

Used Motor Vehicle Imports and the Impact on Transportation in Zambia

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EXECUTIVE SUMMARY

In May, 2014, then Transport, Works, Supply and Communications Minister Christopher Yaluma, announced that Government would not limit the age of motor vehicles imported into Zambia. This was in response to concerns voiced by some stakeholders in the transport sector regarding the condition of some of the second-hand motor vehicle imports. The Minister argued that limiting the age of imported motor vehicles would disadvantage the majority of Zambians who can hardly afford to buy motor vehicles. But was this the right decision? This study assesses the implications of the policy on second-hand motor vehicle importation in Zambia focussing on motor vehicle ageing and roadworthiness.

While the Hon. Minister was right that more liberal motor vehicle importation policies are likely to see more Zambian consumers able to afford a motor vehicle, evidence in this report shows that increases in motor vehicle ownership have occurred side by side with increases in motor vehicles' age and decreases in general road worthiness. Generally, older motor vehicles are less likely to be road worthy than newer vehicles. Similarly, older vehicles are potentially more prone to road crashes than newer vehicles. The key findings of this study are:

Average age of vehicles has increased significantly

The average age of Zambia's motor vehicle fleet has increased from 13 years in 2006 to 17 years in 2014. This increase is expected to continue unless something drastic occurs in the economic fortunes of the country or in the current policies on vehicle importation. On current trends, in the next five years the average age of motor vehicles could reach **20 years**.

The road worthiness of vehicles has significantly deteriorated

The road worthiness status of Zambia's motor vehicles over the same period has deteriorated. The proportion without roadworthiness certification has increased from 14% in 2006 to 32% in 2013. This may hinder progress in the campaign against the high road fatalities in Zambia. The rate of 23.7 road traffic death rates per 100,000 population is one of the highest in Africa and older and older motor vehicles will make this position situation harder to turn around.

The ageing of Zambia's motor vehicles is caused in large part by the age of imported vehicles.

The study associates the ageing and deteriorating roadworthiness of motor vehicles with the highly liberal second-hand motor vehicle import policies. For instance, motor vehicles from the second-hand motor vehicles market have a shorter average road worthy lifespan (under 4 years) than motor vehicles bought new (greater than 12 years) and the average age at which motor vehicles are imported has risen from 10.5 years in 2006 to just under 13 years in 2014.

Policy incongruence

The policy framework that guides motor vehicle importation is in bits and pieces managed by various ministries and their agencies. Those considered include taxation, standards, environmental and health, safety and ownership of motor vehicle policies. Some policies seem to conflict with each other while others appear inappropriate for the present social and economic environment. In order to address the issues of ageing and fitness, this study proposes three short-term policy changes and the consideration of three long-term policy options.

Short-term policy options

i. A strengthening of the pre-shipment road worthiness assessments.

At present the assessments of road worthiness of motor vehicles before they are imported (all currently carried out by one organisation) are inadequate and do not incentivise either value for money for consumers or accurate assessments. In order to address this, Government should engage a variety of providers of pre-shipment assessments and institute greater transparency and information on how effectively these assessors identify faulty motor vehicles.

ii. Changes to the current import duty and excise tax treatment for imported motor vehicles.

At present the tax treatment of imported motor vehicles incentivises the purchase of older vehicles. This is because the taxation policies (which have not been reviewed in nearly three decades) base the various taxes almost entirely on the value of the motor vehicle, regardless of its age. The suggested policy response is to incentivise not only the purchase of utility vehicles but also enable *more* moderate-income Zambian consumers to afford newer and better motor vehicles and also have as little impact on government revenue as possible.

iii. Placing a cap on the age of vehicles imported into Zambia

As an alternative to the suggested tax changes this measure would entail limiting the allowable age of second motor vehicle imports. This policy has been adopted in many other countries, including Congo DRC (10 years and 7 years), Namibia (8 years), Kenya (8 years) and Tanzania (10 years).

Medium to long-term policy options

i. A strengthening of the public transport system.

One major reason for the high demand for motor vehicles is the poor quality of Zambia's public transport system. Addressing this, and reducing demand for older and cheaper second hand motor vehicles of suspect quality, will require a bold set of reforms – which ZIPAR has set these out in detail in "Trip Modelling and Cost Analysis for the Public Transport System in the City of Lusaka". This is the most complete and sustainable measure for addressing the public transit issues the Zambian households face.

ii. Introduce motor vehicle scrappage policy ("cash for clunkers")

Owners of old motor vehicles often attempt to repair or maintain their vehicles and operate them on a salvage value long after the typical motor vehicle consumer would no longer be interested. A scrappage policy, whereby the government would pay to scrap older "clunkers" would help remove unreliable and unsafe motor vehicles from our roads.

iii. Commence local motor vehicle assembly of popular models

Government should consider the development of domestic motor vehicle assembly/refurbishment in the place of imports. This could be done through PPPs and other incentives that could attract purely private investment.

With about one car for every 20 households in Zambia, the second-hand motor vehicle subject emerges as an important debate. Since the second-hand motor vehicle matter affects almost everyone, it is also politically sensitive one. Mixed reactions are expected from different stakeholder constituencies but it is incumbent on Government to make the most optimal choice that would be most in the interest of Zambian consumers.

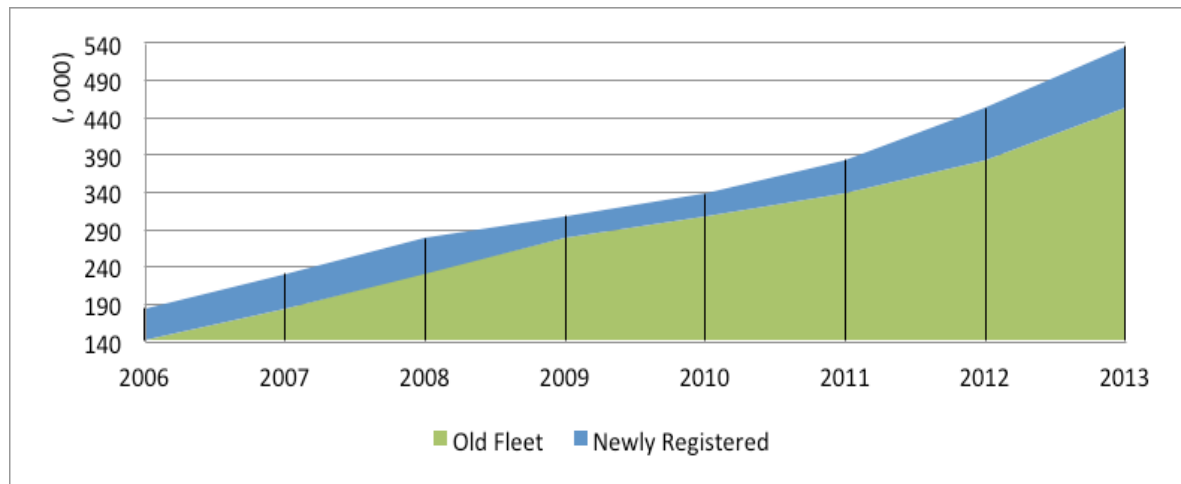
1. INTRODUCTION

Zambia has experienced strong economic growth over the last decade and the country's growth outlook is also positive. This confidence in the economic outlook is reflected in the rapid growth in the purchase of motor vehicles. The majority of these, about 90%, are bought from the second-hand market and imported from outside Zambia. This first section sets out the background and context for ZIPAR's project on second-hand motor vehicles; it addresses two issues. First the section sets out some of the basic facts about the increase in motor vehicle sales, and cars in particular. Second, it sets out the potential problems with a market for motor vehicles which relies predominantly on the second-hand market. It then concludes by setting out the key questions which this study asked.

The growing market for motor vehicles

On average, about 50,000 motor vehicles have been registered in Zambia every year from 2006 to 2013. The average annual growth in the number of motor vehicles registered in the country is estimated at 13.6% for the same period. This is depicted in Figure 1 below, which shows an increase in the size of the overall fleet from under 200,000 in 2006 to over half a million by 2013. It is also reflected in increased rates of car ownership. The level of car ownership in Zambia, though still relatively low, has considerably increased over the past decades from about 9 motor vehicles per 1,000 people in 2004 to just below 40 motor vehicles per 1,000 people in 2013.

Figure 1: Changes in Zambia's Motor Vehicle Fleet (2006 - 2013)



Source: Author's Analysis of RTSA Motor Vehicles Returns Data

Note: This chart includes all registered motor vehicles whether roadworthy or not. In Section 4.4 this paper breaks these numbers down in more detail and shows that while the number of unfit vehicles (which have officially been taken off the roads) has increased the overall picture of large increases in the number and age of the vehicle fleet remains valid.

Economic realities have forced developing countries like Zambia to depend on the second-hand market for their motor vehicles supply. Consumers with less purchasing power are more likely to be able to afford to buy second-hand motor vehicles. Some of the second-hand motor vehicles imported will certainly have been value for money for their owners: they will have conferred greater benefits to their owner compared to their cost of acquisition.

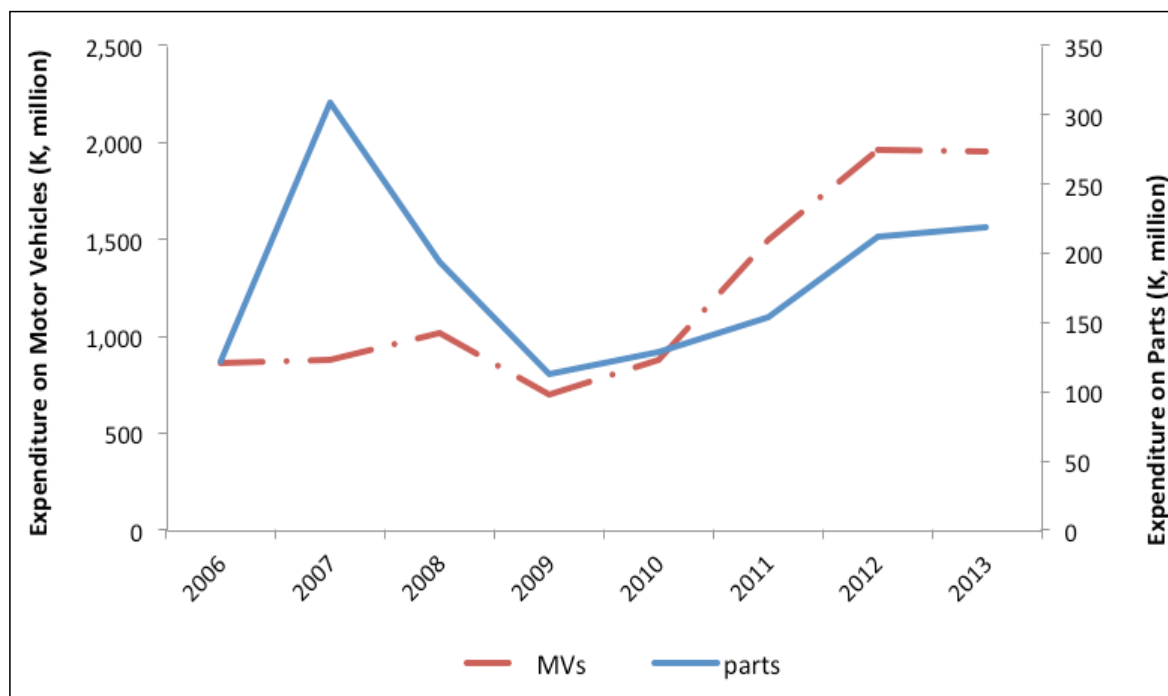
In addition, with no car manufacturer in the country, virtually all motor vehicles are imported. As

Figure 2 below shows, Zambia's total expenditure on importation of motor vehicles (excluding motorcycles, tractors and trailers, works trucks and fork lifters) for 2013 was approximately K1.949 billion (in 2006 prices). This is 2.3 times larger than the expenditure recorded for 2006 - K0.856 billion. This represents an average annual growth rate of 16.2%.¹

This is not shown in the chart, but looking in particular at cars² and other private imports increased at an annual average rate of 15.6% between 2006 and 2013. Estimated at K0.711 billion, the import value for 2013 was 2.4 times larger than the import value for 2006 which was estimated at K0.300 billion³.

This increase in the importation of vehicles themselves has been matched by increases in spare parts imports. Indeed these grew at a faster rate. The average annual growth rate of the value of motor vehicle parts imported in the same period is estimated at 21.5%⁴. As Figure 2 also shows, 2007 posted a dramatic increase in the importation of parts in unclear circumstances but this was eventually reversed in 2008.

Figure 2: Total Expenditure on Motor Vehicle and Parts Importation (K, millions 2006 prices)



Source: CSO Trade Data

Potential problems with the second-hand car market

Increased levels of car ownership, as set out above, has many benefits for Zambians. It can be argued that the current motor vehicle importation policies have contributed to improving the everyday lives of the Zambian population and have enabled better transportation of goods around the country thus facilitating trade.

However, there are potential problems with such a high reliance on a second-hand car market. The second-hand car market exhibits some classic problems which have been long studied by economists: it is an example of when sellers generally have more information than buyers

¹ Central Statistics trade data on motor vehicles drawn from HS-4 (8702 – 8705)

² Defined in the official data as “motor vehicles and other private motor vehicles principally designed for the transport of persons”

³ Central Statistics trade data on motor vehicles drawn from HS-4 (8703)

⁴ Central Statistics trade data on motor vehicles drawn from HS-4 (8512 & 8708)

regarding the quality of a product. On the buyers' side, it is hard to know for sure the quality and the safety of the car they are buying. As a result, second-hand motor vehicles imported in the country may be fine, but they may also be bad motor vehicles - or "lemons" as they are called in economic literature (Akerlof, 1970).

So while there are advantages to being able to buy second-hand motor vehicles, the fact that the conditions under which the market for second-hand motor vehicles has developed in Zambia are characterised by minimal regulation raises questions. In this market, information concerning the fitness of the vehicles being sold is usually inadequate. This means that many buyers will unknowingly have bought a 'lemon'. This has implications for both individual consumers and the general public. For an individual consumer, older motor vehicles are generally less dependable and costly to maintain, but when they buy a 'lemon' they have nowhere to turn to for remedy and risks losing their money. For the general public compromising on safety is of real concern.

Some may also have concerns about the impact on the ability of the country to ever establish local car assembly or manufacture. Consumers may enjoy a surplus by consuming second-hand vehicles now and be comfortable with the trade now, but may in the long term regret the lost opportunity to create jobs and earn incomes from an auto industry and its upstream activities.

This growing concern about the condition of motor vehicles being imported in the country has been a subject of debate in the recent past. At the start of 2014 the overwhelming majority of motor vehicles taking a new automated test of basic roadworthiness failed to pass. This experience stirred concern from the organisation responsible for road safety - the Road Traffic and Safety Authority (RTSA)- about the social cost of the second-hand motor vehicle imports to Zambia.

It is against this backdrop that study on the effects of the second-hand car market in Zambia is born. This paper presents findings from an initial phase of this wider study into the effects of the current motor vehicle importation policies for Zambia. This first phase evaluates motor vehicles importation policy effects with respect to the ageing and fitness of Zambia's motor vehicle fleet.

2. OBJECTIVES

The key objectives for the study are:

- i. To determine whether Zambia's motor vehicle fleet is becoming older or newer over time,
- ii. To determine whether the fitness status of Zambia's motor vehicle fleet is worsening or not,
- iii. To determine the relationship between the source market of motor vehicles - new or second hand - and the fitness status,
- iv. To determine the relationship between motor vehicle ages and fitness statuses, and
- v. Assessing the existing policy framework for the importation of motor vehicles.

3. METHODOLOGY

3.1. Desk Review

This study involved a desk review of the national motor vehicle registration and fitness data as captured on the RTSA database for the period 2006 to date.

3.2. Key informant Interviews

Key informant interviews involving new motor vehicles dealers, imported second-hand motor vehicles dealers, Zambia Environmental Management Agency (ZEMA), Zambia Bureau of Standards - Traffic Management Office, Road Traffic and Safety Agency, Competition and Consumer Protection Commission, Ministry of Finance (MoF), Ministry of Transport, Works, Supply and Communications and Ministry of Commerce Trade and Industry.

3.3. Data and Data Analysis

This study employs cross-sectional quantitative motor vehicle registration and fitness data sourced from the RTSA. The RTSA database is the official motor vehicle data repository for Zambia. The data was processed and analysed in STATA using mainly parametric tests. The two-sample t test with equal variances was applied. However, in the quest for a more complete analysis, non-parametric tools such as histograms and scatter graphs were also applied. Simple descriptive statistics are also used where appropriate.

3.4. Definitions of Concepts

Motor Vehicle Fleet

All light passenger vehicles, light goods vehicles, heavy passenger vehicles and heavy goods vehicles. However, the main interest of the analysis is on the light passenger and goods vehicles and as such, heavy goods and passenger service vehicles are not considered in cases where their inclusion significantly changes the results of the analysis. This definition for motor vehicle fleet – in short, '*fleet*' – excludes all sorts of motorcycles, tractors and trailers.

Motor Vehicle Fitness

A registered motor vehicle will be considered fit only if it has a certificate of fitness issued by the RTSA. The fitness record which included the fitness expiry date is electronically captured into the database at RTSA. A fitness status dummy variable was generated from this data with two values 0 and 1 representing fit and unfit motor vehicles respectively.

Fit lifespan of Motor Vehicle

This refers to the time period in years between the initial registration of a motor vehicle in Zambia and the time the motor vehicles fails to obtain a certificate of fitness for a period exceeding 3 months. The motor vehicle fit lifespan is therefore computed by subtracting the fitness expiry date number + 90 days from the date of first registration number and then dividing the difference by 365. This is done because STATA by default treats date input as number of days from the year 1900. Note that this measure fails to segregate between motor vehicles that are only out of fitness and are on the road and those that have been put out of use.

Motor Vehicle Age

This refers to the period in years from the year of manufacture to 1st August 2014. Motor vehicle age in years at particular point is calculated by subtracting the manufacture date from the current date of the data (1st August 2014) and then dividing by 365. The symbol denotes the number code for the year at which the age is being estimated.

4. FINDINGS AND DISCUSSION

The fleet size of Zambia’s motor vehicles as of 1st August 2014 stood at 523,990. Of these, 389,292 (75%) motor vehicle were acquired from the second-hand market, mainly from outside the country and 131,288 (25%) were acquired as new vehicles. As set out in Section 1 the fleet size has been growing at an average 15.4% per year. Over the same period, just as the fleet size has been increased, our analysis highlights a number of other trends. The key ones are as follows.

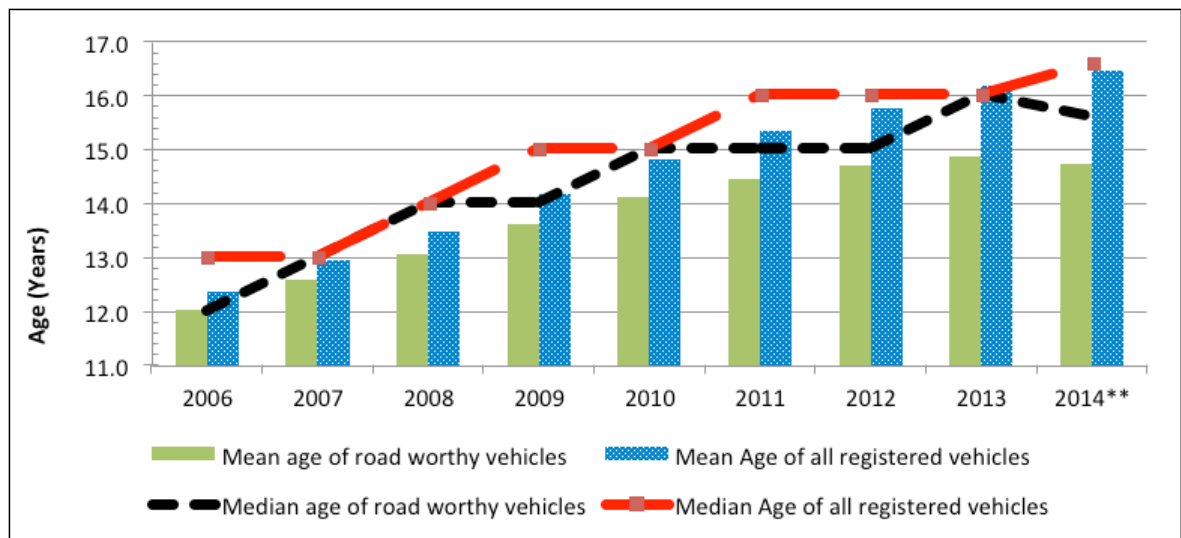
4.1. The average age of Zambia’s Motor Vehicle Fleet is increasing

When looking at the age of vehicles our analysis assessed both all vehicles (including those without certificates of road worthiness from RTSA) and also only those with such certificates. The rationale for this is that while legally speaking only those with certificates should be on the roads, it is widely accepted that many cars which have been deemed not to be roadworthy remain on the roads.

The median age of all registered motor vehicles has increased significantly. This includes all cars whether they have a road worthiness certificate or not. The average age for these vehicles has increased from **13 years** in 2006 to **17 years** in 2014. The median age has been increasing at an average rate of **3% per year** and there has been an increase of over 30% since 2006. At this rate the median age of motor vehicles is expected to reach **20 years** in the next five years, holding all else constant. (This analysis is based on the median age of 520,580 of Zambia’s Motor Vehicle Fleet from 2006 to mid-2014.)

While the median age of the road worthiness certified fleet on the other hand has increased by less it has still seen a significant rise. It has increased by 23% from **12 years** in 2006 to **15 years** in 2014. The rate of increase (2.6%) of the median age for the road worthy vehicles is only slightly less that the whole fleet. Based on this observation, the median age of Zambia’s motor vehicles is projected to go beyond **18 years** in the next five years holding all else constant. This analysis is graphically presented in Figure 3 below.

Figure 3: Age Profile of Zambia’s Motor Vehicle Fleet



**** The data for the year 2014 is for the seven months from January to August. It may therefore not be very comparable to the data for the preceding years represented in the graph**

It was also observed – not surprisingly - that the second hand import market has greater influence on the ageing of the fleet. The average ages of motor vehicles imported from the second-hand market are significantly higher than those of motor vehicles that were acquired from the new motor vehicles dealers. The difference was at least three years.

Another, more detailed way of showing how the age of Zambian cars is increasing is to look at the changing pattern of age distribution. This is presented using histograms in Figures 4 – 9 below. The frequency densities in the histograms represent the relative frequency of the different motor vehicle age clusters. For example, looking at Figure 6, in 2006 vehicles aged 10 years old and below were a large proportion of the fleet. Presenting the data in this way allows us to look beyond the simple mean and median age and instead to see some features of the age distribution – for example how skewed the data is towards older or newer cars.

Below, the three Figures in Panel A show the ageing of the overall motor vehicle fleet (including those without road worthiness certificate) in more detail and the three figures in Panel B show the ageing of the fleet that is certified fit. Each of the two sets of three Figures present a picture of how the age profile of Zambia’s motor vehicles has changed over time – and in particular how it is getting older.

Figure 4 profiles the age of Zambia’s motor vehicles at 2006. It shows that the most common age for vehicles then was around 13 years. Vehicles older than 25 years were not a common observation.

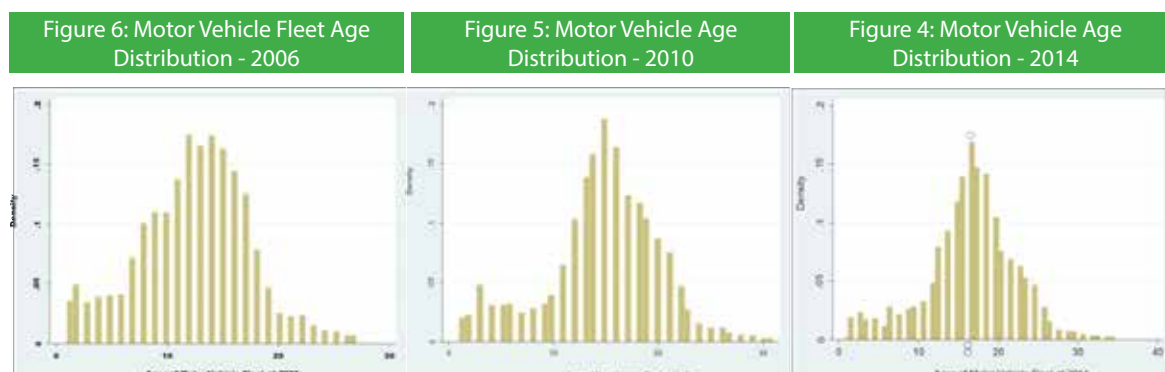
Figure 5 profiles the age of Zambia’s motor vehicles at 2010. The figure shows how by 2010 the most common ages for cars – the spikes in the chart – had moved to around 13 - 15 years. And the density of older cars – over the age of 25 and even over 30 has started to increase.

Finally, figure 6 shows that by 2014 the spike showing the most common age for cars has moved to the right again and is now 17 years. And there is a larger proportion of older cars, including a growing number of the age of 30. By 2014, the observation of vehicles less than 10 years reduces significantly.

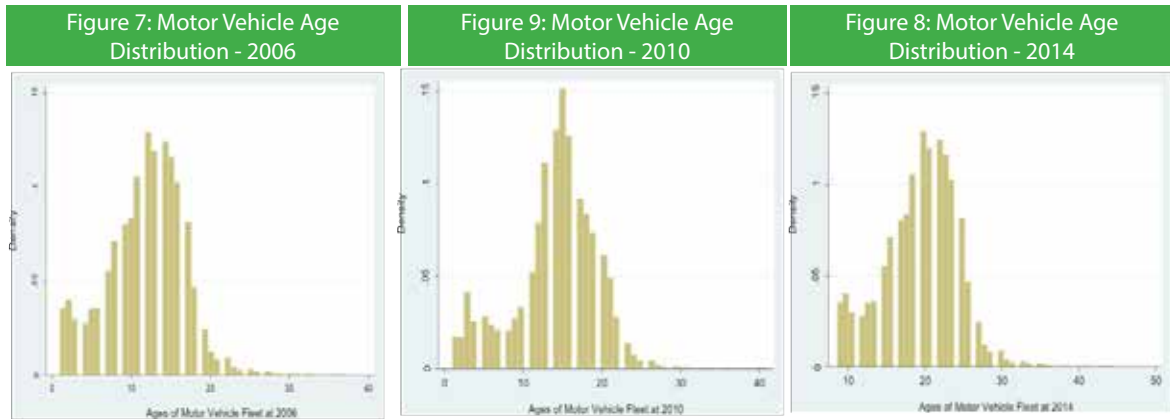
The picture is not very different when only vehicles with certificates of road worthiness are considered except that the peaks shift to the left.

What is clear in all this analysis is that, the proportion of newer cars in Zambia’s motor vehicle fleet is dwindling while that of older cars is increasing. It would be expected of these trends to continue as the fleet ages.

Panel A: Distribution of the Ages of the Overall Motor Vehicle Fleet for Zambia



Panel B: Distribution of the Ages of the Road Worthiness Certified Fleet for Zambia



This increase in the age of the fleet potentially matters for three main reasons.

- **First, the risk of breakdowns increases, with all the associated costs for consumers.** A study by the Monash University Accident Research Centre using New-Zealand data showed that the failure rate generally increases with increasing vehicle age¹. The same study found an overall increase in the crash risk with increasing vehicle age. The increase in risk with each added year of vehicle age was estimated to be 7.8% with a 95% confidence interval of 6.0% to 9.7% (Keall, et al., 2012). Car crash costs can be so devastating to the household that own the car. With these findings in mind, it is logical to some extent to reason that the increasing average age of Zambia’s motor vehicle fleet means an overall increase in the motor vehicle failure rate and the crash risk in Zambia and household expenses.
- **Second, it has an impact on the environment.** Many years of motor vehicle research have established clear relationships between fleet age and emissions. Typically, the older a motor vehicle is the higher the mileage and the higher the emissions level. There is clear deterioration in the emissions behaviour as motor vehicles become older mainly because of the ageing of catalytic convertors and degradation of their emission control systems. Therefore, Zambia’s motor vehicle fleet with mean age around 17 years is on average emitting substantially more per unit per annum and in turn increases the exposure of mainly the high traffic urban population to harmful particulates. (Zachariadis, et al., 2001)

The Zambia Environmental Management Agency ambient air quality monitor stationed at their premises in Rhodes Park has been recording eventful NO_x and SO₂ peaks during traffic peak times (Malasa, 2014). When vehicles are running at idling as in traffic congestions, they emit even more NO_x, CO, CO₂ and SO₂. Larger cities in Zambia are presently experiencing unprecedented levels of traffic congestion. What is more, this congestion is from a very old fleet whose levels of emission can only be expected to be higher. Prolonged exposure to NO_x and SO₂ can be costly to society.

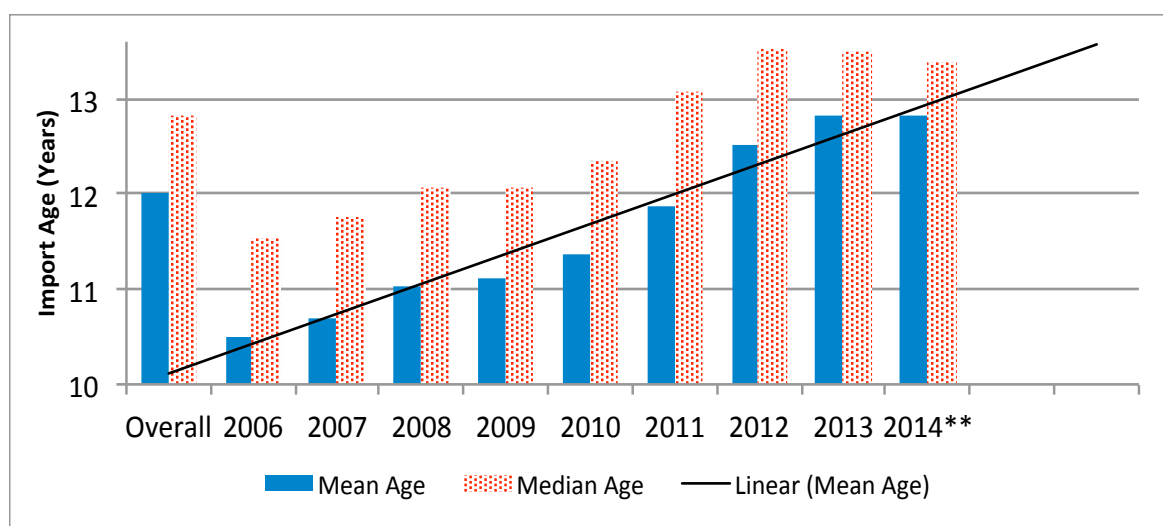
- **Thirdly, there is a risk that it leads to worsening road safety.** Research has shown that the crash incidence increases with the age at the time of importation of second-hand motor vehicles. Again, the Accident Research Centre of Monash University found a progression in crash incidence per 1,000 vehicles per year. The progression was from 6.4 for newer vehicles (<1 year) at the time of acquisition to 10.6 for vehicles that were at least at least 10 years at the time of importation (Keall, et al., 2012). While these incidences may be confounded by driver risk, they help to shape an outlook of road crashes for Zambia. Bearing in mind the high average age at which vehicles are being imported in Zambia – 13 years – it is no wonder that despite the scaling up of road safety programmes in recent years, Zambia still numbers among the high road crash risk countries in Sub-Saharan Africa. However, as is shown in more detail below the official data does not show a further deterioration in road safety in Zambia.

¹ A failure occurs when at least one fault is identified on a motor vehicle

4.2. A significant cause of the ageing fleet is that imported vehicles are getting older.

Zambia's ageing motor vehicle fleet can be traced in large part to the ages at which second-hand motor vehicles have been imported. Over the years, the average age at which motor vehicles are imported has risen from 10.5 in 2006 to slightly less than 13 in 2014. This is an increase of over 20%. Figure 10 below shows the increase in the average ages of vehicles at the time of importation.

Figure 10: Average Age of Vehicles at the Time of Importation



** The data for the year 2014 is for the seven months from January to July. It may therefore not very comparable to the data for the preceding years represented in the graph.

There are a number of possible explanations for this increase. One is the changing nature of demand for cars in Zambia. It is possible that Zambia, as a growing economy with a youthful population, could be seeing increased demand for cheaper cars. Zambian consumers appear to be giving the aspect of motor vehicle age less and less regard when buying motor vehicles. What is unclear is why this is happening. It is theoretically expected that Zambia as growing economy with a youthful could experience this kind of situation. As more youth become economically active and start to earn income they would want to buy motor vehicles. However since most these would not have had time to save much money and because there is, limited access to financing facilities in Zambia, they may not be able to afford newer motor vehicles. As a result they end up buying older ones which are cheaper.

However, there are policy factors which are relevant as well. Another factor which is likely to be an important contributing factor is the value based motor vehicles import tax regime. Importation of motor vehicles attracts customs duty at 25%, an excise duty of 20%-30% (depending on engine size) and on top of this, a value added tax (VAT) at 16%. This results in inflation in the cost of motor vehicles in Zambia of between 75% and 90%.

Table 1 below shows examples of the import tax treatment of both older and new cars. The three cars selected are the commonest motor vehicles models registered in Zambia. For the older cars the analysis has used prices from the second-hand motor vehicles market. For the newer vehicles prices used were obtained from the local franchised dealer of the models. Annex 4.1 and 4.2 contain the full details of the different taxes and how these figures were calculated.

Table 1: Tax treatment of a selection of older and new cars in Zambia

Vehicle Characterisation	Popular cars - Used			Popular cars - New		
	Toyota Corolla, 2001, 2L	Toyota Hi-ace, 2003, 2.4L	Toyota Hilux, 1997, 2.5L	Toyota Corolla, 2014, 2L	Toyota Hiace, 2014, 3L	Toyota Hilux, 2014, 2.8L
<i>Cost and carriage-in (K)</i>	25,767	45,123	50,189	115,320	356,004	201,004
<i>Total taxes and duties (K)</i>	23,131	30,448	23,786	102,386	237,960	94,277
<i>Taxes and duties as percentage of cost and carriage-in</i>	89.9	67.5	47.4	88.6	66.8	46.9
Total cost (K)	48,899	75,571	73,975	217,706	593,964	295,281

Because the taxes applicable on older and newer cars are the same, the absolute amounts of taxes paid on newer cars are as many times larger depending on the pre-tax price. For instance, in the case of the two Corollas, the purchaser of the 2001 corolla costing K25, 767 would pay K23, 132 while the purchaser of the 2014 new corolla costing K115, 320 would pay a staggering K102, 386 in taxes. While this taxation policy may seem equitable, the fact is that, newer motor vehicles become extremely costly and very few Zambian households can to afford such outlays. The commonest motor vehicle types in Zambia are saloons, sedans and station wagons. In the current tax regime, it is this group of motor vehicles that attract the highest tax responsibilities.

The result of these large mark-ups on the cost of motor vehicles is that most consumers cannot afford to buy new or newer motor vehicles. As well as newer vehicles just being more expensive generally, such vehicles generally attract larger tax obligations pushing the cost of acquisition further up.

The importance of the tax policy in this matter can thus not be overemphasised. Policy incongruence is seen in that Government intendeds to afford many Zambian consumers opportunity to acquire motor vehicles through a relaxed second-hand car importation policy framework while at the same time stifling the acquisition of motor vehicles through high taxes. The net effect of this policy incongruence is increased inflow of older vehicles with less and less benefits to the consumer and inevitably higher social cost to society.

The source of the policy incongruence may lie in the out-datedness of the Transport Sector Policy and the Control of Goods Acts. The absence of core transport policy reforms that could set direction with regard to second-hand motor vehicle importation is clearly linked to the increasing age of imported vehicles. For nearly three decades, the motor vehicle tax policy has not been amended. This has made it less responsive the evolving fleet age and fitness pattern.

4.3. The fit Lifespan of second-hand Motor Vehicles in Zambia is low

The analysis supports the claim that the fit lifespan of second-hand motor vehicle imports is far shorter than for those bought new. The average fit lifespan of second-hand motor vehicle imports is slightly below 4 years while that of new motor vehicles is slightly greater than 12 years, three times as long.

This matters for consumers as it will increase the costs, for example of maintenance. Vehicle maintenance and operating costs increase as vehicles age (Grubel, 1980). This means that there is a growing risk that maintenance and operating costs may be a too high. It is intrinsic to the international second-hand market that motor vehicles with higher maintenance and operating

costs will be imported to countries such as Zambia: these vehicles are scrapped in their country of origin and disposed to wherever demand exists. But this creates potential problems for Zambian consumers.

In contrast the motor vehicles sourced from the new auto markets have, on average, sufficiently long fit running times of 12 years. Assuming that the fit running time of a motor vehicle is representative of its lifespan, then the result for motor vehicles sourced from the new vehicles market is almost consistent with the global expected lifespan of a standard motor vehicle; 13 years². Motor vehicle sourced from the new vehicles market can therefore be expected to offer a longer fit running time. Motor vehicle fitness in Zambia is therefore not just a function of maintenance but source market as well.

The question as to whether age has anything to do with the fitness of the motor vehicle fleet could partly be answered by the mean age differences between the vehicles that are currently with and without fitness. The analysis found a statistically significant difference between ages of motor vehicles that are certified fit and those that are not. The mean age for vehicles that were road worthy (fit certified) at the time of the analysis was 14.8 years which is 4 years lower than the mean age for the vehicles without road worthiness. Motor vehicle fitness in Zambia is therefore not just a function of maintenance but age as well.

4.4. The number of vehicles which are deemed unfit has increased significantly

The official view of the Zambian Government is that the fitness status of a motor vehicle declines with age. To this effect, all motor vehicles aged 5 years and above are required to undergo a compulsory annual roadworthiness inspection conducted RTSA. Only motor vehicles that meet the minimum road worthiness requirements are allowed on the Zambian roads.

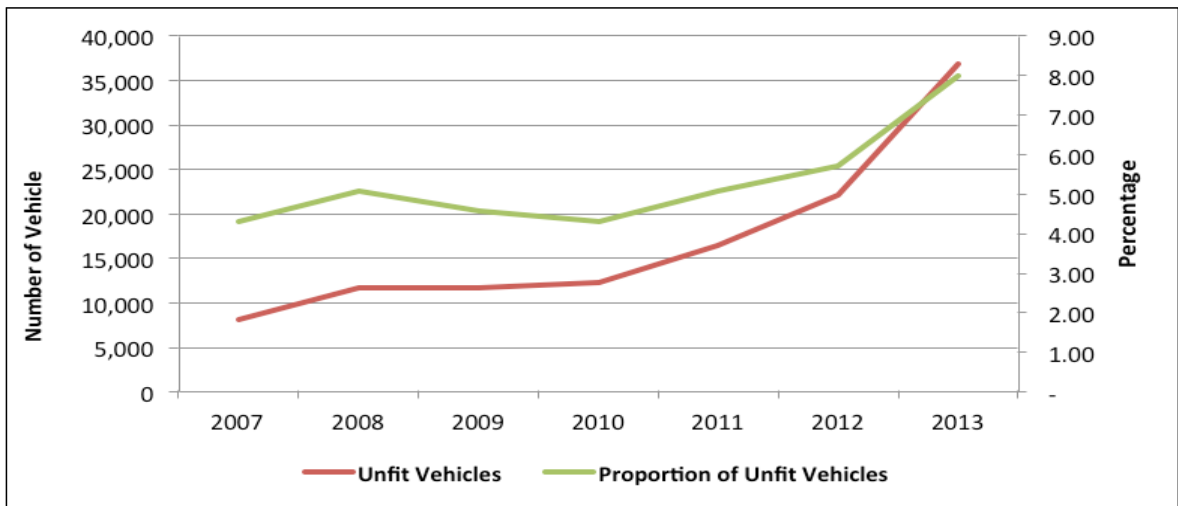
The study finds that both the *annual rate* at which vehicles are now becoming unfit to be on the roads and the absolute number of vehicles considered unfit have increased in recent years.

The increasing annual rate of motor vehicles being deemed unfit

The study observed an increase in the number of vehicles failing their road worthiness tests from year to year. Figure 11 below shows the trends in the number of cars with road worthiness certification at the beginning of each reference year, which were officially taken off the road by the end of the year. In 2007 around [4.5%] of all fit vehicles on Zambia's roads were deemed unfit and therefore not legally allowed to continue to be driven. This represented around 8,000 vehicles being taken off the roads. By 2013 8% of vehicles which were deemed fit at the beginning of the year had been deemed unfit by the end of the year – this represents over 35,000 vehicles being taken off the roads. The figure for 2014 so far is an even higher 14.4%. Looked at another way, the average annual increase in the number of vehicles losing road worthiness each year for the period 2007 to 2013 is 31%. This is greater than the average annual increase in the vehicle registration in Zambia over the period as shown in Figure 11.

² The U.S. Department of Transportation dictates that the average life of a vehicle is just over 13 years, by which point the average mileage accumulation is 145,000 miles. (CarInsuranceQuotes.com, 2011)

Figure 11: Motor Vehicles falling off the Road Worthiness Record

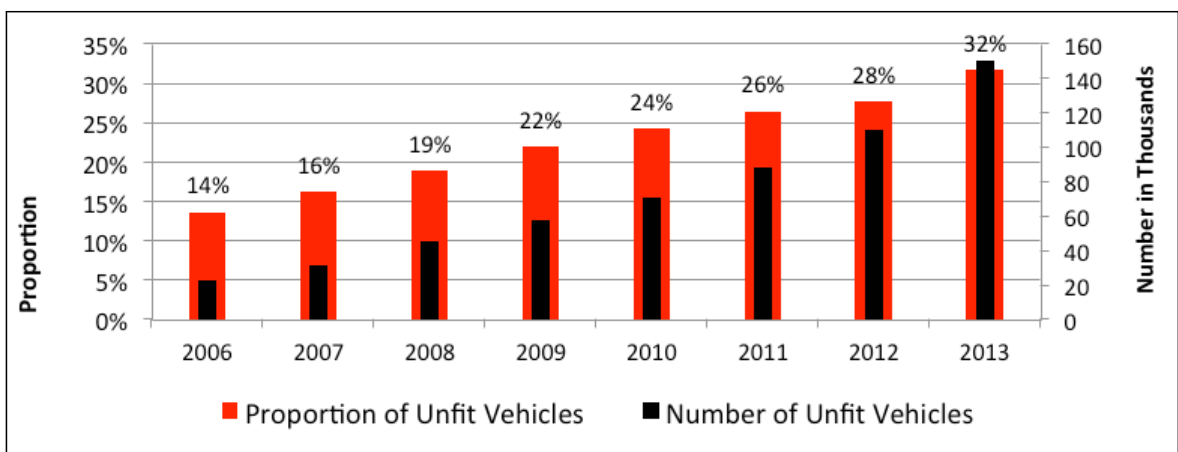


Overall absolute cumulative number of unfit vehicles

The overall number and proportion of vehicles without a certificate of fitness have increased substantially between 2006 and 2013. The proportion of motor vehicles without a certificate of fitness has increased from 14% in 2006 to 32% in 2013. This proportion is premised on cumulative fitness observations and fleet. In other words it is the proportion of the overall stock of vehicles registered in Zambia between 2006 and 2013 which have been deemed unfit. Thus the number of motor vehicles in Zambia which have been found to be unfit has increased from around 20,000 in 2006 to over 140,000 in 2013.

Figure 12 below depicts the changes in the overall number and proportion of non-roadworthy vehicles registered in Zambia. This proportion is still lower than that of the roadworthy vehicles. Some of the unfit vehicles will have been permanently removed from Zambia’s roads. This finding is important considering that (i) some vehicles that are not roadworthiness certified are in operation giving rise to road safety concerns and (ii) Zambia has one of the highest road traffic death rates per 100,000 population in the world and in Africa (World Health Organisation, 2013). With 23.7 road traffic death rates per 100,000 population Zambia is the 12th highest rate out of the 48 participating African countries (World Health Organisation, 2013).

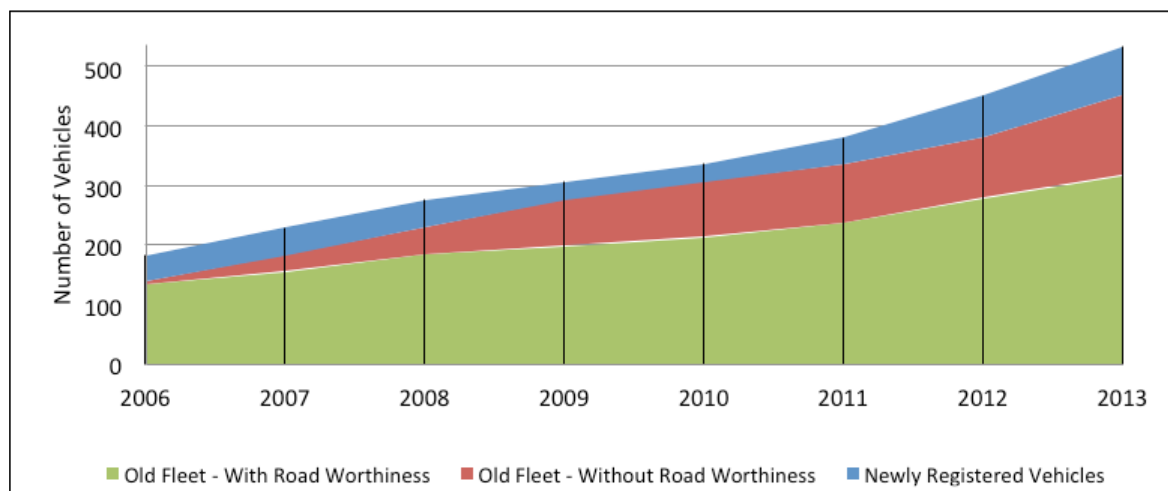
Figure 12: Increasing Number of Motor Vehicles without Certificate of Roadworthiness



The overall picture: A growing fleet, and a growing proportion of unfit cars

Figure 13 below puts this increase in the number and proportion of unfit cars into context. It shows the trends in the overall size of the fleet, but also breaks this down into its component parts. The blue section shows the proportion of the fleet which is made up by *new cars being added to the fleet each year*. The red section shows the cumulative total of unfit cars which should not be on the road (though many are still likely to be on Zambia's roads). And the green section is the total old fleet of cars. The overall picture is one of a significant annual addition of new cars and overall a steady increase in the number of vehicles which are legally on Zambia's roads. But there is also a growing stock of cars which have been registered unfit.

Figure 13: Changes in the Size of Zambia's Motor Vehicle Fleet Disaggregated by Road Worthiness



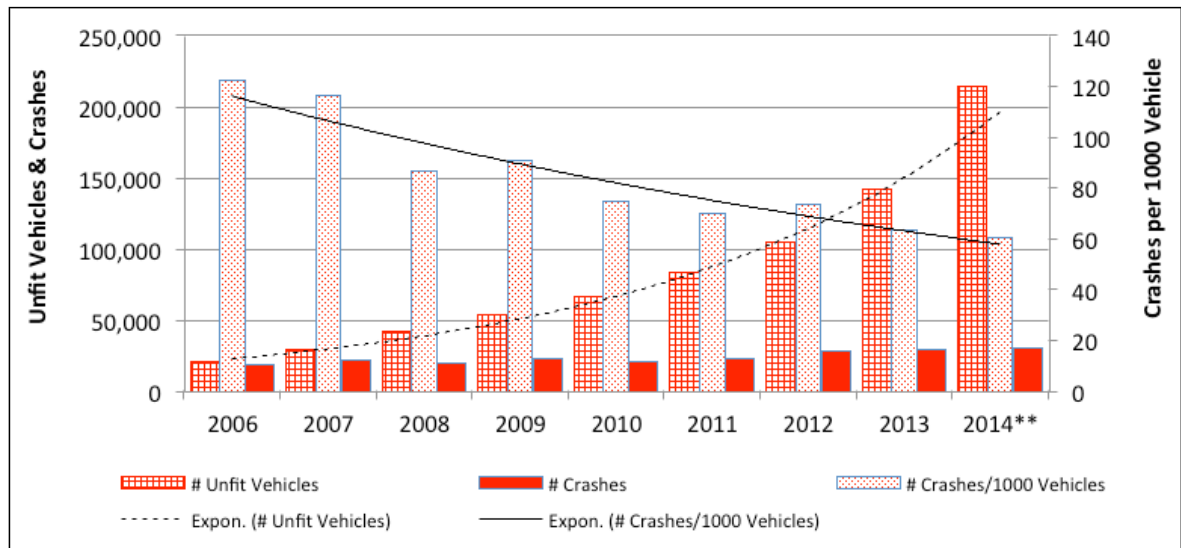
4.5. Road Worthiness Inspections

It is worth noting that these large increases in the number of unfit vehicles have occurred with the present defective vehicle inspection system. Procedures are largely discretionary and there are no performance audit mechanisms for the inspection centres. Inspection centres are currently not authorised to employ any form of mechanisation to improve the accuracy of the inspection. Even in the present defective inspection regime, the proportion of vehicles without fitness is high and increasing. The chances are high that, the now decommissioned computerized road worthiness inspection systems would have meant even higher proportions of motor vehicles falling out of the fitness bracket.

4.6. Apparent disconnect between fitness status and crash rates

There appears to be some disconnect between the fitness status of the Zambian motor vehicle fleet and the risk of crash as shown in Figure 14 below. Ideally, non-road worthy motor vehicles are expected to be out of operation in which case the crash risk is not expected to increase with an increase in vehicles which are not roadworthy. But, the fact that some of the motor vehicles that are not road worthy still have their presence on the road illegally makes the discordance between the two data series a concern. The road worthiness status of the Zambian fleet is deteriorating while crash risk is slowly reducing. This is counterintuitive especially that a large body of research find a causal effect relationship between crash risk and roadworthiness. . It is also widely recognised that crash data is largely under-captured due to high incidences of non-reporting of crashes among other reasons. In this case it is strongly suspected that the Zambian road crash data is not consistent with actual crash occurrence. However, it must be stated that the relationship between crashes and roadworthiness is an empirical one as some researchers have doubted the significance of the relationship. (Rechnitzer, et al., 2000)

Figure 14: Comparing Zambia’s Motor Vehicle Fleet Fitness Trend with Crash Trend



The fact that motor vehicle defects contribute to crash occurrence is undisputed even though its significance is difficult to estimate owing to many confounding factors. The statistics on crashes where vehicle defects play any role is largely underestimated as traffic police normally do not have the time, training or motivation to examine a vehicle thoroughly. Even where such in-depth analysis is engendered, the assessment may be affected by the crash damages on vehicle (Christensen P, 2006). Thus behavioural and attitudinal factors tend to confound estimates of crash risks associated with vehicle defects (3% - 27%) (Tanaboriboon Y, 2005).

4.7. Policy Framework

The current policy on motor vehicles importation is in bits and pieces managed by various ministries and their agencies. The institutions with relevant responsibilities include the Ministry of Transport, Works, Supply and Communication and its Road Transport and Safety Agency, Ministry of Commerce Trade and Industry and its agency, the Zambia Bureau of Standards, the Ministry of Finance and its agency, the Zambia Revenue Authority (ZRA) and the International Criminal Police Commission (ICPC) commonly known as Interpol.

The Ministry of Transport, Works, Supply and Communication is the custodian of the transport sector policy. The existing 2002 transport sector policy which is now under review provides no prescriptions with regard to fleet characteristics. The current liberal policy framework regarding importation of second-hand motor vehicles has evolved without clearly stated specifications in form of objectives, timeframe and strategies. With regard to promotion of efficient and comfortable travel, the 2002 transport policy articulated the aspirations for establishment of a mass transit system but provided no further guidance to make these aspirations operational.

The current policy prescriptions on importation of motor vehicles are more pronounced on the revenue collection and basic road worthiness fronts. ZRA has clear guidelines on tax obligations on each vehicle import and the Zambia Bureau of Standards (ZABS) oversees the road worthy inspection (RWI). Currently, there are no environmental standards applied to motor vehicle importation. Since 2009 motor vehicle trade policy has basically remained unchanged.

Import taxes on motor vehicle

In Section 4.2 this paper discussed import taxes in some detail. It was argued that since taxes are calculated based on the value of the car, engine size (CC) and purpose, the amount of tax paid is higher for newer vehicles and the sedans, saloon and station wagons which are the commonest categories of vehicle in Zambia. The tax system increases the incentive to import and

buy older vehicles. One additional point is that the price of newer second-hand vehicles is often inflated further by the way in which the ZRA undertakes to re-evaluate vehicles to determine the equitable transaction value in the country of supply. The result has usually been higher value for tax purposes for newer second-hand motor vehicles.

In analysing the impact of taxes on motor vehicle acquisition, it must be brought to bear that the extension of excises to motor vehicles was in an effort to improve government revenue. In 2006, an additional carbon tax based on engine size was levied on motor vehicles imported into Zambia. The negative effect of these taxes is higher motor vehicle acquisition cost. Whether these taxes should be maintained and for how long is a matter that must be considered in the light of the resulting quality of motor vehicles being imported to which they are in part contributing.

Pre-shipment Road Worthiness Inspection

In 2009 ZABS announced that all vehicles entering Zambia from Asia, the Middle East and United Kingdom would be subjected to pre-shipment Road Worthy Inspection (RWI) and certification. The RWI is conducted by JEVIC, a private company incorporated in Japan in September 2001. The purpose of the RWI was to minimise the risk of importing faulty and unsafe vehicles. Weaknesses in the current pre-shipment RWI have emerged and some actors have taken advantage of them. Some buyers have devised ways of avoiding the RWI to cut down on cost while others do so out of misinformation. In extreme cases the RWI disc has been counterfeited by some dealers to gain business advantage. JEVIC may also not have sufficient capacity to cater for the entire import markets for second-hand motor vehicles.

Judging by the short fit-lifespan of second-hand motor vehicles in Zambia (see section X) it appears that a significant proportion of these motor vehicles are not able to continue to benefit their owners for longer periods whether out of inadequate maintenance or due to normal wear and tear. This is contrary to the common argument that the second-hand motor vehicles from the developed world are well maintained and could be as good as new.

This lack of effective pre-shipment road worthiness assessment increases the chances that some consumers will unknowingly have bought an unsound car which may not be reliable and may not give a sustainable flow of benefit for any longer than 4 years. The current pre-shipment RWI may not have the capacity to adequately address these issues.

Environmental standards of imported motor vehicles

The Environmental Management Act No.12 of 2011 provides for setting standards of emission from mobile sources. However, these standards are not yet in place presenting regulation challenges. In 2006, Government introduced the carbon emissions tax on all imported and domestic motor vehicles in Zambia for the purpose enhancing implementation of climate change mitigation measures although it is not clear which projects are beneficiary the proceeds of the tax. Although Zambia may not have domesticated vehicle emission standards, the current pre-shipment RWI includes emission testing.

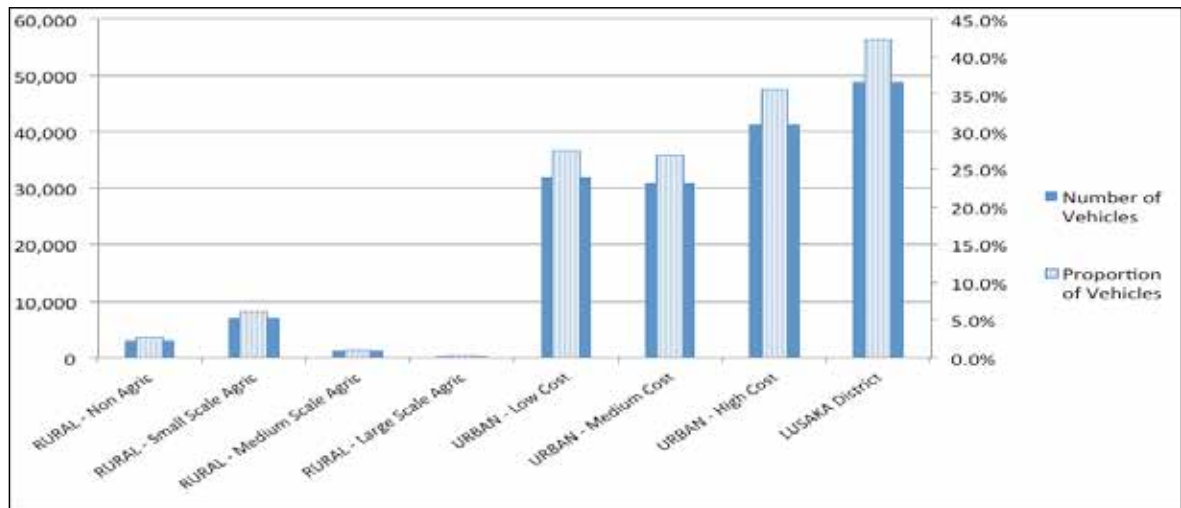
Poorly maintained old motor vehicles do not only negatively affect household financial flows but are also a public health concern as a result of the increased emission of harmful particulates. This must be a matter of concern especially in high traffic cities such as Lusaka, Ndola and Kitwe. In a country where very little is known about the extent of air pollution and ambient air quality, caution must be exercised in the manner in which sources of pollutants to increase are allowed to increase.

Distributional analysis: who owns cars?

In May, 2014, then Transport, Works, Supply and Communications Minister Christopher Yaluma announced that Government would not limit the age of second-hand vehicles entering Zambia. The Minister argued that limiting the age of imported motor vehicles would disadvantage the majority of Zambians who can hardly afford to buy motor vehicles.

In this study, the assertion that more liberal second-hand motor vehicle importation policies will help poor Zambians to own one is challenged when the distribution of motor vehicle ownership among households in different socio-economic strata is brought to bear. As shown in Figure 16 below motor vehicle ownership is still dominated by better off urban households, particularly those from high cost residential areas, most of which are in Lusaka district. About 42% of all motor vehicles owned by households are in Lusaka district. Household ownership of motor vehicles is very low in the strata where household incomes are low; that is, rural and urban - low cost residential areas. About 60% of the Zambian population is rural based. Clearly, the goal of enabling more poor households to own cars has not been achieved by relaxing second-hand car importation policies.

Figure 15: Household Ownership of Motor Vehicles by Stratum



Source: Synthesised from the 2010 Living Conditions Monitoring Survey data – Central Statistical Office

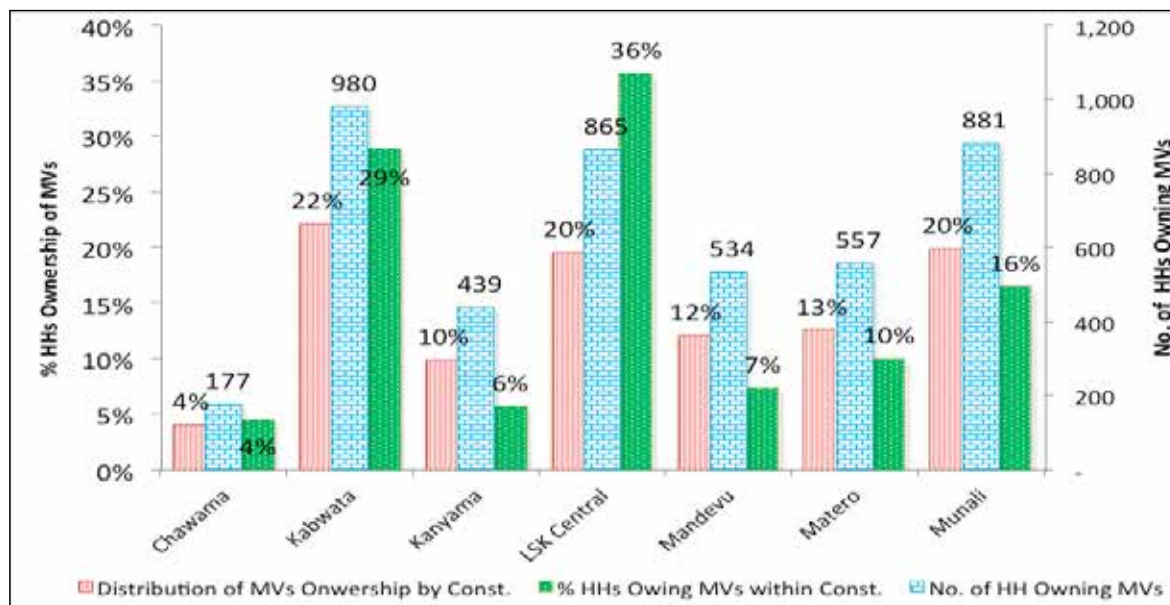
Most of the motor vehicles in Lusaka district are owned by households in the richer constituencies. Constituencies in Lusaka district can be ranked from the richest to the poorest as follows; Kabwata, Lusaka Central, Munali, Matero, Mandevu, Kanyama and Chawama (ZIPAR, 2013) (ZIPAR, 2013). Motor vehicle ownership in the district closely follows the wealth ranking of the constituencies. Poor constituencies still have low vehicle ownership as the poor seem not to respond as much to the inducement of the motor vehicle import policies.

Figure 16 below shows car ownership distribution among the constituencies in Lusaka district. Kabwata constituency has the largest proportion of households owning motor vehicles (22%) in Lusaka, followed by Lusaka Central (20%) and Munali constituencies (20%). With regard to household ownership of motor vehicles within constituencies, Lusaka central leads with a proportion of 36% followed by Kabwata at 29% and then Munali at 16%. In richer constituencies multiple car ownership per household is a common occurrence meaning that well-off households can now easily own more motor vehicles which only help to worsen the traffic congestions in the major economic centres of Zambia especially Lusaka.

It maybe that policy should not aim at facilitating motor vehicle ownership. Rather policy should

be seen to promote effective, efficient and comfortable transit of all who need to move. The over emphasis on owning motor vehicles as a solution to the local travel challenges in Zambia amounts to neglect of the majority of the households that cannot afford to buy a car or maintain one. Household car ownership may therefore not be a sustainable solution to addressing the travel challenges of the poor Zambian households.

Figure 16: Distribution of Motor Vehicle Ownership in Lusaka by Constituency



Source: Synthesised from the 2010 Living Conditions Monitoring Survey data – Central Statistical Office

4.8. Policy Recommendation

This study has reviewed sufficient evidence on the subject at hand to qualify it to make some policy recommendations. If the ageing and the worsening fitness status of Zambia's motor vehicle fleet is to be treated as an issue of national importance, then, the Zambian public must be prepared to make some adjustment in the consumption of motor vehicles. There is enough scope for improvement in the current motor vehicle importation policies. Three (3) short term policy options and three longer-term ideas are recommended in this paper.

4.8.1. Short term policy options

i. A strengthening of the pre-shipment road worthiness assessments.

At present there are concerns that these assessments are inadequate and carried out by one organisation which has little incentive to provide either value for money for consumers or effective and accurate assessments. To respond to this this paper recommends two things: (a) the introduction of more providers of pre-shipment assessments and (b) greater transparency and information on how effectively these assessors identify faulty motor vehicles and remedial options available in case of failure of certified vehicles in transit or within a given period of time after delivery.

ii. Changes to the current import duty and excise tax treatment for imported motor vehicles.

At present the tax treatment of imported motor vehicles incentivises the purchase of older vehicles although older vehicles are generally less roadworthy and more prone

to accidents and breakdowns. This is because taxation is based almost entirely on the value of the car, regardless of its age. To respond to this study suggests options for reform of tax - customs duty and excise - in a way which will achieve the objectives of (a) incentivising the purchase of newer motor vehicles (safer and less prone to breakdown) (b) enabling more moderate-income Zambian consumers to afford newer and better motor vehicles and (c) minimising the impact on government revenue. In this respect, three tax reform options are proposed as follows:

a) *Three tier option with tax subsidy for newer motor vehicles*

Under this option motor vehicles are considered in three groups based on their age at the time of purchase. The vehicle sub-categories based on purpose, weight and passenger capacity of the current policy are maintained but the engine size variable threshold has been at 2000 cc. This option is expected to cause a net loss of about 55 % of the total import tax revenue on motor vehicles to Government in the absence compensatory gain resulting of increased purchases of newer vehicles. Newer vehicles yield higher taxes in absolute terms owing to their higher values and as such increases in the purchase of newer motor vehicles due to favourable tax obligations may result in compensatory tax gains. Besides, there is a strong belief that the middle class in Zambia defined using the affluence approach (ZIPAR, 2013) is growing with the growth of the economy. This class is expected to continue enjoying higher incomes and may be able to afford newer motor vehicles with reduced taxes. However such gains are difficult to project at this point.

Tier 1: Less than 5 years old – substantially lower tax rates than the current

Tier 2: 5 to 10 years old – lower tax rates than the current

Tier 3: More than 10 years old – same tax rates as the current

The three tiers are tabulated in detail in Annex 1

b) *Three tier option with tax subsidy for newer motor vehicles and penalty for older motor vehicles*

Under this option, motor vehicles are considered in three groups based on their age at the time of purchase too. The vehicle sub-categories based on purpose, engine size, weight and passenger capacity of the current policy are also maintained. This option is expected to cause net loss of about 45 % of the total import tax revenue on motor vehicles in the absence compensatory gain resulting of increased purchases of newer motor vehicles. Further, this policy is likely to result in a reduction in the number of second-hand vehicles imported as the market does not have so many vehicles that are less than 10 years on offer.

Tier 1: Less than 5 years old – substantially lower tax rates than current

Tier 2: 5 to 10 years old – lower tax rates than current

Tier 3: More than 10 years old – higher tax rates than current

The three tiers are tabulated in detail in Annex 1

c) Two tier option with tax subsidy for newer motor vehicles

Under this option, motor vehicles are considered in two groups based on their age at the time of purchase to reduce complexity and lessen revenue loss. The vehicle sub-categories based on purpose, engine size, weight and passenger capacity of the current policy are still maintained. This option expected to cause about 40% loss of the total import tax revenue on motor vehicles if in the absence compensatory gains resulting of increased purchases of newer vehicles.

Tier 1: Less than 10 years old – substantially lower tax rates than current

Tier 2: More than 10 years old – same tax rates as the current

The two tiers are tabulated in detail in Annex 3

However, it is worth noting the recommendations of fiscal managers that in order to avoid further distortionary outcomes, motor vehicle tax reforms would require appropriate transport policy reforms to ride on. Simply, tax reforms alone may not be sufficient to address the observed fleet ageing and road worthiness patterns. Thus, the right sequencing of policy reforms is essential in order to achieve the desired results.

iii. Placing a cap on the age of vehicles imported into Zambia

At present the average age of vehicles being imported into Zambia is increasing rapidly. If the changes to the system of taxation on imported vehicles were favourably considered then, another option would be to cap the age of imported vehicles. This policy has been adopted in many other countries, including Congo DRC (10 years and 7 years depending on the design purpose), Namibia (8 years) and Kenya (8 years). The Tanzanian government discourages importation of vehicles older than 10 years. It used a tax policy that imposes surtax on all second-hand vehicles older than 10 years. The age at which the cap would be set would in Zambia need to be considered further. The recommendation is to begin at the mean age of 13 years with the view of reducing further to 10 years or lower

Considering that the standard lifespan of a motor vehicle is only slightly more than 13 years, capping the age of second-hand vehicles imported into Zambia will allow consumers enjoy slightly longer fit-lifespan their vehicles and delay the onset of higher repair, maintenance and operation costs associated with older motor vehicles. This is in addition to the unquantifiable benefit of improved safety of the motor vehicles and the public health benefit of reduced emission of harmful particulates.

The downside of these policy measures is that they still encourages development of private motoring habits which once fully entrenched are difficult to break even in the presence an optimally functional public transport system. The policy has very little contribution to the solution on the emerging traffic congestions in the major cities around the country.

4.8.2. Medium to Long Term Policy Options

The medium to longer-term policy options which that this study proposes to be considered are as follows:

i. **A strengthening of the public transport system.**

It is generally agreed that the majority of the people that use private motor vehicles for routine travel do so because the failure of the public transport system to provide a service that is efficient, effective and comfortable. Strengthening of the public transport system in Zambia requires supply/service management, introduction of high occupancy vehicles, introduction of common ticketing for affordable transfers, route restructuring, buffering the daily leasing costs of public transport vehicles and fuel subsidies for public transport vehicles. The details on this recommendation can be found in the ZIPAR policy brief on "Making Public Transport in the City of Lusaka more Efficient (ZIPAR, 2013)." It is expected that once the public transport system has been made more desirable to use, the propensity for private vehicle ownership will fall. This is the most replete and sustainable measure for addressing the public transit issues faced by the majority of Zambian households.

ii. **Introduce motor vehicle scrappage policy (cash for clunkers)**

In the view of the increasing average age and the deterioration in the fitness status of Zambia's motor vehicles, introduction of a scrappage policy may be in order. This policy would enable people to begin factoring depreciation in their car purchase decision a situation which may encourage consumers to favour newer motor vehicles. Owners of old motor vehicles often attempt to repair or maintain their vehicles personally, and may operate them on a salvage value long after the typical car consumer would no longer be interested. A scrappage policy would help mop out much older motor vehicles which, as already pointed out, more and more consumers are failing to keep in road worthy condition.

This scrappage policy must not be confused with industry stimulus package as Zambia currently has no motor vehicle manufacture or assembly. It is a move aimed at containing road crashes and air pollution. The policy can effectively be implemented with public and private partnership.

Voluntary compensated scrappage would apply to all motor vehicles over 20 years with current road tax and a three year unbroken history of road tax compliance. The consumer that scraps a car would then be given a tax subsidy of up to USD 1000 which they can use the next time they are purchasing any vehicle which is younger than 10 years. In this case, the scrapped car becomes a property of Government who may in partnership with the private sector recondition the car or recycle the basic materials for sale.

Compulsory non-compensated scrappage would apply to all motor vehicles over 25 years without fitness certification for over two consecutive years and all motor vehicles with or without certificate of fitness for as long as they are over 35 years unless if they are kept for antiquity purposes. In this case, the motor vehicle is removed from the national motor vehicle database and is forfeited to Government. Government may in partnership with the private sector recondition the car or recycle the basic materials for sale. In the case of antiquity motor vehicles, the registration of the car shall be changed to antiquity car and the owner must satisfy the antiquity car registration requirements. In the case of duly reconditioned vehicles a new maximum

useful life is to be prescribed by the reconditioning company under the supervision of a standards body.

iii. Commence local car assembly of popular models

The high and increasing number of car imported into Zambia annually is an indicator of the rising demand for motor vehicles. To avoid intricacies of policies woven around individual and foreign dealers of second-hand motor vehicles from outside Zambia and to retain some the foreign currency spent on car importation. It is advisable that Government should prioritise development of car assembly in the stead of mere dealership. This will entail promotion of knocked-down car assembly kits and higher tariffs on imported motor vehicles even those enjoying lower tariffs at present. This is a long term plan whose processes must not longer be dispar

5. CONCLUSION

This study has analysed the outcomes of the second-hand motor vehicles importation policy with respect to vehicle fleet age and fitness. It provides important insights that have been used to help develop policy recommendations.

The major finding of this study is that Zambia's motor vehicle fleet has considerably aged with the average age increasing by 4 years from 2006 to 2013. This ageing matters for two main reasons: (i) it compromises vehicle reliability and safety and (ii) increases emissions. Two important causes of this ageing are first the motor vehicles are older at the point of being imported and secondly that the high cost based tax mark-ups on imported motor vehicles making it more costly even for better-off Zambian households to buy newer cars. It has also been highlighted that it is better-off households that are benefiting from the highly liberal policy framework for second-hand motor vehicles.

The second-hand motor matter affects almost everyone; it is also politically sensitive. With about one car for every twenty households in Zambia, the second-hand motor vehicle subject emerges as an important debate at policy level. This study proposes six policy options of which three are short term and the rest medium to long term measures.

The short term measures proposed include; (i) strengthening of the pre-shipment road worthiness assessments (ii) changes to the current tax and excise treatment for imported cars and (iii) placing a cap on the age of vehicles imported into Zambia. The medium to long term measures include; (i) strengthening of the public transport system (ii) introduction of motor vehicle scrappage policy (iii) promotion of local motor vehicle assembly of popular models.

Some of the proposed measures are revenue neutral while others may have adverse net-effect on Government revenue. In considering the policy recommendations in this paper, Government must ensure an optimal balance of motor vehicle affordability, consumer economy, environmental safety and road safety. It is therefore hoped that this study will be useful in the policy processes on for the improvement of safe, environmentally friendly, cost effective and decent transport in Zambia.

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ANNEXURE

Annex 1: Breakdown of the three tier option with tax subsidy for newer motor vehicles

MOTOR VEHICLE DESCRIPTION			TAXES		
Category	Tier	Sub-category	Customs Duty	Excise Duty	VAT
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	1	With engine capacity of 2000 cc and below	10% or K5,000 whichever is greater	2.5%	16%
		With engine capacity over 2000 cc	10% or K6,000 whichever is greater	5%	16%
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	2	With engine capacity of 2000 cc and below	15% or K3,000 whichever is greater	2.5%	16%
		With engine capacity over 2000 cc	15% or K3,500 whichever is greater	5%	16%
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	3	With engine capacity of 2000 cc and below	25% or K3,000 whichever is greater	25%	16%
		With engine capacity over 2000 cc	25% or K3,000 whichever is greater	30%	16%
Pick-ups, trucks and lorries GVM ≤ 20 tons	1		10% or K5,000 whichever is greater	0%	16%
Pick-ups, trucks and lorries GVM ≤ 20 tons	2		10% or K3,500 whichever is greater	2.5%	16%
Pick-ups, trucks and lorries GVM ≤ 20 tons	3		15% or K3,500 whichever is greater	10%	16%
Buses and coaches > PAX 10 persons	1	Seating Capacity not exceeding 16 persons	10% or K15,000 whichever is greater	5%	16%
		Seating Capacity of 16 and more persons		0%	
Buses and coaches > PAX 10 persons	2	Seating Capacity not exceeding 16 persons	10% or K3,000 whichever is greater	10%	16%
		Seating Capacity of 16 and more persons		5%	
Buses and coaches > PAX 10 persons	3	Seating Capacity not exceeding 16 persons	25% or K3,000 whichever is greater	30%	16%
		Seating Capacity of 16 and more persons		20%	

Annex 2: Breakdown of the three tier option with tax subsidy for newer motor vehicles and penalty for older motor vehicles

MOTOR VEHICLE DESCRIPTION			TAXES			
Category	Tier	Sub-category	Customs Duty	Excise Duty	VAT	
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	1	With engine capacity of 2000 cc and below	10% or K5,000 whichever is greater	2.5%	16%	
		With engine capacity over 2000 cc	10% or K6,000 whichever is greater	5%	16%	
	2	With engine capacity of 2000 cc and below	15% or K3,000 whichever is greater	2.5%	16%	
With engine capacity over 2000 cc		15% or K3,500 whichever is greater	5%	16%		
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	3	With engine capacity of 2000 cc and below	25% or K3,000 whichever is greater	25%	16%	
		With engine capacity over 2000 cc	25% or K3,000 whichever is greater	30%	16%	
Pick-ups, trucks and lorries GVM ≤ 20 tons	1		10% or K5,000 whichever is greater	0%	16%	
Pick-ups, trucks and lorries GVM ≤ 20 tons	2		10% or K3,500 whichever is greater	2.5%	16%	
Pick-ups, trucks and lorries GVM ≤ 20 tons	3		15% or K3,500 whichever is greater	20%	16%	
Buses and coaches > PAX 10 persons	1	Seating Capacity not exceeding 16 persons	10% or K15,000 whichever is greater	5%	16%	
		Seating Capacity of 16 and more persons		0%		
Buses and coaches > PAX 10 persons	2	Seating Capacity not exceeding 16 persons	15% or K3,000 whichever is greater	10%	16%	
		Seating Capacity of 16 and more persons		0%		
Buses and coaches > PAX 10 persons	3	Seating Capacity not exceeding 16 persons	15% or K3,000 whichever is greater	30%	16%	
		Seating Capacity of 16 and more persons		10%		

Annex 3: Breakdown of the two tier option with tax subsidy for newer motor vehicles

MOTOR VEHICLE DESCRIPTION			TAXES			
Category	Tax Tier	Sub-category	Customs Duty	Excise Duty	VAT	
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	1	With engine capacity of 2000 cc and below	10% or K3,000 whichever is greater	10%	16%	
		With engine capacity over 2000 cc	10% or K3,500 whichever is greater	10%	16%	
Motor vehicles & other motor vehicles for transport of persons (saloons, wagons etc.)	2	With engine capacity of 2000 cc and below	25% or K3,000 whichever is greater	25%	16%	
		With engine capacity over 2000 cc	25% or K3,000 whichever is greater	30%	16%	
Pick-ups, trucks and lorries GVM ≤ 20 tons	1		10% or K3,500 whichever is greater	5%	16%	
Pick-ups, trucks and lorries GVM ≤ 20 tons	2		15% or K3,500 whichever is greater	10%	16%	
Buses and coaches > PAX 10 persons	1	Seating Capacity not exceeding 16 persons	10% or K3,000 whichever is greater	5%	16%	
		Seating Capacity of 16 and more persons		0%		
Buses and coaches > PAX 10 persons	2	Seating Capacity not exceeding 16 persons	15% or K3,000 whichever is greater	25%	16%	
		Seating Capacity of 16 and more persons		0%		

Annex 4: Detailed analysis of existing taxation of imported cars

Annex 4.1 Examples of Tax Calculation of Common Car Models Registered in Zambia – Second-hand Motor vehicles

Code	Description	Toyota Corolla, 2001 model, 1790cc			Toyota Hiace, 2003 model, 2430cc			Toyota Hilux, 1997 model, 2440cc		
		Rates	USD	ZMW	Rates	USD	ZMW	Rates	USD	ZMW
C1	Cost (F.O.B.)		2,356.00	14,607.20		4,558.00	28,259.60		5,375.00	33,325.00
C2	Insurance		100.00	620.00		200.00	1,240.00		200.00	1,240.00
C3	Road Worthiness Inspection		200.00	1,240.00		300.00	1,860.00		300.00	1,860.00
C4	Freight		1,100.00	6,820.00		1,800.00	11,160.00		1,800.00	11,160.00
C5	C.I.F.		3,756.00	23,287.20		6,858.00	42,519.60		7,675.00	47,585.00
C6	Other Cost		400.00	2,480.00		420.00	2,604.00		420.00	2,604.00
C7	CIF to Boarder of Entry		4,156.00	25,767.20		7,278.00	45,123.60		8,095.00	50,189.00
	Exchange Rate	6.20			6.20				6.20	
T1	Value for Duty Purpose		4,156.00	25,767.20		7,278.00	45,123.60		8,095.00	50,189.00
T2	Customs Duty (T 1 x Tarrif)	25%	1039	6,441.80	15%	1091.7	6,768.54	15%	1214.25	7,528.35
T3	Value for Excise Purpose		5,195.00	32,209.00		8,369.70	51,892.14		9,309.25	57,717.35
T4	Excise Duty (T 3 x Tarrif)	30%	1,558.50	9,662.70	25%	2,092.43	12,973.04	10%	930.93	5,771.74
T5	Value for VAT Purpose		6,753.50	41,871.70		10,462.13	64,865.18		10,240.18	63,489.09
T6	VAT (T 5 x 16%)	16%	1,080.56	6,699.47	16%	1,673.94	10,378.43	16%	1,638.43	10,158.25
			7,834.06	48,571.17		12,136.07	75,243.60		11,878.60	73,647.34
T7	Carbon Tax		24.19	150.00		24.19	150.00		24.19	150.00
T8	Motor Vehicle Fee		20.65	128.00		20.65	128.00		20.65	128.00
T9	Asycuda Processing Fee		8.06	50.00		8.06	50.00		8.06	50.00
			52.90	328.00		52.90	328.00		52.90	328.00
	Total Tax Payable		3,730.96	23,131.97		4,910.97	30,448.00		3,836.51	23,786.34
	Total Cost		7,886.96	48,899.17		12,188.97	75,571.60		11,931.51	73,975.34
	Tax as percentage of Cost (C7)			89.8%			67.5%			47.4%

Annex 4.2 Examples of Tax Calculation of Common Car Models Registered in Zambia – New Motor vehicles

Code	Description	Toyota Corolla, 2014 model, 2L		Toyota Hiace, 2014 model, 3L		Toyota Hilux, 2014 model, 2.8L				
		Rates	USD	ZMW	Rates	USD	ZMW	Rates	USD	ZMW
C1	Cost (F.O.B.)		16,900.00	104,780.00		55,000.00	341,000.00		30,000.00	186,000.00
C2	Insurance		200.00	1,240.00		200.00	1,240.00		200.00	1,240.00
C3	Road Worthiness Inspection		0.00	0.00		0.00	0.00		0.00	0.00
C4	Freight		1,100.00	6,820.00		1,800.00	11,160.00		1,800.00	11,160.00
C5	C.I.F.		18,200.00	112,840.00		57,000.00	353,400.00		32,000.00	198,400.00
C6	Other Cost		400.00	2,480.00		420.00	2,604.00		420.00	2,604.00
C7	CIF to Boarder of Entry		18,600.00	115,320.00		57,420.00	356,004.00		32,420.00	201,004.00
	Exchange Rate	6.20			6.20			6.20		
T1	Value for Duty Purpose		18,600.00	115,320.00		57,420.00	356,004.00		32,420.00	201,004.00
T2	Customs Duty (T 1 x Tarriff)	25%	4650	28,830.00	15%	8613	53,400.60		4863	30,150.60
T3	Value for Excise Purpose		23,250.00	144,150.00		66,033.00	409,404.60		37,283.00	231,154.60
T4	Excise Duty (T 3 x Tarriff)	30%	6,975.00	43,245.00	25%	16,508.25	102,351.15		3,728.30	23,115.46
T5	Value for VAT Purpose		30,225.00	187,395.00		82,541.25	511,755.75		41,011.30	254,270.06
T6	VAT (T 5 x 16%)	16%	4,836.00	29,983.20	16%	13,206.60	81,880.92		6,561.81	40,683.21
			35,061.00	217,378.20		95,747.85	593,636.67		47,573.11	294,953.27
T7	Carbon Tax		24.19	150.00		24.19	150.00		24.19	150.00
T8	Motor Vehicle Fee		20.65	128.00		20.65	128.00		20.65	128.00
T9	Asycuda Processing Fee		8.06	50.00		8.06	50.00		8.06	50.00
			52.90	328.00		52.90	328.00		52.90	328.00
	Total Tax Payable		16,513.90	102,386.20		38,380.75	237,960.67		15,206.01	94,277.27
	Total Cost		35,113.90	217,706.20		95,800.75	593,964.67		47,626.01	295,281.27
	Tax as percentage of Cost (C7)			88.8%			66.8%			46.9%



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