namibia or from a central point. There are benefits in both approaches.

Agents can interact face to face with a vehicle operator often with the vehicle available and, with an on-line computer system for issuing weight-distance licences, can eliminate most problems associated with incorrect licensing as they occur. The licence can be supplied to the vehicle operator at the same time as payment is received. A range of payment methods, including cash, are possible. Against this, agents are unlikely to provide a weight-distance licensing service 7 days a week. This level of service is required if the non-availability of a licence is to be eliminated as a defence for not having a licence.

A central office could provide a 7 day a week service but would have to deal remotely with vehicle operators, eg by telephone or facsimile. For this type of service to work effectively as a pre-payment system, it would be necessary for operators to establish a credit arrangement with the issuing authority. Weight-distance licences could be sent to operators by facsimile. Recommended provisions to allow this are given in Appendix M.

As an agent network will be in place for vehicle registration and licensing it is recommended that this network or a subset of it also be used for weight-distance licensing. It is recommended that the agent network be the primary point for obtaining weight-distance licences with provision for urgent licences to be issued from a central point.

9.12 Administration Fee

There will be an identifiable cost associated with the issue of each weight-distance licence which will need to be recovered. Options are:

a) Build the full cost of administering the weight-distance system and issuing weight-distance licences into the charges.

b) Set a separate charge to cover the cost of administering the weight-distance system and issuing weight-distance licences.

Under option b) the cost of issuing a weight-distance licence is explicit and will influence the frequency of purchase. *It is recommended that a separate administration charge be set for weight-distance licences.*

Based on using the NaTIS system as the computer support for weight-distance charges, it is estimated that the administration fee for weight-distance licences will be approximately N$15 per licence. This estimate assumes that the capital cost of NaTIS is charged to the vehicle registration and licensing processes and only the marginal transaction costs associated with weight-distance licences are recovered by the weight-distance administration fee.

10. Cross-Border Charges

Foreign registered heavy vehicles contribute a significant proportion of the total road use in Namibia. This is likely to increase with completion of the Trans-Kalahari and Trans-Caprivi highways. It would be inequitable for Namibian registered vehicles only to have to pay the total road costs in Namibia. A system for charging foreign registered vehicles for the use of Namibian roads is required. Such charges are recognised in the international agreements within the Southern African region.

In accordance with the principle of non-discrimination, charges for foreign registered vehicles operating in Namibia should be essentially the same as for domestic vehicles. Cross-border charges, which apply only to foreign registered vehicles, should recover from these vehicles a payment equivalent to that which a domestically registered vehicle would pay for the same journey in Namibia.

10.1 Calculation of Charges

The calculation of cross-border charges is simplified if it is assumed that there is a balance between fuel purchased by foreign vehicles operating in Namibia and fuel purchased by Namibian vehicles operating outside Namibia. In this case the cross-border charge for travel in Namibia only needs to recover an amount equivalent to the corresponding weight-distance charge plus a *pro rata* amount of the annual vehicle licence fee. *This approach is recommended.*

Using the above assumption the only significant charges to be recovered are those for heavy load vehicles. The cross-border charge (or entrance fee) for light vehicles and buses to recover the *pro rata* share of the annual licence fee would be likely to cost more to collect than the revenue received.

The number of foreign registered heavy load vehicles operating in Namibia and the distance they travel in Namibia could be explicitly included in the vehicle population data used to calculate the RUC rates. However this will not significantly affect the calculation of unit costs because the numbers of vehicles are small and the difference between the distance they travel in Namibia and the distance that similar domestically registered vehicles travel outside Namibia is already included in the VKT figures used in the RUC calculations.

Cross-border charges, for the vehicle classes used for weight-distance charges, are given in Appendix J for the various expenditure budget scenarios and for the recommended diesel and petrol levies. The shaded rates in the tables in Appendix J are for the normal legal maximum GVM. The lower GVM value shaded for each vehicle class corresponds to the current Road Traffic Regulation limits while the higher value will apply under the amendment which is proposed to bring Namibia into line with South Africa.

The cross-border charges are calculated on the basis of 100% of fixed costs being converted into a traffic-related charge. As for weight-distance charges, the fixed cost charge for the combination vehicles classes is applied only to truck tractors.

The calculated cross-border charges from Appendix J applied to the current legal maximum GVM for each vehicle class are shown in Table 10.1. *It is recommended that the charges in Table 10.1 be the standard cross-border charges for the vehicle classes shown.*

Table 10.1 Cross-Border Charges (N$ / 100 km) for Current Legal GVM

	1998/99		1999/2000		2000/01	
	Scaled	**Smoothed**	**Scaled**	**Smoothed**	**Scaled**	**Smoothed**
Total Budget, N$ million	329.256	384.237	355.597	414.976	384.045	448.174
Petrol Powered Vehicles:						
2 Axle SUT	13.43	13.83	12.85	14.07	13.38	14.40
3 Axle SUT	12.19	12.51	11.16	12.59	11.64	12.80
2 Axle Truck Tractor	20.76	22.41	20.45	22.96	21.27	23.65
3 Axle Truck Tractor	16.85	17.78	16.00	18.06	16.67	18.48
Diesel Powered Vehicles:						
2 Axle SUT	20.17	22.26	20.27	22.83	21.13	23.50
3 Axle SUT	21.49	24.13	21.39	24.68	22.34	25.36
2 Axle Truck Tractor	27.50	30.84	27.87	31.73	29.02	32.75
3 Axle Truck Tractor	26.15	29.40	26.23	30.15	27.36	31.03
Unpowered Vehicles:						
1 Axle Trailer (single tyres)	8.56	10.62	8.70	10.95	9.05	11.31
1 Axle Trailer (dual tyres)	2.64	3.36	2.56	3.42	2.68	3.49
2 Axle Trailer (single tyres)	16.27	20.18	16.60	20.81	17.27	21.52
2 Axle Trailer (dual tyres)	7.55	9.49	7.55	9.73	7.88	10.02
3 Axle Trailer (single tyres)	18.00	22.38	18.31	23.06	19.05	23.83
3 Axle Trailer (dual tyres)	9.28	11.69	9.24	11.98	9.65	12.32

To allow for the situation where, because of tyre load capacity or other legal limitation, the maximum legal GVM for a particular vehicle is lower than the standard GVM, it is recommended that provision be made for a lesser cross-border charge to be approved for that vehicle. The non-standard cross-border charge can be obtained from the tables in Appendix J.

When the amended Road Traffic Regulations have been implemented it is recommended that the standard cross-border charges be increased to the higher shaded values shown in the tables in Appendix J.

Based on the calculated cross-border charges *it is recommended that only Heavy Load Vehicles, as defined for vehicle registration and licensing (refer subsection 6.1) and including only those diesel powered LGVs with a GVM exceeding 10 tonnes, be subject to the cross-border charge system.*

10.2 Comparison with Maximum SADC/SACU Charges

Table 10.2 gives the maximum cross-border charges calculated by SADC/SACU for Namibia updated from the 1995/96 prices given in Appendix B.

Comparison with Table 10.1 shows that the recommended cross-border charges are well below the recommended maximum values.

Table 10.2 Maximum SADC/SACU Cross Border Charges (N$ / 100 km)

	1998/99	1999/2000	2000/01
Bus	43.1	46.5	50.2
Heavy Goods Vehicle With -			
2-3 Axles	55.4	59.8	64.6
4-5 Axles	107.2	115.8	125.1
6+ Axles	148.6	160.5	173.3

10.3 Measurement of Distance

The same range of options are available for assessing distance for cross-border charges as applies for weight-distance charges, i.e. foreign registered vehicles to which cross-border charges apply could be required to have an appropriate distance measuring device, or the distance travelled in Namibia could be assessed from the cross-border permit under which the vehicle operates.

It is recommended that, at least initially, an assessed distance based on the consignment note for the particular cross-border journey (refer Appendix B) be used for cross-border charges. For most journeys the distance could be computed from tables of distance from border posts to towns within Namibia.

Use of the consignment note as the basis of cross-border charges will mean that a significant enforcement effort should be directed at ensuring that the destination in Namibia shown on the consignment note is accurate. *It is recommended that in administering cross-border heavy vehicle transport strong emphasis be placed on the accuracy of the consignment note required under the international agreements.*

10.4 Cross-Border Licences

As for weight-distance charges, *it is recommended that cross-border charges be pre-paid, i.e. the cross-border charge should be paid for each journey prior to entry into Namibia.*

There is not the same necessity to have and display a licence for cross-border charges because each journey within Namibia is subject to control at the start (and end if necessary). The minimum requirement is a document confirming the charges that have been paid and the journey to which they apply. Such a

document could be issued manually or provision made for endorsement on the consignment note.

10.5 Administration Fee

There will be an identifiable cost associated with the issue of each cross-border licence which will need to be recovered. The options are the same as for weight distance charging system and the recommendation is the same. *It is recommended that a separate charge is set to cover the cost of administering the cross-border system and issuing cross-border licences.*

The administration fee will be the same as for weight-distance charges, ie approximately N$15 per licence.

11. Abnormal Vehicle Charges and Overloading Fees

These charges are just an extension of the Weight-Distance Charging system.

11.1 Abnormal Vehicle Charges

The number of vehicles operating under abnormal vehicle permits and the distance they travel could be included in the vehicle population data. However as for foreign registered vehicles, this will not significantly affect the calculation of unit costs because the numbers of vehicles are small.

If charges for vehicles operating under an abnormal vehicle permit are not covered by the published tables they can simply be calculated using the unit cost information and the process in Appendix L.

11.2 Overloading Fees

The existing Criminal Procedure Act 1977, stipulates fines for overloaded vehicles as shown in Table 11.1.

Table 11.1 Current Overload Fines

Overload per Axle, kg	Fine per Axle, N$
0-500	100
501-1 000	150
1 000-1 500	175
1 501-2 000	200
> 2 000	Prosecution

It is proposed that in the future overloading be decriminalised (with the possible exception of extremely overloaded vehicles) and that overloaded heavy vehicles instead pay a fee sufficiently punitive to deter overloading.

The overload fee should in theory:

a) Recover the weight-distance charge for the measured load less the standard weight-distance charge for the vehicle.

b) Include a punitive multiplier on a).

The charge under a) can be determined from the weight-distance charge tables in Appendix I. As the standard weight-distance charge for the vehicle is the charge applicable to the legally permissible GVM, the overload fee can be expressed as a charge for the increment of mass above the legal limit. An overload charge should be determined for each axle type or axle unit type because it is the mass on individual axles or axle units that cause road damage rather than the total mass of the vehicle (which is more critical for bridges).

For simplicity overload fees, shown in Table 11.2, have been calculated using the 2000/01 "Smoothed Budget Scenario" unit costs for the 5 axle combination vehicle. The fees for the other expenditure budgets would be proportionately smaller. Because the weight-distance charges are expressed in cents/km (or N$/100km) it is necessary to assume a distance over which the overloaded vehicle has operated. This has been taken as 1000km.

Table 11.2 Calculated Overloading Fees

Overload per Axle, kg	Fee per Axle, N$	
	Single tyred Axle	Dual Tyred Axle
500	14	28
1 000	31	63
1 500	52	104
2 000	76	152
2 500	104	210
3 000	137	276
3 500	174	353
4 000	218	441
4 500	267	542
5 000	322	656

As the fees in Table 11.2 are additional charges for road use (if assumed distance is accepted) it is recommended that provision be made for these fees to be paid into the Road Fund.

It is recommended the actual overloading fees include a punitive multiplier of 10 on the fees given in Table 11.2.

12. Collection and Control Systems

12.1 Computer Support

The effective and efficient administration of weight-distance charges requires interactive computer support on a nation-wide basis. This is because of:

- The continuous nature of weight-distance licensing.
- The need to keep a record of licences for refund purposes.
- The need to keep a record of hubodometers associated with vehicles.
- The need to accurately record road user revenue against licences issued.

It is proposed that the Namibian adaptation of the NaTIS vehicle subsystem used for registration and licensing of vehicles will meet this need and provide the necessary controls.

For cross-border charges, only the last of the above requirements apply and the charges could be administered without an on-line computer system. However such a system is desirable particularly if it is used for other border control functions.

NaTIS is one logical database even if distributed processing is used, i.e. any office can access the record for any vehicle no matter where the vehicle is registered. It is proposed that the Namibian NaTIS system would be able to access information on the South African NaTIS system, and in any other country that uses NaTIS.

NaTIS currently uses vehicle classification plus tare mass as input to a lookup table to determine the vehicle licence fee. NaTIS can accommodate a number of fee calculations using a range of input variables, so the facility is already available to determine weight-distance or cross-border charges.

It will be necessary to add features to NaTIS to accommodate the requirements of weight-distance charges and cross-border charges. The required modifications to NaTIS are not extensive but they need to be carefully specified once the various aspects of the weight-distance system and cross-border system have been agreed.

The implementation of the NaTIS system is proposed to start in Windhoek with the other regions later. Current planning is to have the whole country covered by the end of 1998.

Other associated modules that have reached operational status in the RSA include:

- CUPS module - used for cross-border permits, including managing quota limits, in accordance with the SACU MOU.

- PASCB module - used for cross-border permits for all other countries (complies with agreements).

12.2 Border Post Facilities

The Customs Department and Nampol maintain facilities at all border crossings. Nampol is in the process of establishing a computer link to all major border posts to give access to their stolen vehicles database. The MWTC is moving to strengthen some of the major border posts with permanently manned weighbridges. This means that there will be infrastructure available at border posts to administer cross-border charges.

It is recommended that some computer support for cross-border charges be provided at the border posts based on utilising the Nampol system. The availability of the permit administration modules referred to above are desirable but not considered to be critical to the implementation of the RUC system.

12.3 Enforcement

A disadvantage of the more sophisticated RUC instruments is that they require a significant enforcement effort to ensure that they are correctly complied with. This is particularly true for weight-distance charges where there are a number of potential offences.

For the New Zealand weight-distance charge system, a specially trained unit of approximately 70 police officers has been established within the Traffic Division of the Police for on-road enforcement of all heavy vehicle related matters. In addition a separate compliance unit of approximately 12 people operates under the control of the Ministry of Transport. The compliance unit undertakes detailed assessments of operator's records to identify evasion of correct payment of road user charges. A large proportion of potential evasion in the New Zealand system relates to the ability of the vehicle operator to nominate the weight at which the vehicle is licensed. This feature is not recommended for Namibia.

In Namibia enforcement resources are potentially available both within Nampol and the MWTC as described below.

12.3.1 MWTC Road Transport Inspectorate

The MWTC has recently established a transport inspectorate within the ministry with a total of 40 approved positions. Recruitment started in late 1995 and by early 1997 all posts but two were filled. In recruiting staff preference has been given to suitable candidates with prior police or road transport experience. Staff training activities are planned to be implemented with assistance from the Republic of South Africa.

From an operational point of view the Road Transport Inspectorate is organised with five regional offices which have the operational responsibility as far as the enforcement activities are concerned. The regional offices (four of which are operational as of now) are supported by a small headquarters staff with administrative and co-ordination functions.

The Road Transport Inspectorate is empowered to handle enforcement activities in the road traffic and road transportation fields, with emphasis given to the control of road transport permits. With appropriate training and a will to make the weight-distance system work, this inspectorate would go a long way towards meeting the enforcement requirement.

12.3.2 Nampol Traffic Unit

Provided driver and vehicle roadworthiness testing is transferred away from the Nampol Traffic Unit, the existing Traffic Unit resources supplemented with weight enforcement provided by the MWTC Road Transport Inspectorate should be sufficient to enforce the proposed weight-distance system.

The more specific roles and responsibilities of the different enforcement agencies, which in addition to the Nampol Traffic Unit and the Road Transport Inspectorate also include the municipal traffic departments, remains to be settled.

12.3.3 Overload Control

Overload control becomes even more important under a weight-distance charging system. Adequate facilities and resources to man them are required nation-wide and at border posts. Current assessments of the additional damage to the road network from overloaded vehicles is about N$ 10 million per year.

MWTC is at present working out a overload control strategy comprising the following main components:

- As a first step the existing, non-functioning mobile weigh scales are proposed to be replaced and put to use as soon as possible. There are already adequate facilities for mobile weighing operations available along the trunk road network. Once new scales are available these facilities will be used for adhoc overload control.

- The rehabilitation/improvement of existing permanent weighbridges and the construction of new weighbridges will form an important part of the formal overload control program. A total of 11 permanent weighbridges, strategically located, will be established. Seven of these will be operated 24 hours a day. These permanent weighbridges will cover both domestic traffic as well as cross-border traffic at the two main border crossings with RSA and along the future Trans-Kalahari and Trans-Caprivi Highways.

- Both permanent and mobile weigh stations will require manning by police officer and road transport inspectors. It is intended that one of the responsibilities of the road transport inspectors, mentioned under 12.3.1 above, will be to assist in the operation of permanent and mobile weigh stations and scales.

The above mentioned measures will be implemented in three stages, with the first two stages providing the required physical facilities as well as the training of staff. These two stages are scheduled to start in 1997 and be completed by the year 2001. In the final stage the new overload control system shall be fully operational.

A summary of the proposed schedule for permanent weighbridges is given in Table 12.1.

Table 12.1 Establishment of Permanent Weighbridges

Stage	Location	24 hours Operation	Period of Construction
Stage 1	Ariamsvlei	*	Existing
	Noordoewer	*	
	Walvis Bay	*	97/98 - 98/99
	Windhoek North	*	
	Ondangwa	*	
	Gobabis	*	98/99 - 99/00
Stage 2	Otavi		
	Katima Mulilo	*	
	Windhoek South		99/00 - 00/01
	Otjiwarongo		
	Grootfontein		
Stage 3	Consolidation and improvement of the new overload control system		

MWTC has requested a total of N$ 11.9 million for overload control measures under the development budget of the Government for the period 1997/98 - 2000/01 for the above programme.

12.4 Agents

As discussed in section 5, the Road Fund Administration should have overall responsibility for the long term RUC system. It will however be necessary to use agents to sell licences to vehicle owners and operators.

Investigations are currently underway to find new agents for vehicle registration and licensing activities in those areas where the Ministry of Finance and the Ministry of Regional and Local Government and Housing are currently the agents. Fischer & Associates have recommended that the agency structure be rationalised in such a manner that the vehicle licensing arrangements are integrated with vehicle and driver testing, operator registration and traffic policing.

As the NaTIS system is proposed as the computer support for weight-distance charges, *it is recommended that the agents for vehicle registration and licensing, or a subset of them, be used as agents for weight-distance charges*. Weight-distance charges will apply only to a subset of the vehicles in the registration and licensing system and therefore it is possible that not all vehicle registering areas would need to provide agency based weight-distance licensing. Weight-distance licences for vehicles in areas without an agency service could be supplied from a central office.

It is recommended that consideration be given to establishing additional agents for weight-distance charges that are more accessible to the large vehicles which come under the weight-distance system. Truck Ports are one such possibility. In the New Zealand RUC system weight-distance licensing agents include Oil companies and vehicle testing companies as well as New Zealand Post.

Consideration should also be given to setting up agents in adjoining countries who could collect cross-border charges, issue a confirming document and remit the charges to Namibia. The confirming document would need to be provided at the border control post, but the processing time at the border post would be significantly reduced.

12.5 Payment Methods

A range of payment methods should be allowed for the long term RUC system. Possibilities include:

- Cash.
- Cheque.
- Credit card.
- Company card.
- A special RUC debit card.
- Other credit arrangements.

An agreement could be made with oil companies to allow their cards to be used for purchase of weight-distance and cross-border licences at their outlets. The oil company would be responsible for the creditworthiness of the vehicle operator to which the card is issued.

A special RUC card could be provided which would be used only for purchase of weight-distance and cross-border licences. The RUC card should be established to debit the vehicle operator's nominated bank account. Establishment of vehicle operator creditworthiness and issue of the RUC card should be contracted to a bank or credit company.

13. Implementation Issues

The intent for the long term RUC system is that it should be introduced in April 1998. However, the possibility of achieving this goal is dependent on the implementation of a number of supporting activities.

13.1 Legal and Institutional Framework

Preparation and implementation of the new legal and institutional structures within which the long term RUC system will work is proceeding in parallel with the work on the design of the RUC system. This RUC study is not directly involved in the preparation of these new structures. However, the structures will form an essential part of the RUC system.

The following requirements are of particular importance for the future functioning of the RUC system:

a) Road Traffic and Transport Bill

The long term RUC system cannot be implemented without the new Road Traffic and Transport Bill. The Bill allows the freedom for the Minister of Transport to appoint appropriate agents for vehicle registration and licensing and to levy road user charges. It is expected that the new Bill will be enacted by the Parliament during 1997.

From a RUC point of view, the most important aspects of the Bill are that it:

- Provides for the Minister of Works, Transport and Communication to appoint registering authorities (S10), prescribe the system of registration and licensing of motor vehicles (S22), and make regulations with respect to fees to be charged (S24).

- Provides for the testing of drivers to be undertaken by Driver's Licence Testing Centres to be approved by the MWTC (S29 and S34 to S39).

- Provides for vehicle road worthiness testing to be carried out at Vehicle Testing Stations approved by the MWTC (S57 to S62).

- Provides for cross-border permits with prescribed fees (S73) and cross-border agreements (S154).

- Provides for the Minister to make regulations including for fees to be charged under the act (S124).

- Gives power to the Minister to authorise refunds (S140) and in consultation with the Minister of Finance, to levy road user charges (S137).

b) Road Fund Administration and Roads Authority Bill

From a legal point of view it would be possible to implement the long term RUC system without a legally constituted Road Fund, Road Fund Administration or national road authority. However it is desirable that these institutional structures be established as part of the new RUC system.

A layman's draft of Bills for the Road Fund Administration (NamFund) and the national road authority have been prepared. The following aspects of the Road Fund legislation are of particular importance for a well functioning RUC system:

- NamFund should be separate from the Fiscus.
- The board of NamFund should include interested parties, in particular the road users.
- Adequate powers must be provided so that NamFund can ensure an effective management of the road user charging system.
- NamFund must be able to employ staff, consultants and advisers and establish committees as necessary to carry out its functions.
- Accountability and transparency for the road user charges, the Road Fund and road expenditure decisions must be clearly defined.
- The Road Fund Administration should recommend RUC rates to the Minister of Finance and Minister of Transport.
- Recommended rates should be justified in terms of the safe and efficient performance of the road network.
- Payment of road user charges should go directly into the Road Fund rather than via the State Revenue Fund.
- Systems for budget approval and financial management should be designed in such a manner that control of finances in a multi year context is facilitated.
- Requirements for collection and accounting of all road user charges must be defined.

c) Legislation for Weight-Distance Charges and Cross-Border Charges

Some legislation will be required to define details of the weight-distance charging and cross-border charging systems.

The following minimum requirements should apply to weight-distance charges:

- Licensing must be continuous.
- The form of the licence should be defined.
- There should be a requirement for the licence to be carried on the vehicle to which it applies and be prominently displayed. An exception could be made for trailers and semi-trailers.
- The process to apply when weight-distance rates are changed should be specified.
- Provision needs to be made for approval of hubodometers.
- Provision needs to be made for the replacement of damaged or lost hubodometers.
- Weight-distance offences with penalties need to be defined.

Recommended legislative provisions for weight-distance licensing are given in Appendix M.

13.2 Computer Support

The need to ensure continuous licensing and availability of weight-distance licences throughout Namibia, means that it is not practical to implement the systems of weight-distance charges recommended in this report without nation-wide computer support. Implementation of the long term RUC system is therefore dependent on the timing for implementation of NaTIS.

Some changes will have to be made to NaTIS to accommodate the RUC system requirements. These should be commenced as soon as agreement is reached on the design of the long term RUC system.

13.3 Enforcement

The enforcement resources and performance required for the long term RUC system will need to be evaluated in more detail once the various aspects of the new system and the role of the various enforcement agencies have been agreed.

Special training of enforcement officers in the new systems will be necessary.

13.3.1 Nampol Traffic Unit

As noted in earlier sections, weight-distance charges require an adequate level of on-road enforcement. The current enforcement capacity of the Traffic Unit of the Namibian Police is insufficient for this.

The following major institutional changes now being investigated, planned or implemented need to be completed before the long term RUC system is implemented:

- The activities of the Traffic Unit will in the future be financed from the Road Fund. Some formal arrangement should be put in place to permit the Road Fund Administration to have some input to the level of on-road enforcement of the RUC system.

- The transfer of the responsibility for driver and vehicle testing from the Traffic Unit to the DOT of the MWTC needs to be actioned so that Traffic Unit staff are released for other tasks.

- The review of the role and location of the Traffic Unit currently underway needs to be completed and a new focus prepared for the Traffic Unit.

13.3.2 Road Transport Inspectorate

The role of this inspectorate in enforcing aspects of the long term RUC system needs to be defined. It is recommended that the inspectorate at least undertakes vehicle weighing and licensing checks.

13.3.3 Overload Control

The availability of facilities and staffing for control of the mass of vehicles is an essential component in the implementation of the long term RUC system. It is not entirely satisfactory that the infrastructure for weighing vehicles will not be in place until 2001. If possible the programme for building weighbridges should be advanced to more closely coincide with implementation of weight-distance charges and cross-border charges.

13.4 Implementation Strategy

13.4.1 Options

The main implementation question to be answered is when should the long term RUC system be introduced.

The main alternatives are as follows:

a) The long term RUC system is only introduced when all components are in place. This has the advantage of a relatively long preparatory period during

which systems can be properly established with staff training etc. and road users can be properly prepared for the consequences of the new system.

b) The individual components of the long term RUC system are put into operation as and when ready.

c) A two phased approach is selected where manual versions of the weight-distance and possibly the cross-border charging system are introduced in early 1998 together with revised rates for the other charging instruments. In this case the more definite system would start when the support systems have become operational.

Implementation of weight-distance charges under a manual system as for option c) is not recommended. Option b) is rather adhoc but some components may be ready in 1998. Option a) will not become operational until 1999, at the earliest.

13.4.2 Choice of Strategy

The short term RUC system, consisting only of fuel levies and licence fees will not be able to provide sufficient revenue to cover the levels of road expenditure considered in this report unless the rates are significantly increased. This means that from a revenue point of view there is a compelling reason for an early introduction of the long term RUC system.

Another factor influencing the choice of strategy is the need to plan for and implement the different components of the long term system. A fair amount of the preparatory work can be completed in a relatively short period of time. However, the establishment of some of the crucial supporting functions will be time-consuming. A case in point is the NaTIS system which will not be fully operational until the turn of the century. This means that the introduction of the weight-distance system must be closely tailored to the implementation of NaTIS.

Similarly the introduction of a cross- border charging system is dependent on having a domestic weight-distance charging system

The long term RUC system has been designed as an integrated system with the different parts interacting in a logical and mutually supporting fashion. The planning for and introduction of the different components will, in some cases, be time consuming. The recruitment and training of staff will be an important activity which will require proper planning and implementation. All this seems to point to option a) as the preferred option.
The introduction of the new legal and institutional structures and their day to day operations will require a significant learning process by all involved. It will therefore be of considerable importance to make as soon as possible temporary arrangements similar to the proposed long term arrangements. This will make it possible to test specific aspects of the new system, initiate on-the-job and other training activities and in general create enough time and scope for all required preparatory activities.

On balance Option a) is recommended for implementation of the long term RUC system.

With this option some transitional adjustments could be applied to the approved short term system. In particular the rate of the petrol levy could be increased and adjustment could be made to vehicle licensing fees, in both cases the rates should be compatible with the levels recommended for the long term RUC system.

13.5 Cost Assessment

New costs will be incurred by the introduction of weight-distance and cross border charges in the following areas:

a) Amendments to NaTIS to record licences issued and hubodometer serial numbers, and to print weight-distance licences.

b) Training of Nampol Traffic Unit and MWTC Road Transport Inspectorate.

c) Purchase and installation of hubodometers for heavy load vehicles.

d) Establishment of a centralised office for issuing urgent weight-distance licences and providing help to agents.

e) Payments to agents.

The cost of hubodometers will need to be met by owners of heavy load vehicles.

Payments to agents will be recovered by an administration fee on the issue of licences.

13.6 Implementation Plan

A summarised implementation plan for the long term RUC system is presented in Appendix N. This plan covers all major activities required to establish the long term system including the associated institutional and legal structures. It is assumed that the recommendations relating to the short term RUC system, set out in the Interim Report on road User Charges, will have been implemented.

The plan aims for full implementation by 1 April 1999 which is considered to be the earliest feasible date for implementation of weight-distance charges and cross-border charges. Some activities, including the formal establishment of the Road Fund and its administration, may continue beyond this date.

13.7 Monitoring Systems

The implementation plan shows that there are a large number of activities to be completed before the long term RUC system is ready for operation. There is need for clear responsibilities for managing this implementation and a system of reporting progress against the implementation plan.

The recommended process for progressing the implementation of the long term RUC system is to appoint an establishment board (or steering committee) in accordance with the recommendations on the short term RUC system with the responsibility for overseeing the implementation. The board should monitor implementation progress and report monthly to the relevant ministries (MWTC, MOF, etc.).

It is also essential that the accounting system prepared for the short term RUC system be fully implemented as soon as possible and used to provide monthly reports on income from RUC fees and charges and expenditure on roads and road administration.

Requirements for reporting on the operation of the long term RUC system once it is implemented should be defined in the legislation for the Road Fund. The requirements should be based on standard financial reporting principles and include an assessment of performance against plan.

REPORTS AND OTHER MATERIAL REVIEWED

A1. Reports on Road User Charging

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2. A Proposed Policy on Road User Charging. Agenda memorandum by the Minister of Works, Transport and Communication, March 1993.

3. Report on the Implementation of the proposed Policy on Road User Charging in Namibia - Part A: The NAMRUC Computer Model for Determining Road User Charges in Namibia. VWL Namibia, April 1994.

4. Report on the Implementation of the proposed Policy on Road User Charging in Namibia - Part B: Current Road User Charge Levels in Namibia, their Interpretation and Implications. VWL Namibia, April 1994.

5. Manual for the NAMRUC Computer Model for the Determination of Road User Charges in Namibia. VWL Namibia, February 1994.

6. Report on an Investigation into the Technical Feasibility of Introducing a Weight-Distance Charge for Heavy Vehicles. VWL Namibia, April 1994.

7. The Proposed System of Road User Charges. Report of the Interministerial Committee of Technical Experts, Government of the Republic of Namibia, 22 August 1994.

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20. Proposed Road User Charging System for Namibia - Terms of Reference for Accounting System Support. Ministry of Works, Transportation and Communication, November 1996.

A2. Related Reports

1. Memorandum of Understanding on Road Transportation in the Common Customs Area Pursuant to the Customs Union Agreement between the Governments of Botswana, Lesotho, South Africa and Swaziland. SACU, 4 September 1990.

2. International Memorandum - Implementation of the MOU. Ministry of Works, Transport and Communication, 16 October 1996.

3. Cross-Boarder Road Transportation Act 1996. Government Gazette, 14 August 1996.

4. Southern African Customs Union Memorandum of Understanding on Road Transportation Regulations, 1996. Ministry of Works, Transport and Communication, Autumn 1996.

5. White Paper on National and Sectoral Policies. March 1991.

6. White Paper on Transport Policy. October 1995.

7. Human Resource Development in the Transport Sector - Exploratory Study. ISO Swedish Management Group, September 1994.

8. SADC Community Building - Development of Transport and Communications Protocols: Report of the Regional Sub-Sector Stakeholder Workshops. SATCC, March 1995.

9. Annexes to the Protocol on Transport, Communications and Meteorology. SATCC-TU, 24 May 1996.

10. Protocol on Transport, Communications and Meteorology in the Southern African Development Community (SADC) Region. SADC, 24 August 1996.

11. Development of an Urban Road Maintenance Model and Provision of Assistance to Local Authorities. Internal memorandum, Ministry of Works, Transport and Communication, 10 August 1995.

12. Urban Road Maintenance Model. WCE/VWL Consortium, (Draft report).

13. Report on a Review of the Governance of Parastatal Organisations in Namibia. Deloitte & Touche, March 1996.

14. Draft Road Traffic and Transport Bill. Minister of Works, Transport and Communication, 13 May 1996.

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26. Road Fund Administration Bill, Draft No 8, 15 March 1997.

SUMMARY OF SELECTED PREVIOUS WORK

B1. ICTE Report

Significant recommendations of the report of the Interministerial Committee of Technical Experts (ICTE) published in August 1994 are:

a) Government, including local authorities, should continue to be the major provider of the public road network, although they do not have to carry out the work themselves.

b) All vehicles using public roads should pay road user charges, although the instruments for foreign registered vehicles may differ.

c) Road user charges should be set to recover the marginal cost of road use together with additional charges so that road users pay for the full cost of providing, maintaining and administering roads.

d) The portion of the initial cost and maintenance of road projects done for "social" reasons should not be met by road users.

e) There should be no cross-subsidy between classes or categories of road users.

f) There should be no unfair impact on competition between road and rail modes.

g) Charges for foreign based traffic should, as far as possible, be in harmony with systems in neighbouring countries.

h) Charges should be broadly acceptable to affected parties including transport operators.

i) Costs to be recovered by road user charges should include all economically justifiable expenditure on road provision and maintenance and the administration of traffic safety and law enforcement.

j) The following principles should apply to cost recovery:

- Road user charges should recover <u>future</u> expenditure for road provision, maintenance and administration.

- Historical expenditures should not be taken into account except for repayment of loans.

- Road expenditure should be based on the needs of road users, should balance road authority expenditure and vehicle operating costs, and should be an efficient use of resources.

- Local authorities should be reimbursed the marginal cost of urban road maintenance, this in the long term to be based on quantifiable and prioritised needs performed by a single institution, and efficient use of resources.

- Capital expenditure levels used in calculating road user charges should be average long term levels for economically justified projects capital expenditure on major urban arterial roads should be funded as part of the national road network.

- Expenditure on administration of road traffic safety to be covered by road user charges should be the marginal or traffic-related cost.

k) Charging instruments should be:

- Fuel levies for the recovery of marginal costs.
- Annual licence fees for the recovery of fixed costs.
- Weight-distance charges on heavy domestically registered vehicles.
- Abnormal vehicle charges.
- Transit charges of the weight-distance type for foreign registered vehicles.
- Entry fees for foreign registered vehicles to recover their pro-rata share of fixed costs (but this could be recovered by an additional weight-distance charge).

l) Initially only fuel levies, licence fees and weight-distance charges should be implemented so as to:

- Give full cost recovery in aggregate terms.
- Recover most of the fixed cost through licence fees.
- Recover the deficit in fixed costs from the fuel levies and weight-distance charges.

m) Transit charges on foreign vehicles be held in abeyance pending completion of the SACU Study.

n) Overloading penalties be based on some multiple of the marginal damage costs caused by the overloading and revenue from such penalties be treated as road user revenue.

o) Principles of administering the system:

- Linkage between revenues from road user charges and road expenditure.
- Use measures to ensure road expenditure is effective.
- Use audited accounts showing revenue and expenditure.
- Approval of annual road expenditure should precede the setting of road user charges.
- Any deliberate over-recovery of expenditure, after allowance for long term averaging, should be defined as taxes.

p) A National Roads Board, comprising representatives from central Government, local government, area roads boards, road users and other concerned groups or fields of expertise, should be created to manage the road user charging system. Functions of the Board should be:

- Evaluate and recommend road expenditures.
- Recommend road user charges.
- Administer the road user charging system and the Road Fund.
- Account for the Road Fund.
- Monitor and report to Parliament on the road user charging system.

q) A secretariat be provided to manage the National Roads Board's affairs with placement to be reviewed if an autonomous road authority is created.

r) One of the following, in order of priority, be established and administered by the National Roads Board:

- A Road Fund.
- An operational account.
- An account showing aggregate expenditure on roads and revenues from road user charges.

B2. Report on the Feasibility of Weight-Distance Charges

The report by VWL Namibia Inc. on an investigation into the Technical Feasibility of Introducing a Weight-Distance Charge for Heavy Vehicles was completed in April 1994. The report:

- Discussed relevant published literature.
- Described the road transport environment into which the charges would have to be introduced.
- Examined the justification for introducing such charges.
- Described and evaluated the options and identified issues.
- Discussed practical aspects of introducing the charges.

The conclusions were:

- A weight-distance charge is justified, desirable and technically feasible.
- Administrative and enforcement resources are not readily available in Namibia.
- Existing border control posts could be used for collecting transit charges.
- The diesel fuel levy could be used as an approximation of a transit charge and to improve equity between heavy vehicles.
- There is no current administrative framework able to cope with a weight-distance charging system but potential agents are available.
- Extensive development of administration, communication and computer systems would be needed.

Recommendations were:

- No explicit interim transit charging system be implemented because fuel levies would recover most of the road use cost.
- A transit charging system, operated at border control points and based on a transit permit or licence for foreign vehicles and a range of payment methods, be introduced in the longer term.
- An implementation programme, including publicity, be prepared for a transit charging system.
- The fuel levy and licence fee be used as an interim measure.
- A comprehensive computerised accessible database of motor vehicle information with provision for administering a weight-distance tax be a prerequisite for a weight-distance charging system.
- The responsibility for motor vehicle registration and agency arrangements be rationalised with allowance for a weight-distance charging system.
- Enforcement and inspection resources and activities be reviewed and refocused.
- Design and implementation of a weight-distance charging system, based on the New Zealand model, be planned.

B3. Report on the NAMRUC Computer Model

VWL Namibia Inc. developed and reported on a computer model for calculating road user charges for Namibia. The model uses the principles approved by the Cabinet and data available in April 1994. It consists of input modules, a calculation module and output modules.

The input modules require data on:

- Vehicle population in 15 vehicle classes.
- Characteristics for each vehicle class - fuel type, fuel consumption, Equivalent Standard Axles (ESA), number of axles, and Passenger Car Equivalents (PCE)
- Total on-road fuel use.
- Rural road length, road type, Vehicle kilometres of Travel (VKT), ESA-km, and VKT distribution.
- Urban road length, road type and VKT.
- Rural road expenditure allocated as either traffic-related or non-traffic-related.
- Urban road expenditure allocated as either traffic-related or non-traffic-related.
- Proportional allocation of rural and urban road costs to units of account (VKT, axle-km, PCE-km and ESA-km).
- Allocation of relative benefit of non-traffic-related maintenance and capital expenditure to vehicle classes.

Output provides:

- Urban, rural and total VKT.
- Urban and rural ESA-km, axle-km and PCE-km.
- Traffic-related and non-traffic-related maintenance expenditure.
- Average maintenance costs.
- Marginal costs.
- Petrol and diesel levies and weight-distance tax rates.

- Fixed costs.
- Fixed cost recovery through fuel levies.
- Summary of revenue and expenditure.

Vehicle population data used in the calculations was based on surveys conducted in 1986, 1990/91 and 1993. It was necessary to make a number of assumptions to transform the survey data into the form required for the model. Assumptions also had to be made in determining VKT figures and other inputs.

The model was run using forecast 1993/94 data. Five levels of rural road maintenance expenditure and two levels of rural road capital expenditure (N$30 million and N$40 million) were analysed. Fuel levies and licence fees were calculated with and without weight-distance charges.

The report concluded that:

- If marginal cost is recovered through fuel levies and fixed costs through vehicle licence fees, in the absence of a weight-distance charge petrol and diesel levies would need to be 40.2 and 44.7 cents per litre respectively for the recommended budget scenario.
- Vehicle licence fees would need to be increased drastically above present levels. However, if licence fees were kept at the existing level and the remaining fixed cost recovered through fuel levies, petrol and diesel levies, in the absence of a weight-distance charge would be 53.3 and 60.5 cents per litre respectively for the recommended budget.
- If the licence fees were set at 40% of the required level, the petrol and diesel levies would be 50.7 and 60.1 cents per litre respectively. With a weight-distance charge, the diesel levy would be 40.0 cents per litre.

The report recommends that:

- The NAMRUC model should be refined to give verified estimates of road user charges and to remove current data deficiencies.
- Walvis Bay data should be included.
- Levies for off-road use of diesel should be reconsidered.
- Environmental impacts of road transportation should not be included in road user charges in Namibia.

B4. SADC/SACU Agreements

B4.1 SADC Protocol

The SADC Protocol requires member states to conclude bilateral or multilateral agreements which address:

- Single SADC carrier permits or licences.
- Carrier registration.
- Quota and capacity management.
- Harmonised administrative procedures, documentation and fees.
- Harmonised information systems.
- Joint route management committees.
- Carrier obligations with sanctions.
- Harmonised transport law enforcement.

Such bilateral or multilateral agreements are under preparation for the SACU area, Zambia, Zimbabwe and Angola, as outlined below.

The SADC Protocol and associated annexes and the methodology accepted by the SATCC/TU and SACU (set out in the Addendum to the Final Report on the Design and Implementation of a Harmonised System of Road User Charges for International Road Traffic between the SACU Member States) essentially require that cross-border charges:

- Can be country specific but are to be calculated using the same methodology for each member state. They may differ according to the estimated damage by one of five classes of vehicles (specified).

- Should be based on the cost the vehicle imposes on the road network.

- Can accommodate the element of distance travelled in a manner appropriate to the region.

- Can allow for different maintenance costs and traffic levels.

- Are only to apply to the portion of the trip within the member state.

Furthermore, cross-border should address costs of:

- Routine maintenance.
- Periodic maintenance.
- Rehabilitation.
- Bridge maintenance.
- Reconstruction.
- Upgrading/capacity expansion.

- Management, administration and policing.

The agreement requires notification to member states if bridge maintenance, reconstruction, upgrading/capacity expansion costs are to be recovered. The cross-border charges should be administratively simple and are subject to annual revision by the SATCC-TU.

B4.2 Joint Task Team Report

SADC and SACU road user charges studies were reviewed by a Joint Task Team and reported in the Addendum to the Final Report on the Design and Implementation of a Harmonised System of Road User Charges for International Road Traffic between the SACU Member States.

The Joint Task Team report recommends that for cross-border charges:

- Payment should be made in the host country.
- Light vehicles be included in the cross-border road user charging system.
- Country specific ESA factors (Table 3) be used.
- Country specific unit rates for maintenance and rehabilitation be used but inter-country cost variance should be based on economic construction cost indices.
- A range of unit rates of N$13 880 - 87 300/km for periodic maintenance and N$210 500 - 525 000/km for rehabilitation.
- Where possible segmented analysis sets should be used in the calculation of road user costs.
- Variable costs be allocated to road users according to the way those costs are occasioned, i.e. load related by ESA-km and vehicle related by vehicle-km.
- Fixed costs be allocated on the basis of gross vehicle mass.
- Cross-border road user charges for Namibia are (N$/100km):

Light vehicles	5.9
Buses	34.2
Heavy vehicles with 2-3 axles	44.0
Heavy vehicles with 4-5 axles	85.1
Heavy vehicles with 6+ axles	118.0

- Methods of collection and management of funds proposed by the PTA/SADC and by the SACU be used in the combined region, i.e.:

  - each country should be responsible for collecting the charges due to it.
  - each country is responsible for controlling, verifying and auditing its own procedures.
  - various forms of payment will be allowed including cash, credit cards, travellers' cheques, and coupons or receipts acting as coupons.
  - payment should take place at the border or in advance at designated agencies.
  - arrangements for repatriation of revenue should be a matter between the country and its agents.

B4.3 SACU MOU

The SACU MOU has the following main components:

- Permits are to be issued for the carriage of goods or conveyance of passengers in a standard form (see Figure B1) by the applicant's competent authority.

- The competent authority is to:

  i) Collect a fee for the permit covering
     - its administrative cost
     - infrastructure costs.

  ii) Reimburse the other country for the infrastructure costs incurred.

  iii) Keep a register of permits issued.

- A consignment note in a standard form (see Figure B2) is required for the carriage of goods. This note contains information about *inter alia* the origin and destination of the journey and payload weight.

- A passenger list in a standard from (see Figure B3) is required for the conveyance of passengers on international circular or transit tours.

Provisions in the SAC MOU are being redrafted so that cross-border permits are issued to the prime mover. The amended MOU should be ready by mid 1997 but it needs to be signed and then ratified by Parliament before the provisions will be implemented.

Permits issued under the SACU MOU are for a maximum of three months and a specified number of trips between any location in the one country and any location in the other country. Only one permit, issued by the operator's country, is required. This permit is recognised by other member countries.

Figure B1. SACU Cross-Border Permit

XXXXXX XXXX XXXXXX	CUSTOMS UNION PERMIT
Xxxxxx Xxxxxxxxxx Xxxxxx Xxxxx Xxxxxxxxx xxxxxxxx xx xxxxxxxxxx xxx xxx xxxxxxxxx xxx Xxxxxxxxx xxxx xxxxxxxxxxxxxxx xxx xxxxxxxxxxx xxxx	Southern African Customs Union Issued in terms of and subject to the provisions of Memorandum of Understanding on Road Transportation 1990
Xxxxxxxx xxxxxxxxxx xxxx xxxxxxxxxxx xxxxxx xxxxxx xxxxxx xxxxxxxxxxxxxx xxxxxxxxx xxxxxxx xx xxxxxxxxxx xxx xxx xxxxxxxxxx xxxxxxxxxxxxxxx xxx xxxx xxxxx xxxx xx xxxx xxxxx xxxxxx xxx xxxxx xxxxxx xxxxx xxxxxx xxxxx xxxx xxxxxxxxxxxxx xxx xxxxxxxxx xx xx xxx xxxx xxx xx xxxxxxx xxxxxx xx xxxxxxxxxx	This permit entitles the holder mentioned below to temporarily import the vehicle specified herein, subject to the terms and conditions of this permit, into the territory of the country specified herein for the purpose of carrying goods or passengers for hire or reward or in the course of his industry, trade or business.

XXXXXXXXXXXXXXXXXXX	CARRIER PARTICULARS

Xxxx . . . . . Name
Xxxxxxxxxxxxxxxx . . . . . Identity Number
Xxxxx . . . . . Address
. . . . . .
. . . . . .
. . . . . .

XXXXXXXXXXXXXXXXXXX	VEHICLE PARTICULARS

xxxxxxxxxxxxxxxxx registration number	xxxxxxxxx make	xxxx xxxxxxxx type of vehicle	xxxxxxxxxxxxxx chassis number
. . . . .	. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .	. . . . .

Xxxxxxx xxxxx xxxxxxxxxxxxx: Maximum gross vehicle mass:
xxxxxxxx xxxxxxxxxxxxxxxx (xxx) total vehicle combination (tonnes)

XXXXXXXXXXXXXXXXXXXXXXXXXX	SUBSTITUTE VEHICLE PARTICULARS

xxxxxxxxxxxxxxxxx registration number	xxxxxxxxx make	xxxx xxxxxxxx type of vehicle	xxxxxxxxxxxxxx chassis number
. . . . .	. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .	. . . . .
. . . . .	. . . . .	. . . . .	. . . . .

XXXXX XXXXXXXXXXXXX	PERMIT PARTICULARS

Xxxx xxxxxxx . . . . . Type of transport
Xxxxxx xxxxx . . . . . Number of journeys
Xxxx xxx xxxxxxxxx . . . . . Country of origin
Xxxxxxxxxxxx . . . . . Transit country
Xxxx xxx xxxxxxxxxx . . . . . Country of destination
Xxxxxxxxxxxxxxxxxxxxx . . . . . Permit date of issue
Xxxxxxxxxxxxxxx . . . . . Permit expiry date
Xxxxxxxx xxxxxxxxxx . . . . . Special conditions
. . . . . .
. . . . . .

Xxxxxxxxx xxxxxxx
Official stamp

……
xxxxxx xxxxxxxx xxxxxxxxxx / on behalf of competent authority

Figure B2. SACU Consignment Note

XXXXXX XXXXXXXXXX XXXXX XXXXX **XXXXXXXXX**	SOUTHERN AFRICAN CUSTOMS UNION **CONSIGNMENT NOTE**

XXXXXXX XX XXXXXXXXX

COMPLETE IN PRINT

Xxxx xxx xxxxxxxxxx _____ Name of permit holder
Xxxxxxxxxxx _____ Permit number
Xxxxxx xxx xxxxxxx xxxx _____ Number of this journey

XXXX OUTWARD	XXXXX RETURN

Xxxxxxxxxxxxxxxxxxxxxxxxx _____ Vehicle registration number

Xxxxxxxxx xxx xxxx Origin of journey	Xxxxxxxxxx xxx xxxx Destination of journey	Xxxxxxxx (Xxx) Payload (Tons)
	Xxxxxx xxxxxxxx: Total payload:	

Xxxxxxxxx xxxx / Issued by:

_____ _____
Xxxx / Name Xxxxxxxxxxx / Signature

Xxxxxxxxxxxxx
xxxxxxx

Border post
date stamp

Figure B3. SACU Passenger List

XXXXXX XXXXXXXXXX XXXXX XXXXX **XXXXXXXXXXXX**	SOUTHERN AFRICAN CUSTOMS UNION **PASSENGER LIST**

XXXXXXX XX XXXXXXXXX — COMPLETE IN PRINT

Xxxx xxx xxxxxxxxxx _____ Name of permit holder
Xxxxxxxxxxx _____ Permit number
Xxxxxxxxxxxxxxxxxxxxxx _____ Vehicle registration number
Xxxxxx xxxxxxxxxx _____ Number of passengers

Xxxxxxxxxxx xxx xxxxxxxxxx — Particulars of passengers

	Xxxx Name	Xxxxxxxxxxxxx Nationality	Xxxxxxxxxxxxx Passport Number
1	. . . . .	. . . . .	. . . . .
2	. . . . .	. . . . .	. . . . .
3	. . . . .	. . . . .	. . . . .
4	. . . . .	. . . . .	. . . . .
5	. . . . .	. . . . .	. . . . .
6	. . . . .	. . . . .	. . . . .
7	. . . . .	. . . . .	. . . . .
8	. . . . .	. . . . .	. . . . .
9	. . . . .	. . . . .	. . . . .
10	. . . . .	. . . . .	. . . . .
11	. . . . .	. . . . .	. . . . .
12	. . . . .	. . . . .	. . . . .
13	. . . . .	. . . . .	. . . . .
14	. . . . .	. . . . .	. . . . .
15	. . . . .	. . . . .	. . . . .
16	. . . . .	. . . . .	. . . . .
17	. . . . .	. . . . .	. . . . .
18	. . . . .	. . . . .	. . . . .
19	. . . . .	. . . . .	. . . . .
20	. . . . .	. . . . .	. . . . .

Xxxxxxxxx xxx xxxx _____ Origin of journey

Xxxxxxxxxx xxx xxxx _____ Destination of journey

Xxxxxxxxx xxxx / Issued by:

Xxxxxxxxxxxxx xxxxxxx

Border post date stamp

_____ Xxxx / Name

_____ Xxxxxxxxxxx / Signature

Although the current version of the SACU MOU allows for the originating country to collect fees for travel in another country at the time that the permit is issued, this will not be implemented in practice. The main reason for this is that the permit is open-ended and cross-border charges levied for any country should relate to the actual distance travelled in that country. This means in effect that cross-border charges need to be applied to each trip.

B4.4 Agreements with Zambia, Zimbabwe and Angola

Draft cross-border transportation agreements have been prepared between Namibia and Zambia, Zimbabwe and Angola. These draft agreements have provisions similar to those of the SACU agreement and use the same forms for the cross-border permit, consignment note and passenger list. In addition a Joint Road Transportation Committee is to, *inter alia*, set out:

- Permit fees.
- The form of permits and administrative procedures for permits.
- Entry fees (to recover road infrastructure costs).

B5. Urban Road Maintenance Model

Windhoek Consulting Engineers/VWL Namibia Inc. have developed a system for appraisal of urban road maintenance needs (referred to as an urban roads maintenance model-URMM). The URMM is intended to be used by the Ministry of Regional and Local Government and Housing for determining and monitoring the need for road maintenance and hence road funding for the approximately 60 urban local authorities in the country.

The model uses annual field surveys of road condition to identify the treatments required for each road. Only road maintenance activities that are essentially traffic related are considered. Fixed costs such as road reserve clearing, repairs of traffic signs or drainage structures are not included. Neither is the capital cost of building urban streets. A need for surfacing gravel roads is identified by the model if the traffic volume is greater than 500 vehicles per day.

It is intended that the Road Fund will meet the cost identified by the URMM for each local authority. It is noted in the report that major urban arterials may also, under certain circumstances, qualify for funding assistance but this will be dealt with outside of URMM.

MOTOR VEHICLE LICENCE FEES

The motor vehicle licence fees (including trailers and semi-trailers other than caravans) to apply from 1 January 1997 are presented in the Tables C1, and C2 below.

Table C1. Motor Vehicle Licence Fees

Type of Vehicle	Tare of Vehicle (Kg)	Tariff (N$)
Motor cycles and tricycles	All	36,00
Motor cars	< 700 751 - 1 000 1 001 - 1 250 1 251 - 1 500 1 501 >	60,00 96 00 108 00 120,00 144,00
Other self- propelled vehicles	< 1 000 1 001 - 2 000 2 001 - 3 000 3 001 - 4 000 4 001 - 5 000 5 001 - 6 000 6 001 - 7 000 7 001 - 8 000 8 001 - 9 000 9 001 - 10 000 10 001 - 11 000 11 001 - 12 000 12 001 - 12 500 12 501 >	96,00 144,00 240,00 456,00 696,00 1 680,00 2 340,00 2 988,00 3 816,00 4 692,00 5 724,00 6 912,00 8 052,00 8 052,00 plus N$ 480 for every 500 kg or part thereof above 12 500 kg.

Table C2. Vehicle Licence Fees for Trailers and Semi-Trailers

Type of Vehicle	Tare of Vehicle (Kg)	Tariff (N$)
Trailers and semi-trailers (other than caravans)	<1 000 1 001 - 2 000 2 001 - 3 000 3 001 - 4 000 4 001 - 5 000 5 001 - 6 000 6 001 - 7 000 7 001 - 8 000 8 001 - 9 000 9 001 - 10 000 10 001 - 11 000 11 001 - 12 000 12 001>	36,00 120,00 204,00 936,00 1 344,00 1 884,00 2 328,00 2 892,00 3 816,00 4 296,00 4 932,00 5 628,00 5 628,00 plus N$ 384,00 for every 500 kg or part thereof above 12 000 kg.
Caravans	All	48,00

Provided that in respect of a motor vehicle (other than a tractor, truck-tractor or self-propelled caravan) not designated principally for the conveyance on a public road of persons and goods, or both, which is operated on a public road, the licence fee shall not exceed N$ 192,00.

NAMIBIA NATIONAL TRANSPORTATION MASTER PLAN STUDY

Workshop on Road User Charges

MWTC 25 March 1997

Present: **Ministry of Works, Transport and Communication** - F.W. Poolman, B. Gericke, G. Seydack, W. Ravencroft. J.M. Cloete.

Ministry of Finance - G. Savory, V.E. Ngausake, D.N. Basson

Ministry of Regional and Local Government and Housing - B.W. van den Westhuizen, H. Smith.

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Ministry of Trade and Industry - R.A. Kaakunga.

Ministry of Mines and Energy - M. Appolus, M.F. von Jeney.

Nampol Traffic Unit - J.L. Botha,

Coopers & Lybrand - R. van Rooyen.

SWECO - B. Boshoff, A. Kennaird, B. Sedin.

D1. Purpose

The purpose of the Workshop was to discuss a number of issues related to the design of the long-term RUC System with representatives from the various Ministries and consulting firms involved with or affected by the on-going RUC Study.

Four discussion papers had been prepared by SWECO which were used as a basis for the discussions, covering the following areas:

- Costs to be Recovered
- Calculation of Charges
- Weight-Distance Charges
- Implementation Issues

D2. Proceedings

The main purpose of the Workshop was to discuss the issues identified in the discussion papers and if possible reach a consensus on the questions raised in each of these papers. The outcome of the Workshop, summarised in the answers given to the questions raised in the discussion papers, is presented below.

D2.1 Costs to be Recovered

Particular questions and issues relating to costs to be recovered by the RUC system are:

- Is the list of road expenditures to be recovered by RUC instruments and funded by the Road Fund given in section 1 of this paper complete?

  Yes. However, there is one aspect of the Road Construction item which needs to be kept in mind. This has to do with roads in urban areas forming part of the national road network passing through a local community (e.g. municipality, town) are covered under the MWTC's development budget. A nominal funding of N$5 million was previously used for road development work in urban areas. The URMM now gives a more exact amount for sealing of unsurfaced urban roads. Economically justified upgrading of other roads in urban areas could also be funded from the Road Fund.

- Should MWTC DOT policy and regulatory expenditure be a charge on the Road Fund?

  The policy and regulatory part of the MWTC DOT work should in the future (after the establishment of the Road Fund) continue to be financed under the ordinary budget of the Ministry. It is however, difficult to determine the existing DOT administrative costs are divided into;

  - *policy and regulatory work.*
  - *activities to be taken over by the future national road authority.*

  DOT will make an estimate on how the annual cost of the DOT administration (N$7.3 million) could be split into these two fields of activity. This work to be completed within one week.

- Should the cost of administrating vehicle registration and licensing be met by the Road Fund?

  The long term solution must be that the administration of the vehicle registration and licensing activities is funded from a specific charge.

The portion of the licence fee to go to the Road Fund contribution should be identified as a separate licensing fee. However, there is no information available on the level and composition of present or proposed administrative costs. It might therefore be necessary to finance the new registration and licensing system under the Road Fund during the starting up phase. Once the administrative costs are known, it will also be possible to establish a separate fee for the administration of the vehicle registration and licensing activities.

- Is there a need to make explicit allowance in the Road Fund budget for repayment of loans?

  Yes. Old and new road loan commitments are to be fully repaid by the Fund. However, this does not apply to loans for road construction undertaken by the Local Authorities.

- What allowance should be made for road expenditure that may not be economically justified from a traffic benefit point of view? Is it sufficient to say that such expenditure for trunk, main and district roads is covered by foreign grants and from local authority revenues for urban roads?

  The principle of limiting Road Fund financing to economically viable roads must be upheld. The estimates on future construction costs cover only economically viable roads which means that no specific adjustment needs to be made to allow for this in the RUC calculations.

- What allowance should be made for improved efficiency in road expenditure resulting from commercialising the organisations involved and contracting out the work?

  Productivity gains from commercialising of construction and maintenance activities are to be considered.

- What level of road construction (development) expenditures should be allowed for calculating RUC rates?

  The figure used should be the higher alternative proposed in the discussion paper i.e an average of N$59 million annually for the next 3 years.

- What level of road maintenance expenditure should be allowed for calculating RUC rates?

  The estimates on future road maintenance costs are uncertain. The figures presented in the discussion paper could be both too high and too low. It was agreed the calculation of future road user charges should be based on an annual figure of N$185 million.

- Should all costs for the Traffic Police and road safety activities be financed by the Road Fund? If not, which types of activities should be excluded?

  All such costs should be financed by the Road Fund. The existing cost estimates for traffic police and road safety activities (N$8 million) are to be used for the time being. The correct actual costs will be determined later.

- Is the level of traffic-related maintenance expenditure calculated by the URMM (N$ 30 million per year) to be fully funded by the RUC system?

  For the purpose of calculating RUC rates, the Road Fund contribution to the maintenance of Local Authority roads should be an average of N$ 28 million for the next three years.

- Should consideration be given to Road Fund financing of other urban road maintenance costs (e.g. signs, markings, robots and lighting)?

  No. Because more than just traffic-related costs will be financed if the full URMM amount is paid from the Road Fund

D2.2 Calculation of Charges

Particular questions relating to calculation of road user charges for Namibia are:

- Is it acceptable to start the long term road user charges system using rough estimates of vehicle numbers and fuel use and then to refine charges as necessary from data that will be available when the RUC system becomes operational?

  Yes. This is the only realistic approach. The uncertainties associated with the estimates are acceptable.

- Is the Road Fund to receive fines from vehicle overloading or other sources?

  Yes, provided there are no legal problems with such a solution.

- Should there be any change in the units of account used in calculating road user charges?

  No, use the NAMRUC allocations. Leave the necessary adjustments to the new Road Fund Administration

- Does the NAMRUC methodology need to be changed to more completely comply with the SADC/SACU methodology?

  No. The Cross-Border Charges should be based on the domestic RUC system. This will ensure that the important principle of non-discrimination between domestic and foreign vehicles is upheld. The only other requirement that has to be met is that the cross-border charges do not exceed the maximums established by SADC/SACU.

  The SADC/SACU model covers a different network than NAMRUC (only roads of regional importance while NAMRUC covers all roads in Namibia) and uses a different allocation methodology. However, these differences do not need to be reflected in the long term RUC system for Namibia.

- Are the cost allocation proportions used in the NAMRUC model acceptable?

  Yes.

- What unit of account should be used to allocate fixed costs?

  Relative Benefit-km as currently used in the NAMRUC model is to be retained for the time being.

- What charging instrument or instruments should be used to recover fixed costs?

  Vehicle Licence Fees supplemented where necessary with Fuel Levies and Weight-Distance Charges.

- Should there be a relativity between the diesel levy and the petrol levy based on relative energy efficiency?

  Yes, the relative price of fuel must be taken into account when determining RUC for Namibia.

- Is it acceptable to collect under-recovered traffic related costs by means of the vehicle licence fee?

  Yes.

- Should a levy be applied to diesel or should traffic-related costs for diesel powered vehicles be recovered by weight-distance charges and vehicle licence fees as appropriate?

  There are two basic options for recovering traffic-related costs for diesel vehicle:
  - *One option is to make all diesel powered vehicles subject to a weight-distance charge, thus removing the need for a refund system for diesel fuel used off road. The main problem with this option is that the price of diesel fuel would become so low compared with adjacent countries that smuggling of diesel fuel purchased in Namibia could become a problem.*
  - *The other option is to apply a diesel levy. This would have the effect of limiting the weight-distance scheme to a relatively small number of heavy vehicles, thus minimising administrative and enforcement problems during the starting up phase.*

  The basic approach should be to start up with a system which is simple and flexible. The responsibility of further developing the RUC system should rest with the Road Fund administration.

- Are the cross-subsidies inherent in the RUC system acceptable?

  Yes, provided they are not too large.

- Is the assumption of a balance between fuel purchased by foreign vehicles operating in Namibia and fuel purchased by Namibian vehicles operating outside Namibia reasonable?

  Yes.

- Is it acceptable to only collect cross-border charges from heavy vehicles?

  Yes.

D2.3 Weigh-Distance Charges

Particular questions relating to weight-distance charges for Namibia are:

- Should combination vehicles be licensed as one unit for weight-distance charges purposes, or should each separately registered vehicle have its own weight-distance licence?

  Each separately registered vehicle should have its own weigh-distance licence.

- Should weight-distance charges be applied only to vehicle classes or should there be different charges for different weights and configurations within a class?

  To the extent possible try to develop different charges for different weights and configuration within the different classes.

- By what means should distance be measured for weight-distance charges purposes - by an assessed value, by the main odometer, by hubodometer (all separately vehicles or just trailers), by more sophisticated devices?

  Hubometers should be used for trailers, which will allow a different (lower) distance to be recorded for them as they normally travel shorter distances per year than the "horse". Hubometers should also be used for trucks.

- What allowance should be made in weight-distance charge tables for vehicle weight?

  A load factor (e.g. 0.55) should be applied to the ESA calculations to reflect the fact that vehicles are not at maximum GVM at all times..

- Are time licences needed for Namibia?

  Probably for vehicles such as front-end loaders that operate occasionally on public roads (Ben Gericke will try to find out the type and number of vehicles which would need this type of licences. Not a very urgent matter)

- Should there be a separate administration fee for the issue of weight-distance licences?

  Yes.

- Should charges be post-paid or pre-paid?

  Pre-paid please!

- If hubodometers are to be used, how should these be controlled and supplied to vehicle owners?

  The Government to test and approve hubodometer makes. The sale, instalment and service of hubodometers could be handled through the open market.

- Should foreign vehicles be required to have hubodometers?

  No.

- Should there be any refund system for off-road running?

  No.

- How should the distance travelled in another country be allowed for?

  The simplest system seems to be one where a hubodometer reading is made when a vehicle is leaving and re-entering Namibia and registered in the computer system controlling weight-distance licences. The distance driven abroad would be recorded as a credit to that vehicle.

D2.4 Implementation

- What are the revenue consequences, if any, of retaining the short-term RUC system beyond April 1998?

  The opportunity of increasing revenue to the Road Fund from the introduction of weight-distance charges would be lost.

- What are the political consequences of delaying the introduction of the long term RUC system?

  There will be negative implications of major delays. Thus, it is important to press ahead with the introduction of NaTIS.

- Is a manual Weight-Distance system feasible?

  No.

- How would the road users react to a two phased introduction of a Weight-Distance Charging system?

  A two-phased approach is not an alternative. The new system must be introduced once only and the whole process must be carefully planned and implemented. Information and communication with the public in general and the road users in particular is of considerable importance.

- Would it be acceptable to the neighbouring countries to start up the Cross-Border Charging system with a set-up which from the outset is clearly temporary and short-term?

  That would in itself not be a problem provided the temporary Cross-Boarder Charging system is non-discriminatory. However, the best line of action is to wait with the Cross Border Charging system until the domestic components of the long term Road User Charging system are in place.

- Would the advantages of the two-phased approach (e.g. possibilities to try out system components under real conditions, on-the-job training potential, etc.) be enough to out-weigh the administrative and organisational burden of setting up and running a temporary system?

  No.

- Will there be a need to strengthen DOT temporarily to handle a two-phased approach and will there be enough resources (in financial and staffing terms) for such a purpose?

  A two-phased approach is not a realistic alternative. DOT needs additional resources anyway.

REVIEW OF NAMRUC MODEL AND COMPATABILITY WITH SACU/SADC METHODOLOGY

Africon was requested by the Ministry of Works, Transport and Communication in Namibia (MWTC) to review the NAMRUC Model methodology, used for determining the correct and current levels of road user charges, as part of the National Transportation Master Plan Study (NTMPS). This appointment was made as a sub-consultant to SWECO. The Africon report is presented below.

E1. Introduction

This report deals with the review of the NAMRUC Model methodology, and its compatibility with the SACU/SADC methodology, used in a separate study also executed by Africon. In addition, the changes needed to make the NAMRUC model compatible with the SACU/SADC methodology are identified.

This report therefore deals with two main aspects, namely:

- A comparison between relevant aspects in terms of the NAMRUC and SACU/SADCC methodology

- Changes to make the NAMRUC model compatible with the SADC/SACU methodology

The rest of this report has the following structure:

- In Section 2, a comparison is made between the methodology of the two models.
- The changes to make the NAMRUC model compatible with the SACU/SADC methodology are presented in Section E3.
- The proposal is concluded in Section E4.

E2. Comparison of Methodology

In the comparison between the two approaches, the following aspects will be addressed:

- The overall scope or aim of each methodology.

- An overview of the methodology.

- A comparison of the following aspects:

- Costs:	the costs items considered
	the quantification of costs considered
- Use of network:	the network considered
	the vehicle classes
	vehicle characteristics
	road characteristics and use
	quantification of use
- Cost allocation methodology	
- Results format.	

Each of these aspects will now be addressed separately.

E2.1 Scope and Aim

The scope and aim of each methodology are as follows:

NAMRUC: To determine the cost responsibility applicable to each vehicle class in Namibia for the use of the total road network (i.e. rural and urban roads), and to determine the levels of road user charge to be recovered through license fees, fuel levies and weight-distance charges

SACU/SADC: Determine the cost responsibility applicable to each class of transit vehicle for the use of the transit road network in the host country, and to determine the level of transit charges to be recovered through cross-border charges.

E2.2 Overall Methodology

The overall methodology in each case can be described as follows:

NAMRUC: Use marginal cost principles to determine and allocate costs on the full network, based on the forward-looking costs of providing, maintaining and operating the network and the use of the full network by each vehicle class.

SACU/SADC: Use marginal cost principles to determine and allocate costs on the transit route network, based on the annual costs of maintenance and operation, and the use of the transit route network by all vehicles.

E2.3 Cost Items and Quantification

E2.3.1 Cost items

The following is a list of the cost items considered in each methodology:

NAMRUC: Maintenance activities per road type (refer NAMRUC model)
- Capacity improvements
- Traffic control
- Capital expenditure

SACU/SADC: Currently :
- Routine maintenance
- Periodic maintenance
- Rehabilitation
- General maintenance i.e. management, administration and policing

In future:
- Bridge maintenance
- Reconstruction/upgrading
- Capacity expansion
- Externalities i.e. congestion, accidents, pollution

E2.3.2 Cost Quantification

The following methodologies are used to quantify the cost items defined above:

NAMRUC	Maintenance	Estimates of the MWTC per item for optimum/efficient maintenance per year
	Capacity improvements	Capacity improvement costs per year
	Traffic control	Estimate of annual amount
	Capital expenditure	Forward-looking annualised amount
SACU/SADC	Routine maintenance	Standardised cost per kilometre
	Periodic and rehabilitation	HDM-III and dTIMS modelling of optimum life-cycle costs, based on current condition from PMS and traffic per section, and annualised per section
	General maintenance	Determined as percentage of other costs

E2.4 Use of Network

E2.4.1 Network considered

The network considered in each case is the following:

NAMRUC	Rural road network	Earth roads
		Gravel roads
		Salt roads
		Paved roads
	Urban roads	Unpaved roads
		Paved roads
SACU/SADC	Transit routes, i.e. mostly paved routes, and rural by nature	

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E2.4.2 Vehicle classes

The NAMRUC model considers 15 vehicle classes, and the SACU/SADC methodology 5 classes, as follows:

NAMRUC	Motorcycles
	Cars
	Light delivery vehicles
	Minibuses
	Buses
	Light Goods Vehicles (GVM<5 tonnes)
	2 Axle Single Unit Trucks (SUTs)
	3 Axle SUTs
	4 Axle Combination trucks (COMB)
	5 Axle Comb
	6 Axle Comb
	7 and >7 Axle Comb
	Caravans
	Trailers
	Others
SACU/SADC	Light vehicles (GVM<3.5 tonnes)
	Buses
	2-3 Axle Heavy goods vehicles (HGVs)
	4-5 Axle HGVs
	6 or >6 Axle HGVs

E2.4.3 Vehicle characteristics

The following vehicle characteristics are needed for each methodology:

NAMRUC	Fuel consumption Fuel type Max E80 Number of axles Passenger car equivalents (PCEs) Total E80-km for the rural network
SACU/SADC	Average E80 per vehicle type Number of axles GVM

E2.4.4 Road Characteristics and Use

The following information is needed per road link in each methodology:

NAMRUC	Surface type Length AADT VKT Distribution per vehicle type per road type
SACU/SADC	Surface type Length Width Shoulder type Number of lanes AADT Distribution per vehicle type Pavement condition in six different categories Pavement strength and constitution Environmental data Terrain data Pavement history

E2.4.5 Quantification of Use

The following broad consecutive steps are followed in each case to determine the use of roads by different vehicle classes, for cost allocation purposes:

NAMRUC	Determine total network VKT, using relative travel, total fuel sold and fuel consumption per type.

	Determine rural VKT using total rural AADT for rural network. Determine urban VKT using total-rural VKT. Distribute rural and urban VKT per vehicle class and road type. Determine average E80 per vehicle type through iterative process. Determine rural and urban E80-km, axle-km and PCE-km per road type and vehicle class.
SACU/SADC	Determine VKT per vehicle type per link, using AADT and vehicle distribution. Determine E80-km and GVM-km per link.

The elaborate methodology in the NAMRUC model is needed due to the absence of information regarding urban road use.

E2.5 Cost Allocation

The cost allocation methodology used in each model can be described as follows:

NAMRUC	Variable costs	Maintenance, capacity improvement and traffic control costs are divided into traffic related and non-traffic-related costs per activity according to expert judgement. Traffic-related costs are allocated to units of account namely VKT, PCE-km, axle-km and/or E80-km per activity, as applicable, and per vehicle type. Percentage of allocation per unit of account is determined through expert judgement (see Table E2.1 below). This calculation provides a c/unit account cost per activity. A c/km cost responsibility per vehicle type and road type is calculated, followed by a c/l cost responsibility per vehicle type.
	Fixed costs	Fixed costs consist of : - the non-traffic related maintenance costs - the annualised capital expenditure

		Fixed costs are allocated according to the benefit principle, as follows: - non-traffic related costs: VKT - capex: relative benefit in VOC savings weighted by VKT A N$/year cost responsibility per vehicle is then calculated
SACU/SADC	Overall methodology	World Bank model for cost allocation is used, classifying roads according to AADT and % heavy vehicles, and different classes for fixed and variable costs (See table 2.2 below).
	Variable costs	Allocation according to load-related cost (E80-km) and vehicle-related cost (VKT) Result is a c/km cost responsibility per vehicle type.
	Fixed cost	Allocation according to Ramsey pricing or GVM-km. Result is a c/km cost responsibility per vehicle type.

Table E2.1. Proportional Allocation of Units of Account: Rural Roads

ROAD TYPE AND ACTIVITY	UNIT OF ACCOUNT			
	VKT	**PCE-km**	**AXLE-km**	**ESA-km**
EARTH ROADS:				
Blading	100%			
Light gravel maintenance	100%			
Betterment and bush-clearing	100%			
SALT ROADS:				
Maintenance	100%			
GRAVEL ROADS:				
Blading	100%			
Light gravel maintenance	100%			
Betterment and bush-clearing	100%			
Regravelling	100%			
SURFACED ROADS:				
Pavement reseal			50%	50%
Pavement rehabilitation	10%			90%
Bitumen road maintenance			50%	50%
Capacity improvements		100%		
ALL ROADS:				
Traffic control		100%		

Table E2.2. Cost Allocation Percentages

Percentage Heavy Goods Vehicles	Cost Categories	Average Daily Traffic			
		<500	**500 - 1500**	**1500 - 2500**	**>2500**
<30 %	Variable - ESA Related costs	16.5%	16.2%	13.2%	10.3%
	Vehicle related costs	7.3%	17.3%	28.0%	38.5%
	Fixed costs	76.2%	66.5%	58.8%	51.2%
30-55%	Variable - ESA Related costs	25.5%	25.6%	20.9%	16.4%
	Vehicle related costs	7.3%	17.3%	28.0%	38.5%
	Fixed costs	67.2%	57.1%	51.1%	45.1%
> 55%	Variable - ESA Related costs	34.4%	35.0%	28.7%	22.5%
	Vehicle related costs	7.3%	17.3%	28.0%	38.5%
	Fixed costs	58.3%	47.7%	43.3%	39.0%

The above table presents the percentages of total costs which could be allocated to the various cost categories, given certain traffic volumes (ADT) and certain percentages of heavy goods vehicles.

E2.6 Results Format

The results from the cost allocation exercise discussed above are used to determine required levels of road user charges. The format of these charges are as follows:

NAMRUC	Fuel levies	Petrol vehicles : c/l, based on averaged variable cost responsibility Diesel vehicles : c/l averaged across all vehicle types (no weight distance charge), or c/l equal to lowest cost responsibility (weight distance charge in place), based on variable cost responsibility.
	License fees	N$/year license fee, based on fixed cost responsibility.
	Weight distance charge	N$/100km charge, based on balance of variable cost responsibility.
	Other	For given license fee, fuel levy for balance of cost responsibility can be determined, with and without weight distance charge.
SACU/SADC	Cross-border charge	Cost responsibility per vehicle type per 100 km is determined to provide a N$/100km fee

E3. Main Differences and Compatibility

In this section, the main differences between the methodologies will be highlighted, and changes to the NAMRUC model identified to make it compatible with the SACU/SADC methodology.

ASPECT	NAMRUC APPROACH	SACU/SADC APPROACH	COMMENTS ON CHANGES TO NAMRUC METHODOLOGY
Network	Urban and rural network	Transit route network (mostly paved and rural)	Requires more elaborate procedures for VKT in NAMRUC model
E80 determination	Derives E80 vehicle through interactive process	Actual overall values	Change NAMRUC approach to SACU/ SADC approach. This will in fact simplify the NAMRUC methodology (See "Vehicle types")
Cost determination	Uses expert estimates of expenditure	Uses HDMIII/dTims estimates of expenditure or periodic maintenance and rehabilitation	*Rural roads* : Use HDMIII/dTims for paved road cost estimates of periodic maintenance and rehabilitation (ultimately). *Urban roads*: Use URMM for Namibia for improved cost estimates.
Cost allocation	Uses cost allocation units of account per activity (variable cost). Uses relative benefit principles for fixed cost allocation	Uses World Bank model for cost allocation. E80-km or VKT for variable cost, and GVM-km for fixed cost, depending on AADT and % heavy	NAMRUC model could be changed to accommodate this methodology. A detailed investigation of the elements included should be done.
Vehicle types	Uses 15 vehicle types	Uses 5 vehicle types	NAMRUC vehicle types can be consolidated to the 5 SACU/SADC vehicle types. However, impacts of cross-subsidisation should be considered.

E4. Conclusion

The purpose of this report was to present the methodologies of the NAMRUC model and the SACU/SADC approach for determining road user charges, to highlight the main differences between the two, and to identify changes needed to adapt the NAMRUC methodology to approximate the SACU/SADC methodology.

VEHICLE DATA

F1. Introduction

This appendix consists of a number of tables containing the vehicle data used in the RUC calculations. This data is referred to in Section 6 of this report.

Appendix F contains the following Tables:

Table	Content
F1	Vehicle Numbers
F2	Vehicle Characteristics
F3	Vehicle Kilometres of Travel (VKT) for All Roads
F4	VKT for Rural Roads
F5	VKT for Urban Roads
F6	1998/99 Vehicle Data for All Roads
F7	1998/99 Vehicle Data for Rural Roads
F8	1998/99 Vehicle Data for Urban Roads
F9	1999/00 Vehicle Data for All Roads
F10	1999/00 Vehicle Data for Rural Roads
F11	1999/00 Vehicle Data for Urban Roads
F12	2000/01 Vehicle Data for All Roads
F13	2000/01 Vehicle Data for Rural Roads
F14	2000/01 Vehicle Data for Urban Roads

COSTS TO BE RECOVERED

G1. Introduction

This appendix consists of a number of tables containing road expenditure estimates and their allocation to units of account for RUC calculation purposes. The data is referred to in Sections 7 and 8 of this report.

Cost estimates have been prepared for each of the financial years 1998/99, 1999/2000 and 2000/01. There are two expenditure budget scenarios for each financial year:

- A lower expenditure level option ("scaled").
- A higher cost option ("smoothed").

G2. Content

Appendix G contains the following tables:

Table	Content
G1	Annual Road Expenditures
G2	1998/99 Expenditure - Scaled
G3	1998/99 Expenditure - Smoothed
G4	1999/00 Expenditure - Scaled
G5	1999/00 Expenditure - Smoothed
G6	2000/01 Expenditure - Scaled
G7	2000/01 Expenditure - Smoothed

RUC CALCULATIONS

H1. Introduction

Road user charges have been calculated for two different expenditure budget scenarios - "scaled" and "smoothed" for each of the financial years 1998/99 to 2000/01. This appendix presents the results of these calculations for the vehicle types used in the RUC analysis. This appendix is referred to in Section 8 of this report.

H2. Content

This Appendix contains the following tables:

Table	Content
H1	1998/99 RUC - Scaled Expenditure Scenario
H2	1998/99 RUC - Smoothed Expenditure Scenario
H3	1999/00 RUC - Scaled Expenditure Scenario
H4	1999/00 RUC - Smoothed Expenditure Scenario
H5	2000/01 RUC - Scaled Expenditure Scenario
H6	2000/01 RUC - Smoothed Expenditure Scenario

WEIGHT DISTANCE CHARGES

I1. Introduction

A set of weight distance charges have been calculated for different types of heavy vehicles. These calculations have been based on the two main expenditure budget scenarios - "Scaled" and "Smoothed" for each of the financial years 1998/99 to 2000/01. The charges are based on 50% of fixed costs for diesel powered vehicles being recovered by the fuel levies and the weight-distance charges.

Two tables are provided for each budget scenario:

- one for the recommended diesel levy (to be applied to diesel powered vehicles), and
- one for the recommended petrol levy (to be applied to petrol powered vehicles).

This appendix is referred to in Section 9 of this report.

I2. Content

This appendix contains the following tables:

CROSS BORDER CHARGES

J1. Introduction

A set of cross-border charges have been calculated for different types of heavy vehicles. These calculations have been based on the two main expenditure budget scenarios - "Scaled" and "Smoothed" for each of the financial years 1998/99 to 2000/01. The charges are based on 100% of fixed costs for heavy vehicles being recovered by the fuel levies plus the cross-border charges.

Two tables are provided for each budget scenario:

- one for the recommended diesel levy (to be applied to diesel powered vehicles), and
- one for the recommended petrol levy (to be applied to petrol powered vehicles).

This appendix is referred to in Section 10 of this report.

J2. Content

This appendix contains the following tables:

Table	Content
J1.	1998/99 Cross-Border Charges-Scaled Expenditure Scenario-Diesel
J2.	1998/99 Cross-Border Charges-Scaled Expenditure Scenario-Petrol
J3.	1998/99 Cross-Border Charges-Smoothed Expenditure Scenario-Diesel
J4.	1998/99 Cross-Border Charges-Smoothed Expenditure Scenario-Petrol
J5.	1999/00 Cross-Border Charges-Scaled Expenditure Scenario-Diesel
J6.	1999/00 Cross-Border Charges-Scaled Expenditure Scenario-Petrol
J7.	1999/00 Cross-Border Charges-Smoothed Expenditure Scenario-Diesel
J8.	1999/00 Cross-Border Charges-Smoothed Expenditure Scenario-Petrol
J9.	2000/01 Cross-Border Charges-Scaled Expenditure Scenario-Diesel
J10.	2000/01 Cross-Border Charges-Scaled Expenditure Scenario-Petrol
J11.	2000/01 Cross-Border Charges-Smoothed Expenditure Scenario-Diesel
J12.	2000/01 Cross-Border Charges-Smoothed Expenditure Scenario-Petrol

VEHICLE CONFIGURATIONS

K1. Introduction

This appendix contains examples of heavy vehicle configurations and a proposal for classifying these vehicles for purposes of weight-distance charges.

K2. Content

This appendix contains the following figures:

CHARGES FOR ABNORMAL VEHICLES

L1. Introduction

This appendix sets out the basis for calculating Weight-Distance Charges for vehicles in Namibia using pre-calculated unit costs. The procedure in this appendix can be used to manually calculate weight-distance charges for an individual vehicle. This has particular application to vehicles operating under abnormal vehicle permits.

L2. Basis Of Charges

L2.1 Vehicle Attributes

For the purpose of determining charges for road use, each separately registered vehicle is characterised according to the attributes that affect road costs. The basic attributes for any vehicle are:

a) Whether the vehicle is powered or un-powered.

b) The gross vehicle mass (GVM), in tonnes (1 000 kg).

c) The number and type of axles and tyres on the vehicle.

The number of each of the following units is calculated for the vehicle from the above basic attributes:

a) VKT units -

VKT = 1.0, for a powered vehicle, eg a single unit truck, or a truck tractor.

VKT = 0.0, for an un-powered vehicle, eg a trailer or semi-trailer.

b) Axle units -

Axles = the number of axles on the vehicle.

c) Passenger Car Equivalent (PCE) units, calculated from -

$PCE = 0.61 + 1.46 \times Log_{10} (GVM)$, for a powered vehicle.

PCE = 0.5, for an un-powered vehicle.

d) Equivalent Single Axle (ESA) units, calculated from -

$$ESA = (GVM/\text{Sum of Axle Reference Loads})^4 \times \text{Number of Axles} \times \text{Load Factor.}$$

Load Factor in the ESA calculation allows for the vehicle not being operated at the GVM at all times. This applies only to vehicles that carry a payload. For most vehicles using a Load Factor of 0.55 factor in the ESA calculation is equivalent to that obtained by considering the vehicle covering half of any distance at the GVM and the other half at tare mass. Load Factors are given in Table L1.

TableL1. Load Factors for ESA Calculation

Vehicle Type	Load Factor
Light Goods Vehicle (LGV)	0.56
Bus	0.54
2 Axle Single Unit Truck (SUT)	0.40
3 Axle Single Unit Truck (SUT)	0.56
Truck Tractor	0.63
Heavy Trailer	0.63
Other	1.00

e) Fuel Consumption in litres/1000 km, calculated from -

Fuel Consumption = 81 + 16 x GVM, for powered vehicles.

Fuel Consumption = 41 + 6.1 x GVM, for un-powered vehicles.

The fuel consumption calculated above for un-powered vehicles is the additional fuel consumption for the truck tractor resulting from towing the trailer or semi-trailer.

L2.2 Axle Reference Loads

For ESA calculations each axle type and spacing combination is assigned a Reference Load. This is the load on this axle which causes 1.0 ESA.

Axle types are:

Ⓢ Single tyred, i.e. one tyre at each end of a single axle;

Ⓓ Dual tyred, i.e. two tyres at each end of a single axle;

④ Four tyred oscillating, i.e. one tyre at each end of two short axles connected transversely across the vehicle;

⑧ Eight tyred oscillating, i.e. two tyres at each end of two short axles connected transversely across the vehicle.

Axle spacings are categorised as:

- Spaced, if 2.4 metres or more from the nearest adjacent axle.
- Close, if less than 2.4 metres from the nearest adjacent axle.
- Axle Reference Loads for axles fitted with standard tyres (i.e. smaller than 13" x 24" or 14" x 19.5") are given in Table L2.

Table L2. Axle Reference Loads For Standard Tyres (tonnes/axle)

	Single Tyred	Dual Tyred	Four Tyred	Eight Tyred
Spaced axles	6.70	8.20	13.00	14.90
In close group of two axles	7.05	8.62	13.70	15.69
In close group of three axles	7.17	8.77	13.91	15.94
In close group of four or more axles	7.26	8.88	14.08	16.14

Axle Reference Loads for a spaced single tyred axle fitted with large tyres are given in Table L3. To use this table it is first necessary to obtain information on the gross contact area of the tyre from tyre manufacturer's data. As an example, Goodyear 16.00 x 25 Hard Rock Rib tyres have a gross contact area of 1200 cm^2 and the Axle Reference Load for a spaced single tyred axle fitted with these tyres is therefore 7.6 tonnes.

Table L3. Axle Reference Loads for Large Tyres

The Axle Reference Load for an axle other than a spaced single tyred axle, fitted with large tyres, is obtained by multiplying the Axle Reference Load from Table L3 by the Axle Reference Load in Table L2 appropriate to the axle type and spacing, and dividing by 6.7 (the Axle Reference Load for a single tyred spaced axle fitted with standard tyres). For example, if the Goodyear 16.00 x 25 tyres were fitted to a four tyred axle in a close group of two axles, the Axle Reference Load for the axle would be 15.54 tonnes (7.6 x 13.70 / 6.7).

L2.3 Unit Costs

Unit costs for each of the VKT, Axle, PCE and ESA units are calculated from time to time for each vehicle class such that when applied to the total vehicle fleet (not just vehicles subject to weight-distance charges, the revenue obtained is sufficient for Road Fund needs. For light vehicles, these unit rates are converted into rates of fuel levy. Current **(April 1998 Smoothed Expenditure Budget)** unit costs are given in Table L4.

Table L4. Unit Costs (N$/unit/1000 km) -1998/99

Vehicle Class	$VKT	$Axle	$PCE	$ESA
LGV	54.01	1.89	3.68	60.45
Bus	39.62	1.33	3.08	47.87
SUT	140.02	3.63	5.56	99.48
Truck Tractor	151.06	3.75	5.69	102.35
Heavy Trailer	-	3.75	5.69	102.35
Other	13.56	0.38	2.05	100.00

Current fuel levies ($FL) are: Petrol N$0.50/litre.

Diesel N$0.30/litre.

L3. Calculation of Charges

L3.1 Standard Vehicle Types

Weight-Distance Charges have been calculated for a standard set of vehicle types covering normal gross vehicle masses. The formulae used to calculate Weight-Distance Charges for these standard vehicle types are given in Table L5.

L3.2 Charges For Special Vehicle Types

From time to time it may be necessary to determine Weight-Distance Charges for unusual axle configurations, or for vehicles fitted with large tyres. In these cases it is necessary to calculate the Weight-Distance Charges applicable to the vehicle from first principles. A procedure for this is given in Table L6.

L3.3 Time Licensed Vehicle Types

Certain types of off-road vehicles, mainly mobile machinery, which cannot easily be fitted with hubodometers can have Weight-Distance Charges assessed in terms of time rather than distance. For these vehicles Weight-Distance Charges are calculated assuming an average annual on-road distance and that the vehicle will operate at the Permissible Maximum Vehicle Mass for the whole of this distance (these vehicles usually do not carry a payload other than their equipment).

For these vehicles the Load Factor in the ESA calculation [line 14 of the calculation procedure] should be taken as 1.0 and the final weight-distance charge [line 17 of the calculation procedure] should be multiplied by Annual On-Road Distance/1000. This gives a weight-distance charge per annum.

Table L5. Weight-Distance Charge Formulae for Standard Vehicle Types

Vehicle Type	Formula
LGV 1S + 1S	$VKT + ($Axle x 2) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/13.4)^4 x 2 x 0.56) - ($FL x (81 + 16 x GVM))
Bus 1S + 1D	$VKT + ($Axle x 2) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/14.9)^4 x 2 x 0.54) - ($FL x (81 + 16 x GVM))
Bus 1S + 1D 1S	$VKT + ($Axle x 3) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/22.4)^4 x 3 x 0.54) - ($FL x (81 + 16 x GVM))
SUT 1S + 1D	$VKT + ($Axle x 2) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/14.9)^4 x 2 x 0.40) - ($FL x (81 + 16 x GVM))
SUT 1S + 2D	$VKT + ($Axle x 3) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/23.9)^4 x 3 x 0.56) - ($FL x (81 + 16 x GVM))
Truck Tractor 1S + 1D	$VKT + ($Axle x 2) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/14.9)^4 x 2 x 0.63) - ($FL x (81 + 16 x GVM))
Truck Tractor 1S + 2D	$VKT + ($Axle x 3) + ($PCE x (0.61 + 1.46 x Log_{10}(GVM))) + ($ESA x (GVM/23.9)^4 x 3 x 0.63) - ($FL x (81 + 16 x GVM))
Trailer 1S	($Axle x 1) + ($PCE x 0.50) + ($ESA x (GVM/6.7)^4 x 1 x 0.63) - ($FL x (41 + 6.1 x GVM))
Trailer 1D	($Axle x 1) + ($PCE x 0.50) + ($ESA x (GVM/8.2)^4 x 1 x 0.63) - ($FL x (41 + 6.1 x GVM))
Trailer 2S	($Axle x 2) + ($PCE x 0.50) + ($ESA x (GVM/13.7)^4 x 2 x 0.63) - ($FL x (41 + 6.1 x GVM))
Trailer 2D	($Axle x 2) + ($PCE x 0.50) + ($ESA x (GVM/16.8)^4 x 2 x 0.63) - ($FL x (41 + 6.1 x GVM))
Trailer 3S	($Axle x 3) + ($PCE x 0.50) + ($ESA x (GVM/21.1)^4 x 3 x 0.63) - ($FL x (41 + 6.1 x GVM))
Trailer 3D	($Axle x 3) + ($PCE x 0.50) + ($ESA x (GVM/25.8)^4 x 3 x 0.63) - ($FL x (41 + 6.1 x GVM))

Note: The $FL for trailers is taken as the diesel fuel levy.

Table L6. Special Vehicle Rate Calculation Procedure

Note the steps shown below correspond with the line numbers on the calculation sheet.

Step	Action
1	Complete heading details: customer number and name if known; vehicle registration number; vehicle type; the Permissible Maximum Vehicle Mass in tonnes (1 000 kg); whether the vehicle is powered or un-powered; fuel type (petrol or diesel for powered vehicles).
2	Enter the spacing between each axle on the vehicle (forward axle on the left).
3	For each axle, determine whether the axle is "spaced" or "close".
4	For each "close" axle, determine the number of axles in the group containing that axle.
5	Enter the axle type for each axle - S, D, 4 or 8
6	For each axle: (a) if the tyre size is smaller than 13" x 24" or 14" x 19.5", then enter "std" for the tyre size; (b) if the tyre size is 13" x 24" or 14" x 19.5" or larger, then enter the tyre designation.
7	For each axle with large tyres, enter the gross contact area from tyre manufacturer's data.
8	For each axle, determine the axle reference load - see section L2.2. Calculate the sum of the axle reference loads.
9	Enter the current unit costs for VKT, Axle, PCE and ESA for the appropriate vehicle class.
10	Enter the gross vehicle mass for the vehicle in tonnes (1 000 kg). If the vehicle is operating under an abnormal vehicle permit, the gross vehicle mass is the permitted maximum. Otherwise the gross vehicle mass equals the Permissible Maximum Vehicle Mass. Note provision is made on the calculation sheet for 4 different gross vehicle masses for the vehicle.
11	If the vehicle is powered, enter the VKT unit rate under each gross vehicle mass.
12	For each gross vehicle mass, calculate the Axle Component of the charge = Axles x $Axle.
13	For each gross vehicle mass, calculate the PCE Component of the charge = $(0.61 + 1.46 \times \text{Log}_{10}(\text{Gross Vehicle Mass})) \times \$PCE$, if the vehicle is powered. = 0.5 x $PCE, if the vehicle is a trailer or semi-trailer.
14	For each gross vehicle mass, calculate the ESA Component of the charge = $(\text{Gross Vehicle Mass} / \text{Sum of Axle Reference Loads})^4 \times \text{Axles} \times \text{Load Factor} \times \$ESA$.
15	For each gross vehicle mass, calculate the total Weight-Distance Charge without fuel levy. [the sum of lines 11 to 14].
16	For each gross vehicle mass, calculate the amount collected per 1000 km by the current fuel levy (Fuel Component). = (81 + 16 x Gross Vehicle Mass) x Fuel Levy (petrol or diesel), if the vehicle is powered; = (41 + 6.1 x Gross Vehicle Mass) x Diesel Fuel Levy, if the vehicle is a trailer or semi-trailer.
17	For each gross vehicle mass, calculate the total Weight-Distance Charge with fuel levy in N$/1000km. [line 15 minus line 16].
18	Sign the calculation.

Weight-Distance Charges

SPECIAL VEHICLE RATE CALCULATION SHEET

CUSTOMER NUMBER	COMPANY NAME/SURNAME/CUSTOMER NAME		
REGISTRATION NUMBER	**VEHICLE CLASS**	**PERMISSIBLE MAXIMUM VEHICLE MASS (tonnes)**	**POWERED/UNPOWERED** **PETROL/DIESEL**

VEHICLE CONFIGURATION

2. AXLE SPACING (metres)							
3. SPACED/CLOSE							
4. No. AXLES IN GROUP							
5. AXLE TYPE							
6. TYRE SIZE							
7. TYRE CONTACT (cm^2)							
8. AXLE REFERENCE LOAD (tonnes)							

UNIT ROAD USER CHARGES RATES (N$/unit/1000 km)

9. $VKT	$Axle	$PCE	$ESA

CHARGE RATES FOR WEIGHT-DISTANCE LICENCES FOR THIS VEHICLE (N$/1000 km)

10. GROSS VEHICLE MASS (tonnes)				
11. VKT COMPONENT [= $VKT, if Powered]				
12. AXLE COMPONENT [= Axles x $Axle]				
13. PCE COMPONENT [= (0.61 + 1.46 x Log_{10} (Gross Mass)) x $PCE, if Powered = 0.50, if Un-powered]				
14. ESA COMPONENT [= (Gross Mass/Σ Axle Reference Loads)^4 x Axles x Load Factor x $ESA]				
15. WEIGHT-DISTANCE CHARGE without Fuel Levy (N$/1000 km)				
16. LESS FUEL COMPONENT [= (81 + 16 x Gross Mass) x Fuel levy, if Powered = (41 + 6.1 x Gross Mass) x Diesel Fuel levy, if Un-powered]				
17. WEIGHT-DISTANCE CHARGE with Fuel Levy (N$/1000 km)				

18. CALCULATED	CHECKED

EXAMPLES OF SPECIAL RATE CALCULATION

LEGISLATIVE PROVISIONS FOR WEIGHT-DISTANCE LICENSING

M1. WEIGHT-DISTANCE LICENCES

1. Weight-distance licences should specify:

    (a) The registration number of the motor vehicle;

    (b) The serial number (if any) of the distance recorder fitted to the motor vehicle;

    (c) The vehicle type number of the motor vehicle;

    (d) The maximum permissible gross mass for the motor vehicle;

    (e) The minimum and maximum distance recorder readings;

    (f) The licence number;

    (g) The location, date and time that the licence was issued;

    (h) A security feature or features, eg a bar code.

2. A weight-distance licence should be current only if the reading at that time on the distance recorder fitted to the motor vehicle to which the weight-distance licence relates is more than the minimum reading, and not more than the maximum reading, specified in the weight-distance licence.

3. Every weight-distance licence should be in the prescribed form and colour and contain the prescribed information.

4. No weight-distance licence should relate to more than one vehicle.

M2. APPLICATIONS FOR LICENCES

1. Applications for a weight-distance licence for a motor vehicle should be in a standard form provided by the Chief Executive for the purpose.

2. The first application for a weight-distance licence for a motor vehicle should contain the following information:

    (a) The full name and address of the applicant, including:

        (i) In the case of a natural person, the person's date of birth, street and postal address, and contact telephone number:

(ii) In the case of a body corporate, the registered number of the body corporate, the full name of the person who has the day to day responsibility for its operation, its street and postal address, and its contact telephone number:

(b) The registration number of the motor vehicle:

(c) The vehicle type number of the motor vehicle, whichever number most accurately represents the vehicle type:

(d) The maximum permissible gross mass for the vehicle:

(e) In the case of vehicles required to operate under an operator permit, the type and number of that permit:

(f) The predominant use of the vehicle:

(g) The make and serial number of the hubodometer:

(h) Whether the vehicle's distance recorder records in miles or kilometres:

(i) In the case of an application for the first weight-distance licence for a vehicle, the minimum distance being the reading on the vehicle’s distance recorder when it was first fitted to the vehicle and the maximum distance to be specified on the weight-distance licence:

(j) In any other case, the minimum and maximum readings to be specified on the weight-distance licence.

3. Every first application for a weight-distance licence by an applicant, where that applicant wishes to make payment for that and subsequent weight-distance licences by means of an automatic transfer of funds, should be accompanied by a completed bank authority on a form provided by the Chief Executive or a bank.

4. Where an owner is adding a vehicle to an existing fleet of vehicles, it shall be sufficient compliance if the application contains the following information:

(a) The owner's weight-distance charges account number:

(b) The number or distinguishing mark shown on the registration plate or plates of the motor vehicle:

(c) The minimum and maximum reading to be specified on the weight-distance licence:

(d) The distance to which the weight-distance licence is to relate:

(e) The maximum permissible gross mass for the vehicle:

(f) Any information that has changed since any previous application for a weight-distance licence for any motor vehicle owned by the applicant.

5. In the case of an application in respect of the first purchase of a weight-distance licence for a vehicle added to the applicant's fleet or in respect of a replacement hubodometer, the application should, in addition, contain the following information:

(a) The vehicle type number:

(b) The predominant use of the vehicle:

(c) The make and serial number of the hubodometer:

(d) Whether the vehicle's distance recorder records in miles or kilometres.

6. In the case of an application where the holder has previously held a weight-distance licence in respect of the vehicle, the application should contain the maximum reading specified on the last weight-distance licence held in respect of that vehicle.

7. Every person and every body corporate should be entitled to hold a weight-distance licence for a motor vehicle, except the following:

(a) An undischarged bankrupt, where the application relates to a vehicle used in trade or business:

(b) A body corporate in receivership, where the application is made by or on behalf of a person other than the receiver.

8. In every application for a weight-distance licence for a motor vehicle, the minimum reading to be specified in the weight-distance licence should not be greater than the maximum reading specified in the last properly issued weight-distance licence for that vehicle. Where an application for a weight-distance licence is made in contravention of this requirement, the amount arrived at by multiplying the distance in kilometres by which the minimum reading was overstated by the weight-distance charge per kilometre for that weight-distance licence should, until paid in full to, or remitted by, the Chief Executive, constitute a debt to the Road Fund by the applicant for the weight-distance licence, and be recoverable accordingly in any Court of competent jurisdiction.

M3. WEIGHT-DISTANCE CHARGES

1. Every application for a weight-distance licence should be accompanied by the appropriate charge for that weight-distance licence together with the prescribed administration fee.

2. The amount of the appropriate charge for the weight-distance licence and the prescribed administration fee should, until paid in full to the Chief Executive, constitute a debt due to the Road Fund by the applicant for the weight-distance licence, and should be recoverable accordingly in any Court of competent jurisdiction.

3. Where the Chief Executive is of the opinion, after considering the road wear that is likely to be caused by the vehicle to which the weight-distance licence relates, that a charge is excessive in respect of any particular weight-distance licence, he or she should be able to, in his or her absolute discretion, remit part of the charge; and if the full charge has been paid cause the part remitted to be refunded to the applicant for the weight-distance licence.

M4. ISSUE OF WEIGHT-DISTANCE LICENCES

1. Weight-distance licences should be able to be issued:

   (a) By the Chief Executive in such manner as he or she thinks fit:

   (b) By such persons and in such manner as the Chief Executive may authorise in that behalf.

2. The Chief Executive should be able to authorise any employee or agent of any authorised person to issue weight-distance licences.

3. The Chief Executive or any other person authorised to issue weight-distance licences should be able to decline to issue a weight-distance licence in any case where:

   (a) The applicant has an outstanding weight-distance charge debt; or

   (b) The applicant is not entitled to hold a weight-distance licence.

4. Where the applicant has a history of failing to pay the appropriate weight-distance charge or the prescribed administration fee, or both, when making an application for a weight-distance licence, the issue of a weight-distance licence may be made conditional on the payment in cash of the amounts due or the giving of an appropriate security in respect of those amounts.

4. Where an issuing officer is satisfied that a mistake has been made by an issuing officer in the issue of a weight-distance licence, he or she should be able to, upon receipt of the weight-distance licence, cancel the weight-distance licence and issue in its place a new weight-distance licence containing the correct information.

M5. DISPLAY OF WEIGHT-DISTANCE LICENCES

1. Every weight-distance licence should be carried on the vehicle to which it relates or a vehicle attached to that vehicle and should be displayed, in an upright and conspicuous position, as follows:

   (a) In the case of a motor vehicle fitted with a windscreen, the weight-distance licence should be displayed behind the windscreen on the passenger side so that the side of the weight-distance licence displaying the registration number of the motor vehicle faces towards the foremost part of the motor vehicle and is easily visible from outside it:

   (b) In the case of a motor vehicle not fitted with a windscreen, the weight-distance licence should be displayed either:

      (i) Behind the windscreen of a motor vehicle to which the vehicle is attached, as in (a) above; or

      (ii) At the front of the left side of the vehicle so that the side of the weight-distance licence displaying the registration number of the vehicle is easily visible from outside the vehicle.

2. Every weight-distance licence required to be carried and displayed should be required to be produced by the driver or person in charge of the vehicle to which it relates forthwith on demand by a constable or traffic officer or any officer of the Road Fund Administration acting under a delegation from the Chief Executive.

3. Where a weight-distance licence has been issued to an operator but the weight-distance licence has not been received by the operator, the following provisions should apply:

   (a) Until the close of 7 days after the date on which the weight-distance licence is issued, a facsimile copy of the weight-distance licence in the prescribed form should be sufficient evidence of the issue of the weight-distance licence:

   (b) An enforcement officer should be able to accept some other form of proof of the issue of a weight-distance licence during the period referred to in (a), being a form of proof approved by the Chief Executive.

4. A weight-distance label in the prescribed form and containing the correct details in respect of a weight-distance licence should be proof of purchase of a weight-distance licence.

M6. SALE OF VEHICLE

1. Any person who sells a motor vehicle to which weight-distance licensing applies should be required to deliver to the purchaser on or before the date of delivery of the vehicle a weight-distance licence that will be current when the vehicle is delivered.

M7. REFUNDS AND REMISSIONS FOR OFF-ROAD TRAVEL

1. Where a distance recorder fitted to a motor vehicle has recorded distance travelled by the motor vehicle while not on a public road and a weight-distance licence relating to the motor vehicle was current at the time, application should be able to be made (after the expiry or surrender of the licence where applicable) to the Chief Executive for a refund or remission of the appropriate portion of the weight-distance charge paid in respect of the licence.

2. Every such application should be in a form prescribed by the Chief Executive, and should contain such information as the Chief Executive requires to substantiate the application and enable the refund or remission to be made.

3. The chief executive should, as soon as practicable after being satisfied as to the accuracy of the application, refund or remit, or cause to be refunded or remitted, the appropriate portion of the weight-distance charge paid. The proportion of a weight-distance charge to be refunded should be the proportion arrived at by dividing the distance recorded by the distance recorder while the motor vehicle was not on a road by the distance to which the weight-distance licence relates.

4. No refund of a weight-distance charge should be made after the expiry of 2 years from the date of issue of the weight-distance licence, unless the Chief Executive otherwise determines in any particular case.

M8. SURRENDER OF WEIGHT-DISTANCE LICENCES

1. Weight-distance licences should be able to be surrendered where:

   (a) A motor vehicle to which a current weight-distance licence relates is destroyed, becomes permanently useless as a motor vehicle, or is removed permanently beyond Namibia, and the vehicle's registration plates have been surrendered to the Registrar of Motor Vehicles; or

   (b) A current weight-distance licence ceases to be valid by virtue of a change in the rate of weight-distance licences; or

(c) The Chief Executive is satisfied, in respect of a current weight-distance licence relating to a motor vehicle, that:

(i) A mistake has been made in the application for the weight-distance licence and a replacement weight-distance licence has been purchased; or

(ii) The distance recorder, or a registration plate, specified in the weight-distance licence has been removed from the motor vehicle and a replacement weight-distance licence has been purchased.

(d) The Chief Executive in his or her absolute discretion is satisfied, in respect of a weight-distance licence relating to a motor vehicle, that for any other reason the weight-distance licence should be surrendered.

2. The Chief Executive should, as soon as practicable after application to surrender the weight-distance licence is made to him or her, refund or cause to be refunded to the applicant the unused proportion of the charge paid in respect of the weight-distance licence.

3. Every application to surrender a weight-distance licence should be in a form provided for the purpose by the Chief Executive and should contain such information as the Chief Executive considers necessary to enable the refund to be made. Every application under 1(c) or (d) above should be accompanied by the weight-distance licence.

4. The unused proportion of a weight-distance charge to be refunded should be the proportion arrived at by dividing the difference between the maximum reading specified in the weight-distance licence and the reading of the motor vehicle's distance recorder at the time of application (or, where the weight-distance licence has ceased to be valid by virtue of a change in the rate for weight-distance licences, at the time the licence ceased to be valid) by the distance to which the licence relates.

5. No refund of a weight-distance charge should be made after the expiry of 2 years from the date of issue of the weight-distance licence in respect of which the application is made, unless:

(a) The application is made to the Chief Executive before the expiry of that 2-year period; or

(b) The Chief Executive otherwise determines, in any particular case.

M9. VERIFICATION OF APPLICATION FOR REFUND OR REMISSION

1. The Chief Executive should be able at any time, whether before or after a refund or remission is made, require the applicant to produce for inspection any books or records in the applicant's possession or over which the applicant has control which the Chief Executive considers relevant in relation to the refund or remission.

2. The Chief Executive should be able to take extracts from or make copies of any books or records so produced.

3. The Chief Executive should be able to require verification of any information contained in books or records supplied, and should be able to decline to act on any information that is not verified to his or her satisfaction or recover any refund or cancel any remission granted in reliance upon incorrect or unverified information.

M10. FURTHER PROVISIONS RELATING TO REFUNDS

1. There should be no refund of an amount less than N$5.

2. In calculating the amount of a refund payable in respect of a weight-distance licence, the Chief Executive should be able to make allowance for any refund paid or payable in respect of that licence under any other provision, and allowance for any debt due by the applicant under any other provision.

3. Where the refund payable is less than N$5 000, the refund should be credited to the operator's weight-distance charges account unless:

   (a) The account is to be closed; and

   (b) The operator requests that the refund be paid directly to the operator.

4. Where an application for a refund is based in whole or in part on an alleged hubodometer failure:

   (a) The Chief Executive should be able to, by notice in writing, require the operator to produce the hubodometer for inspection at a place appointed for the purpose by the Chief Executive; and

   (b) No refund should be made in respect of the alleged hubodometer failure if the hubodometer is not so produced within 3 months after the date of the making of the application.

5. All money refunded in error, whether of fact or of law, under any provision, should be recoverable by the Chief Executive, or by action at law as a debt due to the Road Fund.

M11. LICENCES BECOME INVALID ONE MONTH AFTER ROAD USER CHARGE ALTERED

1. Where weight-distance charge rates are altered, no weight-distance licence issued before the date of commencement of the alteration should be valid after the expiry of one month from that date.

M12. ADDITIONAL CHARGES FOR DEFAULT IN PAYMENT OF AMOUNTS DUE

1. If any debt due to the Road Fund is not paid to the Chief Executive within 3 months of the date it first becomes due, an amount equal to 10 percent of the debt should be added to the debt by way of an additional charge recoverable accordingly by the Chief Executive from the person who owed the debt in any Court of competent jurisdiction.

2. On written application for relief made by or on behalf of any person who has become liable for the payment of any additional charge, the Chief Executive, if having regard to the circumstances of the case thinks it equitable to do so, should be able to grant relief to the person:

    (a) By the remission of the whole or any part of the additional charge; or

    (b) Where the additional charge has been paid in whole or in part, by the refund to the person of the whole or any part of the additional charge that has been paid, with or without the remission of any part of the additional charge that has not been paid.

3. Any amount imposed by way of additional charge should be in addition to any other penalty to which the person may be liable.

M13. HUBODOMETERS

1. Every motor vehicle to which weight-distance licensing applies should have a hubodometer attached at all times which:

    (a) Is approved for the tyre size designation currently on the wheel to which the hubodometer is fitted; and

    (b) Is fitted in accordance with the following provisions; and

    (c) Is an approved make with a unique serial number visible inside the casing which has been registered with the Chief Executive; and

    (d) Is recording accurately the distance travelled by the vehicle.

2. Notwithstanding the above, a motor vehicle need not be fitted with a hubodometer if:

    (a) The Chief Executive has given written notice to the effect that he or she considers that because of the construction of the vehicle it is impracticable to affix a hubodometer to the vehicle; and

(b) The vehicle is fitted with another kind of distance recorder that has been sealed to the satisfaction of the Chief Executive and records accurately the distance travelled.

M14. FITTING AND REPAIR OF HUBODOMETERS

1. Every hubodometer (other than an electronic hubodometer) fitted to a motor vehicle for the purposes of weight-distance charges should be affixed by a rigid bracket to a non-lifting axle or wheel on the left-hand side (or the right-hand side, in any case where the Chief Executive has given written notice to the effect that he or she considers that it is impracticable to affix a hubodometer to the left-hand side) of the motor vehicle in such a manner that:

   (a) It accurately records the distance travelled by the vehicle; and

   (b) Its face, unique serial number, and the distance travelled are readable from outside the vehicle; and

   (c) Its axis of rotation is central and parallel to the axis of rotation of the axle or wheel to which it is affixed; and

   (d) It is not readily detachable from the axle or wheel to which it is affixed without the use of any tool.

3. Where an adjustable bracket is used to affix a hubodometer to an axle or wheel, the bracket should be welded, riveted, or otherwise modified to ensure that, once so affixed, the hubodometer's position cannot be altered.

4. Where the Chief Executive considers that it is impracticable to fit a hubodometer to a non-lifting axle or wheel, the Chief Executive may approve the fitting of the hubodometer to a lifting axle or wheel; and, in that case, the hubodometer shall be fitted in the manner specified by the Chief Executive and shall comply in all other respects with the above requirements.

5. Every electronic hubodometer fitted to a motor vehicle for the purposes of weight-distance charges should be affixed to the motor vehicle in such a manner that:

   (a) It accurately records the distance travelled by a vehicle; and

   (b) Its wheel revolution detector is affixed by a rigid bracket in such a manner that it accurately records the revolutions of a non-lifting wheel of the vehicle; and

   (c) The face of the distance recording unit thereof, its unique serial number, and the distance travelled are readable from outside the left-hand side of the vehicle; and

(d) All cables and fittings of the hubodometer are easily visible without dismantling any part of the vehicle; and

(e) It cannot be switched off or temporarily disconnected from within the vehicle; and

(f) Where its functioning is dependent upon internal re-chargeable batteries, it is connected to a power supply that continuously re-charges the batteries whenever the vehicle is moving.

6. Where an adjustable bracket is used to affix a wheel revolution detector to a vehicle, the bracket shall be welded, riveted, or otherwise modified to ensure that, once so affixed, the detector's position cannot be altered.

7. No person should be able to, without the written consent of the Chief Executive, fit a hubodometer to a motor vehicle for the purposes of weight-distance charges, if he knows or ought to know that the hubodometer has previously been fitted to the motor vehicle and that the motor vehicle has been operated after the removal, loss, or displacement of the hubodometer from the motor vehicle.

8. No person should be able to, without the written consent of the Chief Executive, fit a hubodometer to a motor vehicle for the purposes of weight-distance charges, if he knows or ought to know that the hubodometer has previously been fitted to another motor vehicle for the purposes of weight-distance charges and that the other motor vehicle is still registered.

9. No person, other than the manufacturer thereof or a person approved in writing for this purpose by the Chief Executive, should be able to repair or modify or attempt to repair or modify, or in any way tamper with any part of, a hubodometer of a kind that may be fitted to a motor vehicle for the purposes of weight-distance charges.

10. Any consent or approval given by the Chief Executive relating to the fitting or repair of hubodometers should be able to be given on such terms and conditions as the Chief Executive thinks fit; and should be able to be, at any time, varied or revoked by the Chief Executive by notice in writing to the person.

M15. RESTRICTIONS ON SALE OF HUBODOMETERS

1. Hubodometers should be registered with the Chief Executive.

2. No person should be able to sell a hubodometer if that person knows or ought to know that the make and serial number of the device are not registered with the Chief Executive.

3. Applications for registration under this section should be in a form approved for the

purpose by the Chief Executive.

4. In any case where a hubodometer is required to be registered, the Chief Executive should be able to:

   (a) Cause a unique identifier to be assigned to the hubodometer; and

   (b) Cause a label bearing that identifier to be affixed to the hubodometer; and

   (c) Determine the tyre size designations with which the hubodometer may be used.

"Sell" should include supply for the purposes of fitting a vehicle.

M16. POWER TO INSPECT RECORDS

1. For the purpose of ascertaining whether the provisions of weight-distance licensing have been or are being complied with by any person to whom weight-distance licensing applies, the Chief Executive should be able to inspect any books or records in that person's possession or over which that person has control, including (but not limited to) logbooks, records associated with logbooks, financial records relating to expenditure on fuel, invoices, vehicle maintenance records, depreciation records for vehicles, time and wage records, and waybills.

2. The Chief Executive should be able to take extracts from or make copies of any books or records so produced.

M17. INQUIRY INTO WEIGHT-DISTANCE LICENSING

1. Provision should be made for a District Court Judge, on the application of the Chief Executive, to hold an inquiry into the number and kind of weight-distance licences that ought to have been obtained:

   (a) During a period specified in the application (being a period commencing not earlier than 6 years before the date of the application); and

   (b) For motor vehicles specified in the application (being motor vehicles that the Chief Executive believes were owned during the whole or any part of the period by a person specified in the application).

2. The chief executive should not make an application to a District Court for the purposes of a weight-distance licensing inquiry unless he or he considers that it is likely that all the appropriate licences that ought to have been obtained during the period, and for the motor vehicles, specified in the application were not so obtained.

3. The Chief Executive should be able to, in an application to a District Court Judge for the purposes of an inquiry into weight-distance licensing, specify any convictions relating to

weight-distance licensing offences that have, during the period of 6 years immediately preceding the date of the application, been entered against the person specified in the application.

M18. PROVISIONS RELATING TO INQUIRIES

1. For the purposes of any weight-distance licensing inquiry, the District Court Judge should be able to, of his own motion or on application, by written notice served on the person:

   (a) Summon before him any person or persons (including, where the inquiry relates to a body corporate, any director or employee of the body) to give evidence; and

   (b) Require any person to produce for the inspection of the Judge, or of any other person authorised by the Judge for this purpose, any books, papers, accounting records, or other documents, or things, that are relevant to the inquiry.

2. If any District Court Judge is satisfied that any person who has been summoned under 1(a) will not attend to give evidence without being compelled to do so, he should be able to issue a warrant for the attendance of that person at the inquiry.

3. At any weight-distance licensing inquiry:

   (a) The District Court Judge should be able to examine on oath any person; and for that purpose the Judge or a Registrar of a Court should be able to administer an oath; and

   (b) The District Court Judge should be able to receive as evidence any statement, document, information, matter, or thing, that in his or her opinion may assist him or her to deal effectively with the subject of the inquiry, whether or not it would ordinarily be admissible as evidence; and

   (c) The Chief Executive, and the person specified in the Chief Executive's application should be able to be each be represented by a counsel or agent; and

   (d) The Chief Executive and the person specified in the Chief Executive's application, or any counsel or agent representing them, should be able to examine, cross-examine, and re-examine, in accordance with the ordinary practice, any person summoned to the inquiry.

4. Every weight-distance licensing inquiry should take place in chambers and at such time or times as the District Court Judge determines.

5. The statement of every person examined under this section should be taken down in writing, and signed by him or her in the presence of the District Court Judge, and copies thereof should be delivered to the Chief Executive and to the person specified in the Chief Executive's application. The statement should not form part of the records of the Court.

6. No person examined under this section should be excused from answering any question on the ground that the answer may incriminate him or her or render him or her liable to any penalty.

7. No statement made by any person in answer to any question put to him or her in examination

under this section, or document or thing produced pursuant to a requirement under this section, should in criminal proceedings be admissible in evidence against him or her, except upon a charge of perjury against him or her in respect of his or her testimony upon that examination.

8. A District Court Judge should be able to, for the purpose of assisting him or her in the exercise of his or her powers, appoint any Registrar of a Court, chartered accountant, or other person or persons to inspect documents and things produced and consider statements made during the inquiry, and to report to the District Court Judge thereon.

9. A District Court Judge should be able to order that any costs (or such part thereof as is specified by the Judge) incurred by:

   (a) The Chief Executive; or

   (b) The person specified in the Chief Executive's application; or

   (c) Any person summoned, or required to produce a document or thing in respect of a weight-distance licensing inquiry,

   should be paid by the Chief Executive or the person specified in the Chief Executive's application, or both (in proportions specified by the Judge); and in any such case the costs so awarded should be recoverable as a debt due by the person against whom they have been awarded to the person in whose favour they have been awarded.

M19. DISTRICT COURT JUDGE ASSESSMENT

1. Where after holding a weight-distance licensing inquiry and considering any reports obtained, a District Court Judge considers, on the balance of probabilities, that all the appropriate licences that ought to have been obtained for the motor vehicles specified in the Chief Executive's application during the period, and while they were owned by the person, so specified were not obtained, he or she should be able to make an assessment of the amount of weight-distance charges that in his or her opinion ought to have been, but were not, paid to the Chief Executive in respect of those motor vehicles while they were owned by that person during that period.

1. In giving reasons for an assessment under this section a District Court Judge should not be required to indicate how the assessment is calculated or what licences he or she considers ought to have been obtained.

2. Every assessment made by a District Court Judge under this section should be delivered by him or her in open Court.

3. A District Court Judge should be able to, when delivering an assessment, state the date from which the amount of the assessment shall be payable to the Chief Executive, which date may be earlier than the date the assessment is so delivered.

4. Where a District Court Judge makes an assessment, the amount of the assessment should, from the date the Judge delivers his or her assessment (or such other date, if any, as the Judge specifies), be payable to the Chief Executive by the person specified in the Chief Executive's

application; and, until paid in full to the Chief Executive, the amount should constitute a debt due to the Chief Executive by the person and be recoverable accordingly in any Court of competent jurisdiction.

M20. DISTRICT COURT JUDGE ASSESSMENT BY CONSENT

1. A District Court Judge should be able to, instead of holding an inquiry and making an assessment, make an assessment by consent of the Chief Executive and the person specified in the Chief Executive's application.

M21. OFFENCES

1. Weight-distance licensing and hubodometer offences will include:

   (a) Operating a motor vehicle on a road without a valid weight-distance licence.

   (b) Operating a motor vehicle on a road without an attached valid distance recorder.

   (c) Operating a motor vehicle on a road when the reading of the distance recorder is less than the minimum reading or more than the maximum reading specified in the weight-distance licence.

   (d) Altering or defacing any weight-distance licence.

   (e) Operating on a road any motor vehicle bearing a weight-distance licence that has been altered or defaced or that is in any way obscured or not easily distinguishable.

   (f) Operating on a road any motor vehicle for which a weight-distance licence is required that does not have such a licence displayed.

   (g) Displaying or causing to be displayed on any motor vehicle anything (not being a weight-distance licence) that is likely to be mistaken for a weight-distance licence; or any weight-distance licence that is not current (other than a weight-distance licence that immediately precedes, or immediately follows, the current weight-distance licence) or is no longer valid or that does not relate to the motor vehicle.

   (h) Operating any motor vehicle that has displayed on it anything (not being a weight-distance licence) that is likely to be mistaken for a weight-distance licence, or any weight-distance licence that is not current (other than a weight-distance licence that immediately precedes, or immediately follows, the current weight-distance licence) or is no longer valid or that does not relate to the motor vehicle.

(i) Not delivering a current weight-distance licence to the purchaser when a vehicle is sold.

(j) Not producing for inspection any books or records, relevant in relation to a refund or remission.

(k) Failing to produce any weight-distance licence when required to do so.

(l) Making any application that is known or ought to be know to be incorrect in a material particular.

(m) Contravening the requirements for fitting, repair or sale of hubodometers.

(n) Operating a motor vehicle which is fitted with a hubodometer which is designed for a tyre size other than that on the wheel to which the hubodometer is fitted unless the prior written approval of the Chief Executive has been obtained.

(o) Operating a motor vehicle on a road in circumstances in which the operator of the vehicle knew or ought to have known that the hubodometer fitted to that vehicle has been damaged in a manner that affects its accuracy, or has been tampered with, or has been modified or repaired other than as permitted.

(p) Altering or wilfully damaging any distance recorder fitted to a motor vehicle.

(q) Failing or refusing to appear before a Judge at the time specified by the Judge, or to take oath as a witness before the Judge when summoned to a weight-distance licensing inquiry.

(r) Failing or refusing to answer any question regarding the subject of a weight-distance licensing inquiry when sworn as a witness at an inquiry.

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(s) Failing or refusing to produce any document or thing for the inspection of the Judge, or of any person authorised by the Judge for this purpose, when required to do so in relation to a weight-distance licensing inquiry.

2. The owner of the motor vehicle should be deemed to have committed an offence where:

(a) A motor vehicle is operated on a road without a valid weight-distance licence, or without an attached valid distance recorder, or when the reading of the distance recorder is less than the minimum reading or more than the maximum reading specified in the weight-distance licence; or

(b) An application for a weight-distance licence for a motor vehicle is made that is incorrect in a material particular;

3. Allowance should be made for the following defences in proceedings for weight-

distance licensing offences:

a) It should be a defence in proceedings for an offence against 1(g), (h) or (k) if the defendant produces proof of purchase of a weight-distance licence.

b) It should be a defence in proceedings for an offence of operating a motor vehicle on a road without the appropriate weight-distance licence if the defendant proves that:

(i) It was not possible to obtain the licence at any time during the period between the time when the need for the licence was reasonably foreseeable by the defendant or any employee or agent thereof, and the time when the alleged offence was committed; and

(ii) An appropriate weight-distance licence covering the distance for which the motor vehicle was on a road in contravention of the legal requirements was obtained for the motor vehicle forthwith after the commission of the alleged offence.

c) It should be a defence in proceedings for an offence of operating a motor vehicle on a road when the reading of the distance recorder is more than the maximum reading specified in the weight-distance licence displayed in the vehicle at the time of the offence, if the Court is satisfied that:

(i) The reading of the distance recorder did not exceed by more than 500 kilometres that maximum reading; and

(ii) As soon as reasonably practical after the offence was drawn to the attention of the defendant, a further weight-distance licence was purchased for a distance of not less than the amount by which the reading of the distance recorder exceeded the maximum reading of the weight-distance licence displayed in the vehicle at the time of the offence.

d) It should be a defence in proceedings for an offence of operating a motor vehicle on a road when the weight-distance licence carried or displayed on the motor vehicle specifies the wrong vehicle type number of that motor vehicle if the defendant proves that:

(i) The vehicle was fitted with a lifting axle which was not transmitting a portion of the weight of the vehicle to the roadway at the time of the offence; and

(ii) The vehicle was unladen, except for normal operating gear; and

(iii) The lifting axle was capable of being altered by the fitted device so as

to transmit to the roadway a portion of the weight of the vehicle; and

(iv) If the lifting axle had been transmitting a portion of the weight of the vehicle to the roadway at the time of the offence, the vehicle type number specified on the weight-distance licence would have been correct for the motor vehicle.

[A "lifting axle" is an axle which is fitted with a device to alter the distribution of weight between the axles of a heavy motor vehicle.]

4. It should be a defence in proceedings for an offence of operating a motor vehicle on a road without a proper working distance recorder if the defendant proves that:

(i) A distance recorder was fitted to the motor vehicle at the time; and

(ii) It was not possible to obtain and fit a properly working distance recorder to the motor vehicle, or to repair the distance recorder fitted to the motor vehicle, during the period between the time of the damage to or malfunction of the distance recorder fitted to the motor vehicle and the time when the alleged offence was committed; and

(iii) A properly working distance recorder was fitted to the motor vehicle, or the distance recorder fitted to the motor vehicle was repaired, forthwith after the commission of the alleged offence.

M22. EVIDENCE IN PROCEEDINGS

1. A document certified by an officer or employee of the Road Fund Administration to be a record held for the purposes of weight-distance charges should be received as prima facie evidence:

(a) In any weight-distance licensing inquiry.

(b) In any proceedings for a weight-distance licensing offence.

(c) In any proceedings for the revocation of an operator permit.

2. For the above purposes, a record held should include a copy of a weight-distance licence issued and a computer record held for the purposes of weight-distance charges; and "computer record" should include a microfiche, a microfiche printout, a computer printout, or any other document produced by a device by means of which information is recorded or stored.

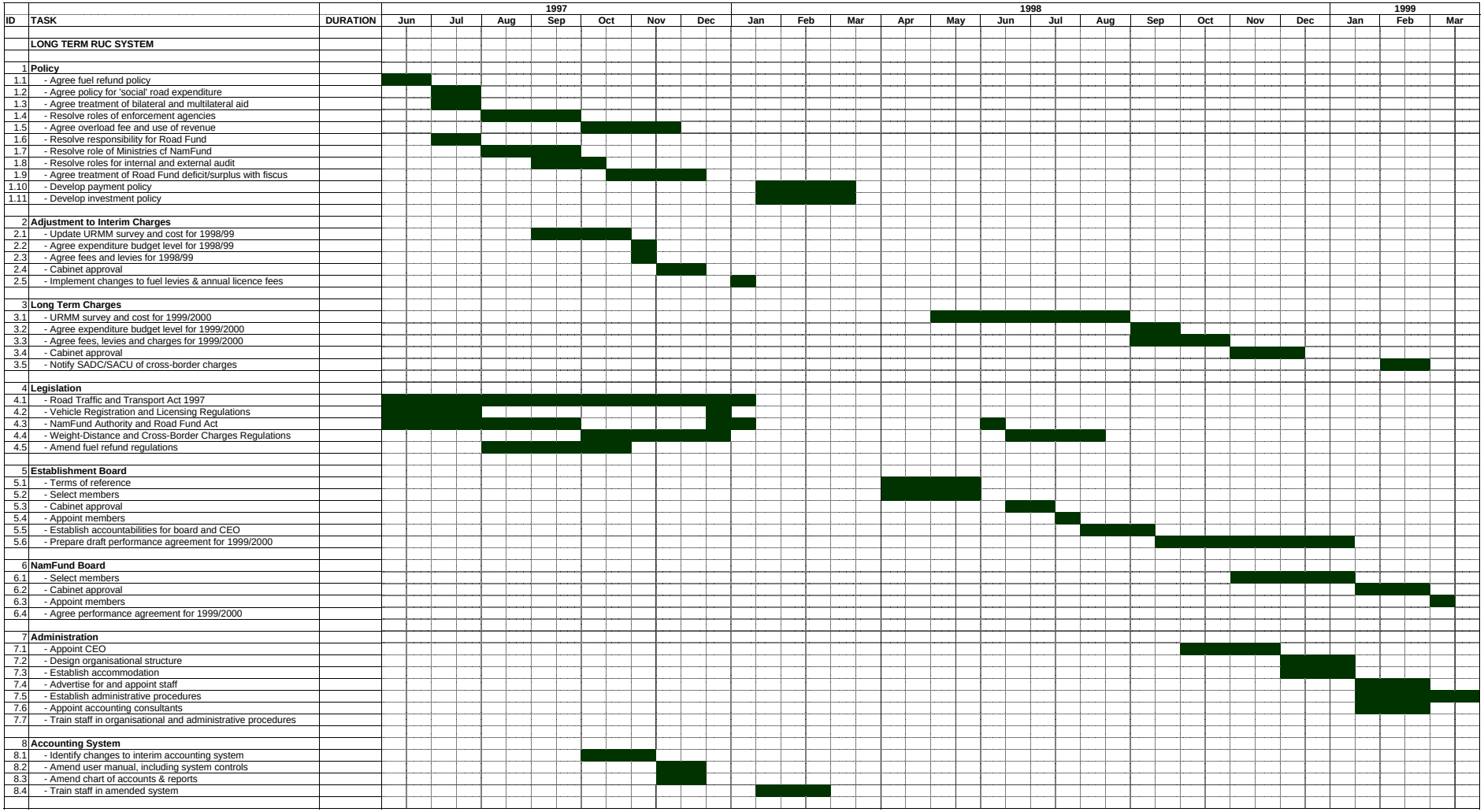
IMPLEMENTATION PLAN FOR LONG TERM RUC SYSTEM

A summarised implementation plan for the long term RUC system is presented in this Appendix M. The plan is presented as a bar-chart on the next two pages and outlines all major activities required to establish the long term system including the associated institutional and legal structures.

The plan assumes full implementation by 1 April 1999 which is considered to be the earliest feasible date for implementation of weight-distance charges and cross-border charges.

The implementation of the plan is dependent on a number of actions and decisions outside the RUC system. However, this dependence is not absolute. Some central activities, including the formal establishment of the Road Fund and its administration, may take place only after 1 April 1999. The implementation of the long term RUC system can go ahead without the Road Fund being in place.

Figure N1. Implementation Plan for Long Term RUC System



ID	TASK	DURATION
	LONG TERM RUC SYSTEM	
1	**Policy**	
1.1	- Agree fuel refund policy	
1.2	- Agree policy for 'social' road expenditure	
1.3	- Agree treatment of bilateral and multilateral aid	
1.4	- Resolve roles of enforcement agencies	
1.5	- Agree overload fee and use of revenue	
1.6	- Resolve responsibility for Road Fund	
1.7	- Resolve role of Ministries cf NamFund	
1.8	- Resolve roles for internal and external audit	
1.9	- Agree treatment of Road Fund deficit/surplus with fiscus	
1.10	- Develop payment policy	
1.11	- Develop investment policy	
2	**Adjustment to Interim Charges**	
2.1	- Update URMM survey and cost for 1998/99	
2.2	- Agree expenditure budget level for 1998/99	
2.3	- Agree fees and levies for 1998/99	
2.4	- Cabinet approval	
2.5	- Implement changes to fuel levies & annual licence fees	
3	**Long Term Charges**	
3.1	- URMM survey and cost for 1999/2000	
3.2	- Agree expenditure budget level for 1999/2000	
3.3	- Agree fees, levies and charges for 1999/2000	
3.4	- Cabinet approval	
3.5	- Notify SADC/SACU of cross-border charges	
4	**Legislation**	
4.1	- Road Traffic and Transport Act 1997	
4.2	- Vehicle Registration and Licensing Regulations	
4.3	- NamFund Authority and Road Fund Act	
4.4	- Weight-Distance and Cross-Border Charges Regulations	
4.5	- Amend fuel refund regulations	
5	**Establishment Board**	
5.1	- Terms of reference	
5.2	- Select members	
5.3	- Cabinet approval	
5.4	- Appoint members	
5.5	- Establish accountabilities for board and CEO	
5.6	- Prepare draft performance agreement for 1999/2000	
6	**NamFund Board**	
6.1	- Select members	
6.2	- Cabinet approval	
6.3	- Appoint members	
6.4	- Agree performance agreement for 1999/2000	
7	**Administration**	
7.1	- Appoint CEO	
7.2	- Design organisational structure	
7.3	- Establish accommodation	
7.4	- Advertise for and appoint staff	
7.5	- Establish administrative procedures	
7.6	- Appoint accounting consultants	
7.7	- Train staff in organisational and administrative procedures	
8	**Accounting System**	
8.1	- Identify changes to interim accounting system	
8.2	- Amend user manual, including system controls	
8.3	- Amend chart of accounts & reports	
8.4	- Train staff in amended system	

Table G1. Annual Road Expenditures

								8 % Annual Inflation							
			Annual Expenditure - 1997/98 Prices						Smoothed Expenditure - Inflated Prices				Scaled Expenditure - Inflated Prices		
Activity	**1993/94**		**1998/99**	**1999/2000**	**2000/01**	**Smoothed**	**Scaled**		**1998/99**	**1999/2000**	**2000/01**		**1998/99**	**1999/2000**	**2000/01**
	N$ million		**N$ million**	**N$ million**	**N$ million**	**N$ million**	**N$ million**		**N$ million**	**N$ million**	**N$ million**		**N$ million**	**N$ million**	**N$ million**
RURAL ROADS															
Earth Roads Maintenance															
Blading	3.000		12.530	13.070	12.530	12.710	10.313		13.727	14.825	16.011		11.138	12.029	12.992
Light Gravel Maintenance	1.250		0.970	1.080	0.970	1.007	0.817		1.087	1.174	1.268		0.882	0.953	1.029
Betterment & Bush Clearing	2.500		4.000	4.100	4.000	4.033	3.273		4.356	4.704	5.081		3.535	3.817	4.123
Drains & Fences	1.250		1.240	1.300	1.240	1.260	1.022		1.361	1.470	1.587		1.104	1.193	1.288
Road Signs	0.400		0.430	0.430	0.430	0.430	0.349		0.464	0.502	0.542		0.377	0.407	0.440
Salt Roads Maintenance															
All Maintenance	1.250		1.350	1.400	1.350	1.367	1.109		1.476	1.594	1.722		1.198	1.293	1.397
Gravel Roads Maintenance															
Blading	24.000		40.400	42.000	40.400	40.933	33.214		44.208	47.745	51.564		35.871	38.741	41.840
Light Gravel Maintenance	3.000		3.350	3.450	3.350	3.383	2.745		3.654	3.946	4.262		2.965	3.202	3.458
Betterment & Bush Clearing	6.500		13.200	13.700	13.200	13.367	10.846		14.436	15.591	16.838		11.714	12.651	13.663
Regravelling	45.000		61.700	63.800	61.100	62.200	50.471		67.176	72.550	78.354		54.508	58.869	63.578
Drains & Fences	2.500		4.100	4.300	4.100	4.167	3.381		4.500	4.860	5.249		3.651	3.944	4.259
Road Signs	1.250		0.970	1.080	0.970	1.007	0.817		1.087	1.174	1.268		0.882	0.953	1.029
Surfaced Roads Maintenance															
Pavement Reseal	12.500		20.000	20.200	20.600	20.267	16.445		21.888	23.639	25.530		17.760	19.181	20.716
Pavement Rehabilitation	15.000		67.700	78.600	80.000	54.300	44.060		58.644	63.336	68.402		47.585	51.392	55.503
Bitumen Maintenance	12.000		19.900	20.700	19.900	20.167	16.364		21.780	23.522	25.404		17.673	19.087	20.614
Drains & Fences	2.500		0.750	0.850	0.750	0.783	0.636		0.846	0.914	0.987		0.686	0.741	0.801
Road Signs	0.600		0.300	0.300	0.300	0.300	0.243		0.324	0.350	0.378		0.263	0.284	0.307
Capacity Improvements	7.500		6.200	0.000	8.200	4.800	3.895		5.184	5.599	6.047		4.206	4.543	4.906
Total Maintenance	142.000		259.090	270.360	273.390	246.480	200.000		266.198	287.494	310.494		216.000	233.280	251.942
Construction	40.000		99.000	82.000	70.000	56.667	56.667		61.200	66.096	71.384		61.200	66.096	71.384
Traffic Control	3.200		8.100	8.100	8.100	8.100	8.100		8.748	9.448	10.204		8.748	9.448	10.204
Administration	0.000		7.000	7.000	7.000	7.000	7.000		7.560	8.165	8.818		7.560	8.165	8.818
TOTAL RURAL	185.200		373.190	367.460	358.490	318.247	271.767		343.707	371.203	400.900		293.508	316.989	342.348
URBAN ROADS															
Unsurfaced Roads Maintenance															
All Maintenance	3.529		20.610			20.610	17.773		22.259	24.040	25.963		19.194	20.730	22.388
Surfaced Roads Maintenance															
Pavement Reseal	1.925		2.160			2.160	1.863		2.333	2.519	2.721		2.012	2.173	2.346
Pavement Rehabilitation	11.904		6.634			6.634	5.721		7.165	7.738	8.357		6.178	6.673	7.206
Bitumen Maintenance	0.858		0.747			0.747	0.644		0.807	0.871	0.941		0.696	0.751	0.811
Capacity Improvments	0.480		0.000			0.000	0.000		0.000	0.000	0.000		0.000	0.000	0.000
Total Maintenance	18.696		30.151			30.151	26.000		32.563	35.168	37.982		28.080	30.326	32.753
Construction	5.000		2.277			2.277	2.000		2.459	2.656	2.868		2.160	2.333	2.519
Traffic Control	2.800		4.000	4.000	4.000	4.000	4.000		4.320	4.666	5.039		4.320	4.666	5.039
Administration	0.000		1.100	1.100	1.100	1.100	1.100		1.188	1.283	1.386		1.188	1.283	1.386
TOTAL URBAN	26.496		37.528			37.528	33.100		40.530	43.773	47.274		35.748	38.608	41.696
TOTAL	211.696		410.718			355.775	304.867		384.237	414.976	448.174		329.256	355.597	384.045

Table F12. 2000/01 Vehicle Data for All Roads

Vehicle Type	Fuel Type	No. of Vehicles	Total VKT	Total Fuel Consump.	Total Axle-km	Total PCE-km	Total ESA-km
			million km	million litres	million	million	million
Motor Cycle	P	8 568	42.92	2.146	-	21.46	-
Car	P	81 251	1 565.50	156.550	3 131.01	1 565.50	-
LDV	P	69 170	1 332.74	133.274	2 665.49	1 332.74	-
Mini Bus	P	6 010	115.80	13.896	231.60	173.70	-
LGV	D	6 230	125.21	32.554	250.41	250.41	43.82
Bus	D	1 141	74.77	29.908	149.54	186.92	103.93
2 Axle SUT	D	2 814	56.56	18.101	113.13	141.41	59.39
3 Axle SUT	D	740	29.89	12.256	89.68	74.73	52.01
4 Axle Comb	D	944	95.26	46.676	381.03	285.77	232.43
5 Axle Comb	D	564	56.97	31.336	284.87	170.92	178.90
6 Axle Comb	D	282	28.44	16.782	170.67	85.33	109.23
7 Axle Comb	D	282	28.44	19.058	199.11	85.33	128.85
Caravan	P	5 980	11.52	0.346	11.52	-	-
Light Trailer	P	15 012	40.50	2.025	40.50	-	-
Other	D	2 617	2.86	1.001	5.72	8.58	-
Petrol		185 991	3 108.98	308.237	6 080.11	3 093.41	-
Diesel		15 613	498.41	207.670	1 644.15	1 289.42	908.56
Total		201 605	3 607.40	515.907	7 724.26	4 382.82	908.56
Total minus			3 555.38				
Caravan & Light Trailer							

ID	TASK	DURATION
	SHORT TERM SYSTEM	
1	**Interim Board**	
1.1	- Terms of reference	
1.2	- Cabinet approval	
1.3	- Appoint members	
1.4	- Establish accountabilities for board and CEO	
2	**Administration**	
2.1	- Appoint acting CEO (full time)	
2.2	- Identify and second staff or appoint staff	
2.3	- Establish accommodation	
2.4	- Establish administrative procedures	
2.5	- Appoint accounting consultants	
2.6	- Train staff	
3	**Interim Charges**	
3.1	- Approve fuel Levies	
3.2	- Approve annual licence fees	
4	**Legislation**	
4.1	Road Traffic and Transport Act 1996	
4.2	Vehicle Registration and Licensing Regulations	
4.3	NamFund Authority and Road Fund	
4.4		
5	**Policy**	
5.1	- Agree refund policy	
5.2	- Agree policy for 'social' road expenditure	
5.3	- Agree treatment of bilateral and multilateral aid	
5.4	- Develop payment policy	
5.5	- Agree treatment of deficit/surplus with fiscus	
5.6	- Develop investment policy	
5.7	- Resolve roles for internal and external audit	
6	**Interim Accounts**	
6.1	- Design interim accounting system	
6.2	- Complete user manual, including system controls	
6.3	- Establish chart of accounts & reports	
6.4	- Setup trial accounts using 1996/97 data	
6.5	- Determine 1996/97 cashflows by month	
6.6	- Determine other comparatives by month	
7	**1997/98 Trading Account**	
7.1	- Develop monitoring system and responsibilities	
7.2	- Auditor-General approval of trading account	
7.3	- Cabinet approval for trading account	
7.4	- Establish separate bank account	
7.5	- Estimate annual revenue	
7.6	- Prepare revenue budgets by month	
7.7	- Prepare annual expenditure budgets	
7.8	- Agree disbursement process and profile	
7.9	- Prepare expenditure budgets by month	
7.10	- Identify existing loan commitments	
7.11	- Adjust ministries' budgets	
8	**Collection Agent Arrangements**	
8.1	- Agree fuel levy collection/reporting/audit	
8.2	- Agree licence fee collection/reporting/audit	
8.3	- Agree refund process/reporting/reconciliation	
9	**Enforcement of Vehicle Licensing**	
9.1	- Resolve role of Nampol/municipalities/MWTC	
9.2	- Agree activity levels with enforcement agencies	

Figure K2. Vehicle Classes for Weight-Distance Charges

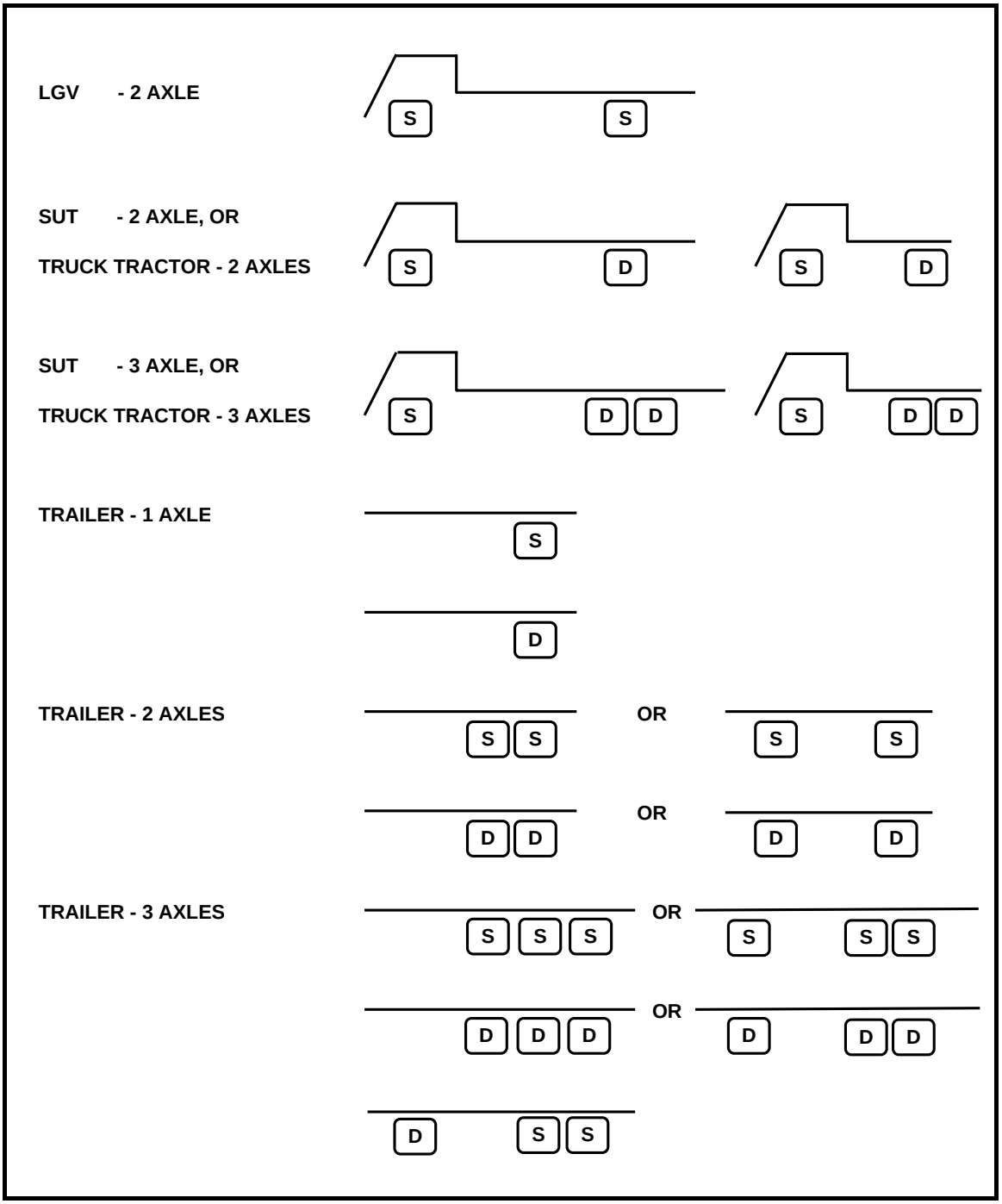


Table F2. Vehicle Characteristics

Vehicle Type	Fuel Type		Inferred GVM	Fuel Con. Rate	Axles/Vehicle	PCE/Vehicle	ESA/Vehicle	Inferred Load
			tonnes	litres/km				Factor
Motor Cycle	P		0.5	0.05	0	0.5	0.00	
Car	P		2.0	0.10	2	1.0	0.00	
LDV	P		2.5	0.10	2	1.0	0.00	
Mini Bus	P		3.0	0.12	2	1.5	0.00	
LGV	D		10.0	0.26	2	2.0	0.35	0.56
Bus	D		15.9	0.40	2	2.5	1.39	0.54
2 Axle SUT	D		15.9	0.32	2	2.5	1.05	0.40
3 Axle SUT	D		24.1	0.41	3	2.5	1.74	0.56
4 Axle Comb	D		32.3	0.49	4	3.0	2.44	0.57
5 Axle Comb	D		40.5	0.55	5	3.0	3.14	0.63
6 Axle Comb	D		48.7	0.59	6	3.0	3.84	0.68
7 Axle Comb	D		56.0	0.67	7	3.0	4.53	0.75
Caravan	P		1.0	0.03	1	0.0	0.00	
Light Trailer	P		1.5	0.05	1	0.0	0.00	
Other	D		10.0	0.35	2	3.0	0.00	