

# DEVELOPMENT AND IMPLEMENTATION OF A CROSS-BORDER ROAD USER CHARGING SYSTEM IN NAMIBIA

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## 1. INTRODUCTION

Cost recovery from especially heavy vehicles that transport goods through countries in the SADC region, has been an issue for many years. It is thought that these vehicles damage the core road network of countries that they travel through but do not make adequate contributions related to the repair and maintenance of the road network.

This paper is aimed at discussing the development and implementation of a cross-border road user charging system for Namibia, operated within the context of the road user charging system implemented in the country since April 2000. The following aspects will be addressed:

- A brief overview of cross-border charging initiatives that were undertaken in the SACU/SADC region in recent years
- A discussion of the Namibian road user charges system in terms of its key elements and requirements
- The design of the system that was developed and its key elements and characteristics, including auditing mechanisms
- The fee structure and levels, ensuring parity between local and foreign vehicles
- The incremental implementation programme that was undertaken at various border posts, to ensure efficient functioning of the system, and constraints that were experienced in the process.

Finally, conclusions will be made as to the possible wider application of this system in the SADC region to address issues of road infrastructure cost recovery and other aspects.

## 2. SACU/SADC CROSS-BORDER CHARGING INITIATIVES

The Southern Africa Customs Union (SACU) commissioned a study in 1995 to investigate the harmonisation of cross-border charges in its member countries, namely Botswana, Namibia, Lesotho, South Africa and Swaziland. Subsequently the study was expanded to incorporate the remainder of countries in SADC. This initiative proposed a system of cross-border charging aimed at foreign vehicles in a host country, and with tariffs based on marginal cost principles, varying per vehicle size and distance travelled.

The SADC Protocol that was signed in 1996 also promulgated implementation of cross-border charging systems in the region. Specifically, Article 4.6(1) states:

*Member States agree to implement harmonised cross-border road user charging systems which shall be regularly reviewed, improved and supplemented through improved research and data collection.*

This article follows on statements that countries should develop adequate sources of funding, including road user charges, and that the revenues from these sources should be used to maintain and provide roads. Principles of pricing at economically efficient levels, transparency and equity between road user categories are also promoted.

The SADC/SACU Infrastructure Cost Recovery Working Group was activated again in late 2000. One of its aims is apparently to recalculate the required charges determined in earlier initiatives, and to attempt to implement harmonised systems for charging vehicles travelling cross-border in the SADC region specifically for purposes of road infrastructure cost recovery.

### 3. NAMIBIAN ROAD USER CHARGING SYSTEM AND REQUIREMENTS

Reform in the road sector has been a strong focus of the Ministry of Works, Transport and Communications (MWTC) in Namibia since the early 1990s, after independence was obtained from South Africa. The so-called MWTC 2000 programme funded and supported to a considerable extent by the Swedish International Development Agency (SIDA), guided this reform.

Policy development and implementation led to the creation of the following entities, with effect from 1 April 2001:

- The Road Fund Administration (RFA), that has the responsibility of managing the Road Fund and disbursing funds for road management to competent authorities, in terms of the Road Fund Act of 1999
- The Roads Authority (RA), that has inter alia the responsibility of managing the national road network, and empowered through the Roads Authority Act of 1999.

The Roads Contractor Company was also formed as a significant step in reform of the roads sector.

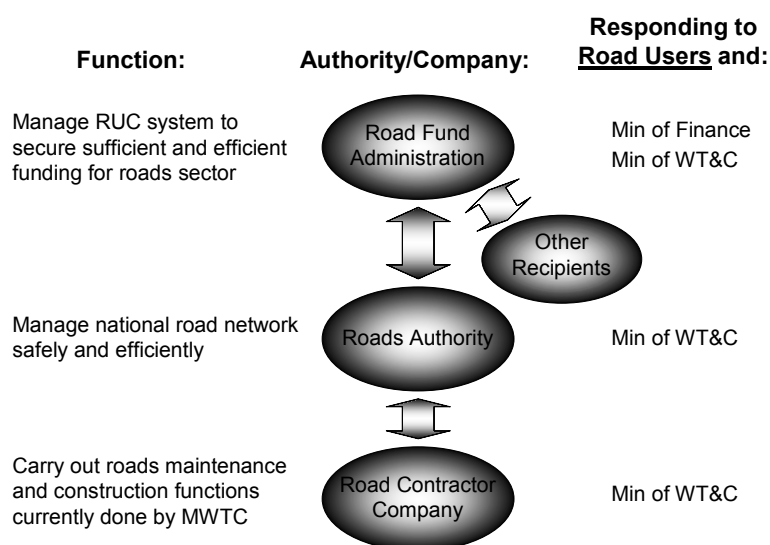
The relationship between these entities and their controlling ministries is shown in the layout on the next page. It indicates the responsible ministries and core functions of each institution.

The levels of road user charges are determined on an annual basis, within the context of the basic underlying principles of efficiency, effectiveness and equity as far as practically possible. There exists a suite of road user charging instruments that is used by the RFA to collect revenues from road users. These are briefly as follows:

- **Fuel levies** are collected on petrol and diesel sales, as a fixed amount per litre of fuel sold. The revenue is collected by the fuel companies at the point of sale and paid over directly into the Road Fund, that is managed by the RFA. Interaction takes place with the Ministry of Mines and Energy to co-ordinate actions when adjusting the fuel price. Bona fide off-road users are given rebates for fuel not used on the road network, through a mechanism customised for this purpose.
- **License fees** are collected from road users on an annual basis, per type of vehicle. Various agencies such as registering authorities collect these fees on behalf of the RFA, and revenues accrue to the RFA account.

- **Cross-border charges** were implemented in December 2000, and are collected at border posts from foreign vehicles entering Namibia. It is on the development and implementation of this collection system that the paper is focussed.
- **Abnormal vehicle fees** are also collected from vehicles with abnormal loads or dimensions by the RA on behalf of the RFA

### Post-reform Structure of Roads Sector in Namibia



In addition, **weight-distance charges** are being considered for implementation in the longer term, to increase equity between heavy vehicles, as the fuel levy does not distinguish adequately between these vehicles in terms of cost responsibility. There are however technical considerations that may constrain this implementation, although it has been implemented with varying degrees of success in countries such as New Zealand and Sweden.

The approximate current distribution of revenues per instrument are given in the following table:

INSTRUMENT	APPROXIMATE PERCENTAGE CONTRIBUTION TO REVENUE
Fuel levies	83
License fees	12
Cross-border charges	3
Abnormal fees	2
Total	100

While this table shows that cross-border charges contribute a relatively small percentage of revenues, these charges are considered to be important for purposes of integrity of the road user charges system and for maintaining non-discrimination between local and foreign vehicles.

#### 4. CROSS-BORDER CHARGES (CBC) SYSTEM DESIGN

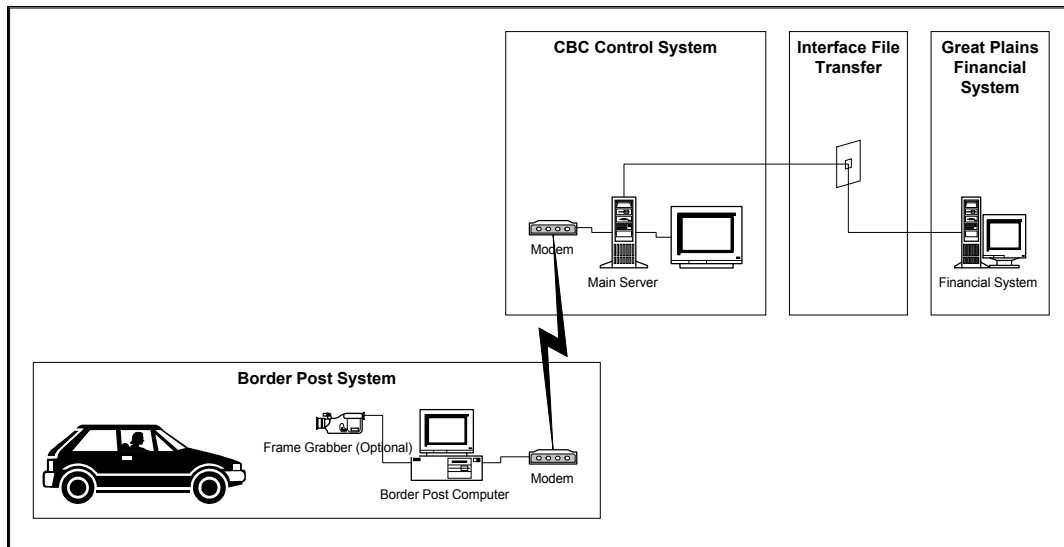
One of the first actions undertaken by the RFA after its inception in April 2000, was to commission the development and implementation of a cross-border charges (CBC) system. The Africon-ArtiTech JV was appointed in this regard. The purpose of this system is to eventually collect fees from cross-border traffic based on the distance travelled and the weight of the vehicle, i.e. in essence a weight-distance charges system.

The key principles underlying the system are the following:

- Fees should be collected from foreign vehicles entering into Namibia. Domestic vehicles are charged through other instruments
- Fee levels should be integrated with the fees charged to domestic vehicles, to ensure equity and non-discrimination
- The system should have sufficient integrity, by giving attention to the following specific aspects:
  - *Vehicle classification* should be done correctly to ensure adequate distinction between vehicle types to do applicable pricing without complicating the system in an impractical way
  - *All foreign registered vehicles* that enter Namibia *should be captured*, again within practical considerations
  - *Corruption should be prevented*, by implementing adequate checks and balances in the system, including independent audits
- Minimum delays and inconvenience should be experienced by road users
- Daily reconciliation of revenue should be done to follow up on discrepancies as soon as possible

With these principles in mind the following conceptual system layout was developed, as illustrated in the figure below:

- The **Border Post System**, that captures data electronically and issues a permit per border post
- The **CBC Control System**, that receives and stores information centrally on a main server
- A **Financial System**, that captures all financial transactions
- A **Manual System** which mimics the electronic system for use:
  - During power or system outages
  - At smaller border posts where traffic volumes do not justify permanent live data links and the capital cost of computer equipment.



**Conceptual Layout of System**

### ***System functionality***

The system was designed to be auditable throughout the whole process and to be available at all times during which the border post is open. A clear goal was that it should be flexible enough to cater for varying traffic volumes at specific border posts throughout the year.

To meet the above requirements an electronic system which logs data in real time on a central data base in Windhoek as well as a manual system was developed with the following procedures:

- The vehicle driver completes an application form on arrival at the border post that contains all the required information to be captured on the system.
- This information contained on the application form is then captured onto the system. This process does not have to take place in the presence of the driver, thereby avoiding delays to the driver if the system is off line.
- On completion of the data capture and the receipt of the required funds the system will print the CBC permit. If a vehicle has previously been issued with a permit all its previous transaction information is also available, allowing for a permit to be issued within ten seconds. New vehicles are captured within two minutes. (If the manual process is followed this permit is issued though a hand-written process).
- The driver departs after the permit has been checked for correctness and the attached payment receipt has been verified.
- On departure at any border post (i.e. when leaving Namibia) the permit is returned to the CBC office and cancelled on the system

### ***Methods of payment***

All transactions are carried out through the legal tenure of Namibia, namely Namibian Dollars (N\$) and RSA Rands, that are at parity with each other.

Three methods of payments are accepted, namely cash, credit cards (Visa or Mastercard) and a pre-payment system made available to regular users.

Regular users register for use of the pre-payment system and payment of CBC charges are made in advance of arriving at the borders. Swipe or debit cards are issued to drivers that have to be produced at the border post, where the transaction's costs are deducted. Transaction statements are supplied to registered users on a regular basis.

### ***System auditability***

The following aspects of the system are audited:

#### *Capturing of all vehicles liable for charges*

The issue of whether all vehicles that enter the country and that are liable for CBC, can only be verified by inspection at the border post by audit staff or at random roadblocks held throughout the country. It must be noted that not all points of entry to Namibia can be manned by CBC staff as this is not cost effective. The immigration stamp that will appear in all passports can however be used to verify places of entry. If vehicles do enter through unmanned border posts, there is an opportunity to acquire a permit in Windhoek or a permit will be issued on departure if the vehicle exits through a manned border post. Furthermore the CBC agent's remuneration is determined per permit issued, which acts as an incentive to issue permits to all vehicles which pass through a manned post.

#### *Data integrity*

- All data is scanned on a daily basis to verify data correctness.
- Before a driver departs from the CBC office, he or she is requested to verify the correctness of the information printed on the permit.
- The road officials carrying out random checks on vehicles will verify the correctness of permits and issue 'spot fines' if found to be incorrect.

#### *Cash collection*

- The complete cash trail, from collection during the specific shift to bank deposit and appearance of the correct balance on the bank statement, is audited
- Transactions from the previous day's shifts are reconciled in Windhoek daily. Cash collections and sequence of permit numbers on the system are verified.

## **5. CBC SYSTEM IMPLEMENTATION**

### *Initial rollout*

Initially the CBC system was implemented at only four border posts, namely Ariamsvlei (RSA), Noordoewer (RSA), Buitepos (Botswana) and Oshikango (Angola). These four borders have the highest volumes of foreign traffic entering Namibia. The initial rollout was completed by 1 December 2000.

### *Further rollout*

By April 2001 a further six border posts were added, namely Holweg (RSA), Klein Menasse (RSA) (served by a CBC office in Aroab), Ngoma (Botswana), Wanella (Zambia) (served by a CBC office in Katima Mulilo), Mahenna (Angola) and Ruacana (Angola) (served by a CBC office in Mahenna).

Due to the low traffic volumes through these posts, CBC payment offices were placed strategically to combine charging of traffic passing through two posts, thereby reducing infrastructure and staff requirements and ensuring that system administration costs are kept to a minimum. In order to further reduce costs, only the Katima Mulilo CBC office has been provided with a real time data link. The offices at Aroab and Mahenna issue permits on the manual system with the data being captured weekly on the system. The volumes at these two offices are very low and justify such a manual system at no inconvenience to the users.

The CBC system now covers all ten border posts where the Department of Customs and Excise has a presence and thus where all heavy vehicles may enter Namibia. As previously mentioned permits are furthermore issued in Windhoek to minimise inconvenience to users.

In general there has been acceptance of the system, as its role was clearly explained in documentation that was distributed prior to and during implementation by e.g. means of a pamphlet. Information sessions were also held by the Road Fund Administration with road user representative organisations prior to implementation. The fact that the revenues are paid directly into the Road Fund, for purposes of funding road management, appeared to promote user acceptance.

#### *Fee levels*

The initial fee levels that were implemented are flat fees per vehicle type. The current levels of fees are given in the following table:

<b>TYPE</b>	<b>DESCRIPTION</b>	<b>FLAT FEE PER ENTRY (N\$)</b>
Type 1	Motor cycles, motor tricycle and motor quadrucycle	Nil
Type 2	All passenger cars, station wagons, SC and D/C bakkies, 2x4 and 4x4 bakkies, kombis; microbus and minibus (fewer than 25 passengers).	70.00
Type 3	Light goods vehicle/delivery vehicles (Tara <3 500 kg)	130.00
<b>HEAVY VEHICLES (Single units)</b>		
Type 4	Bus with 2 axles (carrying capacity of 25 or more passengers).	150.00
Type 5	Bus with 3 axles (carrying capacity of 25 or more passengers).	200.00
Type 6	Single unit truck with 2 axles (Tara >3 500 kg)	150.00
Type 7	Single unit truck with 3 axles (Tara >3 500 kg)	200.00
<b>HEAVY VEHICLES (Traction unit as part of a combination vehicle)</b>		
Type 8	Truck tractor with 2 axles	150.00
Type 9	Truck tractor with 3 axles	200.00
Type 10	Truck tractor with 4 or more axles	350.00
<b>HEAVY TRAILERS (as part of a combination vehicle)</b>		
Type 11	Trailer with 1 axle	100.00
Type 12	Trailer with 2 axles	150.00
Type 13	Trailer with 3 axles	200.00
Type 14	Trailer with 4 axles	250.00
Type 15	Trailer with 5 or more axles	300.00
<b>CONSTRUCTION VEHICLES</b>		
Type 16	Tyre dozer, grader motor, front-end loaders, excavators, self-propelled vibratory rollers.	500.00
Type 17	Any other vehicle not listed	100.00

The next step in the CBC system implementation is to distinguish also per distance travelled. A distance charge will be calculated per vehicle type, based on the closest major destination. This will require that weighbills be used as verification at the border post and that enforcement is improved on the road network. It will however result in a more equitable CBC system.

### *Other aspects*

The following aspects have been addressed to date:

- Locality: All border posts are situated far away from Windhoek. Having a real time link to the busy border posts allows for real time training of staff via the live link and telephone. It further allows for real time auditing and data verification.  
Personnel are sourced locally at each border post. Local sub-contractors (SMMEs) have been contracted to operate each CBC office. These sub-contractors source staff locally which provided employment in these small border towns.
- Traffic volumes: Traffic volumes at each border post fluctuate during the year, with peak flows experienced during December and July holidays, and over Easter weekend. To accommodate larger traffic volumes at the three main border posts (Ariamsvlei, Noordoewer and Buitepos) additional terminals have been installed which reduce inconvenience and delays experienced by users.
- Fraud: Due to the presence of cash at all remote border posts, fraud/theft is an ever-present threat. This risk is carried fully by the CBC Agent, which has to constantly audit the system and initiate legal action against the fraudulent persons concerned. Where possible applicable insurance cover has been acquired and professional cash conveyance companies have been contracted to transport cash from the posts to the nearest banks.

### *Current status of the system*

Presently the system is functioning extremely well and the focus has moved away from solving constraints associated with the developed software and hardware reliability to the softer system issues such as customer service levels at border posts and customer awareness.

Possible methods by which the system can be defrauded are constantly being analysed, and the system is refined to address this. The incidence of fraud has decreased dramatically not only due to the refinement of the system, but also due to firm action being taken against offenders which has lead to successful convictions.

### *Revenue and permits to date*

Total revenues collected over the period 1 December 2002 to 1 April 2002 equals N\$23,4 million, which exceed by far the costs of implementing and operating the system (a service charge is part of the fees imposed). The total number of permits issued in this period is in excess of 190 000 permits.



## 6. WIDER APPLICATIONS IN SADC

It is fair to state that the CBC system has been implemented successfully in Namibia, and that it is a prime example of a public-private partnership in the road transport sector.

Some form of vehicle charging system already exists at most border posts in SADC countries, aimed mainly at heavy vehicles and enforcing permit requirements in many cases. Many of these systems are however fraught with operational difficulties, inefficiencies and inherent constraints, including cumbersome administrative procedures, auditing and data reconciliation difficulties, and possibilities for fraud.

The Namibian CBC system is an example of a simple yet technologically appropriately advanced and efficient system, which can address many of the constraints of existing systems. While it can be argued that the road distances in Namibia are longer than in other countries, it is considered that in principle this system can fulfil the revenue collection function at any border post in SADC, as in practice it would only be the levels of charges that would vary per country.

Further border post services can also be introduced by linking into the existing CBC system. These services could relate to:

- Issuing of horticultural permits
- Issuing of livestock transport permits
- Custom and Excise operations
- VAT refunds for exported goods

In addition, the CBC system can be linked to weigh bridge operations, and limit the time that heavy vehicles should spend at a border post.

Data on cross-border movements of vehicles can be extracted easily from the system, and it can be expanded to capture data on movement of people should that be required by say the Ministry of Home Affairs.

In conclusion it can be stated that the Namibian CBC system has been successfully implemented to date and has many potential applications in the SADC region.

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## **ABBREVIATED CV: DR PAUL C LOMBARD**

Dr Paul Lombard has 16 years' experience in the fields of transportation infrastructure planning, financing as well as restructuring of the roads sector. He was selected as a Fulbright scholar in 1988 and obtained an MSCE in 1989 and a PhD in Urban and Transportation Engineering in 1991 at Purdue University in the USA.

Dr Lombard is fully conversant with privatisation, commercialisation and road tolling issues and the associated economic analyses, also in related fields such as water and landfill services. He has participated either as project leader or as road financing or planning expert in road sector projects throughout Southern and Eastern Africa, and has extensive experience in development and implementation of road pricing systems in the region. He has worked on projects in South Africa, the USA, Ireland, Namibia, Botswana, Lesotho, Swaziland, Zambia, Mozambique, Ghana, Kenya, Tanzania, Uganda, Ethiopia and Lebanon. This includes several projects funded by agencies such as the World Bank, USAID and the UNCDF. This experience also relates to the transportation planning and feasibility fields.

He has executed several airport feasibility studies, and was the project leader for airport master plan studies, including Johannesburg International Airport, as well as Windhoek International Airport and Eros Aerodrome in Namibia.

Dr Lombard has considerable lecturing experience. He has co-presented post-graduate courses in transportation planning at the University of Pretoria, the University of Stellenbosch and the Rand Afrikaans University (RAU) in Johannesburg.