

REFORMING THE NAMIBIAN ROAD USER CHARGING SYSTEM TOWARDS A SUSTAINABLE FUNDING

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ABSTRACT

Most countries in sub-Saharan Africa, including Namibia, have established second-generation road funds for funding the road sector with road user charging (RUC) revenue streams that are deposited into the designated account. The Namibian road user charges system (RUCS) consists of charging instruments such as fuel levies, vehicles registration and annual licensing fees, cross boarder charges, mass distance charges and abnormal load fees. Among instruments in place for charging road user is fuel levy contributing about 60% to the revenue accruing to the Road Fund Administration (RFA). The principal motive driving the RUCS in many countries include gauging against the growing fuel-efficient and electrified motor vehicles that could bring about unsustainability in road funding as the fuel levy loses its prowess as the main revenue contributor. Additionally, heavy vehicles imposes substantial costs when uses the road network, however, the current mass distance charging aimed at ensuring that heavy vehicle owners pay their fair share for the cost they impose is prone to evasion. This paper sought to investigate the current RUCS towards reforming the system. The paper take a proposition that technology could be the answer to such a challenge, by exploring technology to charge per vehicle per kilometre travelled. The paper thus draws business requirements within the proposed framework.

Keywords: Road user charging, funding, road-pricing, sustainable, technology.

1. INTRODUCTION

Funding for road transport networks has been the subject of ongoing research in recent decades (Freeman, 1982; Fon & Heggie, 1999; Gomez & Vassallo, 2014). Studies that investigated the efficient utilisation of resources often focused on economic appraisal of user charges and other taxes levied by the government (see Walter, 1968; Freeman, 1982). Some studies attempted a thorough investigation of road financing systems by focusing on the instruments in place (Queiroz, 2009). Others conducted comparison analyses of road revenue generation, allocation, and expenditure-related ratios (Gomez & Vassallo, 2014; Petrus & Krygsman, 2018).

In comparison, few studies have focused on sub-Saharan African countries and in particular on Namibia. There are a few traceable papers on the Namibian road sector reform, including Bruzelius et al. (2000), and Runji (2003). Bruzelius et al. (2000) and Tekie (2005) explored road management. Runji (2003) discussed in detail the road sector reform process as one moving from dependence on the state revenue fund (SRF) to one managed and partially funded by the road fund (RF). Effort towards a sustainable road funding system in Namibia yielded in the Roads Authority conducting a feasibility study of

toll roads in Namibia (2008). A study will serve as a base for the ongoing study by RFA on investigation of the feasibility on tolling of roads in Namibia.

The aim of the paper is to investigate the current road user charges system (RUCS) towards its reforms. The paper then presented the proposed framework towards implementing the recommended use pay principle. The rest of the paper is organised as follows: Firstly, it highlights the literature on road user charges (RUC) zooming into the Namibian content. This is followed by a deliberate discussion on major success associated with Namibian RUCS and proposed a framework. The paper finally draw conclusion on reforming the road user charges system.

2. LITERATURE ON ROAD USER CHARGES

Road user charges instruments are commonly divided into two categories. The first category comprises those that are charged on the road use and that are related to vehicle acquisition, vehicle ownership, and vehicle usage. The second category entails those that are levied on the road beneficiaries and are mainly used in municipal areas for urban access roads and in rural areas for road access (Heggie, 1995). This study focused on the first category of RUC.

Road users are interested in a well-maintained road network that could reduce their vehicles' operating costs. Therefore, the first step in sourcing road maintenance funding is to ensure that road users pay for the cost of road maintenance (Queiroz, 2009). Experience in various countries indicates that road users are willing to pay for road maintenance and even for further road network expansion provided that the generated revenue is allocated back to improving road networks (Queiroz, 2009). According to Yenny (2002, cited in Queiroz, 2009:2), RUC must be economically efficient, equitable, easy to collect, and not easily evaded. Moreover, RUC should be adjusted for inflation. Preferably, RUC instruments should be closely linked to the use of the road network. To that effect, appropriate charges are those charged for road space and the damage that HGVs impose on the roads. Funding for roads should take into consideration the conditions and characteristics of the country under review. It suffices to analyse the current RUC instruments in the Namibian context.

3. ROAD USER CHARGES SYSTEM: THE NAMIBIAN EXPERIENCE

The RUCS was established in 1999 as a means of collecting revenue from road users. The principles underlying the present method of road pricing in Namibia are largely those stipulated in the RFA Act 18 of 1999. The Namibian approach to road pricing has been shaped by two major parliamentary decisions. The RFA Act 18 of 1999 and the Namibian Transport Policy (2017) state that road users should pay the full cost of their consumption (Republic of Namibia, 1999; MWT, 2017). The RFA from time to time in consultation with the MoF may determine the level of charges to be imposed and issue a notice in the Government Gazette. While the RFA attempts to incorporate the latest knowledge in its calculation, stability in the method is also required, as fluctuations would create uncertainty and mask historic trends (Sansom et al., 1998). The present method is therefore based on a twin approach: one, on the evaluation of road expenditure; and, two, on the allocation of road expenditure to vehicle classes according to each class' responsibilities for road expenses.

3.1 Road User Charges in Practice

The current RUC applied to motor vehicles using the Namibian road network are based on distance travelled, which could be based on the mass, length, width, or height of the vehicle or its loading and axle numbers, or a combination of these factors (Republic of Namibia, 1999). The charges are associated with an entry fee for vehicles not registered in Namibia and using the Namibian road network in the name of CBC, AVLRF for Namibian-registered vehicles, and heavy vehicle-based charges and fuel levies. These charges are set based on cost recovery for the national road network managed by the RA and other roads managed by the respective local authorities. Table 1 depict the revenue generated from the RUC accrues to the RF managed by the RFA for the past seven years.

Table 1: Revenue streams over the past seven years

RUC (in millions)									
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Fuel levy	852	937	975	1 035	1 105	1 299	1 341	1 420	1 500
AVLRF and ALF	330	392	410	408	458	586	634	696	723
CBC	67	78	86	97	106	122	125	131	137
MDC	38	51	63	71	85	85	98	119	142
Total revenue	1 288	1 459	1 535	1 613	1 756	2 094	2 199	2 367	2 502

Source: Author (Data from RFA, 2019)

The RFA Act 18 of 1999 enforced that revenue generated from the RUC is allocated back towards road-related expenditure (Republic of Namibia, 1999). This arrangement foresees the established of the RF with the expectation for the RUCS to bring about desired results in terms of funding the road network from the revenue generated from the RUC.

3.2 Fuel Levy

In Namibia, petrol and diesel are subject to a range of taxes and levies. In addition to value-added tax (VAT) is the customs and excise duty paid to the Southern African Custom Union (SACU). Other charges include the RFA and motor vehicle accident (MVA) Fund and the storage levy paid to the National Energy Fund (NEF). Existing evidence indicates that the pump price for petrol stands at N\$12.95 (MME, 2019). From the pump price, N\$1.36 per litre accrues to the RFA, N\$0.503 per litre is channelled toward the MVA Fund, N\$0.98 per litre accrues to the NEF, N\$0.65 per litre is channelled to the MoF, and N\$0.04 per litre is paid to the SACU.

Table 2: Petrol and diesel taxation in cents per litre

Valid as of	Unleaded petrol (95)		Diesel (500) (50)	
	Fuel tax	RUC	Fuel tax	RUC
1.3.18	40	122	40	122
1.5.18	40	122	40	122
1.7.18	40	130	40	130
1.12.18	65	130	65	130
1.1.19	65	130	65	130
1.4.19	65	136	65	136

Source: Author (MME, 2019)

Table 2 shows the RFA fuel levy per litre for selected months. The values indicate that the fuel levy increased with the same percentage for both petrol and diesel in 2018 and 2019. However, raising the fuel levy to address the road transport funding gap will not ensure

that users pay their fair share (Jones & Bock, 2017). A study by the World Bank (2008) found that 40% to 60% of people in developing countries live more than 8 km away from a health facility, financial services, and shopping centres. In Namibia, more than half of the population resides in rural areas (NSA, 2017), therefore raising the fuel levy is likely to place a heavy burden on low-income households (who may not be able to afford fuel-efficient and hybrid vehicles) and those who must drive longer distances in order to access other services, including hospitals and financial services. A recent study recommended distance charges as the best alternative to a fuel levy when charging users for road services (Jones & Bock, 2017). A lesson can be drawn from an Oregon experiment of per-mile fees as the best alternative to a fuel levy. The purpose of the experiment included to align transportation charges with road use, thus making drivers pay for road service consumed per mile: "For each mile driven, a driver contributes 1.5 cents, regardless of rural or urban location or whether the vehicle's fuel efficiency is 150 mpg or 20 mpg. Each driver's contribution on miles driven is equitable and sustainable" (Jones & Bock, 2017:3).

Currently, the fuel levy for both light and heavy vehicles could be taken as a proxy for distance travelled, given the rough approximate that the longer the distance travelled, the more costs the drivers could incur to fuel their vehicles. The problem with such a proxy is that it does not capture the location as the efficiency pricing does. However, the fuel levy as the main revenue contributor in many nations might see short-term success as hybrid and electric vehicles increase their market share, as these traditional charging instruments are projected to have a relative share of actual road use (Teodorovic, 2016). Smith (1975) alluded that qualified prices of diesel or petrol per litre of vehicle travelling on the network should reflect the relative costs of the trip. Smith (1975) further recommended that for the fuel levy to cover the variable maintenance costs of road use per trip, the fuel levy on diesel per litre should be higher than that of the petrol.

In the Namibian case, this could, however, be justified by the factor that most diesel-powered vehicles are commercial by nature and a huge portion represents heavy goods vehicles (HGVs) that also pay MDC and their vehicle licences fees are set to a certain degree to account for their weight (Government of Republic of Namibia [GRN], 2019). The ongoing debate points out that a fuel levy is best suitable for other objectives than that of setting road-use prices equal to the efficient price of SRMC (Petrus & Krygsman, 2019). As fuel levy-generated revenue falls, new directions are pointed towards alternative funding instruments such as motor vehicle sale taxes and bonds, which are independent of network use and could lead transportation pricing and financing gears away from the desired marginal cost pricing (Teodorovic, 2016). Litman (2011) made an argument that such actions could lead to inefficient markets, where demand is independent of true transportation costs.

According to recent studies, revenue generated from a fuel levy is likely to shrink with the progression of fuel-efficient and electric vehicles (Organisation for Economic Co-operation and Development [OECD], 2019). There is therefore a need to anticipate the potential decline in fuel levy revenue and gauge alternative measures.

3.3 Annual Vehicle Licence and Registration Fees

Every registered vehicle in Namibia, according to specified vehicle classes, pays annual motor vehicle licence and registration fees. The annual motor vehicle licence fee is related to the vehicle weight (see Table 3). Registration and licence fees are decided by the roads agencies in consultation with the MoF, which grants increases to the rate to be imposed.

The revenue accrues to the RA and is then paid over to the RF (Republic of Namibia, 1999).

Table 3 presents a case where the vehicle licence and registration fees could be taken as a rough proxy for vehicle mass (loading), thus the licence varies with the weight. For instance, lighter vehicles (with tare kilograms less than 12 001 and greater than 12 500) pay N\$48 913.00, which is less than a truck with tare kilograms less than 19 501 and greater than 20 000, which pays N\$92 756.00 for its annual licence fee (GRN, 2019). The argument made with the fuel levy, however, applies in the sense that these proxies do not capture costs that are associated with the space and time that the vehicle utilises the network.

Table 3: Annual motor vehicle licence fees

Vehicle class	Annual licence fee (N\$)
Motor car	
0 <kilograms>750	463
12 001<kg>12 500	48 913.00
19 501<kg>20 000	92 756.00
20 000 kg< (increase by N\$2 928.00 for every 500 kg)	
Trailers and semi-trailers	
0<kg>1 000	275
10 001<kg>11 000	30 113.00
19 001<kg>19 500	69 989.00

Source: Author (GRN, 2019)

3.4 Mass Distance Charges

The paramount motivation for charging travelling distance is to capture and allocate the maintenance costs associated with heavy vehicle use of the road network (Rothengatter & Doll, 2002). In Namibia, heavy vehicles using the road network are subject to travelling distance charges. The travelling distance charges apply to every vehicle with a weight of more than 3 500 kg. In this study, the vehicles are categorised into four classes. Level 1 includes heavy vehicles with a weight of more than 3 500 kg and less than or equal to 7 000 kg and pays a charge of N\$7 per 100 km. Level 2 consists of heavy vehicles with a weight value of more than 7 000 kg and less than or equal to 16 000 kg, which are charged N\$8.40 per 100 km. Heavy vehicles of more than 16 000 kg and less than or equal to 34 000 kg under level 3 pay N\$15.30 per 100 km. Trucks over 34 000 kg and less than or equal to 44 000 kg under level 4 pay N\$30.80 per 100 km (see Table 4). Final heavy goods under level 5 weight of more than 44 000 kg pay more N\$46.10 per 100 km (GRN, 2019). The current system is based on odometer readings as a main factor to determine the distance driven. However, such a system cannot serve as an efficient pricing system as its rates do not vary with location, nor do they reflect congestion imposed by a heavy vehicles utilising the road network. This implies that drivers are not receiving the right price signals that reflect the marginal damage heavy vehicles impose on the road surface (McInerney et al., 2010). Moreover, the Namibian road sector is quite extensively served by a small vehicle population of 374 710 registered vehicles (RA, 2016). This implies that Namibian road users are likely to pay more, which spreads the costs of a large network over few users than elsewhere.

Table 4: Travelling distance charges for fiscal year 2019/2020

Travelling distance charges		
Vehicle Type	Description	Charges (N\$) per 100 km
Heavy goods truck	V/D value <3 500 kg and ≤7 000 kg	7.00
Heavy passenger bus Heavy goods truck	V/D value <7 000 kg and ≤16 000 kg	8.40
Heavy goods bus Heavy goods truck	V/D value >16 000 kg V/D value >16 000 kg and ≤34 000 kg	15.30
Goods vehicle truck-tractor	D value >16 000 kg and ≤34 000 kg	15.30
Goods vehicle truck	D value >34 000 kg and ≤44 000 kg	30.80
Goods vehicle truck-tractor	D value >44 000 kg	46.10

Note: D value implies the vehicle is not equipped to draw, and V value implies that the vehicle is equipped to draw.

Source: Author (GRN, 2019)

The OECD (2019) suggested a Global Positioning System (GPS) as an alternative instrument to odometer readings. The GPS has the ability to track vehicle location and can accommodate differentiated rates. From Oregon's distance-based charging experiment, GPS-based rates raised privacy concerns. However, privacy issues from both the Oregon experience and German trucking were addressed by destroying the drivers' information as soon as payment was made (Kirk & Levinson, 2016). The existing MDC attempts to ensure that heavy vehicles pay for the damage they inflict on the road network surface. However, it is a blunt instrument that does not adjust for the weight of the truck or the type of road the heavy vehicle drives on. Therefore, a travelling distance charge that is adjusted to time, location, and distance would have a huge advantage over the current system.

3.5 Abnormal Load Charges

Abnormal motor vehicles driving on the Namibian road network are subject to a permit fee that includes congestion cost of N\$0.24 per km, E80 costs of N\$0.65 per km, and a police escort fee of N\$18.77 (see Table 5). Alternatively, a fixed permit can be purchased monthly, once every three, six, or 12 months.

Table 5: Abnormal Load Charges for the fiscal year 2019/2020

Abnormal load charges	
Cost description	(N\$/km)
Congestion cost	0.24
E80 cost	0.65
Police escort fee	18.77
Fixed permits (minimum N\$)	
1 month	477.64
3 months	557.62
6 months	1035.26
12 months	1455.14
Police escort fee	674.25

Source: Author (GRN, 2019)

3.6 Cross-Border Charges

Every foreign registered vehicle entering Namibia pays a fee according to specified vehicle categories, including MDC for all vehicles with a mass exceeding 3 500 kg. As it applies to domestic vehicles, MDC on foreign vehicles are aimed at recovering variable costs not recovered using fuel levies. Upon entering Namibia, the driver of the foreign registered vehicle is required to visit the RFA office at the respective border of entry and acquire the necessary permit to use the Namibian road network.

4. SUCCESS AND MAJOR ISSUES ASSOCIATED WITH THE NAMIBIAN ROAD USER CHARGE SYSTEM

Currently, the RFA Act 18 of 1999 outlines who should pay RUC, the charging instruments available, the basis of charges (ownership, mass/load, and distance), and refund mechanisms that govern the Namibian RUCS. Petrus and Krygsman (2018) discuss the institutional arrangements and their mandate (including the collection and distribution of the revenue).

4.1 Key Observations Regarding the Road User Charge System in Namibia

The recommended user-pay principle has not been fully implemented, although it, to an extent, had some influence on shaping RUC instruments (Petrus & Krygsman, 2019). The current instruments to an extent mimic a two-part tariff approach where road users pay a flat charge for road network accessibility and a quasi-user charge based on fuel consumption in the form of a fuel levy. There is, however, no close link between the RUC and actual patterns of road use in time and location. For instance, a driver travelling 500 km on the main corridors or in Windhoek's central business district would pay the same charges in fuel levies as a driver covering the same distance on rarely used district roads. Another interesting observation highlighted in recent literature and applicable to Namibia is that owners of fuel-efficient vehicles pay a smaller fuel levy for their use of the road as compared to users with older cars (De Percy, 2018). Furthermore, heavy vehicles pay access fees and usage in terms of MDC (travelling), and there is no direct link between the damage they cause and the cost of road maintenance.

The variable-related levies apply to both petrol- and diesel-powered vehicles paying fuel levies, including the RFA's RUC and the MVA Fund's levy. The variable charges applicable to diesel-vehicles using fuel other than petrol consist of fuel taxes and levies, as well as travel distance charges on HGVs only. The travelling MDC are imposed according to the Road Traffic and Transport Act (No. 22 of 1999), which also contains other regulations pertaining to vehicle taxation. In order to fully implement the user-pay principle, the RUC should be charged based on road use and not vehicle ownership. Other concerns that need to be addressed include the following:

- i) Under the current RUCS, road fees and charges are collected by various agencies, while the accountability for these funds lies with the RFA, which results in an opaque and complex system that disconnects funds generated and transferred to the RF. For instance, there have been debates and proposals for eNATIS (Electronic National Traffic Information System) to be housed under the RFA as opposed to the status quo (under the RA); however, the challenge observed is that eNATIS executes other duties that are not associated with vehicle registration and licence fees (MWT, 2017).
- ii) The power of the RFA to execute the adjustment of the levies is a concern.

Following these arguments, it appears that two things are needed on the transport policy front. Firstly, the RUC must be modified by focusing on encouraging users to make efficient use of the existing network. Planning and pricing are the key instruments to improve the efficient use of the road network in Namibia. Secondly, investing in alternative modes such as rail could reduce road damage when heavy freight is efficiently transported by rail. Chief among the challenges are the prioritisation and funding of road projects (maintenance versus development), as well as lobbying for political support towards an appropriate road pricing system that speaks to the usage pattern so as to facilitate network efficiency while maximising user satisfaction.

Road authorities should be subjected to price oversight and independent pricing determinations as applied to other monopoly sectors, including water, electricity, and telecommunication. The current two-part tariff does not provide price signals to the users that can be adjusted to their behaviours. Charging road users according to the MSC has not yet been applied in practice as road pricing in Namibia, although road users are required to pay for their full consumption of the road network according to the RFA Act and the Namibian Transport Policy (Petrus & Krygsman, 2019). While the current system of collecting revenue is based on the available instruments, the system has loopholes when it comes to fuel-efficient vehicles and electronic vehicles. According to the Transport Information and Regulatory Service department of the RA, no electrical vehicles have been registered in Namibia thus far (RA, 2019). The identified challenge with marginal cost pricing is that, the pricing model could only reap benefits and prove useful to an economical network with substantial traffic (Petrus & Krygsman, 2019).

4.2 Proposed Road Pricing Framework For the Namibian National Road Network

From the international literature discussed in this paper and the Namibian RUCS, a reform of the current charging system could bring about charges closer to the accurate use of the road network. A trial of potential technologies could be a solution to the current HGV (travelling) MDC in Namibia. The trial could be done on a voluntary basis and the RFA could offer incentives to drivers willing to participate in the trial. The idea as outlined in the Namibian Transport Policy (MWT, 2017) is to ensure that HGVs pay their fair share of using the road network. Petrus and Krygsman (2019) demonstrate that HGVs impose greater costs on the road infrastructure and incur greater environmental costs as compared to light vehicles. Reforming the RUC could assist the RFA to ensure that these crucial external costs form part of the RUC. Dealing with the issue of equity, an investigation to introduce toll roads could be lodged possibly in one of the appropriate national corridors or other roads to ensure that light vehicles also pay for the congestion they impose on other users (Petrus & Krygsman, 2019). This view is supported by industry and user representatives at various forums held by the RA toward the formulation of the Namibian Transport Policy: "The representative supports the investigation of toll roads on PPP basis as an addition to the current charging instrument in place" (MWT, 2017:10).

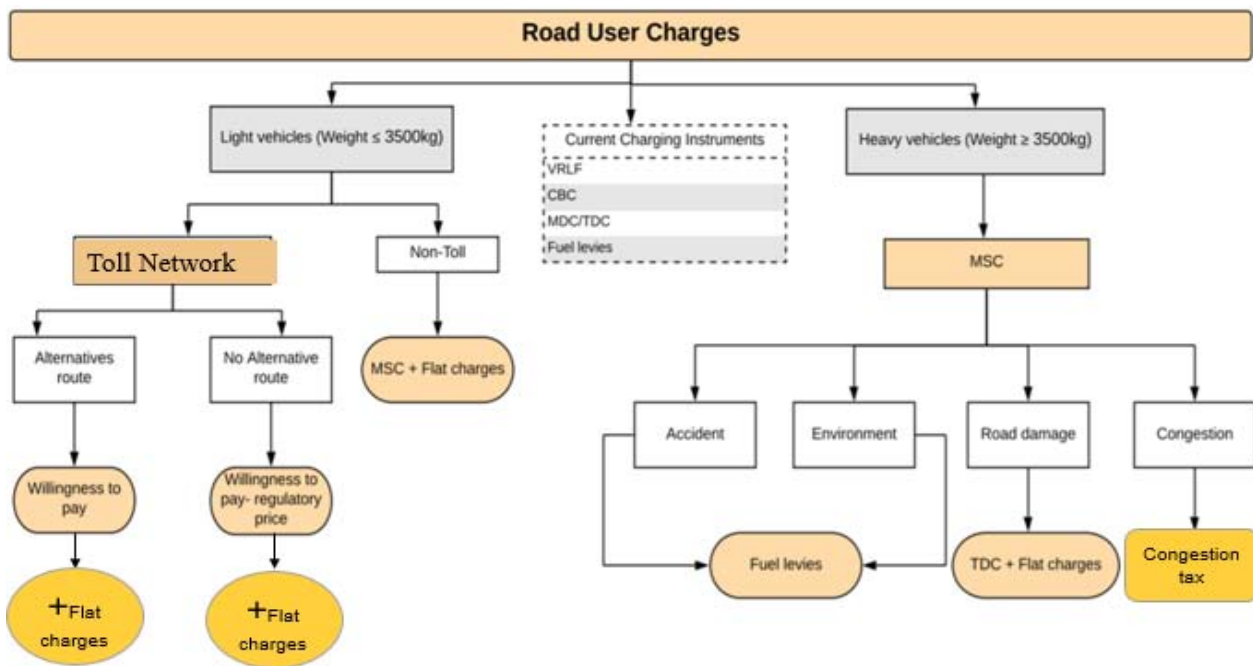
Therefore, the review could examine potential options of road pricing toward revenue generation as a principal objective while also contributing to reducing environmental risks, as follows:

Light vehicles (weight ≤ 3500 kg): Enhance charges for light vehicles, to bring about a system that will bring various improvements to the current status quo. In combination with current charges, consideration of tolls road on a PPP basis is an alternative that is worth exploring.

Heavy vehicles (weight ≥ 3500 kg): In combination with flat charges, introduce technology considerations toward location, time, distance-based charges for HGVs, and possibly introducing a CO₂ tax to be charged via fuel levy, could serve as alternative. Currently, both options of charging for light and heavy vehicles recognise the current charging system and its sound principles; however, there is room for improvement.

Integrating the aptitude to use technology-based distance measurements could offer further efficiency improvements within the system. Better RUC will be designed to charge vehicles per kilometre driven based on factors such as VKT, amount of emissions, vehicle mass, accident costs, congestion, and the type of road used, for instance standard design

to withstand heavy vehicles (Atkinson, 2019). Therefore, the most efficient way to address externalities is by incorporating costs associated with network access into road pricing.



Source: Author

Figure 1: Proposed Framework for a Namibian Road User Charge System

Figure 1 provides a framework for possible charging mechanisms for private vehicles and commercial vehicles. This framework could serve as a solution to the road financing in Namibia and could be applied by following the two-part tariff approach recommended in the literature (Andreson & Thompson, 2014), namely a charging part that could cover the marginal costs of using the road network and another part (flat charges) that could cover the capital costs. This could make it possible for efficient road pricing that manage the user's behaviours towards more economically efficient outcome will raising revenue towards roads maintenance and development. Efficient road pricing could then be achieved through a two part tariffs thus charging for the road access in the name of vehicle registrations and licence fees and for road usage in the name of congestion tax, fuel levies, insurance and toll charges (Figure 1). In addition, a financial transfer could subsidise the road sector for the first three to five years of the RUC reform trajectory. It is worth noting that designing a pricing scheme could be very complex and policymakers must ensure that they consider every possible technology that could send price signals to change road-user behaviours. International experience (Infrastructure Partnerships Australia, 2014) has shown that RUCS reform when pricing models are designed in consideration of the following elements may offer a solution to the Namibian road sector:

1. The time of day the road user accesses the network;
2. Distance travelled (space consumed);
3. Location (urban, trunk, main, and district roads);
4. Associated externalities (for instance, climate, air pollution, congestion, noise, accidents, etc.); and
5. Vehicle model/characteristics (hybrids, safety design, etc.).

The roads agencies and policymakers should consider these elements when reforming the Namibian RUCS in order to economically recover the full costs of road expenditure from those who make use of the network in an equitable manner. Each or a combination of

these elements could be considered to deliver a rational price on road usage while addressing specific objectives such as revenue generation and/or reducing externalities. In addition to the current instruments, the reformed RUCS could explore tolling charging schemes. A toll system could be installed to collect road-user fees for accessing a section of roads in an identified network of the Namibian roads. Tolls could be established at a section or network where the demand for the road service could be found to be inelastic. This could be in urban areas or national corridors; on whichever road considerations for estimating economic cost or incidence of the charge should be a priority. Each section or network identified could be priced by applying price differentiation as service costs differ at various locations. The revenue generated could primarily be spent on maintaining the particular corridor. Revenue that is invested back into a particular road where it is generated appears as an improvement evident to the motorists and surrounding community. A tolling system may have merit within the Namibian context in terms of increasing the generation of funds for the road sector.

In the Namibian context, the RFA has called for the investigation of the feasibility of tolling of roads in the country. Experience from the literature indicates that equity considerations in terms of price for local residents and commuters should be resolved. Moreover, there must be an alternative route as an option for motorists. One caveat with the Namibian road network discussed in literature is associated with sparse roads with few users. The literature, however, discussed that administrative costs are likely to be kept low when the traffic volume on a toll-targeted road section is 10 000 or more vehicle per day.

5. CONCLUDING REMARKS

This paper investigated the possibility of reforming the road user charges system in Namibian content. The paper discussed the notion of road pricing that if the recommended user pay principle ought to be implemented where should the enquiry begin. The Namibian effort towards financing the road network both in terms of road pricing and institutional arrangement are thus highly praiseworthy in its own context. Moreover, there is still room for improvement, in particular in consideration of a system (RUCS) that has the capacity of raising the needed revenues whilst providing additional benefits such as reducing environmental and society externalities, more efficient use of the transportation infrastructure, and sending pricing signals to the road users.

There is a need to review the current RUCS and possibly conduct a feasibility study on introducing road pricing that varies with distance, space, and time of network access. This paper concludes by calling for the reform of the RUCS in Namibia. Moreover, there is a need to determine the optimal level of the two-part tariff charge approach. Furthermore, the identification of sections of the road network for tolling could establish the viability of toll roads in Namibia. Finally, there is a need to conduct a trial in order to establish the relevant technologies applicable to revamp the MDC that seek to internalise the external costs of road users in Namibia.

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