

1 Economic Valuation of Poor Road Infrastructure Lagos: A Focus 2 on Urban Households

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6

7 **Abstract**

8 The inefficiency and lack of urban transport services and infrastructure is a major impediment
9 to economic growth and urban productivity in cities of developing countries like Nigeria. This
10 study is aimed at assessing the impact of poor road infrastructure on urban households using
11 environmental valuation techniques. The study is based on a survey research carried out with
12 the distribution of structured questionnaires to 1040 households in eight metropolitan local
13 government areas (namely; Alimosho, Apapa, Eti-osa, Ikeja, Kosofe, Mushin, Shomolu and
14 Surulere) in Lagos State to elicit information on current condition of infrastructure in the
15 area, household consequential cost due to poor road condition, willingness to pay for improved
16 road condition preferred service option for road infrastructure. Analysis was carried out using
17 descriptive statistical tools. Results from the study shows that urban roads in Lagos are in a
18 deplorable condition and households suffer a lot of consequential damages arising from it. The
19 results also show that households are willing to pay for improved road conditions. The paper
20 recommends that the government should formulate a good infrastructure policy that will
21 enhance the sustainability of infrastructure over time and should also encourage public
22 participation in urban infrastructure provision and maintenance.

23

24 **Index terms**— households, infrastructure condition, road infrastructure, willingness to pay.

25 **1 INTRODUCTION**

26 major and integral part of sustainable development is efficient provision of environmentally sound infrastructure
27 such as road and transportation, water supply and sanitations, power and telecommunications. Urban transport
28 infrastructure in developing country mega-cities such as Cairo, Lagos, Mexico-city and Bangkok, is so deficient
29 that traffic-jam related economic losses of several hundreds of million US dollars is not uncommon, not counting
30 pollution related damages. (Panayotou1998). With population growth, urbanization, and income growth,
31 the demand on infrastructure is growing and the gap between demand and supply is ever widening. The
32 inefficiency and lack of urban transport services and infrastructure is a major impediment to economic growth
33 and urban productivity in cities of developing countries. Increased motorization, public operating transport
34 Author : Phd, Department Of Estate Management, University Of Lagos, Akoka, Lagos, Nigeria, E-mail :
35 austinotegbulu@yahoo.com services, inadequate road maintenance, insufficient bikeways and walkways poor
36 traffic management and lack of enforcement of road rules are contributory factors to congestion, road accidents and
37 air pollution. In many cities, traffic congestion leads to lost in work and leisure time, increased fuel consumption
38 and emission, and high accident rates. The cost of road accidents in developing countries two-thirds of which
39 occur in urban areas, is as high 1-2 percent of GDP, taking into account high fatality and injury rates and
40 property damage ??WHO 1989) cited in (Bartone, Bernstein, Leitmann and Eigen 1995, Odeck & Brathen
41 2000). In Nigeria urban centers, the state of infrastructure is poor. Similarly in the city of Lagos most part of
42 the road network are filled with pot holes leading to traffic congestion, delay in travel time, damage to vehicles

3 III. NEIGHBOURHOOD ROAD DESIGN

43 and accidents (Otegbulu 2010, Lagos State central Office of Statistics 2006). Congestion undermines the major
44 advantage of accessibility which motor transport affords. Harvey and Jowsey (2004) suggested six main ways of
45 tackling the problem of congestion resulting from poor road condition and inadequate road capacity. These are;
46 ? Do nothing ? Invest in the construction of more roads ? Improve physical controls to improve traffic laws.
47 ? Restrict parking ? Use the price system to allocate existing road space. ? Use the existing road system
48 more efficiently through a better distribution of the roads of travel as be free the car and public transport or
49 even cycling.

50 The impact of the poor road condition on Lagos households is enormous as most roads lack adequate drainage
51 which escalates the flooding and damage to roads.

52 Roads like any other environmental good and service cannot be fully priced in the market place due to consumer
53 and producer surpluses hence the resort to economic/environmental valuation.

54 The basic strategy of environmental valuation is the co-modification of the service that the environment
55 provides. It serves to assess individual and group priorities and trade-off in the case of unpaid scarce commodities.
56 It has been used to rank the seriousness of environmental problems in order to provide guidance to relevant
57 agencies as they decide on how to focus The Environmental Valuation Technique to be applied in this study is
58 Contingent Valuation Model (CVM). It entails asking people for either their maximum willingness to pay (WTP)
59 for an improvement in environmental quality, or their minimum willingness to accept compensation (WTAC)
60 to forego such an improvement. It is also described as stated preference method. The method is interested in
61 estimating how much an individual or society's well being will change (Hanley and Splash 1999). Willingness
62 to pay is a measure of individuals' or a society's preference for a particular good or service; the higher the
63 preference, the more the willingness to pay. Contingent valuation model is based on a hypothetical market
64 situation which elicits the prices of those goods and services which cannot be priced in the market place. It
65 is known as contingent valuation model because the results are dependent or contingent upon the hypothetical
66 market devised. ??Thomas, 1996;Field and Field, 2002).

67 This study is therefore aimed at assessing the impact of poor road infrastructure on urban households using
68 environmental valuation techniques. This will be achieved through the following objectives;

69 To

70 2 ECONOMIC IMPACT

71 Poor road conditions and transportation system hinder movement of goods and people in the urban areas. Lack
72 of adequate infrastructure could also be a disincentive to both local and foreign investors in our urban areas.
73 Constraints to productivity at the city level, such as infrastructure deficiencies presented below reduced the
74 productivity of firms and households and this affected the aggregate productivity of the economy (World Bank,
75 1992).

76 Transportation plays a major role in economic development both urban and national. It also has a broader
77 role in shaping development and the environment. The interface between transportation investment and
78 economic development has broad ramification that goes beyond the basic purpose of moving goods and people.
79 Transportation facilities are located in a specific place, they provide services to businesses (and households)
80 within a specific geographic area, and their use is directly related to moving goods and people between two
81 points. It is essential in the operation of a market economy ??Eberts, undated). It should be noted that road
82 infrastructure is fundamental to urban transportation, as it provides access to land and determines whether it is
83 ripe for development or not. It is a determinant of where people can live or not live and constitutes a catalyst to
84 urban development.

85 According to Eberts (undated), four factors are important in examining the relationship between transportation
86 and economic development. These comprise relevant types of transportation investment, data necessary to analyze
87 the economic effect of the investment, appropriate methodology to analyze the economic effect and the proper
88 dissemination of the result and evaluation of professionals as to the economic effect of transportation investment.

89 The dispersed spatial distribution of residential, employment, shopping and leisure facilities in the modern
90 city, frequently predicts walking as a means of getting from one place to another. This and the fact that peoples'
91 time is a scarce resource on which they often but not always wish to economize with respect to travelling, means
92 that some sort of efficient mechanized transport system is required to transport people to their destination in
93 urban areas. ??ESRC, 1996).

94 3 III. NEIGHBOURHOOD ROAD DESIGN

95 Better transportation services that reduce commuting costs and time can allow households the opportunity to
96 devote more time to income-earning activities. They also can be essential to maintaining an acceptable quality
97 of life as well (Fox, 1995).

98 Transportation infrastructure is an important element of neighbourhood design. It is a major wealth and
99 act as the powerhouse of the national economy. There is a clear link between the performances of urban areas
100 and the performance of the economy as a whole ??Oately, 1998; ??-20). The strength of the nation's economy,
101 the contact point of international economics, the health of our democracy and the vitality of the humanistic
102 endeavours all are dependent on whether the city works (Ciceros cited in Lawless, 1996; ??8).

103 Cities have played a key role in the evolution of the global economy. Cities are generators of enormous
104 determinant of neighbourhood form. Within the context of sustainable neighbourhood design, transportation
105 infrastructure should be designed to encourage the use of more sustainable modes of transportation, including,
106 walking, cycling and public transit (Engel-Yen, Kenedy, Saiz and Pressnail 2005). Research by Handy (1993)
107 found that residents in traditional neighbourhoods make more non-work trips by walking and cycling within the
108 neighbourhood than those in auto-oriented neighbourhoods.

109 Designing pedestrian, cyclist, and transit friendly neighbourhood will encourage intraneighbourhood travel
110 by non-auto mode. (Engel-Yen et.al, 2005). This will require providing for pedestrian and cyclist paths in
111 neighbourhood road design. This in addition to the provision of streetlights will enhance security and visibility
112 at night.

113 Road space requirement increases with vehicle size and speed. Faster vehicles need more safe distance that
114 is, the traffic zone between them and other objects. A person typically requires 0.929 square metres feet while
115 standing, and 1.858 square metres while walking. A bicycle requires about 50 square metres when ridden at 16
116 kph. An automobile occupies 13.93 -26.91 square metres when parked, 139.35 square metres when travelling at
117 a moderate speed of (30-mph, assuming 50 vehicles per lane-mile), and more than 464.51 metres when travelling
118 at high speed. A bus requires about 2 -3 times as much parking and road space as an automobile.

119 Walking and cycling facilities such as sidewalks and paths often constitute 10-20% of roadway right of way,
120 although this space is often shared with utilities (telephone poles, signposts, electric poles etc), and side walk
121 exist in part to support automobile travel. www.vtpi.org/landuse.polf.2007..

122 4 IV.

123 5 DEMAND PREFERENCES AND USER CHARGES

124 The first problem with project selection pertains to how projects and problems interact. There is a lack of
125 attention to strategic success (Whether a project's objectives are consistent with needs and priorities in society
126 and has long term benefit which could reasonably be expected to be produced). If projects are developed in
127 response to societal problem it will lead to generation of public trust (Bruzeluis, Flyvbjerg, Rottengatter 2009,
128 Premius, Flyvbjerg and Wee 2008) infrastructure policy decision involve four set of actors. The first are policy
129 makers, who created the basic environment in which decisions are made and in many cases establish policies to
130 determine overall spending, what type agencies deliver services and so forth. Second, infrastructure managers
131 determine policy within service delivery organizations and make major decisions in areas such as technology.
132 Third, operational staff are

133 The poor performance and mismanagement characterizing most publicity-owned and operated utilities gave
134 the impetus for considering private sector participation. Unsustainable levels of budget deficits and external
135 debts, and the need to maintain fiscal discipline to control inflation and spur economic growth has convinced
136 governments to seek private sector resources (Panayotou 1998). Involvement of road users and other stakeholders
137 in the road network planning has been found in some countries to provide the key to effective and efficient
138 and financing measures particularly since governments are usually reluctant to increase taxes and user charges.
139 There is therefore a need to consider involving urban road users on how to manage the road. If members of the
140 community are to be made stakeholders they may be willing to pay more for roads, but only if the money is
141 seen to be judiciously utilized which is not the case in the present situation. According to Adewunmi (undated)
142 involvement of stakeholders in urban road network can create a surrogate market discipline which will encourage
143 road administration to use resources efficiently.

144 V.

145 6 METHODOLOGY

146 The research approach employed in this study is the basic survey design. It is designed to answer questions about
147 road infrastructure condition including; amelioration costs and willingness to pay for improved road infrastructure
148 in different local government areas of Lagos metropolis (8). The study goes further to find out the amount
149 respondents are willing to pay for improved road conditions. The contingent valuation surveys usually value
150 goods which respondents have experience on. Secondly, contingent valuation uses hypothetical market which
151 must be believed and understood by respondents. Structured questionnaires were distributed to 1040 households
152 in the study area and 774 were returned in useful state. The local government areas are; Alimosho, Apapa,
153 Eti-osa, Ikeja, Kosofe, Mushin, Shomolu and Surulere. The questionnaires were framed in such a manner that
154 the grey areas are made explicit to respondents so that they could give valid responses. The questions were based
155 on the likert scale format. Analysis was carried out with the use of descriptive statistical tools such as mean
156 frequency tables and relative impact index (RII). The respondents are of varied income levels and most of them
157 have lived in the area for more than 5years. responsible for undertaking a daily provision of services. Finally
158 users are the major client for infrastructure service. Each set of actors is an integral component of good decisions
159 and must be confronted with appropriate incentive in order to make the correct decisions (Fox 1995, Cotton and
160 Franceys 1993). Based on data from table 1 & 2 a lot of problems emanate from poor road condition. The nature
161 of road problems varies from local government to local government. In Apapa and Ikeja local government, the
162 greatest problem is narrow roads. In Alimosho and Shomolu, the major problem is potholes. In Eti-Osa, Kosofe

10 RECOMMENDATIONS

163 and Mushin it is lack of street light. The problem of street light in the study area creates insecurity at night.
164 Potholes had been causing accidents and damage to cars, delay in traffic movement and robbery at hold-ups.
165 This problem can also influence WTP. The loss in man hours and air pollution arising from poor road condition
166 is enormous and this calls for increased budget allocation for road maintenance and rehabilitation Global Journal
167 of Human Social Science Volume XI Issue X Version I Source: Field survey 2009.

168 7 VI. DATA PRESENTATION AND ANALYSIS

169 From Table 3 above, Apapa has the highest mean WTP of N13,750.00 followed by Shomolu's N13,594.2. The
170 least is Ikeja with mean WTP of N7,979.20 for improved road condition. The high WTP is an indication that
171 households in the study area want less damage to their car, and less delay in their travel time. Data from table
172 4 shows the preferred manner of payment by various households. 50% of households in Apapa local government
173 prefer to pay through income tax. 24.2% of households in Alimosho local government prefer to pay through lump
174 sum payment. In Eti -Osa local government area, majority (32.4%) prefer payment through income tax. The
175 bottom line is that residents have expressed their desire for sustainable urban infrastructure through their WTP
176 and expressed payment vehicle for improved road infrastructure. 5 shows the different service options for road
177 in the study area. This include road with side walk, cyclist path, drainage, traffic light and just motorable. The
178 preferred road type for Ikeja, Kosofe, Shomolu and Alimosho is road with side walk. This option will increase
179 safety in the study area. Households in Mushin local government prefer road with street light probably because
180 of the high crime rate in the area. The peculiar situation in an area will influence their preferred service option
181 for road infratsructure VII.

182 8 SUMMARY OF FINDINGS

183 ? Road Infrastructure provisions in the study area are grossly inadequate and households suffer consequential
184 costs and damage to property ? In addition to inadequacy, the conditions of available ones are quite deplorable
185 in most of the local government areas under study. Most households experience traffic congestion, car damage
186 and robbery at hold ups due to deplorable road and traffic conditions. ? In consideration of the importance of
187 road infrastructure to households in the study area, majority of them are already incurring heavy expenditure
188 due to its poor condition and in consequence are willing to pay for improved service in all the infrastructure
189 under study within the study area. The level of willingness to pay however varied from one local government
190 area to another.

191 9 VIII.

192 10 RECOMMENDATIONS

193 ? There should be a radical change in infrastructure provision policy in the country as the current topbottom
194 approach does not achieve the desired result and fails to meet public expectations. The bottom-top or demand
195 driven approach should be embraced as this will make residents and urban households more committed to
196 its funding where cost recovery is of essence. ? Government can promote public private partnership through
197 introduction of subsidy in infrastructure. For example, if the WTP of the people cannot sustain private investment
198 in infrastructure, governments can provide subsidy by being responsible for part of the Capital Cost, while the
199 extent of cost that can be sustained by households WTP is provided by the private investor. This will help when
200 high standard of households want a higher specification or standard of infrastructure. Households will then be
201 asked to pay the difference between the expected standard and the budgeted sum. This situation is most relevant
202 in areas of water, sanitation and road projects. Inadequate infrastructure can have multiple effects on health,
203 and thereby on individual labour and productivity as well as quality of life. ? Proper pricing is a veritable tool
204 for efficient and sustainable infrastructure provision. It is necessary for financing of service delivery, rationing of
205 consumption to an economically efficient level, and also to provide an indicator for demand. Providers should
206 ensure that prices should be able to recover cost for all infrastructure services except those with significant
207 positive externalities and for very few services, to ensure that poor households have access. Payment of fee must
208 be associated or linked to service delivery and any significant fee increase must result from service enhancement
209 or improvement.

210 Imposing user fees to recover cost may be politically difficult in the short run as urban households are used to
211 receiving under priced services. In spite of this difficulty, pricing is central to improved service delivery system.
212 On the contrary, failure to properly price services could be politically dangerous because inadequate services
213 will lead to dissatisfied urban residents and poor business, resulting in poor economic growth. ? Infrastructure
214 reforms cannot be achieved in the absence of an efficient regulatory system. Governments all over the world
215 are transforming their infrastructure sector to better meet the needs of consumers and regulatory reform is an
216 essential part of this process. A good regulatory system must serve the interest of consumers. In this respect, the



Figure 1:



Figure 2:

217 need to separate operation of facilities and regulation of service quality is very central. The regulatory authorities
218 must be able to regulate the reliability and output of infrastructure providers. ^{1 2 3 4 5 6 7 8 9 10 11}

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¹⁰2011 © 2011 Global Journals Inc. (US) December Economic Valuation of Poor Road Infrastructure Lagos: A Focus on Urban Households infrastructure is of essence. Subsidy can also hold when government has a limited budget and urban 2. Arrosi, S. (1996). Health in metropolitan Buenos Aires. Environment and Urbanization 8(2): 43 -70

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Figure 3: Figure I :

10 RECOMMENDATIONS

1

				Ranking Problems of Road				
	Alimosho RII Rk	Apapa RII Rk	Eti-Osa RII Rk	Ikeja RII Rk		Kosofe RII Rk	Shomolu RII Rk	Mushin RII Rk
Are not wide enough	0.83 8	0.87 1	0.84 2	0.86 1	0.87 2		0.94	3 0.88
Lack pedestal walk	0.83 7	0.72 6	0.77 6	0.81 3		0.8 6	0.93	5 0.84
Full of pot holes	0.94 1	0.87 2	0.83 4	0.77 4	0.83 3		0.98	1 0.85
Not paved	0.86 5	0.63 8	0.71 8	0.72 8	0.78 7		0.93	6 0.77
Lack safety	0.84 6	0.76 5	0.71 7	0.72 7	0.72 8		0.91	7 0.80
Poor traffic management	0.86 4	0.68 7	0.81 5	0.75 6	0.80 5		0.94	4 0.83
Poor drainage	0.91 2	1.33 4	0.83 3	0.77 5	0.82 4		0.98	2 0.83
Lack street light	0.89 3	1.33 3	0.84 1	0.82 2	0.88 1		0.91	8 0.89

Source : Field survey 2010.

Table 2 : Difficulties arising from poor road condition

What difficulties have you encountered as a result of bad road?

	Damage to car	Delay in movement	Robbery	Air pollution	Car accident	Total
Alimosho	67	28	1	0	0	100%
	69.8	29.2	1.0	0.0	0.0	
Apapa	30	20	0	0	0	100%
	60.0	40.0	0.0	0.0	0.0	
Eti-osa	50	43	2	1	1	100%
	51.5	44.3	2.1	1.1	1.1	
Ikeja	44	31	3	4	2	100%
	52.4	36.9	3.6	4.8	2.4	
Kosofe	34	42	3	1	3	100%
	41.0	50.6	3.6	1.2	3.6	
Shomolu	90	10	0	0	0	100%
	90.0	10.0	0.0	0.0	0.0	
Mushin	25	39	10	9	15	100%
	25.5	39.8	10.2	9.2	15.3	
Surulere	19	40	12	14	13	100%
	19.4	40.8	12.2	14.3	13.3	

Source: Field survey 2010.

Figure 4: Table 1 :

3

4,000	6,000	8,000	15,300	14,243	9,145	11,695
10,000	12,000	14,000		13,500		10,783
					9,884	

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[Note: Monthly Expenditure Due to Bad Road (N)]

Figure 5: Table 3 :

4

Payment at once	How would you want to pay?						Toll	Others	Total
	Monthly	Yearly	Included in	Included in income tax	Included in tenement rate	Included in rent			
Alimosho	22	21	23	10	5	1	9	0	93
	24.2	23.1	25.3	11.0	5.5	1.1	9.9	0.0	100%
Apapa	20	10	0	30	0	0	0	0	60
	33.3	16.7	0.0	50.0	0.0	0.0	0.0	0.0	100%
Eti- osa	18	15	8	29	4	6	10	0	90
	20.0	16.7	8.9	32.2	4.4	6.7	11.1	0.0	100%
Ikeja	14	16	5	9	14	5			
	18.2	20.8	6.5	11.7	18.2	6.5			

Figure 6: Table 4 :

5

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What kind of road do you prefer? Road with drainag

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path 5

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	46.2	5.4	33.3	8.6	6.5
Apapa	20	10	20	0	10
	33.3	16.7	33.3	0.0	16.7
Eti-osa	25	3	26	26	18
	25.5	3.1	26.5	26.5	18.4
Ikeja	43	1	15	17	11
	49.4	1.1	17.2	19.5	12.6
Kosofe	36	3	14	24	8
	42.4	3.5	16.5	28.2	9.4

Figure 7: Table 5 :

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