



Working Paper Series

No 2 – July 2013

The Socio-economic Costs of Traffic Congestion in Lagos



Rights and Permissions

The text and data in this publication may be reproduced as long as the source is cited. Reproduction for commercial purposes is forbidden.

This Working Paper Series is produced by the Economic Intelligence Unit (EIU) of the Lagos State Ministry of Economic Planning and Budget (MEPB). The working paper series disseminates the findings of work in progress, preliminary research results, and development experience and lessons, to encourage the exchange of ideas among Ministries, Departments and Agencies (MDAs), researchers, development practitioners, policy makers, and donors. The findings, interpretations, and conclusions expressed in the working paper series are entirely those of the author(s) and do not necessarily represent the view of the Lagos State Government.

Abstract

The quality of life, competitiveness of the industrial base and the ability to attract and sustain business and tourism, all hinge on the provision of safe, fast, reliable and convenient roads, including access through public transit. Economic growth brings with it some congestion during busy times. Up to a limit, crowds and queues signal mobility, prosperity and economic growth and it would probably be impossible to expand transportation infrastructure to operate with zero congestion at all times of the day and year. Beyond a certain level of congestion however, the attendant costs – costs that arise from delays, diminished productivity, wasted energy, environmental degradation and a diminished standard of living – make a place as decent place to live, visit and conduct business.

Over the years, Lagos has witnessed rising transport demand and road traffic which have led to increasing congestion and delays (go-slow) occasioned by greater access to cars (as purchasing power of the middle-income classes has risen), access to credit, population growth and large supply of used cars; as well as poor quality of driving especially by those who drive commercial vehicles or transit vehicles. Traffic congestion in Lagos affects both car and public transport users and produces losses in terms of economic efficiency and other negative social effects like road accidents.

A state agency responsible for traffic matters, traffic lights at certain stops, road expansion, and alternative route creation are parts of government efforts to mitigate the effects of traffic congestion within all routes in the state. Other measures by the LASG include the bus rapid transit (BRT) initiative, the rail lines project and the introduction of a traffic radio to advise Lagosians on traffic issues. Nonetheless, much more than these are required to have the Lagos traffic situation under control especially because of its status as an evolving mega city. Improvement to these is needed and more procedures should be added to ensure that with current population and projected rise, traffic will not hold down opportunities for the state.

This working paper therefore analyses what congestion is and what the consequences are for society. It also looks at government initiatives aimed at tackling the problems of traffic congestion, as well as recommendations for improving traffic congestion problems.

The Socio-economic Costs of Traffic Congestion in Lagos

1. Introduction

The impact of traffic congestion is palpable to anyone witnessing delay on Lagos roadways. An estimated 8 million people travel to work via public transportation each day on the 9,100 roads and expressways available in Lagos (World Bank, 2009). With more than 1 million registered vehicles in 2011, there are potentially more than one million trips made during the peak travel periods of the day; this is much more during seasonal festivities such as Easter and Christmas when there is an influx from other parts of the country.

Commuters in Lagos experience the effects of traffic congestion on a daily basis. According to Adebisi (2011), the congestion is caused partly by road users themselves. Lagos road users are known to be very impatient and bad at obeying traffic rules. Indeed many times traffic congestions have been caused by a driver refusing to give way for another motorist. The effects of congestion are many fold; some directly affect the drivers sense of wellbeing, be it times wasted sitting in a traffic queue and the changes in the behaviour of drivers. Such behaviour might include rude gestures, verbal insults, deliberately driving in an unsafe or threatening manner, or making threats. This can further lead to altercations, assaults, and collisions which result in injuries and even deaths.

Other effects include missed appointments, higher fuel bill, decreased productivity, and high degree of stress and so on. Some of the effects are less palpable, such as the impact on the environment.

Wikipedia puts the principal economic and social costs of congestion to be the following:

- The cost of reduced economic output and accompanying job loss
- The costs of travel delays for automobile and transit users and the unreliability of trip times
- The increased vehicle operating costs associated with higher traffic volumes
- The additional environmental costs of vehicle emissions and the higher frequency of accidents

The purpose of this paper is three-fold. First it highlights the economic and social costs of congestion. Second, it takes a look at the major issues in congestion in Lagos as well as the policies of the government aimed at tackling the problems. Finally, it proposes some policy recommendations that could improve transportation in the state.

2. The economic and social costs of traffic congestion

This section provides a brief overview of traffic congestion, its causes, and the associated social and economic costs, as well as measures aimed at reducing congestion. It draws from studies conducted elsewhere as a background for putting the Lagos traffic congestion in perspective.

Traffic congestion is defined as a condition of traffic delay (when the flow of traffic is slowed below reasonable speeds) because the number of vehicles trying to use the road exceeds the traffic network capacity to handle them (Weisbrod *et al.*, 2001). Similarly Downs (2004) defined traffic congestion as the situation when traffic is moving below the designed capacity of a roadway. Kombs (1988) opined that the situation is usually caused by rapid growth in motorization with less than corresponding improvement in the road network and related facilities, the poor structural pattern of roads especially in the traditional area of cities and the unplanned growth and haphazard land-use distribution.

Indeed, traffic congestion is widely viewed as a growing problem in many urban areas across the world and in particular mega cities like Lagos; because the overall volume of vehicular traffic in many areas (as reflected by aggregate measures of vehicle-kilometres of travel) continues to grow faster than the overall capacity of the transportation system. The resulting traffic slowdowns can have a wide range of negative effects on people and on the business economy, including impacts on air quality (due to additional vehicle emissions), quality of life (due to personal time delays), and business activity (due to the additional costs and reduced service areas for workforce, supplier, and customer markets).

According to Rao and Rao (2012) there are two principal categories of causes of congestion, and they are; (a) micro-level factors (e.g. relate to traffic on the road) and macro-level factors that relate to overall demand for road level (e.g. on the road), and contribute to the incidence of congestion and its severity. The micro level factors are, for example, many people and freight want to move at the same time, too many vehicles for limited road space. Many trips may be delayed by events that are irregular, but frequent: accidents, vehicle breakdowns, poorly timed traffic signals, special events like mass social gatherings, political rallies, bad weather conditions, etc. which present factors that cause a variety of traffic congestion problems. On the other side, macro level factors e.g. land-use patterns, employment patterns, income levels, car ownership trends, infrastructure investment, regional economic dynamics, etc. also may lead to congestion.

By using the cost-benefit approach which comprises economic, environmental and social value, the Greater Toronto Transport Authority (2008) categorised the costs of traffic congestion into five major clusters as follows:

1. Excess time delay automobile users

Longer travel times result in a cost to motorists in the form of value placed on this excess time spent travelling. This cost is the value of activities forgone. The added unpredictability of travel time is included in this cost.

There is also the associated inability to forecast travel time accurately, leading to drivers allocating more time to travel "just in case", and less time on productive activities.

2. Excess time delay transit, public and private users

For transit operations occurring on shared roadways, these transit users experience a cost of excess travel delay in the same form as automobile users.

3. Increased vehicle operating costs

Vehicle operating costs increase in congested traffic conditions due to the stop-and-go nature of travel; wear and tear on vehicles as a result of idling in traffic and frequent acceleration and braking, leading to more frequent repairs and replacements. Additionally, high traffic volumes represent operating costs in excess of the socially optimal level

4. Excess accident externality costs

Congested traffic conditions result in a higher accident rate, which translates into additional costs to automobile users

5. Excess vehicle emissions externality costs

As with operating costs, vehicle emissions increase with congestion due to the stop-and-go driving conditions, and the total amount of emissions is inefficiently high due to excess traffic volume.

In addition to the above costs that affects motorists directly, excess congestion also entail an indirect cost on the economy as a whole. The above costs of congestion result in a higher cost of business activity, due to 1) the direct increase in transportation costs and 2) the adverse impact on the labour market, as higher commuting costs are manifested in higher wages and decreased demand for labour, which leads to a suboptimal allocation of labour resources. The end result is that overall economic output (measured by GDP) will be below the level that would exist in the absence of congestion.

Further, excess congestion results in higher transportation and logistics costs for various industries, due to the higher direct costs of transportation (fuel expenses, labour costs, maintenance, etc.) and several direct costs such as the need to maintain higher levels of inventory as a buffer against delivery time reliability, a higher frequency of missed deliveries, and so on. These effects serve to both increase costs and decrease revenue, with a concomitant reduction in employment.

Reducing congestion

In terms of measures aimed at reducing congestion, Rao and Rao (2012) observed that this can be either demand or supply side oriented and distinguished both types of measures. Three main factors influence the supply side of road travel. Firstly, capacity is one of the most important elements of road space supply. For example, the total kilometres of roads

and the number of lanes determine the capacity of the road network. Secondly, the operation of the road network influences supply. Maximising the efficiency of operations, such as optimising signals. Thirdly, the supply of the road transport equation is also affected by incidents such as accidents or road works. Importantly, the last two aspects can be influenced by traffic management approaches. It is thus the supply-side of the road network that can be optimised by traffic management tools. Supply of road space is mainly determined by past investment decisions and current operations. Changes in the supply side of road space thus involve construction of new road space or reductions in existing road space. Changes in traffic operations are also considered to be supply side measures.

Demand for road space is influenced by a large number of issues. Essentially, demand is created when the need for travel between an origin and a destination arises. Demand therefore strongly depends on socio-economic and population factors. Another important factor influencing demand is the relative cost of road travel as well as the availability of alternative means of transport. Other aspects that influence demand for road travel are availability of parking and the social perception of car versus public transport travel.

3. Lagos Traffic Congestion in Perspective

At a conference on traffic management held in 2010, a common view by participants was that the congestion on Lagos roads was mainly caused by the drivers. Four of six people

(Olorunponmi, 2010). At the same conference, the Managing Director of the Lekki Concession Company (LCC), observed that about 90 per cent of the way people move in Lagos was based on the road, and that a large percentage of the cause of traffic congestion

like Lagos State, the issue is not so much about the congestion but how do we manage and ease the impact of congestion. We must learn to use the roads better, respect the highway

Adebiyi (2011) also observed that the traffic congestion in Lagos is caused partly by road users. Lagos road users are known to be very impatient and very bad at obeying traffic rules. Very often huge traffic jams develop simply because a driver is refusing to give way to another motorist. Additionally most drivers do not acknowledge road signs because many

Another major factor responsible for congestion in Lagos is the increase in vehicular ownership. Data from the Lagos Bureau of Statistics (LBS, 2012) shows yearly increases in the total number of vehicles registered in Lagos State from 2009 to 2011. In 2011, about three-quarters of newly registered and those whose registrations were renewed, were private owned (table 1 below). According to Ubogu (1980) Lagos has continued to

experience traffic congestion because many car owners finds it more convenient to travel to work by car rather than public transport in congested conditions. This observation is still true as majority of the cars on the roads are privately registered.

Table 1: Classification of Vehicles registration by ownership

Type of Ownership.	2009	%	2010	%	2011 Newly reg.	%	2011 Rene wed	%
Private	153,781	72.95	186,429	77.37	196,987	75.92	576,186	75.92
Commercial	32,490	15.41	32,978	13.69	43,641	16.82	127,548	16.81
Government	1,170	.5550	892	.3701	445	.1715	1,302	.1716
Mission	890	.4222	875	.3631	747	.2879	2,186	.2880
Corporation	22,467	10.66	19,789	8.22	17,653	6.80	51,636	6.80
Total	210,798		240,963		259,473		758,958	

Source: LBS: Digest of Statistics 2012 Edition.

What is seen daily on Lagos roads is a scenario where millions are waiting to move during rush hours from high density populated areas and on the one hand, while using their private cars. On the other hand, the available public transit systems cannot meet the needs of the populace. According to the Managing Director of the LAGBUS Asset Management, LAGBUS owns 529 buses, out of which 120 were leased to start the BRT Scheme; the Lagos Metropolitan Area Transport Authority (LAMATA) has 250, while a sub-State. Right now, we are very

The most up to date data available on the costs of congestion in Lagos is from a research study conducted by ROM Transportation Engineering between year 2007 and 2009. According to Olorunpomi (2010) the research estimated the costs of congestion to be \$1 billion (about N160 billion) yearly. These conclusions were reached based on the official population figure of 17 million for Lagos state. The research concludes further that Lagosians collectively lose 3 billion hours to traffic congestions yearly, and that if that time were reduced by 20 per cent, it would save the state at least \$1 billion (about N150 billion) yearly. These figures underscore the seriousness of the issue of traffic congestion in Lagos and the impetus for a reasoned and thorough response towards improving the transportation system in Lagos State.

4. Managing the movement challenges

The perennial road congestion in Lagos has seen the state government devising various approaches to manage the situation. In the early 1980s, the state government implemented a system of odd-even numbers in the early 1980s which allowed motorists ply certain routes within specified periods; the success of this approach may not have been visible and adequate for Lagos of today. Moreover, people who could afford it just bought new cars and had odd and even plated cars.

In recent times, the government began to put in place some far reaching measures to tackle traffic congestion. In the year 2000 the Lagos Traffic Management Authority (LASTMA) was created as an agency responsible for traffic control. According to Stephen (2011) to progress and improvement of the situation over the years. Quick or easy to notice



officials of the agency around the state sometimes do more than just responsibilities in discharge of their duties, they provide service relevant to people and the state. Lagos State Traffic Management Authority (LASTMA) officials work from day break till late night in a shift that is relatively flexible, they work under all weather conditions even as certain motorist find nothing but faults in their works. But for LASTMA in Lagos, traffic situation will be dim-sighted for any solution presented.

In 2008, the state partnering with the private sector under the public-private partnership also introduced the Bus Rapid Transit (BRT), a mass transit bus system on dedicated routes on Ikorodu Road, running from Mile 12 to CMS on the Island. The BRT fleet, run by the National Union of Road Transport Workers (NURTW) with the Lagos Metropolitan Area Transport Authority (LAMATA) as the regulator is said to be currently operating with the combined capacity for over 180,000 passengers daily.



Observers note that the BRT scheme is working well, and I actually used it a couple of time on my recent visit. It was quite gratifying to know that you can actually move from Ketu to Yaba in less than 40 minutes without having to worry about traffic congestion at least on the BRT dedicated lanes. But of more importance to me was the gradual inculcation of a culture of discipline and decorum on the

part of the motorists. Commercial drivers who were notorious for their reckless breach of all traffic regulations are now been forced, albeit reluctantly, to obey regulations. Patience and respect for other road users are now gradually creeping into their sensibilities, buoyed more by their fear of the stiff penalties associated with its non-observance. Deterrent is being achieved by the huge penalty they pay for any breaches.

In apparent appreciation of the fact that other forms of transportation are required to effectively tackle the traffic menace, the government has also shown some serious commitment by conceiving some ambitious projects that would ensure an integrated transportation network incorporating the rail and water ways. The state is working to deliver light rail systems on two major routes Okokomaiko in Ojo area to #U o' " ' O that will run from Agbado area to the k ' O effort to address traffic congestion.



The Lagos State Waterways Authority (LASWA) an Agency in 2008 to serve as the regulating, developing and managing body of all aspect of the waterways in the state. One of the service providers of the water transport system is the Lagos ferry Service Corporation which has gone from procuring ferries to building new modern Jetties in Badore, Ipakodo and Osborne in Ikoyi with each capable of berthing ferries of 500

passenger capacity while old ones are being renovated and rehabilitated. However, there is need to intensify effort to enlighten and encourage people across Lagos on using the ferry service by providing safety jackets(life vest) for every passenger and fashioned out a well organised routes accessible online.

The State also established a Traffic Radio 96.1 FM on May 29, 2012 to assist commuters in acquiring and passing information on areas of free or slow vehicular movement thereby preventing unnecessary traffic gridlock. However, there is the need to broadening the scope of its activities such as point to point direction of vehicles movement across Lagos.

The idea of the cable car system which the present government in the state has thrown its weight behind is in continuation of the effort to give residents and visitors to the commercial city another option that compliments existing transportation facilities in the state. Dapo Olumide, managing director, Ropesway Transport Limited, the franchise owners of the system says the company is set for ground-breaking in June 2013 but billed to commence commercial operations 2015 after all necessary supportive infrastructure would have been put in place.



According to Olumide, the company will begin construction of towers, stations and connecting network of cables along various routes. In the first phase, Ropesway will be completing routes connecting Ijora-Iddo, Iddo-Adeniji, Apapa-Oluwole, Oluwole-Adeniji-Obalende, Falomo-Obalende and Victoria-Obalende and subsequently expands to other parts of the metropolis as the business grows.

5. Recommendations for improving the current situation

This section provides an overview of recommended measures that could improve the existing initiatives aimed at reducing traffic congestion in Lagos. This draws from recommendations of several authors such as Olorunpomi (2010); Stephen (2011); Bassey (2013); and Olaogbebikan *et al.* (2013)

Enhancing LASTMA capacity

LASTMA should expand by recruiting more people to join existing officials, this is very important because of the contribution they will have to ease traffic everywhere around the state. With several major roads in Lagos, traffic on such roads will move faster if more LASTMA officials are a few meters apart to help from extra traffic problem that may arise. Some commuters usually change lanes to advance on time, jalopies still found on Lagos road irresponsibly breakdown causing traffic within a larger traffic, spots with port holes are minor traffic farrow, trucks are potential traffic machineries since they are prone to disobey laws, irregular turns and short cuts are usual factors why traffic persist at some points on Lagos roads. With more LASTMA officials a few meters apart, these will be checked and each official will oversee orderly producing no addition to existing traffic.

Presence of LASTMA officials at alternative routes or streets around major roads will help to sustain regular vehicle flow and avoid unnecessary stopping or parking.

Reducing extra traffic from security checks

Like other major cities, security lists among the priorities of the LASG but sometimes come at a price resulting to traffic at certain points. Checks with blockades sometimes add to the overall traffic situation at certain places harming the effort of the traffic agency. For traffic, checks cannot be abandoned and for checks traffic should not be stacked but a way through both will be helpful to increase residential qualities of Lagos. The Lagos Government recently introduced vehicle identification system to ease manual inspection at security stops. This first in the country should help security officers carry their duty effectively and expose violators.

With the right application of this traffic should be reduced and security officers should also find other means to reduce traffic along routes they are stationed. Blocks or blockades at their check should be varied; this will see a shift in position at different times and condition of traffic. When traffic is building up from their point or another place, they can remove or adjust their blocks and increase observation on road users to notice any suspicion. As traffic flows, likely criminals can be attention than those who should really be suspected.

Lagos traffic authorities can make recommendations to the security operatives in the state for these moves and related ones in order to boost their performance towards crime prevention and ease traffic in the process.

Other measures

A little more is required to move Lagos off its traffic situation class; these will be simple methods like enforcing and punishing parking of vehicles along one-way roads at any time of the day. This in contrast to assigning a time for parking will have road users know that it is against the law to park along such routes because of traffic possibilities.

Parking restrictions can be applied, making motor vehicle use less attractive by increasing the monetary and non-monetary costs of parking, introducing greater competition for limited city or road space. Most transport planning experts agree that free parking distorts the market in favour of car travel, exacerbating congestion. An option is to have parking spaces in major local areas, like we can have a parking venue at national stadium, Orile, Yaba, Ajah, and major residential areas; so all a commuter needs to do is drive cars there at a particular time and there are buses waiting to take them your major zones like VI, Ikeja etc. so that only people whose zones aren't covered can use their cars.

More signposts will be useful to display specific rules and conditions for certain places, a signpost may tell road users to maintain their lane not to cross over to the next lane with or

without traffic and other signposts warning road users against offences common to a specific spot or route. This will keep the road free from moves that can cause traffic by collision or recklessness. Signposts can also direct road users to alternative routes or shorter route to ease traffic along the main road.

Alternative routes: As the Lagos Government works to expand major roads and construct or maintain street roads, streets that are likely to be alternative routes should have some priority, and this will help in present and future traffic solutions. Alternative routes will also have LASTMA official on duty during rush hours to coordinate movements and prevent irresponsible parking.

Traffic technologies are part of a total solution to traffic problems, the lights and signs are useful to leave out manual controls for agency officials. This and more should be available at T-junctions, X or + Junction. More traffic technologies to capture offenders for prosecution at another time will also be necessary, where it alerts the officer on duty if same vehicle passes again and shows a repeat of the past scene to hold and charge the offender, technology solutions for traffic situation in Lagos are projects for the long term.

Flexible working hours can be introduced in both the private and public led sectors. For example, different categories of people can resume say 6am, 8am and 10am; meaning rather than everyone resuming work at 7am or 8am, and companies should have a flexible resumption period. The junior workers may be in the Office by 8am and close by 4pm while the management resume by 10am and close by 6pm daily.

On Thursday mornings in Lagos when traders open for 10am, there usually are lesser busses and cars on the road and getting to work is most times very smooth. The State could adopt this policy to cover certain markets with major traffic flow such that they open late daily.

Procure more BRT buses and expand the routes and let the Central Business Districts/Areas such as CMS, V/I, Lekki-Ajah, Ikoyi; with high density of business and worker (basically Lagos Island and third Mainland Bridge inclusive) should be run by only BRT. As opposed to queuing for them and wasting time, let the BRTs be coming say 10 minutes (but during rush hour in the morning and evenings, 5minutes)and let all their routes pass through all the business areas (Lagos island) and cater for transport on the Island. They will terminate their transportation into the mainland borders like Oshodi, Oworonshoki, Yaba. Let all yellow buses commute from these locations to all areas in mainland. These will reduce time spent on the road from the island because the yellow buses are too many and are a main source of traffic congestion.

Impose congestion charges in these central business districts mentioned above so only people who need to use their cars and probably it will encourage people sharing cars to the island to reduce the cost. Make it high say daily rate of N2000. This is because 80% of vehicles in Lagos traffic are private owned. Of that 70% have only one passenger (i.e., the

driver and probably the owner) is in the vehicle. This charge will serve as extra income and a deterrent.

The government needs to improve **enlightenment of the people**. In particular the Traffic Radio should be used to enlighten people across Lagos on using the Lagos ferry services, giving details about the routes, which should be well organised. In addition, ensure that safety jackets (life vest) are available for every passenger.

Conclusions

This working paper has examined traffic congestion in Lagos and has highlighted the socio-economic costs of congestion, including options for better managing the challenges so as to save the state from the losses associated with congestion. It highlighted government response to traffic congestion through initiatives that bother on the supply and demand side of reducing congestion. On the supply side, the government has embarked on road expansion and rehabilitation, including deploying personnel of LASTMA to manage traffic. \ government has strived to provide alternative means of transport through the BRT initiative and also expanding the use of water transport systems.

As alternative transport means are considered, road transport in Lagos will still be the most used on most routes in the immediate future and beyond making the recommendations in this direction relevant. The government and its agencies should continue consultations with officials, transport managers and everyone relevant to traffic solution in the state. Recommendations presented in this working paper are workable to a great extent, but are gradual and conditional requiring cooperation of every player; the Lagos Government, LASTMA, security operatives, road users and Lagos residents.

Bibliography

Bassey J. (2013). Lagos road congestion: Cable car system to the rescue. Available at <http://www.businessdayonline.com/NG/index.php/news/latest/51370--lagos-road-congestion-cable-car-system-to-the-rescue->

Greater Toronto Transport Authority (2008). *Costs of Road Congestion in the Greater Toronto and Hamilton Areas: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan*. Final Report; December 1, 2008.

Olaogbebikan, J E, I K Njoku, A E Seun and E Okoko (2013). *Traffic Management Problems in Lagos: A Focus on Alaba International Market Road, Ojo, Lagos State Nigeria*. *Journal of Economics and Sustainable Development*: Vol.4, No.4, 2013

Olorunpomi, G (2010). How Lagosians lose N150b to traffic yearly. Available at <http://www.nigerianbestforum.com/generaltopics/how-lagosians-lose-n150bto-traffic-yearly/>

Rao, A M and K R Rao (2012). *Measuring Urban Traffic Congestion A Review*. *International Journal for Traffic and Transport Engineering*, 2012, 2(4): 286 305

Stephen, D (2011) Lagos: Short term Traffic Solutions for the Long term. Available at <http://www.formspring.me/lagostraffic>

Ubogu, R. E. (1980). *Multiple solutions to traffic congestion*. Possible Application to Lagos Metropolitan Area.

Wikipedia (2013). Traffic congestion. Available at <http://www.en.wikipedia.org/>