



UNIVERSITY OF CAPE TOWN
FACULTY OF COMMERCE
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DISSERTATION TITLE

**The Importance of Road Transport Infrastructure
Development and Maintenance in Trade Facilitation: A
South African Case**

Presented to the Graduate School of Business

University of Cape Town

By

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14 August 2015

Submitted in partial fulfilment of Tralac-MComm GSB-UCT

Programme 2012 to 2015

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Acknowledgement

I am grateful to the Department of Transport and some of its agencies that have helped in directing me to some of the relevant and current literature used in this study.

I would also like to thank Peter Copley, a professional Transport Engineer, whose valuable knowledge ensured that this study was factually correct and relevant.

My heart goes to my 2 years old twin girls, Bonolo and Boipelo for serving as an inspiration throughout this study.

Final thanks to Trudi Hartzenberg, whose guidance, knowledge and indelible insight into the subject made this study possible.

Declaration

I, Moeti Kgamanyane, hereby declare that the work on which this thesis is based is my original work(except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

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Abstract

Road transportation is the most frequently used means of transporting goods and people in much of sub-Saharan Africa. Furthermore, because of the region's geographic nature, where many of the countries are landlocked, imports and exports of goods happen primarily by land and in this case by road transport. This is primarily due to the fact that other means of surface transportation like rail and navigable rivers are not well developed.

Nonetheless, the lack of complementarity between the two land transportation modes, that is rail and road, has led to the over usage of the road. This has invariably led to congestion and deterioration of the road network with minimal investment in both the development and maintenance of the road infrastructure.

Though there is an acknowledgement of this problem and attempts to address it through efforts like the Programme for Infrastructural Development in Africa (PIDA), and regionally in SADC through the adoption of the SADC Regional Infrastructure Development Master Plan Vision 2027 (RIDMP), much effort still needs to be put within individual countries to develop and maintain primary road networks that are able to connect to regional trade corridors.

Important findings of this study are that it is still expensive to do business in Sub-Saharan Africa compared to other developing and developed nations. This is mainly because of the lack of connectivity and the ease of moving goods and people. Due to the high cost associated with transportation, sub-Saharan Africa as a region has become less attractive to foreign direct investment and less integrated in terms of trade. This also affects the ability of the region to develop sustainable regional value chains and competitive industries.

In South Africa, the study also found that, though government has over the last five years substantially increased the budget for road development and maintenance to both provinces and local municipalities, lack of skills in road engineering affects efficient use of resources, mainly spending in terms of required periodic maintenance of roads at that level. The result is backlogs in the maintenance of secondary road networks that serve as important connections to the primary network.

The lack of connectivity between primary and secondary road networks means restricted mobility for goods and people. This has a negative impact on the ability of the country and the region to access certain markets and thus stifles trade facilitation.

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List of Abbreviations

ADB	Asian Development Bank Institute
AfDB	African Development Bank
ATPC	African Trade Policy Centre
AUC	African Union Commission
BMI	Business Monitor International
COMESA	Common Market for Eastern and Southern Africa
C-BRTA	Cross Border Road Transport Agency
DBSA	Development Bank of Southern Africa
DPME	Department of Performance Monitoring and Evaluation
DOT	Department of Transport
EAC	East African Community
FDI	Foreign Direct Investment
FOSAD	Forum for South African Directors-General
FTA	Free Trade Area
GDP	Growth Domestic Product
IDPF	Industrial Development Policy Framework
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
LIC's	Low Income Countries
LLDC's	Landlocked Developing Countries

MIC's	Middle Income Countries
MRAMP	Municipal Roads Master Plan
MTEF	Medium Term Expenditure Framework
MTSF	Medium Term Strategic Framework
NEPAD	New Partnership for African Development
PICC	Presidential Infrastructure Coordinating Commission
PIDA	Programme for Infrastructure Development in Africa
REC	Regional Economic Community
RSA	Republic of South Africa
RTA	Regional Trade Agreement
RVC's	Regional Value Chains
SABITA	Southern African Bitumen Association
SADC	Southern African Development Community
SAICE	South African Institute of Civil Engineering
SANRAL	South African National Roads Agency Limited
SIP's	Strategic Integrated Projects
SMME's	Small Micro Medium Enterprises
SOE's	State Owned Enterprises
SONA	State of the Nation Address
TFTA	Tripartite Free Trade Area
TMSA	Trade Mark Southern Africa

UNCTAD United Nations Conference on Trade and Development

WEF World Economic Forum

WTR World Trade Report

Executive Summary

Trade facilitation, which is the creation of an enabling environment for the movement of goods to and from ports of entrance to final consumers, is intrinsically linked to the level of infrastructure capacity to support the seamless movement of goods and people. This being the case, the development and maintenance of transport related infrastructure plays an important role in trade facilitation.

The African Competitiveness Report (2011) lists infrastructure deficiency as one of the top three factors inhibiting foreign direct investment and intra-regional trade in sub-Saharan Africa (World Economic Forum, 2011, p.12). The discrepancy between the available transport infrastructure and the growing demand for it in order to reduce input costs and transit time has a negative impact on the ability of manufacturers and traders alike to be efficient and competitive producers of goods. This negatively impacts on the economic development of many African countries including South Africa.

Road transport in particular is the only option for many land locked countries to transport their goods. Due to prolonged neglect and lack of investment in alternative surface infrastructure such as rail the result has been increased input costs, lengthy transit time between points of manufacturing and ports, the degradation of the road network due to overloading and pressure on the road further creating bottlenecks for connectivity.

The key issue that this study focuses on is the importance of road infrastructure development and maintenance in trade facilitation. The study, through literature review, looks at the state of road transport infrastructure in sub-Saharan Africa and makes an analysis of the impact of such state on regional trade. Furthermore, it includes a look at trade corridor development as a way of addressing the lack of connectivity for many landlocked regional economies.

Finally, an in-depth analysis of the South African situation is undertaken as a case study to nuance problems and challenges that cuts across the region and how these can be effectively addressed in the long term.

The primary aim is to demonstrate how targeted investment in the development and maintenance of road transport infrastructure can impact on the reduction of the cost of doing business and improve the capacity of the freight logistics system to meet demand. This will lead to better integration of markets, creation of sustainable regional value chains and better trade facilitation.

Chapter One: Introduction

1.1. Background

Trade and transport facilitation aim to reduce economic distance in a way that benefits all participating parties (Molnar & Ojala, 2003, p. 3a). Essentially this is about lowering transactions costs of doing business and trading. The costs associated with lack of adequate and quality transport infrastructure invariably impact on the level of trade flows and access to markets. Poor transport infrastructure or inefficient transport services are reflected in higher direct transport costs and longer time of delivery. An improvement in a country's infrastructure can make a big difference to the cost of trading (World Trade Report, 2004, p.116).

South Africa has increased budget allocation for road infrastructure development and maintenance to support, amongst other objectives the improvement of trade facilitation and intra-regional trade. Chapter 5 of this study looks at National Treasury budget allocations for road transport infrastructure amongst other issues and the spending pattern of provinces in South Africa. The realisation that roads play a crucial role in facilitating the movement of goods and people, and the fact that to neglect proper and periodic maintenance of the road network can inevitably lead to stifled trade flows and increase the cost of doing business has also prompted governments in the region to cooperate in planning, financing and managing road transport infrastructure to create trade corridors that allow for seamless movements in the region.

Sub-Saharan Africa (SSA) which is the focus of this study includes many landlocked developing countries (LLDC's) and thus, they are dependent on neighbouring countries for the transit of goods to reach both regional and international markets. It has been established that due to insufficient surface and specifically road infrastructure in the region, sub-Saharan Africa lags behind in economic growth, and that the region's ability to diversify its markets and increase its export volumes is highly impeded. Sub-Saharan Africa, despite its size does not have a well-developed and maintained road network. SSA's total road network is only 204km per 1000 square kilometres of land area, of which only 25% is paved compared to the world average of 944 km per 1000 square kilometres of land area. This translates into 3, 6 km of road per 1000 persons for the region relative to a world average of about 7km per 1000 persons (African Development Bank, 2010, p. 4).

Business Monitor International Limited (2012) also lends credence to this fact that, the negative impact of poor regional transport infrastructure and the pressing need to improve inter- and intra-regional connectivity is starkly borne out by the fact that SSA is the least trade integrated region in the world. Only 12, 5 % of total SSA imports come from other countries in the region, compared to almost 20, 0% in developing Asia, Latin America and the Caribbean (Business Monitor International Ltd, 2012, p.13).

South Africa as part of the region and as a case study is faced with similar road infrastructure development and maintenance challenges. South Africa is the second largest economy in Africa and has an important trading relationship with many countries north of its borders. President Jacob Zuma in his State of the Nation address acknowledged this fact and stated that, sub-Saharan Africa is increasingly becoming a more important trade partner for our country. We are encouraged that South African investments in the continent increased from 5,5 billion rand in 2002 to 32,3 billion rand in 2013 Our exports into the continent are also increasing each year, having been at 28,5 percent up from 22,6 percent in 2002 (State Of the Nation Address,17 June, 2014).

This being the case, the emphasis on an efficient and reliable road infrastructure network cannot be downplayed if the region is to fully integrate its markets and increase its intra-regional trade.

Table 1 Average Daily Vehicle Kilometres in the North South Corridor In 2013

Country	Average Daily vehicle Km	Percentage of average Daily Vehicle Km	Percentage of country vehicle by medium or heavy goods
Botswana	2,941,053	4.6%	6.9%
DR Congo	177,552	0.3%	84%
Malawi	2,479,000	3.9%	15%
Mozambique	1,102,948	1.7%	17%
RSA	43,977,259	68.7%	9%
Tanzania	3,348,323	5.2%	24%
Zambia	5,808,328	9.1%	34%
Zimbabwe	4,168,598	6.5%	20%

Source; Trade Mark Southern Africa (2014)

Table 1 shows that the roads in the Republic of South Africa carry close to 70% of the total number of vehicles moving within the SADC region. Though comparatively speaking, South Africa has a higher average of roads classified as 'fair' to 'good' than most of its trading partners in the region, the impact of high congestion on its roads has led to gradual degradation of the road network. This is also borne out of the fact that more than 74% of freight is transported by road and only 26% by rail (Department of Transport, 2011, p.31). Table 2 gives an indication of pay load and income generated by the two surface transport modes. By all accounts it is clear that through the average daily vehicle kilometres and the payload per ton, road is the most widely used means of transport in the region. This will only change from 2014 onwards with Transnet fleet renewal plan and the acquisition of new rolling stock as per government's Infrastructure Development Plan and the implementation of "from road to rail" policy in the beginning of the 2016/17 financial year.

Table 2: Total Freight Transport Estimates

	RAIL			ROAD		
	PAYLOAD		INCOME	PAYLOAD		INCOME
	(000 TONS)		(R MILLION)	(000 TONS)		(R MILLION)
	2009 1/	2010 1/	2010 1/	2009 1/	2010 1/	2010 1/
January	14 557	15 170	1 668	33 871	33 882	3 939
February	15 102	15 938	1 806	35 712	36 053	4 144
March	15 426	15 389	1 810	36 371	39 275	4 474
April	15 508	15 410	1 784	33 653	35 799	4 109
May	13 536	11 520	1367	35 862	39 348	4 410
June	16 174	14 544	1765	36 531	39 817	4 528
July	15 363	15 815	1 884	38 717	40 609	4 616
August	15 633	14 800	1 879	36 643	40 322	4 616
September	17 254	16 770	1 895	37 576	39 296	4 517
October	15 631	16 673	1 877	38 014	39 731	4 666
November	16 432	16 453	1 874	38 920	41 512	4 851
December	15 680	15 452	1 764	34 645	35 132	4 294
Total	186 296	183 934	21 373	436 515	460 776	53 164

1/ Preliminary **Source: Department of Transport (2010)**

Concerted efforts to maintain road infrastructure network in the region and dedicated coordination by member states to upgrade both 'soft' and 'hard' infrastructure for domestic and cross border trade can help reduce the costs of doing business and further make the region competitive. A relation between the quantity and quality of transport infrastructure and the level of economic development is apparent. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments (Rodrigue, 2013e).

However of particular interest is the extent to which these high transportation costs are an impediment to the creation of an enabling environment for efficient movement of goods and people to and from ports of entry.

For most of the countries in the region including South Africa, the export of primary commodities and agricultural products is ordinarily by road (See p.4, Table 2). It is thus the

proposition of this study that road transport infrastructure development and maintenance will lead to greater trade facilitation and thus economic development. It is concepts such as travel time, cost of doing business, the quality of road infrastructure and connectivity that are essential in addressing the challenges that the region faces.

Transport is a key sector in creating a dynamic investment-export nexus in Africa, but the capacity and efficiency of the transport system in sub-Saharan Africa are being weakened by lack of investment and poor performance of the transport sector is adversely affecting export performance and market development (African Development Bank, 2013, p. 2).

This study also does take cognisance of the efforts of different free trade areas (FTA's) in the region to address this issue. The development of the Southern African Development Community's (SADC) ¹Regional Infrastructure Development Master Plan Vision 2027 and the Tripartite Free Trade Area's (TFTA)² cooperation in the development of the North- South Corridor to address bottlenecks in trade facilitation are some of the initiatives. Nonetheless much still needs to be done particularly at country level where most of the economic activity begins, and where the potential for small scale manufacturing and subsistence farming to grow is hindered by the lack of access to markets due to the cost associated with inadequate and deficient road infrastructure.

¹ SADC comprises of the following countries; Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

² The TFTA comprises of three of Africa's major regional economic communities being Southern African Development Community (SADC), Eastern African Community (EAC), and the Common Market for Eastern and Southern Africa (COMESA).

1.2. Problem Statement

Sub-Saharan Africa is endowed with rich minerals and other resources; however the inability of the region to grow and to diversify its markets and commodities has been blamed to some extent on infrastructure deficiencies. The stagnation of sub-Saharan African economies is in part because of the high cost involved in moving goods and people from the point of production to consumers. The region with many landlocked small economies is also the least integrated compared to other developing nations. This being the case the importance of road infrastructure development and maintenance in facilitating trade and contributing to the reduction in the cost of doing business by providing better access to markets cannot be over-emphasised.

Over and above the inadequacy of the road infrastructure network and the continuous degradation of the existing one, the challenges facing cross-border trade in sub-Saharan Africa also include those that relate to 'soft infrastructure'. Soft infrastructure includes the institutional system, laws and regulations for smooth operation and maintenance of hard infrastructure (Japan International Cooperation Agency, 2013, n.p.). Hard infrastructure, for purposes of this research is the tangible road surface network.

The negligence towards the development and maintenance of both "soft" and "hard" infrastructure in the region is a cause for concern. This is largely due to the fact that it is more expensive for African countries to trade with each other than with other developing or developed nations. The high trade costs associated with poor infrastructure especially road transport infrastructure also inhibit the flow of foreign direct investment in the region and the development of viable value chains which are an important part in the development of the region's industrial base.

The focus of this study is on the importance of road infrastructure development and maintenance in trade facilitation. There is a rich literature that deals with investment in new infrastructure, but very little that deals with maintenance of infrastructure. The maintenance and rehabilitation of roads is essential to ensure the quality and cost effectiveness of transport services which are an integral part of trade facilitation. Though there are clear indications in terms of increased budget allocations towards refurbishment and maintenance of existing road transport infrastructure especially in the South African case, these allocations do not give first hand insight into what impact has been achieved (National

Budget Speech, 2013,n.p.). The same can be said at a regional level. Developing countries devote a considerable proportion of total infrastructure investment to roads and yet recent research suggests that isolation from regional and international markets has contributed significantly to poverty in many sub-Saharan African countries (Odoki & Anyala, 2014, p.1).

1.3. The purpose of the study

The primary purpose of this study is;

- a) To highlight the importance of road infrastructure development and maintenance in trade facilitation.
- b) To assess the impact that road transport infrastructure has on regional trade.
- c) To present a case for targeted government policy towards investment in road infrastructure development and maintenance and requisite skills development.

1.4. The significance of the study

From a review of the literature, it is evident that though sub-Saharan Africa is endowed with mineral resources and a huge market in terms of its population, very little of this potential translates into sustainable and profitable trade and economic development (Business Monitor International Ltd, 2012, p.12) The potential to expand trade in Africa and globally is hampered amongst other things by the lack of quality transport infrastructure and the development, upgrading and maintenance of the existing infrastructure. The significance of this study is to advocate for a focused policy and regional commitment towards such efforts.

Furthermore as shall be demonstrated in the case study, a significant amount of budget allocation is given towards the upgrading and maintenance of the road infrastructure, however this is not coupled with implementation due to lack of skills and institutional capacity to implement maintenance programmes and as such it is also the aim of this study to propose for a stronger, independent and well equipped institutional arrangement both at regional and country level to ensure sustainable development, maintenance and efficient use of resources for road infrastructure.

It is the submission of this study that an important constraint to a sustainable increase in road infrastructure development and maintenance is unlikely to be primarily financial but rather a

question of institutional and implementation capacity, this situation provides a clear rationale for the case study.

1.5. Scope of the Study

The study is premised upon the assertion that transport plays a critical role in the facilitation of trade and thus in economic development. The role of transport in facilitating trade and its provision of seamless movement of goods and people from one point to the other is intrinsically associated with a number of factors such as the cost of doing business, the amount of time spent on the road moving goods, the competitiveness and reliability of the freight logistics system and the ability of a country to attract foreign direct investment.

Clearly a lack of functional transport and an effective trade facilitation regime hinders many countries from becoming bigger players in the global trading system. Better logistics are strongly associated with trade expansion, export diversification and the ability to attract foreign direct investment FDI (World Economic Forum, 2011, p iv). Logistics include the transportation, warehousing, containerisation and shipment of goods from one point to the other, and thus transport services are an integral part of freight logistics. The World Bank's Logistics Performance Index (2010a) based on a worldwide survey of global freight forwarders and express carriers, demonstrates that African countries lag significantly behind other regions in key areas such as customs, infrastructure, competence in logistics and timeliness of exports and imports (World Bank, 2012, p. 8).

Furthermore, through a review of existing literature on road transport infrastructure and its impact on trade facilitation, through an analysis of current South African government policies and related infrastructure plans, this study is an attempt to answer the following question;

- a) What are the economic implications of a neglect of existing road transport infrastructure?

The relationship between transportation and economic development is difficult to formally establish and it has been debated for many years. In some circumstances transport investments appear to be a catalyst for economic growth while in others, economic growth puts pressure on existing transport infrastructure and include additional

investments (Rodrigue, 2013, n.p.). Bearing this in mind, this study, except for a thorough review of academic literature and policy documents does not go further to measure the exact contribution of investment in road transport infrastructure development and maintenance to demonstrate the level of that impact on economic development and trade facilitation in particular.

Notwithstanding the availability of economic models, cost benefit analysis and cost measures of transport like free on board (f.o.b) and cost insurance freight (c.i.f) it is beyond the scope of this study to look at those computations and their implications for trade facilitation.

The first part of the study takes an in-depth look at road transport infrastructure and trade facilitation. The focus is on the role that road transportation plays as a facilitator of the movement of people and goods. It is an analysis of the impediments and constraints including requisite interventions that need to be taken in order to improve the state of road transport infrastructure for ease of connectivity and doing business.

The focus is on sub-Saharan Africa with the intention to demonstrate that there are inherent problems that relate to intra-regional trade and access to markets due to poor road infrastructure. The argument is that the creation of regionally integrated markets, competitive economic activities and sustainable value chains can be realised with amongst others, thoroughly developed and maintained network of roads and trade corridors where inter-governmental and interagency cross border management is efficiently maintained to remove cumbersome administrative processes.

The final chapter takes an in-depth look at South Africa as a case study. As indicated in the introductory section, South Africa plays an important role as a large diversified economy in the continent and as such its challenges in as far as cross border trade are concerned cannot be separated from those of its trading partners in the north. South Africa is also a point of entry for goods that are destined to neighbouring land-locked countries, thus playing an important role in facilitating trade with neighbouring countries as well as between neighbouring countries and global partners. This section will look at the institutional governance of the road network in South Africa. It is an analysis of institutions that deal with road transport and government policies including planned interventions to address the issue of road infrastructure development and maintenance. The study will take a further look at

budget allocations towards this effort, the impact of such allocations and finally recommendations will conclude this study.

Chapter Two: Literature Review

The literature reviewed in this study includes publications from development institutions like the African Development Bank, the Development Bank of Southern Africa, the World Bank, United Nations Conference on Trade and Development and different South African Government policies' and papers including those of academics in trade and infrastructure development disciplines.

Limitations on the availability of data especially provincial allocations and spending on road infrastructure development and maintenance is here-by acknowledged. The challenge with regards to spending patterns by provinces is that the work of transport infrastructure upgrading and maintenance is structured differently from one province to the other. In certain instances it is done by the Department of Transport, and in some by the Department of Public Works. Nonetheless the National Treasury notes on Provincial allocations and expenditure does give a spending trend amongst provinces and it is this data that has been used.

A lot of comparative analysis between countries and regions has been provided in the various publications reviewed and an analysis of that comparison between sub-Saharan Africa and other developing regions has been provided in the study. The comparative studies largely deal with different aspects of development and what is necessary for a region or a country to fully develop its potential to become a leading player in the global trade arena.

The Development Bank of Southern Africa, government departments, like the Department of Transport, and government agencies like the Cross Border Road Transport Agency, have commissioned studies on the 'State of South African Infrastructure' at different levels and highlighted impediments that relates to the inability of the country to grow economically and to diversify its markets. South African government policy in much of the literature reviewed and through legislating some of the plans like the New Growth Path, the National Development Plan and the recently enacted Infrastructure Development Act of 2014, does recognise the cost of not investing in the development and maintenance of existing road infrastructure. This has also led to the pronouncement by the Ministerial economic cluster for a policy of 'from road to rail'. This call is largely borne out of the fact that the rail network in South Africa is also disused as a result of lack of investment leaving the road as the main alternative for traders to transport their goods and thus leading to further congestion and degradation of the road network.

Two studies commissioned by the Department of Transport (DOT), (The Direct Impact of Investment in key Transport Infrastructure 2008 (unpublished) and the other one by the Presidency and DBSA (The State of South African Economic Infrastructure 2012) also form the basis for this study. Nonetheless, what emanated from much of the literature is an emphasis on the development of new road networks and intermodal transport services as an answer for road transport deficiency in sub-Saharan Africa. The work of Joynt (2004), in his doctoral thesis, 'Maximising the economic returns of road infrastructure investment' is among one of the publications that takes a comprehensive view in the investment of road transport infrastructure as a means of enhancing economic growth.

His view takes a balanced approach in looking at the opportunity costs of either investing in new road transport infrastructure or the existing one. He furthermore explores the causality effect of whether investment in road transport infrastructure does lead to economic growth or whether the opposite happens. Joynt's conclusion is that, the correct approach must be followed when making investment decisions. Should the wrong approach be followed, poor investment decisions will be made. The approach in question is whether it is economically beneficial to invest in building a new road or investing in the upgrade and maintenance of an existing road.

Furthermore a publication by Business Monitor International Ltd (2012), entitled 'Africa's Transport Infrastructure Deficit', gives an in-depth account of the problematic areas in the region in as far as infrastructure investment is concerned. However the focus is on a wide area of infrastructural deficiencies and not specifically in relation to road transport infrastructure. This include publications by the African Development Bank (2010, 2012), the World Bank (2012) and Molnar and Ojala (2003).

A number of studies including Odoki and Anyala (2014), UNCTAD (2001) and Arnold (2006) do put emphasis on the development of trade corridors as an answer towards the problem of intra-regional connectivity and trade facilitation in sub-Saharan Africa. Corridors are seen to encourage not only economic activities along the corridor but also more cooperation amongst the countries in which they pass and thus better harmonisation for trade facilitation.

One common deduction that can be made from the literature review is that, sub-Saharan Africa's poor road transport infrastructure contributes significantly to the high costs of doing business. Given the fact that there are no navigable rivers, the region is sparsely populated and largely landlocked, poor connectivity due to deficient road networks stifles intra-regional trade and trade with the rest of the world. Despite a great deal of attention paid to the largest cities like Lagos, Kinshasa and Nairobi, 61 percent of African urban residents lived in cities with a

population of less than 500,000. Only 15 percent are expected to live in cities of more than one million by 2015(Storeygard, 2012, p.2).

The work of Storeygard (2012) in particular makes a comparison between landlocked sub-Saharan African cities with those in coastal areas. His analysis looks at trade flows, GDP, the level of industrialisation and urbanisation as economic growth variables and concludes that, cities connected to the primate, or the largest city with a port by unpaved roads appear to be more affected by transport costs than those close to the ports (Storeygard, 2012,p.1).

The bigger challenge as outlined in the work of Arnold (2006), the World Bank (2012), and UNCTAD (2013) is for sub-Saharan African countries to cooperate in the elimination of NTB's and the harmonisation of cross border transportation laws and customs procedures in order to address the issues around delays, border mismanagement and more importantly investment in road infrastructure development and maintenance. This also finds resonance in Buys, Deichmann & Wheeler (2006) who also expand on this hypothesis by considering the possible effects of road upgrading on international trade using the gravity model and conclude that the negative impact that poor road networks have on trade facilitation and economic development in the region is substantial and a critical prerequisite for this is regional infrastructure integration across Africa (Buys et al, 2006, p.3)

Finally an inference can be made that there is a need for concerted investment in road infrastructure maintenance in the region. Both the "soft" and "hard" infrastructure is indisputably important for trade facilitation and the reduction of transport costs in the region.

Chapter Three: Research Methodology

The research method used is primarily desk research; a review of available academic literature on the subject and the analysis of government policy documents and current data sources using the internet.

A number of unstructured interviews were held with relevant officials in the Department of Transport to get a perspective on recent developments in the road infrastructure sector. It should be emphasised that these discussions do not necessarily form a substantial part of this study as most of them do take place in the course of official duties.

The desktop research has yielded a wealth of information relevant to the subject, though as mentioned much of the focus is on the impact of transport infrastructure development in the economy. This is a descriptive study through which an analysis and interpretation of data has been used to arrive at answering the study question and making a conclusion. When addressing the subject of road transport infrastructure maintenance and its importance in trade facilitation, an acknowledgement is given that though much effort has been made to review current literature and government policy documents on the subject, this might not be exhaustive. An attempt to strictly focus on pertinent literature towards the study topic and an inherent proposition that, high transport costs for moving people and goods from points of production to final destinations can price a country out of export markets (UNCTAD, 1999, p.10) is also acknowledged.

3.1: Case Study Methodology

Though there is a common acceptance among practitioners and scholars that sub-Saharan Africa is comparatively less integrated in terms of transport infrastructure, it should be noted that country specific road infrastructure challenges are unique. The case study reports and references from a variety of industry stakeholders, for example (South African Institute of Civil Engineering, 2011, p. 20), (Development Bank of Southern Africa, 2012, p.51), (The Department of Transport, 2005, p.9), and (The Southern African Bitumen Association, 2014, p.8), give insight into a sombre state of South African road network. The South African Institute of Civil Engineers Report Card for South Africa states that, road condition data is available for 82% of provincial roads, but extrapolation suggests that well over half of these roads have exceeded their design life, rendering them highly susceptible to rapid costly deterioration in

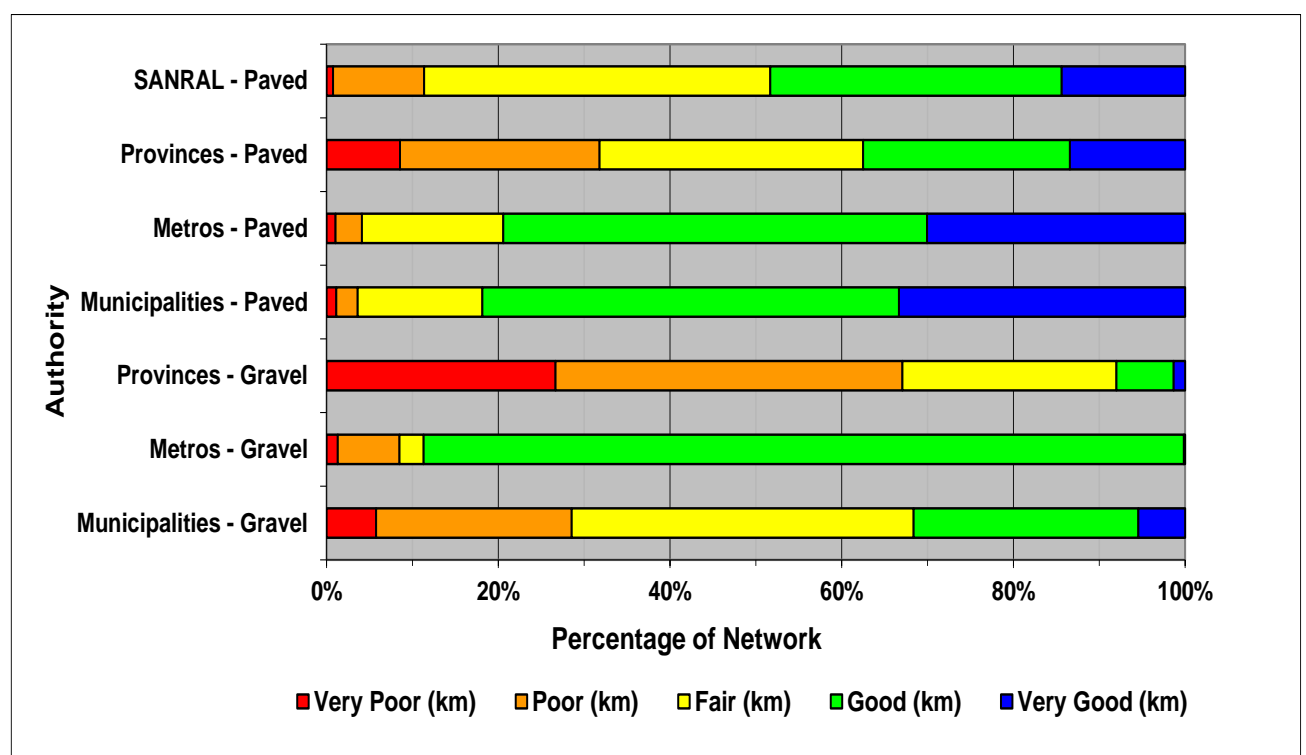
many sections. Visual condition information suggests that the overall provincial road network is deteriorating (South African Institute of Civil Engineering, 2011, p.22).

This is further accentuated by the Development Bank of Southern Africa’s Infrastructure Barometer that regardless of the substantial growth in the allocations to provincial authorities, the deterioration of the road networks is ongoing (Development Bank of Southern Africa, 2012, p.148).

Data gathered by the 9th State of Logistics Survey from a broad range of stakeholders identifies the key challenges and the cost drivers in the South African road freight sector. Respondents felt that poor road conditions (64%), the cost of fuel (52% and a lack of law enforcement and prevalent non-compliance (43%) are the top three challenges in the industry. As far as cost drivers are concerned, the condition of the country’s roads is regarded as a critical factor by 73% of the respondents (Southern African Bitumen Association, 2014, p.2).

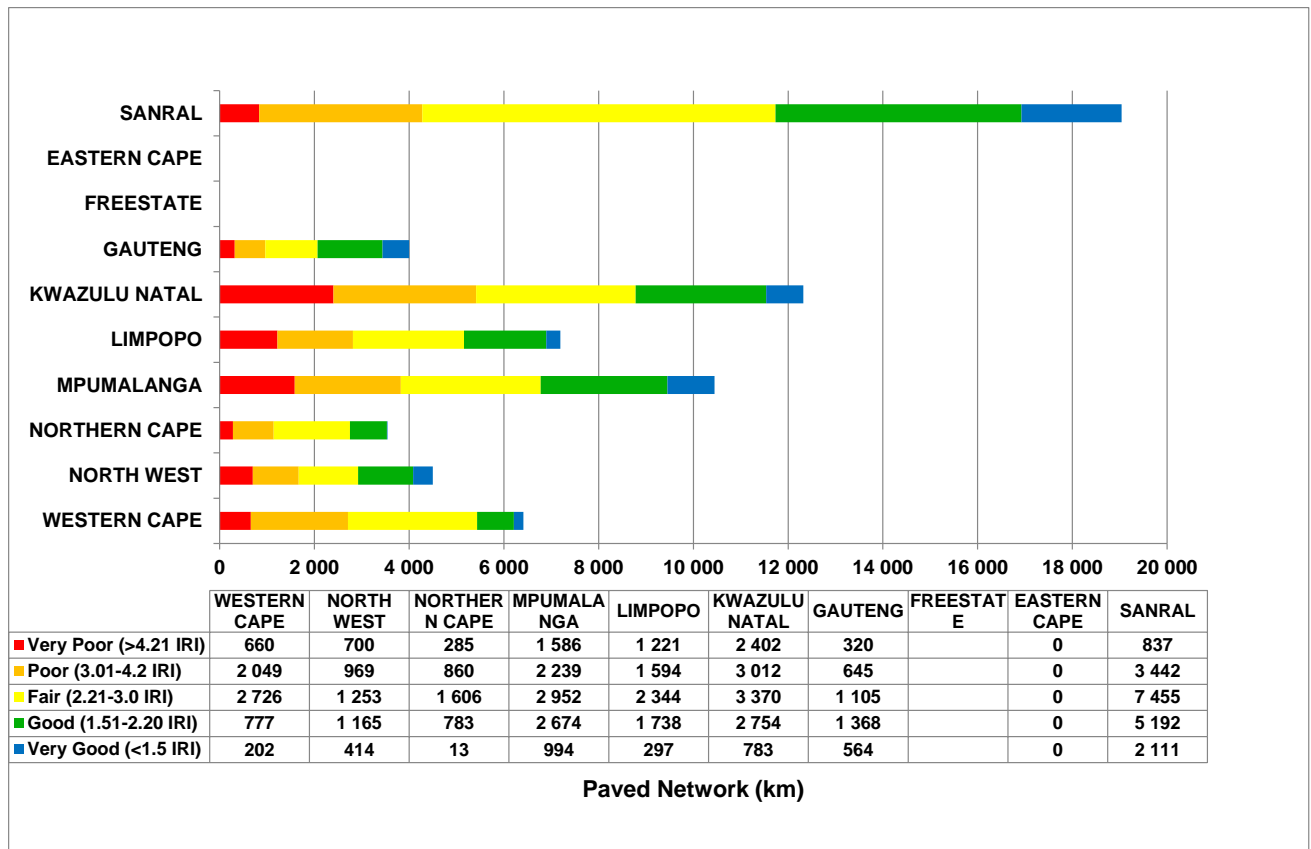
The following diagrams give an indication of the state of South African roads by provinces.

Diagram 1: RSA Road Condition 2013 (for 42, 7% of network with data)



Source: South African National Roads Agency Limited (2013)

Diagram 2: Paved Road Condition per Authority



Source: South African National Roads Agency Limited (2013)

From Diagram 1 above, it is evident that the state of provincial paved road network per (km), excluding the Eastern Cape and Free State provinces due to lack of current data is significantly between poor and very poor. A comparative analysis between the state of provincial roads and budget allocations for road maintenance as reflected in (p.43, 44 and 45) of this study put credence to the issue that the problem lies with institutional capacity and requisite skills and not necessarily with budget allocations.

Chapter Four: Road transport infrastructure and trade facilitation

4.1. Introduction

“Efforts to improve developing countries’ trade performance and competitiveness require policy interventions to reduce transport and related costs and to modernise the trade system and infrastructure” (UNCTAD, 2010).

The focus of this section of the study is on road infrastructure and its importance for trade facilitation. The aim is to look at the role that roads play in the facilitation of trade. As it has already been indicated in the introductory chapter many of the countries in the sub-Saharan Africa region are landlocked. Moreover between the two surface transport modes, that is road and rail in the region, road has a far length by square kilometre compared to rail and ordinarily much of trade happens by road. A pertinent question to ask is what is the impact of unmaintained roads on trade facilitation?

Transport and its related services are prerequisites for the efficient movement of people and goods. The underlying implication is that where there is trade there is a need for efficient and reliable means of transport. In the very same light, where transport services and infrastructure are lacking, the volume of trade and access to markets are highly compromised. In particular, deficiencies in transport infrastructure and logistics are resulting in high costs and long delays in the movement of people and goods, eroding profitability and competitiveness (Business Monitor International Ltd, 2012, p.6).

The box below illustrates the real life effects of the above statement:

Transport costs, market access and rural income in the Democratic Republic of Congo.

Small scale farmers in the Kinshasa region trade their surplus output in Kinshasa. The region is characterised by long distances between villages, and roads are often of poor quality. Traders travel from Kinshasa to the villages and purchase farm products which they bring back to Kinshasa market. Minten & Kyle (2000) studies how the distance between producers and market, and quality of infrastructure affects the prices received by the farmer and the transport margin. Traders can choose between travelling by road or on the river for villages located close to the river. The direct transport costs are considerably lower on the river, but it takes much more time. The journey takes on average 20 days on the river compared to four days on the road, both cases over a distance of about 300km. A very small share of the total produce is transported by the river. The farmers receive about 40 per cent of the wholesale price on average, for goods transported by road. An analysis of the relationship between transport cost and income at each link in the supply chain finds that the farmers share of the wholesale price declines by 3,4 percentage points for 100km, while the share of the transport costs increase by 3.1 percentage point per 100km of road transport on good roads(paved roads), but by as much as 6.2 percentage points on bad road (dirt roads). This implies that a farmer living 500 km from Kinshasa, where 400km is on paved roads and 100km is on dirt roads would enjoy a 15 percent increase in the producer price if the road was paved.

Source: World Trade Report (2004)

It is important therefore to consider transport within the context of many factors which influence economic development and determine its future directions and trends. Such factors include trends in population, urbanisation, real gross output, agricultural and industrial activity. These factors have an impact on transport in terms of new investment, rehabilitation and maintenance requirements (African Development Bank, 1993, p.8).

Considering the iteration above, it can thus be inferred that the lack of sufficient transport, and in particular for the purpose of this study lack of road transport infrastructure can be prohibitive for any region or country to maximise its potential and have a meaningful role in the global trade economy. Roads, by virtue of their penetrative nature and the ability to engineer a labyrinth of connectivity to even the most remote areas can play a crucial role both in linking productive centres with markets and thus contribute to the ease of movement. This statement also found resonance in the former Deputy President of South Africa, Mr Kgalema Motlanthe when he said, the second non-tariff barrier is poor infrastructure. Road, rail or power facilities are sometimes substandard, slowing down transport and worst still, making it cheaper for coastal countries to import items far across the oceans than purchase them from their neighbours (Ernst and Young, 2012, p.5).

Empirical research has shown that trade is reduced or discouraged by increasing transport costs. Other research confirms the crucial importance of transport costs and connectivity for trade competitiveness. High transport costs constrain the ability of LLDC's to compete effectively in global markets. The result is that they trade less and become more marginalised in the world economy through a self-feeding counterproductive cycle that impedes further economic development (UNCTAD, 2013, p.4).

Regardless of the fact that many manufacturers and farmers in sub-Saharan Africa are dependent on roads for the movement of their goods, the infrastructure for this mode of transportation is the least developed in the world. Especially inland nations tend to face longer transport times, higher transport costs, and (as a consequence) lower GDP growth rates. Therefore, inadequate transport infrastructure is a major cause of intraregional economic disparities in sub-Saharan Africa. The main factor inhibiting industrial development and economic growth in the region has been transport costs. For example, the agricultural sector, which employs 60-70% of the region's working population, suffers from very low productivity due to high prices for imported fertilizers as a result of high transport costs (Japan International Cooperation Agency, 2005, n.p.).

This is often attributed to differences in income amongst African countries. Africa's infrastructure deficit is more acute among its low-income countries (LIC's) compared to middle income ones (MIC's). In this context, African LIC's are for example 4 times worse off compared to LIC's from elsewhere in terms of paved road density, while Africa's MIC's are less than twice as worse-off relative to their peers in other regions (African Development Bank, 2010, p.6).

This argument then becomes even a better justification for closer cooperation amongst sub-Saharan African states when it comes to issues of road infrastructure development and maintenance and transit arrangements. Furthermore, it could be argued that transit cargo subsidises the infrastructure investment costs of the transit country (UNCTAD, 2013, p.24).

4.2. Infrastructural deficiencies

The extension of the focus beyond SADC countries is meant to heighten the level of analysis and demonstrate through the review of existing literature that through cooperation and policy coordination between countries and through joint efforts in the management and operation of existing infrastructure a lot of untapped market potential in the sub-Saharan region can be unleashed for facilitating trade.

According to the OECD (2002, p. 14) a region could be separate spatial units that can be linked together as they exhibit uniform characteristics, such as similar production structure, homogenous patterns of consumption or similar topography or climate. Secondly a region might be defined by an emphasis on the interdependence of different components and lastly a region can be defined in terms of the coherence and unity of economic decision making and reflects established political and administrative boundaries.

Sub-Saharan Africa is geographically the area of the continent of Africa that lies south of the Sahara Desert. This wide region consists of 51 countries which belong to different regional trading blocs and are at varied levels of economic development.

The World Bank estimates that in 2012, the GDP of the Sub-Saharan region was \$1,290 trillion with a total population of 910, 4 million people (World Bank, 2012, p.5). Nonetheless the region is still far less competitive and intra-regional trade far less when compared to its developing counterparts in East Asia and South America. What could be the reason for this? An observation by Business Monitor International Ltd states that, for Sub-Saharan Africa (SSA), one of the most frequent cited barriers to entry and economic growth is physical infrastructure,

in particular deficiencies in transport infrastructure and logistics are resulting in high costs and long delays. This is one of the reasons that both intra-regional trade and total integration of markets within the region has not been fully realised (Business Monitor International Ltd, 2012, p.15).

Furthermore sub-Saharan Africa has notoriously high transport costs compared to other major regions in the world. Population density is very low with substantial fraction of people residing far from the coast. Ocean-navigable rivers, which provide transport to the interior of most other regions, are virtually non-existent, and road networks are sparse and poorly maintained , on the whole (Stroreygard, 2012,p.1).

A critical constraint to regional industrial development and integration is the continuing prevalence of weak cross-border infrastructure. Despite robust GDP growth (it is expected that sub-Saharan trade volumes will increase from 376mt in 2009 to 799mt by 2015, and intra-regional volumes in sub-Saharan Africa will increase from 34.9mt in 2009 to 120.4mt), inadequate infrastructure remains a constraint to growth, choking integration efforts (www.transportworldafrica.co.za/2015/05/01/understanding-the-evolution-of-africas-trade-corridors/). Adequate infrastructure is essential for regional integration as it facilitates formation of large competitive markets in place of small isolated and inefficient ones. It also lowers the cost of production across sectors (Department of Trade and Industry, 2014, p.66).

Landlocked countries face two different and unique problems; lack of own territorial access to maritime transport services, which means dependence on decisions taken by coastal neighbours, limitations on improving or planning port and connectivity transport infrastructure and reliance on foreign service, obligation to transit through one or more countries implying additional risks and delays at border crossings, significant land transport costs and dependence on the performance of services provided in the transit countries (UNCTAD, 2003,p. 4). In landlocked countries, transport accounts for 70% of the value of exported goods (www.transportworldafrica.co.za/2015/05/01/understanding-the-evolution-of-africa's-trade-corridors/). Over and above this, issues include specific challenges that the economies of LLDCs face in terms of relatively high transport costs as a barrier to their competitiveness in the form of small volume of trade, import/export imbalances, long distance over land, lack of efficient regulatory framework, and inadequate transport infrastructure and services, which all translates into a general uncertainty and unreliability of transit value chains (UNCTAD, 2013, p.1).

Though the challenges of intra-regional or cross border trade are multifaceted, the issue that relates to road infrastructure development and maintenance, that is the costs associated with the lack of proper development and maintenance of such infrastructure bear much similarity to the challenges faced by domestic traders. In particular poor road infrastructure is responsible for 40 per cent of the transport costs in coastal countries and 60 per cent in landlocked countries (<http://atpc.org/infrastructure>). Whereas external financial commitments to African infrastructure projects rose by 40% to \$55 billion in 2010, the AICD has noted that financial gaps continue to exist and cannot be filled by public sector financing alone (Hagerman, 2012, p.7).

Calestous Juma, (www.forbes.com/poor-infrastructure-is-africas-soft-underbelly), states that, the majority of Africa's rural population do not live within reach of all season-roads. As a result they are not capable of participating in any meaningful entrepreneurship activities. In Kenya, for example, only 32% of the rural people live within two kilometres of all-weather road. The figure is 31% for Angola, 26% for Malawi, 24% for Tanzania, 18% for Mali and a mere 10, 5% for Ethiopia. Expanding rural road networks is a strategic investment for rural development and should not be judged against narrowly defined economic criteria (www.forbes.com/poor-infrastructure-is-africas-soft-underbelly).

As the spotlight moves from developed to rapid-growth economies, we believe that Africans have a unique opportunity to break the structural constraints that have long marginalised the continent (Ernst and Young, 2012, p.10). This will however, only be achieved by fashioning greater regional coherence from the current patchwork quilt of 54 sovereign states. Many of these countries have small populations, underdeveloped economies, limited capacities, low per capita income levels and few resources (Ernst and Young, 2012, p.10).

The competitive advantage of most African economies is in natural resource based activities and labour intensive industries. Hence, key objectives in Africa remain to diversify the export base away from dependence on commodities and implement policies that allow more people to participate in trade (World Bank, 2012, p.3). Moreover, the available evidence suggests that producers in sub-Saharan Africa often face a transport disadvantage vis-à-vis their competitors (UNCTAD, 1999, p.3). Cross border trade presents a unique challenge as opposed to domestic or inland trade in a number of ways which need to be nuanced first. An observation that needs to be made here is that;

- The road infrastructure conditions of an exporting country determines largely its ability to connect and serve as feeder into the regional network, and
- At a point of entry or gateway, the road infrastructure conditions of the importing country are also determinants of the ability of people and goods to move at ease.

Sub-Saharan Africa, despite its size does not have well developed and maintained road network. SSA's total road network is only 204 km per 1000 square kilometres of land area, of which only 25% is paved compared to the world average of 944 km per 1000 square kilometres of land area. This translates into 3, 6 km of road per 1000 persons for the region relative to a world average of about 7km per 1000 persons (African Development Bank, 2010, p.4). This is an indication of a serious deficit in terms of the physical infrastructure, but also more importantly an indication of a lack of coordinated approach towards the maintenance of existing road network, where only a quarter of the existing road infrastructure is paved. The consequences of the investment squeeze for transport is that facilities deteriorate and operating costs escalate and unexpected breakdowns occur. The most dramatic indication of the problem is deterioration of the road network. The World Bank estimates that the value of the total stock of roads in sub-Saharan Africa has depreciated from US\$150 billion to US\$100 billion over the decades (UNCTAD 2013, p.15).

Furthermore in a study conducted by the Africa Infrastructure Country Diagnostic (AICD), it was estimated that the investment required to bridge the gap between levels of infrastructure in Africa and those in other emerging markets would be about US\$90 billion annually for the decade from 2010 to 2020. Though this overall budget estimates does include other economic infrastructure, the overall concern across a lot of literature is on the lack of connectivity due to poor road infrastructure network (Ernst and Young, 2012, p.11).

4.3. Border Posts and Customs delays

Border posts play an increasingly important role as part of the hard infrastructure that is essential for trade facilitation. A border post can be defined as the "location where one country's authority over goods and persons ends and another country's authority begin." It is the location where multitude of government agencies (i.e. Revenue Authority-Customs;

Immigration; Security-Police; Ministry of Agriculture; Ministry of Health; Bureau of Standards, etc.) are involved in the various documents and goods control, the calculation and collection of duties and taxes, as well as immigration (African Development Bank,2012,p.5).

In South Africa before 1994, border posts were strategic points serving more as conduits for both the apartheid and anti-apartheid activities than for trade purposes. As far back as 1997, cabinet noted that the primary obstacles to the efficient border control were the state of infrastructure and lack of coordination among various government agencies responsible for border control (Cross Border Road Transport Agency, 2011/12, p.11).

There was a dire need for comprehensive, infrastructure, personnel and process that ensure the seamless working together of all functions that further sets strategies for regulating and managing the cross border movement of people and goods (Cross Border Road Transport Agency, 2011/12, p.11).

Costly and cumbersome border procedures, inadequate infrastructure and administrative burdens often raise trade-related transactions costs within Africa to unsustainable levels, creating a further barrier to intra-African trade (www.wto.org/english/news-e/spra-e/spra72-e.htm).

At a regional level as well, the issue of transport and transport services and in particular road transport encompasses different regulatory aspects that go beyond road infrastructure development and maintenance. Delays at the border raise trade costs: in order for RTA's to be effective, it is critical that intra-regional trade be able to move without hindrance, high transactions costs are incurred from slow and costly customs procedures and delays caused by other agencies, such as standards operating at the border (World Bank, 2012,p.13). These aspects, namely border post management, transit and check points regulations also do contribute to substantial delays and cross border hurdles.

Effective connections with international markets depend on supply chain reliability, with traders mainly being concerned about reliability. Supply chain unreliability takes many forms such as; long delays and unpredictability of clearing time lines; excessive physical inspections; and unnecessarily strict safety and security measures that impair freight flow and trade (Cross Border Road Transport Agency,2011,p.110) Improving border posts and customs procedures will not only reduce the cost and delays incurred by commercial companies and enhance trade competitiveness but will also boost government revenue potentially by up to 25 percent (African Development Bank, 2012, p. 2).

Table 3: Trading across Borders in SSA is costly and Time Consuming

	Days to export	US \$ per container to export	Days to import	US \$ per container cost to import
East Asia Pacific	22.7	890	24.1	935
Europe and Central Asia	26.7	1,652	28.1	1,845
Latin America and Caribbean	18.0	1,228	20.1	1,488
Middle East and North Africa	20.4	1,049	24.2	1,229
Organisation for Economic Cooperation and Development	10.9	1,059	11.4	1,106
Special Administrative Region	32.3	1,512	32.5	1,744
Sub-Saharan Africa	32.3	1,960	38.2	2,492

Source: World Bank (2012)

Risky Business: Poor Women Cross –Border Traders in the East of the DRC

Cross-border trade between the DRC and neighbors in the Great Lakes region is dominated by women and provides an essential source of income to many households in the region. A recent survey of traders at four border posts in the region identified the following key features of cross-border trade: the majority of traders are women (85 percent of the respondents); most of the officials who regulate the border are men (82 percent); for almost two-thirds of the respondents, income from cross-border trade is the main source of income, and most (77 percent) report that household income is heavily dependent on their trading activity.

Cross-border traders regularly have to pay bribes and suffer harassment. The responses from the survey paint a dark picture of the conditions experienced by poor women cross border traders. It is striking that payments of bribes is a regular occurrence for the majority of traders. Respondents at all four border posts repeated a catch phrase used by officials: “sans argent, on ne passe pas” (no money, no passing). An important feature of border crossings between the DRC and neighboring countries in the Great Lakes region is the large number and range of officials at the border. This exacerbates the problem of poor governance with negative consequences for cross-border traders. A lack of transparency and awareness by both traders and officials of the rules and regulations that are supposed to govern cross-border movements of goods and people compound this situation. A typical account of every day conditions is provided by an egg and sugar trader from Goma: “I buy my eggs in Rwanda; as soon as I cross to Congo I give one egg to every official who asks me. Some days I give away more than 30 eggs!”

A large number of traders report being subject to acts of violence, threats, and sexual harassment. Traders are exposed to beatings, verbal insults, stripping, sexual harassment, and even rape. Much of this abuse is unreported.

Cross-border traders face regular losses in the form of the almost mandatory payment of bribes and are regularly subject to harassment and physical abuse. This lack of economic and physical security and safety undermines the livelihoods of these traders and compounds their lack of access to finance, information, and business knowledge. **Source: World Bank (2012)**

Being landlocked also poses challenges of reliance on one’s neighbours for cross border trade. This is a physical challenge that can be addressed by closer cooperation between states in

order to facilitate freight movement from one point to the other. Improvements in infrastructure and border management can help reduce travel time and vehicle operating costs while other measures are needed to reduce operational and bureaucratic delays and to reduce regulatory burdens. The benefits of shorter travel times will be diminished if long waiting times at the border and multiple roadblocks continue along the transport network (World Bank, 2012, p. 10).

Once the challenge of the physical transportation of goods from one transit country to another country has been addressed, most traders encounter a further significant obstacle, which is the cumbersome and costly procedure to clear goods at customs and border posts (Africa Development Bank, 2012, p.4).

The international trend in border and transit management has been the establishment of One Stop Border Posts (OSBP). This concept entails harmonisation of standards and collaboration between the countries involved in handling immigration and import and export formalities in order to reduce transit times. The introduction of information technology systems for the processing of documents and immigration clearance is one of the important steps in the modernisation of border management internationally. Information technology is providing many tools needed for greater coordination of border agencies (Cross Border Road Transport Agency, 2011, p. 64).

For example; immigration may require initial entry data about an individual crossing a border to know where they originate from and to follow up if the traveller has actually left the country. Other agencies also need the data on drivers actually crossing to produce their own data. Much of the data is re-entered to create a new set of forms. All of this basic data can be captured once and can be in principle accessible to all border agencies (Cross Border Road Transport Agency, 2011, p. 64).

Over and above this, the issue of non-harmonised standardisation of roads maintenance and unbalanced commitment towards the development and maintenance of road infrastructure creates further disparities with regards to the condition of roads between different countries in the region. . For southern Africa, the growing focus and support for addressing both the soft and hard infrastructure challenges along corridors such as the North-South Corridor is producing concrete results through the introduction of One-Stop Border Posts (Hagerman, 2012, p.9).

It has been argued that the extent of these Non-Tariff Barriers (NTB's) to trade is actually worse than tariff barriers even in the SADC region. Non-tariff barriers (NTB's) have been widely cited as a significant constraint to intra-SADC trade, which have increased in importance as tariff barriers have declined. The types of NTB's identified in the SADC region include procedural and administrative matters (e.g. customs clearance procedures, documentation, and interpretation and application of Rules of Origin), technical and regulatory matters (e.g. unharmonised standards, and charges and fees related to clearance of goods in transit) (Trade Law Centre, 2012, p.8).

Furthermore, NTB's are prohibitive to small cross border traders who have the ability to serve small regional markets and thus be able to grow and also create employment. Through reported bribes and at worst confiscation of their goods, these traders find it impossible to increase their trade to a substantial level. To deliver integrated regional markets that will attract investment in agro-processing, manufacturing and new services activities, policy makers have to move beyond simply signing agreements that reduce tariffs to drive a more holistic process to deeper regional integration (World Bank, 2012, p.10).

An approach is needed: that reforms policies that create non-tariff barriers; puts in place appropriate regulations that allow cross border movement of services suppliers, delivers competitive regionally integrated services markets; and builds the institutions that are necessary to allow small producers and traders to access open regional markets (World Bank, 2012, p.10).

Table 4: Cross-border trade indicators in selected sub-regions

Region	Documents to export (number)	Time to export (days)	Cost to export (USD per container)	Documents to import (number)	Time to import (days)	Cost to import (USD per container)
SADC	7.3	31.2	1,856.3	8.4	38.0	2,273.3
COMESA	7.2	32.4	1,915.3	8.2	38.3	2,457.5
ECOWAS	7.6	27.6	1,528.1	8.1	31.6	1,890.9
CEMAC	9.0	35.2	2,808.8	10.8	44.0	3,721.4
Middle East & North Africa	6.4	20.4	1,048.9	7.5	24.2	1,229.3
East Asia & Pacific	6.4	22.7	889.8	6.9	24.1	934.7
South Asia	8.5	32.3	1,511.6	9.0	32.5	1,744.5
Latin America	7.1	19.0	1,310.6	7.5	22.0	1,441.1
East Europe & Central Asia	6.4	26.7	1,651.7	7.6	28.1	2,457.5
EU	4.5	11.5	1,025.3	5.3	12.1	1,086.5
OECD	4.4	10.9	1,058.7	4.9	11.4	1,106.3

Source: African Development Bank (2012)

From Tables 3 and 4 above, it is clear that the cost of doing business in the region is phenomenal. The combination of poor road infrastructure that impedes connectivity and the ease of movement, and that of NTB's like border and customs delays do weigh heavily on business and on consumers. These administrative hurdles escalate trade costs (it is estimated that each day of delay at customs is equivalent to an additional 85km between the trading countries). They also encourage illicit trade and corruption in order to bypass delays at customs and border posts (African Development Bank, 2012, p.4). This point is further emphasised by the World Bank Report (2012) that, in many countries, burdensome customs and trade regulations have added significantly to trade costs. In such countries there is a need to streamline clearance procedures as an important means of facilitating trade. Nearly everywhere there is a need to reduce transport costs by improving roads, railways and port services, although the specific means of achieving these differ from country to country (World Bank, 2012, p.119). Regional implementation of border collaboration is therefore of utmost importance to require the political commitment of regional heads of state and the conclusion of international agreements that will facilitate the legal and statutory challenges associated with

international or regional border management collaboration(Cross Border Road Transport Agency, 2011, p. 113). This is further asserted by Molnar and Ojala (2003) that the role of the state is critical in bargaining for better conditions and more access rights to international markets, but also in becoming the engine for further reforms and facilitation measures in customs as well as transport.

The section above illustrates that while efforts have been made through the formation of different trading blocs in the region to address trade barriers by harmonising trade regimes, there is still a need for collaborative effort through joint financing and the setting of common standards for road rehabilitation and maintenance between transit countries and countries of origin. Equally important is the collaboration in the harmonisation and management of border posts procedures. This will yield positive outcomes for trade facilitation.

4.4. Africa's Approach to Infrastructure Deficiencies

For over five decades, regional integration has been part of the African continent's overarching strategy for economic transformation. The establishment of regional trade agreements (RTA's) and regional economic communities (REC's) was viewed as the panacea for a whole range of socio-economic, developmental and political changes. Their scope included the promotion of intra-regional trade, policy coordination and the management or development of shared infrastructure (African Development Bank, 2012, p.1). Yet despite all these efforts in the establishment of RTA's like SADC, COMESA, EAC etc. Africa is still regarded as the least integrated continent and thus the potential for both inter and intra-regional trade is exceedingly stifled. In order for RTA's to be effective, it is critical that intra-regional trade be able to move without hindrance. However, high transactions costs are being incurred from inadequate transport infrastructure, inefficiencies in customs procedures (including delays at road checks, borders and ports) as well as poor quality and costly logistics due to weak competition among service providers (World Bank, 2012,p.82).

Deficits of infrastructure have a clear impact on African competitiveness. African countries, particularly those south of the Sahara, are among the least competitive, and infrastructure appears to be one of the most important factors holding them back. Deficient infrastructure in today's Africa has been found to sap growth by as much as 2% a year. This is a continental problem that requires a continental solution (www.au.int/infosoc/program-infrastructure-development-africa-pida).

The gap that exists between policy formulation and implementation, cross country institutional misalignment and lack of harmonisation of trade instruments becomes a greater concern and an impediment to an all-encompassing effort to address the challenges that face the region and the continent in as far as infrastructure deficiency is concerned.

Nonetheless recent efforts both at regional and country level through concerted efforts to raise infrastructure financing by working with the private sector and cooperation by various REC's bear testimony to the recognition that there is a need for a continental solution to address infrastructural concerns that are holding the continent back. Even at SADC level, the Industrial Development Policy Framework (IDPF) adopted by the Committee of Ministers in 2012 gives cognisance to the urgent need for regional infrastructure development. The IDPF recognises the importance of an efficient and regionally integrated infrastructure and of services in support of industrialisation (McCarthy, 2014, p.18). The other notable initiative is The Programme for Infrastructure Development in Africa (PIDA). PIDA is a joint initiative of the African Union Commission (AUC); the New Partnership for Africa Development Planning and Coordination Agency and the African Development Bank and this programme has been adopted by the African Union Head of States since 2011-2030 as its implementing arm for Africa's infrastructure planning and Development.

Closing the infrastructure deficit is vital for Africa's economic prosperity and sustainable development. Improved infrastructure would facilitate increased intra-regional and international trade, reduce the cost of doing business and enhance Africa's competitiveness within itself and in the global economy as well as act as a catalyst to Africa's economic transformation and diversification through industrialisation and value addition and sustainable and inclusive growth (www.afdb.org/programme-for-infrastructure-development-in-africa-pida).

The gap that exists in terms of infrastructure funding in the continent and the need to address maintenance backlogs does call for integrated planning across all spheres business and governments, including the international community. The total capital cost for infrastructure maintenance and development in the continent is \$67, 9 billion through to 2020, of which transport account for 37% or \$25, 4 billion ((www.afdb.org/programme-for-infrastructure-development-in-africa-pida)).

Improved infrastructure would facilitate domestic and international trade, reduce the cost of doing business and enhance Africa's competitiveness both as an exporter and a destination for investors (World Bank, 2012, p.5).

In essence the evolution and transformation of the region's and the continent's transport system to meet the demand of a changing African trade landscape and be a catalyst for socio-economic development. Inclusive growth and the alleviation of poverty should be the priority of policy makers and implementers alike. Governments in the continent must create a suitable atmosphere for foreign direct investment and the private sector to be involved and play a partnership role that will enhance the ease of doing business and reduce transport related costs. Several structural weaknesses must be overcome if Africa is to translate rapid growth and higher demand for commodities into rising employment and living standards. Crucially, poor transport links and infrastructure networks, as well as tariff and non-tariff barriers, raise the cost of doing business and hobble both investment and internal trade (National Development Plan-2030, p.22).

This then introduces the well-established approach to regional transport infrastructure investment, and that is the trade corridor investment approach.

4.5. Trade Corridors Development Approach

The development of trade corridors and especially road network corridors can be seen as a pertinent solution to sub-Saharan Africa's road infrastructure problems as most of the countries are landlocked. Roads with their penetration level and the ability to connect the most remote areas can serve to stimulate both trade and regional integration. This approach looks at interconnectivity within the context of industrial activity or centres, and also aims to establish both social and economic activities along the trade route. This was the same approach taken in the integration and development of intra-regional trade in the Greater Mekong Sub-region³ (GMS). The Greater Mekong sub-region adopted a Transport Master Plan which identified priority links-mostly road projects designed to generate the greatest and most immediate improvements in connectivity. This was seen as an important step in economic development with improvements in transportation infrastructure boosting economic opportunities in the region by for example, significantly reducing travel time and costs (Asian Development Bank Institute, 2009, p.1).

Arnold (2006,p. xviii) asserts this view and states that, the concept of a corridor is a powerful construct for addressing most of the major issues confronting freight

³ GMS countries are Cambodia, the People's Republic of China, Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand and Viet Nam

transportation and especially for freight movements between and through adjoining countries. The concept includes not only a collection of routes but also a portfolio of transport services. It provides a mechanism for focusing public and private sector efforts on a common perspective, moving goods efficiently throughout the corridor.

The economic corridor approach look at regional transport routes not only as a means of transporting goods or services or as gateway for landlocked countries, but also as a tool for stimulating social and economic development in the areas surrounding the route. Economic corridors accomplish this by creating industry and social facilities in conjunction with transport infrastructure (African Development Bank, 2013, p. 1).

However most of the critical transport corridors on the continent cross numerous borders which starts to create a complicated funding and management arrangement. The problem is further compounded by the probability of infrastructure becoming politicised as these investments compete with other state funding requirements and become subjects to in-country national economic and political debates (www.transportworldafrica.co.za).

Trade corridors themselves demand closer cooperation amongst all the role players and this might also be the answer to the issue raised in Chapter 2 regarding coordination and cooperation amongst member states in road transport infrastructure development and maintenance and the creation of conducive transit regimes.

The challenges relate to policy coordination amongst and between countries. The second issue has to do with inter-agency management and implementation of harmonised trade instruments including the approach to cross regional infrastructure development and maintenance. It is thus the intention of this section to take a holistic analytical view to such issues as they contribute to delays, lack of interconnectivity and reliability of the broad network which all have an impact on the cost of moving people and goods around the region.

To obtain efficient and effective transport services at a reasonable cost, cooperation among all stakeholders both sides of the border is important. Indeed building institutional capacity through strengthening of corridor management structures is widely believed to increase levels of stakeholder involvement in helping to resolve problems and obstacles (UNCTAD, 2013, p. 25).

This further attests to the fact that cross-border or intra-regional trade poses unique challenges that cannot be addressed by one country and which go

beyond the role of the “hard” physical infrastructure. Arnold (2006, p.xiv), further states that, harmonisation is needed for both transport infrastructure and transport units. It requires an agreement on a common set of technical standards or an acceptance of the technical standards applied by adjoining countries. Over and above, efficiency in the management and operational aspects of corridors is as essential as the development of trade corridors themselves

Empirical evidence suggests that only about a quarter of delays along major transport corridors are as a result of poor infrastructure, the rest being due to non-tariff barriers and poor trade facilitation. Improvements in infrastructure can help reduce travel time and vehicle operating costs while other measures are needed to reduce operational and bureaucratic delays and to reduce regulatory burdens (World Bank, 2012, n.p.). The North–South corridor from Durban to Dar-es-Salaam and the Chirundu One Stop Border Post has already proved to be a success in the reduction of transit time and an effective customs management intervention (Arnold, 2006,n.p.)

The development of efficient transport corridors in Africa is fundamental to promoting trade and the large investments required is justified by the economic opportunities unlocked through these corridors (www.transportworldafrica.co.za).

The acceptance, acknowledgements and enforcements of agreed standards for both road infrastructure maintenance and customs clearance procedures should be built within trade agreements between countries and there has to be a formal structure with appropriate authority to oversee the implementation and adherence to such agreements. Regional solutions are often aimed at reducing transportation costs by improving transport infrastructure, transit agreements and trade facilitation at the border crossings of neighbouring countries. Trade facilitation measures applied within RTA's thus positively affect all traders operating in a country concerned and not only to address traders from the countries participating in the RTA (UNCTAD, 2010, p.15).

These administrative hurdles escalate trade costs and it is estimated that each day of delay at customs is equivalent to an additional 85km between the trading countries (African Development Bank, 2012, p.4). They also encourage illicit trade and corruption in order to bypass delays at customs and border posts (African Development Bank, 2012, p. 4). It can then be inferred that regional approach to trade corridor development can serve to cement closer cooperation for trade facilitation and the efficient maintenance of the road

infrastructure network which in turn will contribute to better trade facilitation between sub-Saharan African countries and lead to economic development.

Therefore close regional cooperation could lead to better utilisation of the scale economies also in transport. The role of the state is critical in bargaining for better conditions and more access rights to international markets, but also in becoming the engine for further reforms and facilitation measures in customs as well as transport. In this regard the development of the Durban Gauteng Corridor is one example of a national initiative that is aimed at being the backbone of freight movement for the Southern African region. It is expected that this trade corridor will form the future foundation for the expansion of trade and play a crucial part in linking adjoining feeder road networks.

The double challenge of having many small and insulated economies in sub-Saharan Africa is a fact that governments in the region need to seriously deal with if they are to regenerate the regions' trade potential and make it competitive in the global trade arena. Road transport infrastructure development and maintenance can thus play a crucial role in opening market opportunities and lead to diversification. The urgent need of creating an enabling environment for commodities in sub-Saharan Africa to reach diversified markets and to reduce delays in travel time, high costs related to both the deficient road transport infrastructure and border crossings should be addressed if the dream of full regional integration and intra-regional trade is to be realised(www.transportworldafrica.co.za).

There are major opportunities to grow trade between African countries through integrated transport corridors, but the challenge is bringing the concepts to fruition (www.transportworldafrica.co.za.)

4.6. Implications for Trade Facilitation

Given the substandard condition of the African road network moving goods across borders is very costly and subject to lengthy delays. This impinges on competitiveness as well as consumer demand since high trade costs result in higher retail prices and damper the public's appetite to increase their spending (African Development Bank, 2012, p. 4). Competitiveness is defined as the set of institutions, policies and factors that determine the level of productivity of a country (World Economic Forum, 2011, p.5). On the other hand, hampered competitiveness and high retail prices impede the development of industries and also the acquisition of basic inputs for many sectors in the economy. Rodriguez (2013,n.p.) further asserts that, locations that have low levels of accessibility such as landlocked countries tend to have higher costs for

many goods (sometimes basic necessities such as food) as most have to be imported often over many distances.

Furthermore, harnessing the opportunities of regional and international markets will play a key role in delivering higher returns to farmers and contributing to food security by making food products widely available at lower prices to consumers throughout the region (World Bank, 2012, p.26). The resulting higher transport costs inhibit the competitiveness of such locations and limits opportunities. Consumers and industries will pay higher prices impacting on their (disposable income, welfare and competitiveness). The African market remains highly fragmented, preventing enormous opportunities for cross-border trade from being exploited and in turn generating new jobs. Effective regional integration is more than simply removing tariffs; it is about addressing the barriers that undermine the daily operations of ordinary producers and traders of both goods and services (World Bank, 2012, p.xv)

It is clear that the state of road infrastructure in sub-Saharan Africa is a major impediment to trade facilitation (UNCTAD 2013, p.15). This in itself makes the region less attractive to foreign direct investment and for more trade potential with the outside world. The direct implication of a deficient road network and a lack of coordinated effort and policy alignment amongst various countries in the region also lead to further fragmentation of economies, lack of diversification for both commodities and markets and generally makes it more expensive to trade with the region as compared to other regions in developed countries.

Furthermore, it can be argued that productive efficiencies become compromised as lack of access to cheaper input factors (material, labour etc.) makes it difficult for business to operate at full capacity, to realise the bottom line and be able to re-invest their profits in expanding operations or in other more efficient production mechanisms. For industry in a given region, time and cost savings as well as gains in accessibility and reliability arising from the transport infrastructure would allow gains to be achieved by improving their production and distribution (OECD, 2002, p. 9).

Wider access to the market will create both new business opportunities and increased competition, leading to further increases in profitability. Thus transport infrastructure projects could be said to have an impact on private capital and labour productivity, and hence on overall economic growth (OECD, 2002, p. 9).

The savings associated with good road infrastructure impact on both businesses and households. For households the impact can be related to job opportunities in the market, and the cost of commodities available for consumption. The incidence of barriers to regional trade fall most heavily and disproportionately on the poor and on women, and is preventing them from earning a living in activities where they have a comparative advantage- catering for smaller , local markets across the border.(World Bank, 2012,p.26). Regional employment is often government's objective. The impact of construction operation and maintenance of transport infrastructure include both created and relocated jobs. Direct and indirect employment linked to the operation and maintenance of transport infrastructure can also be assessed (OECD, 2002, p.9).

In many cases, the objective of transport infrastructure investment is to improve the accessibility of a given region by reducing travel time or increasing the potential to travel. Accessibility can be measured as the quality of economic or social activities that can be reached using transport systems. The fact that only a quarter of the road network in sub-Saharan Africa is paved is also an indication of the lack of connectivity between centres of production and markets. The sparsely located and landlocked small economies in the region are unable to connect with the bigger market and also important gateways for exports and imports which make it impossible to procure material at cost effective prices. Improvement in accessibility will increase the market size for manufacturers, tourism and /or labour leading to increased competition and/or centralisation (OECD, 2002, p.9).

Doubling the kilometres of paved roads per 100 square kilometres is estimated to increase trade by 13 percent. Imports from a country with twice as many kilometres of paved roads per 100 square kilometres than another increases trade by 12 percent (World Trade Report, 2004, p. 125). Firms are able to access production inputs like a pool of skilled labour in the region which in turn will lead to innovation and raised productivity.

Necessary capital for investment in these economies is compromised due to lack of integration and intra-regional trade. It is apparent that with much less per capita income in sub-Saharan Africa compared to other developing economies, the lack of connectivity impacts negatively on small and medium enterprises' ability to grow and create employment. Generally in many sub-Saharan Africa low domestic savings mean a reliance on foreign direct investment or foreign aid to develop. To continue to attract foreign capital for the development of the countries productive capacities and infrastructure, authorities in sub-Saharan Africa

should step up the efforts to improve the domestic business climate also tapping technical assistance from international community (International Monetary Fund, 2013, p.17).

Transport costs generally affect business locations and decisions for enterprise development in the region. Investment will largely be based on the efficiency of the transport infrastructure. With the state of transport infrastructure and specifically road transport infrastructure in sub-Saharan Africa being inadequate and in a poor state, the creation of sustainable backward and forward business linkages or value chains is impossible. High transport costs and long delivery times for imports lead to higher production costs of final goods, in other words, these high transport costs will greatly affect choices made by high import content, assembly –type industries regarding the locations of their production sites. This means that LLDCs are less likely to attract investments, whether national or foreign, to develop manufacturing, trading or distribution industries (UNCTAD, 2013, p. 26).

The same can be said for small scale farmers in rural areas who find it impossible to transport their produce to both domestic and international markets. Weisbrod and Treyz as quoted in (Joynt, 2004, pp.3-26) attest to this notion by stating that, road projects have important spatial location characteristics. They serve to expand the market reach of business, allowing them to realise economies of scale in serving broader markets more economically. In addition, road improvements can also afford business access to greater variety of specialised input products, helping them to become more productive. For better connectivity there is a pressing need for sub-Saharan economies to improve road transport infrastructure and create feeders into better and well maintained regional networks.

Through the development of trade corridors much can be realised in terms of creating economic hubs along such corridors and the ability to connect to the wider regional market can be realised. Remoteness and being land locked continues to be an economic handicap and a barrier to growth. Redding and Venables in (Molnar & Ojala, 200, p.39) found that more than 70% of the variation in per capita income can be explained by the proximity of a country to key markets. Those countries, which are remote from their key markets incur greater transport costs, consequently to remain competitive the wage rates are kept lower.

To further emphasise this point, an observation by Business Monitor International Ltd (2012), has relevance here. The fact though is that SSA is comprised of a patchwork of about 50 economies which are for the most part relatively small. Poor transport connectivity links connecting them mean that access to the SSA consumer pool in its entirety is difficult and expensive. Improved transport links would bolster the attractiveness of the consumer market as a whole and would lure in more competition to drive down prices and improve services (Business Monitor International, 2012 p. 13).

Connectivity as one of the measures of an efficient transport system and in particular the lack thereof as it applies to landlocked sub-Saharan African countries cannot be ignored. The costs associated with poor road transport infrastructure do not only relate to delays and lack of access to markets, but also lead to manufacturers incurring high inventory and storage costs because of the unpredictability of supply.

Globalised production of goods is highly sensitive to time, and thus reliability becomes one of the determining factors in terms of investment. With poor and unreliable road transport system in much of sub-Saharan Africa, the implication is that, even though the continent is endowed with resources and skilled pool of labour, the cycle of dependence on the exports of primary commodities and unprocessed agricultural produce will continue. Nordas, Pinali, and Geloso Grosso (2006) as quoted in Perez and Wilson (2010, p. 9), analysed the relationship between time for import and export producers, logistics services and international trade. They find that time delays result in lower trade volumes and can reduce the probability that firms will enter export markets for time sensitive products. Time savings are benefits resulting from an improvement in the efficiency of the transport system (shortened routes, increased traffic fluidity, better access to connection services, etc.). For freight carriers, time savings will take the form of money savings given that reductions in travel time reduce hourly costs of transport services (e.g. driver's wages, insurance, etc.) for shippers. For consignees, travel savings may be converted into reduced inventory costs (OECD, 2002, p.31).

One of the frequently mentioned negative impacts of high transport costs and lack of connectivity is the issue of access to inputs. When transport costs escalate the price of the final product escalates. This also negatively impacts on the competitiveness of a country and the region as a whole. It also affects the choices of where investors will put their manufacturing plants and the establishment of both forward and backward linkages in the value chain. Production efficiency is compromised and as such manufacturing firms cannot perform at their

optimal level. High transport costs and long delivery times for imports lead to high production costs of the final goods; in other words, these high transport costs will greatly affect choices made by high import content assembly-type industries regarding the locations of their production sites. This means that LLDC's are less likely to attract investments, whether national or foreign (UNCTAD, 2013, p.26).

Transport infrastructure and transport services as one of the major elements for trade facilitation and regional integration has become an important policy focal point in the pursuit to reduce costs. The importance of transport infrastructure in both trade and regional integration is a subject of on-going research and a number of academics and development institutions like the World Bank (Defragmenting Africa, 2012), the African Development Bank (Infrastructure Deficit and Solutions in Africa, 2010, Volume 1) and the Asian Development Bank Institute (Transport Infrastructure and Trade Facilitation in the Greater Mekong sub-region, 2009, Working Paper No. 130) to mention a few, have all commissioned various research studies in order to develop appropriate policy mechanisms for both developing and developed countries.

Poor road transport infrastructure compromises the ability of the region to develop a competitive advantage in terms of requisite skills and in the area of regional and global value chains due to delivery delays and the difficulty of accessing inputs necessary for production processes. This further enforces reliance on primary commodities with little prospect for value addition or beneficiation and thus lack of diversified export commodities. It is thus not surprising that the expense and consequent low amount of inter-regional trade is another reason that the African manufacturing sector has not flourished. Indeed high regional transportation costs mean that it is cheaper for African countries to import furnished products from abroad rather than importing inputs and raw materials from neighbouring countries and manufacturing products themselves (Business Monitor International, 2012, p. 14).

In the final analysis, it is clear that much of the sub-Saharan African countries inability to tap into regional resources and markets is attributable to a deficient road infrastructure network that is not conducive for trade facilitation and the ability of the region to diversify its markets and commodities. A dedicated effort is needed to improve the accessibility, connectivity and mobility in order to achieve a meaningful trade with other African countries and the world.

A deduction can be safely made that, Africa needs a deliberate, systematic and concerted effort at the practical level to integrate, upgrade and modernise regional infrastructure so that it becomes the catalyst for Africa's growth. The regionally integrated corridor approach offers prospects for speedier integration of road infrastructure network in Africa. The vision and ultimate objective for Africa should be to create a single market of 750 million people that is complete within itself and within the global economy. A critical pre-requisite for this is regional infrastructure integration across Africa (Buys, P., Drechen, U. & Wheeler, D., 2006, p.3).

The negative impact that poor road network has on the trade facilitation and economic development for the region is substantial and cannot be ignored. While Southern African countries have largely succeeded in increasing their trade with the rest of the world (more than tripling in value between 2000 and 2008 from US\$50 billion to US\$153 billion), increased regional trade has only played a relatively small value. Opportunities for export growth and diversification therefore remain unexploited at regional level (World Bank, 2012, p.89).

These missed opportunities in terms of skilled labour, resources and capital investment will continue to stifle inter-regional trade in sub-Saharan Africa unless speedy attention is given to the improvement of the road infrastructure through dedicated inter-regional cooperation and policy alignment.

According to Joynt (2004,pp.3-44), the implications for economic development according to transport network performance are based on the premise that an effective transport network will support economic development, while poor performing transport network will constraint it. An effective transport network will allow movement of people and goods resulting in increased flows and interaction with the market, thus assisting economic development. A poor network, however will restrict market interaction and thus inhibit economic development. Perhaps most obviously poor physical infrastructure decreases headline real GDP growth by negatively impacting productivity and raising costs of production (Business Monitor International, 2012, p.11).

For intra-regional trade in sub-Saharan Africa to be realised, and for the region to be competitive and claim its space in the global trade arena, the reduction in the cost of doing business which largely is the result of sub-standard road infrastructure network need to be addressed. This will in turn make the region attractive to doing business and for foreign direct investment which will further lead to the ability of the region to diversify its exports and markets and tap into its full potential; to be a leading player in both the continent and the rest of the world.

The appropriate metric for successful integration is not the extent of tariff preferences but rather reductions in the level of transaction costs that limit the capacity of Africans to move, invest in and trade goods and services across their borders (World Bank, 2012, p.89).

It can thus be concluded that poor transport infrastructure, and especially road transport infrastructure in sub-Saharan Africa is one of the greatest impediments for better trade facilitation and intra-regional trade. The problem of being small landlocked economies can be addressed through better development, maintenance and upgrading of existing network of roads and better cooperation between member states to create conducive transit regimes. This will eventually benefit both the exporting and transit country.

Chapter Five: The institutional governance of road transport in South Africa

5.1. Introduction

The authority which has the responsibility to decide on infrastructure investments should reflect the principle of subordinate government. For example local/municipal level objectives and those of the state concerning infrastructure projects must reflect or complement each other in order to be effective” (OECD, 2002,p. 22).

This section presents a case study of road transport governance in South Africa, the constitutional mandate of the three tiers of government and other agencies that are mandated with road infrastructure development and maintenance. The need to understand the concurrent functions amongst the three spheres of government(National, Provincial and Local) and the agencies, particularly the South African National Road Agency Limited (SANRAL) in this respect will give an insight into the different challenges in as far as policy implementation, skills requirement, and road development and maintenance budget expenditure are concerned.

The section also briefly highlights the challenges faced by these institutions to implement and coordinate policies that are related to road infrastructure maintenance. Historically and prior to the new dispensation, there used to be Local, District, Provincial and National Roads. Local roads were usually smaller internal roads within local municipalities. District roads belonged to district municipalities which were previously referred to as District Councils. Provincial roads belonged to provinces (Transvaal, Natal, Cape and Orange Free State) while national roads fell under the jurisdiction of the now defunct South African Roads Board replaced by South African National Roads Agency Limited(SANRAL) in 1998. The South African Constitution of 1996 created three spheres of government being the National, Provincial and Local. In accordance with schedule 4 of the constitution that deals with transport all the three spheres have concurrent responsibilities in terms of regulation, law enforcement and infrastructure provision. There are however a number of functions ranging from vehicle licensing to road traffic regulation which are not relevant to this study, and as such the focus of this chapter will exclusively be on road infrastructure provision and maintenance within these three spheres of government including relevant government agencies operating in that sphere.

5.2. The role of National Government

The realm of transport policy development lies primarily within the national sphere of government and in this case the Department of Transport (DOT), with its political head being the Minister of Transport. Its constitutional mandate is to provide safe, reliable, effective and fully integrated transport operations and infrastructure which will best serve the needs of freight and passenger customers at improving levels of service and cost in a fashion which supports government strategies for economic and social development whilst being environmentally and economically sustainable (Department of Transport, 1996).

The execution of this vast mandate by the Department of Transport and specifically as it relates to transport infrastructure provision necessitated a blue print to guide such intervention and a number of policy documents, starting with the White Paper on National Transport Policy of 1996 as a foundation to the National Freight Logistics Strategy in 2006 and the National Transport Master Plan 2050 have all been developed as strategic frameworks to guide policy interventions and long term planning.

Nonetheless interdepartmental and inter-governmental coordination is demonstrably the best institutional mechanism to deliver on infrastructure development and maintenance as there is no one institution that can effectively undertake this mammoth task. Vast anecdotal evidence and economic literature around the provision of transport infrastructure attest to the fact that the nature and extent of the autonomy of various institutions responsible for the provision of infrastructure is highly important in determining the success of such mandate. Mitchell (2008) states that the chief constraint to a sustainable increase in road infrastructure investment is unlikely to be primarily financial but rather a question of institutional and implementation capacity. This applies both to the maintenance of existing road transport infrastructure and the procurement and construction of new road networks.

In 2008 with the realisation that there has been lack of proper sectoral coordination in terms of infrastructure provision by government, the cabinet asked the Forum of South African Directors-General (FOSAD) to come with an integrated infrastructure plan for government. The strategic intention being to ensure that Government develops and implements a

comprehensive and integrated infrastructure plan, aligned across the sectors and responding to growth priorities, in order to maximise the impact of prioritised interventions and the achievement of economic and social objectives in line with Government's Development Agenda and international obligations (FOSAD,2008,p.7). This process has been further strengthened by the signing of the Infrastructure Development Act by President Jacob Zuma on the 30 May 2014. The Act provides for Strategic Integrated Projects (SIPs) that bring together a number of catalytic projects that together make up the National Infrastructure Plan. The aim is to allow for better integration of connected projects and improved monitoring and evaluation.

5.3 The role of Provincial Government

Section 104 of the constitution of the Republic of South Africa designates the powers to a provincial government or legislature to enact on matters that are within its competency, and for purposes of this research, these will be matters that relates to schedule 4 and 5 dealing with issues regarding road freight transportation.

Provincial Integrated Transport Plans are developed by provinces to reflect on the overarching national policy with regard to transport in general, but also importantly a number of provinces have developed White Papers on Provincial Transport Policy which puts the emphasis amongst others on their role "to provide, maintain and operate efficient transport infrastructure". It is also important to note that a number of provincial transport authorities and legislations have been established over time to assume different sub-sectors of transport with no particular relevance to this research and as such shall not be mentioned.

The salient point about the concurrent responsibility of the three tiers of government is that it creates a plethora of policies and institutional structures that often have competing imperatives particularly in the provision and maintenance of road transport infrastructure. Also the creation of nine provinces from four in the post-apartheid South Africa stretched the capacity and valuable skills in order for all provinces to be able to meet both their constitutional mandate and to implement national policy. This is also a point of concern in as far as their ability to consistently and diligently maintain road infrastructure projects is concerned.

According to the National Treasury Year-in-Year provincial allocations and spending monitoring, provinces have been too lacklustre in their infrastructure spending. The biggest share (33.6 percent) of provincial capital budget was for the public works, roads and transport department, which spent R1.9 billion or 20.3 percent of the combined capital budget of R9.1 billion as at 30 June 2012.

<http://www.treasury.gov.za/documents/provincialbudget/2011/BudgetStatements>).

In as far as conditional grants spending is concerned, the National Treasury notes indicate that at least seven provinces spent less than 15 percent of their Extended Public Works Programme which has as its largest part, roads maintenance budget

<http://www.treasury.gov.za/documents/provincialbudget/2011/BudgetStatements>).

A further illustration of this point is in the case of the Eastern Cape Province. Expenditure for infrastructure decreased from R43.2 million in 2007/08 to R22.4 million in 2010/11. In the 2010/11 financial year, the department had a new infrastructure budget of R32.4 million, however due to internal reprioritisation the department's infrastructure budget was reduced to R22.4 million (http://www.treasury.gov.za/documents/provincialbudget/2011/BudgetStatements/EC/EC-Vote_10). The following tables provide details of audited provincial expenditure trends for road maintenance in three financial years, 2012/13/ and 2014.

**CONDITIONAL GRANTS: FUNDS RECEIVED AND PAYMENTS MADE BY PROVINCES AS
AT 31 MARCH 2012(AUDITED).**

Table 5: Provincial Roads Maintenance Grant

Province	Division of Revenue Act, 2011 (Act No.6 of 2011)	Provincial roll-overs	Total available	Payment Schedule: Year to date	Received by Province: Year to date	% Actual payments of total available	Audited (over) under
R thousands							
Eastern Cape	1 034 086	-	1 034 086	1 034 086	1 034 086	100%	(113)
Free State	447 165	-	447 165	447 165	447 165	72%	125 260
Gauteng	566 917	-	566 917	566 917	566 917	23%	432 321
KwaZulu- Natal	1 236 648	-	1 236 648	1 236 648	1 236 648	100%	-
Limpopo	934 208	-	934 208	934 208	934 208	84%	145 732
Mpumalanga	1 016 603	-	1 016 603	1 016 603	1 016 603	100%	-
Northern Cape	308 760	-	308 760	308 760	308 760	100%	-
North West	501 826	-	501 826	501 826	501 826	51,6%	242 884
Western Cape	411 141	-	411 141	411 141	411 141	100%	-
Total	6 457 354	-	6 457 354	6 457 354	6 457 354	85,3%	946 085

Source: National Treasury, Estimates of National Expenditure(2012)

**CONDITIONAL GRANTS: FUNDS RECEIVED AND PAYMENTS MADE BY PROVINCES AS
AT 31 MARCH 2013 (AUDITED).**

Table 6: Provincial Roads Maintenance Grant

Province	Division of Revenue Act, 2011 (Act No.6) of 2011	Provincial roll-overs	Total available	Payment Schedule: Year to date	Received by Province: Year to date	% Actual payments of total available	Audited (over) under
R thousands							
Eastern Cape	1 369 985	-	1 369 985	1 369 985	1 369 985	100%	-
Free State	564 930	53 577	618 507	564 930	564 930	91%	52 805
Gauteng	579 081	424 038	1 003 119	579 081	579 081	99,7%	2 951
KwaZulu-Natal	1 501 171	-	1 501 171	1 501 171	1 501 171	100%	-
Limpopo	1 168 594	140 955	1 309 549	1 168 594	1 168 594	73,5%	347 255
Mpumalanga	1 240 694	-	1 240 694	1 240 694	1 240 694	100%	-
Northern Cape	483 706	-	483 706	483 706	483 706	100%	-
North West	594 789	162 929	757 718	594 789	594 789	45,4%	413 769
Western Cape	478 895	-	478 895	478 895	478 895	99,4%	2 637
Total	7 981 845	781 499	8 763 344	7 981 845	7 981 845	90.6%	819 417

Source: National Treasury, Estimates of National Expenditure (2013)

CONDITIONAL GRANTS: FUNDS RECEIVED AND PAYMENTS MADE BY PROVINCES AS AT 31 MARCH 2014 (PRE-AUDITED).

Table 7: Provincial Roads Maintenance Grant

Province	Division of Revenue Act, 2011 (Act No.6) of 2011	Provincial roll-overs	Total available	Payment Schedule: Year to date	Received by Province: Year to date	% Actual payments of total available	Audited (over) under
R thousands							
Eastern Cape	1 102 836	189 554	1 292 390	1 292 390	1 292 390	96,2%	49 162
Free State	1 130 462	243 361	1 373 823	1 325 323	1 325 323	82,8%	235 656
Gauteng	433 048	222 200	655 248	655 248	655 248	100%	82
KwaZulu-Natal	1 678 920	-	1 523 528	1 523 528	1 523 528	100%	-
Limpopo	990 578	-	572 344	572 344	572 344	88,4%	66 495
Mpumalanga	1 487 722	1 671	1 489 393	1 489 393	1 489 393	100%	29
Northern Cape	659 484	40 000	699 484	699 484	699 484	100%	1
North West	639 923	168 627	808 550	661 905	661 905	99,1%	7 005
Western Cape	573 237	2 637	520 797	518 160	518 160	100%	-
Total	8 696 210	868,050	8 935 557	8 737 775	8 737 775	96,0%	358 430

Source: National Treasury, Estimates of National Expenditure (2014)

Tables 5, 6, and 7 reflect audited conditional grant allocations and expenditures by provinces. These allocations are over and above budget allocations by the National Treasury which are reflected in table 10, National and Provincial(s) 2006-2011.

Expenditure trends analysis from both conditional grants, national and provincial roads infrastructure expenditure does give a picture of lacklustre spending by provinces. Though it may appear that there has been an improvement in expenditure from 85,3% in table 5 to 90,6% and 96,0% in tables 6 and 7 respectively, when one looks at the figure in Table 8 where provinces account for a larger network of unsurfaced roads, this spending is negligible compared to the maintenance backlogs and challenges at hand. According to Professor Stephan Krygsman, South Africa has an estimated backlog of R80 to R149 billion in road maintenance funding, and furthermore a three to five year delay in maintenance increases the required repair costs by between six and 18 times. (<http://blogs.sun.ac.za/news/2013/12/23/road-maintenance-solutions>). A reflection on the state of provincial road networks, both paved and unpaved as presented under the section, Research Methodology on page 13 and 14 of this study give a clear account of the disparity between spending by provinces and the enormity of the work at hand. Budget spending is mostly lacklustre due to the lack of sufficient and necessary engineering skills in road maintenance particularly at provincial and local government level.

5.4. The role of Local Government

Both National and Provincial government's transport policies and strategic frameworks inform the local government transport plans. This sphere of government essentially develops its integrated transport plans based on the vision provided for by the White Paper on National Transport Policy, the White Paper on Provincial Transport Policy and other intergovernmental frameworks with regard to road transport infrastructure development and maintenance. More importantly local municipalities are expected to compile their respective Municipal Roads Assets Master Plan (MRAMP). For purposes of this study two outstanding objectives of the MRAMP that cuts across most local government's plans are; the continuous repair and maintenance of internal roads and storm water drainage systems using both internal maintenance teams as well as locally based service providers, the procurement of road construction and maintenance materials preferably from locally based suppliers to enhance Local Economic Development. This in essence is supposed to address the issue of planning at that level.

However, the local government sphere appears to be the most dysfunctional and ill equipped to fulfil both the National and Provincial government's policy goals, perhaps with the exception of the three big metropolitan areas of Tshwane, Johannesburg and Cape

Town. Over and above the issue of skills and capacity the Municipal Infrastructure Grant from both the national and provincial government are often used for other priorities than the provision of transport infrastructure and this has led to further neglect and deterioration of many road transport networks under the legislative mandate of both provinces and local municipalities.

Table 8: Percentage Split between Surfaced and Gravel Roads

	Surfaced	Gravel	Total
SANRAL	100.0%	0.0%	19 704
Provincial	18.6%	81.4%	167 779
Metropolitan	78.1%	21.9%	66 143
Municipalities	11.1%	88.9%	339 849
Unproclaimed	72.6%	27.4%	145 422
RSA NETWORK	33.3%	66.7%	738 897

Source: Department of Transport,(2011)

Table 8 shows that the split between surfaced and gravel roads was 33.3% and 66.7% respectively in 2011, the provinces (81.4%) and municipalities (88.9%) accounts for the highest percentage of gravel road network.

5.6. The South African National Road Agency Limited (SANRAL Ltd)

Efficiency in the provision, maintenance and operation of the primary economic road infrastructure network will be facilitated by the establishment of a professionally managed Road Agency (White Paper on National Transport Policy 1996). This policy pronouncement led to the establishment of SANRAL by the Department of Transport (DOT), enacting the South African National Roads Agency Act of 1998. SANRAL is an entity that reports to the Minister of Transport and its vision is “to be recognised as a world leader in the provision of superior primary road network in Southern Africa” (SANRAL 2010). Out of a national roadwork spanning 200 986 km, SANRAL manages 19 704 km of road network. This is as a result of the transfer of certain provincial roads to fall under national sphere. During the 2013/14 financial year, SANRAL awarded 202 contracts for new works, rehabilitation and improvement, periodic and special maintenance, routine road maintenance, community development supervision and other activities to the value of R11, 6 billion with R9, 5 billion being spent on non-toll roads. The budget allocation for SANRAL for 2014/14 was R3, 454

billion for current operations and R7, 043 billion for capital expenditure (DOT, Budget Vote Speech 2014).

However the classification of roads seems to be a bigger challenge for both rehabilitation and maintenance purpose in the country. South Africa has a total road network of at least 750 000 kilometres (DOT, Budget Vote Speech 2014). An extensive road network that falls under provincial and local government, and those roads that are called “un-proclaimed” roads with an estimated 145 000 km of network are not necessarily captured in the government’s road inventory and thus are not assigned for maintenance and upkeep (SANRAL, 2010).

This problem is what is at the core of the road infrastructure management in South Africa. The capacity to construct and continuously maintain road transport infrastructure at both the provincial and local level is often limited, not primarily because of financial constraints but mainly in terms of requisite skills and experience. This argument can better be understood when one brings into the picture the issue of planning. Sanral has over the years introduced what is called Road Network Management System approach as a planning tool. As Tables 5 and 6 indicate, the overall road network under Sanral’s management is 100% paved. The primary use of this tool is to; access a centralised road network database for inventory, conditions and utilisation data, utilise the data for the life cycle predictions of road deterioration, maintenance needs, agency costs and user costs, and combining the above according to the selected objective function to produce an optimised budget (<http://www.sanral.co.za>).

On the converse provinces’ and municipalities’ planning is purely based on what is contained as key priority areas according to their Integrated Development Plans.

A thorough observation of the magnitude of this problem calls for more coordination and institutional oversight if the problem of road infrastructure neglect is to be effectively addressed at both the provincial and local government spheres. Yet despite a growth in allocations to provincial authorities, the road network continues to deteriorate (Development Bank of Southern Africa, 2011a). On the other hand transport improvement may lower input prices and hence production costs. Other benefits from transport improvement may include increased trade and competition from imports, in turn leading to improved production efficiency,

downward pressure on consumer prices and reduced seasonal price fluctuations (Department of Transport, 2006,p.40).

Table 9: Summary of the South African Road Network

	Surfaced	Gravel	Total
SANRAL	19 704	0	19 704
Provincial			
Eastern Cape	3 285	26 340	29 625
Free State	3 557	21 325	24 882
Gauteng	2 360	1 895	4 255
KwaZulu-Natal	4 540	14 437	18 977
Limpopo	5 011	15 396	20 407
Mpumalanga	3 341	8 887	12 228
Northern Cape	1 308	23 205	24 513
North West	3 978	14 961	18 939
Western Cape	3 759	10 194	13 953
Total Provincial	31 139	136 640	167 779
Metropolitan	51 682	14 461	66 143
Municipalities	37 691	302 158	339 849
Unproclaimed	105 540	39 882	145 422
Total Network	245 756	493 141	738 897

Source: Department of Transport, 2011

Table 9 indicates that the total length of the South African network is estimated to be 738 897 km under road authorities at national, provincial and municipal level. Over 60% of this network falls under provinces and it is unsurfaced.

In essence the management of road transport and transport in general in South Africa operates under a myriad of laws and a complex institutional environment where delivery is often compromised not by lack of financial resources but largely by skills constraint. This disconnect between the national, provincial, and local spheres of government and the multiplicity of role players has been accurately capture by Ross and Fields (2007) that roads constitute the single largest component of planned and actual infrastructure allocation,

accounting for approximately one quarter of budgeted expenditure for the period 2007 to 2010. However effectiveness is hampered by significant maintenance backlogs (estimated to be in the region of R80 to R149billion) the need for continued attention to all elements of the asset life cycle (construction, upgrading and maintenance), the existence of multiple players, with the establishment of road management agencies at all three tiers of government (with integrated planning and delivery still to be achieved), and limited capacity among many of these players to ensure appropriate expenditure (<http://www.npc.gov.za>).

As anecdotal evidence points out, the endemic problem with provinces and local municipalities is often competing priorities when it comes to service delivery. It is a common case that funds allocated for municipal transport infrastructure grants are often used to deliver other services like water provision and sanitation. This in itself is an indication of a lack of coordination and thorough planning when it comes to the interaction between national, provincial and local government.

It is therefore important that the state's intervention in dealing with this issue be based on a multi-pronged approach in order to make a thorough diagnosis of the systemic challenges amongst the three tiers of government and State Owned Enterprises (SOE's) dealing with road infrastructure development and maintenance. This observation has also been succinctly covered in the Development Bank of Southern Africa report (2012,p. 6) that, state's capacity to deliver and effectively maintain infrastructure is grounded in the following functions of a democratic, market based economy such as South Africa;

- Allocative efficiency, which in turn depends on the state's capacity for integrated planning across different infrastructure sectors.
- Effective oversight and regulation of public and private entities that provide infrastructure and associated services.

Levy 2007 as quoted in (Development Bank of Southern Africa, 2012p.6), argues that the macroeconomic impact of infrastructure project can be significantly reduced by governance failures even if the project itself is carefully chosen, well designed and corruption free.

The composition of the Presidential Infrastructure Coordinating Commission, (PICC) in 2011 which is tasked with identifying the so called Strategic Infrastructure Projects (SIPS) through a framework called The National Infrastructure Development Plan, is tasked

with the facilitation of infrastructure delivery agreements and to monitor and evaluate such agreements with responsible departments, and other institutions that have their focus on infrastructure. This is largely seen as a solution to both the problem of coordination and oversight when it comes to project implementation and capacity's constraints.

This should be premised on the fact that, the cost of continuous neglect of road infrastructure will in the long term surpass the cost of construction and as such it will put the country in an unenviable position of missed opportunities in as far as trade facilitation and economic growth is concerned.

5.7. Government Spending on Roads

We are traders. We are inventors. We are workers. We create companies. We set up stalls. We are studious. We are gardeners. We feel a call to serve. We make things (National Development Plan, Vision 2030).

An online newsletter(www.Africa.Info), South Africa Inspiring New Ways 2011, quoted the former Minister of Public Enterprises, Mr Malusi Gigaba as saying, "South Africa's infrastructure investment as a percentage of gross domestic product (GDP) had fallen from 16% of GDP in the 1970's to four or five percent of GDP in recent years". Existing economic infrastructure continued to support economic growth throughout the 90's, however, continued lack of adequate investment in economic infrastructure in the late 80's throughout the 90's is currently having its impact. Rising level of congestions are experienced in the ports and other economic infrastructure leading to inefficient logistics thus reducing trade and growth performance in terms of its potential (FOSAD, 2008,p.66).

Furthermore, as it is indicated by Diagram 1 and 2 in the following pages, there is a clear picture of a disconnect between budget allocations and the state of the road network in South Africa. While increased budget allocation for infrastructure development and maintenance have been attributed to South Africa hosting the FIFA World Cup in 2010, it is clear that according to the two diagrams, the problems may not only be entirely resolved by more budget allocations. In 2013, Finance Minister Pravin Gordhan announced that government will invest R827 billion in building new and upgrading existing infrastructures. Government is currently looking at rolling out 43 major infrastructure projects worth R3, 2 trillion. The issue of infrastructure financing vis a' vis the capacity to implement has become

the paradox of a hen and an egg. While it is clear that past neglect in investment has led to with the current state of infrastructure, under expenditure in the face of increased infrastructure allocations to provinces and municipalities still stands out to be the greatest impediment to road infrastructure maintenance.

What seems to further compound this malaise between budgetary allocations and implementation is the classification of roads in South Africa. While primary roads, or national roads are under the direct management of SANRAL and these are classified as being in “very good” or “good” conditions the same cannot be said of secondary road networks under provinces and municipalities. The significance of the secondary road network cannot be underplayed given their strategic importance as feeders to the primary network, and their potential to serve rural communities and link them to both domestic and international markets for their agricultural produce. In her budget speech on the 15 July 2014, the Minister of Transport Ms. Dipuo Peters gave emphasis to this anomaly and stated that, while some of the roads, particularly those in urban areas are in good condition and are maintained regularly, we cannot say the same of roads in other parts of the country, more so in the rural areas (Department of Transport, 2014, Budget Vote Speech).

The National Freight Logistics Strategy (2005,p. 9) gives further insight on this problem that a further complication of the existing infrastructural system is that it largely bypasses the rural modes that have the highest levels of poverty and unemployment. This has further entrenched the underdevelopment of these centres, and ensured that productive capacity in these regions is largely restricted to servicing internal markets due to the last mile costs of accessing external markets and the higher order elements of the production value chain.

The National Development Plan Vision (NDP) 2030 and the New Growth Path inform government’s intervention in the economy with the primary aim of reducing unemployment and alleviating poverty. Sub-outcome 3, of the NDP clearly states the importance of the upkeep of economic infrastructure as part of the implementation of the National infrastructure Plan. The main important iterations of this Sub-outcome are; to improve national transport planning to develop long-term plans for transport that synchronise with spatial planning and align infrastructure investment activities of provincial and local government and clearly communicates the state’s transport vision to the private sector and to improve and preserve national and local road infrastructure, If these core principles are adequately addressed, it will be in the overall a

response to addressing issues of backlog to infrastructure maintenance of secondary roads in South Africa and more importantly dealing with coordinated planning across all sectors of the economy.

Ittman and King (2010, n.p.) contend that South Africa's unemployment issue will not be solved through interventions from big business- the mainstream economy is limited in its reach. In addition, people outside the mainstream economy will always be forced to engage in entrepreneurial business activities to sustain some form of livelihood. It is therefore imperative to create an environment that is conducive to entrepreneurship so as to enable the unemployed to become economically active within small business environment. There is however a significant logistics divide between medium to large industries located within major industrial logistical hubs and small and emerging businesses located within resource poor environments with poor access to major logistical hubs and corridors.

The concept of accessibility and connectivity plays a major role in as far as road transportation is concerned. Due to the fact that most of the under resourced and under developed areas in the country are in rural areas, the productive capacity and the ability of agricultural producers in such areas are hampered by the lack of access to bigger domestic markets, not even to mention international markets. Access roads are fundamental to the development of poor communities, particularly rural communities but have largely been a marginalised component of the road network system (FOSAD, 2008, p.41). Joynt (2004, pp.3-34) states that, the factors of travel time flows and network capacity influence operating costs and accessibility. Accessibility and travel flows describe the ease of traffic movement and the extent of the road network while the savings of the vehicle operating cost are as a result of improved traffic flow conditions.

Diagram 3: Source: Development Bank of Southern Africa (2012).

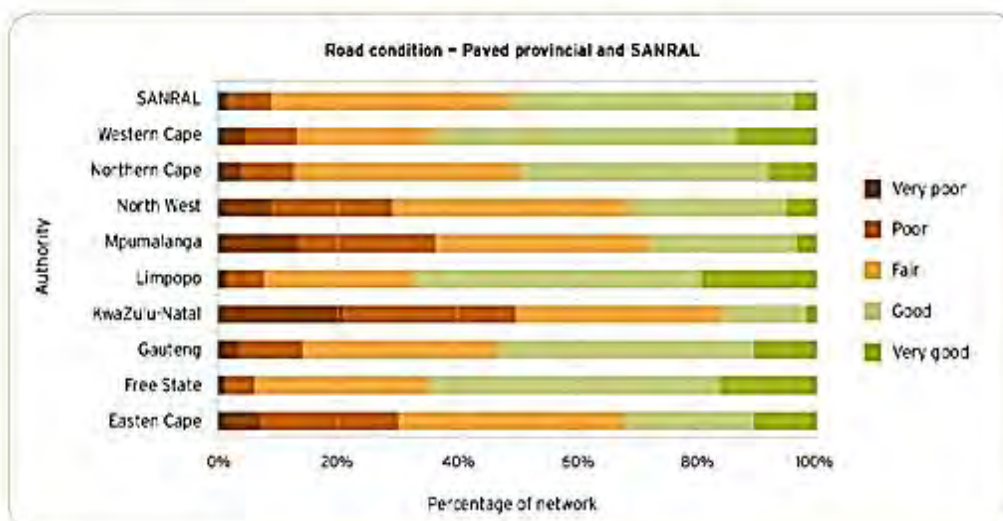
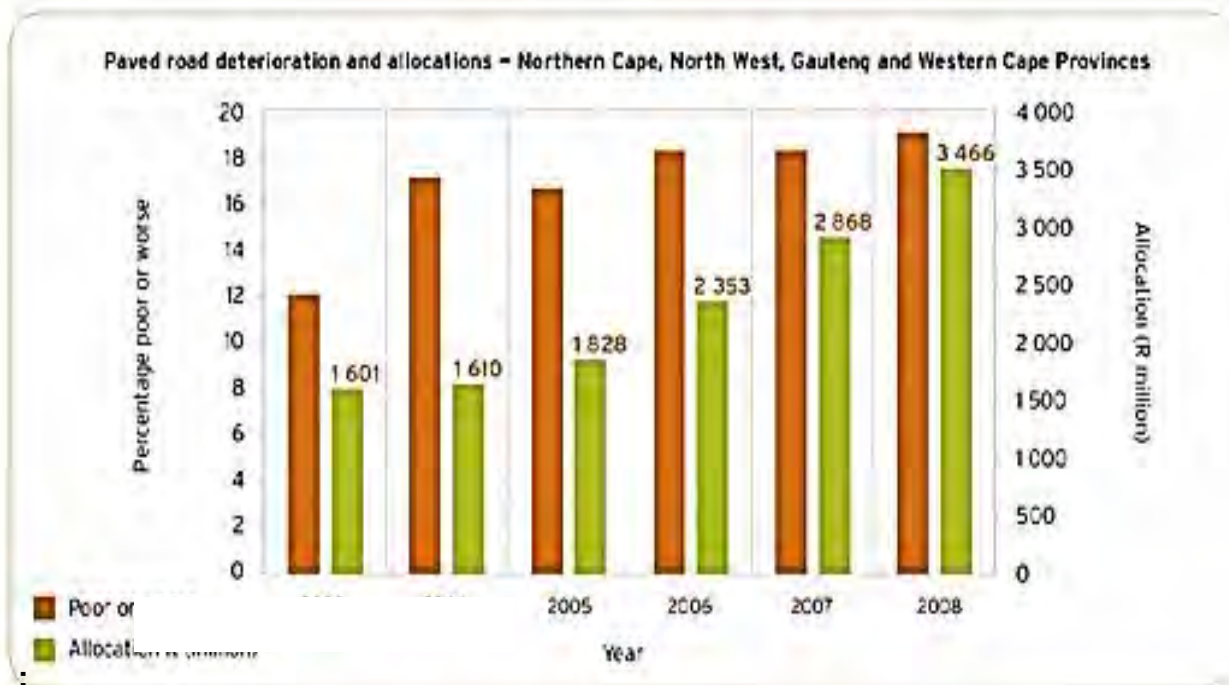


Diagram 4



Source: Development Bank of Southern Africa (2012)

It is evident from diagram 3 and 4 that most of the roads in “poor” or “very poor” conditions, despite more budget allocations are the ones under provincial management authorities, and these are the road networks that could be serving the larger rural population. It is a cause for concern that in the context of substantial growth in allocations to provincial transport authorities, deterioration of the road networks is on-going (See Table 5). In particular, the Northern Cape, North West, Gauteng and the Western Cape provinces were unable to stem the on-going deterioration of their networks despite substantial increases in funding (averaging 17% a year in the past five years) (Development Bank of Southern Africa, 2012,p. 50).

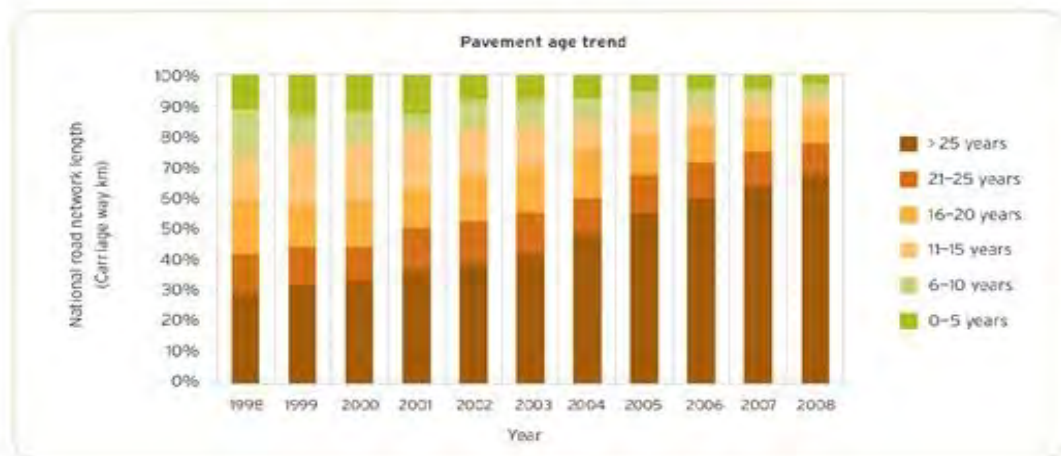
Table 10: National and Provincial Roads Infrastructure Expenditure, 2006/07-2010/11

	2006/07	2007/08	2008/09	2009/10	2010/11	% Growth rates: Estimated actual (Nominal)
	OUTCOME			REVISED ESTIMATES	MEDIUM TERM ESTIMATES	2009/10- 2010/11
Eastern Cape	1 491 951	1 615 105	1 915 156	1 712 976	1 663 661	(2.9%)
Free State	801 091	740 176	962 212	888 342	1 078 639	21.4%
Gauteng	658 234	1 078 818	1 447 688	1 734 743	1 545 534	(10.9%)
KwaZulu- Natal	1 856 013	2 360 281	4 121 902	3 530 260	3 700 348	4.8%
Limpopo	1 138 906	1 442 166	1 425 660	1 487 462	1 560 517	4.9%
Mpumalanga	688 196	993 413	1 123 917	1 035 380	1 242 624	20.0%
Northern Cape	236 268	364 986	432 594	449 394	574 152	27.8%
North West	689 011	681 451	730 041	947 604	1 070 559	13.0%
Western Cape	1 284 886	1 346 388	1 393 703	2 155 144	1 627 975	(24.5%)
NATIONAL	8 844 556	10 622 784	13 552 873	13 941 305	14 064 009	0.9%

Source: Department of Transport (2010)

Table 10 gives an indication of expenditure by provinces for road infrastructure development and maintenance. Though this does not delineate expenditure in terms of what has been spend on maintenance and new roads development, these figures gives an indication of expenditure trends across provinces.

Diagram 5



Source: Development Bank of Southern Africa (2012)

The delayed attention to road infrastructure maintenance affects more than trade facilitation. What should inform policy makers and government officials as a corrective measure to the continuing deterioration of road infrastructure in South Africa is as Rodrique and Notteboom (2013) put it, that, in a number of regions around the world, transport markets and related infrastructure networks are seen as key drivers in the promotion of more balanced and sustainable development of the region or even the entire continent, particularly by improving accessibility and the situation of weaker regions and disadvantaged social groups.

The on-going under- spending of both the provincial and local government invariably leads to backlogs in the maintenance of road infrastructure and has a cumulative effect in the long run. Not only does the wider road network deteriorate but also the financial implications become too high and thus put extra pressure on the fiscus. Transport modes and infrastructure are depreciating assets that constantly require maintenance and upgrades (Rodrique and Notteboom, 2013, n.p.).

Diagram 5 above illustrates the overall age of the South African road infrastructure. With the average economic life of a road being twenty years (with necessary periodic maintenance) it is apparent that in 2008 over 70 percent of S.A roads were above their 20 year life period. The major challenge confronting South Africa's road network is that there is huge backlog in road maintenance and rehabilitation (Development Bank of Southern Africa, 2012, p. 51). The severity of this problem and resultant consequences are well captured by the Automobile Association and it lists three major consequences of the deterioration of the road network as follows:

- The cost to repair the roads is said to be seven times more than it would have been if adequate maintenance had been done.
- The backlog in funding grew to R65 billion in 1999 and,
- Road user costs are twice as high on the road in poor condition as compared to a road in good condition (Development Bank of Southern Africa, 2012, p.50).

Based on the illustration of diagrams 2, 3 and 4, and the observation of the Automobile Association, there is one logical deduction that can be made, and that is though there has been a steady increase of budget allocations to provinces for the upgrade and maintenance of the road network this is a miniscule of what is really needed to deal with the backlog for road maintenance and rehabilitation. Current investment levels are insufficient and maintenance programmes are lagging. This further lends credence to the fact that, the freight system in South Africa is fraught with inefficiencies at system and firm levels there are infrastructure shortfalls and mismatches (Department of Transport, 2005,p. ii). Perhaps a concentration by government and in particular SANRAL on primary network with a constant neglect on the secondary network needs to be reviewed. SANRAL with its capital expenditure and the right skills and experience that it has in managing the primary road network can and should increase the road network under its management. To address this deficiency and secure the benefits that well planned functional infrastructure can generate, there is a need for government to increase the amount they invest into infrastructure (World Economic Forum 2012, p. 4). However, it should be noted that this is just one part of the solution.

Given the government's limited finance, private funding will need to be sourced for some of these investments, and policy planning and decision-making will require trade-offs between competing national goals (Department of Performance Monitoring and Evaluation,2009/14,p.1). A re-look at other systemic issues is necessary in effectively dealing with the backlog in maintenance, funding and skills problems. An effective way to apply traffic demand measures is urgently needed. In addition, the lack of appropriate asset management systems for paved and gravel roads, primarily at municipal level have resulted in an inability to monitor the conditions of the road network. This means that necessary interventions by means of maintenance and rehabilitation activities are not done. This also has significant implications for the cost of intervention which grows

exponentially with increasing deterioration of the network (Development Bank of Southern Africa, 2012, p.151).

Joynt (2004, pp.3-41), argues that transportation is determined by both supply and demand side. This argument is based upon what he calls the relationship between the activity system (land use system) which is what determines the demand for transport, and the supply side of transport which is a function of the transport system itself, and include road transport. Kessides in (Development Bank of Southern Africa, 2012,p.6) concurs with this argument and states that, infrastructure contributes to economic growth through both supply and demand channels by reducing costs of production, contributing to the diversification of the economy and providing access to the application of modern technology, thus raising the economic returns to labour.

Both these perspectives are important to this study for two reasons. Firstly, present and future demand of road transport infrastructure is based on forecasting model for both freight and passenger user demand patterns. This then has to inform planning. The planning exercise which should holistically be based on market demands for both domestic and regional trade will heavily rely on accurate data provided by the modelling techniques for the supply, rehabilitation and maintenance of road transport infrastructure. The analysis of the impact of road infrastructure investment on economic development must consider the local economy, market and other conditions, as well as the factors that influence decision making (Joynt, 2004, pp. 3-10).

Without accurate data, the in-depth study of present and future travel demand patterns, and an appropriate assets register for both the primary and secondary road network there is a possibility that South African road network, already with over 70% of its roads having reached their end of service period will get worse. Joynt (2004,pp.3-48) investigated the locational and real effects of developing a new road with the aim of stimulating economic activity in the real estate market and he concluded that, road infrastructure investment in areas of an underdeveloped market will not attract any significant retail development.

Owing to high costs of relocating business, relocation decisions will only be based on favourable market conditions with clear supply and demand characteristics. A case in point here for South Africa is the fact that there are already known road networks for heavy freight haulage, for example segments of provincial roads in Mpumalanga and

Limpopo that are extensively used for coal haulage clearly indicating the systems activity around that province due to coal mining.

These road networks having been built because of the agglomeration of coal mining in the area need regular maintenance than the provision of new road network. This also ties with a common argument advanced by many economists that a construction of a new road may not necessarily lead to growth in the economy or production efficiencies. Given the scarcity of resources, the maintenance of the existing road infrastructure makes more sense. This view is also reiterated by Development Bank of Southern Africa (2012, p.54), that maintenance of existing infrastructure is as important, if not more important than development of new roads. An assertion to the same effect was expressed in the Mail & Guardian (Nov. 29 to Dec 5 2013: 8) that, operations and maintenance needs to be inherent in all South African infrastructure development otherwise South Africa will simply be building and demolishing.

It is however comforting to a particular degree that a labour intensive road maintenance program called S'hamba Sonke has been launched with an allocation of R22, 3 billion over the MTEF (2009-14) period. Expenditure estimates for road transport infrastructure from SANRAL show that expenditure increases from R16, 7 billion in 2008 to nearly R29 billion in 2013, peaking at R33, 2 billion. This is mainly due to the Gauteng Freeway Improvement Project by SANRAL. Government boosted transport infrastructure spending to R66 billion in the 2011/12 financial year. Over the next three years an additional R2, 5 billion will be allocated to municipalities for public transport systems and infrastructure (Department of Transport, 2014, p.7).

Furthermore, spending focus over the medium term will be on facilitating capital investment and the development of roads and roads infrastructure in South Africa through the transfer of funds to provinces, rural municipalities and the South African National Roads Agency. As a result, expenditure under transfers and subsidies in the Road Oversight programme amounts to 99.5 per cent of the programme , or R19,5 billion, in 20/14 (Department of Transport, 2014,p. 51).

Despite such impressive allocations and committed funding, it is important to emphasise the need for a thorough diagnosis of the underlying problems both in provinces and local municipalities. A comprehensive solution that includes funding levels for backlogs, skills and inherent systemic problems of coordination and integrated planning is highly important.

5.8. Implications for Trade facilitation

In an increasingly globalised and interdependent world, development prospects are heavily reliant on well-functioning lower cost and quality transport systems, a transparent and simplified regulatory framework and efficient trade procedures. Consequently improved understanding of the driving forces currently altering the world transport and trade systems and their inter-relationships is necessary in order to help devise adequate policy measures that promote trade competitiveness through reduced transport and trade costs (UNCTAD, 2013).

The Medium Term Strategic Framework (MTSF 2009-2014) does make a pronouncement on the need to ensure that the regulatory framework does not become inhibitive to trade and economic development. Sub-Outcome Three of the MTSF states that, the elimination of unnecessary regulatory burdens and lower prices increases for key inputs and wage goods foster business confidence, reduces costs for working people, and sustains investment and economic growth.

Nonetheless a plethora of literature point to the fact that transport infrastructure deficit add to the cost of doing business as this is linked to a number of factors inherent to the nature of trade and transportation. These factors include logistics cost, vehicle maintenance costs, reduced travel times, connectivity and accessibility. The salient point is that a relationship between the quantity and quality of transport infrastructure and the level of economic development is indisputable. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity and reliability, they can have economic cost such as reduced or missed opportunities and lower quality of life (Rodrique and Notteboom, 2013, n.p.).

To elucidate further on the impact of inefficient and inadequate transport infrastructure, and in particular road transport infrastructure, it becomes increasingly important to look at the socio-economic impacts of this mode in relation to trade facilitation. The underlying framework of analysis here is that trade must always lead to development and anything that impedes efficient trade facilitation is prohibitive to socio-economic development. The DBSA mentions five spheres of economic activity where road infrastructure supports

improving efficiencies in economic development and for purposes of this study, these three are of relevance;

- Distribution and structure of employment: the geographic distribution of remunerative jobs is both directly and indirectly associated with transportation systems.
- Distribution of regional output and income: the share of production and economic output generated by different geographic regions.
- Distribution of sectoral output and income-the share of total production and output attributable to particular economic sectors.

The ability of people to move from one location to the other for better job opportunities increases the pool of requisite skills in a particular sector and this leads to more efficient productivity and innovation. Inadequate or inefficient road transport infrastructure can have a negative impact on the mobility and presence of natural persons by creating mobility gaps. Rodrique and Notteboom (2013) assert this proposition by stating that, since mobility is one of the fundamental components of the economic benefits of transportation, its variations are likely to have substantial impacts on the opportunities of individuals. Mobility needs do not always coincide due to several factors, namely the lack of income, lack of time, lack of means and lack of access.

Both market and product diversifications are indications of the level of regional integration. This also has an important implication for countries or regions like sub-Saharan Africa to develop sustainable regional value chains and take advantage of economies of scale. The evolution of the production process and associated services has led to the importance of regional and global value chains and their prominence in shaping industrial policies both in developed and developing countries. Inefficient road transport infrastructure does have a negative impact on the sustainability of such value chains as modern production processes are highly sensitive to time and input cost. South Africa should focus on diversifying the economic base. This should include building the capacities required to produce capital and intermediary goods for the infrastructure programme and sub-Saharan Africa. In this case, the country should lay the foundations for more intensive improvements in productivity, including infrastructure delivery and services (Department of Performance Monitoring and Evaluation, 2009-2014, p.1)

The reduction in transport costs means reduction in commodity costs to the business and the consumer with the possibility of business being able to re-invest profit into expanding production and the creation of more jobs. Locations that have low levels of accessibility tend to have higher costs for many goods (sometimes basic necessities such as food) as most have to be imported, often over long distances. The resulting higher transport costs inhibit the competitiveness of such locations and limits opportunities. Consumers and industries will pay higher prices impacting on their welfare (disposable income) and competitiveness (Rodrique and Notteboom, 2013, n.p.). The OECD (2002,p. 9) report sums it succinctly by stating that in many cases the objective of transport infrastructure investment is to improve accessibility of a given region by reducing travel time or increasing the potential to travel.

Transport as part of the wider logistics network in the facilitation of trade, and road transport in particular is susceptible to a number of other costs which can be avoided by effective development and maintenance of road infrastructure. Vehicle maintenance costs, delays due to reduced speed on the road network as a result of road deterioration, and the outright lack of accessibility to points of consumption or export/import gateways all do accrue as costs that inhibit efficient trade facilitation.

Ittman and King (2010) put emphasis on logistics costs of bad road infrastructure and they state that, the effect of bad roads on logistics costs has been quantified and reported on in the 6th State of Logistics Survey. A case study was conducted which showed that a company's logistics costs could increase by as much as 10% when travelling on a poorly maintained road. They further report that, the bad state of roads in the country is already adding to logistics costs and this will deteriorate if the situation is not attended to (Ittman and King, 2010,n.p.)

The principle of Just-in-Time in production processes is also sensitive to time as are other products like fresh produce. Given the fact that the larger part of secondary network in South Africa is the one that is in a deteriorated state, this will have negative economic impact on many agricultural producers due to the lack of access to markets and importantly the cost related to getting such product to the markets. According to Shahia and Smuts as quoted in (Joynt, 2004,pp 2-

5) travel time is the principal characteristics of supply of many types of transport. However, one should bear in mind that travel time has a cost implication that is influenced by the price of the transport service. A further reference to the impact of travel time in as far as road infrastructure is concerned is by Weisbrod and Treyz as quoted in (Joynt, 2004, pp 3-24), and they state that it is important to note that some elements of reduced travel times for shipment trucks an “on-the-clock” business travel, lead directly to cost savings, and hence productivity benefits for business.

It is apparent that a number of costs related to bad road infrastructure can have a negative effect on business and consumers alike. The damage that is caused to vehicles because of the deterioration of the road lead to high vehicle maintenance costs, delays due to long travel time impact on the efficiency of the production process and the ability to trade on certain produce which are time sensitive. Transportation economists use the concept of Total Transport Costs in their analysis. Total Transport Costs is calculated by summing all construction, maintenance and rehabilitation costs spent by the highway agency, with the costs of operating vehicles spent by the driving public. More agency costs lead to fewer vehicles operating costs. Theoretically, there is an optimum level of road maintenance which minimises Total Transport Costs (<http://www.sanral.co.za>).

Inaccessibility and the lack of connectivity to the primary network all have a bearing on the efficiency of trade. The function of the road network to provide access and mobility to facilitate economic and social linkages and ultimately promote economic development and stimulate exports is thus compromised by the lack of proper road infrastructure maintenance (Development Bank of Southern Africa, 2012, p. 14).

6. Conclusion

The significance of road infrastructure development and maintenance lies in its ability to positively contribute to trade facilitation. In essence the availability of both human and financial capital to continuously repair and maintain existing road infrastructure plays a critical role in reducing the costs for building new roads and in moving people and goods from the point of production to the point of consumption.

Roads can enable and catalyse both economic and social development or roads can constrain or block development thereby jeopardising the country's growth potential (Department of Transport, 2006, p.3).

This study has focused on the importance of road infrastructure development and maintenance and its importance for trade facilitation. Since trade is in itself an economic activity and its flow is highly depended on transport, the starting point was to explore the role that road infrastructure plays in trade facilitation. It became imperative to look at what impediments do exist in the sub-Saharan Africa and lastly use South Africa as a case study to highlight various challenges in this mode of transportation.

In addressing the two questions; how can road transport infrastructure contribute to intra-regional trade, and what are the economic implications of neglecting road transport infrastructure? The study has demonstrated that lack of well-developed and maintained road transport infrastructure can be an impediment to growth and intra-regional trade. The lack of access to markets for both primary inputs and products limits the region and member countries to grow their exports, to diversify and become competitive.

Furthermore, the high costs associated with transportation and the inability of the freight logistics system in the region to meet demand affects many locational choices for investment and this renders the region unattractive to foreign direct investment. This also becomes the stumbling block for SMME's in the region to grow and thus a hindrance to the establishment of viable value chains based on the competitive advantage of many countries in the region.

Transport is an input cost and as such the high costs incurred in the import and export of goods ultimately passes on to the consumer. This further makes the region uncompetitive when compared to other developing economies in the world. Producers

also suffer due to high transport costs. The case study at the beginning of Chapter 2; **Transport Costs, Market Access and Rural Income in the Democratic Republic of Congo** is a clear illustration of the disadvantages associated with high transport costs.

For sub-Saharan Africa to move from being an exporter of primary goods and an importer of finished products, a mind shift in industrial policy is needed. Needless to say, this mind shift must be accompanied by the necessary road transport infrastructure maintenance and services to serve the region optimally.

Another challenge that contributes to the suppression of increased trade flows and market integration, which directly has a relationship with road transport infrastructure, is the issue of policy coordination and cooperation among member states in sub-Saharan Africa. Trade facilitation measures can be undertaken along two dimensions; a “hard” dimension related to tangible infrastructure such as roads, ports, highways, telecommunications, as well as “soft” dimension related to transparency, customs management, the business environment and other institutional aspects that are tangible (Perez & Wilson, 2010,p.2).

The emphasis here is that cross border trade involves more than one country and thus it is imperative that sub-Saharan African countries establish harmonised road infrastructure development and maintenance standards including all aspects that relate to behind the boarder issues. Trade and transport facilitation efforts should be aimed at harmonisation of standards, inter-governmental and inter-agency cooperation and a dedicated vision by regional member states to find a solution to a retrogressive situation of less integrated markets and deteriorating regional road transport infrastructure. It is opportune, with the Bali Trade Facilitation Agreement of 2013, which aims to streamline customs procedures and remove trade barriers for African countries to work together to effectively address issues of fragmented markets.

Budget allocations to road infrastructure maintenance are clearly not matched with institutional or human resource capacity. This mismatch is a recipe for unspent or at worst misspent resources allocated for this purpose. In the case of South Africa the issue of lack of capacity at both the provincial and local government can arguably be based on the lack of planning. The lack of proper management planning tools like the Road Network Management System tool will continue to hinder the acquisition of requisite skills and expertise, and more importantly to hinder proper projections in terms of the status of different provincial and municipal roads and their maintenance

needs. This calls for an urgent need to put appropriate systems in place, recruit and train personnel to be able to efficiently perform their duties and thus strengthen capacity at that level of government. The problem is likely to persist if institutions are not properly empowered and strengthened with requisite skills to deal with various problems that relates to road infrastructure development and maintenance. As a recommendation government needs not only to better coordinate collaborative investment by business and provincial and local government into key infrastructure projects, but to shape its institutional, policy and regulatory environment in order to enable investment, realise desired efficiencies, improve infrastructure delivery and maintenance and contribute to economic growth and employment creation (Department of Performance Monitoring and Evaluation, 2009-2014, p.2).

The issues of human resource development, proper coordination, and policy implementation amongst the various institutional players and a dedicated allocation of resources towards continuous maintenance of the road transport infrastructure is recommended as a long term solution in order to reverse the current status of road infrastructure degradation.

Bearing in mind governments' limited resources and competing priorities, it is evident that with the growth of freight movement on South African roads already exceeding projection by fourteen years (Department of Transport, 2005,p.9), there is a need to look at inter-modal operations for the movement of freight in strategic and key trade corridors in the country. Although the focus of this study is on road infrastructure development and maintenance, the manifestation of the degradation and maintenance backlog of the secondary road network does justify a thorough effort of inter-modal mix in the regions' freight movement industry to relieve congestion on the road. This means investment in rail and the development of navigable waterways to move goods and people.

There is a strong case for a regional approach to transport infrastructure as there is for a regional approach to transit traffic facilitation (UNCTAD, 2009). The development of freight and trade corridors along strategic economic development zones with the objective of linking inland manufacturers with different transit points is exceedingly important for regional integration, seamless movement of goods, cutting of costs and also to address issues that relate to customs and transit procedures. Simultaneous action is required at both the supra-national and national levels. Regional communities can provide the framework for reform, for example by bringing together regulators to define harmonised standards or to agree on mutual recognition (World Bank, 2012, p.xvi).

The current conceptualization of corridor development as a means of heightening regional integration and the development of RVC's among these corridors is the step in the right direction to deal with the issue of infrastructure deficit in the region. The role of corridor management should be consistent with the goals that the trade corridor is meant to achieve. While there is a common objective of providing for efficient movement of trade, there are often broader economic goals that the corridor is meant to achieve (Arnold, 2006, n.p.).

As a matter of policy, by addressing the freight infrastructure challenges at home, the South African National Freight Logistics Strategy (2005) must seek to establish mechanisms for the integration of regional transport projects which will include the harmonization of transport standards within sub-Saharan Africa. As a further recommendable action point, there is a need for transport planning, led by central government to formulate credible long-term plans for transport that synchronises with spatial planning and aligns infrastructure investment activities of provincial and local government and clearly communicates the state's transport vision to the private sector (Department of Performance Monitoring and Evaluation, 2009-2019, p.5). Though there is a common pattern of road infrastructure neglect in the region, it is also important to consider the unique challenges of each country. These relate to issues of governance, investment capabilities in road infrastructure development and maintenance and both the geographic and topographical conditions of each country.

Finally, the economic implications in the neglect of road transport infrastructure maintenance can succinctly be put as, lack of market access, lack of regional competitiveness, unattractiveness of the region to foreign direct investment, lost opportunities in terms of impeded growth for both manufacturers in the region and small scale farmers, lack of diversification of markets and products and lower GDP. These are largely the issues that policy makers and implementers in sub-Saharan African region need to strongly nuance for the region to be a forceful player in the global trading system.

Bridging the infrastructure gap will be a key enabler of regional integration, growth and development. It also remains a key challenge and opportunity for investors (Ernst and Young, 2012, p.6)

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