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Road Infrastructure Gap: Kenya's Experience, 2000-2010

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Abstract
One cannot fail to appreciate the significance of road infrastructure to the Kenyan economy. However, for close to 3 decades, Kenya's road network has been in poor order resulting to a road infrastructure gap. Most of Kenya's road infrastructure is in urgent need of maintenance, rehabilitation, upgrade and new construction so as to reduce the infrastructure gap in terms of quantity and quality. It will benefit the policy makers of the County and Central Governments to know to what extent is Kenya's road infrastructure gap. Consequently, this study purposed to surgically analyze the state of Kenya's road infrastructure gap. The study employed a descriptive analysis on Kenya's road density, road indicators benchmarked against Africa's Low and Middle-Income countries, and Infrastructure Index on Global Competitiveness. The results of the study indicated that Kenya's road density was constant at 11km/100sq.km from 2000 to 2010 and grew to 28km/100sq.km in 2011; there is a 234% deficit of Paved Road Density and a 12% deficit of Unpaved Road Density in Kenya when compared to MIC. Additionally, it was found that there exists a road infrastructure gap in Kenya of 66.7%, 28.2% and 25.6% to France, Rwanda and South Africa respectively. This study may be particularly useful to the policy makers of the Ministry of Transport and Infrastructure.

Keywords: Road Infrastructure Gap, Road Sector, Road Density, Transport, Kenya

1. Introduction
The road network infrastructure is central to the country's economic growth and development. In a progressively inter-connecting global community, the capacity of the Kenyan economy to compete and flourish will hinge on the quantity and quality of road network infrastructure. However, this paper established that in the recent past, the mentality in Kenya as regards to road infrastructure has been one for regular maintenance and rehabilitation that resemble automated patch ups. This clearly showed that the bureaucracy lacks planning and therefore placing Kenya at a disadvantaged position of not competing with other countries, both currently and in the long term, that are investing in their road infrastructure to gain economic advantage (British Chamber of Commerce, 2011). The researcher is of the view that the Kenyan government both at County and Central level must engage all the concerned departments of the road sector onto a drawing board for a long standing methodology to design, procurement and administration of road infrastructure void of political interference and consequently promote economic growth across all sectors.

2. Road Infrastructure: A Brief History
Ogonda and Onyango indicate that the road network in Kenya was primarily constructed to aid the railway network i.e. to supply road feeder links to the railway stations through the railway line. The underlying principle for this kind of approach was that road feeder networks offered speed, flexibility and the capacity to adapt with volume brand (Ochieng', 2002) [7]. Apparently the Kenyan experience demonstrates that road transport supports the efficiency and quick exchange of goods and services to the degree that reflects great significance in contrast to the other the forms of transport. Nevertheless, it is of importance to note that the development of road transport consequently resulted to the neglect and deterioration of the railway network in Kenya.

The British colonizers were responsible for the design and construction of the road networks in Kenya. However, this enormous task was sub contracted to the Imperial British East Africa Company (IBEAC) that under took the construction for the period starting the 1890s through to the 1940s. Road construction along the railway line began from Mombasa in the Coastal region and cut across the face of Kenya to Uganda. Some of the roads that were constructed by IBEAC include Mackinnon Road, Machakos Road Station, Sclater Road among others (Ochieng' and Maxon, 1992).

It is important to point out that during the period of Kenya's Independence, the road network system was largely of gravel and earth roads with a handful bituminized trunk roads which linked the main trade centers of the country. At that time, Kenya had a classified road network of 41,800km out of which 1,811km was tarmacked (Ochieng', 2002) [7]. After independence, the Kenyan government assumed the role of nation building and recognized that road transport was a key factor for the growth and development of the economy. The subsequent table points out the various policies that the government implemented for the development of the road networks.

Table 1.1: Road Network Development since Independence

Development Plan	Roads	Government Policy/Program
DP 1963-70: Upgrade of heavy traffic trunk roads and Primary roads to bitumen and gravel standard. -Construction of Feeder roads.	Nairobi-Mombasa. Mombasa-Malindi. Kiganjo-Nanyuki. Sagana-Embu.	-Special Purpose Roads Program, 1964 i.e. tea, sugar, rice, wheat and tourism roads.
DP 1970-74: Construction of Feeder and Minor roads. -Selective bituminization of trunk and primary roads.	Ahero-Isebania. Athi River-Namanga. Kakamega-Webuye. Yala-Busia.	-Expansion of Special Roads Program in Settlement Areas. -Transport Policy-Freedom of Licensing Road Haulers.
DP 1974-78: Boosting Rural Development through improved road accessibility. Major bituminization program	Mombasa-Lunga Lunga road.	-Rural Access Road Program, 1974. -Gravelling, Bridging and Culverting Program.
DP 1979-83: Balance development of entire road system.	Mombasa-NairobiMalaba. Molo-Kericho-KisumuBusia.	-Continuation of Rural Access Road Program and Gravelling, Bridging and Culverting Program. -Revision of existing laws and vigorous enforcement of traffic rules with regards to axle-load and Vehicle dimensions.

(**Source:** Onchieng' and Maxon, 1992)

Further observations showed that through the 1980s and 1990s, the agenda for road network development emphasized on the rural oriented road programs, improvement of the secondary and minor roads as well as the rehabilitation and reconstruction of the failed bitumen roads constructed in the 1960s. It was further noted that development work on the Kenyan road network was adversely hampered in the 1990s due to the donor funds freezing by the development partners early in the 1990s, as well as the negative impact of the El Nino rains between the years of 1997-98 (Ministry of Transport, 2013) [11].

Current Scenario

Road Network

It is of importance to note that reports from the Central Bureau of Statics revealed that the classification of the Kenya road network was finalized in 1970 to fall under either of the following classes. These include

a) A International Trunk Roads: Link the centers of international importance and crossing international boundaries or terminating at international airports.
b) B National Trunk Roads: Link nationally important centers. iii. C Primary Roads: Link locally important centers and higher class roads. iv. D Secondary Road: Link locally important centers and to higher class roads.
c) E Minor Roads: Any link to a minor center.
d) F Special Purpose Roads: Include parks, township, agriculture, fish and strategic roads. Special Purpose Roads include government access, settlement, rural access, sugar, tea and wheat roads (Central Bureau of Statics, 2003) [2].

Kenya's trunk line system of roads supplies the fundamental regional and national connectivity which connects the capital city Nairobi to the Coastal region, the County city capitals, as well as to the inland international border crossings. However, Kenya is confronted with a massive rehabilitation backlog for roads that must be addressed before the trunk network can be considered to be in a maintainable condition. The Table 1.2 below portrays Kenya's road networks in kilometers along with their corresponding road classifications.

Table 1.2: Kenya's Road Networks in Kilometers

AGENCY	Road Class	Paved	Unpaved	Total
KeNHA	A	2,772	816	3,588
	B	1,482	1,156	2,638
	C	2,529	4,932	7,461
	Total	6,783	6,904	13,687
KeRRA	D	1,069	9,092	10,161
	E	461	24,448	24,909
	SPR*	46	9,817	9,863
	U**	692	84,442	85,134
	Total	2,268	127,799	130,067
	B	7		7

KURA	C	164	2	166
	D	169	367	536
	E	116	919	1035
	SPR*	64	552	616
	U**	1,620	8,569	10,189
	Total	2,140	10,409	12,549
KWS	C		230	230
	D		24	24
	E		704	704
	SPR*		7	7
	U**	6	3,612	3,618
	Total	6	4,577	4,583
	Total Classified	8,879	53,066	61,945
	Total Unclassified	2,318	96,923	98,941
TOTAL NETWORK		11,197	149,689	160,886

Source: KRB, 2007 [5]; *Special Purpose Road; **Unclassified

From Table 1.2 above, the road agencies responsible for various road classes have been indicated. They are: Kenya National Highway Authority (KeNHA), Kenya Rural Roads Authority (KeRRA), Kenya Urban Roads Authority (KURA) and Kenya Wildlife Service (KWS). It is of importance to observe that 93% of the road network in Kenya are classified under unpaved.

Road Density

A closer look at Kenya's road density revealed the alarming reality of the existing road infrastructure gap capacity especially considering the recent years from 2000 to 2011. The World.

Bank provides that "Road density is the ratio of the length of the country's total road network to the country's land area. The road network includes all roads in the country: motorways, highways, main or national roads, secondary or regional roads, and other urban and rural roads" (World Bank). With this in mind, it is disappointing to note that Kenya's road density was static at 11km/100sq.km from 2000 to 2010 only to improve in 2011 to 28km/100sq.km. It is also possible to be argued that the plight of Kenya's road network in the years preceding to 2000, road density was more or less the same as indicated in the Table 1.3 below.

Table 1.3: Road Density of Kenya

Year	Kenya's Road Density (km/100sq.km)
2000	11
2001	11
2002	11
2003	11
2004	11
2005	11
2006	11
2007	11
2008	11
2009	11
2010	11
2011	28

Source: factfish.com

It is puzzling to understand why the road density was constant considering the period 2000 to 2011. Reason for course could be attributed to the fact that the Government of Kenya projected a capital predisposition of road expenditure and investment in road maintenance as well as rehabilitation and upgrades as opposed to new road network constructions (Foster and Briceno-Garmendia, 2010) [3]. Furthermore, it is stated that the primary component of the GoK's Roads 2000 programme was "spot improvements, partial rehabilitation, and routine maintenance" of different roads (Ministry of State Planning, 2008). For the reasons mentioned, it was inevitable that the growth of Kenya's road density stagnated since there was no additional construction of road networks.

Factors Contributing to Road Infrastructure Gap

The current research identified the contributing factors that encouraged the road infrastructure gap in Kenya and its negative impact on the economy in general. These causative factors included: poor coordination between the road agencies, poor funding, poor maintenance, repair and rehabilitation of the existing roads, a lack of comprehensive and integrated transport policy framework, gross inefficiencies in the use of road funds, lack of adequate control in execution of roads, misuse of road facilities and lack of adequate R&D in road transport (Kasuku and Muchira, 2003). The research also identified that poor FDI regime in Kenya and consequently foreign investor flight out of Kenya (Nyamwange, 2007) [8] was a contributing factor to road infrastructure gap.

With these problems existent, it is clear that government of Kenya needs to address these issues at a systemic and institutional level for they appear to be chronic in nature. The bureaucrats and policy makers ought to draw up new policies and introduce sweeping reforms that will address these chronic problems. By enhancing governance and improving efficiencies and effectiveness, a lot can be achieved in a bid to address the road infrastructure gap in Kenya.

Reforms in the Road Sector

Since independence, the road sector has evolved through the following Acts of Parliament i.e. Public Roads & Roads of Access Act, Cap 399, The Mtwapa Bridge Act, Cap. 402, Traffic Act, Cap. 403, The Streets Adoption Act, Cap. 406 and Roads Tall Act, Cap.407 (Ministry of Roads, 2012). However, through the 1980s and 1990s, the condition of the Kenya road network continued to deteriorate major due to lack of funding so that rehabilitation of bad roads and the construction of new roads could take place. These worsening conditions called for introspection and consequently studies were carried out in Sub-Saharan African Countries under the supervision of the World Bank. Conclusions of the findings from the studies stated strongly that: "the creation of ownership, clarification of responsibilities, creation of stable financing for the sector and introduction of professional management in the sector had to be established and satisfied to guarantee functionality and sustainability" (KRB, 2007) [5].

The current research recognized that the government of Kenya had taken drastic steps in an effort to correct the existing road infrastructure gap. The Government rolled out the Kenya Vision 2030 in which the first Medium Term Plan (MTP) indicated the various guidelines for the road sub-sector developmental agendas that were to be implemented during the period 2008 2012 to address the problem of road infrastructure in Kenya among which included a National Integrated Transport Master Plan (KRB, 2007) [5].

The Table 1.4 provides to the various reforms that have been implemented in the Road Sector since the early 1990s through to late 2000s (KRB, 2007) [5]. These reforms project the sole objective of providing good and sustainable road infrastructure that would support Kenya's National Development Strategy in achieving the Kenya Vision 2030.

Table 1.4: Reforms in the Kenya's Road Sector

Year	Reforms	Objective
1993	The Road Maintenance Levy Fund (RMLF)	Provision of Needed and Stable Financing
1999	Kenya Roads Board Act, 1999	Provide Ownership
2007	The Kenya Roads Act, 2007	Established three road authorities i.e. Kenya National Highways Authority (KeNHA), Kenya Rural Roads Authority (KeRRA), and Kenya Urban Roads Authority (KURA).

Source: KRB, 2007 [5].

Administrative Structure of the Road Sub-Sector of Kenya

The current administrative framework for Kenya's Road sub sector is a result of the reforms that the government implemented through an Act of Parliament i.e. The Kenya Roads Act, 2007 that facilitated ownership of various road classifications, give clear cut mandate of the various road agencies as well as supply a more efficient and effective investment framework for road infrastructure development. This framework is illustrated by Fig. 1.1 below.

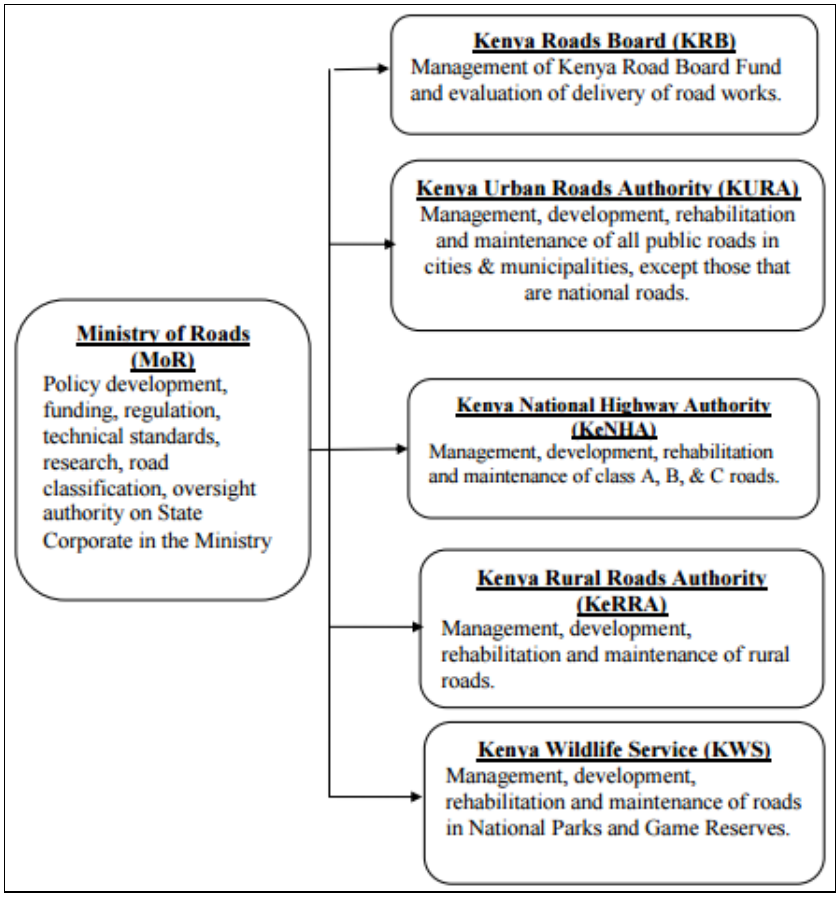

Fig. 1.1: Administrative Structure of the Road Sub-Sector of Kenya.
Source: KRB, 2012 [6]

Road Development Fund Allocation

In Kenya, the process of road development, maintenance and rehabilitation fund allocation is structured in a two-tier format. This is to state that the development of road transport is concurrently funded from two government agencies i.e. the Ministry of Roads [and Public Works] (GoK, 2001) and Kenya Roads Board (KRB, 2012) [6]. The mandate of road development, maintenance and rehabilitation solely lies on the Kenya Roads Board however; the Ministry of Roads also plays a role in funding the auxiliary services that are tied to road development i.e. Building and Works, Other Services and Roads (GoK, 2001).

The fund allocation by the Ministry of Roads and Public Works is furnished by the Central Government i.e. the Ministry of Finance through is annual budgets. This fund is outlined for development through their capital expenditure which includes, "General Administration and Planning, Consultancy, Design, Expenditure on Government Buildings, Other Buildings Works, *Development of Roads*, Materials Branch, Mechanical and Transport Department, Electrical Department, Staff Training Department, Housing Services and Loans to National Housing Corporation' (GoK, 2001).

On the other hand and as earlier noted, the KRB was established in 1999 through an Act of Parliament and was given the charge of Kenya's road network with a mandate of rehabilitation, maintenance and development. The KRB Act 1999, empowers the KRB to manage the Road Maintenance Levy Fund (RMFL) which is comprised of Fuel Levy and Transit Toll that is collected on behalf of KRB by the Kenya Revenue Authority (KRA). The other sources of funds for KRB include Agricultural Cess and income from treasury operations i.e. interests earned from the KRB's liquid assets (KRB, 2012) [6]. The Table 1.5 below indicates the different agencies responsible for the development, maintenance and rehabilitation of the different road classifications in Kenya as well as the source and purpose of the funds (KRB, 2012) [6].

Table 1.5: Allocation Principle by the KRB

Agency	Allocation Criteria (%)	Source of Funds	Purpose of Fund: Maintenance, Rehabilitation And Development of
KeNHA	40%	RMLF, Transit Tolls	A, B and C Roads.
KeRRA	32%	RMLF, Agricultural Cess	Constituency/Rural roads & link roads within the constituency.
Kura	15%	RMLF	Urban Roads within municipalities or cities.
Kws	1%	RMLF	Roads in National Parks and Game Reserves
Allocation By The Minister	10%	Ministry of Roads	Roads based on the five year Road Sector Investment Program (RSIP).
Krb	2%		Funds for KRB operations.

Source: KRB, 2012

Road Infrastructure Gap: Comparative Analysis

In order to meet the purpose of the study, three types of comparative analysis were carried out. First, Kenya's road indicators were compared to Africa's Low Income Countries as well as the Middle Income Countries. This was done to clearly demonstrate the existing road infrastructure gap of Kenya as compared to the other Sub-Saharan Countries. Secondly, Kenya's road density index was compared to a number of identified countries' road indexes i.e. Five 1st World Countries, the members of BRICs and the members of EACs. The objective of this was to establish Kenya's road density index gap. Thirdly, the researcher employed the use of Global Competitive Report 2012-2013 by the World Economic Forum considering the Infrastructure Index i.e. the Quality of Roads of Kenya compared to the five 1st World Countries, the members of BRICs and the EAC to further illustrate the existent road infrastructure gap.

Kenya's Road Indicators

Table 1.6: Kenya's Road Indicators Benchmarked against Africa's Low-and-Middle Income Countries

	Unit	Low Income Countries	Kenya	Middle Income Countries	Gap to MIC (%)*
Paved Road Density	Km/1000km^2 of Arable Land	86.6	152	507.4	**234**
Unpaved Road Density	Km/1000km^2 of Arable Land	504.7	930	1038.3	**12**
GIS Rural Accessibility	% of rural population within 2km of all season road	21.7	32	59.9	**87**
Paved Road Traffic	Average annual daily traffic	1049.6	1108	2786.0	**151**
Unpaved Road Traffic	Average annual daily traffic	62.6	38	12.0	**-68**
Paved Network Condition	% in good or fair condition	80.0	84	79.0	**-6**
Unpaved Network Condition	% in good or fair condition	57.6	63	58.3	**-7**
Perceived Transport Quality	% of firms identifying roads as a major business constraint	23.0	37	10.7	**-71**

Source: AICD, 2010 [1]. * Researcher's Analysis

Table 1.6 above presents Kenya's road indicators compared to the Low-Income Countries and Middle- Income Countries of Africa (AICD, 2010) [1]. To establish Kenya's road infrastructure gap, the researcher analyzed the gap between Kenya to Middle Income Countries as a percentage. From the table it is observed that: there is a 234% deficit of Paved Road Density and a 12% deficit of Unpaved Road Density in Kenya when compared to MIC. Further on, Kenya's average annual daily traffic on paved roads stood at 1,108 while that of the MICs is at 2,786.0. This point to a 151% deficit of traffic movement on paved roads. Consequently, this was supplementary evidence that there is a strong presence of a poor road network infrastructure in Kenya. Therefore, it was established that there is road infrastructure gap in Kenya especially for paved road network.

The other indicator that clearly pointed out Kenya's road infrastructure gap is the GIS Rural Accessibility Index. From the table above, it is indicated that there is a gap of 87% when compared to the MICs of Africa. This is to point out that the road network in the rural areas is not sufficient as it should be. The rational for Kenya's poor Rural Accessibility Index could be attributed to government's Roads 2000 programme that was committed to "spot improvements, partial rehabilitation, and routine maintenance" of different roads (Ministry of State Planning, 2008). However, Kenya fairs well in terms of the condition of the existing road network i.e. paved and unpaved.

From the table above, the quality of the paved and unpaved road network in Kenya is 6% and 7% better than those of the MICs. This could be attributed to the Government's programmes emphasis on road maintenance, rehabilitation, and upgrades as opposed to new road network constructions (Foster and Briceno-Garmendia, 2010) [3].

Road Density of Kenya compared to other Countries

In this section, the road density of Kenya was compared head to head with the road density for other countries with the objective of understanding the road infrastructure gap in terms of road density on a more global outlook. To determine the objective, the countries identified for this comparison consisted of a representative group such as those that are considered as first world countries, those considered as emerging economic blocks in the globe i.e. BRICS and lastly EAC an economic block home to Kenya. These categories formed the parameters for analysis as illustrated in Table 1.7 below.

Table 1.7: Comparison of Kenya to Other Countries on Road Density Index

Category	Country	World Ranking	Road Density (km/100sq.km)	Date
1st World	France	18	192	2011
	Germany	21	180	2011
	United Kingdom	24	172	2011
	Japan	45	90	2011
	USA	55	67	2011
BRICS	India	30	143	2011
	China	74	43	2011
	S Africa	88	30	2001
	Brazil	117	19	2011
	Russia	160	6	2011
East Africa				
Community	**Kenya**	**93**	**28**	**2011**
	Rwanda	62	53	2004
	Burundi	72	44	2004
	Uganda	90	29	2003
	Tanzania	152	9	2011
World			33	2011

Source: World Bank

Observations from Table 1.7 above indicated that in the 1st World category, France led the pack ranked at 18 with 192km/100sq.km even as the USA was distantly ranked at 55 with 67km/100sq.km while the average for the whole world was 33km/100sq.km. As regards to comparison to the 1st World countries, Kenya was out paced by all the 5 countries. But when compared to the countries of the BRICs, it was evident that Kenya out performed Brazil and Russia with a small margin i.e. 19km/100sq.km and 6km/100sq.km respectively.

Further observations from Table 1.7 above in regards to road density indexes of the EAC, Kenya outperformed Tanzania with a wide margin i.e. ranked 93 with 28km/100sq.km while Tanzania was ranked at 152 with a road density of 9km/100sq.km. In comparison with the other members of the East African Community, for the time being no conclusion can be drawn since their respective road density indexes were out dated. But it is of particular to note that by 2004,

Rwanda, Burundi and Uganda had moderately good road density indexes as compared to that of Kenya. This was for the reason that Kenya's road density was static at 11km/100sq.km from 2000 to 2010, and in 2011 it improved to 28km/100sq.km.

In conclusion, observations from the above Table 1.7 point out that Kenya has been found wanting in terms of road density for its road infrastructure. For in the current scenario, Kenya cannot measure up with the 1st World countries for the reason that they are clearly ahead. Rather, Kenya could borrow a leaf from other leader-countries in road infrastructure and therefore place itself at a position of opportunity in terms of cooperation with these countries so as to improve the quality and quantity of roads infrastructure. It is pointed out in the above table that Kenya has a higher road density than countries such as Brazil and Russia. This is to suggest that it is possible to scale up and better the quality and quantity of roads in Kenya by possibly pushing ahead and in a vibrant manner in its programs for road development activities.

The Global Competitiveness Report, 2012-2103: Infrastructure Index

The GCR provides a country's qualitative and quantitative aspects of growth integrated with concepts of social and environmental sustainability to provide of competitiveness as well as economic performance (WEF, 2012). The researcher employed the use of Infrastructure data from the GCR, 2012-2013 to map out the road infrastructure gap of Kenya when compared to the corresponding road infrastructure data of the identified countries used as a benchmark. It must be noted that the GCR considered 144 economies of the world, hence this was instrumental in establishing a clear picture of Kenya's road infrastructure gap.

Table 1.8: The GCR: Infrastructure Index

Country	Quality of Overall Infrastructure (QOI)		Quality of Roads (QR)		Quality of Railroad Infrastructure		Quality of Port Infrastructure		Quality of Air Transport Infrastructure	
	Value	Rank/ 144	Value	Rank/ 144	Value	Rank/ 144	Value	Rank/ 144	Value	Rank/ 144
1st World										
France	6.4	5	6.5	1	6.3	4	5.4	26	6.2	10
Germany	6.2	9	6.1	10	5.7	7	6.0	9	6.4	7
United										
Kingdom	5.6	24	5.6	24	5.0	16	5.8	12	6.0	22
Japan	5.9	16	5.9	14	6.6	2	5.2	31	5.3	46
USA	5.6	25	5.7	20	4.1	18	5.6	19	5.8	30
East Africa Community										
Rwanda	4.9	48	5.0	40	n/a	n/a	3.5	109	4.3	84
Burundi	2.3	142	2.7	121	n/a	n/a	2.6	136	2.8	139

Kenya	**4.0**	**80**	**3.9**	**72**	**2.5**	**72**	**3.8**	**91**	**4.8**	**65**
Uganda	3.4	110	2.9	110	1.4	111	3.8	90	3.8	107
Tanzania	3.1	124	3.2	94	2.3	82	3.3	117	3.5	117
BRICS										
India	3.8	87	3.5	86	4.4	27	4.0	80	4.7	68
China	4.3	69	4.4	54	4.6	22	4.4	59	4.5	70
S Africa	4.5	58	4.9	42	3.4	46	4.7	52	6.1	15
Brazil	3.4	107	2.7	123	1.8	100	2.6	135	3.0	134
Russia	3.5	101	2.3	136	4.2	30	3.7	93	3.8	104

Source: WEF, 2012

Table 1.8 above presents the GCR, 2012-2013 on infrastructure whereby the indexes for Quality of Overall Infrastructure are displayed as well as the Quality indexes for Roads, Railroad, Port and Air Transport infrastructure. However for the purpose of the study, the researcher focused more on the indexes of Quality of Roads (QR) and Quality of Overall Infrastructure (QOI).

To begin with, from the table above, it was seen that the QOI of Kenya had a value of 4.0 and ranked at 80 out of 144 economies. However, the QR of Kenya was at 3.9 ranked at 72 out of the 144 economies considered in the same index. This is a clear indication that Kenya's infrastructure in general calls for an improvements since a position 80 in ranking places it in the second half of the table which means that the infrastructure performance is below average. As regards to the QR of Kenya in consideration with the other countries with respect to comparison on competitiveness, Kenya was ranked at a distant 72 with a value of 3.9 while France was ranked at number 1 with a value of 6.5. This indicates a gap of 2.6 (66.7%) in the QR of Kenya when compared to France. On the other hand, Rwanda led in the EAC block with QOI of 4.9 and a QR of 5.0. This indicates a gap of 1.1 (28.2%) in the QR of Kenya. Further on, considering the BRICs, South Africa led with a QOI of 4.5 and ranking at 58 in terms of Infrastructure in general and a QR of 4.9 ranked at 42/144 in terms of road infrastructure. The road infrastructure gap of Kenya to that of South Africa is 1.0 (25.6%) in the QR of Kenya. The above analysis clearly illustrates the road infrastructure gap that is existent in Kenya in terms of Quality of Roads as suggested in the GCR, 2012-2013. A road infrastructure gap in Kenya of 66.7%, 28.2% and 25.6% to France, Rwanda and South Africa is clear indication that the government of Kenya can no longer fold its hands and sit on the fence with the hope that things will sort out themselves. Consequently, this paper implies that there is need for possible further reforms in the existing road sector administration so as to progressively and vigorously increase the road infrastructure network in Kenya to address issues such as need for increased road density, increased rural accessibility as well as better road conditions other than just maintenance, rehabilitation and improvement.

The Road Ahead

This study sought to probe Kenya's road infrastructure gap. Additionally, the study proved beyond doubt that the factors contributing to road infrastructure gap are consistent and in tandem with the results of the study. Furthermore, indications from the study suggest that the infrastructure gap has been chronic in nature and calls for urgent, vigorous solution to address the existing road infrastructure deficit. It is important to note that there are several implications arising from this study relevant to future practice. Therefore, the researcher suggests the following recommendations to the concerned departments of the government:

1. As regards to poor coordination between road agencies:

a) Set up an Integrated Framework for Coordination and Cooperation between Road Agencies, Government Ministries and stakeholders.

2. As regards to poor funding and lack of efficiency in the use of Road funds:

a) Expansion of Resource Allocation by Government through increased budget allocations for road development.
b) Set up government centrally sponsored schemes for road development.
c) Raise road infrastructure investment capital from the financial market i.e. capital bonds.
d) Advocate for PPPs/Annuity Model/EPC on Road infrastructure development.
e) Prudence in the use of road funds i.e. elimination of corruptions, integrated audits of funds.
f) The government of Kenya to play significant role with respect to enhance the investment climate in Kenya with the intention of attracting FDI inflows in the road infrastructure sector.

3. As regards poor maintenance, repair and rehabilitation, misuse of road infrastructure facilities and lack of lack of adequate control in execution of road works:

a) Set up a National Asset Administration System (NAAS) to appraise the performance and monitor road infrastructure as well as facilitate maintenance and rehabilitation of road infrastructure.

4. As regards to the lack of a comprehensive/Integrated Transport policy Framework:

a) Intensified implementation of the recent "Integrated National Transport Policy: Moving A Working Nation, 2009" with a serious emphasis on "National Roads Development Policy Management.

5. As regards to the lack of adequate R&D in Roads development:

a) Government to promote R&D activities for Road Infrastructure with a special emphasis on the use of indigenous technology where possible.
b) Government to facilitate Technology transfer from developed countries for road infrastructure tailored to meet local needs.

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