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Road Facility Availability and Maintenance in Lagos State, Nigeria

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Abstract

The ever increasing population of Lagos metropolis mounts immense pressure on available infrastructural facilities including transportation network. Lagos State is presently estimated to have a population of about 14 million people with over 12 million, representing 90 per cent of the population relying mainly on road transportation for daily movements. The age of the roads, the continuous use of the roads coupled with untimely maintenance or sometimes near neglect manifest as rough surfaces and pot holes with resultant human discomfort, man hour lost, increased vehicular maintenance cost, vehicular accidents, loss of lives and property. The paper examines road facility availability such as traffic light, street light and culvert; and the conditions of the roads in terms of smoothness, presence of potholes, and cleanliness. Simple descriptive statistics and the Road Maintenance and Quality Index (RMQI) were employed in the analysis of data generated from the sixteen roads selected from the three senatorial districts of Lagos State. The findings revealed inadequate provision of road infrastructure, poorly maintained roads, and general deplorable road condition. The paper stresses the need for timely and efficient maintenance of roads for improved road service delivery to ameliorate the present negative effects of commuting and ensure smooth, easy, and comfortable ride on Lagos metropolitan roads.

Key words: Road facilities, maintenance, road condition, Lagos metropolis

Introduction

Road transportation remains the main mode of transportation among other modes of transportation in developing countries. The importance of road maintenance in achieving efficient road transport delivery cannot be overemphasized as the consequences of neglect are enormous and costly. The effects of road roughness on users' costs are well documented (Johanneck, 2011; LAMATA, 2009; Parkerman et al., 2007). Johanneck (2011) noted that rough pavements reduce fuel economy, accelerate vehicle deterioration, increase vehicle maintenance and tire wear, and cost more to maintain and rehabilitate. On the average, estimated rough roads cost a Minnesota driver about $347 a year. The annual cost of rough roads for about four million drivers in Minnesota amounted to an estimated $1.3 billion in 2007.

The consequences of road deterioration and the paucity of road infrastructure in Lagos, Nigeria are arguably believed to exceed the Minnesota scenario considering the magnitude of the disrepair of the roads. The characteristic feature of most of the roads in Lagos State, apart from the major expressway in recent times, is the deplorable condition of the roads in terms of dearth of road infrastructure and maintenance. Nonfunctioning road culverts and street light, absence of other road infrastructure, and presence of numerous potholes make most roads very uncomfortable for commuting. This paper examines the condition of roads in Lagos Metropolis in terms of road facility availability and maintenance with the objective of providing qualitative evidence of the magnitude of road deterioration. The paper does this through road facility count, facility measurement and analysis using descriptive statistics and the Road Maintenance and Quality Index (RMQI) methods. The findings of the study are imperatives for the strengthening and refocusing of existing road maintenance strategies that will deliver smooth, time saving, and comfortable roads.

Methodology

The paper is based on data generated from primary sources complemented with secondary sources. The survey of road facilities and condition commenced with the selection of eight (8) metropolitan Local Government Areas (LGAs) from the three senatorial districts of Lagos State namely, Lagos Central Senatorial District (LCSD), Lagos East Senatorial District (LESD), and Lagos West Senatorial District (LWSD). In each of the LGAs, two roads were selected making a total of sixteen roads. The selected roads are tarred roads considered as main carriage ways, justified by the paving of the roads. The roads selected for the survey are, Apapa and Liverpool in Apapa LGA, Lewis and Alli in Lagos Island LGA; Pedro and Afolabi Brown in Somolu LGA; and Alaramimo and Musili Street in Agege LGA. The other are Alayabiagba Community Street and Amukoko-Safejo in Ajeromi-Ifelodun LGA; Ogunmokan and Mushin-Isolo in Mushin LGA; Ejigbo-Isolo and Ago Palace Way in Oshodi-Isolo LGA; and Old Ojo and Mile 2- Badagry Road in Amuwo-Odofin LGA as presented in Table1. The field work was in two parts starting with the listing of available road facilities, assessment of the functionality of the facilities and measurement of culvert and pothole dimensions in the months of September and October, 2011. Road facilities as used here refers to other aspects of roads apart from the carriage way, such as culvert, traffic light, road median, road marks and walk way while road maintenance is measured by the functioning of road facilities and the presence of potholes.

Table1: Spatial Spread of Selected Roads

SN	Senatorial District	LGA	Road
1	Central	Apapa, Lagos Islanc	Apapa Expressway, Liver Road Roa, Lewis Street, Alli St
2	East	Somolu, Agege	Afolabi Brown Street, Pedro Rc Alaramimo Street, Musili Stree
3	West	Ajeromi- Ifelodun Mushin, Oshodi-Iso Amuwo-Odofin, Ajeromi- Ifelodun	Alayabigba community Street, Amukoko-Safejo Road, Ogunmokan Street, Mushin-Isolo Road, Ejigbo-Isolo Road, Ago Palace Way, Old Ojo Road, Mile 2 Road

Source: Authors Field survey, October 2011

The second was the measurement of the depth and width of culverts and 10 major potholes on the respective roads.

Analysis of the collected data was done using simple descriptive statistics of frequencies, mean, range and percentages. In addition, we developed and used a standardized measure, the Road Maintenance and Quality Index (RMQI) to achieve a composite index for the explanation and classification of road condition into four categories of very poor, poor, fair, and good road condition. The RMQI ranges between 0 and 1, and the nearer the score is to 1, the better the road condition. It is symbolically expressed as:

$$RMQI = K\left(\frac{f}{\Sigma F} + \mu\right) 100$$

Where K = 0.5 (normalization Factor); f= number of facilities per road; F= expected total number of facilities; $\mu = 1/p$ (p= number of potholes per road and p>o).

The Study Area

Lagos State is located in southwestern part of Nigeria. It is bounded in the north and east by Ogun State, in the west by the Republic of Benin, and in the south by the Atlantic Ocean on the Bright of Benin. Lagos State is the fastest growing city in Nigeria and it is the second most populous and fastest growing city in Africa next to Cairo in Egypt. It has also been ranked as the seventh fastest growing city in the world. The population of Lagos State in1991 was 5.8 million and by 1997, the population was estimated as 11.58 million. Lagos State attained the mega-city status in 1995 when the population reached the 10 million mark (UN-Habitat, 2006). Presently, the State population is estimated at 14 million, a remarkable increase on the 2006 national census figure of 9.01 million.

Lagos State is Nigeria's economic capital as well as its financial and commercial nerve centre. The State accounts for over 33.5 % of national industrial establishment, 65% of its commercial activities, and over 45% of the skilled manpower in the country. Collectively, the socio-economic advantage has implications for traffic generation and flow; and road infrastructural provision. However, road provision has not met the sharp rise in the number of vehicles plying

the roads (Filani, 2011). As noted by Mobereola (2008), transport and services in the city in 2008 remained almost at the levels that supported a population of not more than 6 million about 20 years before.

Overview of Road Facilities Provision and Maintenance in Lagos State

Road facility provision within the context of this paper refers to available road facilities and their maintenance. Road maintenance involves activities programmed to preserve road infrastructure while road infrastructure include the carriage way, pedestrian facilities, drainage system, culverts, bridges and street light amongst others. Data in Table 1 shows the number of road and facility provision between May, 2007 and March 2011.

The State Government's effort at road maintenance has resulted in the reconstruction of some roads within the metropolis. Examples include,Western Avenue, Ekoro Road, Abule-Egba, Isheri Road, Oshodi/Isolo, LASU-Iba Road and Governor Road. Others are Ikorodu Road, Ikotun Road and the on-going Lekki-Epe Expressway. Although the reconstruction of some major roads and the rehabilitation of others have improved traffic flow but the proportion of these roads compared to other roads needing repairs or outright reconstruction is low. Some of the roads in the latter category are John Street and Oscar Ibru Roads in LCSD; Pedro Road and Famous Street in LESD; and Isolo-Ejigbo Road and Old Ojo Road in LWSD.

Table 1: Road Projects and Facilities in Lagos State (May 2007-March 2011)

Year	**ROAD PROJECT**		**Road Facility**			
	Completed	**Length (km)**	**Overhead Link Bridge**		**Pedestrian Bridge**	
			Completed	**On-Going**	**Completed**	**On-Going**
2007	21	19.69	-	-	-	5
2008	33	22.47	1	4	1	-
2009	45	77.94	2	-	-	-
2010	47	51.58	1	-	2	1
2011	4	4.36	-	1	-	-
Total	**150**	**176.03**	**4**	**5**	**3**	**2**

Source: Lagos State Ministry of Works and Infrastructure, 2011

Evaluation of road facility provision indicates very low level of provision. As Table 1 depicts, the provision of 4 overhead link bridges and 3 pedestrian bridges with a few on-going ones in five years (2007 – 2011) is considered to be grossly inadequate considering the paucity of these facilities prior to the reference years and the teeming population of Lagos State. Although information on the provision of other road infrastructure and the frequency and scope of road maintenance in Lagos State is not readily available if it exists, there is however an acknowledgement of the paucity of road facilities and poor road maintenance (LAMATA, 2009). In general, most of the feeder roads are unpaved and lack basic facilities like drainage, traffic light, and road signs. On the hand, where these facilities exist, they are either not functioning or clogged by dirt and weeds, as is the case with most drainage system. The deplorable road condition is exacerbated by increasing vehicular pressure on the roads. There are 222 vehicles to every kilometer of road in Lagos State compared to the national average of just 11 vehicles to every kilometer of road (LAMATA, 2009). According to LAMATA (2009), the Lagos road network density of 0.4 kilometer per 1,000 people is low, even by the standards of other African cities. Similarly, the network efficiency is low with limited number of primary corridor carrying

the bulk of the traffic and few of the junctions are signalized while poor drainage infrastructure combine with drainage clogging make most roads impassable during the rainy season. Poor street lighting, lack of pedestrian facilities and inadequate parking spaces are characteristic features of Lagos roads even in the central business districts of Lagos Island and Ikeja.
LAMATA (2009) succinctly summed up road condition in Lagos State in its paper on "Improving standards and safety of transport in Lagos State" where it listed transportation problems in Lagos Metropolis to include traffic congestion, worsening state of disrepair of roads, deteriorating physical attractiveness and comfort of road-based public transport, sky-rocketing transport fares, absence of effective rail and water mass transport, rising levels of road accidents and increasing rates of traffic-related emission and atmospheric pollution, and growing menace of Okada (motorcycle) transporters and areas boys. While the menace of area boys has been curtailed, the other problems have remained in most part of the metropolis.

Attempts at addressing these challenges have culminated in several efforts made over the years by the Lagos State Government at improving road infrastructure and road safety through it many transport agencies such as Lagos State Traffic Management Authority (LASTMA), Lagos State Drivers Institute (LASDRI), Motor Vehicle Administration Agency (MVAA), and Lagos Metropolitan Area Transport Authority (LAMATA). Although these agencies have strived to ensure improvement in transport provision, the level of their success was however limited mainly by the absence of well-defined duties for the respective agencies. Presently the Lagos Metropolitan Area Transport Authority (LAMATA) is the coordinating agency for transport policies, programmes and actions of all transport related agencies in the Lagos metropolis.
LAMATA was set up in 2002 to ensure the highest level of service in public transportation in the Lagos metropolis by executing the Lagos Urban Transport Project (LUTP). It is vested with the overall responsibility for promoting and developing public transportation in Lagos, managing the strategic road network in Lagos, promoting effective cost recovery in the transport sector and coordinating the delivery of transport projects in Lagos. Specifically, the Authority is designed to carry out the comprehensive maintenance of roads and related infrastructure, inventory of road and transportation network, continuous evaluation of road network status, overall improvement in traffic flow and planned and programmed traffic engineering and management works. Its other tasks include overall improvement of public transportation systems, and orderly and structured development of the rail and water transit systems, among others.

Road maintenance is addressed under LAMATA's urban road network efficiency improvement programme within four categories of maintenance and a fifth form identified in literature is the urgent or special maintenance works:

i. Routine Maintenance: This consists of operations that normally need to be repeated one or more times every year such as control of vegetation, cleaning of ditches and culverts, maintenance of bridges, crack sealing, maintenance of road signalization and repairs of shoulders
ii. Recurrent Maintenance: This involves filling or sealing of cracks, repair of potholes, treatment of swellings and depressions on the roads. These activities may be required at intervals throughout the year. The frequency varies with traffic, topography and climatic condition. They include surface patching, edge repair, and surface marking
iii. Periodic Maintenance: The periodic maintenance involve application of asphalt overlays, reconstruction of walkways, road markings and installation of concrete lined drains to control flooding. They involve some minor traffic system measures such as signage and traffic light

installation at some junctions. These activities are required to maintain acceptable safety, adequate drainage and ridging surface. Such activities include re-surfacing of bituminous surface dressing and paved roads.

iv. Rehabilitation Maintenance: The rehabilitation works involve reconstruction of pavements and application of an overlay of 50-millimetre thick hot rolled asphaltic wearing course. They also involve the reconstruction of drainage systems, kerbs and pedestrian walkways.

v. Urgent or Special Maintenance Works: These include removal of debris, fallen trees and broken vehicles, erection of warning signs and construction of diversions. They must be carried out with minimum delay to avoid danger to traffic.

In practical terms, these efforts have not yielded the desired expectations of road users for smooth, easy and comfortable ride as most of the roads are in poor condition. Examples of poorly maintained and ill equipped roads abound across the three senatorial districts of Lagos State such as Bishop Aboyade Cole Street in Victoria Island in LCSD; Bakare Street, Adebayo Street, and Awe Cresent in LESD; and Kunle Okunsi Street, Oshodi Link Road, Oshodi Street and Church Street axis in Oshodi LGA of LWSD. Exceptions to these roads are the major roads like the Lekki-Epe Expressway which is presently under construction, Muritala Mohammed Way, Ikorodu Road, Hebert Macaulay Road, and Akpogbon Road among others. In addition to the unkempt paved roads, the numerous unpaved roads which account for majority of the metropolitan roads are in more deplorable condition. Findings from the study affirm the above description and highlights specific aspects of road infrastructure and maintenance.

Results and Discussion

This section presents the results of the survey and analyzes the findings of road facility availability and maintenance in Lagos Metropolis.

Road Facility Availability

The level of availability of the ten (10) road facilities under study and their functionality varied within and between the roads as Table 2 depicts. In general, the roads lack basic facilities as only one road; Ejigbo-Isolo Road has a total of 5 facilities, representing 6.3% of the roads while 18.8% of the roads had 4 facilities each, 35.7% had 2 facilities each, and 31.3% of the roads had a facility each. The facilities, in order of their availability on the roads are culvert (100%), street light (37.5%), median (31.2%), and stop sign (18.8%) followed by traffic light, pedestrian bridge, trash bin, and walk-way with a 12.5% level of availability on the roads. In other words, apart from culvert which is present on all the roads (100%), street light stand ranked second in terms of availability followed by road median. The other facilities like traffic light, stop sign, pedestrian bridge, walk way and trash bin were very sparingly distributed among the roads. Bus shelter and zebra crossing mark were not available on the roads. The spatial spread of the facilities is random as the type and number of facilities shows no evidence of concentration.

Table 2: Road Facility Availability

Roads	Road Facility										
	Culver	Traffi light	Stree light	Stop sign	Bus shelter	Zebra	Pedestria Bridge	Media	Trash Bin	Wall way	Total
1. Apapa	x	0	0	0	0	0	0	0	0	0	1
2. Liverpool	x	0	0	0	0	0	x	0	0	x	3
3. Lewis	x	0	x	0	0	0	0	0	0	0	2
4. Alli (TBS)	x	0	0	0	0	0	0	0	0	0	1
5. Afolabi Brow	x	x	x	0	0	0	0	0	x	0	4
6. Pedro	x	0	0	0	0	0	0	x	0	0	2
7. Alaramimo	x	0	0	0	0	0	0	0	x	0	2
8. Musili	x	0	0	0	0	0	0	0	0	0	1
9. Alayabiagba	x	0	0	0	0	0	0	0	0	0	1
10. Amukoko-Sa	x	0	0	0	0	0	0	0	0	0	1
11. Ogunmokun	x	0	x	0	0	0	0	0	0	0	2
12. Mushin-Isolo	x	0	x	x	0	0	0	x	0	0	4
13. Ejigbo-Isolo	x	x	x	x	0	0	0	x	0	0	5
14. Ago-Palace	x	0	x	x	0	0	0	x	0	0	4
15. Old Ojo	x	0	0	0	0	0	0	0	0	x	2
16. Mile 2-Badag	x	0	0	0	0	0	x	x	0	0	3
Total	16	2	6	3	0	0	2	5	2	2	38

X= available; 0 = not available
Source: Authors' Field work, 2011

In terms of functionality of two of the facilities, namely, street light and traffic light, the findings show that only one road (Ejigbo-Isolo Road) out of the 16 roads had functioning street light and traffic light. Furthermore, the culverts at Ago Palace Way, Alayabiagba Street, Pedro Road, and Old Ojo Road were in less optimal state for drainage control as significant portion of the drainages were either completely clogged with dirt and sand as Plates 1 and 2 shows.

Plate 1: Blocked cuvert at Awofodu junction, Pedro Road

Plate 2: Clogged drainage on Alayabigba Street

Data in Table 3 further support the claim that the culverts were in less optimal status as significant proportion of most of the culverts are clogged and shallow. The percentage of unclogged culvert space ranged from 11 % to 64%. Only Alaramimo Road had its culvert with the original depth of 50cm while Amukoko-Safejo and Mushin-Isolo had over 50% available culvert space for flood control.

Table 3: Dimensions of Road Culverts

S/N	Roads	Original depth of Culvert (cm)	*Present Depth (cm)	Propotion covered (cm)	% unclogged culvert Space
1	Apapa Expressway	100	25	75	25
2	Liverpool	90	44	46	49
3	Lewis	80	15	65	19
4	Alli (TBS)	90	30	60	33
5	Afolabi Brown	80	15	65	19
6	Pedro	100	27	73	27
7	Alaramimo	50	50	50	100
8	Musili	50	20	30	40
9	Alayabigba community	100	32	68	32
10	Amukoko-Safejo	50	32	18	64
11	Ogunmokun	100	56	44	49
12	Mushin-Isolo	100	47	53	53
13	Ejigbo-Isolo	100	48	52	35
13	Old Ojo	150	46	104	31
14	Ago Palace Way	100	35	65	35
15	Old Ojo	150	46	104	31
16	Mile 2- Badagry	**	**	**	**

Source: Authors' Field Survey, October 2011

*Present depth is the average of the present depth of the respective culvert taken at three specific points (as at October, 2011), **culvert was completely filled with sand.

A higher proportion of the culverts have more than 60% space clogged by dirt. The clogged portion largely reduces the capacity of the culverts as channels for run-off water and flood control. The usefulness of the culverts at Pedro Road, Alayabiagba Street and Pedro Road (see Plates 1 and 2) is only in their presence and certainly not for flood control at their present state. It is pertinent to add that some of the culverts that are completely clogged at some points now complement the carriage way as pedestrians walk on them and danfo (commercial bus) drivers make illegal U-turns on them. The paucity of pedestrian bridges, traffic lights, and walkway make the roads less user friendly. Furthermore, the fewness of road side trash bins coupled with the care free attitude of most road users encourage indiscriminate disposal of trash on the roads and culverts.

Road Facility Maintenance

The deteriorating condition of the roads and the non- functioning of most of the available facilities attest to the level of repair of roads by government agencies charged with the responsibility of road maintenance. Evidence of neglect are visible on most of the metropolitan roads contrary to the expectations from the well outlined four categories of maintenance of the LAMATA's urban road network efficiency improvement programme. In terms of cleanliness, culverts on only three roads, that is, 18.8% of the culverts, were rated as fairly clean while the others were rated as not clean. The roads in the first category are Liverpool, Ogunmokun and Ejigbo-Isolo Roads. Culverts in the second group were largely covered by sand, trash (pure water sachets, empty bottles, and dirt), weeds, and stagnant water as shown on Plates 1and 2.

A more worrisome feature and glaring evidence of disrepair of all the roads surveyed is the presence of numerous potholes and failed sections in some cases as Plates 4 and 5 describe. Most of the potholes developed over time, from minor wear-out of road tar on a few spots to very large dimensions, and at some points covering more than half the width and a significant length of the respective roads as Plates 3 and 4 illustrate.

Plate 3: Pothole on Mushin-Isolo Road

Plate 4: Dilapidated road portion on Mile 2-Badagry Road

Untimely maintenance and low quality of road surface materials are the main underlying explanation for the development of "small size" potholes to "large size" and sometimes, "gully-like" and uncomfortable dimensions. The common experience is that potholes are left unattended to for several months and with continuous use, they deteriorate fast. The poor conditions of the roads show that the roads are yet to receive the attention of LAMATA under the recurrent maintenance approach. As presented earlier, recurrent maintenance is one of the four maintenance approaches of LAMATA's urban road network efficiency improvement programme. It involves filling or sealing of cracks, repair of potholes, treatment of swellings and depressions on the roads. Related to this, is the low quality of road surfacing and maintenance work as signs of road deterioration begin to manifest soon after completion of work. A good example is Idimu Road. Portions of the road that have been recently resurfaced already have many potholes while work is still ongoing on the other parts of the road.

The dimensions of the potholes and road condition also varied as Tables 4 and 5 depict. Pothole counts on most of the roads were in tens and hundreds. About 19% of the roads had less than 100 potholes while 81% had more than 100 potholes respectively. The number of potholes in the latter group ranged from 21 to 90 potholes on 3 roads while 13 roads, that is those with hundreds of potholes had between 120 and 755 potholes.

Table 4: Pothole dimensions

S/N	Roads	Number of Potholes	Depth of culvert (cm)		Width of culvert (m)		Number of clusters
			Mean Depth	Range of Depth	Mean Width	Range of width	
1	Apapa Expressway	329	19.5	5-36	2.13	0.5-3	27
2	Liverpool	65	10.1		1.67	0.5-2	-
3	Lewis	152	10.3	4-14	1.37	0.8	4
4	Alli (TBS)	292	10.8	4-14	1.41	1-2.4	14
5	Afolabi Brown	150	11.7	6-16	2.0	1-3	14
6	Pedro	221	16.8	8-22	4.8	0.5-7.6	38
7	Alaramimo	120	12	9-18	3.8	0.1-8	20
8	Musili	113	10.5	9-14	3.2	1-6	14
9	Alayabigba	90	23.7	0.9-54	3.8	2.7-6	8
10	Amukoko-Safejo	60	24.5	16-3.8	3.3	2-4	4
11	Ogunmokan	120	10.9	0.7-14	1.98	1-4	6
12	Mushin-Isolo	151	17.6	12-21	3.14	0.9-11	11
13	Ejigbo-Isolo Road	755	22.2	14-30	3.8	1.5-7	16
14	Ago Palace Way	204	16.7	10-29	2.5	0.8-6	9
15	Old Ojo	276	14.6	10-20	3.1	1.3-6	9
16	Mile 2-Badagry	214	21.6	10-32	2.9	0.5-6.6	8

Source: Authors Field Survey, October 2011

Specifically, Pedro, Old Ojo, and Alli Street had 221, 276, and 292 potholes respectively while Apapa Expressway and Ejigbo-Isolo Road recorded the highest number of potholes of 329 and 755 respectively. The depths of the potholes ranged from 0.7cm to 54 cm while the width ranged from 0.5m to 11 meters.

The numbers of pothole clusters on the roads ranged from 4 to 38. Pothole cluster refers to a group of at least 5 potholes located at close proximity and with the potential of merging as one big pothole if not repaired on time.

Table 5: Road Quality Status

S/N	Road	Road Facility count	Pothole count	RMQI	RMQI %
1	Apapa	3	329	0.152	15.2
2	Liverpool	2	65	0.215	21.5
3	Lewis	2	152	0.103	10.3
4	Alli	1	292	0.052	5.2
5	Afolabi Brown	4	150	0.203	20.3
6	Pedro	1	221	0.052	5.2
7	Alaramimo	2	120	0.104	10.4
8	Musili	1	113	0.054	5.4
9	Alayabigba	1	90	0.056	5.6
10	Amukoko-Safejo	1	60	0.058	5.8
11	Ogunmokun	2	120	0.104	10.4
12	Mushin-Isolo	4	151	0.203	20.3
13	Ejigbo-Isolo	5	755	0.251	25.1
14	Ago Palace	4	204	0.203	20.3
15	Old Ojo	2	276	0.102	10.2
16	Mile 2-Badagry	3	214	0.152	15.2
Total		38	3312	0.240	24.0

Source: Authors' Field Survey, October 2011

Furthermore, the RMQI scores I show that all the roads, except one (Ejigbo-Isolo Road) fell within the lowest range of 0 to 0.25 or below 25 per cent, signifying that 93.75 per cent of the roads surveyed were in very poor condition (Table 5 and Figure1).

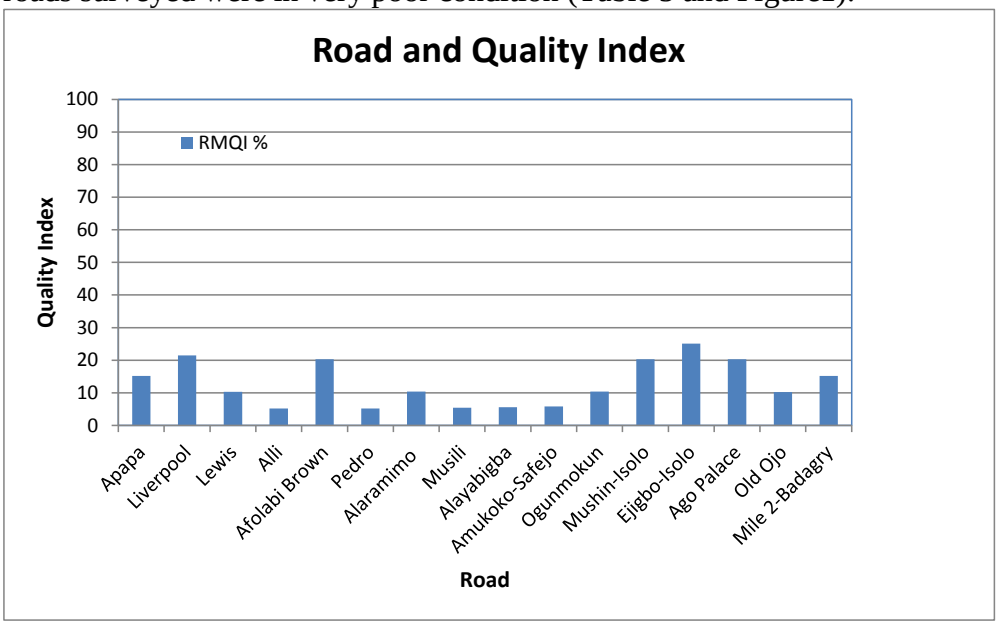

Figure 1: Road quality Index

Ejigbo-Isolo Road may also be regarded as a very poorly maintained road with a score of 25.1 per cent. In other words, none of the road attained the status of good road condition or well-maintained road.

Implication of Findings

Poorly maintained and ill equipped roads usually set in a chain reaction of failed road portion, effects and mitigation. Discomforts from bumpy ride, forced go slow, traffic grid lock, and loss of man hour are some of the effects of dilapidated roads. Others are increased vehicular maintenance cost, vehicular accidents, loss of lives and property. Environmental impact manifests as air pollution arising from increased emission of carbon monoxide due to longer vehicular stay on the roads. For example road users, including these authors spend upward of an hour for a journey of about 10 minutes, on go slow around the Volks Bus stop on Lagos-Badagry Expressway. A common sight at this spot is captioned in Plate 5. Commuting through an average of about four of these "trouble spots" daily translate to longer journey time, loss of several man hours thus making driving a herculean task, very tiring and discomforting.

Plate 5: Traffic grid lock on Mile 2-Badagry Road

It is pertinent to mention that road users have learnt to mitigate the effects of bad roads. The adjustments include early departure from home to create allowance for anticipated time to be spent on traffic hold up, use of alternative roads where feasible, squeeze through narrow road strip by potholes or drive through the pothole sections very slowly. Passengers of motor bike riders and sometimes, the riders themselves, highlight from the bikes briefly to enable the rider have firm grip of the bike as he wades through the deep and sometimes muddy potholes. Apart from road users, residents whose frontage are very close to potholes/failed sections of the roads often times prevent vehicular access on the remaining part of the road by barricading the road at these portions. Plate 6 describes a barricaded road portion. Occasionally, local communities provide palliative measures mainly in the form of filling of potholes with heaps of dirt, sand and hard core (broken concrete) and in the use of sticks and vehicle tires as signal of very deep potholes.

Plate 6: Water logged pothole condoned off

The effects and mitigation presented above are counter-productive to the people and national development but preventable. The slow response to road maintenance must be improved on to achieve safe and efficient road condition at the least cost to the community. The provision of smooth roads is attainable as the experience of Victorian roads in Australia show. The Australia's Better Roads Programme and the *Stitch in Time* philosophy for road maintenance yielded remarkable improvement on road conditions (VicRoads, 2010). As noted by VicRoads (2010), the improvement in the length of bad roads between 1993 and 1997 is consistent with the increased maintenance effort post 1993-1994, following the adoption of *Stitch in Time* funding levels (a 30 per cent increase above 1991-1992 levels), and the annual monitoring of road conditions by VicRoads. The paper therefore recommend that the attitude and enthusiasm underlying the success of the *Stitch in Time* strategy should be adopted by LAMATA's urban road network efficiency improvement programme to achieve similar success in road efficiency for Lagos Metropolitan road users as obtainable in Victoria, Australia.

Conclusion

Our goal in this paper was to highlight the level of road infrastructure availability and the condition of roads in Lagos State. The findings provide micro-level but detailed evidence of inadequacy in the provision and maintenance of road facilities. Specifically, the non-availability of basic road facilities like street light, traffic light, and road side trash bins are pointers to the deficiencies of basic road infrastructure. The non- functioning of the few available facilities describes the state of disrepair of the roads. The presence of a large number of potholes on the roads makes daily commuting an exhausting task. The RMQI show that the roads were in very poor condition. Furthermore, the effects and mitigation of poor road condition was discussed. Conclusively, the conditions of the roads as they are at present do not meet the expectations of road users. The roads are in dire need of maintenance and reconstruction. It is hoped that the regulatory agencies will draw some lessons from the Victorian Road Project to meet the expectations of road users for the speedy repair and timely maintenance of roads that will facilitate smooth, time saving and comfortable ride.

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